## Statistics

in focus

## AGRICULTURE AND FISHERIES

THEME 5 – 15/2000

### AGRICULTURE

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# Thirty years of agriculture in Europe Cereals still the staple crop

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More than a quarter of all farming land in EU-15 is used to grow cereal crops, although there have been lots of changes in the last 30 years. Cereal production was encouraged in the 1970s and peaked at the beginning of the 1980s, before being curbed by the common agricultural policy (CAP). There was then a change in the pattern of crop rotation. Wheat is still the main crop, but there has been a significant decline in other crops. The cereal that has shown the greatest growth in terms of area under cultivation in the last 25 years is maize (+29% in EU-12<sup>\*1</sup>), with the area used for green maize doubling in size. In terms of crop yields, grain maize shows the biggest increase, with production doubling in 25 years. The emergence of this trend can be noticed even outside the world of farming, with maize appearing as a new crop in some regions, with its tall plants standing out in the fields in late autumn.

### Cereal crops changing with Community policy

The percentage of arable land used for cereals has developed similarly since 1966/67 in EU-6\*, EU-9\*, EU-12\* et EU-15\*<sup>1</sup>. Community agricultural policies have thus had more of an impact than any particular national policies (Figure 1).



Figure 1: Cereal cultivation as a proportion of all arable land (% of area)

*1 EU–6 means the six countries (Belgium, Germany, France, Luxembourg, The Netherlands), EU–9 the nine countries (EU–6, Denmark, Ireland, United Kingdom), EU–12 the 12 countries (EU–9, Greece, Spain, Portugal) and EU–15 the 15 countries of the present European Union.* 

In order to avoid having to analyse changes in the figures caused by German unification, EU-6\*, EU-9\*, D\*, aso. refer throughout this report to figures excluding the former East Germany.

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The area under cereals as a percentage of all arable land in EU-6\* expanded between 1966/67 and 1980 to reach a maximum in 1980. There was then a steady contraction until 1993, prompted both by falling prices (world prices and guaranteed prices) and the development of more profitable products such as oilseed and protein crops and the introduction of compulsory setaside arrangements<sup>2</sup> for major producers (Statistics in Focus No 12/2000, Theme 5, *Arable land, increased size of holdings and changes in crop rotation*).

Four distinct periods can be discerned:

• Until 1980, areas under cereals represented a significant and growing proportion of arable land. Advances in crop techniques and better plant protection in the 1970s, against a backdrop of guaranteed prices and a shortage of cereals in Europe, meant a fast increase of production.

- **From 1980**, two factors cause this trend to reverse. First, cereal surpluses that had built up began to push prices steadily down, resulting in a lower gross yield per hectare. In addition, the gross yield per hectare of pulses and industrial crops became more competitive, indeed higher than for cereals when attractive premiums were introduced. Cereal cultivation thus declined from 61% of arable land in 1980 to 49% in 1993 in both EU-6\* and EU-9\*.
- **The 1993 survey** revealed the first effects of CAP reform. Farmers reduced areas under cereal cultivation as a result of the compulsory set-aside arrangements that were introduced. Furthermore, there seems to have been a shift to oilseed and protein crops, especially in the two countries Portugal and Spain new adherents of the Community.
- After 1993 cereals have been making a comeback, rising to 53% of arable land in EU-12\* in 1997, compared with 48% in 1993. Curbs on oilseed production in the European Union as a result of international agreements and changes in the set-aside arrangements were major factors in this development.

## Different patterns of change

Between 1967 and 1997 the area under cereals in EU-6\* declined slightly, falling from 19.8 to 18.7 million hectares, a drop of 6%. This overall decrease conceals some differina trends. France, which accounted for half of all EU-6\* land used for cereals in 1997, is the only Member State where there has been an increase in the area under cereal cultivation (+2.7%). The Benelux countries have recorded a sharp drop in the area under such cultivation, even though the decline of 470,000 hectares in the three countries is not so great in absolute terms. The reduction in the former West Germany, which ranks second in EU-6\* for the area under cereals, is close to the Community average of -5.7% (Figure 2).



*Figure 2: Change in area under cereals in EU-6\*, 1967-1997* 

<sup>2</sup> Producers of cereals and oilseed and protein crops are required by the CAP to "set aside" a part of their arable land, i.e. not to grow any food crops. The minimum surface area is the compulsory set-aside rate (5% in 1997).



Between 1987 and 1997 the contraction was 6% in EU-12\* (Figure 3). This represents a reduction of 2.2 million hectares of area under cereals, the land being left fallow or converted to oilseed and protein crops. The reform of the CAP in 1992 had a limited effect in some Member States, at least as far as cereals were concerned. This was true of France, Denmark and the Netherlands, where the area under cereals went up by 436,000 hectares. In the United Kingdom, on the other hand, the land used for cereals shrank by 422,000 hectares (-11%). Four southern European countries – Portugal, Spain, Italy and Greece – recorded an overall contraction of two million hectares.



Figure 3: Change in area under cereals in EU-12\*, 1987-1997



Between 1987 and 1995 nearly all cereal areas declined. The only exception was *other cereals*, where there was a sharp rise thanks to increased cultivation of triticale<sup>3</sup>. Since 1995, there has been in increase in cereal areas in EU-12 (apart from rye) (Table 1).

There was a rise in the production of rye and oats with the accession of the three new Member States, where the climate favours the cultivation of such crops.



More wheat and maize



Figure 4: The various cereals in EU-9\* in 1975 and 1997

	EU-12*					EU-15			
Million ha	1987	1995	trend	1995	1997	trend	1995	1997	trend
common wheat	12.5	12.0	-3%	12.0	12.4	+3%	13.6	14.1	+4%
durum wheat	3.1	3.1	-1%	3.1	3.4	+8%	3.1	3.4	+8%
barley	12.4	9.3	-25%	9.3	9.9	+7%	11.1	12.0	+8%
grain maize	3.7	3.5	-5%	3.5	4.1	+17%	3.7	4.3	+17%
oats	2.1	1.6	-20%	1.6	1.7	+4%	2.5	2.7	+11%
rye	1.2	0.8	-29%	0.8	0.7	-8%	1.4	1.4	-6%
other cereals	0.6	0.9	+45%	0.9	0.9	+8%	1.0	1.1	+10%
Subtotal	35.4	31.2	-12%	31.2	33.2	+6%	36.4	38.9	+7%
fallow land under incentive schemes	0.0	4.5	-	4.5	2.5	-43%	5.7	3.3	-42%
Total	35.4	35.7	+1%	35.7	35.8	+0%	42.0	42.2	+0%

Table 1: Area used for the various cereals, and changes

<sup>3</sup> Ttriticale is the cross between durum wheat (triticum durum) and rye (secale). A `rural grain', it is used in animal feeding, being digestible and having a high protein level.



As a result of CAP reform, the area of land under cereals stabilised, but production was hardly checked and yields steadily rose (Figure 5). Cereal production (without rice) in EU-12\* in 1997 amounted to 176 million tonnes, an increase of 12% compared with the 1987 figure of 155 million tonnes. Production fell slightly at the start of the 1990s, reaching a low of 162 million tonnes for EU-12\* in 1994, when the compulsory set-aside rate was at its highest (15%). Since then, production has again started to rise, with an increase of 16% in five years to reach over 200 million tonnes for EU-15 in 1999 (Figure 6).

While the basic cause of the decline in production at the outset of the 1990s was uncertainty about CAP reform, there are several factors that serve to explain the increased output since 1994. First of all, there has been a slight rise in areas under cultivation during this period as a result of a cut in the compulsory set-aside rate. Secondly, the climate has been much kinder, with no prolonged drought like the one, for example, that affected the Iberian peninsula in 1993.

### Sharp rise in yields



Figure 5: Change in yields of main cereals



Figure 6: Change in cereal production (excluding rice)

## Wheat consolidating its leading position

Wheat was still the main crop in EU-15 in 1997. It was grown on 17.5 million hectares, i.e. a quarter of all arable land and 45% of land used for cereals. It accounted for nearly half (46%) of total cereal production, excluding rice. Soft and durum wheat will be referred to separately in the rest of this report.

Three groups of countries can be distinguished in EU-12 (Figure 7).

- The countries growing common wheat in central and northern Europe (France, United Kingdom, Denmark, Germany) increased the areas under wheat between 1975 and 1997, and especially in the 1980s (Group 1).
- The southern European countries growing soft and durum wheat (Italy, Spain, Portugal, Greece) recorded a downturn in the total

area under cultivation between 1987 and 1997 (Group 2). Areas under durum wheat increased of 0.25 Mio ha (+9%).

In the smaller producer countries (Belgium, Netherlands, Luxembourg, Ireland) areas under wheat were stable (Group 3).



Figure 7: Change in area under wheat



These changes in area had an effect on production levels (Figure 8). Wheat production has shown a big rise since 1975 in France, Germany, the United Kingdom and Denmark. Together, these countries accounted for near of 80% of EU-15 production in 1999. Output in France went up by a factor of 2.5 (from 15 to 37 million tonnes) and more or less tripled in Germany (from 7 to 19.6 million tonnes) and the United Kingdom (from 4.5 to 14.9 million tonnes). There has been a much more moderate rise in Spain since 1975, with output up by 18% from 4.3 to 5.1 million tonnes. In Italy, where there was a decline in area, production fell even by 18% from 9.5 to 7.8 million tonnes.

Wheat includes both soft and durum wheat<sup>4</sup>. Since 1997 durum wheat accounted for about a fifth of the total area producing wheat (3.4 million hectares for EU-12\* in 1997) and 10% of total wheat production (8 million tonnes in 1999). It is grown mainly in the countries of southern Europe, accounting for two thirds of the area under wheat cultivation in Italy and Greece and a third in Spain (Tables 2 and 3).

The meagre share of the durum variety in total wheat production can be explained by cultural and also by agricultural differences. The average yield for durum wheat in EU-15 in 1997 was 23 quintals per hectare, compared with 62 q/ha for common wheat. There are special aid schemes for durum wheat, however, restricted to 'traditional production zone'. Such schemes allow farmers to achieve gross margins for durum wheat that are close to or even



Figure 8: Change in production of wheat for the groups 1 and 2

x 1000 ha	1987	1990	1993	1995	1997
F	4408	4633	4209	4526	4886
UK	1992	2050	1775	2076	2033
D*	1672	1642	1540	1615	1736
E	1998	1927	1284	1539	1539
DK	398	444	619	607	685
Ι	1000	786	720	772	660
EU-12*	12451	12463	11043	12018	12414

Table 2: Areas under common wheat for the six main producing countries

FU-12*	3142	3171	2925	3115	3369
F	306	411	225	239	282
EL	429	614	477	508	539
E	430	287	722	773	739
I	1948	1825	1485	1572	1781
x 1000 ha	1987	1990	1993	1995	1997

Table 3: Areas under durum wheat for the four main producing countries

greater than the margins for common wheat. Durum wheat is slowly moving ahead in Italy, Greece and Spain, where reductions in areas involve mainly common wheat. This trend is encouraged by rising consumption and the eligibility for durum wheat aid schemes of new "traditional production regions" (Thrace, Navarre, Umbria, etc).

#### **Barley declining in importance**

The area under barley cultivation in EU-9\* declined between 1975 and 1995. With nine million hectares under cultivation in 1975, it was higher than the figure for common wheat. By 1995 the figure was down to 6 million hectares, half the area for common wheat. The average yield in EU-15 in 1997 was around 44 q/ha. The reasons for the decline were yields lower than for common wheat, together with weak prices and equivalent CAP per-hectare payments during the period. Since 1995, thanks to more favourable circumstances, barley has been making a comeback.

<sup>4</sup> As grain, common wheat is used for milling (flour, etc). Durum wheat, less productive but hardier, is used for semolina processing (pasta, etc).



Between 1987 and 1997 France, the United Kingdom and Denmark have shrink seen their barley areas significantly: one million hectares in the case of France and the United Kingdom and 723,000 hectares for Denmark (Figure 9). The decline was more marked between 1980 and 1987, when there was no limit on wheat price guarantees and when the production of industrial crops was booming. The trend continued between 1987 and 1993, and then reversed. A short time after joining the European Community, Spain, the leading barley producer, lost 1.3 million hectares between 1987 and 1993.



Figure 9: Change in area under barley in main producer countries

#### Rye and oats falling off

There was a sharp decline in areas for the production of rye and oats between 1975 and 1995. Oats covered 2.8 million hectares, i.e. a tenth of the total area under cereal cultivation, in EU-9\* in 1975. By 1995 the crop covered only one million hectares and accounted for only 4% of cereal area. There has been a big contraction in the major producer countries, with 700,000 hectares disappearing in West Germany and 730,000 hectares in France between 1975 and 1987. Since 1995 there has been a recovery for oats. The story in the case of rye was similar but less marked. In 1975 it already accounted for only 3% (842,000 hectares) of the area under cereal cultivation in EU-9\*. By 1997 the figure was down to 2% (510,000 hectares).

#### Rye and oats are affected by set-aside arrangements in the centre and south of Europe because of their poor yields (45 and 34 q/ha in EU-12 in 1997). These crops were a way of using land with low agricultural potential but have been replaced by other crops, thanks to new varieties and advances in farming techniques. In addition, oats - grown for selfconsumption (draft animals, for example) in the past - is a crop that is no longer suited to current styles of farming. It is has often been replaced by triticale. It nevertheless accounts for a quarter of the area under cereal cultivation in Sweden and more than a third in Finland. Rye and oats are still major crops in the Nordic countries, where they are also grown for human consumption and have a healthy image.

#### Green maize<sup>5</sup> moving ahead

The total area under maize in EU-12 grew from 5.9 million hectares in 1975 to eight million hectares in 1997, an increase of 29%.

Between 1975 and 1997 the area given over to grain maize cultivation remained steady at about four million hectares in EU-12, in spite of fluctuations in the economic situation. During the same period, the area used to grow green maize doubled in size from two to 3.9 million hectares, including 400,000 hectares in the former East Germany (Figure 10).





<sup>5</sup> Green maize is used as whole plants as silage fodder for cattle.



The reasons for this were:

- the flexibility offered by maize with regard to crop rotation (late sowing, variety of ultimate destinations – forage or grain –, quick return on investment),
- the common use of maize as animal fodder in the form of grain or forage,
- significant improvements with regard to varieties and techniques.

Although grain maize areas have remained fairly stable in size, there has been a definite rise in output (Figure 11). Production in EU-12 more than doubled between 1975 and 1997, rising from 16.8 to 37.8 million tonnes. The average yield has also risen steadily: from 43 q/ha in 1975 to 90 in 1997.

There has been a similar trend in the production of green maize, but the rise in output was mainly as a result of an increase in area. Output in 1975 amounted to 81 million tonnes in EU-9, giving a yield of 410 q/ha. In 1997 the figures were 167 million tonnes for a



Figure 11: Change in production of grain maize and green maize in EU-12

yield of 430 q/ha in EU-12. There are several reasons why the yield figure has remained virtually the same. First of all, many farmer have grown green maize on former grassland that was not very suitable for the crop. Secondly, only the maize needed for fodder requirements is ensiled. The rest of the land under maize cultivation is used for grain maize.

#### Box 1: sources for data on cereals

Two databases contain information on cereals:

1 – **The survey on the structure of agricultural holdings** has eight headings for cereals: D/01 - *common wheat and spelt*, D/02 - *durum wheat*, D/03 - *rye*, D/04 - *barley*, D/05 - *oats*, D/06 - *grain maize*, D/07 - *rice* and D/08 - *other cereals*. It is important to note that green maize is not included under any of these headings but under D/18 - *fodder crops*.

For each Member state and each crop, each survey looks at the number of holdings with areas under crop and the corresponding area since 1966/67 (Council Regulation No 70/66/EEC).

2 – The database on production contains annual national data on areas, production and other details that have been used to compile an exhaustive balance for each type of cereal since 1990 (Council Regulation No 837/90/EEC). Green maize is not included among the data on cereals, but data on this crop can be found under data bank code C2625 - green maize. Rice is not included among cereals.

In this report, apart from the data on maize, the survey on the structure of agricultural holdings was used for the number of agricultural holdings and areas, and agricultural production surveys for output and yield figures.



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New Cronos, Eurofarm and ZPA1 Domain

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