

**LMC INTERNATIONAL**

**EVALUATION OF MEASURES  
APPLIED UNDER THE COMMON  
AGRICULTURAL POLICY TO THE  
PROTEIN CROP SECTOR**

***Synthetic Summary***

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# Synthetic Summary

This report is an evaluation of the impacts of CAP measures in the protein crop sector. It focuses on measures introduced in Council Regulation 1782/2003. It takes into account previous measures applied under Art. 4(3) of Council Regulation 1251/99 (Agenda 2000). This evaluation covers the period after the reform (2004-2008), but the period before the reform is also considered (2000-2003).

## **S.1 CAP measures applied to the protein crop sector**

The 2003 reform introduced the following measures targeted to protein crops. In EU-15 MS, aid received under Agenda 2000 was partially integrated into the Single Payment Scheme, and a special aid of €55.57 per hectare was introduced, subject to a Maximum Guaranteed Area for payments.

EU-12 MS were allowed to make Complementary National Direct Payments for specific crops, within national budgetary envelopes. These could be applied to protein crops.

## **S.2 Budgetary costs of CAP measures in the protein crop sector**

Annual budgetary costs of protein crop coupled aids averaged €494 million in 2000-2004. For MS applying the SPS, the costs fell to €58 million in 2005-2008. Annual coupled aids under the CNDP were €2 million. Support was switched to decoupled payments.

## **S.3 Protein crop areas**

Protein crops covered only 1.5% of total EU COP (cereal, oilseed and protein) crop areas in 2006-2008 (1.02 million hectares), 25% below 2000-2003.

## **S.4 Protein crop supply and demand balance**

Protein crop output fell from 4.3 to 2.8 million tonnes from 2000-2003 to 2006-2008. Demand fell slightly faster, from 4.7 to 2.9 million tonnes, most sharply in feed uses. Imports were well down; exports, mainly of priced food grade field beans and peas, were better maintained.

## **S.5 Prices**

Field peas are the only protein crop with regular EU and world price series. In 2000/01-2006/07, field pea prices in Ardennes and Rotterdam traded in a range of €140-175 per tonne. They rose above €250 in 2007/08, but fell back in 2008/09. Import tariffs are very low, and so local prices follow world markets.

## **S.6 Tools and methodology**

The analysis relied on six main sources of data: FADN, Eurostat, FAO, national and regional databases, questionnaires (to farmers and feed companies) and interviews: and a Canada case study. Field work was conducted in France, Germany, Hungary, Poland, Spain and the UK.

Linear regression analysis is the main econometric tool employed. Applied across regions on a cross-sectional basis, its results lack statistical significance. Time series analysis of protein crop prices has good statistical significance. The models used are simple models with single independent variables, and in each case, exclude consideration of changes in world agricultural markets after 2003.

Simulations are also employed, e.g., to assess the effect of ending special aids.

## S.7 Data limitations

Among the main concerns regarding data are:

- MS data are not all collected on a consistent basis, and so need adaptation.
- FADN data are only available until 2006, and are by holding, not by crop.
- FAO end-use data have not been updated since 2004.
- COMEXT trade data are not consistent between imports and exports in intra-EU trade.
- Comprehensive price series exist only for field peas.
- Agronomists differ about the scale of rotational benefits.

## S.8 Effects on the production of protein crops

EQ1 To what extent have the CAP measures applicable to the protein crop sector affected the output of protein crops, with regard to the choice of crop, area; yield; prices paid to producers; geographical distribution?

To what extent has the special aid for protein crops been an incentive to increase the production of these crops? (Special attention will be paid to impacts linked to crop rotation.)

EU-27 protein crop areas fell after the reform. However, while the field pea area was down 24% between 2000-2003 and 2004-2008, field bean and sweet lupin areas rose 8% and 18%. Field peas had the greatest risk, in terms of coefficients of variation of yields.

The special aid of €55.57 per hectare was derived as the weighted average difference under previous measures between coupled area payments on protein crops and on “other cereals” in EU-15 MS. Thus, full incomes per hectare of average EU-15 protein crop farmers should not have changed, *ceteris paribus*, after the reform, and so minimal change would have been expected in protein crop areas.

The major causes of changes in areas after the reform were external. They included world arable crop price changes; damage from the *aphanomyces* fungus in France; a ban on meat and bone meal in most feeds from 2001, which removed a complement for protein crops in feed; and CAP energy crop measures promoting rapeseed farming, and hence rapeseed meal supply.

Changes in the distribution of protein crop areas from 2000-2003 to 2004-2008 differed between the EU-15 and EU-12. EU-15 field pea and sweet lupin areas fell, but field bean areas increased. EU-12 field pea and field bean areas dipped, yet sweet lupin areas almost trebled.

The analysis provided weak, not statistically significant, evidence that there was a slight change in the geographical distribution of output towards lower yielding regions.

Overall protein crop yields fell after 2003. Field peas declined most, followed by sweet lupins; field bean yields remained fairly stable. External factors, such as *aphanomyces*, had an impact. There was no evidence that farmers cut their input use after 2003.

Lower protein crop yields might be caused by a shift in areas from high to low-yielding regions, but regression analysis testing this hypothesis generated no significant results.

The lack of clear evidence linking measures in 2003 to declines in areas and yields means we cannot establish a relationship between the reform and changes in protein crop output.

The FADN database reveals that protein crops tend to be grown mainly on large holdings. On average, they occupy less than 10% of farm area. There is no evidence that the 2003 reform led to a change in the structure of holdings. FADN data are not available after 2006, and thus include only one year in which the SPS was applied in all EU-15 MS.

Internal protein crop prices track the world market, thanks to minimal import tariffs.

Most protein crop output is used in feed, but a minority of field pea and bean output earns premium prices in food uses.

### S.9 Impacts on supply to the processing industry

EQ2 To what extent have the CAP measures applicable to the protein crop sector influenced the supplies to the compound feed industry, with regard to crop (beans, peas, sweet lupins); quantity; prices; geographical distribution?

To what extent have these supplies corresponded to the plant protein needs of the compound feed industry and influenced substitution with other plant protein sources?

Compound feed use of protein crops fell after 2003. Not all feed uses were equally hard hit. On-farm feed suffered less than compounding. There is some evidence that protein crops have a niche in the non-GMO and organic segments, but organic production fell as a share of output in France, while its share rose in Germany.

Premium human and pet food sales were well maintained, the former mainly for export to N. Africa and S. Asia. Canada's growth in field pea output has been heavily based on exports.

Lower protein crop output after 2004 cut supplies for feed, but external factors also reduced feed demand for protein crops. One factor was a ban on meat and bone meal in many feed uses in 2001, removing a 50-60% protein content product that offset the 21% and 26% protein content of field peas and beans. Other factors were a ready supply of soybean meal to meet demand for high protein feeds; cuts in cereal intervention prices since the 1990s, boosting the mixing of feed wheat with soybean meal to yield a product with a similar amino-acid composition to field peas; and the increase in rapeseed meal output in response to CAP energy crop measures. Its 38% protein content makes it attractive to compounders.

The 2003 measures did not reduce feed use of protein crops, but supplies of substitutes at competitive prices meant that compounders were little affected by lower protein crop output.

Since the 1990s, the location of feed mixing plants has moved from crop growing regions to areas near ports, well placed for imports. This lowered protein crop use, raising unit handling costs. There is no evidence that the 2003 reform was behind these structural changes.

The close correlation since 1993 between field pea prices and a weighted average of feed wheat and soybean meal prices implies that field peas remain competitively priced. In food uses, the premium paid for yellow peas is determined by import demand in S. Asia. Hence, market factors are the key determinants of protein crop prices, not 2003 policy measures.

Protein crop supply affects compounders' willingness to use them. Critical mass is often mentioned as a constraint. Compounders and traders have separate *filières* for protein crops, with dedicated storage capacities. The decline in supplies has increased their unit transaction costs, making them costlier to use.

### S.10 Competitiveness of protein crops.

EQ3 To what extent have the CAP measures applicable to the protein crop sector contributed to fostering the competitiveness and promoting the market orientation of protein crop production?

The relative competitiveness of protein crop production vs. alternatives will be analysed pre-reform; post-reform; and with full decoupling, including associated production responses.

Analysis of gross margins and incomes per hectare in selected regions revealed that protein crops were at a disadvantage to competing COP crops in 2000-2003 and 2006-2007. In the 2006-2007, their competitiveness worsened in six of seven region-crop permutations studied. The exception was the lowest yielding region studied, Castilla-La Mancha. Protein crops were also found to be risky in their full gross margins (measured by coefficient of variations).

The contrast between Castilla-La Mancha and other regions suggests that the 2003 reform had some impact on the distribution of output within the EU-15 (Spain recorded the largest expansion in field pea areas among the EU-15 MS after 2003), but no statistically significant results emerge from the analysis of area changes.

Protein crops lost competitiveness after 2003 as a share of feed demand. As noted above, the reasons for this decline are unrelated to the new measures.

We simulated the effect of full decoupling, lowering full incomes per hectare from protein crops. Using results of farmers' questionnaires and econometric analysis of the relationship between protein crop profitability and changes in planted areas (neither of which approach is statistically robust), the analysis implied that full decoupling would reduce the protein crop areas by between 2.9% and 8.6% from 2008/09 levels.

Another simulation was prepared to determine whether changes, e.g., lower intervention prices, in the broader CAP framework and in world market prices discouraged field pea output vs. wheat across the EU-15. This indicated that high yielding EU-15 regions would have found field pea output increasingly uncompetitive after 2001; low yielding regions only found field peas unattractive after 2003. These results are in line with the observed changes in plantings.

Lower protein crop output reduces the number of seed companies for whom protein crops remain a viable sector. Many stated that they can no longer justify a major research effort. The problem is most marked for field peas.

### S.11 Maintenance of farmers' incomes

EQ4 To what extent have the CAP measures applicable to the protein crop sector contributed to maintaining/increasing farmers' incomes?

After full implementation of the SPS in 2006, coupled aids fell in EU-15 MS. The decline was smaller in France and Spain, which retained 25% of their coupled arable aids. New decoupled aids offset the fall in coupled support. In 2006-2007, combined coupled and decoupled aids per hectare of protein crops were below, though not by much, the (fully coupled) support in 2001-2003 in six of the seven region/protein crop combinations in our analysis. Castilla-La Mancha/field pea output was the sole exception.

Rotational benefits for protein crops rose after 2003, due to higher prices of nitrogen fertilisers and cereals, whose yields increase when they follow protein crops in a rotation.

Protein crops' direct costs benefited from their low fertiliser use, but they lost competitiveness in full incomes per hectare, because of poor yields and higher prices for competing crops.

After 2003, protein crop producers' full incomes did not rise as much as those earned per hectare of other COP crops, but this was not a result of the 2003 reform.

### S.12 Efficiency in achieving the objectives of the measures

EQ5 To what extent are the CAP measures applicable to the protein crop sector after the 2003 reform efficient in achieving the objectives of these measures?

Total support per hectare (coupled and decoupled aid) for protein crop farmers fell slightly in six of the seven regions surveyed in 2006-2007 vs. 2001-2003. The only region with higher total support per hectare was Castilla-La Mancha.

Since total support per hectare changed little after the reform, the measures continued to provide stability to protein crop farm incomes.

Analysis suggests that there was no deadweight in the measures, since the reduction of the protein crop area and output would have been bigger in the absence of all special aids. Budgetary cost-effectiveness of the measures in maintaining protein crop production was assessed from producer questionnaires and linear regression analyses of the relationship between plantings and crop profitability, though none of these has statistical significance.

They suggested that the net budgetary cost of maintaining one marginal hectare of protein crops was €650-€1,950, implying inefficiency in the measures. These were derived by dividing the special aid of €55.57 by estimates of the reduction caused in protein crop areas by full decoupling (2.9%-8.6%, mentioned in S.10).

Analysis of the distribution of protein crop areas provided weak evidence that the measures gave limited encouragement to plantings in low yielding regions, but discouraged them in high yielding areas. This is interpreted as an unintended side effect of the measures. Special aids will end under the Health Check reform, but individual MS may retain coupled aid under Art. 68 Reg. 73/2009 measures.

Our analysis found that the 2003 reform caused no change in the administrative burden for protein crop producers and government agencies.

### S.13 Coherence with the 2003 CAP reform

EQ6 To what extent are the CAP measures applicable to the protein crop sector after the 2003 changes coherent with the overall concept and principles of the 2003 reform of the CAP?

In terms of competitiveness with non-EU protein crop supplies, the EU market remained very open under the 2003 measures.

Competitiveness vs. other COP crops worsened in most regions after 2003, as a result of adverse external factors, not the protein crop measures.

Protein crop use by feed compounders was hit by exogenous factors such as bans on meat and bone meal use and greater supplies of rapeseed meal as a result of CAP energy crop measures. The 2003 measures played no role in the fall in protein crop use.

Some bright spots exist. There has been an increase (relative to the rest of the sector) in three segments: organic production; protein crop on-farm; and output of premium-priced protein crops. Again, these developments were not linked to the 2003 measures.

Protein crops represent a very small share of labour use on protein crop farms. In feed compounding, too, protein crops only account for a small share of inputs. There was no evidence that the 2003 reforms affected employment in either activity.

Protein crops generate environmental externalities via lower input use and higher yields for following crops. Analysis of input use by a sample of protein crop producers found no sign of change between 2003 and 2008.

In Germany, the organically farmed share of protein crop areas rose, but it fell in France. Thus, evidence regarding organic farming is mixed.

Producer questionnaires revealed that a significant minority felt that CAP agri-environmental payments were important in their decision to farm protein crops.

### S.14 Correspondence to the needs of producers and users

EQ7 How far do the objectives of the CAP reform correspond to the needs of producers and those of the compound feed industry and livestock farmers?

Protein crop producers' full incomes per hectare changed little after 2003, but they lost competitiveness against other COP crops. There is no evidence these outcomes are the result of the 2003 reform.

Demand for protein crops in feed has declined since 2000, due to the larger supplies of ingredients with a higher protein content and bans on meat and bone meal use. These were not connected to the 2003 protein crop measures.

Internal market and international prices are closely aligned to the benefit of users, thanks to the virtual absence of trade barriers. This situation was evident before 2003 and was not affected by the reform.

The measures were relevant to producers in two main respects, helping to Maintain producer incomes after the reform, and providing continued stability to producer incomes.

### S.15 Overall conclusion

The sector's decline and loss of competitiveness were not caused by the 2003 measures, but were due to external factors. The decline, notably in field peas, is creating a loss of critical mass in the *filière*, reducing interest from seed and agri-chemical companies and traders.

Not all is bleak. The decline was led by field peas and by EU-15 MS. Experience in the EU-12 is more encouraging; total protein crop areas grew after 2004, led by sweet lupins, which are favoured for on-farm feed use (increasingly important as traceability becomes of greater concern to users). In the EU-15, field beans are a growth sector, helped by the development of erect varieties and by stable high value export markets for food uses.

Three sectors seem well placed for the future: production for food uses, particularly in third countries; on-farm feed use, in response to traceability concerns; and organic production.

## **S.16 Recommendations**

Protein crop output for bulk feed uses will continue to fall, unless agronomic constraints can be overcome. The need for improved varieties is a top priority if the sector is to survive and eventually revive. An increase in spending on research is crucial, to enhance the technical competitiveness of the sector vs. other COP crops.

Lessons should be learnt from Canada's success in premium-priced protein crop exports. Art. 68, Ch. 5 in the Health Check reform, Reg. 73/2009, MS to grant specific support to farmers to improve the quality and marketing of agricultural products, including protein crops; this opportunity should be actively encouraged.