

SECTION 4

Analysis of EU Agricultural Policy in Relation to The Use of Plant Protection Products

(Sub-Report prepared by Produce Studies Limited)

As part of the overall objective to achieve “sustainable use of plant protection products” (as opposed to an unconditional reduction of use) the task of the sub-Report prepared by Produce Studies was defined as follows:

To determine what effects the current Common Agricultural Policy has had and may have in the future, on the use of plant protection products in the EU in order to assist the determination of the most appropriate adjustment and modification of policy instruments to minimise the risk from PPP-use.¹

Research for the sub-Report consisted of (i) an initial economic analysis (comparing the historic relationship between changes in the CAP to changes in crop areas, and PPP-use); (ii) a series of farmer group meetings (to discuss recent changes in CAP (since 1992 CAP reform) and their impact on sustainable PPP-use); and (iii) an evaluation of the impact (actual and potential) of the accompanying measures to CAP Reform, structural funds and other specific measures. This work was carried out through a combination of desk studies and discussions with local scheme administrators in selected case study areas.

4.1 INTRODUCTION

The CAP impacts directly on land use and crop management through its Common Market Organisations (‘CMOs’) for each commodity. The CAP also influences management through incentive measures such as those specifically for environmental protection (*e.g.*: Council regulation 2078/92)². Measures in the CMOs can be divided between market support (through intervention, import duties and so on with the objective of maintaining producer prices); production control measures such as quotas or set-aside; and direct aid (most notably the arable compensation payments that are direct payments to farmers for each hectare grown).

These CAP instruments influence changes in PPP-use both by provoking changes in what crops are grown (as land use changes may lead to shifts towards either more or less intensive PPP using crops) as well as by influencing the way crops are managed.

¹ The study was conducted for Denmark, France, Germany, Italy, Spain, the Netherlands and the United Kingdom. Fuller details of the methodology utilised by the Produce Studies may be found in the full Sub-Report.

² Only small parts, however, of the 2078/92 programme have a reduction-impact on PPP-use since many of the programmes do not specifically address sustainable PPP-use.

The effect of CAP on crop management in terms of use levels of PPP has largely been through the CAP's effect on crop prices and thus the profit optimising level of PPP-use. It should be noted at the outset, however, that this Sub-Report makes clear that although the CAP has an effect, other factors are much more important in determining how much PPP farmers use, such as the weather, new technology (in terms of new agrochemicals and new varieties) and changes in the cost of PPP.

Sustainable use of PPP is subject to factors which are, as a rule, more significant than changes which might be wrought from CAP and related policies. Nevertheless the CAP has had some influence in levels of PPP-use, which have been greatest *via* the workings of the Common Market Organisations for individual crops. While in the past this was through the mechanism of supporting farmer prices for crops, today measures such as compensation payments and set-aside also have an effect.

In contrast to some of the programmes of 2078/92 which have a very direct impact on PPP-use (*eg*: conversion to organic), the CMOs address simultaneously multiple objectives on the CAP, of which environmental sustainability is only one. The challenge for policy makers interested in influencing the sustainable level of PPP-use in relation to the CAP is therefore to consider the various options and scope for change within the available instruments.

Although PPPs consist of different types including the main categories of herbicides, fungicides and insecticides, often the data on spend on PPP is not desegregated into these different categories. The simplification of aggregating different PPP types belies the differential response that may often exist between various economic stimuli and types of PPP.

The sub-Report has examined the last twenty years. The CAP has not, however remained a constant instrument over this time. Because there is only one season of crop production per year, there can be only one observation of use level of PPP for each year. With so many factors other than CAP influencing PPP-use, it is considered extremely difficult to assign a quantitative and statistically valid measure to the CAP impact. In addition, the regional heterogeneity within countries (both climatic and pedological) affects PPP-use. Such diversity confounds the extent to which clear relationships could be identified.

Operation of CAP also altered quite significantly in 1992/93 for many crops (through the CAP reform). Given the limited number of observations following CAP reform, research for the Sub-Report for this period was based on interviews with individual farmers³.

³ Budget constraints for the project as a whole are mentioned as a reason for the limited extent of this survey. In examining the various specific measures of the CAP the project was accordingly limited to an evaluation by desk study.

SUB-REPORT CONCLUSIONS

4.2 MEASUREMENT OF PPP-USE

For the purpose of this Sub-Report, an economic analysis using financial information about spend on PPP per hectare was deflated by the index of agrochemical prices to obtain a volumetric equivalent. From private survey sources, data is available in the UK on the number of treatments on crops. This is called the superdeveloped area treated: area of crop receiving at least one treatment times the number of passes with the tractor times the number of formulations in the tank. The gross total for arable crops over recent years suggests, however, that the volumetric equivalent acts as a good proxy for superdeveloped area (expanded number of treatments).

The deflated spend (volumetric equivalent) is also considered a good measure of use which relates to farm practice as farmers' judgments about use can be expected to be closely related to the number of treatments made for each crop, and for each type of product. It is also a measure that is much easier to integrate with discussions about farmer behaviour and policy than measures of dose rates, as those rates and active material have been declining for reasons of technical advance in PPPs.

4.3 CAP AND PRICES

Historically, the most dominant impact of CAP has been to effect producer prices for crop output, and thereby the economic optimum for the use of PPP. In reality the CAP market support mechanisms have often tried to both diminish the variation in prices from season to season, while increasing the overall level of prices to support farm incomes. As the second objective increases in importance, the extent to which the CAP has been the dominant factor in determining producer prices increases.

By way of illustration,⁴ from the beginning of the CAP up until its reform in May 1992, the principle objective of the CMOs was supporting producer returns through maintenance of the market prices. Up to 1992, analysis suggests that as much as 90-95% of variation in price in these years can be explained by changes in CAP support measures.

Shifts in producer prices (which may have been caused by changes in CAP) have also led to shifts in which crops are grown, as the more attractive the returns from a crop, the more of the crop is likely to be grown. However, for annual crops, there are rotational links for reasons of crop husbandry that mean the economic attractiveness of one crop can cause increases in another crop. For example increases in winter oilseed rape have sometimes encouraged increases in winter barley since this crop is a good entrée for planting oilseed rape⁵.

The work examined cropping up to the 1995 harvest (*ie*: beyond the CAP reform). In more recent years a new CAP instrument has become important: set-aside. This measure clearly

⁴ Compared to arable crops the CMOs for permanent crops have much less effect on producer prices.

⁵ In permanent crops the output price has a less immediate impact on land use since it takes a number of years to establish a fruit bearing crop. Furthermore there are schemes for encouragement of grubbing up as well as limitations on new planting.

has a much more immediate and direct bearing on cropping patterns, and has certainly impacted crop rotations.

4.4 LAND USE AND CAP

4.4.1 Arable versus Grassland

Over ten years up to CAP reform the proportion of land devoted to arable (which includes set-aside) has risen from 56% to 58% as a proportion of total arable plus grass. However the proportion of EU budget put to arable is not a variable that explains much of this variation. There is a relationship but it is very weak, as the CAP explains only 8% of the shift between arable and grassland.⁶

CAP does constrain, however, expansion of milk through its quota system. From 1984 the introduction of milk quotas limited expansion of dairy production. Nevertheless the genetic improvement in EU dairy cows increased yields per cow, thereby reducing dairy cow numbers, as a result of which land was released for arable production.

More recently the CAP has imposed limits on headage numbers for beef and sheep payments. The COP (cereals, oilseeds and protein crops) area has also been impacted by the 1992 CAP reforms, as headage payments for beef and sheep are now limited, and no new arable land may be brought into production. In this way, the land use balance between crops and grassland has essentially become fixed by the rules. Nevertheless, variation in land use between crops remains under the influence of the CAP.

4.4.2 Arable crops

CAP has influenced producer prices and, along with other policy instruments of the CMOs (of quotas and set-aside) is estimated to have influenced 49% of the variation in use.

Since up to the time of CAP reform of 1992 set-aside was not a major policy instrument and producer prices were more dependent on the management of the CMOs, it is possible to say that changes in the CAP provoked 45% of the shifts in area between one crop and another.

From the farmer research⁷ the impression was gained that the shifts in area between one crop and another since the reform of the CAP are equally the result of the CAP. Of these variations an estimated 70-80% has been caused by the introduction and variation of the set-aside instrument and 20-30% by variations in price and compensation payments.

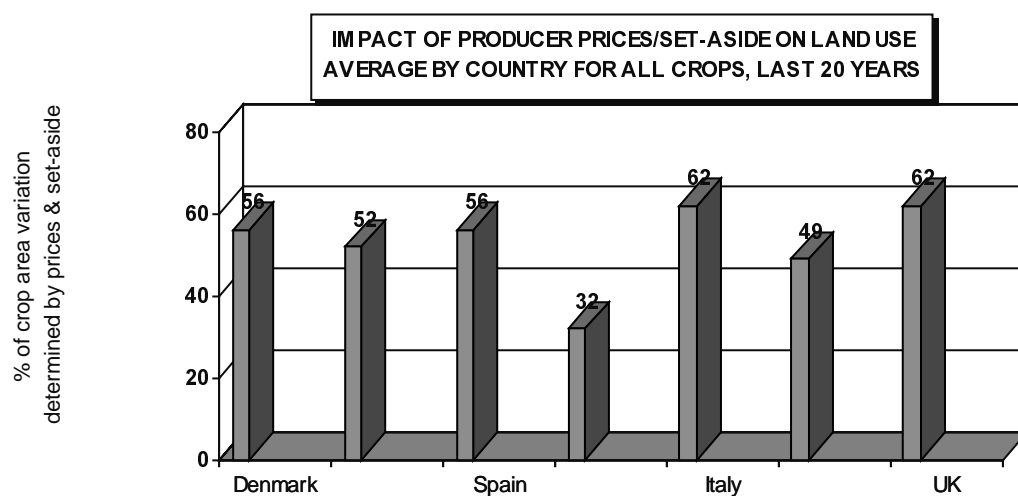
⁶ Grassland is a very light user of PPP products (limited use of herbicide and little else). Thus within the realms of past experience, the CAP change in balance of support between ruminant livestock and arable crops has had a little measurable impact on PPP-use change *via* the stimulus of more or less arable area.

⁷ Note that the work was qualitative and consisted only of a very small sample, so the results must be considered as indicative only and treated with some degree of caution.

Since CAP reform, set-aside has become a more important policy instrument, and has had a significant impact on crop rotations and choice of crop (for example a drop of 5% points in the set-aside rule has related to a fall in sunflower area of 26 % while in the wheat area of just 2%). The impact of the CAP on price has, however, become less important. Direct payments to farmers have been introduced for cereals, protein crops, oilcrops and durum. Such differences arise in part from the price per tonne set at an EU level and in part through translation to per hectare payments via the average yields of the region. Thus although the CAP reform has less impact on producer prices and choice of crop, it still influences the relative economic attractiveness of each crop.

From the analysis of the last twenty years it has been possible to examine the extent to which the variation in crop areas can be explained by the variation on producer prices. Thus through this instrument and the set-aside, the CMOs have an impact on producer prices with consequent effects on crop areas. The order of magnitude is broadly similar across the different arable crops. Of course in some ways it does not make much sense to examine the last twenty years since policy has changed very much over this time, as have technical methods of crop husbandry. On the other hand, reducing the time period examined also reduces the number of observations available for analysis, rendering the results less significant.⁸

Figure 1 **Impact of producer prices and set-aside on land use, by country**



Source: Produce Studies research

⁸ This is considered in the sub-Report as the dilemma of econometrics applicable to agriculture: taking a sufficiently long period for there to be enough observations and yet not so long to address completely different characteristics of external variables. Most convention examines periods of around twenty years. Data availability for longer periods is also often a problem. In this case the principle variable is producer price which has been influenced by CAP in a reasonably consistent way during this period. The main and more recent change has been the introduction of set-aside. But this too seems reasonable to examine over this period, first when it has not been an influential factor and more recently when it has.

Other than crop price and set-aside, important factors such as climate and soil conditions also influence farmers' land use decisions. For example the balance between winter sown cereals and spring sown cereals may well change as a result of weather conditions, as poor weather in the autumn can hold up planting to such an extent that they switch to spring planting instead.⁹

4.4.3 Permanent Crops

The impact of producer prices on the change in area of permanent crops is very limited. For countries examined the weighted average of the impact of producer prices on crop area was found to be: 8% of the variation in apple area; and 14% of the variation in citrus area.

The CAP has a very low impact on producer prices in these crops estimated as 0.5-3% of the variation in crop area. In contrast the area of vines is 100% affected by the CAP since all new planting is prohibited under CMO for wine and there are grants for permanent abandonment of the crop area.

4.5 PPP-USE AND CAP, DIRECT EFFECT

CAP also has an impact on the management of crops and thus PPP-use change. Data for economic analysis has been for the ten years up to and including the harvest year 1993. To obtain an understanding of relationships since CAP reform farmer interviews have been used.

4.5.1 Arable Crops

(a) Up to CAP-Reform (1992)

The measure of PPP-use has been the expenditure per hectare on all PPP deflated by the index of PPP prices. This effectively measures the aggregate number of treatments per hectare. The amount of PPP-used should relate to their cost and the unit value of the crop output. The ratio of the PPP input cost to crop output value has therefore been used to explain the variation in PPP-use change.

Summarising all crops examined in the countries studied then during the last 10 years around 28% of PPP-use change may be linked to changes in the ratio of producer prices to PPP prices.

During this period CAP caused 90-95% of the variation in producer price. 72% of the variation in the producer price/PPP price ratio was caused by producer price changes. It is estimated therefore, that rather than changes in PPP price 19% of PPP-use change can be attributed to the CAP.

This suggests that the majority of the reasons for the change in use are factors other than those influenced by CAP changes: weather, new technology, PPP price.

⁹ Breakdowns of the relationship between particular crops and producer prices/set-aside are provided in the full Sub-Report. See in particular in this context pages 17-18.

(b) *Since CAP-Reform 1992/3*

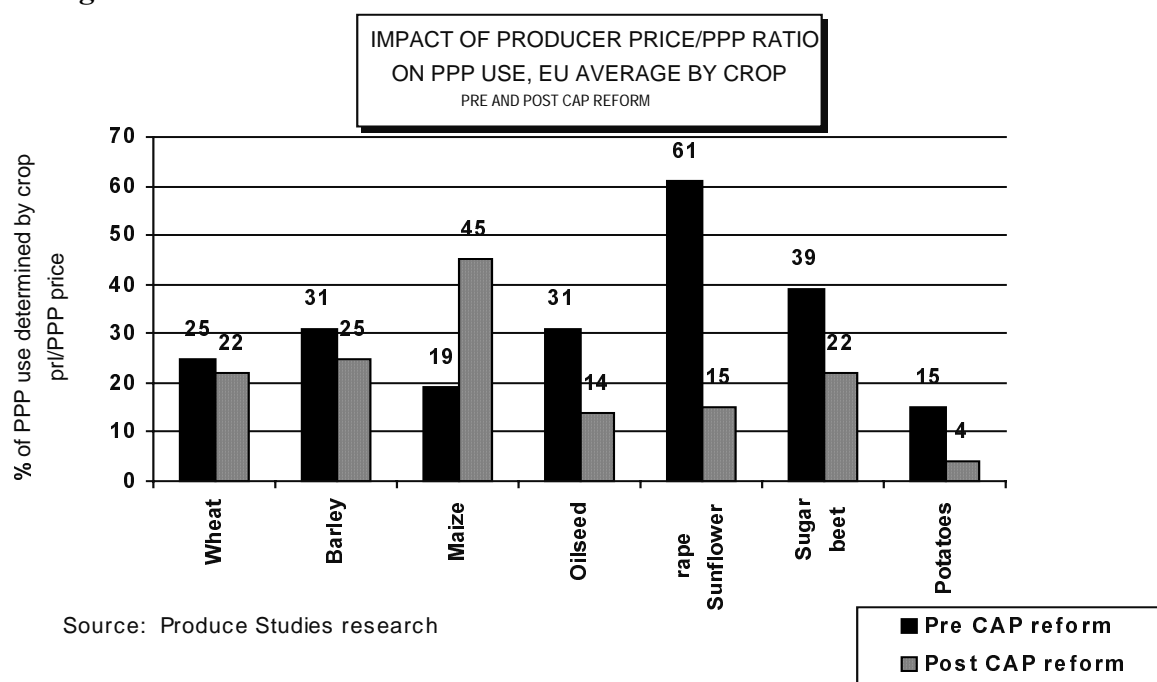
Information on the relationship between PPP-use change and CAP, since the 1992 CAP reform is based on the farmer survey work. Summarising all crops examined in the countries studied, then during the last 3 years around 20% of PPP-use change may be linked to changes in the ratio of producer prices to PPP prices.

This is a decrease compared to the previous period and reflects an increase in the effect of crop rotations stimulated by the implementation of CAP reform and most notably set-aside.

The proportion of changes in the ratio of PPP price to producer price attributable to producer price has remained similar at an estimated 65% (compared to 35% of the variation coming from changes in PPP price).

Since reform the influence of the CAP on producer prices has therefore declined (fallen for cereals and removed altogether for oilseeds).¹⁰ On the other hand farmers claim that the direct payments have some small influence on PPP-use change. Bringing all these factors together then around 21% of PPP-use change can be attributed to the CAP. As indicated above, the majority of the changes in PPP-use must therefore be attributable to factors such as weather, new technology, PPP price and quality of production target.

Figure 2



¹⁰ For oilseeds the CAP regime no longer supports farmer returns through aids to processors and thence supported farmers prices. The support takes the form of compensation payments which are adjusted in relation to the difference between internal farmer price and world market price. Thus the CAP still influences returns per hectare, but the level of the returns are decoupled from individual farmer yields. For example in the UK in 1995 32% of crop returns came from compensation payments, not affected by the individual yield.

(c) *Sensitivity of PPP-use to producer price change*

Changes over the last ten years may be summarised as follows: a +/- 20% change in producer prices has caused a +/- 5% change in the use of PPP on arable crops.

4.6 OTHER CROPS

A full economic analysis was possible only for Italy (where sufficient time series of data existed). This suggests that PPP-use change over the last ten years has been influenced by both producer prices and PPP prices. The variation of PPP-use change that can be explained by price changes are: 13% for apples; 46% for melons; 5% for peaches.

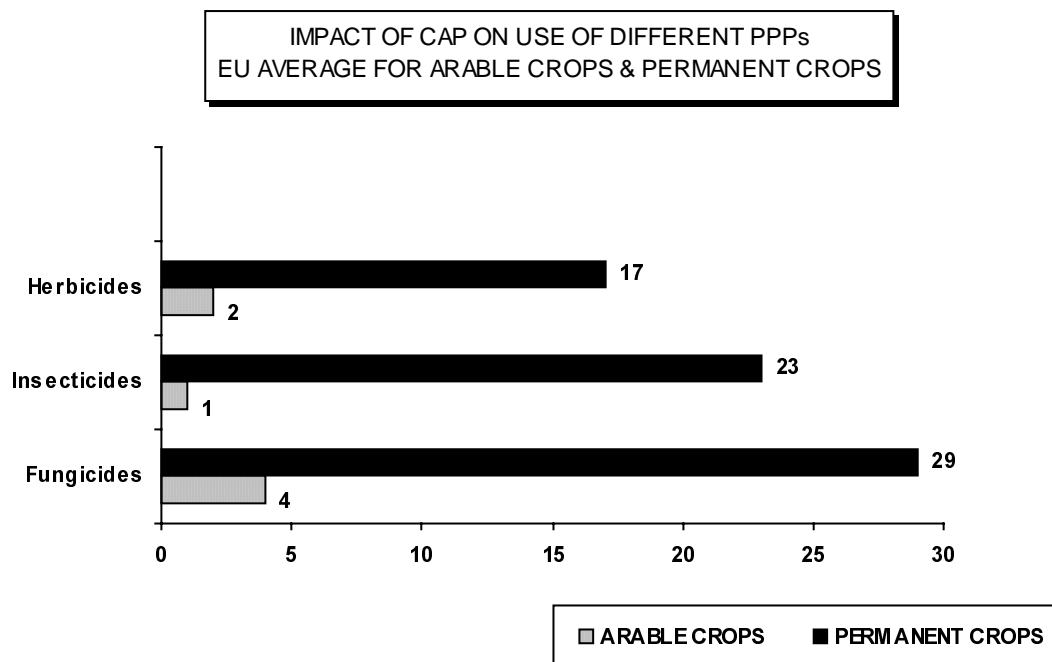
The farmer survey work for vines and apples further suggest that 19% of PPP-use change may be linked to changes in the ratio of producer prices to PPP prices.

Since CAP during that period caused 2 - 42% of the variation in producer price and 58% of the variation in the producer price/PPP price ratio (the balance caused by PPP price changes) it is therefore estimated that just 0.2-5% of PPP-use change can be attributed to the CAP.

4.7 DIFFERENT TYPES OF PPP-USE AND CAP

The farmer research suggests that fungicide use is more influenced by the economic ratio of producer price to PPP price than insecticides or herbicides. This translates into a similar relative importance for the measures of the CAP.

Figure 3 - Estimate of the variation in different types of PPP-use effected by the CAP.

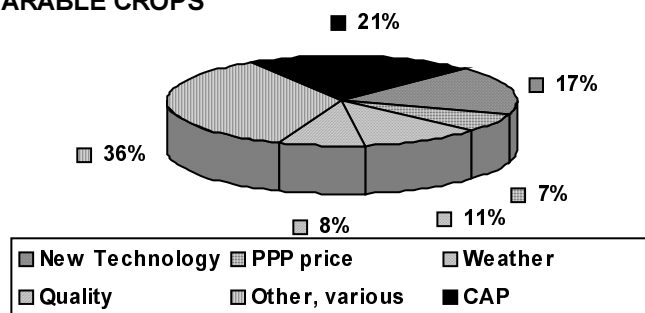


Source: Produce Studies research

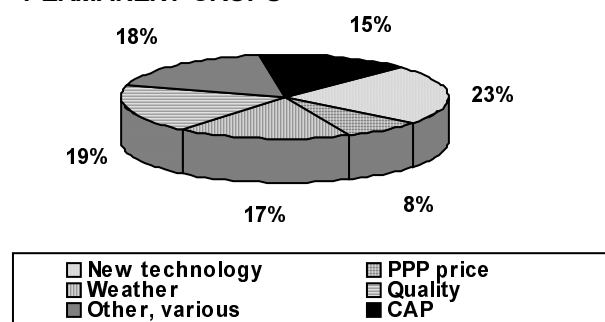
4.8 PPP-USE AND NON-CAP FACTORS

According to farmer research a number of other factors impact the use of PPP. Weather is an important criteria. In the case of permanent crops (vines and apples) then pursuit of a quality product is an important factor.

ARABLE CROPS



PERMANENT CROPS



4.9 CAP AND PPP-USE, INDIRECT EFFECT, ARABLE CROPS

While above sections considered how the CAP, (most notably through its effect on prices of crop output) has had some influence on the level of use of PPP, (*ie*: modification of the management of individual crops) this sub-Report also examined the effect of CAP on land use and choice of crop. These two factors are not, however, distinct. The choice of land use and how the crop is managed are intimately bound together. For example, planting wheat after another wheat crop will likely result in that crop being managed differently than had it been planted after ploughed out grassland.

The impact of CAP on PPP-use change is accordingly considered as a consequence of shifts in land use, as CAP influences areas of crop grown. Since the crops have different levels of PPP-use there is an effect on overall PPP-use. CAP nevertheless remains only one of the factors to cause change in land use.

4.9.1 Producer Price Changes

A shift in one of the crop output prices relative to others will affect overall PPP-use change to only a relatively a modest degree and depends on which crop price is altered as to the direction of the effect. Overall the average response to a 10% price change is +/-0.7-0.8% change in overall PPP-use change. The increase in price of most crops causes shifts in land use change that result in only a small increase in PPP-use change.¹¹ This effect is far more significant than the indirect effect on land use.

4.9.2 Set-aside

As set-aside has been introduced crop rotations appear to have been changed. Even though set-aside takes land out of arable production altogether, in the arable area that remains there are changes in cropping mix. If to those changed areas a standard amount of PPP-use per

¹¹ Such conclusions only apply in so far as the level of PPP-use on each individual crop does not change, *i.e.*: ignoring the crop management change within a crop caused by price changes.

hectare is applied then an increase in set-aside has therefore increased PPP-use. In practice set-aside became very important at the same time as the price support for arable crops took place.

The set-aside instrument appears to have provoked cropping changes towards more intensive PPP-using crops. If other factors associated with CAP are not changed and PPP price does not change, then at constant intensity on PPP-use change per crop a 5 % increase in set-aside has tended to increase change in PPP-use by 7-8%.¹²

In practice, however, CAP reform has been associated with changes in both crop prices and PPP prices, both factors that have compensated this tendency for increase.

4.10 SPECIFIC CAP MEASURES

A number of specific policy instruments of EU agricultural policy have an effect on sustainable PPP-use. The diversity of the measures are such that investigation in the full Sub-Report was conducted by desk study. The type of impact of these measures are summarised in the following Tables,¹³ in which four graded classifications are made about the nature of the impact of measures on sustainable PPP-use:

- *Insignificant*: the aspects of the programme that have very little at all to do with issues that affect PPP-use;
- *Marginal*: measures where there may be some aspect of the programme that could conceivably influence PPP-use but then in a marginal way only;
- *Indirect*: parts of programmes or programmes which can be expected to have some impact on PPP-use but the nature of the impact is indirect;
- *Direct*: measures that directly target use of PPP or the intensity of the methods of crop production.

The scale of the impact is necessarily a qualitative and judgmental view, the only way possible to summarise the findings.

¹² The model is, however, subject to statistical error, so the precise number should not be used without reserve. However the potential direction in the relationship is valid that set-aside has on the one hand the tendency to increase PPP-use change because of crop rotation changes (notwithstanding that PPP-use on set-aside land is minimal).

¹³ It has not been possible to quantify in numeric terms the impact of this part of the CAP although some case studies are provided in the full Sub-Report.

Table 1 - Impact of Structural Funds on PPP-use

Policy	Budget (mn ECU)	Potential Area (% of Community area)	Nature of impact on PPP-use				Scale of impact
STRUCTURAL FUND			Insignificant	Marginal	Indirect	Direct	
Objective 1							
1989-93 1994-99	36,2 93,810	38 45	* agricultural related projects only a small part of Obj. 1 budget (approx. 15% 1989-93 programme).	* agricultural measures such as: rural tourism; rural infrastructure	* measures which may lead to increase/decrease in PPP usage - Reforestation; Increasing value of quality products; Improving production conditions * crop conversion measures possible +/-ve impact on PPP reduction. * environmental protection measures only limited application, but +ve direct impact on PPP usage.		Very limited, since both the budget assigned to measures relating to agriculture are small (in comparison with CAP market support measures) and the objectives are not specifically targeted at PPP reduction. - limited impact not due to poor efficacy of instrument
Objective 5a							
1989-93 1994-99	3,415 5,371	horizontal measure		* measures designed to improve the efficiency of agricultural structures: compensatory allowances; aid to individual investment; aid to young farmers.	* measures to improve processing and marketing conditions for agricultural and forest products: rationalise and modernise processing and marketing without increasing capacities; improve product quality and the efficiency of distribution networks	* prior the 1992 reform Objective 5a included set-aside, extensification and environmental measures in sensitive areas, these were withdrawn as they are covered in the Accompanying Measures.	Very limited. Both the budget assigned to measures relating to agriculture are small (in comparison with CAP market support measures) and the objectives are not specifically targeted at PPP reduction. - limited impact not due to poor efficacy

Table 1 - Impact of Structural Funds on PPP-use (continuation)

Policy	Budget (mn ECU)	Potential Area (% of Community area)	Nature of impact on PPP-use				Scale of impact
STRUCTURAL FUND			Insignificant	Marginal	Indirect	Direct	
Objective 5b							
Policy	Budget (mn ECU)	Potential Area (% of Community area)	Nature of impact on PPP-use				Scale of impact
STRUCTURAL FUND			Insignificant	Marginal	Indirect	Direct	
1989-93 1994-99	2,607 6,134	17 26.6	* two priority axis of no significance - development of human resources and development of non- agricultural sector. * under environment axis - installation of sewage purification; air pollution reduction; processing of bio	* under agricultural priority - farm tourism; village renewal; agri- infrastructure; adjustment to market developments	* forestry, qualify production and irrigation measures	* under environment axis - environment preserving agriculture & protection of flora and fauna (application/uptake reported to be limited). * cultivation of hill areas (Cantabria) direct/-ve impact on reduction of PPP usage	* limited impact due to - endeavours not to duplicate the PPP usage measures addressed in the agri- environmental programmes and limited uptake of those measures which may impact on PPP usage - limited impact not due to poor efficacy of implementation

Table 2 Impact of Accompanying Measures (2078/92) on PPP-use

Policy	Nature of impact on PPP-use				Scale of impact
	Insignificant	Marginal	Indirect	Direct	
					See Part 3 for justification of comments Limited impact due to limited budget assigned to the measures and not notably low efficacy in implementation.
Reg 2078/92, ~5 Becu over five years, but 1995 underspend of 40% on 1.4 Becu					
Art 2.1 a				* reduction of fertilisers and PPP	* without total ban difficult to assess actual decrease in active ingredients
Art 2.1 a				* organic farming - implemented according to 2092/91 (Art 6.1)	* low premium levels so predominant uptake on existing organic farms
Art 2.1 b			extensification - less intensified production measures may specifically refer to reduction livestock density (possible +/-ve impact on PPP reduction)	* extensification - less intensified production measures often specifically refer to reduction of fertilisers & PPP	* Included in most programmes but uptake focuses on low level environmental commitment measures * low premium levels so concentration on maintaining existing extensive practices not converting practices (income support rather than environment benefits) * uptake concentrated on least useful farm types
Art 2.1 b				* convert arable into grassland - reduced inputs	* premium levels in general too low to make up for loss of earning
Art 2.1 c			* reduction in livestock density		
Art 2.1 d		*environmental practices - may include drilling or mowing requirements	* environmental practices - may include crop growing or land improvement requirements	* environmental practices - may include reduction/banning of PPP	* concentration on maintenance not introduction of environmental practices.
Art 2.1 d				* maintenance of countryside - may require a reduction/banning of PPP	
Art 2.1 d	* to rear animals of local breeds in danger of extinction				

Table 2 Impact of Accompanying Measures (2078/92) on PPP-use (continuation)

Policy	Nature of impact on PPP-use				Scale of impact
	Insignificant	Marginal	Indirect	Direct	
					See Part 3 for justification of comments Limited impact due to limited budget assigned to the measures and not notably low efficacy in implementation.
Art 2.1 e				* upkeep of abandoned farmland and woodland - may include PPP usage specifications (limited inclusion in aid programmes)	* minimal adoption/uptake
Art 2.1 f				* 20 year set aside	* minimal adoption/uptake
Art 2.1 g	* manage land for public access and leisure activities - limited inclusion in aid programmes				

4.10.1 Specific Measures for PPP¹⁴

Registration of agrochemicals is now harmonised at an EU level with the implementation of Directive 91/414, and existing PPPs are being reviewed under Regulation 3600/93, although at the time this sub-Report was prepared, no national product authorisations had yet been made under this Regulation, and as yet the current impact is therefore considered to be minimal.

Although in Member States such as Denmark, Netherlands and Sweden the quantity of PPP-use has fallen the advent of more active PPP with lower dose rates (particularly herbicides) suggests that reduction in quantity of PPP-use may have occurred irrespective of reduction programmes. Different additional measures are, however, being introduced in the more recent five year programmes which may bring more direct effects.

4.10.2 Overall Extent of Impact

The most direct effect on sustainable PPP-use arises from Regulation 2078/92, although complete data is not easily accumulated for all the programmes and measures. From information on six countries the proportion of farmed area that may be covered by 2078/92 is around 38%. Actual take up is however running below the target in the majority of situations.

The measures of direct impact, conversion to organic production and various programmes for reduction of PPP-use account for 2-26% of the total 2078/92 package in regions. In many ways it is too early to judge the efficacy of the accompanying measures' programmes. There are much more extensive surveys in progress contracted by the Commission that will provide greater depth of analysis about the efficacy of the measures. A critical issue for these studies is considered to be the question of additionality: the extent to which the premiums paid to farmers incite them to additional behaviour and actions more favourable to the environment.

(c) Organic Production

Council Regulation 2092/91 on organic production of agricultural products sets out uniform and harmonised rules for this type of production, although it does not set out an organic farming conversion or support programme. Measures under Regulation 2078/92 include aid to farmers who undertake to introduce or continue with organic farming.¹⁵

The area under organic cultivation has increased fourfold in recent years. However, it remains a limited share (about 0.3%) of total utilised agricultural area. It is suggested that the higher prices for organic crops do not necessarily offset lower yields that are achieved and that support payments are at present too low to overcome loss of income from traditional farm practices.

¹⁴ In assessing the impact of 2078/92 and related measures and comparing these with the impact of the market support measures of the CAP it is important to keep in mind the difference in scale of the EU budget associated with each: 2 billion ECUs 1996 for accompanying measures compared to 17.2 billion ECUs for arable crops, market measures. Such budget limitations mean that the area targeted by 2078 is limited but also the premiums for inciting farmer participation in schemes are often on the low side.

¹⁵ Programmes adopted under this Regulation are implemented in accordance with Regulation 2092/91.

In summary, if the findings of the limited case studies proved representative of the whole programme the PPP reduction measures of 2078/92 may provoke 0.25-3% decline in PPP-use.

Another comment from local administrations was that the grants do not encourage farmers to enter organic production, but are rather mainly received by farms who have already converted (or who would have converted anyway). These two factors together lead to a tentative conclusion that 2078/92 measures for organic farming are effecting overall PPP-use by less than 0.5%¹⁶.

The assessment in this paragraph is not a judgement on the efficacy of the 2078/92 instrument, (that must be subject to more rigorous examination through direct research) as the objectives of the research have been only to measure the impact of the CAP on PPP-use.

(b) PPP-Reduction Measures, 2078/92

Other specific measures that have a direct effect on PPP-use under 2078/92 include specific reduction of pesticide use (eg: Lombardy); restriction on use of herbicides/plant growth regulators (MEKA Germany); and support for integrated pest management (eg: Spain, Veneto, Piemonte).

(c) Arable to Pasture Land Conversion

Schemes to stimulate such conversion from arable to pasture also exist under 2078/92. Although such will reduce PPP-use significantly (since there is little PPP-use on pasture) the areas subject to these programmes is even less than that for organic farming or PPP reduction. Initial reports derived from discussions with local administrators in the case studies further suggest that uptake is low (estimated to be because the premiums provided are considered insufficient).

4.10.3 Comparison of different measures

It is somewhat difficult at this early stage of the 2078/92 programme, with the limited research of this project to evaluate the efficiency of the different types of measure for reducing PPP-use. Conversion to organic production has the advantage of removing all PPP-use (provided the premiums stimulate an action of conversion that really is additional to that which may have taken place anyway). This same issue of additionality applies to the various pesticide reduction programmes. These programmes also face the challenge of monitoring and measuring that reduction actually takes place.

¹⁶ In part this results from the fact that 2078/92 measures are only applicable to a limited part of the territory uptake has not been high so far.

4.10.4 Structural Funds

The overall impact is anticipated to be minimal. Again this is not a judgment on the quality or efficacy of the instruments, as the objectives are not specifically to reduce PPP-use. It appears that the positive and negative effect on PPP-use in some programmes across the whole of the EU are likely to balance each other out.

The observation does not imply that the Structural Funds might have greater impact on PPP-use with modification, but simply that the current formulation of the instrument does not have reduction of PPP-use as an objective, so it is not surprising to note that its impact is limited.

4.11 SUMMARY OF IMPACT

4.11.1 CAP Changes

The figures below summarise the overall findings of the research in terms of the extent to which CAP has affected producer prices, the extent to which CAP has affected land use, and how CAP has affected the management of crops in terms of changes in PPP-use. (NB: Only the CMO measures of CAP are treated here, not 2078/92). As has been explained in the introduction, the models and farmer research from which such results are drawn are statistically weak. Thus, the absolute numbers must be treated with caution. Necessarily, the charts have to contain some numbers, but their purpose has been to illustrate the order of magnitude of impact and the relative influence.

Figure 4 - Impact on Producer Returns and Arable Returns

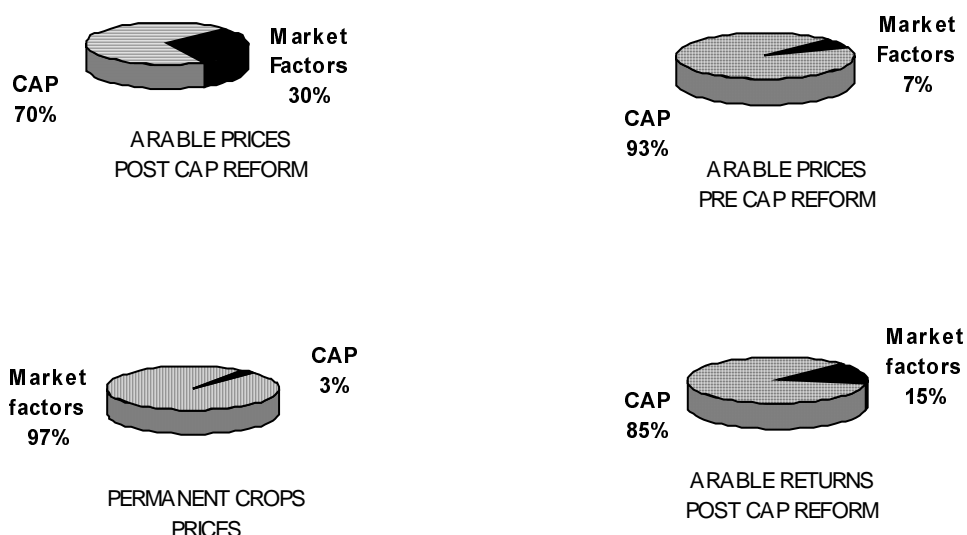


Figure 5 - Impact of CAP on Land Use

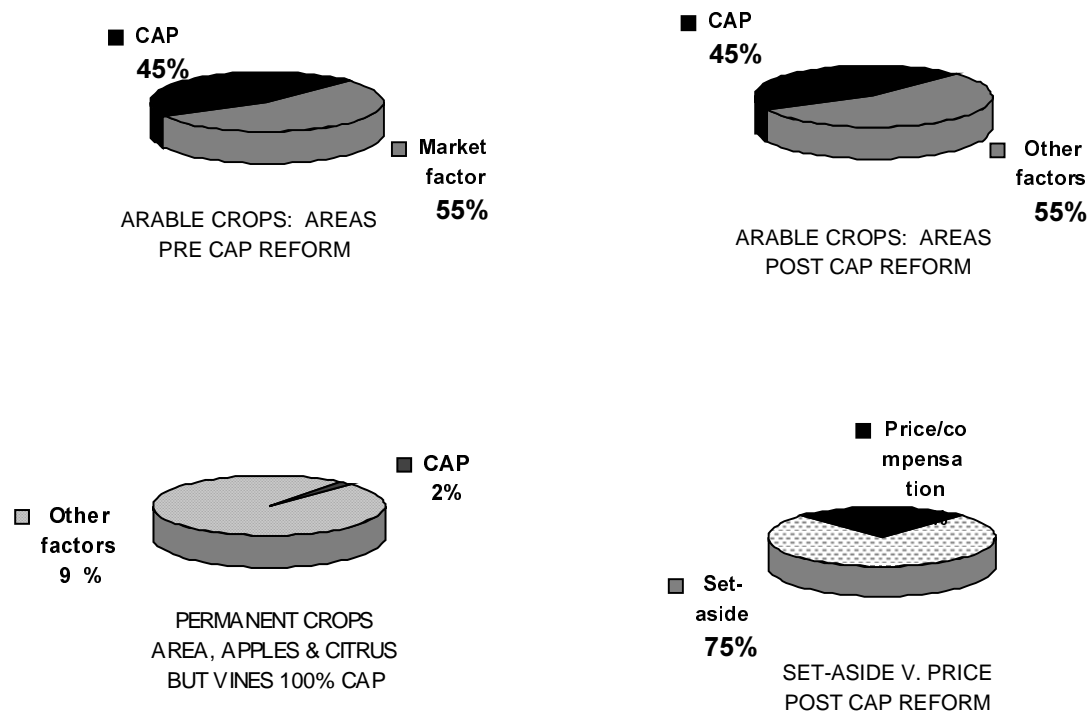
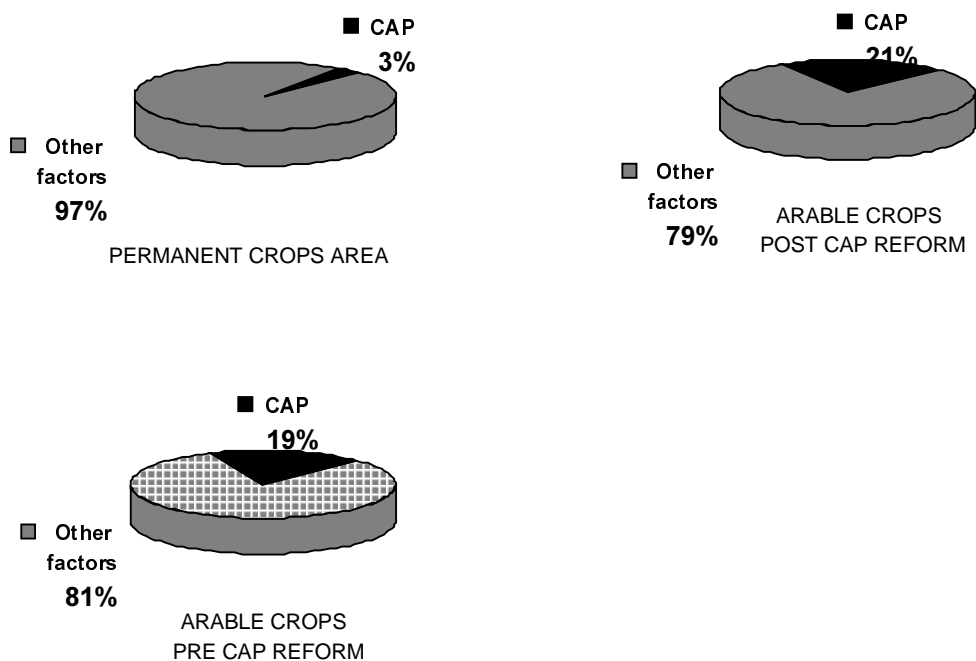


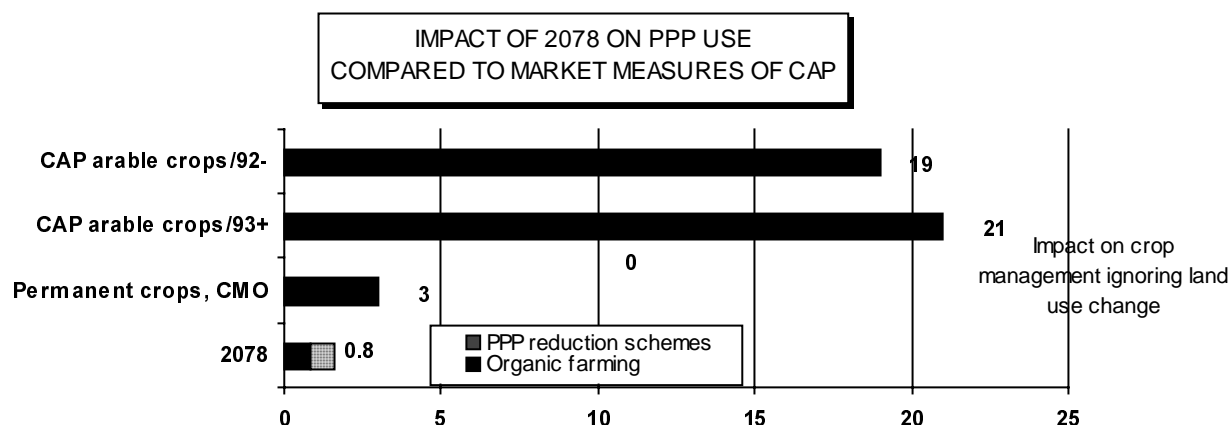
Figure 6 - Impact of CAP on PPP-Use in Crops



4.11.2 Specific measures

The most direct influence of measures (between structural funds and accompanying measures) are programmes identified under 2078/92. The broad order of magnitude of influence roughly estimated from the study is compared to the impact of the rest of the CAP.

Table 3 - Comparison of possible scale of effect of 2078/92 on PPP-use to CAP market measures.



Source: Produce Studies research

The scale of the impact of specific measures therefore seems to be much less than the overall impact direct of CAP market instruments. This is explained by the fact that the budget for implementing 2078/92 is extremely low (at 2-3%) relative to the total annual expenditure under the CAP budget. Even within 2078/92, a majority of measures is orientated towards livestock and reduction of fertiliser. In addition, measures which have a direct PPP effect (conversion to organic and PPP reduction programmes) have only a limited target area under 2078/92. Early tentative reports (not however, quantitatively substantiated) also suggest that uptake is lower than anticipated and that, within programmes targeting PPP reduction, the level of reduction may be less than could otherwise be expected.

4.11.3 Sensitivity

Sensitivity of changes in producer prices and set-aside on PPP-use are summarised in greater detail in the full text of the sub-Report. The CAP influence through prices on the level of PPP-use is an important factor. In contrast the impact of CAP through prices on land use (which may increase or decrease PPP-use depending on crop) is much smaller.

4.12 DISCUSSION OF RESULTS/CONCLUSIONS

At the 'highest' level of policy making the CAP can affect the balance between grassland (very low use of PPP) and arable crops (the more intensive user of PPP). Up to CAP reform the economic relationship was weak, but tending to increase arable at the expense of grass. Since CAP reform, the measures of CAP on both arable and livestock side have tended to more or less 'fix' the areas associated with each. In discussion of policy change it would be theoretically possible to consider changes in the relative balance of livestock, as determined

by milk quota plus headage payment limits on beef and sheep compared to permitted arable area.

The sub-Report illustrates that there is a relationship between how CAP is managed and the level of PPP-use. In the past the main influence of CAP was through price support for crop output, as higher prices can shift the economic optimum for PPP-use. Of course, over time, there are many other factors that also effect PPP-use such as changes in the weather, technical developments in the genetic make up of the crop, and in improvement in the efficacy of the PPP. These other factors are dominant.

Since CAP reform, the price support instrument has become less important. Thus the relationship between CAP and PPP-use through this price signal has become less significant. However, at least for arable crops, the introduction of the set-aside instrument has had a limited indirect effect on overall PPP-use through influencing the mix of crops grown. Thus since CAP reform, the relationship between CAP and PPP-use has become more complex. With the current rules of set-aside (small farmer exception and so on) and within the experience of a nominal set-aside in the range 0-15%, then increasing the set-aside instrument has a tendency to increase PPP-use in so far as it has encouraged a switch to more intensive PPP-using crops. This is, however, slightly mitigated by the tendency of the CAP reform to reduce PPP-use per hectare.

Whilst the economic analysis has suggested this relationship is in both directions, it may be doubtful that a removal of set-aside now will reverse the crop shift of recent years. Introduction of set-aside encouraged a shift towards wheat away from oats, rye and spring barley (depending on country). Technical developments both in crop production (varieties, PPP) and in animal feed use (permitting higher proportions of wheat) have supported this shift.

It is likely that increasing the set-aside instrument to >15% (nominal level, not actual) will begin to reduce overall PPP-use as crop is taken out of production and the switch in land use does not provoke an increase. Of course if set-aside was applied on a crop specific basis rather than as an aggregate measure for COP (cereals, oilseeds and protein crops) the conclusion would be different. In these circumstances the CAP would clearly have a direct effect on each crop area.

In contrast to the rise in importance of set-aside, the price instrument of CAP has become less important in influencing market prices and thus the optimum use of PPP. The change that has taken place is that a much higher proportion of arable crop returns comes from direct payments. It would therefore be possible for policy makers to adjust the relative return between different crops taking into consideration the relative intensity of PPP-use between crops. No doubt, up to now in policy decisions of this sort, the PPP-use impact has not been a factor in assisting relative returns to different crops.

It should be noted that there are crops where land area is very much controlled by CAP. Sugar beet is a profitable crop in comparison with other arable crops. However the area devoted to the crop is limited by quotas. In contrast, potatoes (except industrial starch potatoes) have no policy instrument affecting the land area (though they have been influenced by the policies on other crops that have affected the relative attractiveness of potatoes), while the area put to vines is very strictly limited by the implementation of CAP.

Generally speaking the impact of CAP on areas of fruit and vegetables (not vines¹⁷) is minimal, as too, the impact on levels of PPP-use through the producer price affects all crops, including vines. These are significant users of PPP (around 26% by value in the EU), thus there is a large element of PPP-use in which the CAP has limited impact.

Other measures such as 2078/92 and Structural Funds have a much lower, and, in some situations, negligible impact on PPP-use. As far as this sub-Report was able to assess, the Structural Funds have had as many positive impacts on use as negative, and both are extremely small. It might be considered as policy neutral as far as PPP-use is concerned. Only small parts of the 2078/92 programme are noted as having a reduction impact on PPP-use.

It would be wrong to conclude from this study that 2078/92 is an effective or ineffective instrument. Funds put to the programme are relatively modest, especially compared to the major part of CAP expenditure on CMOs. It is also too early to know with any confidence what the impact of 2078/92 will be in those zones where highly specific PPP reducing measures have been introduced.

In the past the major expenditure of CAP in CMOs was in price support. This has an impact on PPP-use. The objectives of the CAP are many and the explicit objective of PPP reduction does not feature directly. It appears only indirectly as part of the objective of environmental sustainability. In the policy decision making of the past it is difficult to imagine a PPP reduction objective featuring very heavily in CMO adjustment decisions. The more recent CAP for COP crops has a more direct link with land use, but the nature of the relationship between changes in the measures and land use is quite complex. Development of a PPP risk reduction philosophy within the context of these new CAP instruments so as to move towards a more sustainable use of PPP will not be easy.

Some programmes of 2078/92 have a very direct impact on PPP-use (*e.g.*: conversion to organic). However, such programmes may have highly specific objectives. In contrast the CMOs have to address simultaneously the multiple objectives of the CAP, of which environmental sustainability is but one. The challenge for policy makers interested in influencing the sustainable level of PPP-use is therefore whether to develop and expand the highly specific programmes and policy instruments (such as 2078/92) or whether to focus attention on modification of how the CMOs work, building more criteria of PPP sustainability in the decisions on compensation levels for the different crops.

¹⁷ The area of vines determined directly by the CAP in that all new planting (as opposed to replanting) has been prohibited since 1996.

