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IMPACT ASSESSMENT

Accompanying the document

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on protective measures against pests of plants

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Acronyms

BTSF	Better Training for Safer Food programme
CAP	Common Agriculture Policy
CBD	Convention on Biodiversity
COP	Conference of Parties of the CBD
COPHs	Chief Officers for Plant Health
CPM	Commission on Phytosanitary Matters of the IPPC
CSF	Common Strategic Framework
EFSA	European Food Safety Authority
EPPO	European and Mediterranean Plant Protection Organisation
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FCEC	Food Chain Evaluation Consortium
GATT	General Agreement on Tariffs and Trade
IA	Impact Assessment
IAS	Invasive Alien Species
IPPC	International Plant Protection Convention
ISPM	International Standard on Phytosanitary Measures
ISSG	Inter-Service Steering Group
ISTA	International Seed Testing Association
IT	Information Technology
MS	Member State
NGO	Non-Governmental Organisation
NPPO	National Plant Protection Organisation
PHD	Plant Health Directive
PHR	Plant Health Regime
PRA	Pest Risk Analysis
PRM	Plant Reproductive Material
PZ	Protected Zone
RPPO	Regional Plant Protection Organisation
SME	Small and Medium-sized Enterprises
SPS	Sanitary and Phytosanitary Agreement under the WTO
TF	Task Force
TFEU	Treaty on the Functioning of the European Union
TRACES	Trade Control and Expert System
WPM	Wood Packaging Material
WTO	World Trade Organisation

Acronyms of consulted stakeholders' organisations are provided in the Annexes.

Section 1: Procedural issues and consultation of interested parties

1.1. Consultations

Member States

The Council on 21 November 2008 invited the Commission to proceed to an evaluation of the EU plant health regime (PHR) and to consider possible modifications to the existing legal framework and the impact of such modifications[1]. The Commission initiated a comprehensive evaluation of the regime from the introduction of the internal market (1993)[2] and contracted the necessary study out to an external consultant[3]. Member State (MS) experts participated in the Inter-Service Steering Group for the evaluation. A conference took place on 23-24 February 2010 to inform the stakeholders and MS on the progress of the evaluation and to consult them on the provisional options for the future developed by the consultant. The input received framed the final options and recommendations. The report of the evaluation[4] (Annex I) was presented in a second conference[5] on 28 September 2010 including stakeholders, the general public, and representatives of MS and third countries. Linked to this conference was a public consultation on the recommendations from the evaluation and the scope of the subsequent impact assessment.

In preparation for the impact assessment (IA), the options recommended by the external consultant were discussed with the MS in Council with the Chief Officers for Plant Health (COPHs)[6] and, as concerns the coherence with the Plant Reproductive Material (PRM) regime, the Heads of Service for that regime and the relevant Working Party[7]. Four task forces with MS experts and Commission were set up and twice convened[8] to further discuss the main areas of change. A fifth task force was set up[9] to discuss the inclusion of plant health controls in Regulation 882/2004/EC. Task force reports were approved by the Council Working Party of the COPHs, with whom final meetings on the foreseen changes and the impact assessment took place on 3-4 May and 7-8 June 2011. At the 3-4 May 2011 meeting, a consultation document concerning the strategic review options was launched. In addition, input for the consultations and position papers were received from several MS and data for the evaluation and IA were supplied by the

[1] Council of the European Union, 2906th Economic and Financial Affairs/Budget, Brussels, 21 November 2008. Council Conclusions on the Review of the EU Plant Health Regime (104228).
[2] Taking account of a previous evaluation of the financial aspects of the regime, completed in 2008.
[3] Food Chain Evaluation Consortium (FCEC), consisting of Civic Consulting, Agra CEAS Consulting (project leader), Van Dijk Management Consultants and Arcadia International.
[4] http://ec.europa.eu/food/plant/plant_health_biosafety/rules/docs/final_report_eval_en.pdf
[5] Opened by the Commissioner for Health and Consumers, the Chair of the Parliamentary Committee for Agriculture & Rural Development and the Belgian Presidency's Federal Minister responsible for agriculture.
[6] On 29 September 2010, 8 October 2010 (jointly with Heads of Service for Plant Reproductive Material), 8-9 November 2010, 30 November 2010, 1 December 2010, 3-4 May 2011 and 7-8 June 2011.
[7] On 8 October 2010 (jointly with the Chief Officers for Plant Health) and 13 December 2010.
[8] Remit of the Task Forces: List of harmful organisms, prioritisation, positioning of harmful organisms (TF1); Plant passport, protected zones and responsibility sharing (TF2); Import regime and surveillance (TF3); Emergency measures and solidarity (TF4). The Task Forces were convened on resp. 10, 17, 18 and 29 November 2010, 3, 14 and 16 February 2011 and 11 March 2011. TF3 was additionally convened on 27 May 2011.
[9] TF5 was convened on 26 May 2011.

MS to the external consultant. The MS were also informed on the review via the Standing Forestry Committee on 28 June 2011.

Stakeholders

Stakeholders (industry association representatives and NGOs) were consulted from the very start of the review process, prior to the initiation of the evaluation of the PHR[10], during the evaluation study and again during the preparation of the IA. An ad-hoc Working Group on Plant Health[11] was set up under the Advisory Group on the Food Chain, Animal and Plant Health. The progress was furthermore presented and discussed in the aforementioned Advisory Group itself[12], in other Advisory Groups[13] and on invitation in meetings of COPA-COGECA, EUROPATAT, ESA and UNION FLEURS[14]. Stakeholder consultation was a key element of the evaluation study and the supplementary economic study contracted out to an external consultant. The consultation concerned changes of the EU plant health regime itself as well as elements of the regime to be transferred to or from the PRM regime and the future *chapeau* EU regime on official controls[15] on food and feed, animal health and welfare, plant health and plant reproductive material.

The conferences organised during the review process ensured stakeholders' input and views concerning the recommendations and the scope of the impact assessment, both orally at the conferences and through the linked public consultation. A consultation on the technical change proposals was linked to the meeting of the Working Group on Plant Health on 18 February 2011 and targeted the preferred way forward for the changes with major impact. Consultations were additionally published on the dedicated web page[16] of DG SANCO. A final consultation[17] on the strategic options was launched on 13 May 2011.

Summary of the consultation of the interested parties

Throughout the evaluation, IA and policy making process interested parties' (MS and stakeholders) views have been sought in order to design the policy options and assess their potential usefulness and impacts. Annex X gives an overview of their positions and Annex XI lists the stakeholders that were consulted during the process and/or sent in opinion papers.

1.2. Data collection

The collection of data commenced with a comprehensive evaluation of the PHR by the external consultant from 2009 to 2010. The evaluation included an *ex post* analysis of

[10] On 9 December 2008.
[11] On 1 July 2009, 23-24 February 2010 (jointly with the Chief Officers for Plant Health) and 18 February 2011.
[12] On 29 May 2009, 4 December 2009, 26 March 2010, 17 February 2011 and 14 March 2011.
[13] Advisory Groups on Seeds (19 April 2010; 10 November 2010), Advisory Group on Cotton (11 June 2010), and Advisory Group on Floriculture and Ornamentals (9 November 2009; 18 October 2010; 12 October 2011).
[14] On 8 May 2009, 14 and 17 October 2009, 12 October 2010, 16 December 2010 and 27 January 2011.
[15] A recast of Regulation (EC) 882/2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.
[16] http://ec.europa.eu/food/plant/plant_health_biosafety/rules/index_en.htm
[17] The stakeholders were consulted through continuous targeted consultation of all known actors with possible interest, rather than a web-based public consultation, given the highly specialized nature of this policy area.

the regime for the period 1993-2008, the collection of economic data on costs and administrative burden for competent authorities and stakeholders stemming from the regime, as well as the development *ex ante* of options and recommendations for the future. The evaluation report was delivered in May 2010.

The internal process to develop the IA was further supported by a second contract with the consultant. This contract concerned a study on the quantification of costs and benefits of amendments to the regime, supplementary to the data that had been collected during the evaluation. The study consisted of modules addressing the *ex ante* assessment of the economic impact of specific technical options for the revision of the legislation. The scope of the issues to be addressed had been subject to stakeholder consultation. The modules were set up in such a way that aggregation was possible to potential overall policy options. In July 2011, the final report of the study (Annex XII) was delivered by the consultant. Where necessary further information was gathered from the literature, study reports and queries to assess the key impacts the change in policy would have. Furthermore, the social and environmental impacts of the policy options were assessed by Commission's services.

The data gathered as described above are used and referenced throughout the IA, along with data from the scientific literature and reports of studies carried out for the Commission and the MS in relation to harmful organisms (pests of plants) and invasive alien plant species and their impacts.

1.3. Inter-Service Steering Group

A Commission Inter-Service Steering Group (ISSG) on the IA for the revision of the legislation was established. The group was led by DG SANCO with the participation of the following Commission Directorates General and Services: Agriculture and Rural Development, Budget, Environment, Enterprise and Industry, Research and Innovation, Taxation and Customs Union, Trade, Legal Service and the Secretariat-General. The group met on 6 December 2010 (planned approach and problem analysis were discussed), 15 April 2011 (report from the contractor on progress, collection of data and a first draft of the impact assessment were discussed) and 26 September 2011 (exchange of views on draft final impact assessment report). Final comments received from the ISSG members were incorporated as appropriate.

1.4. Follow-up of recommendations of the Impact Assessment Board

The IA was discussed at a meeting of the Impact Assessment Board on 14 December 2011. The recommendations of the Board prior to the meeting in its quality checklist and following the meeting in its opinion have allowed improving the report. Firstly, the revised IA report further clarifies the budgetary implications of co-financing direct operator losses due to action to tackle EU priority pests. As requested, Annex IX now provides further details on the level of those costs, the respective rules for Union co-financing and capping of those costs and the mechanisms to cope with high demand, the modalities to allow operators to obtain the financial compensation, and the interplay with the listing of priority pests. Secondly, the report further underpins the need for Union financial support for early detection and eradication of pest outbreaks. Thirdly, the report explains the extent to which smaller firms could use approaches suitable to their size. Fourthly, the differences between invasive alien plant species and harmful organisms (pests) of plants and the implications for their management are clarified.

Section 2: Problem Definition

2.1. Background

2.1.1. Rationale for the EU plant health regime

Plant health is a key factor for sustainable and competitive agriculture, horticulture and forestry. Healthy seeds and propagating material are required for profitable crops and ensuring jobs, plant innovation and food security[18]. In the case of trees and shrubs, protecting plant health is essential for the preservation of the Union's forests, landscape and public and private green. As a rule, organisms (insects, fungi, nematodes, bacteria, viruses) that are injurious to plants co-evolved with host plant species on their own continent, where they cause mild damage and can be managed by good agricultural practices such as crop diversification, rotation, resistant plant varieties and the use of plant protection products (pesticides). However, these approaches are often insufficient to address pests and diseases from other continents, against which European plants and trees usually lack genetic resistance (no co-evolution) and for which no natural enemies occur in Europe. When introduced into Europe, such pests and diseases cause severe economic damage and reduce the growth of agriculture: they jump to previously unaffected and even entirely new host species, spread fast across countries, and cause lasting yield reduction and permanently increased costs for production and control. The often severe economic losses undermine the profitability and competitiveness of agriculture and forestry and put additional burden on Member State (MS) expenditures. In addition, the establishment of new pests and diseases often elicits trade bans from third countries, causing further damage (economic, jobs) to EU exports.

Therefore, the first objective of the EU plant health regime (PHR) is to protect European agriculture and forestry by preventing the entry and spread of non-native harmful organisms (pests and pathogenic micro-organisms). The main tool hereby is Council Directive 2000/29/EC, which also reflects international trade agreements in this area. The PHR secures safe trade by the establishment of EU import requirements and intra-EU movement conditions for plants and plant products[19]. Outbreaks of the listed organisms have to be eradicated or, if that is impossible, contained to protect the rest of the EU territory. A second objective of the regime is to ensure the availability and use of healthy plant material at the beginning of the chain of plant production by preventing the spread of harmful organisms with seeds and planting material. This objective is shared with the EU regime for plant reproductive (planting) material. Healthy planting material is critical for organisms (e.g. viruses) against which no pesticides are available. Where available, pesticide use is mainly restricted to agriculture, horticulture (applications in forestry are very limited) and gardens and may bring along environmental and human health risks.

The EU PHR is unique in that it is an open regime: movements of plants and plant products into and within the EU are allowed on condition that specific restrictions and requirements are respected (e.g. provenance from a pest free area or appropriate treatment). The high volumes of imports from other continents (Annex VI) nevertheless

[18] The Great Famine in Ireland in the 19th century was caused by the introduction of a potato pest new to Europe. Today, food supplies crops worldwide continue to be threatened by pest and disease outbreaks and the threat increases rather than decreases (Bruce, 2010).

[19] Securing export potential is not an objective of the PHR. The success of the regime however impacts on the possibilities to export EU plants and plant products to third countries with similar quarantine requirements.

imply a high probability of future outbreaks of alien harmful organisms. The PHR is therefore indispensable both for protecting the health, economy and competitiveness of the EU plant production sector as well as for maintaining the Union's open trade policy.

There are close analogies between the PHR and the EU animal health regime, which have similar objectives and intervention logic (stamping out)[20].

2.1.2. International legal framework

The international framework for regulatory plant health is the *International Plant Protection Convention* (IPPC; Annex III), to which the EU and the MS are contracting party. The *WTO Sanitary and Phytosanitary Agreement* (SPS; Annex IV) recognises the right of WTO members to decide on the appropriate level of protection of plant life or health, while setting out rules how that level may be achieved without undue interference with trade. The *Convention for Biological Diversity* (CBD; Annex V) aims to prevent the introduction and spread of invasive alien species (IAS) in general, including non-native pests of plants. Reversely, the IPPC definition of 'pest' (the equivalent for 'harmful organism' in the EU legislation) includes invasive alien *plant* species, i.e., a subset of the IAS covered by the CBD. Since 2004, the CBD and IPPC officially cooperate to promote synergy and avoid overlaps and unnecessary duplication. No IAS plants have been regulated so far under the PHR other than parasitic plants.

2.1.3. The Plant Health Directive

The main instrument of the PHR is Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products[21] and against their spread within the Community (hereafter: Plant Health Directive). It is a consolidation of the initial Council Directive 77/93/EEC that dates back to 1977, when the import requirements of the MS were harmonised while plant health controls were maintained for movements between MS. Major updates:

- At the creation of the internal market (1993), border controls between MS were abolished, including those for plant health. A fundamentally new system was developed to balance the free trade of plant material across the EU and the protection of parts of the EU that should remain free from harmful organisms occurring elsewhere in the EU (the 'protected zones' (PZ)). To this end, a document ('plant passport') was introduced to accompany plant material moved between MS, replacing the phytosanitary certificate foreseen under the IPPC. The passports also have to be used for movements inside a MS. Official controls on plant passports were now to be made at the source (operator premises) instead of the border or destination and a registration obligation was established for operators handling regulated plant materials;
- An EU co-financing system was put in place in 1997 for the costs of control and

[20] The PHR however regulates far higher numbers (thousands) of plants and harmful organisms and combinations of these and, other than for animal diseases, a world-level list of quarantine pests does not exist. The PHR has a wider impact as regards the environment but in principle does not relate to human health. The timeframe is longer: while culled animals can be replaced, felled forests may require decades to recover. The economic relevance is similar (EU crop production in 2009 €175 billion, animal production €136 billion).

[21] Plants are defined as living plants and specified parts thereof (seeds, fruit, vegetables, cut flowers, etc.). Plant products are defined as products of plant origin, unprocessed or having undergone simple preparation.

eradication of harmful organism outbreaks (Council Directive 97/3/EC);

- The import regime was reinforced in 2002, on which occasion the scope of plant material subject to import controls was expanded, a system for reduced frequency checks was created as well as an obligation to levy fees for import controls.

The scope of the Plant Health Directive includes requirements concerning:

- Import and intra-EU movements of plant material and harmful organisms (including plant passports and protected zones);
- Surveillance, notification, eradication and containment of outbreaks (including a framework for emergency measures);
- Financial measures.

The EU plant health regime is an open regime. Movements of plants and plant products into and within the EU are allowed on condition that specific restrictions or requirements are respected. This relates to import (prohibitions of specific high-risk plant materials; conditions to be fulfilled and attested on the phytosanitary certificate for others) and intra-EU movements (plant passporting requirements, with a special variant for protected zones). The Plant Health Directive does not cover export[22], other than setting out the format of the phytosanitary certificate (the IPPC format) that is to be used for export certification, which otherwise is the responsibility of the MS.

As concerns the harmful organisms covered, the Directive in its Annexes lists the particularly dangerous harmful organisms against which official measures shall be taken. In order to be able to take measures against outbreaks of new, as yet unlisted harmful organisms, the scope of the Directive allows covering any harmful organism if justified by its potential socio-economic and environmental impacts. National measures concerning non-listed harmful organisms shall be notified to the Commission and the other MS, justified by a Pest Risk Analysis (PRA) and subsequently harmonised at EU level or rescinded. Measures should not be taken against harmful organisms of minor importance (no justification under IPPC and SPS) or widespread harmful organisms where territorial protection is not relevant. The scope of the Plant Health Directive does not include the official control of widespread harmful organisms (for example native pests and pathogens)[23], which are to be managed by good agricultural practices such as crop diversification and rotation.

At its update on the occasion of the creation of the internal market, the Plant Health Directive was designed to focus on the movements of plants and plant products and the eradication or containment of outbreaks. The spread of harmful organisms other than by movement of consignments (natural spread) was explicitly excluded from any EU co-financing, even though the mandatory eradication and containment of outbreaks would often require acting against follow-up outbreaks resulting from natural spread.

The provisions in the Plant Health Directive impose obligations on the MS to transpose and implement the Directive and officially control compliance. The Directive imposes indirectly restrictions on private operators, subjects them to official controls for which fees may (plant passport) or shall (import) be levied and subjects them to measures

[22] Data from surveillance under the PHR for regulated harmful organisms may however be used to clarify the EU pest status for those organisms.

[23] The regime does not include such harmful organisms even when operators take measures against them for export purposes to third countries where these pests and pathogens are prohibited from entry.

upon findings of regulated harmful organisms. It does not provide incentives for compliance. Private operators may however be authorised to issue plant passports under official supervision, and private laboratories may be authorised for official analyses under official supervision.

2.1.4. The Control Directives for potato

With respect to four specific, internationally recognised regulated pests of potato, Control Directives were adopted, two of which antedate the Plant Health Directive. Control Directives for potato cyst nematodes and potato wart disease were adopted in 1969, followed by Control Directives for potato ring rot (1980) and potato brown rot (1998). These harmful organisms occur in several MS and cannot be completely eradicated from the Union territory. The objective of the Control Directives is to control (contain) the presence of the regulated harmful organisms in infested fields, thus mitigating the risk of further spread in the EU. The four harmful organisms are also listed in the Annexes of the Plant Health Directive.

2.1.5. The Marketing Directives for plant reproductive material

Plant reproductive material is the cornerstone for agricultural production. Therefore, ensuring the availability of PRM of sufficient quality and health is crucial for the production of food, feed and other agricultural commodities. The PRM legislation is based on the registration of varieties and the certification of PRM lots. It consists of a horizontal Council Directive on the Common Catalogue of varieties of agricultural plant species and 11 vertical Council Directives on the marketing of commodities of seed and propagating material. About 200 harmful organisms are regulated which may be widespread in the EU, but impact on quality and can usually not be detected visually (market failure). Some of these overlap with those regulated under the Plant Health Directive and the Control Directives for potato. Under the IPPC, these harmful organisms are called Regulated Non-Quarantine Pests.

Plant health controls are part of the certification system of the Marketing Directives, which leads to issuance of a certification label which may be combined with the plant passport issued under the Plant Health Directive. Certification is based on a systems approach consisting of field inspections during the season and inspections on lots prepared for marketing, including mandatory laboratory testing. Equivalence agreements have been concluded with specific third countries, under specific certification schemes, in which case no systematic import controls are in place. In absence of equivalence, the import into the EU is prohibited or temporarily allowed under specific requirements. For the implementation of those Directives that foresee process control, like in the Plant Health Directive, private operators have to be registered and authorised. In some MS but not in others, the competent authorities for PRM coincide with those under the Plant Health Directive. The responsibilities of operators are similar to in the PHR, although differences exist in relation to the possibilities for official delegation of tasks. Laboratory testing of seed is carried out using the protocols of the International Seed Testing Association (ISTA). The PRM regime is under review, including improvement of the coherence with the PHR. Changes in arrangements between the two regimes are addressed in this impact assessment.

2.1.6. Regulation (EC) No. 882/2004 on Official Controls

Regulation (EC) No. 882/2004 provides a harmonised framework of general rules for the official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules. Certain aspects of this Regulation already apply to the plant health sector and in particular those concerning the establishment of multi-annual control plans and Union inspections in MS and third countries. A recast of the Regulation is being developed which will cover fully also PHR and PRM controls. The horizontal principles of the amended Regulation will replace those in sectoral legislative acts. The present impact assessment addresses the changes in the traditional pillars of the PHR, also if specific provisions (for example fees) will be absorbed by that Regulation. This is essential since the PHR review concerns the functioning of the regime as a whole.

2.1.7 The development of an EU Strategy on invasive alien species

Invasive alien species are organisms (animals, plants, microbes) that are introduced accidentally or deliberately into the EU where they are not native. They represent a serious threat to native plants and animals in Europe which needs to be addressed if the EU is to achieve its goal of halting the decline of biodiversity by 2020. IAS cause some EUR 12.5 billion worth of damage each year in the EU[24]. The Commission published a Communication[25] "Towards an EU Strategy on Invasive Species" in December 2008 and noted that while some EU instruments exist to deal with other drivers of biodiversity loss, there is currently no comprehensive instrument at EU level to tackle IAS, although action has been taken at EU level to address certain aspects of this threat. The European Commission adopted its EU post-2010 biodiversity strategy[26] in May 2011, including a target dedicated to IAS: "By 2020, IAS and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS". Two actions have been identified to support this target (scheduled for 2012): (i) to integrate additional biodiversity concerns into the plant and animal health regimes; and (ii) to fill policy gaps in combating IAS by developing a dedicated legislative instrument. The current review of the PHR aims to reinforce the Union's protection against invasive pests and pathogens, while where possible contributing to wider biodiversity goals.

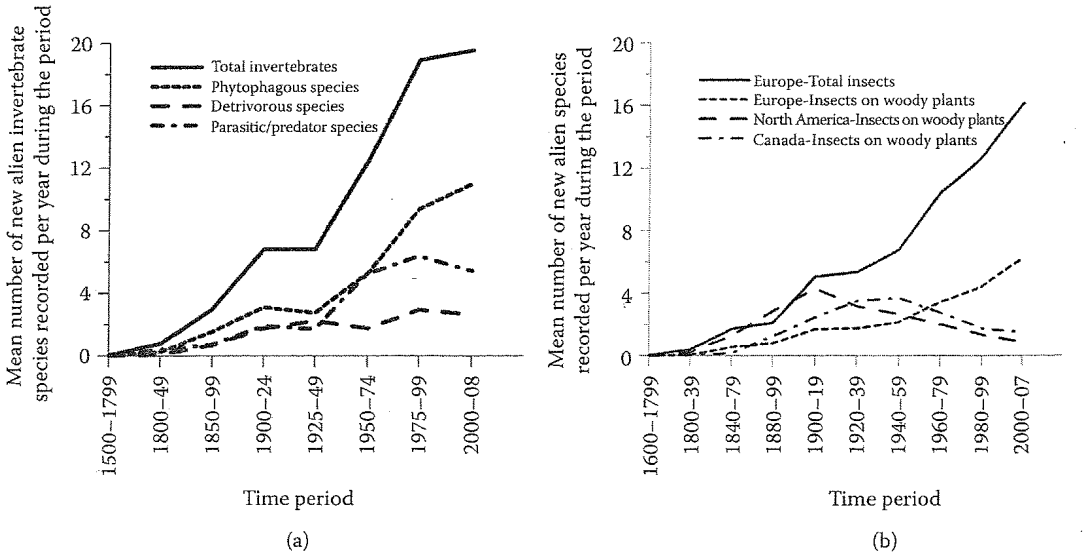
The future IAS legislation will not cover pests and pathogenic microbes of plants and animals, as these are covered already by the PHR and the EU animal health legislation, but will close the existing legislative gap for other invasive organisms such as introduced grey squirrels and tiger mosquitos (a vector of dengue and other human diseases). Depending on the outcome of the review of the PHR, the IAS legislation would or would not also cover invasive plants, such as water hyacinths and ragweed. Invasive plants differ from the harmful organisms regulated under the PHR in that they do not cause direct harm to plants, like pests and diseases do, but compete with other plants for nutrients and space. Invasive plants may affect not only terrestrial but also aquatic and marine ecosystems, which are presently not dealt with by the PHR. Both the harmful organisms currently regulated by the PHR and invasive plants require import prohibitions and restrictions to protect the EU territory. However, the strict eradication measures of the PHR ("stamping out") may not be suitable for invasive plants in natural habitats, where management by suppression may be more appropriate.

[24] European Commission, *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*.
[25] http://ec.europa.eu/environment/nature/invasivealien/docs/1_EN_ACT_part1_v6.pdf
[26] http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/1_EN_ACT_part1_v7%5b1%5d.pdf

Also, restricted local release of invasive plants may be justified in certain cases (for example gardening) while the release of regulated pests and pathogenic microbes should be fully prohibited. There are pros and cons for including invasive plants in the future PHR.

2.2. Problem identification

Since its creation in 1977, the PHR successfully protected the EU against the introduction and spread of many pests (e.g. potato and citrus pests). The situation has however changed due to the on-going globalisation of trade, resulting in ever increasing imports from new parts of the world. This has led to a sharply increased influx of new harmful organisms, especially in the last decade. Europe increasingly fails to stop that influx where North America succeeds relatively well (see graph below)[27]. The problems are being exacerbated by climate change, which allows new pests to establish and thrive that previously did not survive in the EU as well as higher vulnerability of EU crops and forests to alien pests (e.g. Robinet et al., 2011). The EU is thus confronted with an increased risk of entry of pests, increased opportunities for their establishment and spread, and increased vulnerability of agricultural and natural ecosystems (including forests). The enlargement of the EU has moreover resulted in a wider diversity of climates, agricultural cropping systems, forest types, landscapes and natural habitats, often differing in sensitivity or resilience to harmful organisms which leads to even more significant and wider impacts at EU level. Indeed, globalisation of trade, climate change and evolutionary adaptation of harmful organisms to new host plants are being considered major drivers of the increasing problems with plant pests and diseases (Waage et al., 2007).



Temporal changes in new records per year in Europe of alien invertebrates. (a) Total number of alien invertebrates. (b) Total number of alien insects associated with woody plants in Europe compared to North America. Source: A. Roques, Invasive patterns of alien terrestrial invertebrates in Europe (in: Pimentel, 2011).

[27] It should however be noted that the US does not have an equally open regime for plant material imports. While a closed system indeed offers more effective protection than the EU open system, a transformation of the PHR to a closed system would cause unacceptable damage to the EU economy. This underlines the importance of the measures proposed in the current revision, which will strengthen the PHR while maintaining its open character.

Major outbreaks in the past decade of dangerous import-related harmful organisms affecting forestry (e.g. pine wood nematode, citrus longhorn beetle, red palm weevil) have raised societal and political awareness of the costs and impacts of inadequate protection. The evaluation of the PHR (2010) has shown that the regime has to adapt in order to be able to fully address these increased risks and recommends to modernise it through more focus on prevention, better risk targeting (prioritisation) and more solidarity (moving from a MS based to EU approach for joint action to tackle risks of EU significance). A mismatch between currently available resources and targeted objectives is reported to underpin many of the identified shortcomings and weaknesses. The need is underlined for a reinforced financial instrumentation to ensure better preparedness in case of emergency.

The main problems identified relate to insufficient focus on prevention in relation to increased imports of high-risk commodities, the need for prioritising harmful organisms at EU level across all 27 MS, the need for better instruments for controlling the presence and natural spread of pests in case they eventually reach the Union territory, and a need for modernising and upgrading the instruments concerning intra-EU movements (plant passports and protected zones), and a need to foresee additional resources. The science base of the regime (research, laboratories) also needs to be reinforced. These problems should be addressed to reinforce the positive cost-benefit balance of the current regime in the long term. Failure of regulatory action against outbreaks would undermine the credibility of those actions, discourage investments in the regime and stimulate MS to give priority to short-term national interests above EU priorities (vicious circle). This would damage the EU economy as a whole.

Pine wood nematode

The pine wood nematode (PWN), *Bursaphelenchus xylophilus*, is a serious pest of conifers, vectored by bark beetles. It is native to north America, where it does little harm to pine trees (co-evolution). It spread to southeast Asia in the early 20th century where it caused mass mortality of forests in Japan, China, Korea and Taiwan. Its main spread to new areas is with infested wood. To offer protection against wood-vectored pests, the IPPC developed the International Standard for Phytosanitary Measures No. 15 concerning appropriate treatment of wood packaging material.

An outbreak in Portugal in 1999 led to EU emergency measures for PWN eradication. Despite these, PWN spread within Portugal, the continental part of which is now considered infested as well as Madeira. Three outbreaks occurred in Spain which are being eradicated with large-scale felling (in a radius of 500-3000 m around the infested trees), monitoring and testing. The area at risk in the EU is 13 mio hectares of coniferous forest in southern Europe where 50-90% mortality is predicted (valued at EUR 39-EUR 49 billion) (FCEC, 2011). Spread of PWN would additionally impact on central European forests and on exports from Scandinavian forests.

Red palm weevil


The red palm weevil, *Rhynchophorus ferrugineus*, is an extremely damaging pest of a wide range of productive and ornamental palm trees. The pest reached the EU with infested planting material from third countries. Red palm weevil has spread across most of the Mediterranean where it has killed thousands of palms. The impact of the pest in the EU is estimated to have reached at least EUR 50 mio in containment and eradication costs for the MS competent authorities alone and to have involved the destruction of at least 65,000 trees, which is only a fraction of those infested. On the basis of the destroyed palms alone, the value of the trees lost is estimated at EUR 65-EUR 195 mio, on the basis of the infested palms, EUR 96-EUR 288 mio (FCEC, 2011). The red palm weevil threatens the survival of three endemic, endangered palm species in Europe: *Phoenix theophrasti* in Crete, *P. canariensis* in the Canary Islands, and *Chamaerops humilis* in the western Mediterranean region.

2.2.1. Insufficient focus on prevention in relation to imported high-risk organisms

The evaluation has shown that the instrumentation of the regime has shortcomings as concerns prevention of the entry, establishment and spread of import-related high-risk organisms. The Plant Health Directive in its current form addresses risks related to imports from third countries by prohibitions of the import of some plant species and specific requirements for numerous other plants and plant products. Detailed rules exist on official import controls. The instrumentation for the follow-up, including surveillance, contingency planning, rapid outbreak eradication and containment, is weak should a harmful organism have gone unnoticed during import inspection. It consists mainly of the obligation to notify outbreaks and take the necessary measures, along with a possibility to adopt national and EU emergency measures. No general surveillance obligation exist. The evaluation report recommends introducing mandatory general epidemio-surveillance at EU level for priority HOs and co-financing to improve surveillance. EU co-financing is currently limited to costs for eradication and containment. For many years the EU budget was EUR 1 million per year; for 2011 EUR 12 million was allocated[28]. So far, the EU has not co-financed losses of private operators for destroyed plant material following official measures (contrary to the policy for culled animals under the EU animal health regime[29]). This is a disincentive

[28] The budget sharply increased in recent years due to measures necessary to eradicate and contain pine wood nematode outbreaks in Portugal and Spain as well as outbreaks of the red palm weevil and longhorned beetles.

[29] The annual EU budget under the EU animal health regime for compensating farmers for losses of culled animals varies from €10 million to, in exceptional cases, almost € 1 billion. The objective is to allow MS to provide swift and adequate compensation of the livestock farmers for the costs of slaughter and destruction of animals and animal products, contaminated feed and equipment, cleaning and disinfection. Consequential losses from marketing and movement restrictions are not compensated but can be insured, with EU co-financing through the Common Agriculture Policy.

for growers to notify outbreaks of regulated harmful organisms and comply with the measures, while eradication measures need to be taken in the very early phase of invasions when infestations are still small (Pluess et al., 2012).

Costs of late detection of outbreaks due to lack of surveillance

Pine wood nematode was detected in 1999 in Portugal in the Setubal peninsula. At the time of detection, > 500 000 hectare of forest proved already infested (the PHR does not oblige MS to carry out systematic surveys for new harmful organisms). Up to 2011, the Union granted EUR > 38 million to eradicate the pest in Portugal. Eventually, eradication proved impossible and the pest is now under containment.

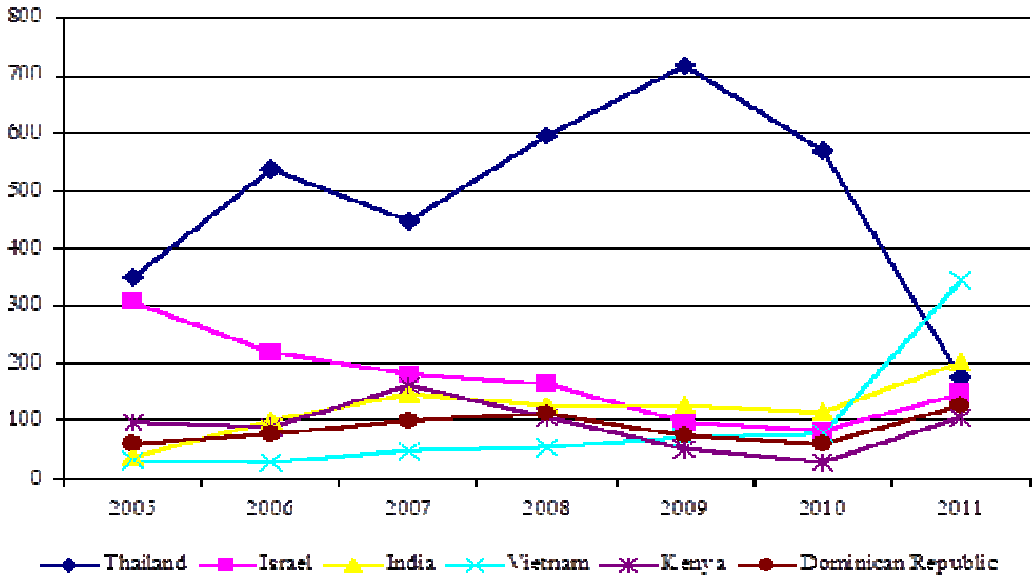
Three isolated PWN outbreaks subsequently occurred in Spain, close to Portugal. They were immediately identified and successfully eradicated by large-scale felling of forest. This was achieved with a Union support, up to 2011, of below EUR 5 million.

Successful eradication of the citrus longhorned beetle

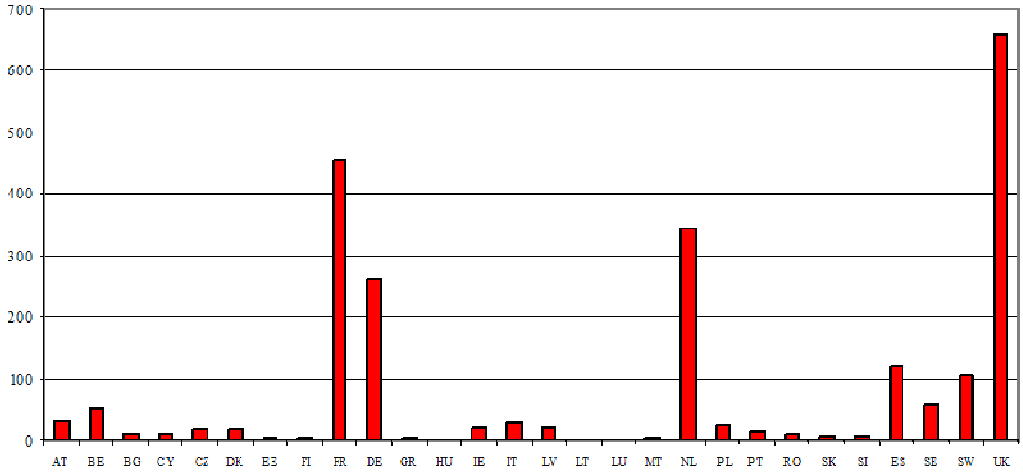
The longhorned beetles, *Anoplophora chinensis* (citrus longhorned beetle) and *A. glabripennis* (Asiatic longhorned beetle), affect a wide range of deciduous (broad-leaved) tree species. Pest risk analysis has shown that the potential economic and environmental impact of both CLB and ALB is high to massive. In their home range, these beetles have caused the death of millions of trees. Outbreaks of longhorned beetles in the EU have been related to the import of infested live woody plants.

The citrus longhorned beetle was detected in Boskoop (Netherlands), a leading area of European nursery stock production in December 2009. This concerned two larvae and one exit hole in a *Carpinus* tree in a hedgerow of a nursery in the town centre, linked to ornamental trees imported from Asia. Thanks to a massive intervention in a radius of 2 km surrounding the finding, confirmation of pest eradication was ascertained by the end July 2010. This required clear-cuts of all susceptible host plants in a radius of 100 m from the infested tree, systematic monitoring of all private and public green and large-scale destructive sampling of nursery stock in the buffer zone. The clear-cut included removal of plants and roots of at least 316 trees, 809 square meters of hedge, 241 large shrubs (1.5 m or higher) and 1291 small shrubs (smaller than 1.5 m) as part of public and private green. Examination of each plant did not result in any further signs of the pest. In the nurseries in the 2 km buffer zone in total 85,000 plants were cut and inspected for the presence of larvae of the citrus longhorned beetle inside the stem, not resulting in any findings of the harmful organism. The Union granted EUR 1,08 million to co-finance the costs of the measures.

Horizon scanning for emerging risks is not specifically addressed in the regime. Problems exist with high-risk trade from third countries, in particular plants for planting. Many major outbreaks of the last decade stemmed from imports of such material, carrying latent pests and diseases which could not be detected at import but only after considerable time, when the organisms had spread and eradication had become very difficult. Furthermore, passenger luggage, currently exempted from the import prohibitions and restrictions and border controls, has shown to be a source of influx of prohibited regulated harmful organisms[30].



Third countries with the largest number of interceptions in trade to the EU, 2005-2011 (Source: FVO).



Numbers of interceptions by Member States concerning the presence of harmful organisms in commodities imported from third countries, 2011 (Source: FVO).

[30] The introduction of small quantities of plants for gardening, potentially infested with dangerous pests, can start unnoticed epidemics. For example, orchids with regulated pests from Thailand are being found by Member States. All major countries worldwide (e.g. US, Japan, Australia, New Zealand) regulate plant material in passenger luggage.

2.2.2. Need to focus on harmful organisms of EU priority

The evaluation has shown that the PHR does not adequately allocate the available resources to the major EU risks. The Plant Health Directive classifies the 250 regulated harmful organisms in two Annexes divided into Parts and Sections in relation to the plant material covered and presence in the EU, without prioritising them according to risk or impact. In practice, MS allocate resources as they see appropriate and priority may be given to national interests[31] above EU priorities. Harmonisation can be promoted through EU emergency measures, which have been put in place for 11 organisms, or through Control Directives which only exist for harmful organisms of potato[32]. This may however be at the expense of preventive actions against organisms that may be equally dangerous but have not yet led to outbreaks.

While the PHR needs a mechanism to ensure that priority is given to the interests of the Union as a whole, it also needs a flexible system for risk-based de-prioritisation. Organisms regulated under the PHR may become established and spread to an extent that territorial protection is no longer justified. In such cases amending their status to quality pests under the PRM regime or de-listing may be appropriate. This rarely happens. The Commission in 1991 listed 24 organisms as candidates for transfer from the Plant Health Directive to the Marketing Directives, of which by 2011 only one had been deregulated[33]. A major obstacle is the coverage of harmful organisms under two EU regimes, with separate Competent Authorities at MS level and separate Standing Committees at EU level. De-listing in the Plant Health Directive simultaneously with inclusion in the Annexes of the Marketing Directives requires two Commission Decisions. The lack of a common policy on harmful organisms and joint decision making has resulted in a lack of timely status change and double listing of organisms.

2.2.3. Need for better instruments for controlling presence and natural spread of pests

If a listed harmful organism is detected in a part of MS territory in which it was unknown, the MS shall take all necessary measures to eradicate the pest or, if that is impossible, inhibit its spread. Measures taken concerning outbreaks originating from natural spread are however not eligible for EU co-financing. The emphasis on movements of host plants rather than natural spread of pests reflects the history of the regime, which was shaped to protect agriculture and horticulture while at the same time supporting the creation of the internal EU market. Natural spread of harmful organisms in relation to eradication can temporarily be addressed in EU emergency measures by Commission Decisions. Control measures to permanently contain regulated organisms that could not be eradicated have to be laid down in Council Directives, which requires considerable time, disproportionate to the urgency of the matter.

Natural spread can in practice not be separated unambiguously from spread with movements (e.g. hitch-hiking insects in an airplane or truck not carrying plant material). Excluding natural spread from EU co-financing is a disincentive to action by the competent authorities and has undermined the success of eradication and containment measures[34]. Where forests and the landscape are affected, natural spread is often even

[31] For example: surveillance and controls for organisms relevant to national production; maintenance of protected zones to support the export position of national growers.

[32] Outdated Control Directives exist for carnation leaf-roller and San José scale but will be repealed.

[33] In the same period, 16 new organisms were added to the Annexes of the Plant Health Directive.

[34] An example is the Emergency Decision for the Western Corn Rootworm, *Diabrotica virgifera*, in maize. The lack of EU co-financing for outbreaks outside the Buffer Zone if due to natural spread

the key factor which cannot be excluded. The interests of society have moved from a private to a public good emphasis: the protection of the natural environment, landscape and public and private green (the concepts of "greening" and "ecosystem services").

2.2.4. Need to modernise and upgrade the instruments of the intra-EU movements regime

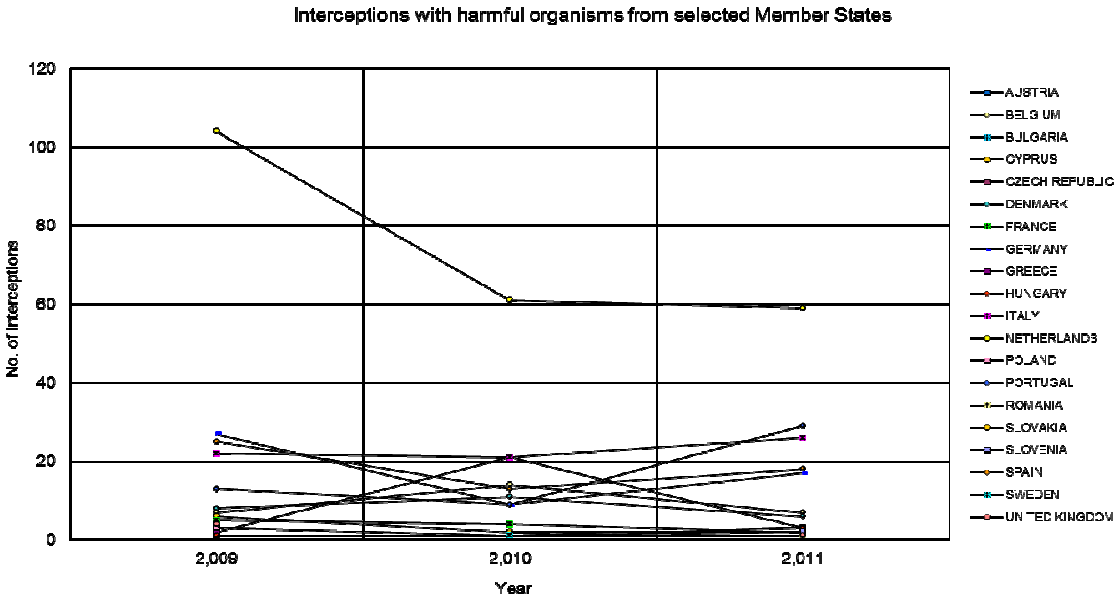
The evaluation expresses concern about the credibility of the plant passport and protected zone systems. These were at the core of the 1993 review and created to balance free trade (movement) of plants and plant products within the EU with protection of certain pest-free zones in the EU against spread of pests with such commodities coming from other MS. Plant passports were created to replace phytosanitary certificates, previously issued by the Member States, for intra-EU trade on the single internal market. Protected zones were created to accommodate the unequal presence of certain harmful organisms across the EU (regionalisation). Plant material moved into a protected zone requires a specific "Zona Protecta" plant passport linked to enhanced phytosanitary safeguards. Enterprises within protected zones have competitive advantages over operators outside those zones, which have to meet higher standards to send plant material to the protected zones, and they have competitive advantages for export to third countries as they can attest that their material originates in a pest-free area.

The problems with the plant passport relate to its limited scope, lack of harmonisation of its format, ambiguity in its use as a traceability tool and overlap in use with the certification label of the PRM regime. Operators ask for more room for self-controls and issuance of the label under official supervision and for full responsibility for ensuring traceability of lots (rather than including such information on the plant passport). This would allow them to save costs. They perceive the role of private sector in the PHR in relation to the plant passport as more restrictive than for the certification label of the PRM regime. Unnecessary burden stems from coherence problems between these regimes, e.g. the positioning of harmful organisms in two regimes, one for territorial protection and one for ensuring quality, legally prohibits the inclusion of territorially regulated pests in the EU certification schemes for quality pests, while this would enhance effectiveness and reduce burden. Finally, unequal implementation between MS (fees, room for self-control) distorts the level playing field.

Several problems with the protected zones are due to MS failure to apply the legal measures and not flaws in the concept *per se*. There is evidence of failure to carry out surveillance and report the results and failures in the implementation of the PZ plant passport system. This is possible because the wording of the obligations is too general and does not fix how to manage outbreaks. The status of protected zones is thus regularly maintained despite multiple outbreaks, counter to the aim of the legislation. The zones are in such cases perceived by the private sector as a distortion of competition[35].

(flight) of the beetle prompted MS to stepwise move the Buffer Zone to include the new outbreaks. Refraining from drastic outbreak measures saved the affected farmers' income but the Buffer Zone steadily moved westwards across Europe. This has considerably reduced the benefits of the measures (the costs of non-action are €475 million per year; Wesseler & Fall, 2010). Problems also exist with the unbalance of costs (on MS with outbreaks) and benefits (for MS that are free from the pest), for which insufficient EU compensation is possible.

[35] According to the evaluation, the general perception is that protected zones were not designated only on technical grounds but that significant commercial/political considerations are also present.



Number of interceptions of harmful organisms in trade between Member States (EUROPHYT)[36].

2.2.5. Erosion of the science base of the regime

The PHR was developed in decades where adequate support from R&D and laboratories was available, while since then severe erosion has taken place of the science base for the regime. A major shift has occurred in the academia from classical biological disciplines (plant pathology, taxonomy) to molecular-biological sciences and biotechnology. Molecular diagnostics however cannot replace classical diagnostic expertise but are supplementary. The erosion of the science base of the PHR creates risks as concerns the continuity of the regime in terms of the technical justification of legal provisions[37] and measures and rapid and reliable diagnosis. A solid legal base for official plant health laboratories, as provided by Regulation (EC) 882/2004, is lacking. The need for scientific support for policy development and for diagnostic laboratories via the establishment of EU reference laboratories for plant health will be addressed under the review of Regulation 882/2004 and via the Horizon 2020 programme.

2.2.6. Lack of resources for the regime

The initial absence of co-financing from the regime reflects its supposed private good nature, assuming that measures against harmful organisms would be good agricultural practice and costs from such measures should therefore be considered a risk inherent to entrepreneurship. The initial private good nature of the EU plant health regime links to a low level of public awareness and a low political profile. This is reflected in a low level of resources and cuts in staff and budget of MS competent authorities. The outbreaks in forests and public and private green in the past decade have highlighted the public good aspects and demonstrated the political need for public (EU) financial compensation. Although the EU budget available to the regime has increased from EUR

[36] No figures are available in EUROPHYT concerning notifications relative to MS intra-EU trade volumes, which strongly influence the absolute numbers of notifications shown in this graph. For example, the exceptionally large share of The Netherlands in import, intra-EU movement and export influences the total number of outbreaks.

[37] EFSA set up a Panel on Plant Health in 2006 to provide in scientific opinions concerning plant health risks. The Panel draws on the expertise available in the field in Europe.

1 mio to EUR 12 mio (for 2011), the level available is too low to cover the needs. Budget is lacking altogether for co-financing of mandatory EU surveillance and operator losses from destruction measures. In essence, the lack of resources is due to a lack of awareness of the benefits of short-term actions to safeguard the long-term interests of the Union (lack of recognised justification of the regime) and market failure (public goods, externalities, information asymmetry).

2.2.7. Inconsistent implementation of the regime

Implementation of the regime has been hampered by a lack of appropriate instruments and resources, resulting in failure of actions concerning outbreaks. MS may give priority to short-term national interests above EU priorities, taking the advantages and opportunities for specific harmful organisms relevant to them (e.g. protected zones) and avoiding the disadvantages and costs of action (e.g. surveillance and eradication measures) for others which are not directly relevant to them. This hampers the effectiveness, reliability and credibility of the regime and the level playing field (the unequal levying of fees being a special case, in particular for plant passports where no fee obligation exists as yet). The current Directive contains minimal obligations concerning eradication of outbreaks and none on surveys, other than for the recognition of protected zones or in the case of emergency measures. On its own, enforcement by the Commission of the implementation by the Member States of the Directive, through infraction procedures, will not address the fundamental problems of the regime. Financial incentives need to be introduced to stimulate growers to notify outbreaks and to stimulate Member States to impose the necessary eradication measures. Unnoticed outbreaks and inadequate measures will allow pests to become established and spread to an extent where eradication is either no longer feasible or extremely expensive.

2.2.8. Need for a framework to regulate invasive alien species

The economic and environmental impacts of IAS are increasingly apparent. Especially the import of new IAS is of concern to the EU. The Commission has announced that a dedicated EU legislative instrument which could tackle outstanding challenges relating *inter alia* to IAS pathways, early detection and response and containment and management of IAS will be developed. IAS plant species, although part of the scope of the IPPC to the extent that they are terrestrial plants, are not addressed in the Plant Health Directive (parasitic plants excepted). It should be investigated in how far IAS could be included in the scope of the plant and animal health regimes in order to optimise the use of resources and infrastructures, while avoiding duplication of requirements under the future general invasive alien species legislation.

2.3. Related issues

2.3.1. Need for modernised governance

The expectations of society as concerns governance have changed. The current regime defines obligations to stakeholders, obliges them to pay fees for the mandatory controls, but involves them only to a limited extent in the policy development and implementation. This is no longer seen as appropriate; a new balance needs to be struck as concerns costs and responsibility sharing (partnership development). In this respect, it should be noted that the Commission proposals for the CAP 2014-2020 facilitate explicitly the use of insurances and mutual funds to cover losses from outbreaks of plant pests as well as losses resulting from eradication measures pursuant to Directive 2000/29/EC.

With the Better Regulation (SMART) agenda, and exacerbated by the current financial crisis, there is a strong need to reduce unnecessary costs and administrative burden. A modernisation need furthermore exists in terms of incentives.

2.3.2. Changed emphasis on public good

When the regime was created, agricultural productivity and food security were the global objectives of the Common Agricultural Policy (CAP) of the EU. A need for "greening" of the CAP has emerged and objectives relating to the natural environment and landscape have gained importance. This impacts on the intervention logic of the PHR which is moving from a private good regime for agriculture to a mixed public/private good regime for agriculture, forestry, natural environment and landscape. The assumptions and modalities for the financing of the regime are equally impacted (from private insurances and mutual funds only to mixed public/private funding reflecting responsibilities and objectives). In the near future, the PHR will however no longer be linked financially to the CAP[38], except for access to the crisis reserve.

2.3.3. Damage incurred by the regime in the past decade

The eroding benefits of the regime and the decline of resources have partly undermined the credibility of the regime, accelerated the erosion of the regime's science base (in itself an autonomous evolution) and allowed an increasing backlog in the organisational arrangements, capacities and quality assurance systems of plant health laboratories.

2.3.4. Overly complex legislation

The current text of the Plant Health Directive, the product of 34 years of amendments to the text of 1977, is highly complex and needs simplification. Missions of the Food and Veterinary Office of the Commission have shown that misunderstandings and differences in interpretation of the Directive are an important cause of non-compliances and, therefore, failure to achieve the objectives of the regime.

2.4. Parties affected

The regime affects the private sector (farmers/growers/traders in agriculture, horticulture, forestry), which is subject to obligations, prohibitions, restrictions, official controls for which fees are levied and, in case of findings or outbreaks, official measures. The costs of the regime impact on the profitability of the sector. The impact is small to sectors with a high profit margin (such as the seed industry) but more substantial to sectors with low profit margins (such as importers of fruit and vegetables and bulk commodities).While the private sector as a whole benefits from the regime, the economic impacts of measures on individual operators in case of an outbreak may be negative (up to bankruptcies).

The regime affects landscape managers, citizens, environmental NGOs and other parties interested in the conservation of the natural environment, landscape and public and private green. The impacts of non-action for these public goods can be considerable, including the disruption of ecosystems and disappearance of forest and street tree

[38] Historically, the PHR expenditures have been financed through the CAP under Heading 2 of the Multi-annual Financial Framework (MFF). As of 2014, the PHR will be part of the Food Safety programme of the MFF under Heading 3, without any remaining link to the CAP.

species. The impacts of eradication and containment measures to prevent that from happening may, on a local scale, be dramatic and costly for the owners.

The regime affects citizens in case of eradication measures in case of outbreaks in so far as the measures also concerns private gardens. As small quantities of plant material intended for non-commercial use by the owner in passenger luggage are exempted from the provisions, travellers are at present not impacted by the regime.

Regulated harmful organisms of trees may be spread with wood. The regime therefore regulates wood and wood packaging material used in shipment and transport of commodities. This impacts on the wood industries, wood packaging material industries, logistics industries and industry and trade at large.

Traders and growers in third countries are affected in that they have to comply with the EU provisions and pay for export controls and issuance of phytosanitary certificates. The competent authorities in third countries are affected because they have to perform these controls prior to export to the EU.

The competent authorities of Member States are affected as they shave to ensure infrastructural and staff resources for surveillance, official controls, official laboratory analyses, registration, authorisation and supervision of operators, training of staff and research and development.

2.5. How would the problem evolve if no action was taken?

The increasing influx[39] of new harmful organisms would cause new epidemics in EU agriculture and forestry. The resulting losses would affect the economic viability of agriculture and forestry and, at longer term, the rural environment, undermining food security and damaging the landscape and natural environment. Eradication and containment would continue to fail due to lack of resources and erosion of confidence in the regime. There would be growing opposition from private sector to carry the costs of the regime, given its lack of effectiveness and the limited sharing of costs and responsibilities between competent authorities and operators. As a consequence of on-going outbreaks and spread of dangerous harmful organisms, exports of EU plants and plant products to third countries would decline due to recurrent trade bans. The negative financial impact could range up to billions of Euros per year (FCEC, 2011).

Further to the text boxes provided, cases of damaging outbreaks in agriculture and forestry in Europe and on other continents are provided in Annex VII. The no-action scenario is further elaborated in Annex VIII.

2.6. Does the EU have the right to act (subsidiarity)?

2.6.1. Right of the EU to act

The Plant Health Directive and the Control Directives were based on Article 37 of the EC Treaty, now Article 43 of the Treaty on the Functioning of the European Union, implementing the Common Agricultural Policy. The objectives of that policy are to increase agricultural productivity, to ensure a fair standard of living for the agricultural

[39] In their Strategic Plan, the US phytosanitary authorities (APHIS-PPQ, 2011) similarly note that "over the past five years introductions of plant pests and diseases are occurring with increasing frequency").

Agricultural losses from plant pests

Losses from harmful organisms have been estimated to be attributable for 30% to new pests and diseases (Pimentel, 2005), although poor agricultural practices may be responsible to a larger extent in less developed countries. On a global scale, losses would be 50–80% in the absence of control measures such as resistant cultivars, crop protection chemicals and crop rotations.

Even today, ca. 40% of staple cereal crops are lost to pests, diseases and weeds worldwide, equivalent to approximately a billion tonnes. Kenis & Branco (2010; as quoted by Pimentel, 2011) estimate annual economic losses for the EU of approximately €10 billion caused by already introduced alien insects, not including control, eradication, or quarantine costs, nor costs linked to foreign trade or market aspects. This does not yet consider similar costs due to introduced viruses, bacteria, fungi and nematodes, which add up to a multiple of that figure.

The FAO (2006) forecasts that global food production will need to increase by 40% by 2030 and 70% by 2050 because of increasing demand due to population growth and changing diets, while crop losses caused by pests have not decreased since the 1960s, if anything they have increased (Bruce, 2010).

Examples of damaging plant pests in agriculture

***Diabrotica virgifera virgifera* (Western corn rootworm):** the "billion dollar bug" causes US $1 billion losses annually in the United States and induces the highest insecticide use in the world.

***Ralstonia solanacearum* (potato brown rot):** the bacterium causes up to 75% losses in the tropics and up to 40% in northern Europe, threatening an EU production value of about EUR 9 million.

***Xanthomonas axonopodis* pv. *citri* (citrus canker):** following its introduction into Florida, the US authorities have spent EUR 800 million in their fight against the bacterium. The production value of citrus in the EU, where the pest could cause huge damage, is about EUR 3.9 billion.

Examples of damaging plant pests in forestry

The impact of new pests and pathogens on forests could be disastrous. Some common tree species might disappear, as happened before to other once common tree species.

Invasions from China of the so-called **Dutch elm disease**, caused by a fungus **(*Ophiostoma ulmi*)** that was foreign to Europe, have wiped out most of Europe's and America's elms while elms used to be as common as poplars are today (Brasier & Buck, 2011).

The once widespread chestnut forests in the US have disappeared due to the introduction of the **chestnut blight fungus (*Cryphonectria parasitica*)**.

Mortality of western Canada's pine forests due to the **mountain pine beetle (*Dendroctonus ponderosae*)** outbreaks currently approaches 80% and reversed these vast forests from carbon sink to carbon source. Scandinavian pine forests are still free from the pest but are equally susceptible (FCEC, 2011).

community, to stabilise markets, to assure the availability of supplies and to ensure that supplies reach consumers at reasonable prices. In the framework of the current review, it is considered to widen the legal basis to also include TFEU Articles 114 (internal market) and 191 (environment).

2.6.2. Necessity for the EU to act

Regulating plant health at EU level allows for coordinated and in the long run cheaper action on EU priorities, making it more effective and less expensive than actions by individual MS. For example, border controls for differing national lists of harmful organisms would be highly inefficient and ineffective, given the free movement of commodities on the single EU internal market after import. Furthermore, plant pests are mobile by themselves and cross-border effects will occur not only through intra-EU movement of commodities but also via natural spread. Inevitably therefore pests and diseases of EU significance need to be addressed jointly. Inaction in one MS may however result in spread to others. Third country trade partners might also implement restrictions on imports from the EU as a whole if an outbreak in one of the MS is not properly eradicated. The membership of the EU (not only of the individual MS) to the International Plant Protection Convention and the WTO Sanitary and Phytosanitary Agreement further implies the EU responsibility to maintain an adequate legal framework ensuring international plant health standards.

The specific added value of the EU co-financing of the PHR is that it provides incentives to MS who put in place eradication and surveillance actions which are in the long-term interest of the Union as a whole. Large-scale eradication actions by MS for outbreaks could be difficult without EU support in view of the large costs incurred by the individual MS to the benefit of the EU, even if the overall cost/benefit for the Union as a whole would be clearly positive. This requires solidarity between MS in sharing the costs and burden. The current example of the pine wood nematode outbreaks in Portugal demonstrates that EU plant health co-financing budget is crucial to implement the eradication and containment measures which cause damage to Portuguese forestry, however are essential to protect forestry in the other 26 MS.

The PHR cannot be left to the private sector because of market failures (public good interests, information asymmetry, externalities, inadequacy of market instruments to transform the large and diverse outbreak risks into marketable risks due to their potentially catastrophic size, fragmentation of the sectors involved and non-insurable cross-links between sectors).

While the EU has the right to act to harmonise intra-EU trade and trade with third countries, it should be ensured that the measures are proportionate to the objectives, do not create undue administrative burden for MS and private sector and do not distort the level playing field.

As concerns subsidiarity, the necessity for the EU to act also relates to the necessity to ensure that the regime is adequately resourced. The evaluation underlined that a lack of resources plays an important role in the regime's shortcomings. The costs of official controls (import controls, controls at the place of production for plant passport issuance, the registration of operators requiring controls) are not adequately recovered in many MS, resulting in shortages for competent authorities to implement the legislation and, from the operators' perspective, a distortion of trade. This will be further elaborated in the review of Regulation 882/2004 on official controls.

Section 3: Objectives

3.1. General objectives

The general objectives of the revision are to ensure an EU plant health regime which:

- Supports the Union's agricultural policy (TFEU Art. 43) and environment policy (TFEU Art. 191) by protective measures against harmful organisms of plants, with prevention at the source as important principle;
- Allows a smooth functioning of the Union's internal market with fair competition (TFEU Art. 114, while respecting the need for a high level of protection of health and the environment, based on scientific facts);
- Contributes to the harmonious development of world trade (TFEU Art. 206, by adopting legislation which complies with the WTO-SPS Agreement).

3.2 Intermediate objectives

- To ensure that the EU territory remains free from harmful organisms that are not yet present in the Union
- To ensure that the areas affected by harmful organisms with the most severe impacts to the Union (priority organisms) do not increase
- To modernise the regime in terms of governance and incentives
- To ensure adequate support for the regime

3.3. Specific objectives

Objective 1: Definition of EU priorities

- To recognise priority harmful organisms with large or potentially large socio-economic and environmental impact for the Union territory as a whole (versus organisms of more restricted impact).
- To improve the ability of the regime to smoothly move harmful organisms for which territorial protection is no longer justified to the PRM regime or deregulate them.

Objective 2: Improved prevention at import

- To increase the protection against high-risk trade imported into the EU and passenger transport associated risks.
- To increase preparedness and surveillance for outbreaks of harmful organisms not known to occur in the Union and of priority organisms.

Objective 3: Strengthened eradication and containment capacities

- To upgrade the instrumentation for eradication and containment (including suppression of the presence and natural spread of priority organisms).
- To incentivise the notification, eradication and containment of outbreaks of priority organisms.

Objective 4: Restoration and modernisation of the regime for intra-EU movements

- To restore the reliability and credibility of plant passports and protected zones.
- To rebalance competent authorities' and private operators' responsibilities and costs, reduce administrative burden and ensure a level playing field.

Objective 5: Improved support for the regime

- To ensure cost recovery from operators for controls by competent authorities as these costs relate to private interests, and Union co-financing of costs incurred for public interests.
- To ensure the availability and quality of diagnostic and scientific support.
- To generate public awareness of the relevance of the regime and public support.

3.4. Consistency with other EU policies and horizontal objectives

This initiative was undertaken to improve the regime in terms of effectiveness as well as with respect to the Commission's Communication on Smart Regulation in the European Union. It takes account of the requests of the private sector to improve the governance model of the regime as concerns consultation on policy development, cost and responsibility sharing in policy implementation and reduction of burden. The policy should help SMEs (the majority of growers and traders) develop in the market.

The initiative improves the coherence with three related EU policies:

- It is part of a larger initiative in which Regulation (EC) 882/2004, as appropriately amended, becomes the general framework for official controls on food and feed, animal health and welfare, plant health and plant reproductive material, allowing simplification and harmonisation of common aspects in the food chain legislation;
- It comprises re-arrangements and better linkage with the complementary PRM regime as concerns plant health requirements, allowing simplification and reduction of burden;
- The initiative has been co-ordinated with the Commission's initiative to develop a strategy and legislation concerning IAS.

The initiative helps to transform today's challenges (such as the effects of globalisation, world demographic trends and the need to substantially increase global food production, resource depletion, climate change, competition over land use for production of food and non-food, including energy) into opportunities and improve the competitive capacities of EU agriculture. It is coherent with other important EU policies:

- *Common Agricultural Policy*: the Communication "The CAP towards 2020: Meeting the food, natural resources and territorial challenges of the future" underlines the importance of plant health for agriculture and food security;
- *Single Market*: the regime ensures a high level of protection of health, whilst ensuring the effective functioning of the internal market;
- *Europe 2020 Strategy*: the regime helps to deliver a more sustainable, social, greener and knowledge-based EU market economy;
- *Common Strategic Framework (CSF) Horizon 2020*: the Union's financial instrument for research and innovation;
- *Trade policy*: effective protection of plant health is a prerequisite for international trade in plant materials[40];
- *Environment policy*: the regime helps to protect natural ecosystems and biodiversity;
- *Climate change*: the regime enables mitigating the increasing plant health risks from climate change;
- *Development policy*: support for capacity-building activities (existing BTSF training programmes) to help inspectors in poor third countries satisfy the PHR rules.

[40] The Council on 16 September 2010 concluded that, for a more integrated approach, the EU should further enhance the coherence and complementarity between its internal and external policies (EUCO 21/1/10 REV 1).

Section 4: Policy options

4.1. Policy options included in the analysis

In light of the problems and objectives outlined above, four options were developed to improve the regime (for a description of the elements of each option, see Annex IX). In all options, the provisions on official controls in common with other Union food chain legislation are transferred to the revised Regulation (882/2004) on official controls. As said, the present impact assessment addresses the changes in the existing pillars of the PHR, whether or not specific provisions (e.g. rules on import controls, certification, fees) are absorbed by that Regulation. This is inevitable since the PHR review concerns the functioning of the entire regime and its current instrumentation; the present impact assessment would otherwise be artificial and meaningless. The introduction to the PHR of new instruments from Regulation 882/2004 (e.g. creation of EU reference laboratories, accreditation of official laboratories, use of TRACES) and modifications for setting the level of mandatory fees (plant passports, import controls) will however be dealt with in the impact assessment for the revised Regulation 882/2004.

Option 1: Improve only the legal form and clarity of the regime. The legislation would be converted from a Directive into a Regulation, and simplified and clarified. This would ensure uniform application. The status quo is maintained in terms of substance.

Option 2: Prioritise, modernise and step up prevention. Additional to Option 1, prioritisation would be improved by transforming the Directive's current Annexes I and II, which list regulated pests according to technical features irrespective of their priority for the Union, into Annexes[41] based on intervention logic and priority:

- Future Annex I: all pests requiring territorial protection (identical to current Annex I but expanded with the non-European pests listed today in Annex II, Part A, Section I and the pests listed today in Annex II, Part B for which protected zones exist);
- New Annex / list: "upgraded" Annex I pests that require priority in surveillance, contingency planning and eradication in view of the large socio-economic and environmental risks they pose to the Union as a whole. Priority pests would be identified by risk assessment based on transparent criteria;
- Future Annex II: all pests that do not require territorial protection but pest-free planting material, including "downgraded" pests from the current Annex II, Part A, Section II (pests present in the EU that in practice only require pest-free planting material), along with the pests currently regulated under the PRM regime and subject to the certification schemes currently foreseen by the PRM.

The plant passport and protected zone systems would be modernised (responsibility sharing with operators as they have requested[42]; self-certification; reliance on their traceability systems; use of their barcodes/holograms/chips) and upgraded (plant

[41] The Annexes would be part of future implementing acts, based on an empowerment in the basic act.

[42] Furthermore a permanent consultation platform, also requested by the stakeholders (see Annex X (III), eighth indent), will be set up in the form of a permanent Working Group "Plants" under the Advisory Group on the Food Chain, Animal and Plant Health. Such a Working Group is currently convened on an ad-hoc basis only. Likewise, a permanent Working Group "Animals Health" exists. The costs are limited to the use of a Commission meeting room.

passport scope, format, mandatory cost-recovery based plant passport fees[43] as already exist for import, rules for outbreaks in protected zones). The coherence between the PHR and PRM regimes would be improved[44] to increase effectiveness and reduce costs for operators. Prevention would be reinforced by introducing a new category of high-risk plant materials that are not authorised for import until completion of a risk analysis, and by removing exemptions for passenger luggage (to be subject to low frequency controls only to minimise the cost impacts; see Annex IX).

Option 3: Prioritise, modernise, step up prevention and reinforce actions against outbreaks. Additional to Option 2, obligations would be introduced for surveillance and contingency planning. In analogy with the arrangements in the animal health regime, EU co-financing would be made available for surveillance for new organisms and priority organisms and for financial compensation of direct losses of operators for those organisms. The legal instruments for eradication and containment would be further developed. The degressivity rule for EU co-financing of eradication and containment measures and the exclusion of natural spread related measures would be removed.

The Commission proposal for the Multi-annual Financial Framework 2014-2020 clarifies that "the programme will also fund additional and much-needed action to address the plant health pests and diseases which are becoming increasingly prevalent across the EU". Evidently this option can be put in practice only if the proposal is supported by Parliament and Council.

Option 4: Prioritise, modernise, step up prevention, reinforce actions against outbreaks and expand the scope to IAS plants. Additional to Option 3, the regime would also cover IAS plants, in terms of legal provisions for measures and EU co-financing. IAS plants (other than parasitic plants) are not covered in Options 1, 2 and 3.

4.2 Discarded policy options

The **status quo** option (no changes at all to the current legislation) was discarded, given the outcome of the evaluation and the consultations.

In theory, the regime could be rescinded entirely (**deregulation**). This option was discarded because the EU and its MS are contracting party to the IPPC and have thus agreed on a legally binding obligation to regulate plant health. The impact of this option on trade from the EU to third countries would over time evolve to an unacceptable level. MS would impose trade bans on plant material from each other, at the expense of the Single Market.

In theory, the regime could also be changed into a **closed system**, like in many third countries, thus prohibiting all entry of plant materials unless specifically allowed through an import license system on a case-by-case basis. This option has not been recommended in the evaluation or during the consultations. It would result in huge impacts on trade to and from the EU, agriculture and the economy at large. This would also create a huge administrative burden for third countries' operators and would likely

[43] The obligation for cost recovery for plant passports was presented as part of Option 2 in the consultations. Further elaboration of the logic and form of the fee system is part of the impact assessment for Regulation 882/2004.

[44] Definitions and provisions of the PHR and PRM regimes would be aligned to remove obstacles to combine health inspections under the two regimes. A combined operator register would be required. If consignments require a plant passport and a certification label, the authorities would be obliged to issue a single document.

require a significant increase of human resources at EU level to manage the system. This option was therefore discarded as it appears disproportionate. An element of the closed system approach may be included in the new regime for new high-risk trade from third countries, which would not be allowed to enter the EU pending risk analysis (see Option 2).

None of the options considers the **exclusion of micro-enterprises** (SMEs with less than 10 employees and a turnover or balance sheet total equal to or less than €2 million). The vast majority of enterprises (growers) affected by the PHR are micro-enterprises or, if not, SMEs[45]. Micro-enterprises and SMEs trade plant material across the Union. Exempting them from the regime would fundamentally jeopardise the protection of the EU territory against the introduction and spread of harmful organisms. For the same reasons, citizens are not being exempted from the regime either. During the consultations, stakeholders did not request any exemption for micro-enterprises.

Adapted solutions and lighter regimes for micro-enterprises have been sought for. Where small enterprises sell their products exclusively on the local market, strongly limiting the phytosanitary risk of movements of plant material, certain measures (e.g. the obligation to issue a plant passport) will not apply to them. Sales to non-professional final users will also be subject to certain exemptions, in line with current legal provisions under Directive 2000/29/EC. An adapted solution for micro-enterprises for the mandatory fees for plant health controls, proposed in the revised Regulation on Official Controls[46], will also apply in relation to plant health controls.

[45] The labour force per enterprise for plant production is on average below 10 employees (EUROSTAT, Food: from farm to fork statistics, 2011).

[46] See the impact assessment for the proposal for a revised Regulation on Official Controls.

Section 5: Analysis of impacts

This section examines the economic, social and environmental impacts of the policy options in Section 4. Each of these comprises a series of amendments of which the costs and/or burden for operators (mostly SME)[47], MS and the EU is detailed in Annex IX. Those amendments cover all areas for which public consultation[48] had identified a need for impact assessment.

Each option was assessed against the theoretical baseline of 'do nothing' and therefore the impacts outlined are the difference from the *status quo* (which at long term has negative impacts on the economy, employment and environment; see Annex VIII). The following criteria were used. For economic impacts: costs and burden (based on the supplementary economic study); productivity, profitability and competitiveness. For social impacts: employment; food security / safety. For environmental impacts: sustainability (including impacts on use of pesticides); biodiversity and ecosystems conservation; health of forests, landscape, and public and private green. To help comparisons between options the impacts have been rated (**0**: no impact; **+**, **++**, **+++**: small, medium or large positive impact; **-**, **--**, **---**: small, medium or large negative impact). Apart from costs and burden, quantitative estimation was not possible since it cannot be known in advance what outbreaks of which harmful organisms would be prevented.

According to the evaluation report, the baseline costs of the PHR incurred in the reference year 2008 were as follows (Annex VIII):

Overall compliance costs (including administrative burden and fees)	**Competent Authorities**	**Operators**	**EU budget**	**Total**
Baseline scenario: **-- Prior to levying of fees** **-- After levying of fees**	 **€ 96 mio** **€ 59 mio**	 **€ 51 mio** **€ 88 mio**	 **€ 2 mio** **€ 2 mio**	 **€ 149 mio** **€ 149 mio**

These figures include the costs of official controls (incurred by the competent authorities but partly recovered from the operators through fees[49]) and the costs of surveillance, eradication and containment measures. It should be noted that the figure of €2 mio EU budget is based on 2008 [50]. Given the claims for 2010, 2011 and 2012, annual MS and EU expenditures will likely be EUR 20 mio higher.

[47] Apart from the seed industry, most operators are small and medium-sized enterprises (SME).

[48] The public consultation in autumn 2010 allowed differentiating between proposed amendments that could have major economic impact and should be specifically addressed in the impact assessment, and amendments with minor impact for which impact assessment was not needed. The amendments with perceived major impact were included in the Terms of Reference for the supplementary economic study.

[49] The PHR obliges MS to levy fees for import controls. It does not require fees for plant passport controls and registration of operators, for which fees are levied in some but not all MS.

[50] The figures were taken from the PHR evaluation (2010), which had the year 2008 as the cut-off date. Increased expenditures since 2008 relate mainly to outbreaks of pine wood nematode, for which the situation in Portugal deteriorated in 2008. Isolated outbreaks in Spain have since been successfully eradicated in a very early stage. To if possible avoid such high costs, the new plant health law will oblige Member States to carry out intensive surveys for priority organisms. Immediate notification of outbreaks will be a condition for eligibility for Union co-financing of eradication measures.

5.1. Option 1 – Improve only the legal form and clarity of the regime

In Option 1, the costs and burden of the EU plant health regime would be identical to the baseline scenario after levying of fees. The increased clarity of the legal text and the form of a Regulation, avoiding "noise" during transposition, would help to uniformly understand and implement the legislation, resulting in some limited benefits for effective prevention and control of harmful organisms. No economic or social impacts are expected. None of the stakeholders or MS indicated that this option (or the status quo) was their preferred option.

→ ***Summary of the key impacts under Option 1*:**

Areas	**Impacts**
Economic impacts	
Reduction of cost/burden to operators	**0**
Productivity, profitability, competitiveness	**0**
Social impacts	
Employment	**0**
Food security and safety	**0**
Environmental impacts	
Sustainability	**+**
Biodiversity and ecosystems conservation	**0**
Health of forests, landscape, public and private green	**+**

5.2. Option 2 – Prioritise, modernise and step up prevention

This option would bring along the following changes (labelled according to Annex IX and explained in more detail in that Annex) to the foreseen Regulation:

(a) Creation of a list of EU priority pests
(b) Transformation of current Annex II of Directive 2000/29/EC into an Annex, of an implementing act, listing harmful organisms for which thresholds apply
(i) Restrictions for new high-risk trade pending risk analysis
(j) Dropping the existing exemption to import requirements for passenger luggage
(l) Operators fully responsible for intra-EU traceability information
(m) Extension of plant passport scope to all business-to-business movements of all plants
(n) Simplification and harmonisation of the plant passport format
(o) Alignments with the certification label issued under the PRM regime
(p) Obligation to MS to levy cost-recovery-based fees for registration (a prerequisite for plant passport inspections)
(q) Obligation to MS to levy cost-recovery-based fees for plant passport inspections
(r) Introduction of standardised rules for eradication of outbreaks in protected zones

5.2.1. Economic impacts

Overall compliance costs (including administrative burden and fees). According to the estimates in Annex IX, no significant impacts are foreseen for changes a, b, l, m, n or r. The annual administrative burden / costs would change as follows:

Overall compliance costs (including administrative burden and fees)	Competent Authorities	Operators	EU budget	Total
Baseline scenario: **-- Prior to levying of fees** **-- After levying of fees**	**€ 96 mio** **€ 59 mio**	**€ 51 mio** **€ 88 mio**	**€ 2 mio** **€ 2 mio**	**€ 149 mio** **€ 149 mio**
Option 1	**€ 59 mio**	**€ 88 mio**	**€ 2 mio**	**€ 149 mio**
Changes compared to Option 1:				
(i) Temporary restrictions new high-risk trade[51]	+ € 1 mio (AB)	+ € 3.5 mio (fees)	+ € 1 mio (AB)	
(j) Passenger luggage controls	+ € 1 mio (of which 5% AB)			
(o) Alignment with PRM certification label		– € 0.7 mio (fees)		
(p, q) Cost-recovery based registration fees and plant passport fees	– € 16 mio (fees)	+ € 16 mio (fees)		
Option 2 total costs	**€ 45 mio**	**€ 106.8 mio**	**€ 3 mio**	**€ 154.8 mio**
Option 2 compared to the baseline scenario after levying of fees	**− € 14 mio**	**+ € 18.8 mio**	**+ € 1 mio**	**+ € 5.8 mio**

It should be noted that the baseline figure of EUR 2 mio EU budget is based on the official figure for 2008. Given the EUR 10-20 mio higher level of claims for 2010 and 2011, annual MS expenditures will rather be EUR 55-65 mio, and EU expenditures EUR 13-23 mio.

The impact of this option on the EU budget will depend on the evolution of outbreaks, which is unpredictable. While the ceilings set for plant health expenditures in the MFF will be respected, a need may arise in extreme cases to have access to the crisis reserve for food safety.

The liberated budget for competent authorities from full cost-recovery for registration and inspection activities would be available only in those MS that do not yet have cost-recovery based fees (budget will not be liberated in all MS). Liberating budget in MS where presently no major outbreaks occur could result in budget cuts to the plant health services.

Productivity, profitability, competitiveness (including level playing field). Option 2 will provide better protection against the entry of new harmful organisms thanks to better use of resources (prioritisation and where appropriate status change of harmful organisms) and measures against new high-risk trade and passenger luggage related risks. This should have a positive impact on productivity, profitability and competitiveness as regards third countries (an improved EU plant health status results in a higher export potential). The benefits will be achieved only partially because surveillance and action against outbreaks will also need to be reinforced and this can be done in this option only in MS where today no full cost recovery for inspection and registration is in place.

[51] The lost value would be the range of EUR 1.5-3.7 million per year and the total administrative costs for Member States and EU in the range of EUR 0.8-2.7 million per year.

The major benefit of Option 2 is that the intra-EU movement system (plant passports) will be modernised. Operators will be made fully responsible for traceability of consignments, accordingly the plant passport can and will be simplified to the essentials, and modern information carriers already used by operators (barcodes, holograms, chips) will be allowed to replace the classical lot number. However, due to the full cost-recovery for registration and inspection, the costs for operators would nevertheless go up, which would impact negatively on profitability and competitiveness. The estimated cost increase per operator is EUR 400 per year for those Member States that currently do not levy fees at cost-recovery level (Annex IX). Mandatory cost-recovery based fees across the EU would reinforce the level playing field for operators. Trade distortions due to poorly managed protected zones, providing unjustified benefits to operators within infested protected zones, would also be removed.

The impact of this option on third countries concerns the restrictions on new high-risk trade. This would affect in particular countries with emerging trade of plants to the EU.

5.2.2. Social impacts

Employment. The cost increase for operators could have negative impact on employment. Sectors with low profit margins (end products: fruits, cut flowers) would be impacted more than sectors with a high profit margin (seed industry). MS with many small operators (mainly new MS) could be more affected because such operators have lower profit margins, although on the other hand the costs would be shared between higher numbers of operators.

Food security and safety. The increased level of protection against new harmful organisms would impact positively on long-term food security. However, the positive impact would be minor since the territorial protection would be improved only partially in this option.

5.2.3. Environmental impacts

Sustainability (durability; use of pesticides). The increased protection for the EU territory against new harmful organisms would impact positively on sustainability and would mitigate pesticide use. The positive impact would be minor since the territorial protection would be improved only partially in this option. Moreover, the increased pressure on operators without compensation for losses could be a perverse incentive to cover up outbreaks.

Biodiversity and ecosystems conservation. The increased protection against new harmful organisms would impact positively on biodiversity and ecosystems conservation. However, the positive impact would be minor since the territorial protection would be improved only partially in this option (limited resources for surveillance and eradication).

Health status of forests, landscape, public and private green. The partly increased level of protection for the EU territory against new harmful organisms would impact positively on the health status of forests, landscape, public and private green. The positive impact would be minor since the territorial protection would be improved only partially in this option.

→ ***Summary of the key impacts under Option 2*:**

Areas	Impacts
Economic impacts	
Reduction of cost/burden to operators	−−
Productivity, profitability, competitiveness	−
Social impacts	
Employment	−
Food security and safety	+
Environmental impacts	
Sustainability	+
Biodiversity and ecosystems conservation	+
Health of forests, landscape, public and private green	+

5.2.4. Views of stakeholders and Member States

One single national stakeholder organisation (PLANTUM NL) was in favour of Option 2. Another organisation (EUROPATAT) was in favour of Option 2 but found Option 3 also acceptable. The majority of the stakeholders (including the farmers' EU umbrella organisation COPA-COGECA) was in favour of the options with increased budget (Options 3 and 4). Only two of the responding Member States were in favour of Option 2, due to lack of resources and/or opposition to any increase of the EU budget. However, if the increased budget for plant health stemmed from a reallocation within the existing EU budget, they were open to this.

5.3. Option 3 – Prioritise, modernise, step up prevention and reinforce actions against outbreaks

In this option, it is assumed that the additional EU resources necessary to reinforce prevention and actions against outbreaks would indeed be made available. In addition to the changes foreseen in Options 1 and 2, this option would bring along the following further changes to the Regulation (note that no impact is foreseen for changes (d), (e) and (g) in Annex IX):

(c) Introduction of mandatory surveillance by the MS (with EU co-financing)
(d) Introduction of mandatory contingency planning
(e) Clarification of measures required for eradication and containment of outbreaks
(f) Extension of the scope of the EU co-financing "solidarity regime" to natural spread
(g) Removal of the degressivity rule (mandatory decrease of EU co-financing over time)
(h) EU co-financing to also cover MS expenditures to compensate operator losses from measures related to EU priority organisms

5.3.1. Economic impacts

Overall compliance costs (including administrative burden and fees). According to the estimates in Annex IX, the annual burden / costs would change as follows:

Overall compliance costs (including administrative burden and fees)	**Competent Authorities**	**Operators**	**EU budget**	**Total**
Baseline scenario: **-- Prior to levying of fees** **-- After levying of fees**	**€ 96 mio** **€ 59 mio**	**€ 51 mio** **€ 88 mio**	**€ 2 mio** **€ 2 mio**	**€ 149 mio** **€ 149 mio**
Option 2	**€ 45 mio**	**€ 106.8 mio**	**€ 3 mio**	**€ 154.8 mio**
Changes compared to Option 2:				
(c) Mandatory surveillance (with EU co-financing)[52]	− € 4 mio (compliance costs)		+ € 10 mio (co-financing)	
(f) Coverage natural spread	− € 3.7 mio (compliance costs)		+ € 3.7 mio (co-financing)	
(h) Compensation for operator losses also covered[53]	+ € 7 mio (compensation)	− € 17 mio (compensation)	+ €10 mio (co-financing)	
Option 3 total costs	**€ 44.3 mio**	**€ 89.8 mio**	**€ 26.7 mio**	**€ 160.8 mio**
Option 3 compared to the baseline scenario after levying of fees	**− € 14.7 mio**	**+ € 1.8 mio**	**+ € 24.7 mio**	**+ € 11.8 mio**

In the table above, the figures for mandatory surveillance follow the estimate of FCEC (2011) that the current level of surveillance would increase from EUR 14 mio to EUR 20 mio per year if it would become an obligation and if EU co-financing would be available. It is assumed that the MS at present already implement measures against outbreaks resulting from natural spread in line with the legal obligations, the difference being that these measures would now be co-financed by the EU. It is furthermore accounted for that certain MS at present already provide some compensation to growers for losses resulting from imposed measures, estimated in Annex IX to be EUR 3 mio per year. Assuming that operator losses from official measures would be EUR 20 mio per year, this would imply that MS costs would go up to EUR 10 mio and operator compensation would go up to EUR 20 mio per year, the differences at EU level being reflected in the table above.

It should be noted that the baseline figure of EUR 2 mio EU budget is based on the official figure for 2008. Given the EUR 10-20 mio higher level of claims for 2010 and 2011, annual MS expenditures will rather be EUR 54-64 mio, and EU expenditures EUR 37-47 mio.

The impact of this option on the EU budget will depend on the evolution of outbreaks, which is unpredictable. While the ceilings set for plant health expenditures in the MFF will be respected, a need may arise in extreme cases to have access to the crisis reserve for food safety.

[52] The surveillance costs are estimated to rise from EUR 14.0 million to EUR 16.8-21.0 million (FCEC, 2010), here assumed to be EUR 20.0 million.

[53] The estimates for the additional costs to co-finance operator losses vary from EUR 5 million (FCEC, 2010) for five priority pests to EUR 20.9 million per year if not restricted to priority pests (being 50% of the average of a range of total compensations between EUR 26.5-57.0 million). Here they are assumed to be EUR 20 million per year for a maximum of 20 priority organisms.

Productivity, profitability, competitiveness (including level playing field). Option 3 would introduce incentives to MS and operators to better support the objectives of the regime through vigilance, immediate notification and early action (note that compensations for losses would be conditional to compliance with good bio-security practices). Budget would be available in all MS to upgrade surveillance and to reinforce eradication and containment. Thus, the full range of protective measures would be in place (prevention against high-risk trade, enhanced surveillance, reinforced early action). This would substantially limit the influx, establishment and spread of new harmful organisms into and within the EU, with a significant positive impact on productivity, profit and competitiveness with third countries (an improved, well-documented EU plant health status will result in higher export potential). Risks of trade restrictions from third countries from EU outbreaks of internationally regulated harmful organisms would be substantially mitigated.

As in Option 2, a major benefit of Option 3 would be that the intra-EU movement system (plant passports) will be modernised and cheaper for the operators. Operators would be made officially responsible for traceability of consignments, as is being requested. Due to the full cost-recovery for registration and inspection, the costs for operators would go up, but to a same extent as compensation for losses would be foreseen. Full cost recovery in all MS would reinforce the level playing field. Trade distortions due to poorly managed protected zones, providing unjustified benefits to operators within infested protected zones, would be removed in this option.

5.3.2. Social impacts

Employment. The positive impact on productivity, profit and competitiveness would imply a moderately positive impact on employment too.

Food security and safety. Achieving full positive impact on EU plant health would have a long-term positive impact on food security. As argued previously, food safety would not be affected.

5.3.3. Environmental impacts

Sustainability (durability; use of pesticides). The positive impact on EU plant health would imply a positive impact on sustainable agriculture and forestry and a mitigation of the needs for pesticide use.

Biodiversity and ecosystems conservation. The increased level of protection for the EU territory against new harmful organisms would impact positively on biodiversity and ecosystems conservation, especially but not exclusively in relation to the health status of forests and forest-related biodiversity.

Health status of forests, landscape, public and private green. The increased level of protection for the EU territory against new harmful organisms would impact very positively on the health status of forests, landscape, public and private green, which are particularly at risk in the baseline scenario. Examples of the success of this approach are the eradication of the pine wood nematode outbreak in 2008 in Spain, of red palm weevil in the Canary islands and of the citrus longhorned beetle in the Boskoop area (The Netherlands).

***→Summary of the key impacts under Option 3*:**

Areas	Impacts
Economic impacts	
Reduction of cost/burden to operators	**0**
Productivity, profitability, competitiveness	**+++**
Social impacts	
Employment	**++**
Food security and safety	**++**
Environmental impacts	
Sustainability	**+++**
Biodiversity and ecosystems conservation	**+**
Health of forests, landscape, public and private green	**+++**

5.3.4. Views of stakeholders and Member States

With the two exceptions mentioned under Option 2, all stakeholders and Member States are in favour of Option 3 or its variant including IAS plants (Option 4). EFNA (representing EU forest nurseries), ENA (representing EU nurserystock producers), UFS (a seeds industry organisation) and the NATIONAL TRUST (a national heritage NGO) were in favour of Option 3. USSE (representing southern EU foresters) was in favour of Option 3 or Option 4, depending on the available EU budget.

5.4. Option 4 – Prioritise, modernise, step up prevention, reinforce actions against outbreaks and expand the scope to IAS plants

In this option, it is assumed that the additional EU resources necessary to reinforce prevention and actions against outbreaks would indeed be made available. In addition to the changes foreseen in Options 1, 2 and 3, this option would bring along the following further change to the Regulation (labelled according to the list in Annex IX):

(u) Expansion of the scope of the plant health regime to also cover IAS plants

5.4.1. Economic impacts

Overall compliance costs (including administrative burden and fees). According to the estimates in Annex IX, the annual administrative burden / costs would change as follows:

Overall compliance costs (including administrative burden and fees)	Competent Authorities	Operators	EU budget	Total
Baseline scenario: **-- Prior to levying of fees** **-- After levying of fees**	**€ 96 mio** **€ 59 mio**	**€ 51 mio** **€ 88 mio**	**€ 2 mio** **€ 2 mio**	**€ 149 mio** **€ 149 mio**
Option 3	**€ 44.3 mio**	**€ 89.8 mio**	**€ 26.7 mio**	**€ 160.8 mio**
Changes compared to Option 3:				
(u) Coverage of IAS plants[54]	+ € 20.4 mio (compliance costs)		+ € 20.4 mio (co-financing)	
Option 4 total costs	**€ 64.7 mio**	**€ 89.8 mio**	**€ 47.1 mio**	**€ 201.6 mio**
Option 4 compared to the baseline scenario	**+ € 5.7 mio**	**+ € 1.8 mio**	**+ € 45.1 mio**	**+ € 52.6 mio**

[54] The estimated costs for eradication measures would be in the range of EUR 18.5-632.0 million per year, being on average EUR 40.8 million per year.

It should be noted that the baseline figure of EUR 2 mio EU budget is based on the official figure for 2008. Given the EUR 10-20 mio higher level of claims for 2010 and 2011, annual MS expenditures will rather be EUR 75-85 mio, and EU expenditures EUR 57-67 mio.

The cost estimate for including IAS plants in the scope of the PHR is an average estimate (Annex IX) for the financial "best case" (EUR 18.5 mio) and "worst case" (EUR 63 mio) scenarios, representing an increase of the total costs of the regime to minimally EUR 179 mio and maximally EUR 224 mio (an increase of 20% to 50% compared to the baseline and 12% to 39% compared to Option 3). The potential annual costs for competent authorities range from EUR 54-76 mio and for the EU expenditures from EUR 36-58 mio.

The impact of this option on the EU budget will depend on the evolution of outbreaks, which is unpredictable. While the ceilings set for plant health expenditures in the MFF will be respected, a need may arise in extreme cases to have access to the crisis reserve for food safety.

Productivity, profitability, competitiveness (including level playing field). In principle, significantly positive impacts are expected as in Option 3. Preventing the entry of future IAS weeds would result in further savings for the economy. The balance would shift from plant health proper benefits to wider benefits. However, the positive impacts could be less to the extent that the EU co-financing budget for plant health would be insufficient to cover the needs of the regime in its current scope. If the additional needs for IAS plants would be met at the expense of the current needs, this could entail in failure in both areas.

5.4.2. Social impacts

Employment. A moderately positive impact on employment would be expected, as for Option 3, however dependent on possible competition between current needs of the regime for EU co-financing budget and the needs for IAS plants.

Food security and safety. A positive long-term impact on food security would be expected, as in Option 3. Given the health problems associated with some IAS plants (allergies, skin irritation), Option 4 would also favour public health.

5.4.3. Environmental impacts

Sustainability (durability; use of pesticides). The positive impact on EU plant health would imply a positive impact on sustainable agriculture and forestry and a mitigation of the needs for pesticide use, however dependent on possible competition between current needs of the regime for EU co-financing budget and needs for IAS plants. Including terrestrial IAS weeds in the PHR would improve coherence with the PRM and plant protection products legislation managed by DG SANCO and could result in synergies (better prevention and control with minimal herbicide inputs).

Biodiversity and ecosystems conservation. The increased level of protection for the EU territory against new harmful organisms would impact positively on biodiversity and ecosystems conservation, especially but not exclusively in relation to the health status of forests and forest-related biodiversity. In addition, biodiversity and ecosystems conservation would greatly profit from protection against IAS plants.

Health status of forests, landscape, public and private green. The increased level of protection for the EU territory against new harmful organisms would impact very positively on the health status of forests, landscape, public and private green, which are particularly at risk in the baseline scenario. However, the positive impact could be smaller dependent on possible competition between current needs of the regime for EU co-financing budget and needs for IAS plants.

→***Summary of the key impacts under Option 4*:**

Areas	**Impacts**
Economic impacts	
Reduction of cost/burden to operators	**0**
Productivity, profitability, competitiveness	+++
Social impacts	
Employment	++
Food security and safety	++
Environmental impacts	
Sustainability	+++
Biodiversity and ecosystems conservation	+++
Health of forests, landscape, public and private green	+++

5.4.4. Views of stakeholders and Member States

The views of stakeholders concerning the preferred option (3 or 4) are mixed. AIPH (representing EU horticulture), COPA-COGECA and its member LTO NEDERLAND were in favour of Option 4, on condition that the budget for IAS plants will not come from the CAP (COPA-COGECA) and/or only IAS plants with serious impacts to agriculture would be regulated (AIPH). USSE (representing southern EU foresters) was in favour of Option 3 or Option 4, depending on the available EU budget.

Several MS have indicated that they are not in favour of Option 4 because they do not have the financial resources to cope with IAS plants. For such MS, Option 4 will anyhow be detrimental to the plant health needs. Other MS have indicated that they are in favour of Option 4, however arguing that the emphasis would be on import protection and that costs would be limited. As shown by FCEC (2011), this may not fully reflect reality.

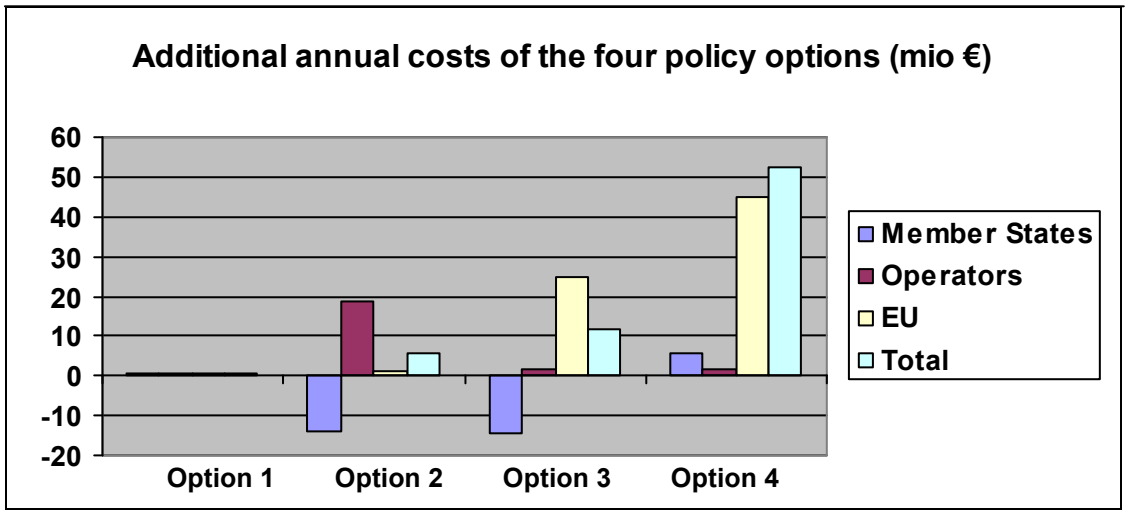
Section 6: Comparing the options

6.1. Comparing options in terms of economic, social and environmental impacts

To evaluate the impact of the policy options, the balance of the positive and negative scores in the summary tables in Section 5 (excluding the administrative burden / costs) were compared:

- Positive economic impacts from an improved plant health status would occur in Options 3 and 4, more than in Option 2 where protection was partial and where the increased costs for operators (full cost-recovery fees; no compensation for outbreak losses) would take away the benefits in terms of profit and competitiveness. Although the overall costs of the regime would increase in Options 3 and 4, the benefits would increase even more. Option 1 did not have any economic impacts;
- Positive social impacts followed this pattern as they are derived from the degree of improvement of the EU plant health status (food security and safety) and the impacts on productivity, profitability and competitiveness (employment);
- Positive environmental impacts were limited in Options 1 and 2 but significant in Options 3 and 4.

The costs of the policy options (based on the tables in Section 5), compared to the baseline scenario, differed substantially:



Based on the comparisons of options above, it appears that Option 3 provides the optimal balance of costs and benefits (value for money) in terms of economic, social and environmental impacts:

- Option 1 did not involve cost changes but had little impact;
- Option 2 resulted in 21% higher costs for operators (EUR 18.8 mio above current EUR 88 mio), allowing MS to reduce costs and invest in a.o. surveillance, but with limited environmental and – due to the cost increase – no economic benefits. Total PHR costs in this option increased with 4% from EUR 149 mio to EUR 154.8 mio;
- Option 3 had a slightly higher cost level than Option 2 (+ 8%), however in this option the costs for operators remained stable (+2%) compared to the baseline scenario, while EU costs increased and MS costs decreased. The changed

balance of costs resulted in significantly better socio-economic and environmental impacts;

- Option 4 required a 35% increase of total expenditures for the regime (from EUR 149 mio to EUR 201.6 mio, an increase in the range of 20-50%) and resulted in positive economic, social and environmental impacts to a similar level as Option 3.

6.2. Comparing the options in light of the objectives

In order to measure its usefulness, each option was rated against the initial objectives of the review to examine which option best met the aims of the review.

		Option 1	Option 2	Option 3	Option 4
General objectives	**Ensuring that the regime effectively protects the Union against harmful organisms of EU priority**	0	+	+++	+++ (also IAS plants)
	Modernising the regime as concerns incentives, costs and responsibilities, including the removal of competition distortion and the reduction of burden	0	+	+++	+++
Specific objectives	**Definition of EU priorities** -- Recognition of priority pests -- Improved ability to smoothly declassify harmful organisms	0 0	+++ +++	+++ +++	+++ +++
	Improved prevention at import -- Increased protection against high-risk trade -- Increased preparedness and surveillance	0 0	++ ++	++ +++	+++ ++
	Strengthened eradication and containment capacities -- Upgraded instruments -- Incentivised notification, eradication and containment of outbreaks of priority pests	0 0	+ 0	+++ +++	++ ++
	Restoration and modernisation of the regime for intra-EU movements -- Restored credibility of plant passports and protected zones -- Rebalanced MS/operator responsibilities, reduced burden/costs, level playing field	0 0	+++ +	+++ +++	+++ +++
	Improved support for the regime -- Full cost recovery for controls of operators and Union co-financing for public interest -- Good diagnostic and scientific support -- Public awareness and support	0 N.A. 0	++ N.A. +	+++ N.A. ++	+++ N.A. ++

Magnitude of impact: ++ strongly positive; + positive; −− strongly negative; − negative; 0 none. N.A.: not applicable (to be addressed by the revised Regulation 882/2004 and through the Horizon 2020 programme).

Option 2 ranked lower than Options 3 and 4 for eradication / containment and burden reduction and thus also for the general objectives of the review. Options 3 and 4 differed in the extent to which they offered protection at the border (higher for Option 4 as IAS plants would be covered too) and ensured early detection and eradication (higher for Option 3 as limited resources would not be shared with IAS plants).

The need for scientific support for policy development and for diagnostic laboratories was left out of the analysis. Research on plant health will be ensured through the Horizon 2020 programme[55]. Laboratory support will be provided by setting up EU reference laboratories for plant health under Regulation 882/2004 and will be addressed under that review.

Based on the comparisons of the options above against our initial objectives, it appears that Options 3 and 4 are the most effective policy options. Option 4 adds to Option 3 that IAS plants are also covered, however this may be at the expense of the effectiveness to eradicate and contain regular pests and the additional costs for the EU are high.

6.3. Highlight the trade-offs and synergies associated with each option

Option 1 – Improve only the legal form and clarity of the regime

The assessment shows that this option will insufficiently meet the objectives of the review. This option will consolidate the regime's failures, result in avoidable long-term costs and losses (estimated by the FCEC at up to billions of EUR per year) and will undermine trust that the regime makes sense at all.

Option 2 – Prioritise, modernise and step up prevention

Option 2 improves the regime in so far as possible without additional EU engagement, by responsibilising operators but imposing full cost recovery and by strengthening prevention. Given the financial crisis in the EU, Option 2 might be the default candidate for the future PHR. The assessment however reveals that its cost-effectiveness is poor.

Stricter import provisions should help to reduce the influx of prohibited regulated harmful organisms into the Union. The high volumes of imports from other continents where those pests are widespread nevertheless imply that sooner or later some regulated organisms will slip through and cause outbreaks, unless the open approach of the EU concerning import of plant material is given up (which option was discarded, also politically, from the start because of the damage it would cause to the Union's economy). These outbreaks needs to be timely detected and effectively addressed if the open EU approach is to be maintained (like in the animal health regime). The quintessence of Option 2, avoiding further EU engagement, implies that the necessary additional expenditures for surveillance and early action against such outbreaks can be generated only partially, through increased cost recovery related to intra-EU movements of plant material. This will help only in some MS (those with incomplete cost recovery at present). It will increase the burden for operators (stricter import provisions, temporary suspension of high-risk trade) without offering reinforced long-term protection against harmful organisms from third countries, as incentives for early notification by operators are not provided and in many MS budget for surveillance and early action remains insufficient. This is a risk since harmful organisms do not respect MS borders.

The main advantage of Option 2 is the modernisation and rebalancing of the role and responsibilities of operators versus MS competent authorities (as well as better

[55] The Framework Programmes for research and innovation fund projects aiming to deliver cheaper and more versatile diagnostic tools. A combination and coordination of national and European funding (under the CSF Horizon 2020 programme) will likely further strengthen plant health related scientific competency.

arrangements between the PHR and PRM regimes and a more level playing field). While this was one of the general objectives of the review, the other general objective (improved prevention and early action) would only be partly met. The harmful organism influx into the EU would at best be slowed down and the damage would continue to increase, in agriculture and as concerns the natural environment, forests, landscape and green. Using hindsight to examine which outbreaks could have been avoided if this option had been in place a decade ago, it is not clear that the plant health status of the Union would have been much better than it is today.

Option 2 supposes that MS and operators are best placed to deal with plant health problems, which conflicts with the outcome of the regime's evaluation and with the preference of most stakeholders and MS to move to stronger EU engagement (for details see Annex X). It neglects market failure and the existence of significant public good aspects, and rather reflects the original PHR logic that the regime is about agriculture and movements in trade.

Option 3 – Prioritise, modernise, step up prevention and reinforce actions against outbreaks

The main difference of this option compared to Option 2 is the increased EU co-financing for surveillance and outbreak eradication. This proves to result in a series of synergies which are critical to ensure a better functioning of the PHR as concerns prevention and early detection of and action against outbreaks, necessary to achieve the desired socio-economic and environmental benefits (including reinforced export potential).

EU financial support for surveillance for and eradication of new pests and priority pests will help to timely detect and eradicate outbreaks, more than in Option 2 where it is questionable whether MS will have the resources to meet new obligations to carry out intensified surveys. Eradication actions are also likely to be implemented more robustly. EU co-financing of compensation by MS to growers for direct losses from eradication will remove disincentives to hide outbreaks. By making any compensations conditional to demonstrated adherence to good biosecurity practices and timely notification of outbreaks, an incentive for prevention is introduced that is absent from Option 2. Supporting operators as concerns their direct losses from outbreaks of priority pests would encourage them to become a partner in the EU plant health regime, as they have asked to be. As long as operators do not receive 100% compensation at national level (normally not the case), it is unlikely that EU co-financing of operator losses would act as a perverse incentive for recklessness[56]. Moreover, the eligibility for EU co-financing would be restricted to the direct value losses, consequential losses remaining for the grower; these could be insured or covered under mutual funds under the Common Agricultural Policy. Indeed, the FCEC (2011) reports that EU co-financing of direct losses is likely to stimulate the development of national mutual funds, which would be a welcome development. The legal proposal of the Commission of 12 October 2011 on support for rural development foresees support for financial contributions to farmers for insurances and mutual funds providing compensation for damages, including those caused by outbreaks of regulated organisms of plants.

Option 3 balances costs and benefits for all parties involved. Other than in Option 2, costs for operators remain stable and MS costs decrease, while the economic and

[56] Neither seems this to be the case with compensations for direct losses under the EU animal health regime.

environmental benefits are much higher. This however requires increased EU expenditures. This is justified to address the market failures outlined in Section 2.6.2, in particular lack of support for public good objectives. By accepting EU responsibility for environmental protection also financially, the entire regime can function better. There are moreover economies of scale at EU level. It should be noted that the overall costs of Option 3 are just slightly higher than in Option 2, while the benefits are much higher. With limited investments in early detection and eradication[57], large savings can be made as concerns eventual losses from outbreaks and curative measures against outbreaks in agriculture and the natural environment. The improved cost/benefit ratio is due to a redistribution of costs of operators, MS and the Union. This allows introducing incentives and creating synergies. Option 3 converts MS "subsidies" on fees into compliance incentives (compensation for losses from eradication measures). It thus responsibilises the operators for bio-security and covers part of their risks, but only for EU priority organisms and conditional to compliance with the EU legislation.

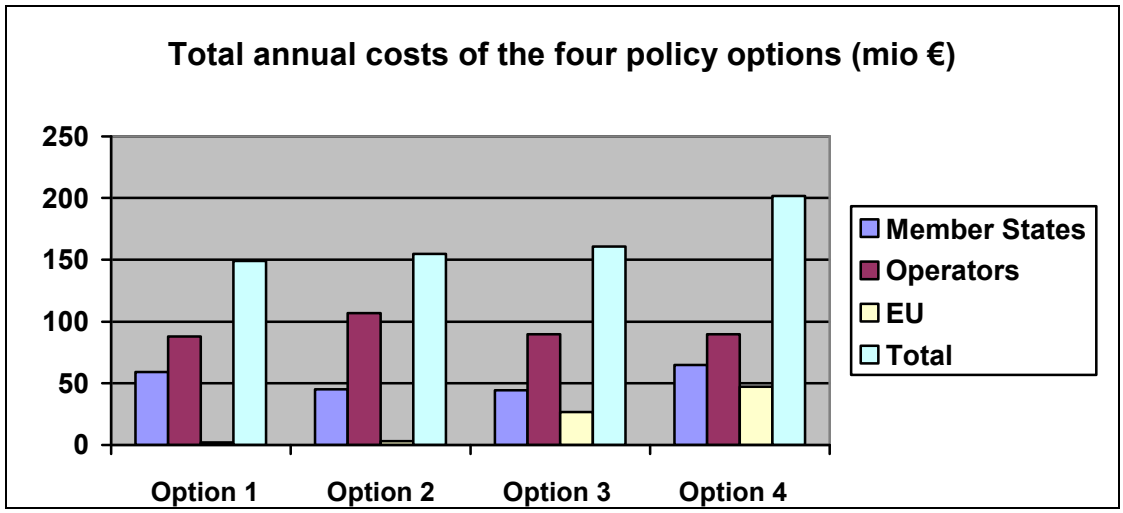
Using hindsight to examine which outbreaks of the past decade could have been avoided if Option 3 had been in place, it is likely that many outbreaks of forest pests could have been detected earlier and successfully eradicated with timely allocation of Union resources. Indeed, the successful eradication of pine wood nematode in the Sierra de Dios Padre, Extremadura (ES) and the on-going one in Galicia would not have been possible without EU support. Otherwise, outbreaks are not truly eradicated but suppressed and MS accept that the pests gradually spread. Union support to competent authorities and farmers is critical to enable MS to take the necessary drastic measures, financially and at a political level.

Option 4 – Prioritise, modernise, step up prevention, reinforce actions against outbreaks and expand the scope to IAS plants

The coverage of invasive plants results in additional benefits to the environment, however with potentially high costs to the MS and the EU. As long as IAS plants are not yet present in the EU, the costs of including them in the regime are minimal. Once outbreaks occur, the costs for surveys and eradication measures increase significantly, to the order of magnitude of forest pest outbreaks. Large-scale outbreaks may lead to a higher level of costs than incurred for the plant health regime within its current scope. Under the SPS Agreement, it is not allowed to prohibit import of IAS plants from third countries without equal domestic measures[58]. Regulating IAS plants thus brings along the risk of unexpected costs for the EU budget. In so far as the budget is limited, the coverage of IAS plants would be detrimental to the needs of the regime in its current form, unless a different intervention logic is applied for IAS plants (but then it is questionable to include them in the PHR). By lifting out IAS plants from the new IAS policy, Option 4 might in due course result in policy inconsistencies with the overall IAS policy objectives, due to inappropriateness of a stamping-out approach in natural habitats of environmental importance. Managing IAS plants may require accepting limited local release for gardening, where release has to be categorically prohibited for harmful organisms. The main tools for ensuring safe international movement of plants, the phytosanitary certificate and the plant passport, are of no use for regulating the movement of IAS plants. Aquatic IAS plants are moreover not covered by the IPPC. The management of IAS plants thus likely requires a legal instrument of its own.

[57] The additional costs of Option 3 for the regime as a whole as EUR 6 million per year (EUR 160.8 million instead of EUR 154.8 million).

[58] Following a liberal eradication approach for IAS plants could undermine the PHR coherence and credibility.



Total annual costs for Member States, operators, the European Union and the regime as a whole for the four policy options (cost level based on reference year 2008)

6.4. Preferred option

In the light of the assessment above, it is considered that **Option 3** provides the best way forward to achieve the objectives with the best cost-benefit level[59] and an optimal balance of inputs from MS, operators and the Union as a whole. Option 3 should have a significant positive impact on profitability and economic growth of the sectors involved; it was also the closest reflection of the overall outcome of the stakeholder and MS consultation (Annex X). It addresses the main concerns of the stakeholders expressed in reply to the consultations: the need for a better functioning of the regime, the need for partnership in the regime including the use of modern tools (barcodes, chips etc.) already employed by them, and the need for compensation of losses of operators subject to eradication measures. The EU budget necessary to implement Option 3 has been secured in the Commission proposal for the MFF 2014-2020[60].

The concerns on IAS can be resolved by creating the possibility in Regulation 882/2004 for MS to utilise Border Control Posts for official controls on import of IAS plants and animals (similar to current arrangements for the implementation of CITES). This will allow MS to utilise the synergies of plant (and animal) health controls and IAS plants controls at the border. Territorial surveillance and eradication provisions will be set up in dedicated legislation on IAS, in line with the set-up for sectoral plant and animal health legislation.

[59] The overall cost increase for the regime would be 8% (€11.8 mio) to avoid future losses of billions of Euros per year (FCEC, 2011). Assuming that 10% of the 250 listed pests could cause such huge damage, a cost increase of maximally €50 mio for the EU would save some €25 billion, i.e., a return factor of 500:1.

[60] The limits set for plant health expenditures in the Multi-Annual Financial Framework will be respected. Legal access will be ensured to the crisis reserve for (animal and) plant health crises, for unforeseen large-scale outbreaks requiring temporarily high levels of expenditures exceeding the limits set by the MFF.

Section 7: Monitoring and evaluation

The review of the PHR firstly aims to improve its effectiveness. Most objectives concern improved measures against entry into, and establishment and spread of harmful organisms within the EU. Others target the modernisation of the regime's functioning and governance, by more efficient use of scarce resources, rebalancing responsibilities and costs between competent authorities and private operators, reducing administrative burden and ensuring a level playing field. The following progress indicators could be used as regards the five specific objectives provided in Section 3.2 (regardless of whether the legal provisions are positioned in the new plant health Regulation or the future Regulation on official controls):

Overall indicators

- Number of regulated harmful organisms that are present / not present in the Union.
- Total areas in the Union affected by priority organisms.

Definition of EU priorities

- To recognise priority harmful organisms with large socio-economic and environmental impact for the Union territory as a whole (versus organisms of more restricted impact).
- To improve the ability of the regime to smoothly deregulate harmful organisms for which territorial protection is no longer justified.

→ *Indicators: not required (addressed by changing the structure of the legislation)*

Improved prevention at import

- To increase the protection against high-risk trade imported into the EU.
- To increase the preparedness and surveillance for outbreaks of harmful organisms not known to occur in the EU and of priority organisms.

→ *Indicators:*
- Numbers of import inspections and tests carried out by the Member States
- Numbers of surveillance inspections and tests carried out by the Member States for regulated harmful organisms not known to occur in the EU and for organisms listed as EU priority

Enforced eradication, containment and control

- To upgrade the instrumentation for eradication and containment (including suppression of the presence and natural spread of priority organisms).
- To incentivise notification, eradication and containment of priority organism outbreaks.

→ *Indicator:*
- Numbers of eradicated / non-eradicated outbreaks in the EU territory of regulated harmful organisms listed as EU priority
- Elapsed time from the detection of regulated harmful organisms to their notification
- Elapsed time from the detection of the presence of priority organisms to their eradication

Restoration and modernisation of the regime for intra-EU movements

- To restore the reliability and credibility of the plant passport and protected zones.

- To rebalance competent authorities' and private operators' responsibilities and costs, reduce administrative burden and ensure a level playing field.

→ *Indicators:*
- Interceptions by MS of listed harmful organisms in consignments from other MS (in absolute numbers and in percentage of the trade volume)
- Numbers of eradicated / non-eradicated outbreaks in protected zones
- Degree to which operators are satisfied with the regime's functioning and cost level

Improved support for the regime

- To ensure cost recovery for competent authorities as concerns controls of operators and Union co-financing of costs incurred for public interest.
- To ensure the availability and quality of diagnostic and scientific support.
- To generate public awareness of the relevance of the regime and public support.

→ *Indicators:*
- Percentages of cost recovery by MS for import and plant passport inspections
- Number of national and EU reference laboratories
- Degree to which citizens are aware of the existence of the regime and support it

Despite foreseen methodological difficulties, work is foreseen also on development of parameters on avoided losses, which may then serve as more direct measure of regime efficiency.

The monitoring of the PHR legislation is currently included in Regulation 882/2004 and Directive 2000/29/EC, which foresee that MS shall prepare integrated multi-annual control plans and report annually on, among others, the results of controls and audits and the type and number of non-compliances identified. Specific reporting obligations also exist in the Control Directives for harmful organisms of potato and the various Emergency Measures. The indicators listed above are a part of the existing general reporting obligations under Regulation 882/2004, albeit without reference to the above specific indicators.

The plant health Regulation will contain provisions for the Member States to annually collect the data pertinent to the above-mentioned indicators in so far as they relate to concrete parameters linked to official activities carried out by them (numbers, percentages, elapsed time, cost recovery rate). The Member States will be asked to provide these data prior to the entry into force of the Regulation so as to determine the baseline level of the parameters.

The measurements of the degree to which operators are content with the functioning and cost level of the regime, and the degree to which citizens are aware of the regime and support it, are a new element. These measurements should not be carried out annually, but will be a part of the recurrent future evaluation of the regime, along with the evolution of the above-mentioned indicators and the EU financial expenditures. The first evaluation of the Regulation will take place seven years after the Regulation will have become applicable.

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Annexes

Annex I: Executive summary of the evaluation report

For the complete report, see:
http://ec.europa.eu/food/plant/plant_health_biosafety/rules/docs/final_report_eval_en.pdf

European Commission
Directorate General for Health and Consumers

EVALUATION OF THE COMMUNITY PLANT HEALTH REGIME

Framework Contract for evaluation
and evaluation related services - Lot 3: Food Chain
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Final Report

Prepared by:
Food Chain Evaluation Consortium (FCEC)
Agra CEAS Consulting - Civic Consulting -
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EVALUATION OF THE COMMUNITY PLANT HEALTH REGIME

Final Report

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Key messages of the Evaluation

- Over the period covered by this evaluation (from the launch of the single market on 1 January 1993 until now), the Community Plant Health Regime (CPHR) has contributed significantly to prevent the introduction and control the spread of pests affecting plant health in the European Union.
- Despite this positive conclusion overall, the objectives of the CPHR, as defined in the EU legal basis (Directive 2000/29/EC and legislation on emergency and control measures), are considered to have been only partially met. A number of shortcomings and weaknesses have been identified, and these point to the need for improvements to the system.
- Over the period under review, and particularly in more recent years, plant health risks have increased while the EU has expanded. New and increased risks are due both to globalisation (including the expansion of trade) and climate change. These challenges call for a review of the current system.
- Options for the future have been developed and a preliminary analysis of these options was undertaken in the course of the evaluation. As a result, key recommendations are made, based on a preliminary analysis of the balance between advantages/disadvantages and anticipated impacts.
- At the core of the recommendations is the need to modernise the system through: more focus on prevention; better risk targeting (prioritisation); and, more solidarity (moving from an MS based to EU approach for more joint action to tackle risks of EU significance).
- In this context, it is recommended to:
    - Include in the scope of the future EU PH regime Invasive Alien Species (IAS) plants with wider/environmental impacts (on habitats and ecosystems) and/or economic impacts on a wider range of stakeholders (*Recommendation 1*).
    - Explicitly include natural spread in the regime, and – where deemed necessary on a case by case basis – cover by the solidarity regime (*Recommendation 2*).
    - Adopt a zero tolerance regime (i.e. including Regulated Non Quarantine Pests with zero tolerance), and further explore potential synergies with S&PM regime (*Recommendation 3*).
    - Take complementary measures on imports, in particular: for emerging risks, e.g. on new trade in plants for planting/propagating material (PM): commodity pathway analysis; strengthen measures for plants for planting/PM via official post entry inspections for latent harmful organisms (HOs) and, on the basis of commodity pathway analysis, proceed to import bans where necessary (*Recommendation 4*).
    - Introduce mandatory general epidemio-surveillance at EC level for priority HOs, after exploring further the process and criteria to be used for the identification and selection of HOs, and scope and method of surveillance; develop common principles and guidelines for harmonized surveillance/reporting; and, introduce co-financing to improve surveillance (*Recommendation 5*).
    - Step up emergency action, via: horizon scanning; compulsory development of contingency plans according to a harmonized framework; and speeding up the process for adoption and adaptation of both emergency and control/eradication measures (*Recommendation 6*).
    - Improve the Plant Passport (PP) system, in particular by revising the scope of application and harmonising the PP document (*Recommendation 7*).
    - Tighten the system of Protected Zones (PZ), in the short term by improving the status quo, and longer term by further examining the implications of applying the IPPC Pest Free Area (PFA) concept (ISPM 4) more widely (*Recommendation 8*).

- Improve incentives throughout the system by extending the current scope of solidarity to: cover the loss of destroyed material for producers/growers; enable co-financing of new measures e.g. surveillance, contingency planning. Carry out further analysis on the possibility of introducing cost-responsibility sharing schemes, in line with the ongoing development of this concept in the animal health field. (*Recommendation 9*).
- Improve support activities in terms of R&D and scientific advice: promote more sufficient and stable EU and MS resources for funding and coordinating research (e.g. structural budget within the CPHR in addition to the FP7); continue EUPHRESCO; identify the appropriate structures to address the economic impact of Pest Risk Assessment (e.g. PRATIQUE follow up; SANCO/EFSA and EPPO cooperation) (*Recommendation 10*). Enhance diagnostic capacity by completing the establishment of National Reference Laboratories in MS and establishing EU-Reference Laboratories for a limited number of priority HOs (*Recommendation 11*). Continue and strengthen training activity for inspectors and extend the training to experts in the diagnostics field (*Recommendation 12*).
- Improve organisational aspects: establish an EU/MS Emergency Team for Plant Health (within DG SANCO supported by an extended network of MS experts), as is practiced for animal health (*Recommendation 13*); developed and implement, both at EU and MS level, public awareness campaigns to improve awareness of plant health issues (*Recommendation 14*).
- This evaluation of the CPHR performance to date, and in particular of the financial framework (solidarity regime) has extensively highlighted the mismatch between currently available resources and targeted objectives and this underpins many of the identified shortcomings and weaknesses. The analysis of options for the future has in all cases pointed to the need to increase resources and/or prioritise to meet the objectives set out in these options. The Commission will have to reflect on the best options to follow. The evaluation results have also confirmed the conclusions of the solidarity regime evaluation, according to which, a financial instrument is needed to ensure better preparedness in case of emergency.
- In this context, the evaluation recommends that the merits of developing a specific financial instrument in this sector, possibly in the form of a Plant Health Fund (drawing a parallel from the Animal Health Fund), is examined further (*Recommendation 15*).

Executive Summary

S.1. Background and scope of the evaluation

This evaluation[1] of the Community Plant Health Regime (CPHR)[2] was launched by DG SANCO with the support of the Council[3]. It covers the period from 1993 to date, i.e. since the introduction of the internal market. The basic structure of the current CPHR was established in 1977 (Council Directive 77/93/EEC); since the 2000 codification, the basic legal framework is Council Directive 2000/29/EC[4].

Since its inception in 1977, various major changes and developments justify a comprehensive evaluation of the regime. Apart from the introduction of the internal market concept in 1993 and its implications in terms of reassessing the balance between intra-Community free trade and prevention of the introduction/spread of Harmful Organisms (HOs), other major developments include: the successive EC enlargements, in particular the addition of 12 new Member States (MS) in 2004 and 2007; the establishment of the WTO - SPS Agreement and the EC accession to the International Plant Protection Convention (IPPC), and the resulting implications for EU policy in terms of aligning with international standards on phytosanitary measures and adjusting to the globalisation and rise in trade; global warming (climate change); changed expectations from society, the changing balance of interests involved in the agricultural system as a whole; decreasing resources for public services; the increasing role of Pest Risk Analysis (PRA) as a foundation for phytosanitary measures and the availability of scientific expertise to develop PRA; the establishment and role of EFSA; and, the evolution of related Community regimes, in particular in the field of seed and plant propagating material (S&PM), and of conceptually parallel EU policy regimes, in particular the new EU Strategy for Animal Health (AHS).

The evaluation had two objectives: a) to analyse the results of the CPHR to date, as compared to the acknowledged objectives that were set out by the Community when it was introduced; and b) to clarify which aspects of the current regime need to be improved and to suggest potential options for improvement. The aim is to feed into the design of future policy in this field and the development by the Commission services of an EU plant health strategy.

The analysis covered all EU 27 MS. MS data, information and views were gathered through a general survey of Competent Authorities (CAs) and relevant stakeholders in the 27 MS, supplemented by in depth interviews with a wide range of stakeholders and experts at EU and international level, field visits in 12 MS and the review of 5 third country plant health policies. For the economic analysis (administrative and other operational costs), a purpose built cost model was developed (on the basis of the EC Standard Cost Model) with data collected via a specific cost survey covering the EU-27 (CAs and stakeholders).

S.2. Evaluation of the performance of the CPHR to date

Although the CPHR's scope and objectives, as they have developed in the period 1993 to date, are considered to continue to be both relevant and appropriate, the general view nonetheless is that the regime has only partly achieved these objectives and that it has only partly been effective in preventing the entry, establishment and spread of HOs in the EU.

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[1] This evaluation was carried out by the Food Chain Evaluation Consortium (FCEC) under the leadership of Agra CEAS Consulting with the additional technical expertise of Professor John Mumford (Imperial College), and participation of two other FCEC partners Arcadia International and Van Dijk Management Consultants.

[2] The evaluation refers to the Community Plant Health regime (CPHR), for the historical analysis of the policy since its establishment in 1977.

[3] ECOFIN Council Conclusions of 21 November 2008.

[4] The evaluation covered the entire CPHR policy area. This includes the entire Community plant health *acquis*, its implementation in the Community and the relevant infrastructural and budgetary support. The evaluation also addressed the relationship of the CPHR to related Community regimes.

Several of the CPHR measures and provisions are assessed to have only partly been useful or effective and this is attributed to certain key underlying factors. Implementation by MS is incomplete or not harmonised, and these gaps are often due to variability in knowledge, training, interests and perspectives, traditions, administrative structures and capacities as well as resources between MS in the EU-27, but also a lack of clarity in the provisions of the legal base as such (e.g. on Invasive Alien Species - IAS and natural spread). Furthermore, there are significant and growing constraints in the availability of staff and resources devoted to plant health in general (EC, MS, research bodies and diagnostic facilities etc.). Public awareness of plant health issues is generally limited, and consequently political support to finance and enact the policy remains relatively weak, thus reducing the focus on prevention or on drastic measures at the start of the outbreaks. There is lack of incentives and disincentives (including in the form of sanctions/penalties), in the current system, or – where these exist - inadequate enforcement. Thus, for example, a lack of incentives to report and notify findings in a timely manner constitutes a key reason for delays in notifications, which has ramifications on the speed, and thus the effectiveness and efficiency, of action to address outbreaks. In emergency situations, the limited support and lengthy decision-making process results in measures being taken too slowly, too late. In this context, it is argued that a dedicated financial instrument, e.g. in the form of a 'plant health fund' would contribute to enabling decision-makers to speed up the process.

In addition, the assessment of the financial framework of the CPHR, which has expanded and updated on the independent evaluation of the Solidarity Fund carried out in 2008[5], has concluded that a key deficiency of the current system is that it only acts *a posteriori* and does not cover any measures or activities taken on a preventive basis, before or as soon as, outbreaks or new findings occur. This results in a loss of efficiency, as investment on prevention in the longer term ensures greater cost effectiveness than measures to address outbreaks, particularly measures taken at more advanced stages of an outbreak when the targeted HO is established and may be fairly widely spread. Generally speaking, the later action is taken, the more costly and less cost-effective it will be.

The above highlights that the current CPHR does not sufficiently address prevention. Emergency measures are generally adopted too late, and there is no formal framework or support to deal with emergency situations. Contingency plans have not been systematically put in place (either at MS, or at EU level). Furthermore, beyond compulsory surveillance, the efforts for more general surveillance made by MS are relatively limited (with significant variation between MS) and are not systematic or coordinated. The current degree of emphasis of the CPHR on prevention and early response, including the solidarity regime as such, is therefore judged to be largely inadequate.

The evaluation has also addressed the question of the deadweight effects of the CPHR ('What if no Community financing was in place'). The analysis of the CPHR costs and benefits during the period from 1993 to date demonstrates that: a) the budget devoted to the CPHR to date remains relatively limited; and b) on a case by case basis, the CPHR has had clear benefits (as discussed in particular in the context of 5 HOs: *Anoplophora (chinensis* and *glabripennis)*, *Ceratocystis (fagacearum* and *fimbriata)*, *Erwinia amylovora*, *Grapevine flavescence dorée* and *Phytophthora ramorum*). In conclusion, through the measures adopted in all these cases, the CPHR has contributed either to the avoidance of the introduction of potentially injurious HOs or to slow down their spread, resulting in significant overall benefits. Notwithstanding its successes, the CPHR can nonetheless be improved to maximise the effectiveness and efficiency of the measures taken.

The problems identified are compounded by the changing context within which the policy operates, in particular the growing challenges of globalisation and climate change. Moving forward, it is noted that these new challenges and new risks arising from them as evidenced by increases in solidarity budget spending in recent years, will require the adjustment of the regime for the future.

[5] This evaluation was carried out by the Food Chain Evaluation Consortium (FCEC) under the leadership of Van Dijk Management Consultants.

S.3. Key findings of the evaluation per thematic area

The results and main findings of the evaluation per thematic area can be reported as follows:

1. Scope of the CPHR

Natural spread

The extent to which the current CPHR scope includes natural spread was examined with regard to the following two aspects:

Inclusion of natural spread in CPHR scope: the current legislation is not explicit on 'natural spread' (as opposed to man-assisted spread), leading to considerable confusion and divergence in interpretation amongst MS and stakeholders. From the review of the CPHR legislation, natural spread is covered by Directive 2000/29 Article 16 which requires measures to deal with spread. Article 23 however explicitly excludes natural spread from eligibility for solidarity funding, and past experience has shown the shortcomings of this approach in terms of effectively targeting pests at the start of an outbreak (e.g. *Diabrotica virgifera*). Technically, the strong interaction between the natural spread and movement of plants, and the fact that natural spread is an inherent characteristic of any pest, make the distinction of causal effects on plant health questionable; ISPM 2 includes consideration of natural spread where the pest risk is considered unacceptable and the phytosanitary measures are feasible. Therefore, there is need for clarification of the CPHR rules on natural spread. The potential longer term effects of climate change in terms of altering patterns of natural spread of HOs in the EU also need to be taken into account. In view of these conclusions, options for the explicit inclusion of natural spread in the CPHR were developed and explored.

Suitability of CPHR intervention logic for forestry, public green and natural habitats: the appropriateness of the CPHR to address the control of HOs in these sectors is an issue which goes beyond the clarification of the provisions on natural spread as such. Principally, the CPHR should continue to provide protection against non-EU HOs in these sectors as is currently already the case, and as is the practice in the plant health legislation of third countries. Deciding on the best course of action in case of outbreaks of regulated non-EU HOs in EU forests, public green or natural habitats (e.g. PWN and Anoplophora), however, requires consideration on a case by case basis of whether the potential impact (economic, environmental and social) of the pest in these sectors continues to warrant drastic measures under quarantine regulation (= CPHR) when initial eradication fails. Such decisions may ultimately be political (Commission action vs MS subsidiarity) and need to involve close coordination between plant health and environment protection policy makers.

Invasive Alien Species (IAS)

There is currently a lack of common understanding, leading to considerable confusion, on both the definition of Invasive Alien Species (IAS) and the extent to which IAS are covered by the scope of the Directive. The defining characteristic of IAS, according to the CBD definition, is their wider environmental impact on ecosystems. Historically, this has been considered as an indirect impact for the purposes of Directive 2000/29, but in recent years there has been a *de facto* shift in implementation, due to major pest incursions with significant indirect, non-commercial or purely environmental impacts. In practice, many regulated pests are IAS which are already listed in the Directive (recent examples include *Anoplophora spp*., *Phytophthora Ramorum*). There have also been international developments in considering IAS at the level of IPPC and EPPO, and a more general EU strategy on Invasive Species (IS), following the CBD definition, has been developed. There are therefore extensive calls for clarification of the CPHR on this issue. The potential effects of climate change in terms of altering patterns of alien species invasion in the EU also need to be taken into

account. Consequently, options for the future regarding the inclusion of IAS in the CPHR were explored.

2. Approach followed for the classification of HOs

The current classification of HOs in Directive 2000/29/EC (several Annexes with lists for which a range of measures are foreseen, 250 HOs in total) is based on the historical approach taken by EU MS and therefore reflects MS and EU historic priorities on risks. Although the number of HOs listed as such is not an issue for effective management at MS CA level in terms of imports from third countries, there is need for revision of the lists (reviewing the approach to Annexes I and II in particular). There is also a need to consider prioritisation of HOs that are of EU-wide concern (e.g. in the context of pathway analysis for import inspections, or for intra-EU surveillance measures); especially as concerns HOs occurring on EU territory. If greater prioritisation is needed, then this could be based on criteria to be developed, and the general survey has already pointed in the direction these could take. The scope for prioritisation is explored further in relation to options for the future to ensure better prevention and to maximise the cost-effectiveness of current measures and resources (in particular for import inspections and for intra-EU surveillance).

Additions to the lists of the Directive, on the basis of PRAs, are constrained by current data availability and methodologies and this delays the process for listing new HOs. Longer term, the EU FP7 funded project PRATIQUE is expected to support the development of generic methodologies with a view to improving PRA availability on a systematic basis and more proactively (before risks emerge). In the meantime, the use of expanded fast-track risk analysis to speed up the adoption of measures (particularly in emergency situations), as well as improving cooperation between all bodies currently involved in PRAs (EFSA, EPPO, MS CAs, stakeholders where possible) should be considered.

More generally, major limitations of the current approach are found to be the lack of horizon scanning and the lack of efficiency in dealing with emerging risks. Approaches to overcome these issues are explored further under the options for the future (prevention at import and emergency action, respectively).

The approach followed for the positioning of Regulated Non Quarantine Pests (RNQPs) was also examined. The question is raised because in the EU, two sets of legislation currently cover the range of regulated pests: the Plant Health Directive 2000/29/EC and the Marketing Directives for Seeds and Plant Propagating Material (S&PM). In conclusion, the results of the evaluation indicate that the major issue of concern is the current overlap between the two sets of legislation rather than inconsistencies, and that a mechanism should be in place to allow careful consideration for transfer of eligible RNQPs between the two sets of Directives. Consequently, options for the appropriate positioning of RNQPs were explored.

3. Implementation of surveillance provisions

Surveillance is currently compulsory only in the case of emergency, control measures and Protected Zones (PZs); the degree of application is variable by HOs (systematically undertaken only for potato diseases). Procedures for surveys (including protocols and reporting formats) are generally not harmonised at EU level (with the notable exception of PWN), leading to varying implementation. In the great majority of cases notification of findings is not done in conformity with legal requirements. This has hindered the possibility for early action against HOs, and delayed communication of information to CAs and stakeholders. There is therefore agreement on the need to introduce a quicker system for notification of findings and outbreaks (possibly to be developed within current EUROPHYT database).

Other (general) surveillance is carried out by some MS for certain HOs, according to MS priorities and following different procedures and reporting standards. This affects the extent to which comprehensive information on the spread of HOs on the EU territory is available, thus leading to less effective and efficient eradication measures.

The involvement of POs is generally limited, despite the importance of stakeholder involvement in early action.

There is general agreement about the importance and need of more and intensified surveillance, and support for introduction of compulsory general surveillance at EU level for priority HOs, although views on the process and criteria to be used for the identification and selection of HOs to be subject to such surveillance, as well as the scope and method of surveillance, are divergent. The introduction of surveillance on a compulsory basis is associated with general support for introduction of EU co-financing for this measure. Consequently, options for improving surveillance were explored.

4. Implementation of import regime

Overall, the current system of plant health procedures and requirements as applied during the last 15 years for commercial imports of plants and plants products have been largely effective in preventing the introduction of major HO threats into the EU. Nonetheless, the system has some shortcomings as demonstrated by the fact that it not been effective in all cases. A number of weaknesses were identified as follows:

- Effectiveness of plant health border controls is highly variable between MS, and import inspections are focused on regional/national plant health issues rather than pests of EU-wide relevance. Improving the uniformity of import inspections could be addressed by: EU training (e.g. BTSF); networking between inspectors; development of general guidelines;
- Significant delays in notifications of interception at import (EUROPHYT): up to 90 days in certain cases. This, combined with limited processing of notifications in current system to provide targeted information, leads to limitations in use as a risk analysis tool, as evidenced by limited use for risk based inspections at MS level;
- Identification of high risk pathways (in particular plants for planting including ornamentals) indicates scope for a pathway approach on imports in some cases;
- For some specific plants on which latent diseases can be present (particularly plants for planting), the need for more extensive post entry inspections has been identified;
- Current implementation of derogations is considered to present a potential phytosanitary risk, in particular those regarding small quantities not used for commercial purposes, and regarding transit consignments;
- Widespread concern for lack of traceability from Point of Destination (PoD) back to Point of Entry (PoE) as this could in theory pose a problem, due to the complexity of trade patterns (including consignments in transit);
- Use of reduced frequency checks is very mixed between MS and remains rather limited (18 MS have not applied this possibility), although for the 8 MS that apply this system it is considered to have been effective. The limited use of reduced frequency is not necessarily a weakness as such, but suggests that some MS may not be prioritising inspection according to risk possibly leading to weaker focus on risk areas;
- There is scope to improve and strengthen EU emergency measures, with a view to reducing delays and enhancing effectiveness and efficiency;

- Third countries have difficulties understanding EU requirements through the reading of legislation and perceived lack of uniform interpretation between MS inspection services;
- Cooperation between plant health and customs authorities needs to be enhanced, *inter alia* to target consistency of nomenclature and to promote IT system interoperability;
- Lack of sufficient traveller awareness of the phytosanitary risks or private imports poses significant risk in the absence of any measures on passenger transport and divergent policies and practices of MS in this area (passenger transport controls, passengers' personal luggage allowance);
- Underlying the above shortcomings, there is a lack of sufficient staff resources and training for authorities at all levels, to ensure full and satisfactory implementation, particularly within the current economic context.

Moving forward, in the context of the significant expansion in trade volumes and change in trade patterns (new products and sources of supply), the EU is faced both with increasing and emerging risks of introduction of HOs. These trends, which have already been witnessed in the last decade, are occurring in the context of reduced administrative and financial resources at MS level for inspections. In conclusion, therefore, better risk targeting and maximising the effectiveness and efficiency of current resources, as well as improving the availability of staff and resources, are critical success factors and should be the basis for future improvements to address the challenges ahead. Consequently, options for the future import regime were developed and explored.

5. Implementation of intra-EU movement regime (plant passport system)

Overall, while the regime has succeeded in achieving the free circulation of plants and plants products within the EU, there are significant concerns on its effectiveness in terms of addressing plant health problems as such. Perceived inadequacies, related mainly to the implementation of rules, have demonstrated a certain conflict between the two objectives in practice. In particular:

- The producer registration system is generally perceived to work reasonably well. The concerns are mainly related to the issuing of plant passports and the credibility of plant passport documents *per se*;
- Although nearly all MS have implemented the option to delegate the issuing of PPs to registered private operators under official NPPO supervision, the majority of MS CAS has nonetheless expressed concerns on the functioning and reliability of the system. This appears to be partly linked to the resources available to carry out the appropriate level of inspections and controls and to ensure correct implementation. On the other hand, for stakeholders, the delegation of responsibilities to issue PPs to private operators has been a major step forward in terms of facilitating trade and introducing flexibility in the current system.
- Lack of uniformity in the application of the PP system is a particularly significant concern. This is associated with the lack of a standardised format for the plant passport document and divergent practices on the information contained in the document and its attachment to products. Plant passports are difficult to read when too often plant passports information is being mixed with trade information. There is an urgent need for rules/guidelines, including possibly a harmonised plant passport format;
- Although the PP document was not intended by the legislation to be a traceability tool, it can offer certain elements of traceability. However, full traceability cannot be ensured by the PP document alone, as it is often used jointly with trade documents, and there is considerable difficulty combining the plant passport and the physical plant or plant products, particularly with smaller plants such as ornamentals. The plant passport only provides information on the previous stage in the supply chain and difficulties are being observed when there is a need to further trace back and/or trace forward;

- Six MS have not implemented exemptions for "*small producers serving the local market*" and for "*products destined for final consumption*" due mainly to potential phytosanitary risk, but in those MS that have implemented the exemptions the risk is considered minor relative to the potential burden on these sectors.

In conclusion, by and large, the implementation of the current PP system does not sufficiently take into account risk analysis nor does it provide a sufficient guarantee that products are safe to move within the EU. In many cases, the shortcomings identified in the implementation of the current system have undermined the trust of both MS CAs and stakeholders on some of the provisions, and this is a critical success factor for restoring overall credibility in the system.

The above findings confirm that the situation remains as challenging as highlighted in the FVO Report of 2005 on this subject. These concerns are particularly acute in the case of protected zones (PZs) and call for a significant review of both systems. Consequently, options for improving the intra-Community movement regime were explored.

6. Implementation of the Protected Zones (PZ) system

Overall, while the concept of Protected Zones (PZs) is generally considered to be useful and effective in slowing down the spread of certain HOs, continued persistent variability in implementation at MS level has led to loss of credibility, hence undermining the usefulness of the system as a plant health measure. Despite significant progress in providing technical justification for the current PZs at EU level, the general perception is that PZs were not designated only on technical grounds but that significant commercial/political considerations are also present The evaluation has found that these concerns are largely linked to an on-going debate on the cost and benefit distribution of the current implementation of the PZ system. Moreover, the distribution of costs and benefits is generally assessed from the perspective of individual MS or regions, largely ignoring the cost-benefit distribution of the current system of PZs for the EU as a whole.

Many of the problems of PZs are due to MS failure to apply the agreed measures and not to flaws in the concept *per se*. There is evidence of MS failure to carry out surveillance and report the results; and, of certain failures in the implementation of the PZ plant passport system ('ZP' marking) which is considered to create additional administrative and financial burden for traders.

The consensus view is therefore that controls should be strengthened and legislation fully enforced (e.g. surveillance and reporting obligations) to restore the credibility of the PZ concept. In this context, options to pursue further the IPPC PFA concept, which is the approach followed internationally, could also be explored (the two concepts could potentially be applied in parallel). It is noted, however, that the credibility issue (vis à vis third countries) is not unique to the EU PZ system; in the WTO SPS and IPPC context, these are common and relatively frequently occurring problems with the application of the PFA concept. Alternative regionalisation concepts could also be considered, e.g. *Diabrotica virgifera* may be a good example of the need for a concept using definitions of demarcated infested zones and pest-free zones. However this approach should be restricted to limited cases and not be widely applied, to avoid excessive complexity in the implementation of plant health measures. Consequently, options for the future of the PZ system were explored.
Ultimately, a critical success factor for the application of any regionalisation concept will be to ensure a fair balance between the distribution of costs and benefits at MS level and for the EU as a whole. This will need to be determined on a case-by-case basis, considering infested and non-infested MS, and the consequences of potential infestation for the EU as a whole, taking into account liability aspects, incentives, feasibility and proportionality.

7. Implementation of control and emergency measures

Overall, the control and emergency measures have been partly successful in preventing the entry, establishment and spread of HOs in the EU. The effectiveness of the measures taken tends to be specific to the HO being targeted and can vary between regions, and therefore has to be considered on a case by case basis.

Additionally a distinction has to be made between emergency and control measures: while emergency measures are largely considered to have been ineffective on the basis that they are generally adopted too late (despite the fact that the legislative process as such – comitology - is relatively less cumbersome than for a Council Control Directive), control measures are generally considered to have been largely effective (despite the fact that the legislative process in this case – Council approval and since Lisbon Treaty (Dec. 1, 2009) co-decision Council and Parliament - is by definition longer and less flexible).

Control measures for ring rot and brown rot in potatoes are considered to have been most effective. Critical success factors can be summarised as follows:

- Adoption and implementation of very strict measures swiftly after the outbreak, with strict provisions in the infested fields and refined methods for analysis procedures, and movement restrictions (these apply for 4 years);
- Application of common procedures through control Directives with detailed obligations restricting free interpretation;
- A commercial crop and therefore producers/growers and industry are concerned and economically motivated to act;
- Potato sector is of high commercial/trade value and is highly integrated.

Early prevention is considered to remain the most effective and efficient approach for plant health management. Consequently, recommendations for improving emergency response were provided. Options to improve the system include speeding the adoption and adaptation of emergency measures (based on the evaluation of pest situation through PRAs developed step by step), and strengthening emergency approach for outbreak measures *inter alia* via creation of emergency team (SANCO/MS) to coordinate EU response to emergencies (as in animal health sector).

8. Support activities

<u>Research and development and scientific advice</u>

The number of HOs arriving and spreading within the EU is expected to increase in the coming years mainly due to globalisation trends and climate change. Against these trends, it is recognised that the R&D expertise in plant health is declining in the majority of the most important disciplines required for this sector (taxonomy, entomology, diagnosis, etc.), leading to the need to further coordinate R&D activities at EU level. In this context, the use of existing EU R&D programmes (ERA-networking, networks of excellence, etc) is crucial, but currently not perceived to be sufficient.

DG RTD supports the coordination of plant health research activities commissioned under national MS budgets (which roughly account for 90% of all such budgets available in the EU), through the ERA-net EUPHRESCO. The establishment of this network is perceived to be a significant step forward in the direction of establishing a coordinated EU R&D approach and there is wide support for its continuation in future.

EFSA can contribute to the harmonisation of the framework for PRA and the identification and evaluation of risk management options. However, the role of EFSA does not encompass the economic (cost/benefit) analysis required in full PRAs according to ISPM 11 and 21 and WTO-SPS. It is therefore important to find an appropriate platform to carry out this type of analysis, which at present is provided on an ad hoc and exceptional basis through impact assessments. In this context, the outputs of the EU FP7-funded project PRATIQUE are expected to provide generic economic and modelling techniques to support the development of decision support tools for pest management. Finally there is a concern that the PRA process *per se* is becoming increasingly complex and this can inhibit timely decision-making to the detriment of effective and efficient plant health management.

Moving forward, the need to create a more permanent platform to ensure the continuity of the coordination and support of research and development in this field has been identified.

Diagnostic capacity

Overall, in the majority of MS the existing capacity is considered to allow only partially the rapid and reliable diagnosis of all regulated HOs, and this is mostly due to the relatively limited and decreasing financial and human resources. Gaps for the detection (in terms of methods and reference materials) are indicated by several MS, particularly with regards to rare or new HOs, as well as increasing difficulties to find experienced experts in specific fields as expertise is generally eroding especially in classical subjects (as also noted under previous section). Resources for diagnostics are in many cases limited even with regard to HOs for which detection is possible and in terms of activities that the laboratories would technically be able to carry out.

The divergence in diagnostic capacity across the EU is largely due to the inherent characteristic of research on plant health which explains the difficulties of attracting financial support in this field: plant science is not a high priority compared to other scientific fields such as nanotechnology, engineering etc., and commercial interest remains limited. In those MS where plant health is important for trade and production, the diagnostic sector is more developed, with significant resources devoted to research, a clear structure and organisation in place, and there is additional funding by industry. However, only a minority of MS are in this situation.

There is lack of cooperation and networking among MS, although this is considered crucial for overcoming current deficiencies. The contribution of EU Projects, particularly EUPHRESCO, is generally recognised for having a positive impact on networking between research bodies and laboratory experts, but this needs to be further strengthened. Experts stress the fact that coordination among activities at MS level remains the main weakness for research and diagnostics at EU level.

A particularly weak aspect is the development of diagnostic methods, for which funding is not always available. There are several EU funded projects to improve diagnostic methods/protocols and update with latest technology in this field (including DIAGPRO (Diagnostic Protocols), QAMP (whole genomic DNA amplification methods), QBOL (DNA bar coding) and Q-DETECT). At EU level, binding protocols for diagnostic methods do not exist (with the exception of some HOs for potato diseases under control measures), but for a range of HOs, the EPPO and IPPC have issued standards for diagnostic methods and procedures (some 97 protocols to date). Many laboratories are currently in the process of preparing for accreditation, and EPPO is working to share the experience gained between laboratories.

Moving forward, the need to establish reference laboratories (NRLs and EU-RLs) was identified, in order to provide guidance on diagnostic methods and training, as well as to provide maintenance of reference collections.

Training

The evaluation highlighted the reduced availability of training and significant variability among MS in the level and quality of resources for training activities. Coupled with the lack of communication and cooperation among inspectors of different MS, this contributes to the limited harmonisation of inspection practices and the variability in the effectiveness of import inspections among MS. Some EU-funded training in the field of plant health to EU NPPO services was provided in 2008 and 2009 under the BTSF (Better Training for Safer Food) program. Moving forward, it is recommended that this training is strengthened and continued, and that it is provided both for inspectors and diagnosticians.

9. Organisational aspects

Distribution of responsibilities

The NPPO is the Single Authority and the Responsible Official Body within the meaning of Article 1.A of Directive 2000/29 in the majority of MS; the current legal framework is considered to be adequate.

As foreseen in the legal framework, delegation of certain tasks is possible under the authority and supervision of the responsible official bodies. This is currently done by approximately half of the MS and mainly concerns the conducting of official checks, control and inspections and the conducting of official laboratory analysis; these tasks are delegated mainly to public bodies. Although the majority of MS CAs consider that the public resources devoted in their country to the duties and tasks derived from the CPHR are insufficient, in the context of the present evaluation the majority view has been that there is limited need or opportunity for further delegation of tasks to other bodies or legal persons. However, in view of the recent amendment of Dir. 2000/29 with regard to delegation of laboratory testing, it is recommended that further study is undertaken on this issue. This would be particularly relevant in view of the resource constraints extensively reported and identified throughout this evaluation, and the need for increased collaboration and responsibility sharing among CAs and stakeholders. Delegation should be carefully examined considering the different capacities existing in the MS, to ensure a high degree of quality, independence and impartiality. The evaluation highlights the general lack of incentives as regards the timely reporting of outbreaks and the effective implementation of control measures, and the limited current availability of mechanisms that would act as incentives, both for private operators and CAs (e.g. compensation schemes, solidarity regime). Options to improve these aspects were explored.

FVO activities

The role and functions of the FVO are considered highly useful and important for monitoring and contributing to harmonising the implementation of the CPHR in the MS and for the improvement of compliance with EU import requirements from Third Countries (TCs). It is however noted that the follow-up of missions is as important as the missions, and therefore measures to ensure implementations of recommendations should be in place. The main constraint to the work of the FVO is the limited availability of resources; an increase in FVO resources would enable some of the suggestions made for future improvement (e.g. missions to TCs, as these are considered to be highly useful).

EUROPHYT

EUROPHYT has proved to be a useful tool for the exchange of information among MS on interceptions of HOs. However, this mainly applies to imports, as there is no legal obligation in place

for systematic reporting of findings in plant material from other MS. It is recommended therefore that the use of EUROPHYT for compulsory notification should be extended from trade with third countries to intra-Community movements.

Another set of improvements is suggested in order to make the system more user-friendly (e.g. improved search engines), to increase readability and usability of data for inspection targeting (e.g. data elaboration) and to increase the usefulness for signalling upcoming threats (e.g. modification of information required).

Communication and consultation

The current communication activities around the CPHR are generally perceived to be limited, and confined mainly at public authority level (between COM and MS authorities). There are significant calls for more transparency in the decision-making process (based upon risk analysis) and the communication of actions to stakeholders.

The current level of consultation in CPHR decision-making is generally perceived by stakeholders to be relatively limited, with traders seen as more represented via their organisations than producers/growers (in part due to less divergence of interests within the representative organisations). It is generally acknowledged that the CPHR has to seek a fine balance between conflicting interests (i.e. trade interests versus production interests, divergent interests across MS depending on production and trade interests). Furthermore, it is stressed that the interests of stakeholders may not fully correspond to plant health protection objectives. Plant health encompasses significant public good components and, in this context, plant health authorities consider that the interests of stakeholders should be taken into account insofar they are in line with plant health objectives, which are considered the overriding priority for policy making in this field. On the other hand, stakeholders call for a proportionate and balanced approach in deciding on plant health measures, based on appropriate PRA. More generally, the need for raising public awareness on plant health was also identified.

10. Costs and benefits of the CPHR

The impacts of plant diseases can be as devastating as animal diseases. Based on existing studies, past cases of HOs introduced and established in the EU, as well as estimates of potential impacts, the costs associated with plant diseases can be substantial, and ultimately the scale of the impact can potentially reach those recorded in the case of animal diseases. For example, in the case of *Bursaphelenchus xylophilus* (PWN) the control costs of the disease in PT have reached some 40 million € in the period 1999-2008 (including solidarity funding); the potential economic impact of failure to act could reach some 5 billion €/year from the potential destruction of some 10-13 million ha of susceptible coniferous trees (50-90% mortality rate). Other cases not specific to the EU, but that have occurred elsewhere, are an example of the potential scale of impact that could be reached. Ultimately, in value terms, in the EU, the share of production and exports of plants and plant products in the total value of agricultural production and exports is comparable to that of animals and animal products.

The actual and potential scale of impacts also highlights the extent of the benefits where the CPHR has effectively contributed both to avoiding the introduction of potentially injurious HOs and to slowing down their spread. A case study of 5 HOs (*Anoplophora (chinensis and glabripennis*), *Ceratocystis (fagacearum and fimbriata)*, *Erwinia Amylovora*, *Grapevine Flavescence dorée* and *Phytophthora ramorum*[6]) demonstrates substantial benefits.

[6] HOs selected out of a total 203 combinations (MS x HO) for which the benefits of the CPHR were widely attributed by respondents to the specific cost survey, although not necessarily representing absolute success cases across the EU-27.

The overall benefits of avoiding or delaying the introduction and spread of any HO in the EU include not only the avoidance or reduction of agricultural losses and gain in competitiveness for which the private sector is the main beneficiary, but extend to the avoidance or reduction of damage to ecosystems, biodiversity and rural communities from which the wider society benefits. **The strong public good components of the CPHR are therefore highlighted.**

The CPHR is considered to have been partly successful in preventing the introduction and spread of HOs, with success highly dependent on the targeted HO. The main lesson drawn from the cases of failure or partial failure (e.g. PWN; *Rhynchophorus ferrugineus* - red plam weevil; *Tuta Absoluta*) is the need to act quickly and decisively in case of introduction. Currently, the evaluation of the situation before taking measures is, sometimes, too slow or not decisive enough in responding to phytosanitary emergencies. A critical factor, in this context, for determining the success or failure of phytosanitary measures taken in any sector will be the availability of incentives for action at all levels.

CPHR provisions have provided the most effective protection as regards the HOs covered by the EU Control Directives (e.g. potatoes) for a range of reasons, mainly relating to the focus of the measures in a specific sector and the availability of incentives. By contrast the least effective protection appears to be provided in sectors where there is currently lack of clarity in measures and which are highly complex with a broader spectrum of affected stakeholders and potentially conflicting interests; this includes both some commercial production sectors and public / private green space.

The evaluation has confirmed the results of the earlier (2008) evaluation of the solidarity regime, in that the incentives provided by the regime remain relatively limited in a number of areas (intervention ex-post; exclusion of production losses; difficulty of assigning responsibility, particularly in cases of natural spread; lack of disincentives; non effective enforcement of penalties); in all these areas there is considerable room for improvement of the solidarity regime. A major gap is considered to be the exclusion of coverage of costs and losses incurred by private operators. However, there is a lack of data on the extent and scale of these costs, for which further cooperation with stakeholders is needed, as this is a crucial element for examining any revisions to the current system.

Costs and responsibility sharing schemes are generally considered to be the appropriate tool to provide incentives for government and private operator enforcement and compliance. The choice of tools (government contributions; private sector based) needs to be pursued on a case by case basis, where feasible. The generalised application of private sector schemes is constrained by industry specificities and structures and where the plant health threat has an environmental, public good component. In such cases, there are strong arguments for government supported compensation schemes.

The total administrative and other operational costs of the CPHR were estimated on the basis of a purpose-built cost model (applying the methodology of the EC Standard Cost Model), with data provided by MS through the specific cost survey. In total, based on the data provided for 24 MS[7], the total costs associated with the 13 CPHR obligations selected for the analysis amount to €148,799,204 on average per year, of which €57,191,859 are administrative costs and €91,607,345 are compliance costs. The total average annual costs for the 24 MS CAs amount to €59,218,314 (net of fees), of which 8.5% are administrative costs). These costs cover the three most important obligations of the CPHR, which are: import inspections. inspections at the place of production; and, the compulsory annual surveys of HOs regulated under the emergency measures and the Control Directives. The total amount recovered by the 24 MS CAs through fees charged to the private operators pursuant to Article 13d(1) of Directive 2000/29/EC is estimated at €36,914,993. In addition to the above costs, based on data provided by 18 MS CAs, the costs of eradication and control measures amounted to €132,139,696 in total during 1993-2008. The total administrative costs for private operators (same 24 MS) amount to €51,445,518 on average per year, with the obligation to keep records representing 80.42% of the total.

[7] Of the 25 MS that responded to the specific cost survey, the analysis was only possible for 24 MS, as in the case of 1 MS the response was incomplete.

Finally, the total cost on average per year for the European Commission is estimated at €1,881,066, of which 38.3% is the administrative cost.

The evaluation has highlighted a number of areas where opportunities for cost reduction exist, including the quicker adoption measures, the swifter adaptation of measures taken to the evolving situation, and the provision of incentives through responsibility sharing and the solidarity funding. More generally, enhancing prevention and the prioritisation of measures present opportunities for improving the cost effectiveness of the current system. These aspects have been built into the options that have been developed for the future (e.g. prevention: options on imports and on intra-EU surveillance; incentives).

S.4. Conclusions and options for the future

This evaluation of the various measures implemented under the CPHR indicates that, in the last 15 years, the policy has only partially been effective in preventing the entry and establishment, or where this has already occurred, in containing the spread of major pest incursions of significant potential economic, social and environmental impact in the EU.

The analysis of the regime's costs and benefits since 1993 demonstrates that the budget devoted to the CPHR to date remains relatively limited and, on a case by case basis, the CPHR has had clear benefits (e.g. *Anoplophora*, *Ceratocystis*, *Erwinia amylovora*, *Grapevine flavescence dorée* and *Phytophthora ramorum,* as well as potato brown and ring rot). Through the measures imposed in these cases, the CPHR has contributed either to avoiding the introduction of potentially injurious HOs or to slow down their spread, resulting in significant overall benefits and cost prevention.

Despite success in some cases, the regime overall has not been fully effective in meeting its objectives and, in its current form, was found to have both some stronger and some weaker aspects. A number of areas were identified where improvements are needed.

The identified weaknesses and shortcomings are partly due to the fact that the regime has been in place for a long period and the world has changed. The current regime is the product of a series of ad hoc, rather than strategic or systemic, adjustments to the various developments in the context the regime has operated in (notably: the introduction of the Single Market in 1993; successive EU enlargements in 1995, 2004 and 2007; EU international and bilateral relations). This is the first time that an opportunity exists to develop this policy area on the basis of a more complete and coherent strategy. A larger EU of 27 MS has meant that there is a more diverse range of climatic and pest situations to address than ever before, and trade is now truly global with new origins and products being continuously introduced, often with very short timescales. Evidence of failure of the current regime to respond to new challenges is the fact that it has not prevented some major new pests from entering the EU (e.g. *Anoplophora* sp., *Rhynchophorus ferrugineus*, PWN), in many cases largely due to the fact that new pathways that pose plant health risks have been discovered too late.

Several measures were assessed to have only partly been useful or effective. This is mostly attributed to a number of underlying factors including: implementation gaps and the lack of a harmonised approach between MS; significant constraints in the availability of staff and resources devoted to plant health at all levels (EU, MS, research bodies and diagnostic facilities etc.); the lack of clarity in certain legislative provisions (including on IAS and natural spread); lack of risk-based prioritisation of HOs and lack of targeted, risk-based prioritisation in the use of scarce resources; limited visibility and public awareness and thus political support to finance and enact the policy; lack of incentives and disincentives (including in the form of sanctions/penalties) or – where these exist – lack of enforcement; and, the limited support and lengthy decision-making process in emergency situations, which results in measures being taken too slowly and too late. These factors often lead to poor implementation. It is noted that the extensive identification of shortcomings in MS enforcement was due to a combination of the above factors, in particular insufficient resources/capacity, lack of clarity

in some provisions of the legal base, but also the fact that infringement provisions are not effectively pursued against MS.

Overall, the current level of emphasis of the CPHR on prevention and early response was found to be largely inadequate. This lack of a pro-active approach manifest itself at various levels: the CPHR financial framework (Solidarity Fund) only acts *a posteriori* and does not cover any measures or activities taken on a preventive basis, before or as soon as, outbreaks or new findings occur; emergency measures are generally adopted too late, and there is no formal framework or support to deal with emergency situations; contingency plans are not systematically put in place (either at MS, or at EU level); efforts to undertake more general surveillance (beyond compulsory surveillance) are relatively limited (with significant variation between MS) and are neither systematic or coordinated. In conclusion, therefore, the current policy has clearly shown some limitations.

Moving forward, the more general conclusion that can be drawn from the analysis of future challenges points to the evolving nature of risks, particularly in the context of climate change and increasing trade, and their potential far reaching impact on both commercial agriculture and forestry but also on the society as a whole (ecosystems, biodiversity and rural communities). It is generally acknowledged that globalisation is the overriding challenge, with climate change adding to the complexity and range of potential impacts. These challenges are not unique to EU plant health policy, but exert a wider impact on countries around the world. At the same time, MS CAs (National Plant Protection Organizations - NPPOs) are increasingly confronted with recurrent obstacles at different levels, including the lack of resources and insufficient knowledge on emerging pests.

In view of the relative success of the regime so far, the majority of MS CAs and stakeholders believe that the CPHR scope and objectives, as reflected in the development of the intervention logic in the period 1993 to date, are still being met and are still appropriate. At the same time, the majority of MS CAs and stakeholders considered the current CPHR to be only partly suitable to mitigate risks introduced by new challenges, in particular by climate change. On balance, the general view would be that the plant health regime needs to respond to the new challenges, by building on those stronger aspects of the regime that have been proven to work well and addressing the weaker areas: evolution rather than revolution is needed. A key feature of the new intervention logic developed by the FCEC on this basis is that it proposes an ***adaptation to the current regime rather than a complete change***.

The identified weaknesses and shortcomings, as well as future needs and challenges (opportunities and threats), point in the direction of potential options for improvement and these have been developed and assessed on the basis of the wide consultation carried out by the FCEC.

At a conceptual level, the various options aim to respond to the need for:

- ***More prevention;***
- ***Better risk targeting (prioritisation);***
- ***More solidarity: moving from MS to EU approach for more joint action to tackle risks of EU significance.***

S.5. Recommendations

The preliminary analysis of the options has highlighted those that represent the best balance of advantages/disadvantages against anticipated impacts. It is noted that options are complementary (can be pursued in parallel) and, in all cases, the assumption is made that the improvements suggested in relation to the status-quo (option i) will be taken on board. The options are supplemented by a number of additional recommendations on possible improvements to the regime. As a result of this process, this evaluation provides a total of 15 recommendations, as follows:

Recommendation 1: IAS
Based on an analysis of the scope of the IPPC and the consensus view as it emerged in the process of the evaluation and the FCEC analysis, the explicit inclusion of IAS plants with wider/environmental impacts (habitats and ecosystems) and/or economic impacts on wider range of stakeholders **(option iii)** is recommended.

Recommendation 2: Natural spread
The evaluation results, confirmed by the outcome of the conference of February, indicate that in the context of increased demand for better prevention and timely action against outbreaks, but also to improve the consistency of the current approach, natural spread needs to be explicitly included in the regime (option ii), and covered by the solidarity regime (option iii), in order to maximise the relevance, effectiveness and efficiency of this approach (costs and benefits of the approach to be established on a case by case basis). On this basis, **option ii** is generally recommended, with consideration of **option iii** recommended in certain specific cases.

Recommendation 3: RNQPs
From the analysis of the options, the adoption of a zero tolerance approach to the regime covering both quarantine and non quarantine pests for which tolerance is zero (PH: RQPs + RNQPs; tolerance = 0) **(option ii)** is the most recommended. It is noted that this includes the improvements suggested in the status-quo (option i).

It is also recommended that the potential benefits of synergies between the CPHR and S&PM are further explored.

Recommendation 4: Prevention strategies at import
Based on the consensus view as it emerged in the process of the evaluation and the FCEC analysis, it is recommended that complementary measures, are taken. These measures include: for emerging risks, particularly new trade in plants for planting/ propagating material (PM), commodity pathway analysis **(option iii);** for plants for planting/PM, official post entry inspections for latent HOs (**option iv(a)**); and, for plants for planting/PM, on the basis of commodity pathway analysis, the introduction of import bans where necessary (**option iv(c)**).It is noted that this includes the improvements suggested in the status-quo (option i).

Depending on severity of non-compliance or infractions (both at the level of individual traders and at the level of the CAs involved), sanctions could be introduced in the system. This issue is more broadly considered under the options regarding incentives.

Recommendation 5: Intra-EU surveillance
The evaluation results, confirmed by the February conference, identified significant support for general epidemio-surveillance for priority HOs, although the process and criteria to be used for the identification and selection of HOs to be subject to such surveillance, as well as the scope and method of the surveillance, remain to be discussed.

Considering the views of MS CAs, stakeholders and experts, and taking into account the Council conclusions of 2009, the following options are recommended: the development of common principles and guidelines for harmonized surveillance and reporting (**option ii**); the introduction of mandatory general surveillance at EC level for priority HOs (**option iii);** and, the introduction of co-financing for surveillance (**option iv**). It is noted that this includes the improvements suggested in the status-quo (option i).

Recommendation 6: Emergency action
Based on the analysis of the options for emergency action, the following options are recommended: horizon scanning (**options ii**); the compulsory development of contingency plans according to a harmonized framework (**option iii**); and, speeding up the process for adoption and adaptation of both emergency and control/eradication measures (**option v**). It is noted that these options are complementary (i.e. can be adopted in parallel), and that, in all cases, they include the improvements suggested in the status-quo (option i).

Recommendation 7: Plant Passport (PP) system
From the analysis of options for the future of the PP system, revising the scope of application (**option ii**) and harmonising the PP document (option **iii**) are the most recommended options. It is noted that these options are complementary (i.e. can both be adopted), and that, in both cases, they include the improvements suggested in the status-quo (options i).

Recommendation 8: Tightening the system of Protected Zones (PZ)
The analysis of options for tightening the PZ system suggests that improving the status quo (**option i**)) is the most recommended starting point, on the basis that it represents the best balance of advantages/disadvantages against anticipated impacts while being the most acceptable. Longer term, there is also a need to further examine the implications of applying more widely the PFA concept (ISPM 4).

Recommendation 9: Incentives
On the basis of the evaluation results, confirmed by the February conference, and the results of the evaluation of the solidarity regime, the most recommended options for incentivising the current system are to extend the current scope of solidarity to: cover the loss of destroyed material for producers/growers (**option i(a)**); and, co-finance certain measures which contribute to better prevention e.g. surveillance, contingency planning (**option i(c)**).
It is also recommended to carry out further analysis of the possibility to introduce cost-responsibility sharing schemes, in line with the ongoing development of this concept in the animal health field.

Recommendation 10: Research and development and scientific advice
The definition of a structural role for EUPHRESCO-like coordination of national research funding is recommended, with the establishment of a specific budget for this purpose.
The evaluation highlighted a strong need for sufficient and stable EU and MS resources for funding research projects; for short term research needs, a structural budget within the CPHR could be established in addition to the FP7.
It is recommended that discussions and cooperation between SANCO/EFSA and EPPO continue with a view to identifying complementarities to cover the economic impact of the EU PRAs, complementing the EFSA role.

Recommendation 11: Diagnostics
To enhance the diagnostic capacity in this sector in the EU, it is recommended to complete the establishment of NRLs in MS and to establish EU-RLs for a limited number of HOs. Longer term, EU-RLs could be established for each of the disciplines (nematology, entomology, acarology, mycology, bacteriology, virology), and subset of disciplines, so that they should be able to detect all the 250 HOs.

Recommendation 12: Training
It is recommended to continue and strengthen training activity in the plant health sector for inspectors and to intensify efforts by extending the training also to experts in the diagnostics field.

Recommendation 13: EU/MS emergency team
The establishment of an EU/MS Emergency Team (within DG SANCO and supported by extended network of MS experts) for Plant Health is recommended, in line with the existing emergency preparedness approach in the animal health field.

Recommendation 14: Communication and transparency
The need for an increased public and political awareness was a clear outcome of the evaluation. It is therefore recommended that both at EU and MS level public awareness campaigns are developed and implemented.

Recommendation 15: Financial Framework
The evaluation of the CPHR performance to date, and in particular of the financial framework (solidarity regime) has extensively highlighted the mismatch of currently available resources to objectives, which underpins many of the identified shortcomings and weaknesses. The above analysis of options for the future has in all cases pointed to the need to increase resources and/or prioritise to meet the objectives set out in the options. The Commission will have to reflect on the best option to follow.

The evaluation results have also confirmed the conclusions of the solidarity regime evaluation, according to which, a financial instrument is needed for better preparedness in case of emergency.
In this context, the evaluation recommends that the merits of developing a specific financial instrument in this sector, possibly in the form of a ***Plant Health Fund*** drawing a parallel from the Animal Health Fund, need to be examined further.

The contribution of the various options and recommendations towards the various identified needs and objectives is depicted in Table 1. The priority assigned to each option and need for further assessments are also highlighted. The overarching objective in all cases is to improve prevention.

Table 1: Key recommendations for the future and their contribution to achieving the identified needs and objectives

	Specific objective: better prevention								
	Operational objectives:								
Options (most recommended)	**Early detection**	**Early response**	**Risk basis**	**Definition of responsibilities**	**Incentives**	**Clarification[68]**	**Public/political awareness**	**Priority**	**Need for further assessment**
1.Explicit inclusion of IAS plants with wider environmental impacts and/or economic impacts on wider range of stakeholders	✓	✓				✓ (a)		Medium	
2.Inclusion of natural spread in solidarity regime[69]		✓		✓		✓	✓	Medium	To enquire feasibility of pursuing implementation of sanctions/penalties.
3.Zero tolerance regime			✓			✓ (b)		Low	A separate impact assessment is recommended in order to examine scope of HOs involved and to ensure coherence with S&PM legislation
4. Imports									
For emerging risks: commodity pathway analysis [70]	✓		✓			✓ (a)		High	A cost-benefit analysis may be required
For plants for planting/PM strengthen measures: *a. Official[71] post entry inspections for latent HOs*	✓							Medium	A cost-benefit analysis may be required
b. Introduce import bans where necessary			✓					High	Acceptability of ban needs to be further assessed
5.Surveillance									
Development of common principles and guidelines for harmonized surveillance and reporting	✓					✓	✓	High	

[68] Where appropriate, clarification is further indicated in terms of: (a) alignment to international standards; (b) better coordination of EU policies

[69] Consideration of solidarity funding for natural spread to be addressed on a case by case basis (e.g. in line with conclusion of 2008 solidarity regime evaluation).

[70] This concerns particularly new trade in plants for planting/ propagating material (PM).

[71] "Official" refers to form of inspection and not agent (the issue of whether the agent would be a CA or licensed private sector inspector is not addressed here).

	Specific objective: better prevention								
	Operational objectives:								
Options (most recommended)	**Early detection**	**Early response**	**Risk basis**	**Definition of responsibilities**	**Incentives**	**Clarification[68]**	**Public/political awareness**	**Priority**	**Need for further assessment**
General surveillance mandatory at EC level for priority HOs[72]	✓	✓		✓			✓	High	Prioritisation criteria to be defined.
Introduction of co-financing for surveillance	✓	✓	✓	✓	✓		✓	High	Assessment to be conducted under solidarity funding scope
6.Emergency actions									
Horizon scanning			✓					High	
Compulsory development of contingency plans according to harmonized framework		✓		✓	✓		✓	High	To be analysed whether these should be general or pest specific; degree of involvement of stakeholders
Speed up process for adoption and adaptation of both emergency and control/eradication measures		✓		✓				High	
7.Plant Passport system									
Clarify the scope and level of PP application, in terms of: a. Plants; b. *Marketing stage*			✓			✓		Medium	Further detailed analysis of scope required
Harmonise PP document						✓		Medium	A separate study is recommended in order to examine scope for harmonisation
8. Protected zones									
Status quo (with improvements)of PZs: a. Improve surveillance targets, b. Involve stakeholders, c. Harmonised eradication programmes, d. ending status on time				✓	✓	✓		Medium	More detailed analysis needed of implications of moving to PFA and possible coexistence of PZs and PFAs
9.Incentives									

[72] Other than Emergency Measures, Control Directives and PZ

	Specific objective: better prevention								
	Operational objectives:								
Options (most recommended)	**Early detection**	**Early response**	**Risk basis**	**Definition of responsibilities**	**Incentives**	**Clarification[68]**	**Public/political awareness**	**Priority**	**Need for further assessment**
Extend current scope of solidarity: <u>Eradication measures (current scope)</u>: a. Extend (within current scope) to cover loss of destroyed material			✓		✓		✓	High	Further detailed analysis of scope required
Extend current scope of solidarity: <u>New measures</u> Measures for co-financing consideration may include e.g. surveillance, contingency planning, prevention of emerging risks and emergency actions.	✓	✓		✓	✓		✓	High	Further detailed analysis of scope required
Further recommendations									
10.Research & Development	✓	✓	✓			✓	✓	High	
11.Diagnostic laboratories	✓	✓	✓	✓		✓		High	
12.Training	✓		✓					High	
13.EU/MS Emergency Team		✓		✓		✓	✓	High	
14.Communication and transparency							✓	Medium	
15.Financial framework	✓	✓			✓		✓	High	

High: action recommended within the following year

Medium: action recommended within 1 to 5 years

Annex II: Legal structure of the regime and foreseen changes

The plant health regime comprises a large volume of legislation. The main legal acts, changes foreseen to those acts and the related impact assessments are outlined below.

A. Overview of the relevant legislation

Basic act: Council Directive 2000/29/EC

- The basic act of the plant health acquis – covered by the present IA - is Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. The Directive has been repeatedly amended since its initial adoption in 1977.
  → *The current review foresees to change the basic Directive into a Regulation and to upgrade and expand the legal provisions (for details, see Section 4 and Annex IX).*

  The proposal will be subject to co-decision of Council and European Parliament.

- The Directive contains numerous empowerments for the Commission to change the Annexes and to adopt secondary Commission acts (Regulations, Directives, Decisions, Recommendations). Large numbers of Commission acts have been adopted since the basic Directive entered into force in 1977.
  → *Certain secondary acts, for example Commission Regulation (EC) No 690/2008 recognising protected zones exposed to particular plant health risks in the Community, will be repealed following the entry into force of the new plant health Regulation as they are absorbed into Articles of that Regulation or replaced by secondary acts adopted under that Regulation.*

  Most existing Commission acts (in particular emergency measures) will remain in force after the review.

- The empowerments have the form of classical Comitology provisions, involving the Standing Committee on Plant Health that was established by Article 18 of the Directive. They are all subject to the simple regulatory procedure (no regulatory procedure with scrutiny).
  → *In the new plant health Regulation, the general empowerments will be changed into empowerments for delegated and implementing acts. This had to be done anyhow due to the entry into force of the Lisbon Treaty.*

  Empowerments to change the new Annexes of the Regulation (concerning for example the criteria for categorisation of harmful organisms and for risk assessment and management) will take the form of delegated acts. Empowerments to adopt secondary legislation can refer to both delegated and implementing acts, depending on their nature.

Other Council Directives

- Four additional Council Directives (69/464/EEC, 93/85/EEC, 98/57/EC, 2007/33/EC) exist concerning the control of specific harmful organisms of potato. Part of these are consolidations and amendments of earlier Directives.

→ *These so-called 'Control Directives' will be replaced by implementing acts under the new Regulation, with transitional arrangements.*

- Two further Council Directives exist concerning the control of carnation leaf-rollers and of San José scale, pests that have in the meanwhile become widespread in the EU. These two Control Directives are no longer implemented.
  → *These two Control Directives will be repealed by the new plant health Regulation.*

Council Regulation on Official Controls

- Council Regulation (EC) 882/2004 concerns official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules. Currently, only four Articles (41-46) concerning the obligation for MS to set up multi-annual control plans and Union inspections within the MS and in third countries are applicable to plant health, which was otherwise excluded from the scope of the Regulation.
  → *The scope of Regulation 882/2004 will be expanded to fully cover plant health. Horizontal principles such as the definition of competent authorities, the provisions for delegation of official tasks, the principles for certification, official controls and fees will be transferred from the plant health Directive to Regulation 882/2004.*

  Regulation 882/2004 will be a recast, with its own IA. The main changes with foreseeable impact on plant health will be the provision of rules concerning official controls, fees, requirements for laboratory accreditation, the setting up of EU reference laboratories for plant health and the inclusion of plant health imports in the TRACES IT tool used for tracing of animals, animal products, food and feed that are imported into the EU.

Commission Decisions concerning accession to international treaties

- Two Council Decisions (94/800/EC and 2004/597) concern the accession to the IPPC and WTO-SPS.
  → *These Council Decisions will remain in force after the review.*

Council Directives on plant reproductive material

- 12 Council Directives[73] concern the marketing and production of seed and plant propagating material. As explained in Section 2, these currently also regulate harmful organisms.

  → *All these will be replaced by a Regulation on plant reproductive material, to be accompanied by its own IA. However all provisions of these Directives concerning plant health will be transferred to the new EU plant health regime.*

[73] Directives 66/401/EEC, 66/402/EEC, 68/193/EEC, 2002/53/EC, 98/56/EC, 1999/105/EC, 2002/54/EC, 2002/55/EC, 2002/56/EC, 2002/57/EC, 2008/72/EC, 2008/90/EC

Annex III: International Plant Protection Convention[74]

The International Plant Protection Convention (IPPC) is an international plant health agreement, established in 1952, that aims to protect plants by preventing the introduction and spread of pests of plants and plant products. The convention has been deposited with the Director-General of the Food and Agriculture Organization of the United Nations (FAO) since its adoption in 1951. A new revised text[75] was approved by the FAO Conference in 1997. The EU and all its Member States are contracting parties to the IPPC.

The Convention extends beyond the protection of cultivated plants to the protection of natural flora (wild plants) and plant products. It takes into consideration both direct and indirect damage by pests, so it includes weeds. It also covers vehicles, aircraft and vessels, containers, storage places, soil and other objects or material that can harbour or spread pests.

The Convention provides a framework and a forum for international cooperation, harmonization and technical exchange between contracting parties. The IPPC develops so-called International Standards for Phytosanitary Measures (ISPM). At present 34 of such standards have been published:

ISPM 01	Phytosanitary principles for the protection of plants and the application of phytosanitary measures in international trade
ISPM 02	Framework for pest risk analysis
ISPM 03	Guidelines for the export, shipment, import and release of biological control agents and other beneficial organisms
ISPM 04	Requirements for the establishment of pest free areas
ISPM 05	Glossary of phytosanitary terms
ISPM 06	Guidelines for surveillance
ISPM 07	Phytosanitary certification system
ISPM 08	Determination of pest status in an area
ISPM 09	Guidelines for pest eradication programmes
ISPM 10	Requirements for the establishment of pest free places of production and pest free production sites
ISPM 11	Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms
ISPM 12	Phytosanitary certificates
ISPM 13	Guidelines for the notification of non-compliance and emergency action
ISPM 14	The use of integrated measures in a systems approach for pest risk management
ISPM 15	Regulation of wood packaging material in international trade
ISPM 16	Regulated non-quarantine pests: concept and application

[74] Based on information provided by the IPPC at https://www.ippc.int/

[75] https://www.ippc.int/file_uploaded//publications/13742.New_Revised_Text_of_the_International_Plant_Protectio.pdf

ISPM 17	Pest reporting
ISPM 18	Guidelines for the use of irradiation as a phytosanitary measure
ISPM 19	Guidelines on lists of regulated pests
ISPM 20	Guidelines for a phytosanitary import regulatory system
ISPM 21	Pest risk analysis for regulated non quarantine pests
ISPM 22	Requirements for the establishment of areas of low pest prevalence
ISPM 23	Guidelines for inspection
ISPM 24	Guidelines for the determination and recognition of equivalence of phytosanitary measures
ISPM 25	Consignments in transit
ISPM 26	Establishment of pest free areas for fruit flies (Tephritidae)
ISPM 27	Diagnostic protocols for regulated pests
ISPM 28	Phytosanitary treatments for regulated pests
ISPM 29	Recognition of pest free areas and areas of low pest prevalence
ISPM 30	Establishment of areas of low pest prevalence for fruit flies (Tephritidae)
ISPM 31	Methodologies for sampling of consignments
ISPM 32	Categorization of commodities according to their pest risk
ISPM 33	Pest free potato (Solanum spp.) micropropagative material and minitubers for international trade
ISPM 34	Design and operation of post-entry quarantine stations for plants

The implementation of the Convention involves collaboration by National Plant Protection Organizations (NPPOs) — the official services established by governments to discharge the functions specified by the IPPC — and Regional Plant Protection Organizations (RPPOs), which can act as coordinating bodies at a regional level to achieve the objectives of the IPPC. A Regional Plant Protection Organization (RPPO) is an inter-governmental organization functioning as a coordinating body for National Plant Protection Organizations (NPPOs) on a regional level. There are currently nine RPPOs; one of them is the European and Mediterranean Plant Protection Organisation (EPPO). Not all contracting parties to the IPPC are members of RPPOs, nor are all members of RPPOs contracting parties to the IPPC. Some contracting parties belong to more than one RPPO.

Countries that wish to become contracting parties to the IPPC must deposit their instrument of adherence with the Director General of FAO. At present, the IPPC has 177 contracting parties.

The Commission on Phytosanitary Measures (CPM) is the governing body of the IPPC. The CPM Bureau is the seven-member elected executive body of the CPM that provides guidance to the IPPC Secretariat and CPM on strategic direction, cooperation, financial and operational management. The IPPC Secretariat is responsible for the coordination of core activities under the IPPC work programme. The Secretariat is provided by the Food and Agriculture Organisation of the United Nations.

Annex IV: WTO Sanitary and Phytosanitary Agreement[76]

The Agreement on the Application of Sanitary and Phytosanitary Measures ("the SPS Agreement") sets out the basic rules for food safety and animal and plant health requirements. It allows countries to set their own standards. However, it also specifies that regulations must be based on scientific findings and should be applied only to the extent that they are necessary to protect human, animal or plant life or health; they should not unjustifiably discriminate between countries where similar conditions exist.

WTO member countries are encouraged to use the standards developed by the relevant international bodies whenever they exist. However, members may use measures which result in higher levels of health protection, so long as their measures are based on an appropriate assessment of risks and the approach is consistent, not arbitrary. The agreement sets out a framework for what countries can do, but is not prescriptive in how countries use health standards and methods of inspecting products.

Key features

All countries maintain measures to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants. These sanitary and phytosanitary measures can take many forms, such as requiring products to come from a disease-free area, inspection of products, specific treatment or processing of products, setting allowable maximum levels of pesticide residues or limiting the permitted use of additives in food. Sanitary (human and animal health) and phytosanitary (plant health) measures apply to domestically produced food or local animal and plant diseases, as well as to products coming from other countries.

Protection or protectionism?

Sanitary and phytosanitary measures, by their very nature, may result in restrictions on trade. All governments accept the fact that some trade restrictions may be necessary to ensure food safety and animal and plant health protection. However, governments are sometimes pressured to go beyond what is needed for health protection and use sanitary and phytosanitary restrictions to shield domestic producers from economic competition. A sanitary or phytosanitary restriction which is not actually required for health reasons can be a very effective protectionist device and, because of its technical complexity, it can be a particularly deceptive and difficult barrier to challenge.

The SPS Agreement builds on previous GATT rules to restrict the use of unjustified sanitary and phytosanitary measures for the purpose of trade protection. The basic aim of the SPS Agreement is to maintain the sovereign right of any government to provide the level of health protection it deems appropriate, but to ensure that this sovereign right is not misused for protectionist purposes and do not result in unnecessary barriers to international trade. In other words, it strikes a balance between the right of governments to protect health and their desire to see goods flow smoothly in international trade.

Justification

The SPS Agreement therefore permits governments to maintain appropriate sanitary and

[76] After http://www.wto.org/English/res_e/booksp_e/agrmntseries4_sps_08_e.pdf

phytosanitary protection. At the same time, it reduces the possibility that decisions are arbitrary and encourages consistent decision making. Sanitary and phytosanitary measures must be applied for no other purpose than to ensure that food is safe and that animals and plants are healthy, or to protect a country's territory from pests. In particular, the agreement clarifies which factors should be taken into account when risks are assessed. Measures to ensure food safety and to protect the health of animals and plants should be based, where possible, on analysis and assessment of objective scientific data.

International standards

The SPS Agreement encourages governments to apply national SPS measures that are consistent with international standards, guidelines and recommendations. This process is often called "harmonization". The WTO itself does not and will not develop these standards. However, most of the WTO's member governments participate in the development of these standards in other international bodies by leading scientists in the field and governmental experts on health protection. These standards are subject to international scrutiny and review. International standards are often higher than those actually applied in many countries, including developed countries, but the SPS Agreement explicitly permits governments to choose their own standards. However, if the national requirement results in a greater restriction of trade, a country may be asked by its trading partners to provide scientific justification demonstrating that the relevant international standard would not achieve the level of health protection the country considers appropriate.

Adapting to conditions

Due to differences in climate, existing pests or diseases, or food safety conditions, it is not always appropriate to impose the same sanitary and phytosanitary requirements on food, animal or plant products coming from different countries. Therefore, sanitary and phytosanitary measures sometimes vary, depending on the health situation in the country of origin or destination, of the food, animal or plant product concerned. This is taken into account in the SPS Agreement. Governments should also recognize pest and disease-free areas which may not correspond to political boundaries, and adapt their requirements so that they are appropriate for products from these areas, an approach known as "regionalization". The agreement, however, prohibits unjustified discrimination in the use of sanitary and phytosanitary measures, whether in favour of domestic producers or among foreign suppliers.

Alternative measures and "equivalence"

An acceptable level of risk can often be achieved in alternative ways. Among the alternatives — and on the assumption that they are technically and economically feasible and provide the same level of food safety or animal and plant health protection — governments should select those that do not restrict trade more than necessary to meet their health objective. Furthermore, if another country can show that the measures it applies provide the same level of health protection, these should be accepted as equivalent. This helps to ensure that protection is maintained while providing the greatest quantity and variety of safe foodstuffs for consumers, the best availability of safe inputs for producers, and healthy economic competition. "Equivalence" is one of the subjects regularly discussed in the SPS Committee.

Risk assessment

Countries' SPS measures must be based on an appropriate assessment of the actual risks involved. If asked, they must make known what factors they took into consideration, the assessment procedures they used and the level of risk they determined to be acceptable.

Transparency

The SPS Agreement makes sanitary and phytosanitary measures more transparent. Governments are required to notify each other, through the WTO Secretariat, of any new or changed sanitary and phytosanitary requirements which affect trade. Each WTO member must also set up offices (called "Enquiry Points") to respond to requests for more information on new or existing SPS measures, including how they justify their requirements and how they apply their food safety and animal and plant health regulations. By systematically communicating information and exchanging experiences, WTO member governments can improve their national standards. The increased transparency also protects consumers and trading partners alike from protectionism hidden in unnecessary technical requirements. This information is now readily available in a comprehensive online database, the SPS Information Management System (http://spsims.wto.org).

SPS Committee

A special committee has been established within the WTO as a forum for member governments to exchange information on all aspects of the SPS Agreement's implementation. The SPS Committee reviews how countries are complying with the agreement, discusses issues that may impact on trade and maintains close cooperation with technical organizations in the field. If a legal dispute arises on a sanitary or phytosanitary measure, the normal WTO dispute settlement procedures are used, and advice from appropriate scientific experts can be sought.

Annex V: Convention on Biological Diversity[77]

Biological diversity - or biodiversity - is the term given to the variety of life on Earth and the natural patterns it forms. The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend.

This diversity is often understood in terms of the wide variety of plants, animals and microorganisms. So far, about 1.75 million species have been identified, mostly small creatures such as insects. Scientists reckon that there are actually about 13 million species, though estimates range from three to 100 million. Biodiversity also includes genetic differences within each species - for example, between varieties of crops and breeds of livestock. Chromosomes, genes, and DNA-the building blocks of life-determine the uniqueness of each individual and each species. Yet another aspect of biodiversity is the variety of ecosystems such as those that occur in deserts, forests, wetlands, mountains, lakes, rivers, and agricultural landscapes. In each ecosystem, living creatures, including humans, form a community, interacting with one another and with the air, water, and soil around them.

At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy for "sustainable development" -- meeting our needs while ensuring that we leave a healthy and viable world for future generations. One of the key agreements adopted at Rio was the Convention on Biological Diversity (CBD). This pact among the vast majority of the world's governments sets out commitments for maintaining the world's ecological underpinnings as we go about the business of economic development. The CBD entered into force on 29 December 1993. It has 3 main objectives:

- The conservation of biological diversity;
- The sustainable use of the components of biological diversity;
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

The EU and all its Member States are parties to the CBD. At present, 193 countries are parties to the Convention.

Thematic programmes

The Conference of the Parties (COP) has established seven thematic programmes of work which correspond to some of the major biomes on the planet. Each programme establishes a vision for, and basic principles to guide future work. They also set out key issues for consideration, identify potential outputs, and suggest a timetable and means for achieving these. Implementation of the work programmes depends on contributions from Parties, the Secretariat, relevant intergovernmental and other organizations. Periodically, the COP and the SBSTTA review the state of implementation of the work programmes.

The thematic programmes are:

- Agricultural biodiversity
- Dry and subhumid lands biodiversity

[77] Based on the information on the CBD website: http://www.cbd.int

- Forest biodiversity
- Inland waters biodiversity
- Island biodiversity
- Marine and coastal biodiversity
- Mountain biodiversity

Cross-cutting issues

The COP has also initiated work on key matters of relevance to all thematic areas. These cross-cutting issues correspond to the issues addressed in the Convention's substantive provisions in Articles 6-20, and provide bridges and links between the thematic programmes. Some cross cutting initiatives directly support work under thematic programmes, for example, the work on indicators provides information on the status and trends of biodiversity for all biomes. Others develop discrete products quite separate from the thematic programmes. The work done for these cross-cutting issues has led to a number of principles, guidelines, and other tools to facilitate the implementation of the Convention and the achievement of the 2010 biodiversity target.

The cross-cutting issues are:

- Aichi Biodiversity Targets
- Access to Genetic Resources and Benefit-sharing
- Biodiversity for Development
- Climate Change and Biodiversity
- Communication, Education and Public Awareness
- Economics, Trade and Incentive Measures
- Ecosystem Approach
- Gender and Biodiversity
- Global Strategy for Plant Conservation
- Global Taxonomy Initiative
- Impact Assessment
- Identification, Monitoring, Indicators and Assessments
- Invasive Alien Species
- Liability and Redress - Art. 14(2)
- Protected Areas
- Sustainable Use of Biodiversity
- Tourism and Biodiversity
- Traditional Knowledge, Innovations and Practices - Article 8(j)
- Technology Transfer and Cooperation

Invasive alien species

Invasive alien species (IAS) are species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity. IAS occur in all taxonomic groups, including animals, plants, fungi and microorganisms, and can affect all types of ecosystems. While a small percentage of organisms transported to new environments become invasive, the negative impacts can be extensive and over time, these additions become substantial. A species introduction is usually vectored by human transportation and trade. If a species' new habitat is similar enough to its native range, it may survive and reproduce. However, it must first subsist at low densities, when it may be difficult to find mates to reproduce. For a species to become invasive, it must

successfully out-compete native organisms, spread through its new environment, increase in population density and harm ecosystems in its introduced range. To summarize, for an alien species to become invasive, it must arrive, survive and thrive.

Common characteristics of IAS include rapid reproduction and growth, high dispersal ability, phenotypic plasticity (ability to adapt physiologically to new conditions), and ability to survive on various food types and in a wide range of environmental conditions. A good predictor of invasiveness is whether a species has successfully or unsuccessfully invaded elsewhere.

Ecosystems that have been invaded by alien species may not have the natural predators and competitors present in its native environment that would normally control their populations. Native ecosystems that have undergone human-induced disturbance are often more prone to alien invasions because there is less competition from native species. For example, imported red fire ants (*Solenopsis invicta* Buren) are more successful in establishing themselves in disturbed areas such as roadsides and agricultural fields and rarely colonize intact closed forests.

Islands are especially vulnerable to IAS because they are naturally isolated from strong competitors and predators. Islands often have ecological niches that have not been filled because of the distance from colonizing populations, increasing the probability of successful invasions.

Addressing invasive alien species

The Conference of the Parties (COP) to the CBD has recognized that there is an urgent need to address the impact of IAS, and established IAS as a cross-cutting issue at its fourth meeting. The decision of COP 6 included adoption of Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species. The Guiding Principles are:

- Precautionary approach;
- Three-stage hierarchical approach;
- Ecosystem approach;
- The role of States;
- Research and monitoring;
- Education and public awareness;
- Border control and quarantine measures;
- Exchange of information;
- Cooperation, including capacity-building;
- Intentional introduction;
- Unintentional introduction;
- Mitigation of impacts;
- Eradication;
- Containment; and
- Control.

At COP 7 (2004), it was decided that "specific gaps in the international regulatory frameworks at global, regional and national levels persist, notably in relation to species that are invasive, but do not qualify as plant pests under the regulations of international agreements", with regard to the following pathways:

- The use of non-native organisms in aquaculture and the restocking of marine and inland water systems for commercial and recreational fisheries taking into account contributions of national codes, and voluntary international efforts such as Codes of Practice on the Introductions and Transfers of Marine Organisms developed by the International Council for the Exploration of the Seas and the FAO Code of Conduct on Responsible Fisheries;
- Unintentional or opportunistic introductions (e.g., "hitchhiker organisms"), including through hull-fouling, packaging material, import consignments, vehicular transport and other means;
- Unintentional introductions of invasive alien species through international assistance and humanitarian programmes, tourism, military, scientific research, cultural and other activities;
- Intentional introductions of alien species for non-food purposes, including certain aspects of horticulture and trade in pets and aquarium species;
- Intentional introduction of alien species, as biocontrol agents for control or eradication of invasive alien species, pests or weeds;
- Transnational and national ex situ breeding projects with alien species as sources for intentional or unintentional introduction;
- Intentional introduction of invasive alien species through international assistance programmes, including conservation and development projects and other activities;
- Intentional introduction of potentially invasive alien species through international incentives schemes; and
- Introduction of alien species through aquaculture escapes, bait and pet releases, water transfer schemes.

The decision of COP 8 identified measures by which Parties, other governments, relevant organizations and the Executive Secretary should address identified pathways for invasive alien species.

Collaboration between CBD and IPPC

The CBD acknowledges the IPPC as covering IAS plants. The COP in 2008 adopted the following decision: "The Conference of Parties … encourages parties … to make use of the risk assessment guidance and other procedures and standards developed by the International Plant Protection Convention, … and in particular, to consider applying, where appropriate, the procedures and standards for quarantine pests under the International Plant Protection Convention, to all invasive alien species that have adverse impacts on plant biodiversity, consistent with international obligations; and invites the International Plant Protection Convention to continue its efforts to expand, within its mandate, its actual coverage of invasive alien species which impact on biodiversity, including in aquatic environments".

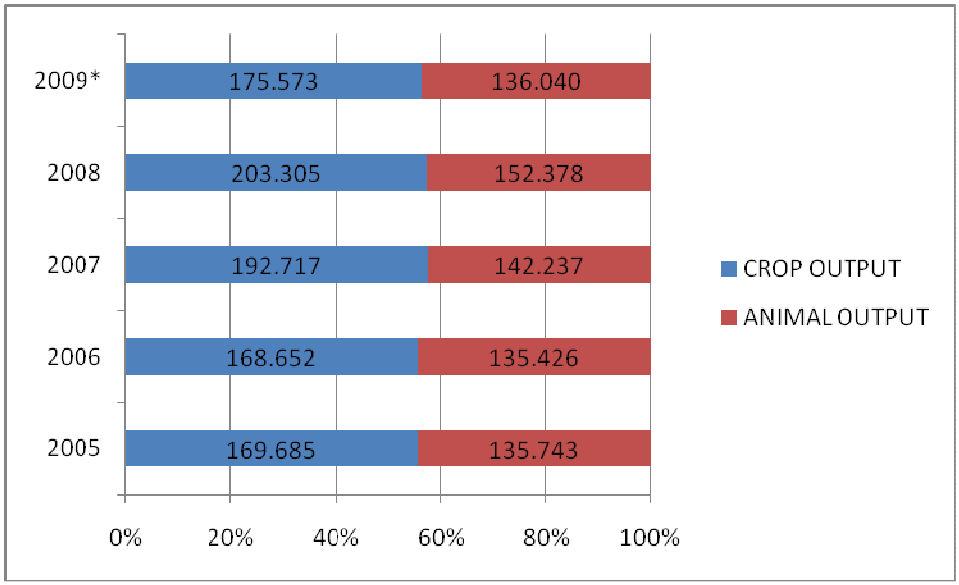
Annex VI: Overview of the EU agriculture and forestry sector

The EU plant health regime covers all areas of agriculture, horticulture, forestry, public and private green and the natural environment (wild plants, ecosystems). Some key figures for the main sectors are given below.

Crop production in the Union

The production of plants and plant products accounts for an equal share of EU agricultural output value as that of animals and animal products. The share of plant products in EU exports is also comparable to that of animal products; in 2009, each of the sub-sectors accounted for around 20% of exports of all food products.

Value of agricultural production, in billion € (current prices), 2005-2009



Source: EUROSTAT

Seeds, propagating material and nursery stock[78]

Seeds

The European Seed Association (ESA) estimates that the EU commercial seed market has a total estimated production value at over EUR 7 billion, representing more than 20% of the total worldwide market for commercial seed. The EU seed markets for cereals and pulses are estimated at EUR 2.5 billion, maize at EUR 1.6 billion, seed potatoes at EUR 0.9 billion, vegetables at about EUR 0.8 billion, while oil and fiber plants, sugar beet and grasses are at EUR 0.2 billion to EUR 0.3 billion. The EU is the largest exporter with an estimated export value of more than 60% of the total worldwide export value; in 2008, the export value was EUR 3 billion and the import value EUR 2.3 billion. The EU

[78] Main source: DG SANCO (2011).

became a net exporter of planting seeds in 2002/2003, and its trade surplus has gradually increased since then.

The number of seed companies in the EU is estimated at 6,797 (source: ESA, 2010) and includes breeding companies, seed producers and seed traders. About 6,580 out of 6,797 companies are based in ten Member States. The Member States with the highest number of seed companies are Poland, Romania and Hungary, however, the size of seed companies in these countries is extremely low with most of them (> 90%) being SMEs. The total employment in the seed sector is estimated at about 50,000 employees, concentrated in a limited number of Member States. An important consolidation has occurred in Denmark, France and the Netherlands, where the number of companies is small but the number of employees is rather high.

In the last 40 years, the commercial seed industry has transformed dramatically. It has shifted from a competitive sector of agribusiness, composed primarily of small, family-owned firms, to an industry dominated by a small number of transnational pharmaceutical/chemical corporations. This transformation is nearly complete now for key commodity crop seeds but is still ongoing in EU12 MS and in the EU wide vegetable sector. These corporations entered the industry by acquiring numerous smaller seed companies, and by merging with large competitors. The hybrid seed corn industry, which emerged in the 1930s in the US with the advent of high-yielding hybrid varieties, was the first to consolidate in the EU in early 1990's. This process accelerated in the US due to enforcement of Intellectual Protection systems, which attracted the entrance of chemical and oil companies to add to their portfolio of agricultural inputs. The decade of the 1990s saw numerous mergers between pharmaceutical and chemical companies, in order to take advantages of potential synergies. These new conglomerations were described as life science companies due to their focus on biotechnologies. By 2009, six companies with chemical and/or pharmaceutical company roots remained dominant in the seed industry. In the top-ten of the biggest seed companies at global level, five are Europe-based companies, four of which are from EU Member States.

In parallel to this evolution, changes of ownership in original farmer-owned supply cooperatives have led to the appearance of cooperatively owned global seed companies (e.g. Limagrain, Svalof Weibull).

Vegetable seeds are a special case. They are mainly produced outside the EU in a wide range of countries in which labour costs are not as high as in the EU. The produced seeds are shipped to the EU, especially to the Netherlands, for treating, sampling and packaging and re-exported to their final destination in the EU or outside the EU. Main producers are France, Italy, the Netherlands, Hungary, Denmark and Poland. The five biggest companies have 95% of the seed market.

Propagating material (vine, ornamentals, fruit plants, forest)

Figures and statistics regarding plant propagating material (other than seed; for example cuttings and nursery stock) are fragmentary as no consolidated sources of relevant data were available. In most Member States, activities related to certification of plant propagating material is organised at regional level or by different organisations, as a consequence of which the statistics are not consolidated at national level.

For the ornamentals sector, no figures are available concerning the starting material. The total value of the EU production of potted plants and flowers however is EUR 10.8 billion (FCEC, 2011).

For the fruit plants sector, Commission's services consolidated some key figures in 2007-08 and concluded that more than 12,000 enterprises are involved in production of fruit plants in the EU. About 90% of these are small to medium enterprises frequently based in rural areas where alternative business is not possible. The estimated value of this business was estimated at about EUR 2.5 billion.

The tree nursery production is valued at EUR 5.3 billion (FCEC, 2011).

Arable land crops

Cereals

Cereals amount to 14% of agricultural gross output at basic prices. In 2009 the harvested production of cereals in the EU was 296 mio tonnes, of which France alone contributed close to one quarter (23.6 %); Germany and Poland were the only other Member States with a share above 10 %. Wheat was the largest cereal crop in the EU, and France's share of wheat production reached 27.7 %, ahead of Germany (18.2 %) and the United Kingdom (10.2 %); wheat accounted for a relatively high share of total cereal production in the Netherlands. France and Germany each produced around one fifth of the EU's barley crop, while Spain and the United Kingdom produced about one tenth of the EU total; barley accounted for a relatively high share of total cereal production in Cyprus, Ireland, Finland and Estonia. France produced 26.5 % of the EU's grain maize, while Romania, Italy and Hungary were also clearly specialised in this cereal product, each contributing between 13 % and 14 % of the EU total; grain maize also accounted for a relatively high share of total cereal production in Portugal, Slovenia and Greece (source: Eurostat).

The EU has a considerable trade surplus for cereals, which in 2010 was equal to 23.2 mio tonnes. Cereal exports (predominantly wheat and meslin) amounted in 2010 to 22.2 mio tonnes while imports were 10.4 mio tonnes. The value of cereal exports to third countries in 2010 was EUR 9.5 billion and that of the imports EUR 3.4 billion (net trade surplus of EUR 6.1 billion).

The directly employed labour force in commercial farms in the EU for cereals, oilseed and protein crops in 2007 comprised 2.5 million persons (Eurostat).

Sugar beet

The total EU production of sugar from sugar beet is restricted to certain quota. For 2010-2011, the sugar production in the EU amounted to 15 million tonnes generated on 1.5 mio ha. The value of sugar imports from third countries was EUR 1.3 billion (for 3.1 million tonnes) and the value of the exports to third countries EUR 1.0 billion (for 2.2 million tonnes). The value of the intra-EU sugar trade was EUR 2.8 billion (imports) and EUR 2.9 billion (exports).

Vegetables

Vegetable commodity production in the EU has a value of EUR 27 billion. The bulk of vegetables production in the EU tends to be concentrated in a few Member States, with five Member States (Italy, Spain, Romania, France and Poland) together representing more than 50% of the production. In 2009 Italy and Spain had a combined tomato harvest of 11.1 million tonnes – for comparison, the production of tomatoes in Turkey was 10.8 million tonnes. Portugal and Greece (2008 data) recorded tomato harvests reaching just over 1.3 million tonnes each. The production of carrots was highest in the United Kingdom (752 000 tonnes) and Italy (624 000 tonnes); Germany, the Netherlands and France all had production levels of around half a million tonnes. The Netherlands and Spain produced well over 1 million tonnes of onions each, and together with Poland accounted for more than half of the EU's onion production. Again, Turkish production was higher than in any of the EU Member States, reaching 2 million tonnes of onions in 2009.

The directly employed labour force in commercial farms in the EU for general field cropping (including field-grown vegetables) in 2007 was 2.5 mio persons. The figure for 2007 for horticulture, which in part includes vegetables, was 636,000 persons (Eurostat).

The quantity of EU vegetable exports to third countries in 2010 was 4.2 mio tonnes (including 832,000 tonnes of potatoes and 158,000 tonnes of tomatoes). The import quantities were 3.8 mio tonnes (including 403,000 tonnes of potatoes and 497,000 tonnes of tomatoes). The trade surplus thus was 379,000 tonnes (including a surplus of 428,000 tonnes for potatoes but a deficit of 338,000 tonnes for tomatoes). In addition, a trade surplus exists of EUR 1.1 mio tonnes of prepared or preserved vegetables.

The value of EU vegetable exports to third countries in 2010 was EUR 2.5 billion and for imports, EUR 3.4 billion. Thus, a trade deficit exists for fresh vegetables of EUR 960 million. This is balanced by a trade surplus of EUR 911 million for prepared or preserved vegetables.

Potato

Worldwide production of potatoes in 2009 was 330 mio metric tonnes. With 63 mio metric tonnes, the EU was the second main producer, after China (Faostat). The production area in the EU in 2009 was 2.1 mio ha. The production is concentrated mainly in 8 Member States (DE, FR, RO, NL, UK, PL, IT, ES). The production value is around EUR 9 billion. The number of potato production holdings in the EU in 2007 was 3.2 mio (circa 25% of all holdings; of these 2.2 mio holdings in RO and PL).

On average, total EU potato trade is valued at EUR 4.8 billion, of which EUR 3.9 billion is intra-EU trade. This includes fresh and chilled potatoes for a value of EUR 1.7 billion and processed potatoes for EUR 3.1 billion.

The EU is a net exporter of fresh and chilled potatoes to third countries (export value in 2010 EUR 0.51 billion; import value EUR 0.15 billion). On a world scale, the EU production of potatoes is increasingly competitive and valuable, specifically as concerns seed potatoes which are mainly concentrated in four Member States representing 68% of the cultivated area (32% in NL, 15% in DE, 13% in FR, 12% in UK). Of the average potato export surplus over 2008-2010 of EUR 413 mio, a large part was attributable to

exports of seed potatoes (EUR 266 mio). Besides this, the EU is also a significant net exporter of processed potatoes (average trade surplus over 2008-2010: EUR 456 mio).

In several Member States, potatoes play a very important role, especially in Poland and in the Baltic countries, with a high number of small holdings cultivating potatoes: whereas on average (EU-27) the share of direct labour force employed in potato cultivation amounts to 25%, in some Member States this is significantly higher (85% in LT, 80% in LV, 66% in SI, 59% in EE and 55% in PL) (FCEC, 2011).

Tomato

In 2009, total EU tomato production in the EU27 amounted to 16.9 mio tonnes grown over ca. 293,000 ha. The total tomato production value is estimated at ca. EUR 9.3 - EUR 12.7 billion or 2.8-3.8% of the total EU27 agricultural production value of EUR 329 billion (source: EUROSTAT/DG AGRI). The tomato sector accounts for an estimated 20-25% of all fruit and vegetable production value in the EU. Tomato production is concentrated in a few Member States: IT accounts for 43% of production volume, ES for 28%, and EL for 10% (2007 data). The sector is an important source of employment: for example, in ES, one of the key producing MS, the tomato sector gives direct employment to more than 100,000 people. Some 66% of total tomato imports in the NL and 38% of total tomato imports in the UK come from ES.

Intra-EU tomato trade is important, as 90% of tomatoes consumed in the EU are produced in the EU; during 2006-09, some 15% of production (2.5 million tonnes) per year were exported intra-EU; this trade is estimated at ca. EUR 2.55 billion (2008).

A deficit exists in the trade with third countries (net 2010 deficit EUR 217 mio for 338,000 tonnes; value of 2010 exports: EUR 215 mio and imports: EUR 432 mio).

Other field crops

Many other arable land crops exist, such as sunflowers, oilseed rape, alfalfa, etcetera, the socio-economic value of which is not further elaborated here.

Fruit production and vineyards

The directly employed labour force in commercial farms in the EU for fruits (including citrus) in 2007 was 1.3 mio persons and that for vineyards 1.1 mio persons, representing respectively 5.3% and 5.1% of the agricultural labour force (Eurostat; data for 2007). The production figures for citrus and other fruit types are specified below.

The value of imports of fruits and nuts from third countries in 2010 was EUR 12.3 billion. With a export value of EUR 2.7 billion, a significant trade deficit exists of EUR 9.6 billion. This is largely due to citrus, for which a net deficit exists of EUR 1.0 billion (import: EUR 1.5 billion; export: EUR 0.5 billion), and bananas (net deficit EUR 2.8 billion).

Citrus

Global citrus fruit production in 2009 amounted to 11.1 billion tonnes (Faostat). Citrus production in the EU in 2010 amounted to EUR 3.9 billion for a production of around 11 mio tonnes (mainly oranges) (Eurostat). Orange production is concentrated in the

Mediterranean Member States, particularly Spain and Italy. The main importers of EU-produced citrus fruits are DE, FR, PL, BE and UK.

As a result of a large deficit in citrus production in the EU compared to the consumption, a significant trade flow exists from third countries into the EU. Imports from third countries in 2010 amounted to EUR 1519 mio (for 2.2 mio tonnes), mainly from South Africa, Argentina, Brazil, Morocco, Egypt and Turkey. The main importing countries are FR, NL and ES. Consequently, the main intra-EU exporting countries are not only ES, GR and IT but also NL. The intra-EU import/export values in 2010 were EUR 3.3-EUR 3.5 billion (for 4.3-4.6 mio tonnes). Spain provides two thirds of the overall intra-EU exports.

The 2010 exports to third countries amounted to EUR 473 mio (for 0.7 mio tonnes), mainly from ES and GR.

The number of holdings producing citrus in the EU in 2007 was 151,890 and the number of persons working there 223,200, with the largest shares for successively ES, IT and GR.

Other fruit trees

The production of apples, pears, peaches and apricots takes place in the EU on 880,529 ha (Eurostat data for 2007). The production of apples and pears in the EU in 2009 was 15 mio tonnes. Fruit production is relatively specialised across the EU Member States. Poland, Italy and France in 2009 together produced 6.7 mio tonnes of apples, more than half of the EU production. The largest producers of pears were Italy, Spain, the Netherlands, Portugal and Belgium, with a combined harvest of just over 2 mio tonnes.

The value of the export from the EU to third countries in 2010 of apples, pears, quinces, apricots, cherries, peaches and plums was EUR 1.2 billion (for 2.0 mio tonnes) and the value for imports EUR 1.1 billion (for 1.1 mio tonnes) (Source: Comext).

Vineyards[79]

The European Union is the largest wine-producing region in the world. The total vineyard area in the EU-27 in 2009 was 3.7 mio ha, of which 96% for wine production. Within the EU-27, Spain has the largest vineyard area (32%), followed by France (23%), Italy (21%) and Portugal (6%); 8% of the EU-27 vineyard area is located in Bulgaria and Romania. The official production volume in recent years was circa 160-180 mio hl, of which 70 mio hl quality wines.

Exports to third countries amounted to 19.6 mio hl and imports from third countries to 14,0 mio hl (data for 2007). The value in 2010 of exports to third countries was EUR 6.7 billion and the import value EUR 2.3 billion. Within the EU, the value of exports and imports were EUR 8.2 billion and EUR 7.9 billion, respectively.

The number of vineyard holdings in the EU-15 was 1.8 mio (data for 1999).

[79] Eurostat database, 2011; Eurostat Agricultural statistics, Main results - 2008-09

Ornamentals[80]

The EU is the largest world producer of potted plants and flowers, valued at EUR 10.8 billion, accounting for 41% of the world production estimated at EUR 26.2 billion. In addition, the tree nursery production is valued at EUR 5.3 billion. The total EU-27 land area of flowers, ornamental plants and nursery plants is estimated at 195,000 ha in 2009. Production is highly concentrated in five Member States: the Netherlands (43,200 ha), France (27,200 ha), Germany (26,400 ha), Italy (24,520 ha) and Poland (15,900 ha), which together accounts for 58% of the total area used for ornamentals production. The top five producers have a share exceeding 80% of the total EU-27 production of plants and flowers and over 90% by value. During the last decade, the area devoted to ornamentals production has been declining, except in the case of the Netherlands. In 2007, there were ca. 124,000 holdings producing plants and flowers, whereas the number was nearly 165,000 in 2003.

Exports to third countries have been growing steadily in the past decade in volume, with 518,000 tonnes in 2009 or 19% of total EU export trade. Of this volume, 31% are potted plants, 31% are bulbs and corms, 23% conifers and hardy perennial plants, and 16% cut flowers and cut foliage. The value of these exports was estimated at EUR 1.5 billion in 2009.

Imports from third countries represent 17% of total imports or 430,000 tonnes in 2009. Of this total volume of imports, 74% were cut flowers and cut foliage, 20% potted plants, 4% bulbs and corms, and 2% conifers and hardy plants. The total volume of these imports was estimated at EUR 1.5 billion in 2009.

The directly employed labour force in commercial farms in the EU for horticulture (however including greenhouse vegetables) in 2007 was 636,000 persons (Eurostat; data for 2007).

Forestry, public and private green and natural environment[81]

Forests are a multi-functional resource offering landscape and amenity functions, a significant environmental role (including in the context of Natura 2000 and climate change mitigation targets), as well as supplying wood as a raw material to a range of downstream industries.

The total forest and wooded land area in the EU is 178 million ha, corresponding to 42% of the total land area. About 73% of the total forest area is available for wood supply, and of this, only 60-65% of the net annual increment is currently harvested, which is why EU forests are accumulating growing stock but also ageing. The estimated standing timber volume of EU forests is estimated at ca. 27 billion m³ and annual timber growth or net annual increment is estimated at ca. 610 million m³ (EUROSTAT, 2009; Forest Europe, 2011).

<u>Wood production</u>

In recent years, total EU-27 wood production has ranged at ca. 400 million m^3 of roundwood per year, consistently maintaining its position as one of the main roundwood

[80] FCEC, 2011 (based on Eurostat, DG AGRI, COMEXT, AIPH and Union Fleurs data)
[81] From FCEC (2011).

producers in the world, and ca. 100 million m^3 of sawnwood per year, with a labour force of 285,000 annual work units (source: EUROSTAT). In 2010, the EU annual roundwood production was roughly valued at ca. EUR 16.1 billion (Forest Europe, 2011).

Non-wood goods

In addition, non-wood goods (NWGs) are an important source of income and their share of the total economic value generated by forests is increasing. In 2010, Christmas trees, fruits and berries, and cork were the most important NWGs. The total annual value of marketed NWGs represents ca. 15% of the roundwood value (or EUR 2.4 billion). The annual value of total marketed services[82] represents ca. 7% of the roundwood value (or EUR 1.1 billion). In total, therefore, EU forests supply primary goods and services valued at nearly EUR 20 billion per year.

Forest-based industries

The EU27 forest-based industries, with a production value of EUR 365 billion and an added value of EUR 120 billion account for more than 3 million jobs in 344,000 enterprises (DG ENTR). In addition to their economic weight, many parts of these industries play an essential role in maintaining sustainable employment in rural areas, and in the woodworking and printing sectors, SMEs are particularly present.

The availability of wood as a raw material at a competitive price is a determining factor for the performance and potential added value generated by many EU industries. Wood is the highest cost component in most downstream sectors (in paper making more than 30 % of total costs are for wood; in the sawmill industry 65 to 70%). The price of wood can fluctuate considerably depending on prevailing supply and demand conditions which are *inter alia* influenced by plant pests and diseases and their impact on the availability of wood at the required quality.

The woodworking industries (excluding furniture sector) have a turnover of EUR 134 billion and generate an added value of EUR 37 billion, employing 1.3 million people in 197,000 enterprises (DG ENTR). Most companies are small or medium-sized; the only exception are the wood-based panel sub-sector and a handful of sawmills having large enterprises. Together the woodworking and furniture industry has an estimated production value of ca. EUR 240-260 billion and is dominated by five MS (DE, IT, FR, UK, ES), which together account for EUR 170 billion or two thirds of the EU27 output value.

Wood packaging material

With regards to the wooden pallet and packaging industry, 3 billion pallets circulate and 450 million pallets are manufactured annually in the EU; 90 % of all trade flows use WPM in some form. The WPM is also significant for the wood sector in that 22-25% of all sawn timber are used for WPM and the industry is also a major employer (directly and indirectly), especially in rural areas (source: FEFPEB).

[82] The reported marketed services are forest-dependent or mainly forest-related and include social services (e.g. hunting or fishing, recreation and tourism), ecological services (such as environmental functions as well as infrastructure and managed natural resources), biospheric services (e.g. related to functions provided by protected and conservation sites).

Trade

Trade of forest-based products is very important, particularly within the EU27: in recent years imports (intra-EU and extra-EU) have reached circa EUR 100-110 billion and exports circa EUR 110-120 billion. The EU is a net importer of forest-based products from third countries (2009: extra-EU imports worth EUR 6.3 billion and exports worth EUR 3.2 billion).

Wider benefits of forests

On average, 13% of forest areas in the EU-27 have protective functions; however, most forests have many functions and may be protective without being officially designated as such. Certain stands are protected, e.g. in national parks, where the trees themselves are protected as well as all the habitats they provide for other plants and animals. Other stands have protective functions, e.g. for water resources or to prevent erosion (soil, water and other ecosystems functions) and to prevent landslides and avalanches in mountainous areas (infrastructure and managed natural resources functions). Forests growing on very steep slopes can thus protect other forests growing below them, settlements, roads and railways in ways that would be very expensive to replace by manmade structures. (source: Eurostat 2009).

From an environmental viewpoint, forests and forest-based industries have a strategic role in climate change mitigation. Forests act as carbon sinks by capturing carbon dioxide from the atmosphere and storing it in wood, thus reducing the climate-changing effect of this greenhouse gas. Carbon storage in harvested wood products can extend the carbon sequestration benefits provided by forests; their role in mitigating climate change is therefore important. The available data (Eurostat, 2009) show that at least 9,580 million tonnes of carbon are stored in the EU27 woody forest biomass; additional amounts are stored in the forests' deadwood (in addition, carbon is stored in similar biomass on other wooded land, but this has only been estimated in certain MS).

The wider benefits of forests have been estimated in some studies. For example, the landscape/recreational value and the biodiversity/carbon sequestration value have been estimated by the UK Forest research (2010) for specific tree species: e.g. oak (*Quercus* spp.): £240 million (EUR 270 million) and £750 million (EUR 844 million) per year, respectively; Corsican pine: £42 million (EUR 47 million) and £28 million (EUR 32 million) per year, respectively. The high values of these environmental benefits of forests in one MS point to the extensive wider environmental value of forests in the EU27 as a whole; the total UK coniferous and broadleaved area accounts for ca. 2% of the total EU27 forestry area. By simple extrapolation on these UK estimates, the landscape/recreational value and the biodiversity/carbon sequestration value of EU27 forests could therefore be valued at ca. EUR 56 billion.

Annex VII: Relevance of harmful organisms and invasive alien plant species to the EU agriculture and forestry, environment, landscape and public and private green

This Annex provides an overview of the 250 harmful organisms listed in Council Directive 2000/29/EC as relevant to the various sectors (agriculture, forestry, natural environment) and provides some examples of their importance.

The plant health Directive (PHD) requires import controls for all plants for planting (also called nursery stock) and for some specified seeds:

- Planting material are the commodities with the highest level of risk as living plants with roots can harbour numerous pests in a invisible (latent) form;
- Seeds are a much lower risk, because the generation of seeds is a biological cleaning-up process which few pests can pass.

The import inspections on plants for planting require checks for the compliance with specific import requirements (these should have been fulfilled by the third country), in particular the absence of the listed pests in Annexes I and II of the PHD. All sectors start with plants for planting, unless they can start with seed[83].

Import inspections for seeds are restricted to sunflower seed, beet seed, lucerne seed, bean seed, tomato seed, and cereal, maize and rice seed. The inspections target 12 specific virus, bacteria and fungi, in addition to the requirement that the seeds are free from the other harmful organisms listed in Annex I.

Examples of the relevance of plant health measures are given below. For further information, see Pimentel (2011), in particular Chapter 8 (A. Roques, Invasive patterns of terrestrial invertebrates in Europe) and Chapter 9 (I. Sache et al., Invasive plant pathogens in Europe).

Cereals

Tilletia indica (karnal bunt) is a major regulated fungus on wheat, that is not present in the EU. It is locally present in the US with a limited distribution. An economic analysis for the US Department of Agriculture demonstrated that deregulation would result in an average annual loss of 15.1% in export markets for US wheat producers, a reduction in wheat prices of 7.5% and a reduction of national net farm income of $8 billion below the baseline be cause of the loss in export markets over a time period of eight years (Vocke et al., 2010).

Cereals amount to 14% of EU agricultural gross output at basic prices. The EU has a considerable trade surplus for cereals, which in 2010 was equal to 23.2 mio tonnes. The value of cereal exports to third countries in 2010 was EUR 9.5 billion and that of the imports EUR 3.4 billion (net trade surplus of EUR 6.1 billion).

Diabrotica virgifera virgifera (western corn rootworm) is the most important insect pest of maize in North America, where it causes US$ 1 billion losses annually and is nicknamed the "billion dollar bug". WCR is probably the most important maize pest

[83] This depends on the nature of the crop; some can only start with seeds for biological reasons and others only with vegetatively produced cuttings or young plants.

worldwide and induces the highest insecticide use in the world. Up to 1992, the pest was absent from Europe. Since its introduction, it has spread across most of eastern and central Europe. The damage caused by this new pest for the EU-27 is estimated to amount to 5.6 to 6.3 billion euro over the next 25 years (FCEC, 2009). Costs associated to the eradication of isolated new WCR outbreaks in Member States that are WCR-free vary from EUR 240.000 to EUR 3,610.000. The WCR case shows that effective prevention of the entry of the pest into Europe would have been by far the most cost-effective measure (billions of euros savings).

Aphelenchoides besseyi (the rice white tip nematode) has been reported causing serious losses to rice in Japan and parts of the USA (especially from 1935 to 1945). Attack results in poorly filled or unfilled, chaffy grains; the proportion of the latter may be as high as 40% in some cultivars, but early-ripening cultivars are relatively less affected. Yield reductions in rice of 17-54% and 0-24% have been recorded for susceptible and resistant cultivars, respectively (CABI/EPPO, 1997). The pest is not known to occur in the EU.

Xanthomonas campestris pv. *oryzae* (bacterial leaf blight of rice) is the most serious disease of rice in South-East Asia. In the Philippines, losses are of the order of 22.5% in wet to 7.2% in dry seasons in susceptible crops and 9.5-1.8%, respectively, in resistant crops (CABI/EPPO, 2007). The pest is not known to occur in the EU.

Sugar beet

Beet necrotic yellow vein virus is the cause of Rhizomania, which is considered the most serious disease of sugarbeet world-wide. It was first reported in northern Italy in 1952 and has since spread to nearly all areas of the world where sugarbeets are grown. Although the disease will only move a few inches per year through soil without aid, it is easily spread by infected plant material, within soil adhering to non-host root crops, agricultural equipment carrying contaminated soil, irrigation water, and any other means that can move even small amounts of soil.

For 2010-2011, the sugar production in the EU amounted to 15 million tonnes generated on 1.5 mio ha. The value of the intra-EU sugar trade was EUR 2.8 billion (imports) and EUR 2.9 billion (exports).

Vegetables and ornamentals

Numerous polyphagous (i.e., non host specific) pests are listed in the PHD that are relevant to vegetables and ornamentals and so far do not occur in the EU.

Bemisia whiteflies transmit numerous viruses, which can be extremely damaging. Non-European populations of whiteflies are prohibited from entry into the Union so as to keep out those foreign viruses. With the evolution of the highly polyphagous B biotype, *B. tabaci* became a pest of glasshouse crops in many parts of the world, especially *Capsicum*, courgettes (*Cucurbita pepo*), cucumbers (*Cucumis sativus*), *Hibiscus*, *Gerbera*, *Gloxinia,* lettuces (*Lactuca sativa*), poinsettia *(Euphorbia pulcherrima*) and tomatoes (*Lycopersicon esculentum*). *B. tabaci* moves readily from one host species to another and is estimated as having a host range of around 600 species (Asteraceae, Brassicaceae, Convolvulaceae, Cucurbitaceae, Euphorbiaceae, Fabaceae, Malvaceae, Solanaceae, etc.). *B. tabaci* is the vector of over 60 plant viruses in the genera *Geminivirus*, *Closterovirus*, *Nepovirus*, *Carlavirus*, *Potyvirus* and a rod-shaped DNA

virus. The geminiviruses are by far the most important agriculturally, causing yield losses to crops of between 20 and 100% (CABI/EPPO, 1997).

Liriomyza sativae (the vegetable leaf miner) is reported as economically damaging on a wide range of vegetables including tomatoes, potatoes and *Cucurbita*. *L. sativae* has been recorded as causing 30% defoliation in an 80-ha field of tomatoes in the USA. Cucurbit crops severely attacked in the seedling stage by *L. sativae* can be totally destroyed. The species transmits a number of plant viruses, including celery mosaic potyvirus. Damage is caused by larvae mining into leaves and petioles. The photosynthetic ability of the plants is often greatly reduced as the chlorophyll-containing cells are destroyed (CABI/EPPO, 1997). The PHD regulates several *Liriomyza* species.

Spodoptera spp. (cotton leafworm) are polyphagous and attack over 40 families. In most of Europe, outdoor crops are not likely to be attacked and the principal hosts are ornamentals under glass. In the south of Europe, cotton, lucerne, soyabeans, *Trifolium* and vegetables are hosts for *Spodoptera* spp. *S. litura* is an extremely serious pest, the larvae of which can defoliate many economically important crops. Its control requires high pesticide inputs. *S. littoralis* is similarly one of the most destructive agricultural lepidopterous (butterfly) pests within its subtropical and tropical range. It can attack numerous economically important crops (cotton, groundnuts, tomatoes) all the year round. In Europe, damage due to *S. littoralis* was minimal until about 1937. In 1949, there was a catastrophic larval population explosion in southern Spain. The main crops affected were lucerne, potatoes and other vegetable crops. At present, this noctuid is of great economic importance in Cyprus, Israel, Malta, Morocco and Spain. In Italy, it is especially important on protected crops of ornamentals and vegetables (CABI/EPPO, 1997).

Thrips palmi (melon thrips) can cause damage to a wide range of glasshouse ornamentals and vegetable crops, particularly plants in the cucurbit and tomato families. The pest is not established in Europe but several glasshouse outbreaks have occurred which all were eradicated. In the UK, a study estimated the net economic impact of *T. palmi* over 10 years at ca. EUR 20 mio (FCEC, 2011). Cost ratios for eradicating outbreaks and maintaining exclusion of *T. palmi* ranged from 4:1 to 19:1 excluding the loss of exports and from 95:1 to 110:1 including export losses.

Potato

A range of internationally regulated pests poses a threat to potato cultivation. Brown rot (*Ralstonia solanacearum*), a bacterium, causes production losses of up to 75% in the tropics and the Mediterranean and in northwest Europe up to 40% (Rafoss & Sletten, 2004). Direct damage from potato ring rot may reach up to 30% of the crop yield (field trials show up to 50% loss) (FCEC, 2011). Potato export requires freedom from regulated pests such as brown rot, ring rot (*Clavibacter michiganensis* spp. *sepedonicus*) and potato cyst nematodes (*Globodera pallida* and *G. rostochiensis*). Costs for Member States of regulated potato pest outbreaks can be high. For example, the impacts of regulated pest outbreaks for the Netherlands alone (with an annual production value of potato of EUR 700 million, of which EUR 300 million seed potatoes) could include export losses up to EUR 192 million annually (Breukers, 2007) if no measures would be taken. In 2000-2001, a small outbreaks of potato wart (*Synchytrium endobioticum*) on Prince Edward Island, the main export seed potato area of Canada, caused a near collapse of the sector due to the loss of its main export market, the US.

The EU plant health regime lists 16 regulated pests for potato, mainly from South and Middle America (the region of origin of potato where the largest diversity of its pests exists), most of which today do not occur in Europe (those that do occur in the EU are under strict control). Entry of these into the EU and uncontrolled spread would immediately impact on trade from the EU (import bans). So far, the EU plant health regime has succeeded to keep these exotic regulated pests of potato out. Permanent surveillance for them across the EU territory on *Solanaceous* crops (potato, tomato, eggplant, peppers, ornamentals), albeit costly, is essential to ensure that the EU remains free from these pests.

Economic studies have shown that intensified monitoring for regulated potato pests is highly cost-effective (Breukers, 2007; Breukers et al., 2007, 2008). In terms of profit margin, the impact of brown rot findings can be disastrous. If a potato lot is found infected, the company or industry sees the profit margin on this lot reduced from approximately EUR 1,575/ha for seed potatoes to EUR 0 (if found infested) or to EUR 75/ha (for clonally related lots which are not found infested themselves). Short-term gains by economizing on monitoring and control could easily result in long-term costs that more than outweigh the initial savings. At long term, the whole export market would be lost because of protective measures taken by the countries of destination. Optimal cost-effectiveness of control requires cooperation of the sector and government, in which case brown rot incidence in the Netherlands could be reduced by 75% and the costs of control could be reduced by at least 2 million euros per year (Breukers et al., 2007).

The production value of potatoes in the EU is around EUR 9 billion. On average, total EU potato trade is valued at EUR 4.8 billion, of which EUR 3.9 billion is intra-EU trade. On a world scale, the EU production of potatoes is increasingly competitive and valuable, specifically as concerns seed potatoes. Of the average potato export surplus over 2008-2010 of EUR 413 mio, a large part was attributable to exports of seed potatoes (EUR 266 mio). Besides this, the EU is also a significant net exporter of processed potatoes (average trade surplus over 2008-2010: EUR 456 mio). In the new Member States, potatoes play a very important role, especially in Poland and in the Baltic countries, with a high number of small holdings cultivating potatoes.

The importance of potato for the EU goes back to the 19th century, when *Phytophthora infestans*, the late blight fungus, entered Europe from southern or middle America and caused the Great Famine in Ireland (O'Grada, 2002).

Tomato

Tomato is attacked by many of the polyphagous vegetable pests and viruses mentioned above. Protection against regulated pests is very important to tomato production given the tomato production value in the EU is estimated at EUR 9.3-EUR 12.7 billion (FCEC, 2011).

The introduction of new non-European pests can be extremely damaging. Recently, the south-American leafminer *Tuta absoluta* reached the EU and spread rapidly across the EU on tomato fruits. It was not listed in the plant health Directive and was detected too late for effective action. Infestation is also reported on potato, eggplant and common beans. *Tuta absoluta* is a very challenging pest to control. Effectiveness of chemical control is limited due to the rapid development of insecticide resistant strains.

Potato spindle tuber viroid, a pest that is absent from the EU (various outbreaks have all been eradicated) could cause yield losses in tomato of 20% for an individual grower and a 1% yield loss for the sector as a whole (ca. EUR 100 mio per year) if allowed to establish and spread. In addition, a 30% yield loss could occur in potato (ca. EUR 567 mio per year).

The tomato seed sector is especially sensitive to outbreaks of regulated pests because of the extremely high value of tomato seed (*one kg of tomato seed at the end of the season yields a profit in terms of tomato fruits that is worth more than 1 kg of gold*). In the past five years, outbreaks occurred in the EU of the regulated bacterium *Clavibacter michinagensis* pv. *michiganense* which can cause up to 70% production losses (CABI/EPPO, 1997). The tomato seed sector has gone far to trace the source of these outbreaks and ensure complete eradication. Loss of trust can lead to tremendous damage to the seed sector and may cause the collapse of even multinational enterprises.

Citrus

The EU plant health Directive lists 36 pests of citrus. *Xanthomonas axonopodis* pv. *citri* (citrus canker) and *Guignardia citricarpa* (citrus black spot) are examples of pests that must be kept out of Europe as they would pose a serious threat to EU citrus production and export.

Citrus canker used to be absent from the US, where it was unfortunately introduced in 1999, after which EUR 800 million were spent by the competent authorities on compensation and control costs (Waage et al., 2007). The fight against citrus canker was lost due to among others a series of hurricanes in Florida. The US citrus sector is now faced with permanently higher production costs and export market losses.

Citrus production in the EU in 2010 amounted to EUR 3.9 billion.

Other fruit trees, small fruits

Rosaceous fruit trees (apple, pear, plum, peach, apricot) and small fruits are susceptible to many pests. The PHD Annexes list 37 pests specifically for this purpose. Fruit trees need to remain healthy for many years and infestations generally cannot be eradicated (e.g. many viruses and bacteria). This is a vulnerable but important sector for the EU (the value of the export from the EU to third countries in 2010 of apples, pears, quinces, apricots, cherries, peaches and plums was EUR 1.2 billion).

Vine

The PHD annexes list 6 pests specific for vine. *Daktulosphaira vitifoliae* (phylloxera) is the most well-known pest of vine. In the late 19th century, the phylloxera epidemic destroyed most of the vineyards for wine grapes in Europe, most notably in France. Phylloxera was introduced to Europe when avid botanists in Victorian England collected specimens of American vines in the 1850s. Because phylloxera is native to North America, the native grape species there are at least partially resistant. By contrast, the European wine grape (*Vitis vinifera*) is very susceptible to the insect. The epidemic devastated vineyards in Britain and then moved to the mainland, destroying most of the European grape growing industry. In 1863, the first vines began to deteriorate inexplicably in the southern Rhône region of France. The problem spread rapidly across the continent. In France alone, total wine production fell from 84.5 million hectolitres in

1875 to only 23.4 million hectolitres in 1889. Some estimates hold that between two-thirds and nine-tenths of all European vineyards were destroyed[84].

Trees (forests, landscape, public and private green)

The PHD Annexes list 53 pests of trees (both broadleaved and coniferous). More than 50% of invasive plant pathogens attack woody plants (Pimentel, 2011, p. 229). Some examples of the risk posed by these pests are provided.

Agrilus planipennis, the emerald ash borer, recently arrived in the Moscow region. In North America, this woodborer already killed over 15 million ash trees (*Fraxinus* spp.) in a few years. The Asian emerald ash borer expansion to the west of Russia is seriously threatening the European ash forests (Pimentel, 2001, p. 207).

Anoplophora chinensis and *A. glabripennis* (citrus longhorned beetle (CLB) and Asiatic longhorned beetle (ALB)) have a wide range of potential host species, with *Acer* being especially susceptible and furthermore *Betula, Salix, Aesculus, Fagus, Carpinus* and *Populus*. Citrus is also susceptible to CLB. Several outbreaks of ALB and CLB have occurred in the EU, probably due to the import of infested live woody plants. Pest risk analysis has shown that the potential economic and environmental impact of both CLB and ALB is high to massive. In its native range, ALB has killed millions of trees in China, whereas the greatest losses from CLB in Asia (its natural homeland) have occurred in fruit tree plantations, especially citrus (FCEC, 2011).

Bursaphelenchus xylophilus (pine wood nematode). The pine wood nematode (PWN) is a serious pest of conifers, which is vectored by bark beetles of the genus *Monochamus*. PWN is native to north America, where it does little damage to pine trees (co-evolution). PWN spread to southeast Asia in the early 20th century where it subsequently caused mass mortality of conifer forests in Japan, China, Korea and Taiwan. The main means of spread of PWN is with infested wood moved to other areas. To offer protection against PWN and other wood-vectored pests, the IPPC developed International Standard for Phytosanitary Measures No. 15 concerning appropriate treatment of wood packaging material.

PWN outbreaks occurred in Portugal in 1999. The EU put in place emergency measures for its eradication. Despite these, the pest spread within Portugal, the continental part of which is now a demarcated area for PWN. It spread also to Madeira. Three outbreaks occurred in Spain which are being eradicated with large-scale felling, monitoring and testing. The area at risk in the EU is 13 mio hectares of coniferous forest in southern Europe where 50-90% mortality is predicted (valued at EUR 39-EUR 49 billion) (FCEC, 2011). Spread of PWN would additionally impact on central European forests and on exports from Scandinavian forests.

Ceratocystis fagacearum (oak wilt) occurs in the US, with considerable damage occurring in the Midwest. It was first recognized as an important disease in 1944 in Wisconsin where, in localized areas, over half the oaks have been killed. Surveys in eight Wisconsin counties showed that about 11 percent of the annual growth increase of oak forests was offset by mortality caused by oak wilt. No species of oak is known to be immune to this vascular disease. Experiments have demonstrated that over 35 oaks are

[84] Source of historic information: http://en.wikipedia.org/wiki/Phylloxera

susceptible, as well as American and European chestnuts. Oak bark beetles, *Pseudopityophihorus* spp., transmit the fungus. They breed abundantly beneath the bark of oak wilt- infected trees. After egg laying, parents emerge carrying spores and feed on healthy oaks. Unfortunately, there is no known way to save an oak tree infected by the oak wilt fungus. The only way to maintain healthy trees is through prevention[85].

Cryphonectria parasitica (chestnut canker). Before the turn of the 19th-20th centuries, the American chestnut (*Castanea dentata*) was arguably the most important broadleaved tree in the forests of the eastern US, comprising some 25% of the individual trees present in these ecosystems which covered some 82 mio hectares. Estimates suggest that over 4 billion chestnut trees were present in the eastern broadleaved forests at the end of the 19th century. Some of the largest angiosperm trees ever recorded were chestnuts present in these forests. The trees were heavily exploited and the timber was in great demand. The chestnuts were an important food source for many wild animals. In 1904, the first reports of chestnut blight emerged in New York, following shipments of chestnut timber from Asia. In 40 years time, chestnuts were largely wiped out from north America (BIO Intelligence Service, 2011). The chestnut blight case is a textbook example of the necessity of effective quarantine legislation.

Dendroctonus ponderosae (mountain pine beetle) is a bark beetle that is not present in Europe. Expert analysis suggests that, if introduced, conditions would be favourable for its establishment and spread. The native European pine *Pinus sylvestris* (Scots pine) is susceptible to the beetle. Scots pine is the most widely distributed conifer in the EU, its range extending to large areas of the continent, covering a wide variety of environmental conditions within this natural range. Scots pine forests exceed 20% of the productive forest area of the EU. The total area at risk in the EU is estimated at 30 mio hectare.

In Canada, the mountain pine beetle has killed 70-80% of the pines on 16 mio hectares of pine forest in British Columbia, leading to the closure of 16 major sawmills and the long-term decline of the forest industry. Experts anticipate that it would also affect the availability of raw material for the construction industry in Canada and the US, while it is predicted to result in lumber shortage in the US by 2018 The extent of the damages has justified significant direct control costs: in 2006, the Canada federal budget provided $400 mio over two years to combat the infestation, including industry support. Beyond the economic impacts as such, there have been significant environmental impacts. By 2020, the mountain pine beetle outbreak will have released 270 megatonnes of carbon dioxide into the atmosphere from Canadian forests, which is the same amount of greenhouse gas emissions that Canada is committed to reducing by 2012 under the Kyoto Protocol, and more than the total average sink of all of Canada's managed forest over the last decade. The beetle has on its own converted the forest from a small net carbon sink to a large net carbon source (FCEC, 2011).

Dryocosmus kuriphilus, the Asian chestnut gallmaker, seriously affects chestnut fruiting, causing yield reductions up to 70% (Pimentel, 2011, p. 207) and impacting on chestnut-dependent local economies. This invasive insect is spreading in Italy, Slovenia, southeastern France, and Hungary.

Ophiostoma ulmi (Dutch elm disease). Two enormously destructive pandemics of Dutch elm disease occurred in the 20th century, resulting in the death of a majority of mature

[85] Source: http://www.na.fs.fed.us/spfo/pubs/fidls/oakwilt/oakwilt.htm

elms across much of the northern hemisphere. Despite the name given to the disease, it originated from Asia and not from Europe[86]. The first pandemic, caused by *Ophiostoma ulmi*, occurred as this pathogen spread across Europe, North America and South and Central Asia during the 1920s-1940s. The current pandemic is caused by another species, *O. novo-ulmi*. The initial pandemic led to the death of approximately 30% of infected trees, but many individual recovered from infection. From the early 1930s, a more aggressice disease spread in the US, which in the mid 1960s reached Europe via shipments of elm logs imported into the UK from North America. By the end of the 1970s, over 75% of the elm population in southern England was dead or dying, approximately 17.5 mio trees. Since that time, most elms in the UK and in continental Europe have been killed, although there are still mature elms in some isolated areas and cities such as Amsterdam (elms have always lined the historic canals) where control measures are taken. Once a very common tree across Europe, like poplar today, elms have substantially disappeared from Europe and most people would not even know elms any more. The disease has had major impacts on landscapes and ecosystems. Populations of any organisms dependent on mature elms for the provision of food or habitat have reduced as a consequence of the enormous losses in elm numbers in Europe over the last 40 years. (BIO Intelligence Service, 2001; Brasier & Buck, 2011).

Rhynchophorus ferrugineus (red palm weevil) is an extremely damaging pest of a wide range of productive and ornamental palm trees. The pest reached the EU via Spain, probably with infested planting material from third countries. Red palm weevil has spread across most of the Mediterranean where it has killed thousands of palms. The impact of the pest in the EU is estimated to have reached at least EUR 50 mio in containment and eradication costs for the MS competent authorities alone and to have involved the destruction of at least 65,000 trees, which is only a fraction of those infested. On the basis of the destroyed palms alone, the value of the trees lost is estimated at EUR 65-EUR 195 mio, on the basis of the infested palms, EUR 96-EUR 288 mio. These figures underestimate the actual loss in value as they exclude high-value trees (FCEC, 2011).

The red palm weevil and the palm moth (*Paysandisia archon*) threaten the survival of three endemic, endangered palm species in Europe: *Phoenix theophrasti* in Crete, *P. canariensis* in the Canary Islands, and *Chamaerops humilis* in the western Mediterranean region (Pimentel, 2011, p. 207).

Natural environment and biodiversity

Invasive alien species (IAS) pose a significant threat to biodiversity in the EU, and this threat is likely to increase in the future unless robust action is taken at all levels to control the introduction and establishment of these species and address those already introduced. IAS cause some EUR 12.5 billion worth of damage each year in the EU (European Commission, 2011, *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*).

The DAISIE project supported under the Sixth EU Research Framework Programme has identified 10,822 non-native species present in Europe, 10-15 % of which are expected to have a negative economic or ecological impact. Isolated islands with high biodiversity, including most of the EU's overseas entities, are exceptionally vulnerable to invasion,

[86] The name "Dutch elm disease" refers to its identification in the Netherlands in 1921; the disease is believed to be originally native to Asia.

which can also have a disproportionate impact on local livelihoods, culture and economic opportunities. As regards introduction pathways, most invasive plants originally escape from gardens or aquaria, while invasive freshwater fauna reach the wild via aquaculture escapes or deliberate stocking by anglers. In contrast, most invasive species in the marine environment are unintentionally introduced as "hitchhikers" or contaminants (e.g. via ballast water). With increasing volumes of plant and animal materials from more and more locations being transported across the globe, the potential for introduction of IAS is also rising.

IAS are considered one of the major threats to biodiversity. Ways in which they impact on the local ecology include:

- Competition with native organisms for food and habitat;
- Changing ecosystem structures**,** for example the seaweed *Caulerpa taxifolia* has changed extensive areas of the Mediterranean coast into *Caulerpa* monocultures;
- Hybridisation with native species;
- Direct toxicity;
- Being a reservoir for parasites or a vector for pathogens**;**
- Disruption of pollination services due to competition with local bee species.

IAS can reduce yields from agriculture, forestry and fisheries. IAS are also known to decrease water availability and to cause land degradation. Invasive plants such as the Himalayan balsam (*Impatiens glandulifera*) outcompete native plants that play an important role in binding soil with their roots and may thereby contribute to increased soil erosion. IAS can damage infrastructure due to burrowing or via their root systems. The root system of the Tree of heaven (*Ailanthus altissima*) can damage pavements, archaeological remains and walls. IAS may also obstruct transportation by blocking waterways. Azolla waterfern (*Azolla spp.*) and Eastern White pine (*Pinus strobus*) have led to a decline in recreational and cultural heritage values associated with different landscapes and water bodies. A number of human health problems, e.g. allergies and skin problems, are caused by IAS such as the Giant hogweed (*Heracleum mantegazzianum*) and the Common hogweed (*Ambrosia artemisiifolia*).

The main identified costs in Europe comprise eradication and control costs and damage to agriculture, forestry, commercial fisheries, infrastructure and human health. While it may appear that there are either impact costs or eradication costs, in fact partial eradication and control programmes are undertaken in parallel, on an ongoing basis in order to try and limit the impact. In 2008, an initial estimate assessed annual IAS-related costs in Europe at between EUR 9,600 million and EUR 12,700 million per year. This figure is undoubtedly an underestimate, as it is based on current expenditure to eradicate and control IAS plus the documented cost of the economic impact. Given that many countries are only now starting to document and record costs and effects, the real figures for the financial costs involved will be considerably higher. (European Commission, 2008, *Towards an EU strategy on invasive species*).

Examples of IAS plants and their impacts:

- *Ambrosia artemisiifolia*: one of the most damaging IAS weeds in Europe affecting human health (highly allergenic), agriculture and biodiversity, with a total impact on Europe of EUR 225 mio annually (FCEC, 2011);
- *Eichhornia crassipes*: during 2005-2008, Spain spent EUR 14.7 mio to remove nearly 200,000 tonnes of water hyacinth from the Guadiana River. In Florida, EUR 30 mio was spent during 1980-1991 to suppress water hyacinth, while in Louisiana the Department of Fisheries treats about 25,000 acres of *E. crassipes* with herbicides each year, at an annual cost of EUR 1.4 mio;
- *Fallopia japonica*: for the UK alone, annual control costs for Japanese knotweed are estimated at EUR 188 mio (Williams et al., 2010);
- *Hydrocotyle ranunculoides*: for the UK alone, annual control costs for management of floating pennywort in waterways and aquatic systems (including effect on tourism) are estimated at EUR 142 mio (Williams et al., 2010);
- *Pueraria lobata*: in the US, about 2.8 mio ha of forestry are overgrown by *P. lobata*, and the losses in the commercial forestry sector from decrease of productivity are estimated at EUR 235 mio per year (FCEC, 2011).

Annex VIII: Costs and expected impacts of baseline scenario

This Annex describes the costs and expected economic, social and environmental impacts of the baseline scenario.

Costs

The current overall compliance costs (including administrative burden and fees) of the PHR are as follows (FCEC, 2010):

– *Costs before the charging of fees by MS authorities to private operators*

Obligations	Competent Authorities			Private operators			Commission			Total costs		
	Administrative	Substantive	Total	Administrative	Substantive	Total	Administrative	Substantive	Total	Administrative	Substantive	Total
Obligation 1: Registration												
EU 24	1.359.856	0	1.359.856	1.490.585	0	1.490.585	0	0	0	2.850.441	0	2.850.441
Obligation 2: Authorization to issue Plant Passport												
EU 24	138.727	0	138.727	134.372	0	134.372	0	0	0	273.099	0	273.099
Obligation 3: Issuance of plant passport												
EU 24	3.164.606	0	3.164.606	8.286.093	0	8.286.093	0	0	0	11.450.699	0	11.450.699
Obligation 4: Notification of interceptions in trade												
EU 24	217.368	0	217.368	0	0	0	115.386	0	115.386	332.753	0	332.753
Obligation 5: keeping of records												
EU 24	0	0	0	41.373.782	0	41.373.782	0	0	0	41.373.782	0	41.373.782
Obligation 6: Check the correct and uniform application of CPHR												
EU 24	277.774	0	277.774	0	0	0	553.235	0	553.235	831.010	0	831.010
Obligation 7: Submission and treatment of applications for Solidarity Funding												
EU 24	28.322	0	28.322	0	0	0	15.924	0	15.924	44.246	0	44.246
Obligation 8: Import inspection (at border or at place of destination)												
EU 24	0	25.983.570	25.983.570	0	0	0	0	0	0	0	25.983.570	25.983.570
Obligation 9: Official inspection of plants, plant products and other objects at the places of production												
EU 24	0	33.320.135	33.320.135	0	0	0	0	0	0	0	33.320.135	33.320.135
Obligation 10: Annual survey of protected zones or buffer zones												
EU 8	0	563.557	563.557	0	0	0	0	0	0	0	563.557	563.557
Obligation 11: Annual surveys of regulated harmful organisms												
EU 24	0	27.563.913	27.563.913	0	0	0	35.829	0	35.829	35.829	27.563.913	27.599.743
Obligation 12: Overall management of the Plant Health policy												
EU 24	0	2.305.769	2.305.769	0	0	0	0	555.832	555.832	0	2.861.600	2.861.600
Obligation 13: Conduct Pest Risk Analysis (PRA)												
EU 8	0	709.709	709.709	0	0	0	0	604.860	604859,85	0	1.314.569	1.314.569
Total costs	5.186.653	90.446.654	95.633.307	51.284.831	0	51.284.831	720.375	1.160.691	1.881.066	57.191.859	91.607.345	148.799.204

– *Costs after the charging of fees by MS authorities to private operators*

Obligations	Competent Authorities			Private operators			Commission			Total costs		
	Administrative	Substantive	Total	Administrative	Substantive	Total	Administrative	Substantive	Total	Administrative	Substantive	Total
Obligation 1: Registration												
EU 24	1.236.625	0	1.236.625	1.613.816	0	1.613.816	0	0	0	2.850.441	0	2.850.441
Obligation 2: Authorization to issue Plant Passport												
EU 24	101.272	0	101.272	171.827	0	171.827	0	0	0	273.099	0	273.099
Obligation 3: Issuance of plant passport												
EU 24	3.164.606	0	3.164.606	8.286.093	0	8.286.093	0	0	0	11.450.699	0	11.450.699
Obligation 4: Notification of interceptions in trade												
EU 24	217.368	0	217.368	0	0	0	115.386	0	115.386	332.753	0	332.753
Obligation 5: keeping of records												
EU 24	0	0	0	41.373.782	0	41.373.782	0	0	0	41.373.782	0	41.373.782
Obligation 6: Check the correct and uniform application of CPHR												
EU 24	277.774	0	277.774	0	0	0	553.235	0	553.235	831.010	0	831.010
Obligation 7: Submission and treatment of applications for Solidarity Funding												
EU 24	28.322	0	28.322	0	0	0	15.924	0	15.924	44.246	0	44.246
Obligation 8: Import inspection (at border or at place of destination)												
EU 24	0	8.495.711	8.495.711	0	17.487.859	17.487.859	0	0	0	0	25.983.570	25.983.570
Obligation 9: Official inspection of plants, plant products and other objects at the places of production												
EU 24	0	14.553.688	14.553.688	0	18.766.448	18.766.448	0	0	0	0	33.320.135	33.320.135
Obligation 10: Annual survey of protected zones or buffer zones												
EU 8	0	563.557	563.557	0	0	0	0	0	0	0	563.557	563.557
Obligation 11: Annual surveys of regulated harmful organisms												
EU 24	0	27.563.913	27.563.913	0	0	0	35.829	0	35.829	35.829	27.563.913	27.599.743
Obligation 12: Overall management of the Plant Health policy												
EU 24	0	2.305.769	2.305.769	0	0	0	0	555.832	555.832	0	2.861.600	2.861.600
Obligation 13: Conduct Pest Risk Analysis (PRA)												
EU 8	0	709.709	709.709	0	0	0	0	604.860	604859,85	0	1.314.569	1.314.569
Total costs	5.025.967	54.192.347	59.218.314	51.445.518	36.254.307	87.699.824	720.375	1.160.691	1.881.066	57.191.859	91.607.345	148.799.204

Economic impacts

Productivity, profitability, competitiveness (including level playing field)

Primary production. Due to an ongoing increased influx of harmful organisms that are new to the EU and to an increased suitability of EU agriculture, forests and natural ecosystems to these organisms because of climate change, losses from new plant pests will increase, affecting the economic viability of agriculture and forestry. Reduced

productivity is to be expected, profits and competitiveness compared to third countries will be under pressure.

Trade. With the establishment of internationally recognised regulated pests in the EU, trade restrictions will be put in place by third country trade partners, limiting the export of EU produce, with knock-on effects on farmers and growers whose produce cannot be sold any more and whose investments cannot be paid back[87]. This is enhanced by the current deficiencies in the surveillance and protected zones systems, which undermine trust in the reliability of pest status data for the EU as a whole and for specified protected zones.

Internal market. Large-scale outbreaks in one MS may locally result in higher production costs and restrictions to movement and sales from demarcated outbreak areas to other MS. Already the current carefully set-up system of protected zones, which brings along higher costs for growers outside such zones, can distort the level playing field in the EU (FCEC, 2011; present stakeholder consultations). Large-scale outbreaks may have larger consequences: the impacts of phytosanitary measures against expanding outbreaks of pine wood nematode in Portugal were assessed by FCEC (2008) to potentially have serious consequences on the Portuguese economy, depending on the nature of the measures taken (FCEC, 2008).

SME. The seed industry excepted, the affected producers in agriculture and forestry are mostly Small and Medium-sized Enterprises (SME).

Industries. With large-scale outbreaks, supplies to agriculture and forestry based industries may decline. In general, the economic value of these industries is a manifold of the primary production value (Annex VII). In some cases (e.g. citrus), the supplies may be obtained from third countries; in other cases (e.g. potato) third country supplies would not be able to meet EU demands because third country production is insufficient or because imports are not allowed because of plant health import restrictions concerning other regulated pests.

Innovation

No action will have negative impacts on innovation of agriculture and horticulture, as production, sales and profit will be under pressure.

Social impacts

Employment

EU primary production of crops in 2007 ensured employment for 16.4 mio persons (equalling 9.0 mio annual work units), half of the value of which was attributable to crop production (Eurostat, 2011). Forestry and logging in 2008 ensured employment for 0.3 mio annual work units, while the wood-based manufacturing activities gave employment to an additional 2.8 mio annual work units (Eurostat, 2011). Decreasing production,

[87] Examples: the restriction imposed by the US in 2011 on nursery stock from the entire EU because of the local incidental outbreaks of *Anoplophora chinensis* and *A. glabripennis*; the loss of 15.1% of wheat export marekets for the US if the quarantine status of *Tilletia indica* within the US would be lifted (Vocke et al., 2010); the EHEC bacterium crisis in April-June 2011, which did not concern harmful organisms of plants but human pathogens vectored by plant food material. A trade ban was imposed by Russia on EU vegetable produce; the EU allocated compensations to a level of €210 mio.

sales, profit and export imply losses of jobs. With an estimate of 7.6 mio annual work units at stake (4.5 mio in crop production; 3.1 mio in forestry and forest-based industries) a shrinkage of agriculture and forestry with 1% could lead to a loss of 76,000 annual work units (jobs for 138,000 persons). The average income of EU farmers is currently less than 50% of the average EU citizen income (COPA-COGECA, reply to the stakeholder consultation) and margins in many sectors are small. In the past two decades, the production of various crops (vegetables, tomatoes, cut flowers) has already been moving from the EU to developing countries, were wages are lower. This process will be enhanced if no action is taken.

While the loss of jobs would generally be a gradual process, it may be acute in case of major outbreaks of harmful organisms. Measures against recent outbreaks of the citrus longhorned beetle (*Anoplophora chinensis*) in the Netherlands in the Boskoop area, the major nursery stock production area of the EU, questioned its very existence. Potential measures against Portuguese wood to stop the spread of pine wood nematode were assessed to threaten 3,300 jobs (FCEC, 2008). An unprecedented outbreak of mountain pine beetle (*Dendroctonus ponderosae*) in Canada eliminated 70-80% of all pine trees in the main western forests of British Columbia and will lead to the closure of 16 major sawmills and the long-term decline of the western Canadian forest industry; spread of the beetle out of infested British Columbia across the Rocky Mountains to Alberta alone will subsequently impact on a further 38,000 people (FCEC, 2011).

Food security and safety

At short term, the ongoing influx of new harmful organisms would not impact on food security for EU citizens if no action is taken. It is nevertheless questionable whether the EU can afford an ongoing influx of new pests and diseases. Global food production will need to increase by 40% by 2030 and 70% by 2050 because of increasing demand (FAO, 2006). It should be stressed that, on a global scale, losses from harmful organisms are very considerable. It is estimated that these losses today are 40% (staple foods) and would be even higher (50-80%) in the absence of control measures (estimate for all crops) (Bruce, 2010). Of those losses, probably 30% are due to newly introduced harmful organisms (Pimentel, 2005).

Food safety is in principle not endangered by harmful organisms of plants, which rarely have a direct impact on human health. Certain harmful organisms (in particular fungi, for example *Claviceps purpurea* and *Fusarium* spp.) produce metabolites that are toxic to humans, those organisms are mostly have a worldwide distribution and for that reason none of them is currently listed under the PHR. Certain human-pathogenic bacteria and viruses may be present on the surface of plants, or even invade the tissues of plants, like the EHEC bacterium. However, those bacteria and viruses do not cause any harm on the plants themselves and therefore are not regulated either under the PHR.

The introduction and spread of new pests leads to an enhanced use of pesticides[88], which might indirectly impact on food safety and human health. However, the EU legislation in

[88] According to Sache et al. (in Pimentel, 2011), downy mildew and powdery mildew of grapevine, introduced from the United States in the 19th century, consume €180 mio of fungicides annually for France alone. In 1991, €163 mio of fungicides were used worldwide against potato diseases, Europe accounting for 59% of this use. Diseases, including potato late blight, accounted for a yield loss of 15%, which could have reached 35% if no fungicides had been applied. Since then, the disease has increased in aggressivity and earliness in most European countries, a shift linked to the invasion of

place for plant protection products already ensures that plant protection products can be used only when they are safe.

Environmental impacts

Sustainability (durability; use of pesticides)

An ongoing influx of harmful organisms new to the EU will impact negatively on the sustainability. In agriculture, the introduction and spread of new pests and diseases nearly always leads to an enhanced use of pesticides so as to maintain previous production levels. Alternatives (biological control, crop rotation) may be available but are generally less profitable. The development of biological control agents may require substantial investments in research and development during many years and a demanding and expensive registration process at the end of the pipeline, often preventing new products from being placed on the market at all. Crop rotation may be effective to control soil-borne pests, however it implies by definition that crops with high profit margins (potato, maize) cannot be grown permanently, which undermines its economic usefulness. An example is the western corn rootworm (*Diabroticia virgifera virgifera*), a very damaging pest that is native to the US where it is known as the billion dollar bug due to its high control costs. This pest reached Europe in 1992 and has now spread over a large part of the EU. Farmers prefer to drop the current regulated status of this pests as they seem to trust that the pest can be controlled by the use of seed pesticide coating (against the soil-borne larvae) and possibly in future GMO maize lines. Already in 2008, the total volume of insecticides used in the EU per year on maize crops amounted to 570 tons of active substance, mainly as seed and soil treatment; however, chemical control solutions have a limited to satisfactory efficiency, but several toxicity issues and the implementation of the new Regulation on plant protection products might lead to the conclusion that these solutions are not sustainable in the long term (FCEC, 2009). The large scale use of seed coatings on maize seed may significantly contribute to bee hive mortality (Marzaro et al., 2011; Apenet, 2010).

According to Eurostat (2007)[89], in 2003 some 129,000 tonnes of active substance of fungicides (108,000 tonnes) and insecticides (21,000 tonnes) was applied in the EU-25, in particular on potatoes and on cereals. A significant increase in the need for pesticides thus may result in substantial additional amounts being applied at EU level.

Biodiversity and ecosystems conservation

An ongoing influx of harmful organisms new to the EU will also impact on natural ecosystems and biodiversity. Those impacts would mostly be due to the introduction of new pests and diseases of forest trees, the decline of which would endanger the natural ecosystems which depend on them. Many tree species harbour specific lichens, mosses, insects and other wildlife. Disappearance of tree species may have serious consequences on biodiversity. In addition, some new harmful organisms directly threaten the undergrowth itself. An example is the fungus *Phytophthora ramorum*, which in the UK has spread from infected *Rhododendron* to *Vaccinium* species (heather) which appears to be highly susceptible to this new fungus. Massive decline of heath in the UK, the

Europe by the A2 mating type. In Finland, for example, sales of fungicides used against late blight increased after this introduction fourfold from the 19870s to 2002.

[89] Eurostat, 2007. The use of plant protection products in the European Union. Data 1992-2003. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-76-06-669/EN/KS-76-06-669-EN.PDF

Member State with the largest heathlands of the EU, would have very significant impact on the natural ecosystems and biodiversity.

Among the harmful organisms invading the EU, IAS plants are particularly harmful to ecosystems and biodiversity. Their impact concerns not only terrestrial ecosystems (invasive weeds) but also equally aquatic ecosystems and marine ecosystems (algae, aquatic weeds). IAS plants may furthermore clog waterways. Some IAS plants are serious human allergens. Several IAS plants have shown to cause substantial harm to tourism by ruining natural ecosystems and lakes and therefore require expensive permanent control measures, with costs up to several hundreds of millions of Euros per year (FCEC (2011). An ongoing influx of IAS plants in the baseline scenario will cause increasing damage to ecosystems and increasing control costs.

Health status of forests, landscape, public and private green

An ongoing influx of harmful organisms new to the EU will certainly impact significantly on EU forests, landscape, public and private green. Most of the major problems experienced in the past decade concern tree pests (pine wood nematode, citrus longhorned beetle, red palm weevil). The 20th century has witness the potential of invasive pests and pathogens to cause large-scale tree mortality, with the disappearance of elm trees (*Ulmus* spp.) from most of Europe and of the native chestnut (*Castanea dentata*) from the eastern US, where it once constituted 25% of the vast broadleaved forests. Were tree pests such as oak wilt (*Ceratocystis fagacearum*) or mountain pine beetle (*Dendroctonus ponderosae*) to reach the EU, oaks and pines could similarly disappear.

Annex IX: Outline of the amendments to the regime in options 1–4 and foreseen impact on costs

This Annex presents an overview of the main elements of potential changes to the plant health regime and an estimate of the expected financial impacts.

Prioritisation

Changes under consideration:

(a) **Creation of a list of EU priority pests**, to be subject to enhanced levels of surveillance, mandatory contingency planning and stricter procedural rules for eradication and containment (no such Annex exists at present). Priority pests will be identified, in coordination with the Member States, on the basis of transparent risk assessment criteria (in an Annex to the Regulation), demonstrating that their economic, social and environmental impact to the Union as a whole is most severe. They will be listed as such in a delegated act, if necessary using the three-days urgency procedure. Priority pests may concern pests that so far do not occur in the EU (measures against such pests will anyhow be eligible for EU co-financing) as well as pests already occurring in the EU but requiring stringent EU measures (less Member State subsidiarity; more EU financial support). The maximum number of priority pests to be listed will be set at 10% of all listed Union quarantine pests (10% of 250 = 25).
Financial impact: see under surveillance, contingency planning and eradication and containment.

(b) **Transformation of current Annex II of Directive 2000/29/EC into the Annex of an implementing act concerning harmful organisms for which thresholds may apply.** The current Annex II will be amended to exclusively comprise pests that do not require territorial protection but rather pest-free planting material. Organisms currently listed in Annex II, Part A, Section I (non-European organisms) and Annex II, Part B (organisms for which protected zones exist) require territorial measures and will therefore be transferred to the Annex of an implementing act concerning all organisms subject to territorial protection measures. The future "Annex II" will comprise pests from the current Annex II, Part A, Section II (pests present in the EU that in practice only require pest-free planting material), along with the pests currently regulated under the PRM regime and subject to the certification schemes currently foreseen by the PRM regime.
Financial impact: the existing arrangements under the PRM for the role of operators will continue to apply, ensuring that the cost level is unaltered. Cost reductions are expected for the pests currently in Annex II, Part A, Section II that are transferred to the new Annex II, because survey, eradication and containment measures will no longer apply to them. This will liberate staff resources of the competent authorities for priority plant health tasks.

At long term, further cost reductions are expected. It will be easier to change the status of regulated harmful organisms from territorial (quarantine) to marketing (quality), since such a change can be made in one legal Decision instead of by deregulation in the plant health regime, with uncertainty about inclusion in the

Annexes of the PRM regime. As the costs of measures under the plant health regime are higher than for the PRM regime, costs for operators will gradually decrease and further staff resources of Member States for the plant health regime will be liberated.

Surveillance and contingency planning

Changes under consideration:

(c) **Introduction of mandatory surveillance by the Member States for outbreaks of listed and new harmful organisms**. A general survey obligation would apply in relation to all listed regulated pests and all pests that are new to the EU, while an enhanced level of surveys would be required for EU priority pests. EU co-financing for surveys would be put in place.
Financial impact: the current costs of surveys for the Member States have been estimated by FCEC (2011) at EUR 14 mio. An obligation for surveillance, for priority pests moreover at an enhanced level, will require additional resources and would be put in place only when simultaneously introducing EU co-financing. The financial costs in that case would rise to EUR 16.8-EUR 21.0 mio (FCEC, 2011).

In this impact assessment, the assumption is made that this measure will lead to an increase of the survey costs from EUR 14 mio (borne by the MS) to EUR 20 mio, half of which would be borne by the EU (co-financing).

(d) **Introduction of mandatory contingency planning for priority harmful organisms**.
Financial impact: negligible; this is an activity that would be carried out by the MS services, largely as a part of their normal duties.

Eradication and containment

Changes under consideration:

(e) **Clarification of measures required for eradication and containment of outbreaks**. The current plant health law requires such measures to be taken but does not specify these (apart from some potato diseases in the relevant Control Directives). Member States are required, in very general terms, to eradicate regulated harmful organisms or if that is not possible, to contain them. This allows Member States complete freedom about the nature and the scale of interventions. The new law would clarify what actions are required, in terms of carrying out a delimiting survey to determine the actual extent of the outbreak, establishing a demarcated area and a buffer zone, implementation of specific eradication measures and – in the case of priority pests - provision of an action plan containing all those actions and measures. It would allow to set up permanent measures to eradicate or contain harmful organisms in analogy with the Control Directives on potato pests, without the need for a co-decided act. Those Control Directives have proven to be successful thanks to such detailed requirements. The new PHR would thus acquire access to the same useful toolbox.
Financial impact: none. These measures are already good practice and should be applied anyway. The measures will however follow a harmonised logic and

the action plan will need to be communicated to the Commission and the MS. Proper implementation of already existing obligations may bring along new costs, but those costs should not be attributed to the new regime. The costs of any harmonised Union measures for specific crops / pests cannot be assessed at this stage, as they will depend on the crop and pest concerned.

(f) **Extension of the scope of the EU co-financing "solidarity regime"** for plant health to also cover costs of measures addressing outbreaks that are due to **natural spread** within the EU. Costs from such measures are explicitly excluded from EU co-financing under the current plant health law.
Financial impact: according to the FCEC (2011), the current level of costs of MS for measures related to natural spread is at least EUR 7.3 mio. These costs are already incurred at present but they are not co-financed by the EU.

In this impact assessment, the assumption is made that this measure will not lead to additional expenditures but will change the attribution of the costs, from today around EUR 7.3 mio (borne by the MS) to in future EUR 3.65 mio for the MS and EUR 3.65 mio for the EU.

(g) **Removal of the degressivity rule**. The current plant health law requires degressivity (mandatory decrease over time) of EU co-financing of MS expenditures for eradication and containment. No level of degressivity is specified. No such rule exists in the animal health regime and it would be dropped for plant health too.
Financial impact: the relevance of the degressivity provision has in practice been limited. In certain cases, degressivity of EU co-financing levels could be counter-productive to achieve the objectives of the measures. For such cases, a fall-back exists in Directive 2000/29/EC, Article 23(6) to continue payments despite the degressivity rule, even at levels above the standard 50% level. Reversely, Art. 23 empowers the Commission to attribute lower priority and budget to certain dossiers, depending among others on the availability of EU budget for plant health. These provisions will remain in the new law. Altogether, the impact of dropping the degressivity rule is therefore zero.

(h) **Widening of the scope for EU co-financing of MS expenditures to compensate operators** for the lost value of plant material subject to official destruction measures. This would apply to direct costs and losses only, since consequential losses are very difficult to estimate beforehand (they are not co-financed in the animal health regime either)[90]. The eligibility of MS compensation payments to operators would be restricted to measures against EU priority pests (for the identification of priority pests, see change (a)). The Union financial contribution would be 50%. By exception, a higher percentage may be set where measures taken by a Member State against certain priority pests are primarily designed to protect Union territories other than that of the Member State concerned.

Article 23 of Directive 2000/29/EC already allows such compensations, however an Implementing Regulation has not been put in place and EU co-

[90] Consequential losses could be co-financed under the current regime if, in accordance with Article 23 (3) of Directive 2000/29/EC, an implementing Regulation is adopted. This has not happened. Dropping the possibility therefore has zero impact.

financing for operator losses in practice has not occurred (a grey area nevertheless exists where MS dossiers included costs related to operators that were subject to eradication measures). The new plant health Regulation will not require such an Implementing Regulation. Compensations to operators paid by MS will be part of the dossiers submitted by MS for EU co-financing (the Union itself will not pay any compensation directly to operators).

Financial impacts: the FCEC (2011) estimates the additional EU budget needed to co-finance operator losses at EUR 5 mio per year for the selected 10 priority pests. In this impact assessment, the assumption is made that total expenditures for this measure might prove higher. The figure of EUR 5 mio relates to the studied 10 priority pests only and more pests may be listed in due course in the priority Annex, up to a maximum of 20 priority pests. In addition, availability of EU co-financing for compensating operators might attract further requests from operators to MS competent authorities, and from MS to the EU.

We assume that the eligible expenditures would be around EUR 20 mio per year for a maximum of 20 priority pests. It should be noted that the FCEC study shows that current MS compensation payments to operators for costs and losses are around EUR 6 mio per year, of which we assume EUR 3 mio is compensation for value loss. The assumed MS expenditures would therefore be EUR 10 mio (EUR 7 mio higher than today) and the EU expenditures EUR 10 mio as well (new). The compensation to operators would go up from the current EUR 3 mio to EUR 20 mio.

By way of comparison, for France alone, the financial impact for operators due to mandatory destruction, treatment or detention measures from 2005 to 2007 was in the range of EUR 5.3 to EUR 11.4 mio per year. Since France produces 20% of the EU crop value, the eligible figures could amount to EUR 26.5 mio - EUR 57.0 mio (average: EUR 41.8 mio) for the Union as a whole, if the EU would co-finance operator losses from eradication measures for all listed pests (not only priority organisms). In that case, the necessary additional EU budget would be EUR 20.9 mio.

The magnitude of the EU expenditures will be restricted by limiting the number of priority organisms. Where the annual ceiling set by the Multi-annual Financial Framework (MFF) for plant health expenditures would nevertheless be surpassed because of large-scale outbreaks of priority pests, the MFF crisis reserve for food safety expenditures will be used. A provision allowing to use the crisis reserve mechanism will be included in the legislation.

Losses of operators resulting from eradication measures for pests other than priority pests will not be eligible for EU co-financing. This does not preclude MS compensation for those costs (note that MS will not be obliged anyhow to compensate operator losses). For these cases, operators may set up mutual funds or rely on dedicated insurances, for which the proposed Common Agricultural Policy legislation allows MS financial support and offers Union support.

Import

Changes under consideration:

(i) **Temporary restrictions of new high-risk trade pending risk analysis**: in addition to the current Annexes of Directive 2000/29/EC, a new Annex would be created to cover new trade in plants for planting for which no specific requirements exist in the plant health regime but that are provisionally seen as a high risk, based on preliminary technical and scientific evidence. Such plants for planting would be subject to precautionary measures, allowing time for the competent authorities and Commission to fill knowledge gaps and develop a full-fledged PRA (in line with the SPS Agreement). After expiry of a maximum period of 4 years, the listed articles would be transferred to regular Annexes or, in absence by that time of a PRA, deleted.
The new Annex would consist of three Parts (A: materials requiring intensified inspection and mandatory laboratory testing; B: materials requiring post-entry quarantine; C: materials of which the entry is refused pending risk analysis). To minimise impacts on trade, high-risk materials would be subject to the least costly measures, on condition that the effectiveness of the measures is not jeopardised.
An exemption would be created for scientific purposes, trials and varietal selection, provided that special phytosanitary safeguards are applied.

Financial impact: FCEC (2011) estimates the costs of mandatory laboratory testing for a single ornamental species in the range of EUR 0.3 mio to EUR 1.3 mio per year, and for all ornamentals EUR 6.8 mio to EUR 23.4 mio. Assuming that the measures would affect 1% of the total trade, the annual costs for operators would be between EUR 68,000 and EUR 234,000 (on average: EUR 0.15 mio), at a full cost-recovery basis.

The FCEC furthermore estimates the costs of post-entry quarantine at EUR 1,000 / m^2 or up to EUR 1 mio in total for a standard facility (up to 1,000 m^2) to set up such facilities and EUR 2,500 per year for administrative costs[91]. Assuming that a quarantine facility would be set up in 10 MS and that the life span of such a facility would be 20 years, the annual expenditures would amount to EUR 0.5 mio. Assuming maintenance and operational costs of EUR 0.25 mio per facility per year, the total annual costs at EU level would amount to EUR 0.75 mio, to be paid by the operators through fees.

The value of nursery stock imports into the EU is EUR 1.5 billion per year; assuming that new trade amounts to 1% of the total trade, a temporary blocking of new trade would impact on a trade value of EUR 15 mio per year. Assuming a profit margin of 10% to 25%, the lost value would be in the order of EUR 1.5 mio to EUR 3.7 mio per year (on average, EUR 2.6 mio). As long as the measures are strictly confined to new trade, the impact of blocking that trade is however formally zero.

Apart from the costs for operators, additional burden would follow from this measure for the Commission and for the competent authorities of the Member States. For each listed plant or plant product, a PRA would need to be carried out and that PRA would need to be assessed by EFSA. Assuming that the development of a PRA requires 0.5 man-year on MS side and 0.5 man-year on

[91] The FCEC argues that in some cases the costs for the operators could however exceed the value of the commodities.

Commission side (EFSA), the costs per PRA would range from EUR 30,000 to EUR 100,000 depending on the salary level in the MS. With one request per year per MS for listing new trade, the annual costs would amount to EUR 0.8 mio to EUR 2.7 mio.

In this study, we assume that operator costs from mandatory testing of plant material, post-entry quarantine and temporary import restrictions would be EUR 3.5 mio per year. We assume that costs for MS and the Union would be EUR 1 mio each per year for PRA.

(j) **Dropping the existing exemption to import requirements for passenger transport**: the current legislation exempts plants and plant products imported into the EU by persons intending to use the material for private non-commercial purposes. This exemption would be dropped, so as to stop currently ongoing high-risk imports with passengers and at the same time generate awareness of the public at large of the need to keep out regulated harmful organisms from third countries. This would be supported by random checks of passengers at international airports, carried out incidentally at a low frequency. Additionally, information posters would be placed at airports.
Financial impact: assuming that a single action requires four inspectors for 3 days (1 day of action, 2 organisational days), and that each MS would carry out 10 actions per year, the workload would be 0.6 man-year per MS per year, amounting for the entire EU to EUR 18,000 to EUR 60,000 per MS per year. The estimated costs for the EU-27 would be EUR 1 mio per year, including the costs of posters which are here estimated at 5% of those costs.

(k) **Inclusion of plant and plant product imports in the TRACES application** used today for imports of animals, animal products, feed and food. An obligation would be created for operators and competent authorities to use TRACES to submit prior notice of imports and to keep track of the status of checks that are being carried out. The use of national IT systems for these purposes would be abandoned.
Financial impact: the initial costs to expand the TRACES software to cover plant health are estimated by Commission services at EUR 100,000, together with training costs for national inspectors and/or users under the BTSF programme during two years (3 courses for 30 persons per year), estimated at in total EUR 400,000. These costs will be fully borne by the Commission, which thus would have a total one-off cost of EUR 0.5 mio. Further maintenance of TRACES would be taken care of by the existing TRACES team in DG SANCO.

The operator costs for filling TRACES with daily data should be negligible. These costs are currently made as well, but through other systems. In so far as MS still allow operators to fax or mail information, the archiving costs for MS are substantial. Such information carriers have to be individually scanned and saved, which consumes substantive memory space and is known to be highly expensive. Those costs can be substantially reduced by using TRACES, which stores the factual data and not the template. Costs will also decrease for MS in which the inspectors feed the fax and e-mail data of the operators by hand into IT applications. TRACES should thus be anyhow cheaper for the MS.

MS however have divergent views on the need to include plant health in TRACES and the associated costs. Some insist to maintain their existing national systems and believe that the costs of linking these to TRACES would be very high. The issue will be explored and addressed in the IA for the new Regulation 882/2004 (no provision on TRACES will be incorporated in the new plant health Regulation itself).

Plant passport system

Changes under consideration:

(l) **Attribution of the responsibility for the availability of traceability information concerning intra-EU movements to the operators**: the operators would be explicitly responsible for keeping record of the necessary traceability information. The current legislation is ambiguous whether such information has to be included in the plant passport or can be left to the operators to keep record in their own files.
Financial impact: none, as operators already today already have that information in their records and store it for the required minimum period of one year.

(m) **Extension of the scope of the plant passport to all business-to-business movements of all plants**: the scope of the current plant passport provisions would be expanded to cover all plants for planting (not only specific ones), except seeds, in business-to-business. The same requirement applies already to imports from third countries and, for compliance with the SPS Agreement, needs to be mirrored for movements within the Union.
Financial impact: none, as argued by FCEC (2011). The economic study by FCEC (2011) identified that all transactions in the trade chain are at present already accompanied by documents in various forms. The information required for issuing a plant passport to all plants for planting (except seeds) is thus already present in the ICT systems of the operators (e.g. for stock keeping and invoicing), meaning that the cost of possible modifications to the format of labels, tags and the like (including a plant passport label printed on them) are one-off and can be split over many users of the specific software packages in use. This is also evidenced by the fact that today many operators already issue plant passports without the obligation, this being easier (cheaper) than issuing them for some but not for other species.

(n) **Simplification and harmonisation of the plant passport format**: the plant passport format would be simplified and harmonised to a mark consisting of a logo accompanied by the botanical name of the plant material, the country code, the registration number of the operator, and the lot number (or a traceability identifier such as a barcode or a chip).
Financial impact: none, as argued by FCEC (2011). The simplification would rather reduce operator costs as less data need to be filled for the plant passport.

(o) **Alignments with the certification label issued under the PRM regime**: where possible definitions and provisions of the EU plant health and PRM regimes are aligned to remove obstacles for Member States to combine health inspections under the two regimes and reduce burden. Where consignments

require a plant passport and a certification label, the competent authorities shall issue a single document. A combined operator register is foreseen.
Financial impact: cost reductions for operators. Further combined health inspections would allow for a reduction of operator costs up to EUR 0.7 mio per year (FCEC, 2011). Obliging MS to issue one document in cases both the plant health and the PRM legislation require the issuance of a certification will eliminate double costs for operators. The same is true for the obligation to MS to set up a combined plant health and PRM register of operators.

(p) **Introduction of an obligation to MS to levy cost-recovery-based fees for registration**. Currently MS are free to levy or not fees for plant passport related activities such as official inspections at the place of production.
Financial impact: based on the administrative cost spreadsheets provided with the evaluation (FCEC, 2010)[92], the impact can be calculated as follows.

Current situation	CA costs	Operator costs	Total costs
Before fee charging	€1.36 mio	€1.49 mio	€2.85 mio
After fee charging	€1.24 mio	€1.61 mio	€2.85 mio

The current costs of EU operators are administrative costs (EUR 1.49 mio = 52% of total costs) and fees (EUR 0.12 mio = 4% of total costs), out of a total of EUR 2.85 mio. Recoverable competent authority (CA) costs for which no fees are levied amount to EUR 1.24 mio (being 44% of total costs, and 91% of the CA costs for registering operators). Registration fees vary between MS from EUR 7 to EUR 681 (weighted average: EUR 47). Fees are levied in 11 MS.

Full cost recovery[93] will increase operator costs from EUR 1.61 mio to EUR 2.85 mio (+ 77%). The increase of EUR 1.24 mio will be borne by 24224 operators in MS without full cost recovery (= number of annual renewals and new registrations, out of 133144 registered operators), implying an average cost increase for those operators of EUR 51 per year.

(q) **Introduction of an obligation to MS to levy cost-recovery-based fees for plant passport inspections**
Financial impact: based on the administrative cost spreadsheets provided with the evaluation (FCEC, 2010), the impact can be calculated as follows.

	CA costs	Operator costs	Total costs
Before fee charging	€33.32 mio	€ 0 mio	€33.32 mio
After fee charging	€14.55 mio	€18.77 mio	€33.32 mio

[92] Data relate to the EU-27 except BG, GR and LU which had not replied to the cost questionnaires.
[93] Once plant health is included in the scope of Regulation 882/2004, the modalities to set the fee level will be governed by that Regulation. This could lead to some limited (probably <20%) deviations from the figures used in our study, which are based on full cost recovery.

The current costs of EU operators are fees (EUR 18.77 mio = 56% of total costs related to plant passport inspections). Recoverable CA costs for which no fees are levied amount to EUR 14.55 mio (being 44% of total CA costs related to plant passport inspections). Fees are levied in 17 MS, are not levied in 6 MS and no data are available for 4 MS. In those MS that levy fees, the cost recovery varies from 5% to 100% (reached in 7 MS). The weighted average fee at 100% cost recovery is EUR 128.

Full cost recovery will increase operator costs from EUR 18.77 mio to EUR 33.32 mio (+ 78%). Per MS, the additional burden for operators would range from EUR 0 to EUR 2.9 mio per year. Per operator, the additional burden would range from EUR 0 to EUR 1278 per year. The weighted average additional cost per operator in MS with currently incomplete cost recovery would be EUR 349 per year.

The combined impact of mandatory cost-recovery based fees for registration of operators and for inspections at the place of production for plant passport issuance is as follows.

	CA costs	Operator costs	Total costs
Before fee charging	€96 mio	€51 mio	€147 mio
After fee charging	€59 mio	€88 mio	€147 mio
100% cost recovery for registration and	€43 mio	€104 mio	€147 mio

The current costs incurred by competent authorities for plant passport inspections that are recovered from operators through fees amount to 85% of the recoverable costs. The non-levied recoverable costs are 11% of total costs, 17% of all CA costs and amount to 15% of the total recoverable costs.

Full cost recovery will increase operator costs from EUR 88 mio to EUR 104 mio (+ 18%). Per MS, the additional burden for operators would range from EUR 0 to EUR 2.9 mio per year. Per operator, the additional burden would range from EUR 0 to EUR 1329 per year, with a weighted average increase in MS with currently incomplete cost recovery of EUR 400 per year.

Protected zones system

Changes under consideration:

(r) **Introduction of rules for demarcation and temporary or permanent exclusion of outbreak areas**: upon an outbreak in a protected zone, MS would have to apply the principles of demarcated areas and actively eradicate the outbreaks. The area under eradication would not be excluded from the protected zone, unless no demarcated area is timely established, no measures are taken or no eradication is achieved within two years.
Financial impact: negligible for MS that fulfil their current legal obligations. Costs would be incurred by MS that today do not fulfil those obligations,

however, from a formal impact assessment perspective, the additional impact compared to the current legislation is zero.

Laboratories

Changes under consideration:

(s) **Introduction of an obligation to plant health laboratories to be accredited**, at least for a single diagnostic protocol (or a single protocol per taxonomic discipline), with a transitional period of 5 years. The costs charged by the accreditation body for the initial accreditation would be borne by the EU, the annual audit costs would be for the laboratories themselves and should be included in the cost-recovery based fees to the extent that a laboratory carries out official diagnoses.
Financial impact: accreditation requires laboratories to set up quality assurance systems, including the appointment of a quality assurance officer (this may be an additional task for a staff member who is not actively involved in the diagnoses). Quality assurance should be good practice for any modern laboratory and the associated costs should therefore not be taken into account as additional. The transitional period of 5 years should normally be sufficient.

The additional costs relate to the formal accreditation itself, which consists of an initial accreditation, valid for 4-5 years (dependent on the MS in case), and the costs of annual audits. Based on a survey of MS laboratories[94], the costs of the initial accreditation are assumed to range, depending on the size of the laboratory and the price level in the MS, from EUR 2,000 to EUR 20,000 (rarely EUR 30,000). Since the accreditation would be valid for 4-5 years, the annual costs would be EUR 450 to EUR 4,500 per year per laboratory. The annual audit costs would amount to EUR 1,300 to EUR 15,000 (rarely EUR 20,000).

In some MS, the official plant health laboratories have already been accredited or largely so. In others, this is not yet the case. The number of laboratories per MS presumedly ranges between 1 (for centralised MS)[95] and 26 (for MS with regional laboratories). In this study, it is assumed that 20 MS still need to apply for accreditation, that this would apply to on average 6 laboratories[96], and that the initial accreditation costs on average would be EUR 2,500 (yearly basis) and the annual audit costs on average EUR 8,000.

Based on these assumptions, the initial costs for the EU would be EUR 0.3 mio. The average annual audit costs for the MS would be 27 x 6 x EUR 8,000 = EUR 1.3 mio.

Assuming that 50% of laboratory activities relate to official diagnoses and the remaining activities are commercial, the impact on operators from the obligation would formally be EUR 0.65 mio. Since the need for accreditation would stem only from the EU plant health legislation, it is more appropriate to attribute the full EUR 1.3 mio to the impact of the legislative changes.

[94] Replies were received from AT, BE, CZ, DE, DK, ES, FR, IE, LV, NL, MT, PL, SE, SI, SK.
[95] One MS does not have any such laboratory at all but has contracted out all analyses to other MS.
[96] This is the average number of relevant laboratories in the 15 MS that replied to the consultation.

The issue will be further addressed in the IA for the new Regulation 882/2004 (no provision on laboratory accreditation will be incorporated in the new plant health Regulation itself).

(t) **Creation of EU reference laboratories for plant health diagnosis**: inclusion of plant health in the scope of Regulation 882/2004 would legally create the possibility to set up EU reference laboratories in the plant health area, building on and reinforcing existing laboratories of Member States, and support these financially from the EU budget.
Financial impact: it is estimated that in due course EU reference laboratories would be set up for circa 10-12 priority pests. At present, the EU supports 42 EU reference laboratories in the other areas covered by Regulation 882/2004 for a total annual sum of EUR 14.2 mio (figure for 2010/2011); the average EU support thus amounts to EUR 338,000. This implies that the annual costs for plant health reference laboratories would be EUR 3.4 mio to EUR 4.1 mio (based on this our assumption is EUR 4 mio).

The issue will be further addressed in the IA for the new Regulation 882/2004 (no provision on reference laboratories will be incorporated in the new plant health Regulation itself).

Invasive alien plant species

Changes under consideration:

(u) **Expansion of the scope of the plant health regime to also cover invasive alien plant species**: the regime would explicitly include IAS plants for all provisions, including survey obligations, import and intra-EU movement measures, eradication and containment measures and the EU co-financing rules and levels of Union financial contribution.
Financial impact: according to the FCEC (2011), listing of IAS plants would have relatively moderate financial impacts as long as these plants are and continue to be absent from the EU. Once outbreaks occur, survey, eradication and control costs would be significant (order of magnitude per IAS plant species: EUR 0.7 mio for surveys; EUR 3 mio for eradication and control). For IAS plants that are widely distributed in the EU, costs could be very significant (order of magnitude per IAS plant species: EUR 1.5-EUR 3.0 mio for surveys; EUR 10-EUR 30 mio per year for eradication and containment).

Assuming that the EU plant health regime would list 20 IAS plant species, of which eventually 5 species have restricted outbreaks and 2 species large-scale outbreaks, the total costs would amount to EUR 63 mio per year (5 x EUR 3.7 mio + 2 x EUR 22.25 mio), of which EUR 31.5 mio would be borne by the MS and EUR 31.5 by the EU. If IAS plant species with large-scale outbreaks would be rapidly deregulated, the total costs would be EUR 18.5 mio.

In this study we assume reality will be halfway, i.e. EUR 40.8 mio, of which EUR 20.4 mio for the MS and EUR 20.4 mio for the EU.

Repeal of obsolete Directives

(v) **Repeal of Council Directives 74/647EEC and 2006/91/EC**: these legal acts would be repealed as the relevant harmful organisms (carnation leaf rollers and San Jose scale) are widespread across the EU and are no longer listed in Directive 2000/29/EC (i.e., no import restrictions apply). They are however listed under the Marketing Directives for PRM (Commission Directives 93/48/EEC and 93/49/EEC), as quality pests from which commodities in trade should be "substantially free". The objectives of the two Council Directives to contain the relevant pests and inhibit their spread are obsolete.
Financial impact: in technical sense, the repeal will not have any impact because the organisms are no longer controlled by plant health inspectors, despite the PHR legislation (they are only controlled at present in the context of the PRM legislation). Formally, the PHR costs for operators and MS would decrease as a consequence of the repeal, however the net impact is zero since the legal acts are no longer implemented under that regime (while control continues under the PRM regime).

Annex X: Summary of the opinions of stakeholders and Member States

This Annex presents an overview of the positions taken by the stakeholders and the competent authorities of the Member States in reply to the consultations, either at conferences and consultation meetings or in writing. The Commission has attempted to correctly summarise and refer to those positions, which however had to be re-arranged and interpreted for the purposes of this Annex.

I. Opinions concerning proposed measures

For a description of these measures, see Annex IX.

Prioritisation

Changes under consideration:

(a) **Measure:** introduction of a new Annex for EU priority pests
Stakeholders: supported by LTO NEDERLAND, NATIONAL TRUST, PLANTUM NL.

Member States: general support, except for one MS that would prefer to use the emergency measure instrument for addressing priority pests. Another MS sees a need for different prioritisation for surveys compared to eradication / containment.

(b) **Measure:** transformation of current Annex II into an Annex listing harmful organisms for which thresholds apply instead of territorial objectives
Stakeholders: supported by AIPH, ESA, EUROPATAT, NAO, UFS, VGB (as long as the conditions concerning the role and responsibilities of operators would not change for the organisms so far listed under the Marketing Directives). COPA-COGECA, LTO NEDERLAND and PLANTUM NL preferred listing of these organisms under the PRM regime (*it should be noted that the proposed measure in practice results in the outcome advocated by these three stakeholders, but using a different legal technical solution, this was apparently not sufficiently clear in the consultation document*).

Member States: support from all but one MS.

Surveillance and contingency planning

Changes under consideration:

(c) **Measure:** introduction of mandatory surveillance by the Member States for outbreaks of listed and new harmful organisms, supported by EU co-financing
Stakeholders: supported by AIPH, COPA-COGECA, ENA, ESA, HTA, LTO NEDERLAND, NATIONAL TRUST, UFS.

Member States: general support. More stakeholder involvement was requested by several MS.

(d) **Measure:** introduction of mandatory contingency planning for priority harmful organisms

Stakeholders: supported by AIPH, COPA-COGECA.

Member States: general support.

Eradication and containment

Changes under consideration:

(e) **Measure:** clarification of measures required for eradication and containment of outbreaks
Stakeholders: supported by COPA-COGECA, NATIONAL TRUST, UFS, VGB. However, LTO NEDERLAND and VGB requested more flexibility to adapt to the needs of the local situation.

Member States: variable support, ranging from support (4 MS) to strong reservations (1 MS), and questions how to technically solve specific cases such as outbreaks in greenhouses. The MS with reservations requested a more flexible approach to allow for measures tailored to the local situation.

(f) **Measure:** extension of the scope of the EU co-financing "solidarity regime" to also cover costs of measures addressing outbreaks that are due to natural spread
Stakeholders: supported by AIPH, EFNA, ENA, ESA, HTA, NATIONAL TRUST, UFS, restricted to cases where measures would make sense. However, COPA-COGECA requested a careful analysis of the potential financial impacts, and VGB preferred the status quo.

Member States: general support.

(g) **Measure:** removal of the degressivity rule
Stakeholders: no consultation was organised as this is a technical issue without impact in practice (see explanation in Annex X). Nevertheless noted and supported by UFS.

Member States: no consultation was organised as this is a technical issue without impact in practice (see explanation in Annex X). One MS however itself flagged up that the degressivity rule should be removed.

(h) **Measure:** widening of the scope for EU co-financing of MS expenditures to compensate operators for the lost value of plant material subject to official destruction measures
Stakeholders: supported by AIPH, COPA-COGECA, ENA, ESA, EUROPATAT, HTA, LTO NEDERLAND, NAO, NATIONAL TRUST[97], UFS[98], USSE, VGB. Their view was that growers do not always have the possibilities to take adequate measures to prevent the introduction of harmful organisms and that measures have a mixed public/private objective, implying that MS and EU tax payer co-financing is justified. The share of financial contribution between grower and tax payer should depend on the extent of the public interest. A prudent approach was needed because of the potentially

[97] Provided that payments are conditional to compliance by operators with legislation and that perverse incentive are not possible, and targeting landowners rather than high-value industries.
[98] Provided that mutual funds cannot be set up and on conditions of good hygiene and prevention practices by operators.

significant impact at MS and EU level. Distortion of competition because of different national arrangements should be avoided. Cost sharing should also mean responsibility sharing with private sector. An active role of stakeholders in horizon scanning and preparedness for outbreaks was proposed. Prevention measures by operators should be conditional to payments (incentives). Compensation should be open to all sectors, including landowners in the case of forests and private green. PAN EUROPE recalled that no preventive measures are in place in the CAP at present. Without a link to obligations concerning preventive economic measures, it was not in favour of giving any money. Greening of the CAP should be conditional to payments.

Member States: diverging views, ranging from clear support to clear opposition. According to the MS that were in favour, compensations to operators are important, restricted to priority organisms and conditional to compliance with the legislation and good practices. Priority should be given to compensations relating to outbreaks of harmful organism affecting public goods. Several MS referred to positive experiences with national public compensation funds. Several MS believed that compensations for suppression measures and/or indirect (consequential) losses should also be eligible. MS that were against believed that compensation could create a perverse incentive, would be too costly, and/or should be left to the sector to organise through mutual funds or insurances (in any case it would require deeper involvement of and coordination with the industry). It was also questioned whether MS would be able and willing to pay their national part of the compensations, with risks of disrupting the level playing field for operators.

Import

Changes under consideration:

(i) **Measure:** temporary restrictions of new high-risk trade pending risk analysis
Stakeholders: in principle supported by AIPH and LTO NEDERLAND (only for new trade and in exceptional cases), COPA-COGECA, NATIONAL TRUST, PAN EUROPE, PLANTUM NL and UFS (noting however that an import license system would be harmful to the EU agricultural economic activity as a whole). Concerns were expressed by AIPH, COPA-COGECA, ENA, ESA, NAO, UNION FLEURS, ZVG about the introduction of post-entry quarantine because of the impacts on quality of the quarantined material, impacts on trade, risk of cross-contamination during quarantine and expected high costs to operators; in addition, counter-reactions from third countries might follow. PLANTUM NL advocated post-entry inspections rather than post-entry quarantine. It stressed that case-by-case authorisations (import licenses) will have a huge impact on the trade of plants for planting and producers in the EU, and the process of scientific studies concerning high-risk commodities could be too slow and complex to meet the needs of trade. Several stakeholders stressed the need to better support developing countries in setting up proper phytosanitary systems.

Member States: general support for introducing restrictions on new high-risk trade[99].

(j) **Measure:** dropping the existing exemption to import requirements for passenger transport
Stakeholders: supported by NATIONAL TRUST. No other comments received.

Member States: general support, to the exception of ca. 3 MS that question the feasibility.

(k) **Measure:** inclusion of plant health imports in the TRACES application
Stakeholders: not included in the consultation.

Member States: potential benefits seen by the MS, the general support however being conditional to careful consideration and elaboration of plant health specificities. Some believe that the costs could be very high and disproportionate.

Plant passport system

Changes under consideration:

(l) **Measure:** attribution of the responsibility for the availability of traceability information concerning intra-EU movements to the operators
Stakeholders: supported by AIPH, COPA-COGECA, LTO NEDERLAND.

Member States: general support.

(m) **Measure:** extension of the scope of the plant passport to all business-to-business movements of all plants
Stakeholders: extension to all plants (instead of the currently listed ones) supported by UNPT but not by AIPH, COPA-COGECA, UFS.

Member States: support by eight and opposition by three MS to expand the scope to all plants (however mixed views on excluding or not pot plants). With three exceptions also support to restrict the scope to business-to-business movements, up to professional final consumers.

(n) **Measure:** simplification and harmonisation of the plant passport format
Stakeholders: supported by AIPH, COPA-COGECA, ENA, ESA, NAO, NATIONAL TRUST, PLANTUM NL, UNION FLEURS, UFS. However EUROPATAT and NAO wished to additionally retain national mark with a view to exports to third countries.

[99] The MS would even prefer stricter ones than here proposed, permanently blocking all plants for planting from third countries, unless these are today already allowed in via the requirements in Annex IV of Council Directive 2000/29/EC, pending risk analysis for each commodity / origin. Derogations would be possible on a case-by-case basis after completion of the relevant PRA, or for scientific purposes and varietal selections.

Member States: general support.

(o) **Measure:** alignments with the certification label issued under the PRM regime
Stakeholders: supported by AIPH, COPA-COGECA, ENA, LTO NEDERLAND, NATIONAL TRUST, UFS.

Member States: general support.

(p) **Measure:** introduction of an obligation to MS to levy cost-recovery-based fees for registration
Stakeholders: discussed as part of measure (q).

Member States: discussed as part of measure (q).

(q) **Measure:** introduction of an obligation to MS to levy cost-recovery-based fees for plant passport inspections
Stakeholders: supported by AIPH, COPA-COGECA, ESA, NATIONAL TRUST, UFS, VGB.

Member States: general support (14 MS), although two MS have concerns about the way harmonisation should be achieved and whether this should not be left to the individual MS.

Protected zones system

Changes under consideration:

(r) **Measure:** introduction of rules for demarcation and temporary or permanent exclusion of outbreak areas
Stakeholders: supported by AIPH, COPA-COGECA, ENA, ESA, LTO NEDERLAND, NATIONAL TRUST, PLANTUM NL, UFS, VGB, ZVG and to some extent EUROPATAT (no formal transition to the Pest Free Area as this would endanger trade with third countries in case of an outbreak; a concern shared by NAO).

Member States: general support, although five MS question the justification of the foreseen 2-year grace period (they consider that biological parameters should have priority) and one MS does not share the perceived need to set up demarcated areas in case of outbreaks.

Laboratories

Changes under consideration:

(s) **Measure:** introduction of an obligation to plant health laboratories to be accredited
Stakeholders: not included in the consultations.

Member States: all but one MS support to move towards accreditation but with a long transitional period in view of the costs and on condition that the specialities of plant health diagnostics are acknowledged and the scope is restricted to a limited number of diagnostic protocols / methods.

(t) **Measure:** creation of EU reference laboratories for plant health diagnosis
Stakeholders: not included in the consultations.

Member States: support by all MS.

Invasive alien plant species

Changes under consideration:

(u) **Measure:** expansion of the scope of the plant health regime to also cover invasive alien plant species
Stakeholders: several stakeholders have expressed fears that inclusion of IAS plants will take place at the expense of plant health proper. Seven agricultural stakeholders (EUROPATAT, EFNA, ENA, HTA, PLANTUM NL, UFS, UNION FLEURS) and two NGOs (NATIONAL TRUST and the JOINT NATURE CONSERVATION COMMITTEE[100] of the UK) for this reason are not in favour of including IAS plants (some stakeholders because they are anyhow against any increased ambitions requiring more financial resources). Four others (the umbrella farmers' organisation COPA-COGECA, AIPH, LTO NEDERLAND, VGB-NL) would accept or even favour coverage of IAS plants on the condition that the necessary EU co-financing budget comes from a dedicated environmental budget line (not the CAP) and/or on condition that only agricultural weeds will be covered.

Member States: the views of Member States diverge considerably, five being in favour of including IAS plants and assuming costs would be limited and five being against because of lack of resources and priority and/or because a separate environmental legal framework is being preffered. The Member States that are in favour of including IAS plants argue that the costs of including IAS plants would pertain mainly to import control, which costs should be relatively low. Other Member States have requested careful analysis of the potential impacts prior to any decision.

Repeal of obsolete Directives

(v) **Measure:** repeal of Council Directives 74/647EEC and 2006/91/EC
Stakeholders: not consulted as this is a purely technical issue.

Member States: all but one MS support repealing both Directives (the exception being due to procedural objections).

Conclusion: support for most measures from stakeholders and Member States, except:

- **(e) Stricter eradication / containment measures (one MS requires more flexibility)**
- **(h) EU co-financing of MS compensation to operator losses (wide support from stakeholders, mixed views among MS)**

[100] Perhaps to the exception of some IAS plants that had not yet reached Europe.

- **(i) Measures addressing high-risk trade (stakeholders fear disproportionate impacts)**
- **(m) Expansion of plant passporting obligation to all plants (disputed by several stakeholders and Member States)**
- **(u) Expansion of regime to include IAS plants (diverging opinion among stakeholders and Member States)**

II. Opinions concerning the four strategic options

Replies from stakeholders

Ten replies were received from the stakeholders to the final consultation:

- PLANTUM NL (a seeds industry organisation) was in favour[101] of Option 2. EUROPATAT (representing potato trade) was in favour of Option 2 but if additional funds were available Option 3 would be acceptable as well.
- EFNA (representing EU forest nurseries), ENA (representing EU nurserystock producers), UFS (a seeds industry organisation) and the NATIONAL TRUST (a national heritage NGO) were in favour[102] of Option 3.
- USSE (representing southern EU foresters) was in favour of Option 3 or Option 4, depending on the available EU budget.
- AIPH (representing EU horticulture), COPA-COGECA and its member LTO NEDERLAND were in favour of Option 4, on condition that the budget for IAS plants will not come from the CAP (COPA-COGECA) and/or only IAS plants with serious impacts to agriculture would be regulated (AIPH).

Replies from Member States

From the consultations with the Chief Officers for Plant Health of the Member States on individual technical issues, it was clear that most MS seemed in favour of allocating additional EU budget to the EU plant health regime. Replies to the consultation on the strategic options weres however received only from eight MS[103]:

- None of the MS was in favour of Option 1;
- Two MS were in favour of Option 2, due to lack of resources and/or opposing any increase to the EU budget, however, if the increased budget for plant health stemmed from a reallocation within the existing EU budget, they were open to this (*i.e., in that case options 3 and 4 could be acceptable too; however, one of these two respondents anyhow rejected option 4*);
- Three MS were in favour[104] of Option 3;

[101] PLANTUM NL considered this option feasible if there would be more focus on high risk trade and priority pests, stakeholders would be better involved in surveillance and more tasks would be delegated to operators under official supervision.

[102] EFNA submitted a majority position; some of its members preferred Option 2. The NATIONAL TRUST made the proviso that EU funding should not be centered on compensation but rather on increased prevention and surveillance actions. ENA believed the additional money should not come from the CAP but from EU tax payers. For NATIONAL TRUST the fall-back option is Option 2, in case no additional EU budget would be available.

[103] It is likely that the other MS did not wish to bind themselves to any position at this stage. Replies received generally pertained to tentative / provisional / informal positions.

[104] One of these specified that additional resources should be taken from the CAP and only be used for EU priority pests.

- Three MS were in favour[105] of Option 4.

<u>Conclusion</u>: Option 3 best reflects the average outcome of the consultation, both for the stakeholders and for the Member States.

<u>III. Other issues</u>

Aside from the specific issues addressed above, stakeholders requested the following:

- An active role for operators in surveys for harmful organisms
- More delegation of tasks to operators, to be carried out under official supervision, thus saving resources (as also believed possible under Regulation 882/2004), also needed for laboratories involved with routine sampling and testing
- In line with Regulation 882/2004, a more risk-based approach (better use of the reduced frequency checks instrument; urgency required for cleaning up the Annexes and removing outdated organisms)
- More attention for the cost-effectiveness of measures (economic cost-benefit analysis)
- A solution for outstanding problems concerning re-export involving multiple MS
- Better EU support for scientific research, diagnostics and training to support the plant health regime
- Partnership between private and public sectors for the governance of the health regime (cost and responsibility sharing)
- Establishment of a permanent Working Group on Plant Health under the Advisory Group on the Food Chain, Animal and Plant Health, as a permanent forum for discussing plant health between the Commission and the stakeholders (*this request was supported by most Member States*)
- Concerns were expressed about the phasing out of active substances of plant protection products, which are indispensable to control outbreaks; in case of outbreaks of regulated pests, eradication costs will be unnecessarily high (for PAN EUROPE however, pesticides should be a last resort)
- More support to developing countries to set up proper phytosanitary systems (prevention at the source; capacity building)

[105] One of these assumed that the inclusion of IAS plants would not lead to any substantial additional costs.

Annex XI: List of consulted stakeholders

The European stakeholders' organisations listed below were invited to attend consultation meetings and invited to reply to consultation documents[106].

AIPH	International association of horticultural producers
ANTHOS	Koninklijke handelsbond voor boomkwekerij- en bolprodukten (NL)
AVBS*	Beroepsvereniging voor bloemisten, snijbloementelers, boomtelers, tuinaannemers en detailhandelaars (BE)
BEUC*	European consumers organisation
BLGG AgroXpertus	Bedrijfslaboratorium voor grond- en gewasonderzoek (NL)
CEI-BOIS	European confederation of woodworking industries
CELCAA	European liaison committee for the agricultural and agri-food trade
CEPF	Confederation of European forest owners
CIAA	Confederation of the food and drinks industries
CIOPORA*	International community of breeders of asexually reproduced ornamental and fruit varieties
CLECAT	European association for forwarding, transport, logistics and customs services
COCERAL*	Comité du commerce des cereals, aliments du bétail, oléagineux, huile d'olive, huiles et graisses et agrofournitures
COPA-COGECA	European farmers European agri-cooperatives
DPA	Dutch produce association (NL)
ECPA	European crop protection association
EEB*	European environmental bureau
EFNA	European forest nursery association
EISA*	European initiative for sustainable development in agriculture
ELO	European landowners' organisation
ENA	European nurserystock association
ESA	European seed association
ESC*	European shippers council
EUROCHAMBRES*	Association of European chambres of commerce and industry

[106] National stakeholders' organisations that replied to the consultations (indicated by their country acronym) are listed in so far they participated in or replied to the consultations. Stakeholders that participated in meetings without sending in position papers are also listed, in many cases these stakeholders gave oral input during the meetings. Additional to the listed stakeholders, 21 other stakeholder organisations participated in the conferences. Stakeholders that were formally invited to participate in meetings and consultations but never sent in any replies (mainly members of the umbrella Advisory Group) are marked with an asterisk.

EUROCOMMERCE*	Association for retail, wholesale and international trade interests
EUROCOOP	European community of consumer cooperatives
EUROPATAT	European potato trade association
EUSTAFOR	European state forest association
FEDIOL	EU oil and proteinmeal industry
FEFPEB	Fédération européenne des fabricants de palettes et emballages en bois
FERN*	Forests and the European Union network
FOE Europe*	Friends of the earth Europe
FRESHFEL Europe	European fresh produce association
GLOBALGAP*	Global partnership for safe and sustainable agriculture
Greenpeace*	Greenpeace
HLB	HLB research and consultancy in agriculture (NL)
HTA	Horticultural trades association (UK)
IFOAM-EU	International federation of organic agriculture movements (EU Group)
IORPIB	Plant Protection Institute – National Research Institute (PL)
IRU*	International road transport union
JNCC	Joint nature conservation committee (UK)
LRF	Lantbrukarnas riksförbund (Federation of Swedish farmers) (SE)
LTO Nederland	Nederlandse land- en tuinbouworganisatie (NL)
MTK	Central union of agricultural producers and forest owners (FI)
NAO	Nederlandse aardappelorganisatie (NL)
National Trust	National Trust (UK)
NFU	National farmers' union of England and Wales (UK)
NUTFRUIT*	International nut and dried fruit council
PAN Europe	Pesticide action network Europe
PLANTUM NL	Branchevereniging voor bedrijven in de sector uitgangsmateriaal (NL)
UFS	Union française des semenciers (FR)
UNION FLEURS	International floricultural trade association
UNPT	Union nationale des producteurs de pommes de terre (FR)
USSE	Union des sylviculteurs du sud de l'Europe
VGB	Vereniging van groothandelaren in bloemkwekerijprodukten (NL)
WWF*	World wildlife fund
ZVG	Zentralverband Gartenbau (DE)

Annex XII: Executive summary of the supporting economic study

For the complete report, see:
http://ec.europa.eu/food/plant/plant_health_biosafety/rules/docs/fcec_final_report_economic_study_plant_health_en.pdf

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QUANTIFICATION OF COSTS AND BENEFITS OF AMENDMENTS TO THE EU PLANT HEALTH REGIME

FINAL REPORT

Prepared by the Food Chain Evaluation Consortium (FCEC)
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(1)

Key messages

The aim of this study was to provide supplementary economic data on impacts of amendments to the current EU plant health regime and to support the development of the impact assessment accompanying the legislative proposal of the Commission on the future EU plant health law. The key conclusions of the study are as follows:

- The total annual costs for the EU and MS of introducing **mandatory general intra-EU surveillance** (*Task 1*) for ten potential priority Harmful Organisms (HOs) were estimated at EUR **€23.4 million** per year if surveillance is carried out at fixed 'best practice' levels (*"EU surveillance requirements" option)*, of which **€9.4 million** are **additional** to the current estimated EU 27 surveillance expenditure. Under the *"EU surveillance facilitation" option* (i.e. without fixed levels) the estimated costs range from **€14 million** (current levels of expenditure) to **€16.8 - €21 million,** of which **€2.8 – €7 million** are **additional** to the current estimated EU 27 surveillance expenditure.
- The costs of introducing compulsory **post-entry quarantine (PEQ)** in the import regime for a limited number of high risk ornamental plants for planting (*Task 2*) would largely fall on private operators (POs) and this measure may result in some rationalisation in the sector. The highest component are costs of building new facilities at the required biosecurity level (implementing the newly adopted ISPM34), which are estimated at ca. **€1,000/m^2** or **up to €1 million** in total for a standard facility (up to 1,000 m^2). Administrative costs for MS Competent Authorities (CAs) are to be fully recovered through fees charged to POs (inspection costs estimated at ca. €5,000 per facility in total over a PEQ period of 2 years), while the expected impact for the COM is likely to be minimal.
- The rationale and structure of the animal health financing could be applicable as a model for plant health to compensate for direct PO costs and losses, but the model will need to be adjusted to the specificities of plant health and the wide diversity of sectors affected, with a view to prioritisation and seeking a balance between public and private (commercial) interests. The financial impact of expanding the EU solidarity regime to **co-finance direct costs and losses of POs** (at 50% co-financing rate) (*Task 3*) was estimated at an additional expenditure for the EU of ca. **€5 million per year** at the current level and number of measures imposed by MS CAs on POs. This is very likely to increase the implementation of officially imposed measures by POs, and to trigger the implementation of national compensation schemes, but it is most unlikely to increase the intensity of measures taken by MS CAs.
- The financial impact of expanding the EU solidarity regime to also include **natural spread** of plant pests (*Task 4*) was estimated at additional EU expenditures of **min. €3.7 million per year** (50% co-financing), with a substantial increase in the case of inclusion of natural spread for HOs affecting the environment.
- In case of no action, the introduction, spread and establishment in the EU of regulated HOs impacting on agriculture, horticulture, forests and the environment (*Task 5*) has the potential to cause multiple **billions of Euros of economic damage** per year across the EU to sectors directly affected and upstream/downstream industries, as well as also potentially adversely affecting tourism, retail, and ecosystem values and services. The impact of an outbreak of any of the selected HOs reviewed by the study in terms of damage costs may extend to the entire value chain of the sector/s affected, with potentially very significant knock on effects on employment and the wider economy.
- Whatever approach is considered for solving the current lack of coherence in listing HOs between the seed or plant propagating material (S&PM[107]) *acquis* and the EU plant health regime (*Task 6*), **impacts of aligning the two regimes** are likely to be **negligible**. Merging

[107] Indicated in the main text of the impact assessment as the plant reproductive material (PRM) regime.

the visual inspection based plant passports (PPs) of the plant health regime with the sampling and laboratory testing based health certificates of the S&PM regime would lead to a cost reduction of about €1.5 million but, as several MS have already implemented this approach, the total benefit would be less. Delegation of tasks would help alignment to the approach of Regulation 882/2004/EC which is based on results to be obtained and not on how it should be done (current logic of the plant health regime).

- The **modifications to the plant passport (PP) system** (that would be issued in a larger number of cases than at present and/or in a more harmonised format; Task 7) have a **negligible financial impact** on POs. The required information is already present in their ICT system (used e.g. for stock keeping and invoicing), and the cost of possible modifications to formats of reports, labels, tags and the like (hence also PP), can be split over many users of the specific software packages in use.
- If mandatory surveillance targets for **protected zones (PZs)** (*Task 8*) are introduced, the cost of surveillance is increased (in the order of several thousand to millions of Euros, depending on PZ); where economic benefits of maintaining a PZ could be estimated, such **benefits clearly outweigh the costs of surveillance** even if this is carried out at an increased 'best practice' level. The costs of mandatory surveillance do not currently appear to be always shared between MS CAs and POs, and there is a need to reinforce the implementation of EU plant health regime provisions to collect mandatory fees for cost recovery of the inspections and sampling/testing in PZs. Immediate delisting of an infested PZ would no longer allow protection, thus possibly reducing the potential to eradicate while increasing the cost; on the other hand, immediate benefits may result for non-PZ MS in terms of saving high inspection and eradication costs to export to the PZ. Delisting an infested PZ after 2 years allows the time that is technically considered necessary for the eradication programme to run its course while enhancing the transition towards reinforced measures to maintain the integrity of the PZ, more in line with the Pest Free Area concept under the IPPC.
- The introduction of mandatory requirements for the prevention and control of IAS plants within the EU plant health regime may result in an increase in management costs across the EU as a whole. Although the total cost for absent or largely absent IAS plants is currently expected to be relatively moderate on the basis of the known level of presence and distribution and provided that EPPO guidelines on prohibitions of import/trade/planting are effectively introduced, **if in future these IAS plants become more widespread**, as is currently the case of *Ambrosia artemisiifolia* and *Hydrocotyle ranunculoides*, then the surveillance and control/eradication costs likely to require funding under Directive 2000/29/EC could become **very significant**. Given the widespread presence of some of these IAS plants and the fact that natural spread is by definition an important factor in their distribution, future eligibility for EU co-financing of measures against natural spread related outbreaks could have very significant impacts on the EU budget (per IAS plant, potentially €1.5-€3.0 million annually for surveillance and €10-€30 million for eradication and containment).

(2) Executive summary

The aim of this study, which was carried out by the Food Chain Evaluation Consortium (FCEC) in 2011, is to support the development of the impact assessment accompanying the legislative proposal of the European Commission (COM) on the future EU plant health regime (EU PH regime). The purpose is to provide supplementary economic data on impacts which form part of the analytical and descriptive inputs necessary for COM to complete its impact assessment and to fill existing knowledge gaps. The study investigates the potential impacts of various options to amend the EU PH regime, based on the conclusions and recommendations of the CPHR evaluation (FCEC, 2010).

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– The study has followed a highly targeted analytical approach, with a specific methodology developed for each of the 9 Tasks. To allow a more in-depth analysis, each Task has focused on a representative selection of HOs of high impact for the range of sectors potentially affected. The analysis is based on a range of scenarios and assumptions that serve as the working hypothesis for deriving the required quantitative and qualitative estimates. The development of these working hypotheses, as well as data collection, is based on extensive consultation with the relevant organisations (including inputs received from the various COM services; Member States (MS) Competent Authorities (CAs) and stakeholders) and four Task Forces (TFs) set up to support the COM in the review of the EU PH regime.

Task 1: costs of introducing mandatory general intra-EU surveillance

The objective of Task 1 has been to estimate the costs of introducing mandatory general intra-EU surveillance for 10 potential priority harmful organisms (HOs)[108] and the impact on the costs of EU co–financing of such surveillance. The selection of HOs includes those currently considered to represent the greatest threat for the EU, on the basis of data on interceptions, provisional emergency measures, control Directives, and the requirements of Council Directive 2000/29/EC. For some of these HOs[109] mandatory surveillance is currently foreseen by EU legislation. The analysis undertaken was required to:

1.1 Determine an appropriate level of surveillance from best practices among MS and by comparison with known surveillance levels for other important HOs, including potato pests.

The appropriate level of surveillance was established on the basis of existing information on current surveillance methodologies in use in the MS and best practices were identified

[108] *Anoplophora chinensis, Bursaphelenchus xylophilus, Erwinia amylovora, Guignardia citricarpa, Phytophthora ramorum,* Potato Spindle Tuber Viroid, *Rhynchophorus ferrugineus, Synchytrium endobioticum, Thrips palmi, Xanthomonas axonopodis pv. citri.*

[109] For 5 HOs mandatory surveillance is already currently foreseen under emergency measures for *Anoplophora chinensis, Bursaphelenchus xylophylus, Phytophthora ramorum, Rhynchophorus ferrugineus,* Potato Spindle Tuber Viroid (PSTVd), and in one case (*Erwinia amylovora*) under Protected Zones and buffer zones in place; although the remaining HOs are not currently subject to mandatory surveillance rules (*Guignardia citricarpa*, *Synchytrium endebioticum, Thrips palmi, Xanthomonas axonopodis pv. citri.*), voluntary plans are in place in some MS.

in part by means of a comprehensive survey of the EU27 MS CAs (to which 25 MS responded). The 'best practices' identified in this way were used as the basis for the cost calculations and reflect expert views as to what constitutes the most realistic combination of science and economic considerations rather than a technical gold standard[110]. Indeed, current National Plant Protection Organisation (NPPO) decision-making when planning and prioritising surveillance is a combination of what is practical and possible - given resource constraints - and achieving a balance between the need to address a number of potentially extensive HO threats and the economic interest in those sectors the NPPO is called on to protect. For example, on the basis of the information provided by the MS, inspections in nurseries generally tend to be combined for HOs affecting ornamental plants. Also in many cases, where data availability allows this, the level of sampling and testing is undertaken on the basis of suspected cases only.

1.2 Estimate total annual costs for the MS and the EU of introducing mandatory surveillance at fixed surveillance levels (at 50% co-financing)

On the basis of the identified 'best practices' in terms of surveillance methodology, the total costs of introducing mandatory surveillance across the EU-27 at these levels, were estimated at **€23.4 million** per year for the 10 potential priority HOs. This includes visual inspections in production places and the environment (40% and 34% respectively of total costs), sampling and testing (24%), and awareness-raising campaigns (2%). On the basis of the results of the CPHR evaluation (FCEC, 2010), the current EU 27 expenditure on surveillance for the 10 HOs is estimated at €14 million (see also Task 1.3). Therefore, the **additional costs** of introducing compulsory surveillance at fixed levels would be **€9.4 million.** The additional costs **for the EU**, given that currently there is no co-financing of these surveillance costs, are estimated at 50% of the global figure of €23.4 million, i.e. at **€11.7 million.**

HO	Visual inspections/ production places	Visual inspections/ environment	Sampling	Information campaigns	Total
Production places - nurseries	€ 9.3 million		€ 2.5 million	€ 81,000	**€ 11.8 million**
Forestry/open environment		€ 8.0 million	€ 1.9 million	€ 242,000	**€ 10.2 million**
Other production places			€ 1.2 million	€ 162,000	**€ 1.4 million**
Total (10 potential priority HOs)	**€ 9.3 million**	**€ 8.0 million**	**€ 5.6 million**	**€ 485,000**	**€ 23.4 million**
% of total	***40%***	***34%***	***24%***	***2%***	***100%***

(a) Estimates based on average EU fee rate. Figures rounded.
Source: FCEC calculations

1.3 Estimate total annual costs for the MS and the EU of introducing mandatory surveillance for the selected HOs without fixed surveillance levels (at 50% co-financing).

The underlying assumption under this option is that the EU would facilitate surveillance, but MS apply those levels of surveillance they consider appropriate. Under this assumption, the availability of EU funding could result in:

[110] Defining 'best practices' on a scientific basis is an exercise beyond the scope of Task 1.

a. '*Status quo'*: MS continue at current levels of surveillance on the basis of their current priorities and budget availability. They therefore use EU funding to match the total funding they currently provide for surveillance. In this case the annual cost for the EU is estimated at ca. **€7 million** (at 50% co-financing); this is new expenditure since surveillance costs are not currently co-funded;

b. '*Dynamic scenario'*: this assumes that a higher budget would be available if there was EU co-financing at 50% as MS may decide to increase surveillance levels, to reach what they currently consider to be their needs (i.e. an increase of 20-50%), as indicated by MS by means of the MS survey In this case, the total annual cost for the EU and the MS is estimated at ca. **€8.4-€10.5 million** each (at 50% co-financing). For the EU, this is new expenditure since surveillance costs are not currently co-funded.

In summary, therefore, the costs and additional costs of the various options are as follows:

Scenario	Total (100 %)	EU (50%)
Current expenditure (FCEC, 2010)	*€14.0 million*	-
At fixed surveillance levels (Task 1.2)		
	€23.4 million	€11.7 million
Additional to current expenditure	**€9.4 million**	**€11.7 million**
Without fixed surveillance levels (Task 1.3)		
a. 'Status quo'	€14.0 million	€7.0 million
Additional to current expenditure	-	**€7.0 million**
b. 'Dynamic scenario'	€16.8– €21.0 million	€8.4 – €10.5 million
Additional to current expenditure	**€2.8– €7.0 million**	**€8.4 – €10.5 million**

Task 2: costs of introducing compulsory post-entry quarantine (PEQ) for a limited number of plants for planting

The objective of Task 2 has been to estimate the costs of introducing compulsory post-entry quarantine (PEQ)[111] for non European latent HOs which cannot be immediately detected by visual inspection or via appropriate laboratory testing within the timeframe of normal import procedures, but which pose a latent risk of infection. This option concerns a limited number of high risk ornamental plants for planting, in particular palm trees (risk of *Rhynchophorus ferrugineus*); and, trees of the *Acer* species and bonsai (all species), imported from East Asia (risk of a number of HOs including *Anoplophora chinensis).*

– From our analysis and expert consultation (MS CAs, stakeholders, COM, TF3, and European and Mediterranean Plant Protection Organization (EPPO)) the following conclusions on the impact of this option can be drawn:
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[111] PEQ is different from post-entry inspections which are already possible today, after the consignment has been released for the internal market. Post-entry quarantine (PEQ) implies that the consignment is released for free movement only after an official quarantine period within which the consignment is held or planted under quarantine conditions and subject to official inspections and testing.

- The largest impact will be felt by Private Operators (POs) importers of the selected categories of plants;
- As PEQ facilities would be based on PO premises, there would be a need to build/upgrade current PO facilities, as these are currently considered largely inadequate, in terms of biosecurity. In other words there is a need to adjust to the requirements arising from the recently adopted ISPM34 – i.e. at least biosecurity level 2, and possibly also in terms of capacity (to allow all imports of the selected plant categories to be placed into PEQ);
- In terms of costs for MS CAs, the administrative costs of setting up and implementing PEQ are to be fully recovered, through fees charged to POs for registration, regular inspections and sampling;
- The expected impact (in terms of administrative costs) for the European Commission is likely to be minimal, although there will be a need to: hold further consultations with MS and to steer the process of setting up and reviewing the system, e.g. in terms of the appropriate requirements for bio-security (implementation of ISPM34); and, to ensure that MS implement the PEQ requirements correctly.

– The costs involved in building/upgrading and maintaining facilities to the appropriate biosecurity level (i.e. at least level 2) are estimated at ca. **€1,000/m^2** or **€300,000 - €1,000,000** in total for a standard 300 m^2-1,000 m^2 facility. In addition administrative costs (registration, regular inspections and sampling fees to be paid to MS CAs on the basis of full cost-recovery) are estimated at ca. €4,480 – €5,040 per facility during a PEQ period of 2 years (on the basis of an estimated 32-36 inspections).

– The above costs are considered to be relatively high, particularly for businesses with a high turnover trading small plants and therefore a relatively high number of low unit value commodities. It is therefore expected that this measure would result in some rationalisation in this sector. Although, in terms of business disruption, the impact is expected to be zero to minimal after the first 2 years (i.e. when products are released from quarantine), it is nevertheless considered that PEQ may not be a viable economic option in those cases where the costs exceed plant value (e.g. small *Acer* species), as this would effectively mean that the costs would outweigh the value of the plants put into quarantine.

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– It is noted that third country (TC) trading partners, e.g. Australia and New Zealand also have PEQ obligations on imports of certain plants into their territory. The Australian model, for example foresees specifically dedicated and high bio-security level facilities run exclusively in PEQ stations appointed by the Australian Quarantine and Inspection Service (AQIS), and importers bear the full cost of the measures for the officially imposed minimum quarantine periods and at officially set fees.

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Tasks 3 and 4: financial impact of applying the EU solidarity regime to co-finance direct costs and losses of POs; and to include natural spread

The objective of Task 3 was to analyse the financial impact of applying the EU solidarity regime to co-finance not only costs of MS CAs but also direct costs and losses of POs pursuant to official measures imposed.

3.1 To clarify the extent to which the rationale and structure of animal health financing is applicable, as a model, for establishing a similar structure for plant health to compensate for such costs

The study has found that the rationale and structure of the animal health (AH) financing could be applicable as a model for establishing a similar structure for plant health (PH) to compensate for direct PO costs and losses, but the model will need to be adjusted to the specificities of PH and the diversity of sectors affected, for which a more in-depth feasibility study would be recommended. The diversity of HOs and affected sectors covered by the PH regime makes it unlikely that it will be possible to find a model capable of addressing all scenarios and all sectors. To achieve this there is need for prioritisation, based on the significance and impact of plant pests at EU level and for the different sectors. It is further noted that the balance between public and private (commercial) interests needs to be fully taken into account in any model to be developed and in assessing the relative importance of individual HOs for different groups of beneficiaries, the purpose of compensation, and the relative weight of the public versus private good component of such compensation.
Regarding the potential for cost-sharing, a key principle of the ongoing cost and responsibility sharing schemes (CRSS) being developed in AH, is that direct costs should be partly covered by public resources (up to maximum ceilings), while for the compensation of non-covered direct losses and consequential losses, POs should assume primary responsibility through the development of private insurance schemes/mutual funds. PO liability - a key component in relation to Food Law - for helping mitigate risks through appropriate action is seen as an important element for future CRSS, as long as this does not result in a disproportionate administrative burden. The availability of support could be linked to compliance with statutory action, analogous to the "three tier approach"[112] which is being developed by the COM/MS for contingency planning/minimum mandatory action. In practice, for a very limited number of EU priority pests, pest-specific contingency plans should be developed, with strong involvement of stakeholders. Contingency plans could thus include both preventative measures taken by POs and PO response/cooperation in the event of an outbreak. In such cases the co-financing of the eradication measures by the EU should be very substantial given the high importance of the pests and the fact that the actions are mandatory.

Stakeholders' views were found to be quite divergent and generally the need for public intervention with solidarity funding appears to correlate with the interests of the more fragmented sectors. In broad terms, the arable sector appeared to favour reliance on Common Agricultural Policy (CAP) support in relation to funding, arguing that the funding for plant health solidarity should not affect the overall funding for CAP, while the horticultural and forestry sectors were more interested in compensation.

3.2 *To estimate in global terms (order of magnitude) the direct costs of POs associated with the officially imposed measures that would be eligible for compensation.*

[112] 1. Detection of a new listed/non-listed pest in new areas (minimum mandatory action – no contingency plan);

2. Detection of a listed pest of EU importance (generic EU contingency plan);

3. Detection of a listed pest of priority EU importance (EU pest-specific contingency template with minimum mandatory actions and national contingency plans).

– This analysis was carried out for a representative selection of HOs affecting the different sectors[113]. The FCEC estimates are summarised according to eligibility under three headings:

(i) Already eligible direct costs and losses: these are currently covered by solidarity i.e. costs of removal, destruction, disinfection, sampling and testing. These were estimated at the range of €19.3 - €44.8 million per year, reflecting the various scenarios used in the calculations. As an average between all scenarios, **the costs of heading (i) are estimated at €32 million per year**;

(ii) Currently non eligible direct costs and losses: these are the costs not covered currently by solidarity i.e. loss of plant/production value for POs. These were estimated at €6.7 - €13.4 million per year, reflecting the various scenarios used in the calculations. As an average between all scenarios, **the costs of heading (ii) are estimated at €10 million per year**;

(iii) Currently non eligible indirect costs and losses: these are the costs that go beyond the scope of Task 3, i.e. consequential losses from movement bans for POs. These were estimated at €15.3 - €19.4 million per year, reflecting the various scenarios used in the calculations. As an average between all scenarios, **the costs of heading (iii) are estimated at € 17.4 million per year**.

3.3 *To estimate the costs for the EU and MS CAs of expanding the solidarity regime to co-finance direct costs of POs, under two different scenarios: at current level of checks (scenario 1: static scenario); at increased level of checks (scenario 2: dynamic scenario)*

A priori, it is noted that the current legal basis in principle already provides the framework for compensation of certain costs/losses of POs when these are directly related to the implementation of officially imposed phytosanitary measures; this has however not yet been fully implemented. The impact on EU solidarity funding should therefore in principle be considered as neutral on this basis, as an increase in the required funding would relate to the full implementation of the current provisions. Nonetheless, in practice, full implementation of these provisions will carry an additional cost for the solidarity funding when compared to the current implementation.

Under the *static scenario*, on the assumption that all the MS where outbreaks occur introduce solidarity requests and all the dossiers submitted by MS are eligible[114], all direct costs and losses would be covered by the EU at 50%[115]. The additional EU expenditure required for funding under solidarity if direct losses are made eligible (heading (ii)), at 50% co-financing rate, would therefore amount to ca. **€5 million per year**. This expenditure would be **additional** to the estimated expenditure to cover the already eligible direct costs (heading (i): €16 million per year of EU co-financing at 50%).

[113] *Diabrotica vv, Ralstonia solanacearum, Clavibacter michiganensis ssp. Sepedonicus, Bemisia tabaci, Erwinia amylovora,* Potato Spindle Tuber Viroid*, Bursaphelenchus xylophilus*, *Anoplophora chinensis, Anoplophora glapripennis, Rhynchophorus ferrugineus*

[115] Compensation rate by MS is 100%.

The inclusion of direct costs and losses under solidarity funding may have an impact of the level and intensity of measures imposed on the POs, and therefore impact on the overall solidarity funding (*dynamic scenario*). Over the last five years, a total amount of **€29 million** was paid in 10 MS to compensate costs and losses of POs following outbreaks of HOs, i.e. an average **€5.9 million per year.** By extrapolating to the whole EU, this would result in potential compensation at EU level of some €11 million per year[116]. In the absence of any further evidence, it is **not possible to quantify** the impact of the introduction of the coverage of costs and losses of POs on the level of measures imposed on the POs and co-financed by MS and therefore by the solidarity regime. On a qualitative basis, the availability of compensation for direct PO costs and losses incurred by the officially imposed measures is likely to trigger the implementation of national compensation schemes the legal basis for which currently exists in MS, but which have not been so far activated, very likely to increase the implementation of officially imposed measures by POs, and mostly unlikely to increase the intensity of measures taken by national authorities.

Task 4: *To estimate the impacts for the EU and the MS of expanding the Solidarity Regime so as to also cover prevention measures for natural spread.*

Only 7 MS (out of the 25 MS that responded to the FCEC survey) indicated they would submit a dossier for outbreaks caused by natural spread. The **total cost** of these dossiers, as indicated by MS (only 5 MS provided figures), would reach **at least €7.3 million per year**.
On the basis of 50% co-financing, the **impact on the EU solidarity budget** would therefore be **at least €3.7 million per year**.

The figures provided by MS indicate that the increase in solidarity, although **not significant** in most cases, **would become substantial** in the case of inclusion of natural spread **for HOs affecting the environment**, as the case of *Rhynchophorus ferrugineus* indicates. This is due to the high eradication costs of these HOs, as shown in the analysis for Task 3, particularly if direct losses (heading ii) are also to be covered. It is also evident that the HOs with the highest potential for natural spread are also those with the most significant potential costs from the control measures taken in the case of outbreaks.

Task 5: economic impact of harmful organisms

The objective of Task 5 has been to estimate the potential economic impact arising from the spread of HOs, by focusing on specific HOs affecting a range of sectors (agriculture, horticulture, forestry, public/private green spaces).

The economic analysis undertaken primarily covers the actual or potential damage to the sector/s concerned (damage costs). The assessment of these is conducted drawing on the best available evidence from past outbreaks as existing studies and literature including pest risk assessments (MS, EU, EPPO Pest Risk Analyses) and cost benefit analysis (CBAs) of pest management. It is to be noted in this context that ultimately, the impact of an outbreak in terms of damage costs may extend to the entire value chain of the sector/s

[116] It includes all costs and losses. It is noted that this calculation does not take into account specificities in MS in terms of current cost sharing arrangements, and focus on particular HOs and sectors of national relevance, but it is simply based on the current French compensation model.

directly affected by the introduction, spread and establishment of the HO. This has potentially very significant indirect and knock on effects on employment, as well as on other dependent sectors and the wider economy.

The available evidence from past outbreaks and studies indicates that, if no action is taken, the introduction, spread and establishment in the EU of the HOs under review has the potential to cause multiple **billions of Euros worth of economic damage per year** across the EU to both those sectors directly affected and upstream/downstream sectors (including input suppliers, food processing and the wood working industries), as well as also potentially adversely affecting tourism, retail and other services, and ecosystem values and services.

The FCEC analysis and findings highlight the need to distinguish between the potential impacts of pests affecting the agricultural, horticultural and nursery sectors in terms of yield and quality losses, and the impacts of pests affecting forestry and private/public green spaces. For the latter, impacts are both more complex and long lasting in effect, while there are less possibilities and considerably higher costs involved in replacing destroyed or susceptible plants than is the case for agricultural crops. In addition to longer term commercial impacts arising from harvest losses, there are significant potential adverse impacts on biodiversity, amenity, landscape and other environmental values (including broader environmental objectives such as the reduction of CO_2 emissions), which are generally very difficult to monetarise. We particularly note that as these functions of forestry and private/public green spaces have yet to be fully identified or quantified, the complete value of ecosystem services is always likely to be underestimated (European Commission, 2008a). Moreover, since the global impacts of pests and diseases are both complex and impossible to capture in their entirety, the estimates provided must also be considered to under-represent the entirety of the impacts. In the forestry sector, several of the HOs reviewed have the potential to cause severe damage to EU forests, in terms of economic and landscape value, as indicated by the FCEC estimates below. The range of losses depends on the underlying scenarios and assumptions, including the extent of the infestation, anticipated timber harvest and the extent of yield losses in the affected area, and producer prices in the various markets. For example, the results indicate that in the worst case scenario for a single pest the cost could reach somewhere in the range of €42.6-€89.2 billion (*Anoplophora*) or €39-€49.2 billion **(***Bursaphelenchus xylophilus)* in terms of the commercial value of the susceptible lost timber. Such losses could also have significant effects on employment: extrapolating on available evidence in the case of *Bursaphelenchus xylophilus*, some 11,040 jobs in the forestry and wood cutting sectors could be directly affected under the worst case scenario. Many more jobs would be at risk in the downstream sectors; the EU27 forestry and forest-based industries employ an estimated 2.4-3 million workers. Moreover, it would take at least 20-30 years for the lost forests to be replanted and mature to the point of generating new income from harvested timber.

	Estimated potential impact of key HOs affecting EU-27 forestry, in case of 'no action' (a)
***Bursaphelenchus xylophilus* (PWN)**	Threatened area: 10-13 million ha of coniferous forests (assumed 50-90% mortality rate); Productive forestry value loss: **€0.9-€1.7 billion** (scenario 1: PWN widespread in current area: PT) **to €39-€49.2 billion** (scenario 4: PWN widespread in EU27); Export value loss: €174 million (worst case scenario: TC ban on EU imports).
***Anoplophora* (ALB/CLB) (b)**	Threatened area: loss of 30% hardwood forest in the EU; Productive forestry value loss: **€19.6-€39.2 billion** (scenario 1: *Anoplophora* widespread in currently infested MS) **to €42.6-€85.2 billion** (scenario 2: *Anoplophora*

	widespread in EU27);
Phytophthora ramorum	Threatened area: loss of 20% hardwood forest in the EU high risk area (EU PRA); Productive forestry value loss: at least **€4.2-€9.1 billion**, plus threat to EU cork industry.
***Dendroctonus ponderosae* (MPB)**	Threatened area: not yet present in EU; if introduced, 100% of susceptible area in medium/ high risk regions (77% mortality rate), or 11.6 million ha coniferous (*Pinus sylvestris*) forest; Productive forestry value loss: **€31.8-€45.5 billion**

(a) Impacts on the sectors directly affected by the indicated pests.
(b) *Anoplophora chinensis* (CLB) and *Anoplophora glabripennis* (ALB)

Source: FCEC estimates

The potential loss in value indicated above refers to harvested timber only, and excludes other forest landscape, recreational and environmental values which, as forestry data demonstrates, are much more significant. Based on estimates by UK Forest Research (2010) for specific UK tree species, the landscape/ recreational value and the biodiversity /carbon sequestration value of EU27 forests could roughly be valued at ca. **€56 billion (FCEC extrapolation)**. Other estimates (PRATIQUE) provide a landscape value of trees susceptible to *Anoplophora glabripennis* at €287.6/tree.

According to data reported by MS to Forest Europe, some **4.4 million ha of the EU27 forest area** (ca. 3% of the total forestry area) **is already damaged by insects and diseases**, which are the most significant damaging agents within EU forests and far more significant than the damage caused by wildlife and forest fires. The total area damaged by insects and diseases in the EU27 may affect the production of an estimated annual felling volume of 12.3 million m^3 of roundwood with an estimated value of €492 million. In addition, in the damaged area, such damage may affect the provision of non-wood goods (NWGs) (estimated value: €74 million) and of services (estimated value: €34 million). Taking these factors together therefore, the total loss of value from damage caused to date by insects and diseases may have already reached an estimated **annual loss of ca. €600 million in terms of income** generated from wood, NWGs and services provided by the affected forestry resource.

In the agricultural sector, the HOs under review can cause significant production and trade losses, as indicated by the FCEC estimates below (the range of losses depends on the underlying scenarios and assumptions, as noted for forestry pests):

	Estimated potential impact of key HOs affecting EU-27 agriculture, in case of 'no action' (a)
Maize	*Diabrotica virgifera virgifera:* Crop value loss: €472 million per year; up to € 6.1 billion over 25 years (FCEC, 2009); Export value (under threat): extra-EU exports of €336 million per year (2008-2010 average)
Potatoes	High risk from a range of HOs (b), for 3 of which EU Control Directives are in place: Crop value loss: yield losses can vary from 20%-80% depending on the HO; on this basis, PCN could cause losses of up to **€8 billion**, ring rot up to **€3 billion**, and brown rot up to **€4 billion**; Export value (under threat): extra-EU exports of €413 million per year (2008-2010 average)
Tomatoes	High risk from several HOs (c): Crop value loss: **€6.6 - €9 million** (scenario 1: PSTVd spreading in previously infested MS) to **€93-€127 million** (scenario 2: PSTVd spreading throughout the EU27); Export value loss: from *Tuta absoluta* outbreak (US and Canada restrictions on EU imports) estimated at ca. €11.5 million per year

(a) Impacts on the sectors directly affected by the indicated pests.

(b) Including *Clavibacter michiganensis spp. sepedonicus* (potato ring rot); *Globodera* (potato cyst nematodes - PCN); *Ralstonia solanacearum* (potato brown rot); Potato Spindle Tuber Viroid (PSTVd).
(c) Including Potato Spindle Tuber Viroid (PSTVd); Pepino Mosaic Virus (PepMV); *Tuta absoluta*

Source: FCEC estimates

– Even at the level of direct impacts, it is difficult to put a monetary value on the production loss due to a plant pest, since a range of factors including pre-outbreak agricultural and forestry management practices and other preventive action will affect the extent of the damage likely to be caused by a specific pest, while the lost production value will depend on the prevailing market prices at the time the commodity concerned would have been produced and/or sold. Market prices are difficult to obtain in many cases (there is generally significant lack of data on prices, while in most sectors there is no 'EU price', making it complex to extrapolate at EU level). Furthermore, prices also fluctuate considerably depending on a range of factors, including in many cases the prevailing supply and demand in international markets. Such effects are compounded by the fact that outbreaks themselves may affect the level of market prices if they result in significant and drastic losses of production.
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Other costs of 'no action', which have not been investigated here, include the impact that the spread and establishment of a HO could have on the functioning of the internal market if MS are forced to adopt measures which may affect the free circulation of goods within the EU.

By comparison, in the US, it is estimated that plants and plant pathogens cause annual damage of the order of $64.1 billion, of which $21 billion consist of crop losses caused by plant pathogens, $13.9 billion of crop losses caused by insects and mite pests, $4.2 billion consist of loss of forest products and $24 billion are estimated to be caused by crop weeds; of these figures, 40%-65% is due to introduced pests, pathogens and weeds (Pimentel et al., 2005). In the UK, a study carried out in 2010 estimated the total current annual cost of invasive non native pests to the British economy at approximately €1.9 billion.

The common conclusion that emerges from all available studies and the FCEC estimates is that, although the total annual costs (to both industry and government) of prevention and current (early response) measures may be significant, the potential benefits to be obtained by excluding the pest or containing/eradicating as early as possible are several times the order of magnitude of the cost of the measures taken.

Task 6: improving the coherence between the EU Plant Health Regime (CPHR) and the EU Seed and Plant Propagating Material Regime (S&PM)

The objective of Task 6 has been to address the coherence between the EU Plant Health Regime and the EU Seed and Plant Propagating Material (S&PM) *acquis.* The analysis undertaken was required to:

6.1 Determine the appropriate positioning of HOs in the CPHR and the S&PM regimes and estimate the economic impacts (costs and administrative burden for MS and EU authorities as well as for POs) of moving regulated HOs from one regime to the other according to the following three options:

- Status quo (with cleaning up of double listing). Costs for cleaning the different legislative texts are considered as marginal. It consists of a desk review of the texts, a contact with NPPOs to secure that all HOs are considered and then cleaning-up of the texts;
- All HOs to be moved from the S&PM regime to a separate Annex in the CPHR (but retaining their provisions and requirements). Impacts of moving all HOs listed in the S&PM Regime to the CPHR are limited to impacts linked to the mandatory import control measures. However as the large majority of host species for the HOs to be considered for transfer are plants for planting which are already inspected at import, and as all plants for planting entering the EU are already controlled by at least a visual control of each consignment, the costs for import control will not increase. Costs would however increase significantly if laboratory testing would be a mandatory part of the inspection. For illustrative purposes, applying one laboratory test to each consignment of ornamental plants would cost €6.8 - €23.4 million for EU 27 MS;
- All HOs pertinent to seed or plant propagating material to be moved from the CPHR to the S&PM regime. As the S&PM regime shall apply "*without any prejudice to the Plant Health regime*", any S&PM certified material shall already comply with the provisions of Directive 2000/29/EC and therefore no cost impacts are anticipated. As certain species are not covered under the S&PM regime, some host crops (e.g. tobacco) and related HOs will be de-regulated under this option but with marginal impacts as these crops are not of high European economic value and pest diseases to be considered are not of high risks.

6.2 Assess the impacts of merging the plant passport and certification schemes and more particularly:

The analysis of the costs and benefits for MS CAs and for POs of merging the visual inspection based PPs of the CPHR with the sampling and laboratory testing based health certificates of the S&PM Regime. Currently none of the current CPHR and S&PM regimes are a barrier to the merger of field inspection services. For S&PM, field inspections can be done under official supervision and in the case of CPHR some operational tasks can be delegated to bodies other than the official NPPO. Costs can be reduced by asking the S&PM inspectors to control holdings in the context of the PP obligations. In case all inspections for PP were carried out by S&PM inspectors, total yearly savings can be estimated at less than €1 million per year. The total benefit of moving from a non-integrated approach to a coordinated joint inspection would lead to a cost reduction of about €1.5 Million but as several MS have already implemented this approach the total benefit would be less.

- The analysis of the economic impacts for POs and for CAs (CPHR and S&PM) of upgrading the PP requirements for propagating material to the level of the S&PM regime. We consider that upgrading PP requirements to the level of the S&PM regime requirements does not lead to any impact as there is no additional requirements to be implemented as they already exist. Inconsistency exists only in the legislative texts from which they have to be removed.
- The analysis of the economic impacts of merging the new PP document (logo) and the certificate document. Adding a logo on these labels will have a nearly

zero cost as the only thing to be done would be to add this logo on the label format.

6.3 Determine the role of the private sector in the CPHR regime and delegation of tasks.

The different evaluations and other studies that have been performed during the last three years in the areas of S&PM and PH have all highlighted the demand by a majority of stakeholders and CAs of delegation of tasks that should be understood in two different ways:

- Delegation of tasks from the official NPPO to other official bodies (as already implemented in some MS for PP controls carried out by certification bodies);
- Delegation of tasks directly to POs (e.g. certification under official supervision in S&PM).

Conclusions of this analysis show a low level of consensus regarding this possibility of delegating tasks.

MS CAs in favour of delegation of tasks (i.e. FR) have highlighted that further delegation would help to align to the approach of the Regulation 882/2004/EC which is based on results to be obtained and not on how it should be done (current logic of the CPHR regime). In that context any tasks related to the monitoring of compliance of businesses with CPHR obligations may be delegated e.g. inspections, sampling and analysis etc. However, delegation of responsibility for taking action where infringements are found is prohibited. The COM retains the possibility to restrict further the types of tasks that may be delegated.

Apart from using private laboratories in the context of CPHR, stakeholders and CAs consider that any other controls, and especially visual controls, related to general surveillance and implementation of control and emergency measures should remain an official task that should not be delegated.

Task 7: impact of options on possible modifications to the existing plant passport system

The objective of Task 7 has been to evaluate the impact of six different options concerning possible modifications to the existing PP system:

7.1 Obligation to have PP accompanying the smallest unit in trade in the business to business (B2B) chain
In principle there is no impact, since such an obligation is already in place, through the issuance of replacement PPs, as foreseen under the present regulation, especially in the case that a large passported consignment is split in several smaller ones.

7.2 Obligation to have PP accompanying the smallest unit in trade in the business to consumer (B2C) chain, meaning that all plant material (for which at present a passport is needed), sold in nurseries and garden centres to a final consumer, would have to be passported

With the exception of individually sold bulbs, all other plant material (seeds, seedlings, ornamental plants, etc.) already carry some type of tag or label; adding information to these can be done either by the garden centres or by their furnishers, at a negligible extra cost. Note that final buyers who need large quantities of a given species will not buy from garden centres (B2C) but from nurseries (B2B), and thus already receive a PP if this is required for the species.

7.3 Dropping the existing distinction between sales (of passported plant material) inside or outside a protected zone (PZ)
Although such a distinction is foreseen under the present regulation (with sales outside a PZ not needing a PP), business practice today is already such that POs do not distinguish, and thus issue PP for all their consignments of species needing a PZ passport, even those not sold inside a PZ; this is also an indication that the cost of issuing plant PPs in cases where this is strictly spoken not compulsory, is not an issue.

7.4 All plant material (traded in the B2B chain) should carry a passport (this option does not extend to the B2C chain)

The implementation of this option would lead to an increase in the number of passports, the gross unit cost of which can be estimated at below 10 eurocent per consignment (the average value of a consignment in the B2B chain is not known, but is probably at least €100, so the increase is less than 1 ‰); the net unit cost can be still lower, if the "passport" information can be added to already existing documents such as invoices or transportation document (as is usual business practice, with the consent of the CAs).

Note that in that case, all operators will have to be authorised to issue PPs; such authorisations do not lead to an extra cost in the large majority of the MS, the necessary inspections being combined with normal phytosanitary inspections.

7.5 The existing formats, which cover a wide variety, should be harmonised, while keeping the existing data fields

This option would obviously have no impact for POs who fill in the PP by hand. For POs using a computer system, the impacts will be limited to minor modifications to the existing software packages (adapting the layout of documents to be printed); note that most operators use a package developed by specialised software companies, and that consequently the cost of its modification can be split over a large number of users (and will probably be considered to be part of the normal updating/upgrading that is included in the licence, and so will not be invoiced separately by these software companies to their users).

7.6 The existing formats should not only be harmonised but also simplified, so that they could take the form of a label
The impact would be the same as for 7.5: none for POs who still fill in the passports by hand; a limited impact (modification of software packages) for the ones who use a computer system, since the cost can be split over many users of such packages.

Task 8: costs and benefits of introducing mandatory surveillance targets and mandatory de-listing procedures for infested protected zones

The objective of Task 8 was to analyse the costs and benefits of introducing mandatory surveillance targets and mandatory de-listing procedures for infested PZs, by focusing on specific examples of PZs[117]. The selected PZs provided a balanced representation of the various types of HOs and the different situations in MS with regard to the implementation of measures for the maintenance of PZ status, and of the challenges, added value and the costs for MS to maintain PZs in place.

8.1 Identify best practices of surveillance targets for each HO for the selected PZs

The improvement of surveillance targets within the PZs was recommended by the CPHR evaluation (FCEC, 2010) as one of the options for improving the current system of PZs and reinforcing their credibility, as the concerns with the current system of PZs stem from implementation issues. The ongoing work of a dedicated DG SANCO/MS TF also highlighted the need to introduce at EU level minimum levels of surveillance within PZs in order to provide a degree of harmonisation in the approach followed across the EU. For this Task, appropriate surveillance levels were identified on a case by case basis, to the extent this was possible, and applied to the selected case studies (PZ/HO).

8.2 (a) Estimate the costs of introducing mandatory surveillance at identified surveillance level versus benefits

Costs: The current costs of surveillance in PZs are generally lower than in the case of Buffer Zones (BZs) established within infested non-PZs. This is due to the fact that in PZs, in the absence of infestation, intensified surveillance levels are not generally applied. In the case of host plants and sectors with high economic value for the MS, the costs of surveillance in BZs could be from 2.5 to up to 10 times higher, as the number of controls needed to guarantee the same level of protection would need to be increased substantially. If current surveillance levels are considered insufficient to justify/ensure freedom from the HO, these would need to be raised and this would result in a higher cost. If mandatory surveillance targets are introduced at the level of 'best practice' (as defined for the purposes of Task 8 and indicated Task 8.1 results), the cost of surveillance is increased, as these levels generally result in higher inspection and/or sampling intensity. This increase may concern the level of visual inspections, with an intensity increase of 100% (e.g. *Erwinia amylovora*) in certain cases, and/or the level of sampling, with 10% additional sampling applied (e.g. *Globodera pallida*) or even higher increases, in the range of 100% or more (e.g. from symptomatic cases only to established levels of sample/ha in the case of *Erwinia amylovora*).
Benefits: Evidence of the benefit of PZs is generally scarce; in most cases, there are currently no CBAs to support already established PZs (with the notable exception of *Bemisia tabaci*). In this regard, it needs to be considered whether carrying out a CBA should become a formal requirement in future for the establishment of PZs. In those cases where economic benefits could be estimated (i.e. *Bemisia tabaci*, *Erwinia amylovora*, and *Globodera pallida,* and in general for HOs affecting plants with a commercial value), it can be concluded that such benefits clearly outweigh the costs of surveillance even if this is carried out at an increased level. Thus, for example where the economic sector is highly important at national level, e.g. apple and pear production in IT, where the sector generates some €1.1 billion in terms of annual production value, the value of production in those regions where the bulk of production is concentrated will

[117] *Erwinia amylovora* – IT, LV; *Bemisia tabaci* (European populations) – UK, FI; *Ips amitinus* – IE, EL; *Cryphonectria parasitica* – CZ, SE; *Globodera pallida* – SK.

amount to several hundred million Euros. In other words potential production losses are very substantial indeed compared to surveillance costs at increased levels amounting to hundreds of thousands of Euros. The same holds true in the case of the potato sector in SK, where the costs of the order of thousands of Euros of increased surveillance are far outweighed by the benefits of the protection of a sector with a value of €34 million.

Results of costs and benefits for the PZs selected for the purpose of this exercise are presented in the table below:

HO for which PZ is in place	Surveillance costs at 'best practice' levels (a)		Benefits (value of protected sector)
Globodera pallida	SK: € 41,000		SK: €33.8 million
Erwinia amylovora	PZ: IT (two regions): €54,800 IT (est.): €4.2 million LV: €85,900	BZ: IT (two regions): € 264,960	IT (two regions): €180 million IT: €1.1 billion LV: €3.2 million
Bemisia tabaci	FI: €331,700		€48.9 million (tomatoes only) Cost - benefit ratio estimated at 0.93-1.99 over 30 years (at current levels of surveillance)
Ips aminitus	SE: €4,200 CZ: €19,000 - €33,400		Environmental value (non quantifiable)
Cryphonectria parasitica	EL: €55,010 IE :€ 5,800		Economic value: Export value of coniferous round and sawn wood EL: €1.5 million IE: €62.6 million
			Environmental value (non quantifiable)

(a) 'Best practices' defined in accordance with methodology followed in the study (Task 8.1).

(b) Recommendation on the appropriate sharing of the costs of mandatory surveillance between MS CAs and POs

The analysis highlighted several cases where the costs of mandatory surveillance do not currently appear to be appropriately shared between MS CAs and POs. In particular, although mandatory fees are foreseen by the EU plant health regime for the cost recovery of the inspections and sampling/testing carried out by the MS CAs in the PZs, in several cases this provision is not being implemented and fees are only partly collected or not collected at all. This issue was also identified in the evaluation of the CPHR (FCEC, 2010). There is therefore a need to reinforce the implementation of these provisions.

8.3 Estimate the economic impact of mandatory de-listing of the selected PZs (a) immediately, or (b) after two years

Eradication efforts are pursued in PZs for as long as it is economically, as well as technically, justified. During the eradication period (i.e. up to 2 years according to EU legislation) POs benefit from the continued status of a PZ, but also bear the higher costs of intensified inspections and eradication. The balance between these costs and benefits

will determine the degree to which MS pursue their efforts to eradicate in order to maintain PZ status.

(a) In case of immediate revoking of PZ status, it is no longer possible to protect the area while engaging in an intensive eradication effort. Free trade immediately occurs, thereby potentially placing the area at higher risk and possibly reducing the potential to eradicate while increasing the cost of eradication. It can also be expected that surveillance will have to be intensified in this case, as the requirements on imported material can no longer be imposed. Therefore the impact is in all cases the immediate loss of the benefits from the protection that a PZ offers (as described above). On the other hand, there could be immediate benefits for non-PZ MS which today may have to maintain costly (i.e. intensified) inspection and eradication systems to export to the PZ, if these requirements no longer need to exist;
(b) Delisting after 2 years offers certain advantages to an infested PZ under eradication, compared to immediate delisting in that: a) it allows the time that is technically considered necessary for the eradication programme to achieve its objectives; and, b) where the PZ faces difficulty in achieving the objectives of the eradication programme, it allows the possibility of a smooth transition of that PZ towards alternative measures for maintaining some protection of non-infested territories within the PZ, via the establishment of BZs.

Task 9: costs of including in the EU plant health regime five Invasive Alien Species (IAS) plants

The objective of Task 9 has been to estimate in global terms, the costs for the EU of including in the EU plant health regime five IAS plants (weeds)[118]. All of the selected IAS plants have a high probability of entry, establishment and spread in the EU27 and very significant potential impacts, as documented in the main literature[119].

By definition, the inclusion of any new HOs in the EU plant health regime will entail some costs for the EU and MS associated to the obligation to adopt management measures for their prevention, and in the event of introduction, for their control and eradication. While the general assumption has been that the IAS plants under review would be dealt with in the same way as currently regulated HOs (i.e. under Council Directive 2000/29/EC), ultimately the costs would depend on the specific measures to be followed. Such measures include control at import, surveillance, eradication and containment, as well as, where relevant, movement within the EU (PP system). The identification of the measures that would be most suitable for each of the examined IAS is an exercise beyond the scope of the study. Thus, in order to estimate costs, the FCEC has developed hypotheses on the measures that might be appropriate in each case, based on the information currently available in the reviewed literature and by means of expert consultation. It is also noted that, *a priori*, it is not clear at present whether any of the

[118] *Polygonum perfoliatum, Pueraria lobata*, *Hydrocotyle ranunculoides, Eichhornia crassipes* and *Ambrosia artemisiifolia.* The aim of this particular selection has been to cover the following key criteria: geographic impact and distribution of IAS plants across the EU27 (north/south; east/west); presence and distribution of the plants within EU, i.e. absent/locally present/established in some MS; range of plants' habitats (land/water); affected sectors (agriculture/environment).

[119] Including, EPPO PRAs (available for *Polygonum perfoliatum, Pueraria lobata*, *Hydrocotyle ranunculoides* and *Eichhornia crassipes*) and, in the case of *Ambrosia artemisiifolia*, EUPHRESCO.

reviewed IAS would fulfil the eligibility criteria for co-financing under the EU solidarity budget[120].

From this analysis and extrapolations of each of the selected IAS plants, the following key conclusions can be drawn.

For four of the selected IAS plants[121], the main pathway appears to be intentional introduction through imports of ornamental plants. Consequently, EPPO recommends the prohibition of imports, sale, movement and planting (of *Pueraria lobata, Hydrocotyle ranunculoides; Eichhornia crassipes*) or controlled imports only (*Polygonum perfoliatum*). The implementation of the **EPPO recommendations on imports** would appear the simplest and most cost-effective control option that would be available under Directive 2000/29/EC; nonetheless, taking account of WTO-SPS obligations, similar restrictions would also apply to intra-EU movements and the obligation to eradicate and contain outbreaks.

The absolute scale, as well as relative share, of the costs of prevention, control and management measures that could be pursued under Directive 2000/29/EC, will depend on the **current status and distribution** of each of the selected IAS plants. A distinction can be made between two groups:

1. For IAS plants absent (*Polygonum perfoliatum*) or largely absent (*Pueraria lobata*, *Eichhornia crassipes*) from the EU27, the potential costs will be mainly in terms of preventive action, including import controls and surveillance. These costs are generally expected to be significantly lower in order of magnitude than for the second group, as long as no new outbreaks of these IAS plants occur. On this basis, for these plants, the additional cost of **general (preventive) surveillance** is expected to be **relatively moderate**. This cost might become **more significant if specific intensive surveillance** in the context of control and eradication plans is to be required, indeed very significant the more infestations become widespread and the scale of the surveillance expands, but cannot be estimated with the information available. As an indication, the cost for more specific intensive surveillance of *Pueraria lobata* in forestry in the affected and high risk areas could be up to the estimated costs for the surveillance of *Bursaphelenchus xylophilus* in forestry (**€656,000**).

   The potential **control and eradication costs** for these pests in the event of pest introduction could be **significant**, as has been seen in the case of the control and eradication costs for *Eichhornia crassipes*, i.e. ca. **€3 million** per year (according to documented cases in ES and the US; average annual expenditure over 3 years in ES and 10 years in the US). **At EU level**, therefore, the **total cost is expected to be lower for this first group** of pests (compared to the second group), as long as they are absent or largely absent from the EU[122].

[120] This is particularly questionable for *Ambrosia artemisiifolia*, for which 'natural' (i.e. not man-assisted) spread is a significant risk factor; it could also be questioned for the other IAS as, by definition, all IAS plants owe their invasiveness to their intrinsic ability for natural spread.

[121] In particular, those currently absent (*Polygonum perfoliatum*) or largely absent from the EU (*Pueraria lobata*, *Eichhornia crassipes*), as well as for the more widely present *Hydrocotyle ranunculoides*.

[122] As indicated above, it is also noted that not all of this cost is expected to be eligible for solidarity compensation under current rules, for example the current restrictions for outbreaks due to natural spread.

2. For IAS plants that are already widely present/distributed in the EU (*Ambrosia artemisiifolia, Hydrocotyle ranunculoides*), the total potential costs are likely to be **significantly higher** in order of magnitude than for the first group.

   In this case, the available evidence suggests that the **cost of surveillance** could be **very significant**, as this would certainly be required within control and eradication programmes. The cost could therefore approach the order of magnitude of HOs affecting the open environment, estimated under Task 1 at ca. **€1.5 - €3 million** per pest per year[123].

   Furthermore, the potential **control and eradication costs** for these pests could be **very significant**. As an indication, the control and eradication costs in the case of *Hydrocolyte ranunculoides* have been ranging from ca. **€1 - €2 million** per MS per year (according to documented cases in BE, NL and the UK). Given the currently already widespread distribution of these IAS plants, this implies that **at EU level**, individual IAS plants may require **€10 - €30 million** per year for eradication and containment. **At EU level, therefore, the total cost is expected to be higher for this second group of pests** (compared to the first group)[124].

In conclusion, the introduction of mandatory requirements for the prevention and control of IAS plants within the EU plant health legislation may result in an increase in management costs across the EU as a whole. **With the exception of *Ambrosia artemisiifolia* and *Hydrocotyle ranunculoides*,** the **total cost** for the other selected IAS plants is expected to be **relatively moderate**, **under the following two conditions**:

i. This global assessment is made on the basis of the **current known level of presence and distribution** within the EU27 of these IAS plants. If the presence and distribution proves to be different than what is currently known from the available literature or any of these IAS plants becomes established and spreads, this would immediately affect the level of surveillance and control and eradication costs that might be incurred;
ii. **EU-wide prohibitions of import/trade/planting of ornamental plants and/or susceptible material** are introduced, in accordance with EPPO guidelines and recommendations, as this is assessed to be the main pathway for the introduction and/or further distribution of *Pueraria lobata*, *Hydrocotyle ranunculoides*, *Eichhornia crassipes* and *Polygonum perfoliatum* in the EU27.

In this sense, the estimates made here reflect the impact of known pest risk and action taken to avoid introduction or further spread, rather than hazard analysis which is effectively the worst case impact. However, if in future the above conditions change, and these **IAS plants become** more **widespread**, as for example *Ambrosia artemisiifolia* and *Hydrocotyle ranunculoides* below, then the surveillance and control/eradication costs likely to require funding under Directive 2000/29/EC could become **very significant**.

[123] This order of magnitude corresponds to earlier estimates provided under the CPHR evaluation on the basis of data submitted by MS CAs, which had estimated that for the 10 HOs covered by emergency measures annual surveillance costs amounted at ca. €18.6 million i.e. on average ca. €1.86 million per HO.

[124] Again, it is also noted that not all of this cost is expected to be eligible for solidarity compensation under current rules, for example in the context of the current restrictions for outbreaks due to natural spread.

The case of ***Ambrosia artemisiifolia***, and to a certain extent also that of ***Hydrocotyle ranunculoides***, sets these apart from the other IAS plants examined here. Due to the wide distribution of these plants throughout the EU, the introduction of mandatory requirements for the control of these IAS plants under Directive 2000/29/EC could result in a **very significant impact** on the plant health budget. In any case, given their widespread distribution and the fact that natural spread is an important factor in their distribution, it is not clear at present which of the current measures available under the Directive would be applicable for the management of these IAS plants. It is therefore impossible with the information available to date to make a meaningful estimate of the global cost of including these IAS plants in the future EU PH regime[125]. For *Ambrosia artemisiifolia*, at present, prevention (through early detection and eradication) of new populations is considered the best measure for halting further spread, while full eradication is currently largely considered impossible[126].

[125] The likely impact of the various management options for the control of *Ambrosia artemisiifolia* is expected to become clearer after the completion of a study recently launched by DG ENV which aims to assess the epidemiology, effects and control costs of this pest in the EU27.

[126] Guidelines for management of common ragweed, *Ambrosia artemisiifolia* - Results of the EUPHRESCO project Strategies for Ambrosia control 2008-2009. See also EPPO datasheet and PL PRA 2001.