

Organic farming and the new CAP
– results for the Austrian agricultural sector

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Abstract

In 2003, the Common Agricultural Policy (CAP) has been reformed and decoupling direct payments from farm output is one of its core elements. We estimate the likely responses in organic product supply due to the reform at regional and sectoral levels. In addition, we analyse how the new programme for rural development, to be implemented in 2007, might affect organic farming. Our results show that organic farming will become more attractive after the 2003 CAP reform in Austria. Our results support the view that interactions among agri-environmental measures affect farmers' choice to maintain, abandon or adopt organic farming practices.

Keywords: agricultural sector modelling, Common Agricultural Policy, organic farming

JEL classification: Q11, Q18, Q21

1. Introduction

Organic farming is considered to be a production system with a wide range of benefits. Many consumers appreciate the fact that organic food is produced without the use of certain inputs (e.g. synthetically produced pesticides, mineral fertilizers). In addition, stricter animal welfare requirements guarantee that food is produced at ethically higher standards. Generally, some technological innovations that are available in conventional farming, are banned in organic farming systems. This makes organic food attractive for producers and consumers who are sceptical towards genetically modified organism (GMO) which are banned in organic farming. Therefore, organic food has many attributes that allow producers to differentiate it from conventionally produced food.

Consumers pay higher prices for certified organic products. But there are some benefits that go beyond the relationship of producers and consumers of organic products. One of them is that surplus production is reduced due to lower average yields, another one are environmental benefits (Wein-schenck, 1990). Certainly, price wedges are a signal, that such benefits are actually internalized by the price system (Offermann and Nieberg, 2002). However, not all certified farmers get higher prices for their products. This likely happens, when separate processing channels are not available for conventional and organic farm products.

In many countries, the public is supporting the adoption and sometimes even the maintenance of organic farming production (Semos, 2002). In the EU, the programme for rural development is the most important tool to promote organic farming (Häring et al., 2004). From an economic point of view such assistance is welfare enhancing if several conditions are met. One justification is that external benefits are associated with alternative farm management practices that cannot be internalised in markets.

Organic farming stimulates production innovations which spill over to conventional farms. In particular, techniques saving inputs through improved biological pest control or nutrient management systems (e.g. Dima and Otero, 1997) can be adopted by conventional farms, too. Such benefits cannot be internalised by those developing them, and consequently public support can be welfare enhancing. Agricultural policy makers in Austria and in the EU are convinced that such benefits prevail. Action programmes have been put in place in order to stimulate both, demand for and supply of organic products (CEC, 2004 and BMLFUW, 2003b). We describe some details of these programmes in the next chapter.

In the last few years, exponential growth (number of farms and acreage) has been observed in organic farming (Eurostat, 2003). Such a boom can not be explained solely by subsidies of agri-environmental programmes. There is evidence that other factors, like environmental attitudes of farm-

ers (Vogel, 1999), or lower output prices of conventional products (e.g. Pietola and Lansink, 2001) are accelerating the rate of adoption. This literature shows that influences not directly addressing organic farming are determining production decisions and thus the overall supply of organic food.

The 2003 reform of the Common Agricultural Policy (CAP) will change the basic conditions of farming significantly from 2005 on. Thus, we expect that supply of organic products will be affected, because opportunity cost will change. It is relatively unknown to what extent such a change may take place at sector level. We use an agricultural sector model to evaluate likely supply responses of organic products after the 2003 CAP reform in Austria. This country is chosen as a case study, because it has a heterogeneous set of agri-environmental measures in place, and a broad collection of farm management data has been made available for such an analysis.

Starting in 2007, an updated version of the programme for rural development (the "Second Pillar" of the CAP) will be implemented. This programme not only has different goals and instruments compared to the previous one but entails some financial reallocations, as well. We identify which financial adjustments need to be made in order to make the existing Austrian agri-environmental programme compatible with the new one. Thus we are able to identify supply responses to both, the reformed First Pillar and the reformed Second Pillar of the CAP.

The topic of the paper is (i) to analyse whether the 2003 CAP reform will reduce or boost the acreage used for organic production, (ii) how crop and livestock outputs are going to be affected, (iii) what implications are to be expected from financial reallocations due to the new programme for rural development, and (iv) which efforts are likely to become necessary to meet policy goals concerning organic farming.

The remainder of the text is structured such that key figures on organic farming in Austria and EU-15 as well as the Austrian and EU action programme for organic farming are summarised next. The model used for the analysis is briefly described, and the 2003 CAP reform is outlined along with the details of the scenarios. Results from the sector model are presented before we draw conclusions.

2. Policies for the promotion of organic farming in the EU

For decades, organic farmers were a small group of producers with a strong commitment to their special way of production against a mainstream of high input/output farming. Motivations of these farmers are environmental concerns, philosophies of life, traditions of extensive farming systems, and pure economic considerations, in particular cost saving arguments (Vogel and Bichlbauer, 1992).

In EU-15 organically farmed land has been doubled between 1985 and 1990 and exponentially grown during the 1990s (see table 1). Part of this boom is due to the decision on the legal framework (Council Regulation (EEC) No 2092/91) of organic crop production which established trust among food processors and consumers. In addition, growth is supported by agri-environmental programmes. This programme aims at reducing farm output, stabilizing farm incomes and improving environmental quality. It has been implemented by Council Regulation (EEC) No 2078/92 and is part of the 'accompanying measures' of the 1992 CAP reform.

In Austria a support programme for organic farms was established in 1990. Five years later, when Austria accessed the EU, 17,000 organic farms were counted. This increase was accompanied by the establishment of organic farmer associations. They created labels to allow their members to differentiate their products and they organised certification and extension programmes. Some of the associations invested in processing plants and established wholesale operations of organic products. In a parallel move, super market chains introduced organic brands and today organic products are sold at premium prices in a large number of outlets.

In 2000, the Member States with a percentage of the UAA higher than or equal to the EU-15 average (3%), were Austria and Italy (both 8%), Finland (7%), Denmark and Sweden (both 6%), the United Kingdom (4%) and Germany (3%). In the other Member States percentages remained below the EU-15 average. All Member States, except Austria, have seen a more or less pronounced increase in the UAA percentage over the period 1998-2000 (Eurostat, 2003).

Table 1: Development of organically managed land in EU-15 in hectares and average premiums per hectare in 2001

| | 1985 ha | 1990 ha | 1995 ha | 2000 ha | premiums Euro/ha |
|-------------|------------|------------|------------|------------|---------------------|
| EU-15 | 100,310 | 292,561 | 1,250,867 | 3,778,144 | 186 |
| Belgium | 500 | 1,300 | 3,385 | 20,263 | 269 |
| Denmark | 4,500 | 11,581 | 40,884 | 165,258 | 199 |
| Germany | 24,940 | 90,021 | 309,487 | 546,023 | 163 |
| Greece | 0 | 150 | 2,401 | 24,800 | 445 |
| Spain | 2,140 | 3,650 | 24,079 | 380,838 | 195 |
| France | 45,000 | 72,000 | 118,393 | 371,000 | 188 |
| Ireland | 1,000 | 3,800 | 12,634 | 32,355 | n.a. |
| Italy | 5,000 | 13,218 | 204,494 | 1,040,377 | 318 |
| Luxembourg | 350 | 600 | 571 | 1,030 | 173 |
| Netherlands | 2,450 | 7,469 | 11,486 | 27,820 | 156 |
| Austria | 5,880 | 21,546 | 335,865 | 271,950 | 286 |
| Portugal | 50 | 1,000 | 10,719 | 50,002 | 111 |
| Finland | 1,000 | 6,726 | 44,695 | 147,423 | 117 |
| Sweden | 1,500 | 28,500 | 83,326 | 171,682 | 162 |
| UK | 6,000 | 31,000 | 48,448 | 527,323 | 45 |

Source: CEC (2001) and CEC (2003).

The promotion of organic farming in the EU was reinforced after the follow up farm policy reform, decided upon at the Berlin Council in 1999. The Agenda 2000 reform established the 'Second Pillar' of the CAP, the programme for rural development. It was implemented by Council Regulation 1257/1999 and spans over a period from 2000-2006. Over 49 billion € have been allocated from Community funds (17 billion € for the Guidance section and 32 billion € from the Guarantee section of EAGGF). Member States are required to co-finance the set of 26 measures which were established to address the challenges of rural areas. The measures can be summarized in two major groups (EAGGF budget shares in brackets):

- **structural measures** (53 % of budget): investment in agricultural holdings (9.5 %), setting up of young farmers (3.7 %), training (0.7 %), improving processing and marketing of agricultural products (7.6 %), forestry measures (4.8 %) and Art. 33 measures (25.6 % encompassing land improvement, farm relief and farm management services, marketing of quality agricultural products, basic services for the rural economy, conservation of the rural heritage, diversification of agricultural activities, agricultural water resources management, improvement of infrastructure connected with the development of agriculture, encouragement for tourist and craft activities, protection of the environment and improvement of animal welfare, restoring agricultural production potential damaged by natural disasters, financial engineering)
- **accompanying measures** (47 % of budget): compensatory allowances (12.4 % mainly for farms in less-favoured areas), afforestation of agricultural land (4.8 %), support for early retirement of farmers and farm workers (2.9 %), and agri-environmental measures (27.2 %).

Member states have considerable discretion of how to define the details of the programme. This allows them to fine-tune the measures to local needs. In table 2 further details of accompanying measures are provided. The sums reported in table 2 are the totals of EAGGF and national payments in the year 2001 broken down in payments for structural and accompanying measures.

In 2001, 3.6 billion € were spent for structural measures and even more (4.3 billion €) for accompanying measures. About 61 % of these funds were allocated for farms in less-favoured areas (LFA) and areas with environmental restrictions, for early retirement, and afforestation of agricultural land. Agri-environmental measures accounted for the rest, which was equivalent to 22 % of the total programme funds (not reported in table 2). In 2001, EU-15 countries spent 3 % of the funds for the programme for rural development – 6 % of the accompanying measures – for the promotion of organic farming.

Table 2: Programme for rural development in 2001 (national expenditures and EAGGF-payments)

| | structural measures | | accompanying measures | | | |
|-------------|---------------------|--------|-----------------------|-----------------------------|-----------------------------|----------------|
| | public funds | | public funds | LFA and other ¹⁾ | agri-environmental measures | |
| | | | | | organic framing | other measures |
| | mil. € | mil. € | % | % | % | |
| EU-15 | 3.618 | 4.347 | 61 | 6 | 33 | |
| Belgium | 95 | 19 | 1 | 5 | 94 | |
| Denmark | 80 | 29 | 25 | 55 | 21 | |
| Germany | 957 | 623 | 62 | 7 | 31 | |
| Greece | 0 | 121 | 85 | 4 | 11 | |
| Spain | 457 | 300 | 78 | 7 | 14 | |
| France | 593 | 480 | 88 | 3 | 9 | |
| Ireland | 0 | 346 | 81 | n.a | n.a | |
| Italy | 900 | 248 | 41 | 13 | 46 | |
| Luxembourg | 0 | 16 | 98 | 1 | 1 | |
| Netherlands | 149 | 13 | 22 | 18 | 61 | |
| Austria | 190 | 727 | 29 | 8 | 63 | |
| Portugal | 0 | 73 | 86 | 0 | 14 | |
| Finland | 95 | 695 | 61 | 2 | 38 | |
| Sweden | 57 | 286 | 24 | 20 | 57 | |
| UK | 42 | 373 | 87 | 1 | 12 | |

¹⁾ Expenditures for less-favoured areas (LFA), areas with environmental restrictions, early retirement, and afforestation.

Source: CEC (2003).

After a successful boost of organic production, deficiencies in the supply chain and a mismatch between supply and demand for some products (in particular beef and milk) have appeared. Farm policy makers became aware of the problem and implemented countermeasures. In 2001, the first **Austrian Action Programme for Organic Farming** was established, a co-operation between the farm ministry and accredited organic farmer associations. A year after, the official report on Austrian farming concluded (BMLFUW, 2003a) that the results were encouraging:

- the number of organic farms has increased after a decline in the previous years (18,576 farms in 2002),
- the acreage of organically managed land has expanded (295,000 hectares in 2002),
- the sales volume of organic products has increased, and
- consumers have been better informed about organic products.
- In 2003, an follow-up programme has been launched. Among the objectives are an additional increase of arable land managed organically, and a further penetration of the catering sector with organic food. A broad set of measures is employed to reach these goals (BMLFUW, 2003b):
- promotion of extension and education, of both producers and consumers;
- support for better marketing including public relations;
- more research efforts specifically addressing organic farming;
- further improving the control and certification system and extending it to the feed sector;

In January 2005, Austrian 19 organic farmer associations established 'Bio Austria', a national umbrella organisation. One of the goals is to promote organic food in new distribution channels like factory canteens and schools. In addition, the new organisation tries to establish a uniform label for organic products and puts an emphasis on stringent quality certification procedures.

In June 2004, the European Commission (CEC, 2004a) presented an **Action Plan for Organic Farming**. It was initiated by the Agricultural Councils of June 2001 and December 2002 and is a follow-up of a previous study (CEC, 2002), which provided a basis to analyse the development of or-

ganic farming in Europe and possible elements for actions. Its aim is to identify the requirements to ensure the ongoing development of the organic sector in the community. In addition, imports of organic products from developing countries should be facilitated. It provides policy measures designed to encourage such a development:

- better information and improved transparency with a focus on consumers to establish demand induced growth;
- position organic products as GMO free and thus communicate an important attribute for consumers who may be indifferent towards organic products but are concerned about GMOs;
- further standardisation of methods and procedures covering production, certification, and auditing;
- efforts to guarantee international recognition of EU standards and improved procedures for recognition of foreign certification schemes.

The Council of Farm Ministers supports the Commission's proposals of 21 actions (Council of the European Union, 2004). Their rapid and consistent implementation is seen to be an important contribution to the removal of impediments to growth and thus to the strengthening and expansion of the organic sector. The direct support of organic food production is not on the list of actions to be taken under this plan. This can be interpreted that in future, the focus of measures should shift away from government induced supply stimulation towards demand driven incentives.

3. Model, policy reform, scenarios, and results

3.1 The Positive Agricultural Sector Model Austria - PASMA

The Positive Agricultural Sector Model Austria (PASMA) is employed to estimate the impact of farm policy measures on the supply of organic farming in Austria. PASMA depicts the political, natural, and structural complexity of Austrian farming in a detailed manner (figure 1). The structure ensures a broad representation of production and income possibilities that are essential in comprehensive policy analyses, i.e. development analysis. Data from the Integrated Administration and Control System (IACS), Economic Agricultural Account (EAA), Agricultural Structural Census (ASC), Farm Accountancy Data Network (FADN), the Standard Gross Margin Catalogue, and the Standard Farm Labour Estimates provide necessary information on resource and production endowments for 40 regional and structural (i.e. alpine farming zones) production units in Austria. Consequently, PASMA is capable to estimate production, labour, income, and environmental responses for each single unit. Most production activities are consistent with EAA, IACS and ASC activities to allow comparable and systematic policy analyses with official, standardised data and statistics.

The model differentiates between conventional and organic production systems (crop and livestock). All other relevant management measures from the Austrian agri-environmental programme ÖPUL, and the support programme for farms in less-favoured areas (LFA) are accounted for, as well. Thus the two most important components of the programme for rural development are covered on a measure by measure basis. Future model development will focus on farm investment aid and additional diversification measures. Apart from major components of the programme for rural development, a complete set of CAP policy instruments is accounted for, as well. Both, the set of instruments before and after the 2003 reform are modelled explicitly.

The model maximises sectoral farm welfare and is calibrated to historic crop, forestry, livestock, and farm tourism activities by using the method of Positive Mathematical Programming (PMP). Howitt (1995) has initially published PMP and since then it has been modified and applied in several models e.g. (Lee and Howitt, 1996; Paris and Arafini, 1995; Heckeley and Britz, 1999; Cypris, 2000; Röhm, 2001; Röhm and Dabbert, 2003). This method assumes a profit-maximizing equilibrium (e.g. marginal revenue equals marginal cost) in the base-run and derives coefficients of a non-linear objective function on the basis of observed levels of production activities.

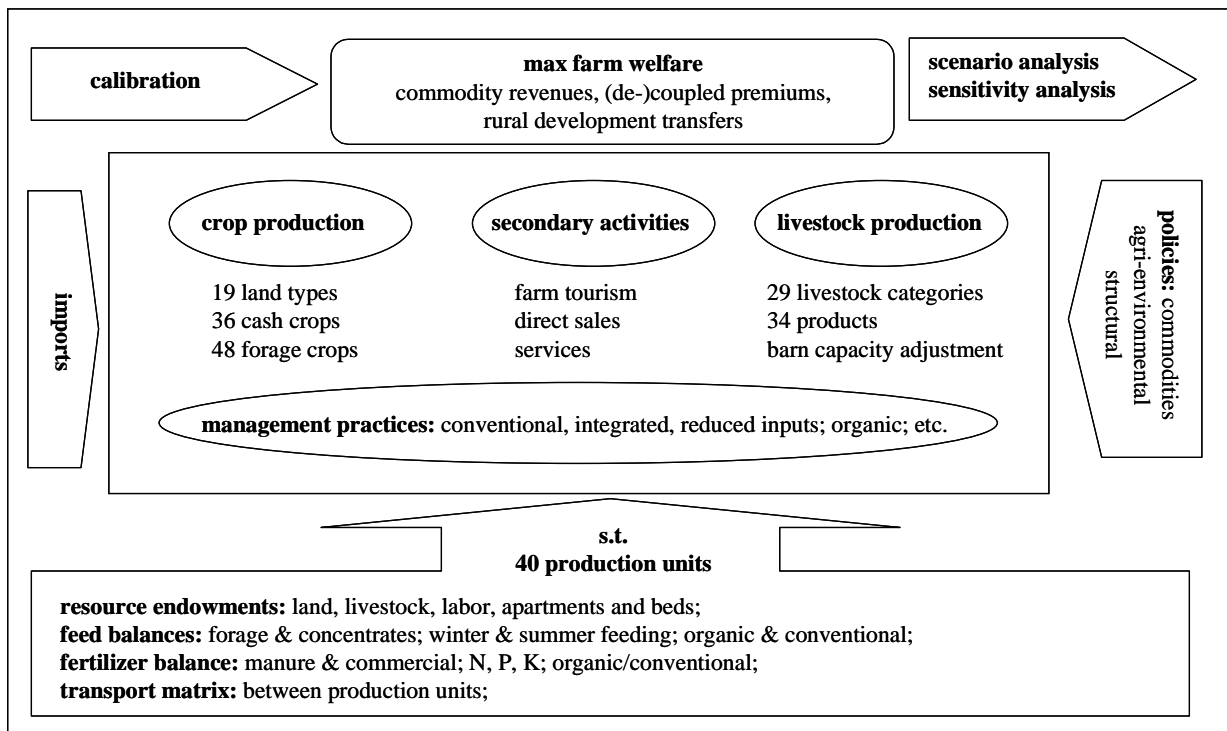


Figure 1: Structure of the agricultural sector model PASMA

Two major conditions need to be fulfilled: (i) the marginal gross margins of each activity are identical in the base-run, and (ii) the average PMP gross margin is identical to the average LP gross margin of each activity in the base-run. These conditions imply that the PMP and LP objective function values are identical in the base-run.

Another important assumption needs to be made by assigning the marginal gross margin effect to either marginal cost, marginal revenue or fractional to both. In PASMA, the marginal gross margin effect is completely assigned to the marginal cost and consequently coefficients of linear marginal cost curves are derived. In PASMA, linear approximation techniques are utilized to mimic the non-linear PMP approach. Thus large-scale models can be solved in reasonable time. In combination with an aggregation procedure, i.e. building convex combinations of historical crop and feed mixes (Dantzig and Wolfe, 1961; McCarl, 1982; Önal and McCarl, 1989, 1991), the model is robust in its use and results.

PASMA is a set of three almost identical Linear Programming models. The purpose of the first one is to assign all farm activity levels i.e. crop, forestry, livestock, and farm tourism, and remaining cost shares from feed and manure balances. For instance, the area of meadows is recorded in various data sources listed above. However, information on which activities are actually carried out and to what extent are not available (e.g. grazing, hay, silage, or green fodder production activities). In the model, these activities and remaining cost shares (i.e. fertilizer and feed) are accordingly assigned using historical livestock records and detailed feed and fertilizer balances (phase 1). Phase 2 is the second LP in which the perturbations coefficients (Howitt, 1995) are incorporated to compute the calibration coefficients of a linear marginal cost curve primarily following the approach of Röhm and Dabbert (2003). The third LP (phase 3) is the actual policy model. Calibration coefficients are built in using linear approximation techniques that allow calibration of crop, forestry, livestock, and farm tourism activities to observed and estimated shares.

Other model features such as convex combinations of crop and feed mixes, expansion, reduction and conversion of livestock stands, a transport matrix, and imports of feed and livestock are included to allow reasonable responses in production capacities under various policy scenarios (Schmid and Sinabell, 2005). Product prices and other model assumptions are referenced in Sinabell and Schmid

(2003), and Schmid and Sinabell (2003). Most prices are exogenously given and based on OECD (2003), FAPRI-Ireland-Partnership (2003). Prices for organic products are based on Eder et al. (2002), and Freyer et al. (2001).

3.2 *The scenarios*

The objectives of the CAP reform 2003 are:

- economic sustainability, through increased competitiveness, stronger market orientation and more efficient income support;
- social sustainability, through more responsiveness to consumer demands, encouragement to improve food quality and safety and a better balance of funding towards rural development;
- environmental sustainability, through a clear framework for a more efficient application and development of environmental and animal welfare standards (EC, 2003).

In order to achieve these goals, the following measures were agreed upon in 2003 (Greek Presidency, 2003; Fischler, 2003) to:

- modify market regimes (reduction of administrative prices, special regulations for protein crops and durum wheat, prolongation of the milk quota system until 2014/15),
- decouple direct payments, and
- introduce several accompanying measures (e.g. degression, modulation, new instruments to enhance consumer trust, additional environmental and animal welfare standards).

Member states have got the freedom to fine tune CAP-instruments according to their specific policy goals. They may choose to introduce the single farm payment in full or they may opt to retain part of the premiums coupled to the output. The funds saved by modulation will be used to reinforce the programme for rural development. Via this new instruments, funds can be re-allocated among Member States (Austria will be among the beneficiaries).

The overhaul of the European farm policy does not stop after the implementation of the 2003 CAP reform in 2005. In mid 2004, the Commission presented a proposal for the new programme of rural development, due to be implemented in 2007 (CEC, 2004b). The proposal goes beyond streamlining administrative procedures by substituting two EAGGF funds by EAFRD, the European Agricultural Fund for Rural Development. It will be organized along three thematic axes corresponding to the main policy objectives:

- increasing the competitiveness of the agricultural sector through support for restructuring;
- enhancing the environment and countryside through support for land management (including RD actions related to Natura 2000 sites);
- enhancing the quality of life in rural areas and promoting diversification of economic activities through measures targeting the farm sector and other rural actors;

Programme success will be benchmarked against quantified objectives and core result indicators (comprising a minimum set of EU-wide common indicators). Stakeholder consultation in the design, implementation and evaluation of national strategies and programmes, the integration a bottom up approach, exchange of best practice and networking will all help to ensure the structured dialogue underlying good governance.

For axis 1 (competitiveness of farming and forestry) the restructuring strategy will be built on measures relating to human and physical capital and to quality aspects. For axis 2 (environment and land management) agri-environment will be a compulsory component. The existing less-favoured areas measure will be redefined based on updated socio-economic data and a new delimitation based on soil productivity and climatic conditions. For axis 3 (wider rural development), the preferred implementation method is through local development strategies targeting sub-regional entities, either developed in close collaboration between national, regional and local authorities or designed and implemented through a bottom up approach. Successful programmes will be chosen according to the

LEADER approach (selection of the best local development plans of local action groups representing public-private partnerships).

The scenario analysed in this paper are a comparison between the base-line in 2003 (with the Agenda 2000 in place) and situations in 2008 when the reformed CAP will be fully implemented (introduction of the single farm payment). The rationale for these comparisons is to contrast a situation when the growth of organic farming has consolidated with the likely reactions of supply to the new policy framework. We look whether we can expect a stimulation or a weakening of organic farming after the recent CAP reform.

Organic farming will be affected by the recent farm policy reform and the proposal of the new programme for rural development in two ways:

- Organic farming will not be affected by the CAP reform directly, but indirectly because opportunity cost and farm output prices change. But we assume that farmers will get mark-ups for organic food similar to those observed historically.
- In a set of scenarios we consider adjustments to the programme for rural development. Such modifications will be likely because the Commission's proposal requires for a balanced strategy a minimum funding for axis 1 (competitiveness) and axis 3 (wider rural development) of at least 15% of total EU programme funding. It implies that the volume of the Austrian agri-environmental programme must shrink, because the share of axis 2 measures is currently about 80 % of the programme volume.

We analyse four scenarios:

- Austria-RDP-2000: This scenario mimics the implementation in Austria. The premium for suckler cows will remain coupled to production by 100 % and the slaughter premiums by 40 %. All other premiums apart from rural development payments will be decoupled. A regional scheme with homogeneous premiums across farms will not be introduced. The assumption is made that the programme for rural development of 2000 will stay in place.
- Austria-RDP-2007: Apart from the last assumption, this scenario is identical with Austria-RDP-2000. Here we assume that in the new rural development programme the volume for axis 2 measures will be reduced by 12 % to allow for the axis 1 and axis 3 minimum shares. Support for organic farming is not limited. The assumption is made that support for the offsetting measures has no production effect.
- Council-RDP-2000: In this scenario the Council proposal will be evaluated. Almost all direct payments are decoupled and allocated among farm operators. Premium entitlements must be matched by an equivalent amount of eligible hectares. If land is not maintained in "good agricultural and ecological condition", entitlements are foregone. The assumption is made that the programme for rural development of 2000 will stay in place.
- Council-RDP-2007: Apart from the last assumption, this scenario is identical with Council-RDP-2000. The volume for axis 2 measures will be reduced by 12 % to allow for the axis 1 and axis 3 minimum shares. Support for organic farming is not limited.

We also assume a moderate (exogenous) rate of technical progress and constant real input prices. We do not adopt exogenously given labour declines in order to isolate the policy affect on structural adjustment. As required by regulations, decoupled premiums must be matched by eligible hectares of land. Three further assumptions have to be kept in mind when the scenario results are compared:

- exogenously given prices based on OECD (2004) between the reference (2003) and the simulation periods (2005 and 2008) change (partly induced by the CAP reform);
- premiums for organic farming will be at levels observed in 2000 in all scenarios of 2008. An implication is that organic farming can expand at the cost of other agri-environmental measures even if the total for all axis-2 measures declines;
- other conditions affecting organic farming (e.g. animal welfare requirements and restrictions on feed components) do not change between the scenarios.

3.4 Results

The model results reported in tables 3 show a comparison between the (modelled) situation in 2003 and the likely outcomes in 2008. The results are summarized as follows:

Financial consequences

- the response is minor due to a reduction of transfers in axis-2 measures (premiums for organic farming are exempt); it can be explained by the payments for farms in less-favoured areas, which show lump-sum payment effects in the short run (long run effects are not yet captured by the model)
- farmers are likely to adjust participation in the agri-environmental programme, and enter the organic farming scheme.

Production costs

- average production cost of conventionally produced beef and milk will likely be higher after the reform; the partial coupling of premiums will increase cost of beef production; due to decoupling cost of crop production will decline;
- due to the expansion of production, the average cost of organic farming will increase (i.e. marginal area effect).

Land allocation and crop production

- the acreage of conventional arable land will be reduced and grassland will be expanded (farm land will not be turned into woodland because of the restriction of the single farm payment);
- due to decoupling, crop output will be smaller after the reform, as far as conventional farming is concerned; the output of organic crops will increase;
- organic farms will (slightly) expand land, at a higher rate in the scenario of full decoupling compared;

Livestock production

- cattle production is the activity most heavily affected by the reform apart from conventional crop production; the number of male cattle is likely to decline;
- Austria will maintain the suckler cow premium and part of the slaughter payments, consequently, the number of female cattle is going to increase slightly;

Given these results we conclude that organic farming is going to become more attractive for farmers after the CAP-2003 reform. The competitive edge of organic farming is mainly due to the fact that payments from the agri-environmental programme are process linked premiums. The same is true for most other premiums from the agri-environmental programme. Because most schemes are activity based, production declines are cushioned.

Table 3: Percentage change of financial, land use and crop production indicators in 2008 compared to 2003

| | Austria - | | Council - | |
|--|-----------|----------|-----------|----------|
| | RP-2000 | RDP-2007 | RD-2000 | RDP-2007 |
| financial indicators | | | | |
| volume of programme for rural development | +0.0 | +0.0 | +0.0 | +0.0 |
| volume of agri-environmental programme | +0.2 | -10.6 | +0.2 | -10.6 |
| organic farming premiums | +2.0 | +2.2 | +1.7 | +2.1 |
| average production cost conventional farming | | | | |
| beef | +10.5 | +9.7 | +2.8 | +2.8 |
| milk | +5.7 | +5.7 | +4.0 | +4.0 |
| cereals | -3.2 | -3.3 | -3.4 | -3.4 |
| average production cost organic farming | | | | |
| beef | +11.2 | +11.8 | +3.0 | +3.0 |
| milk | +30.2 | +31.2 | +30.2 | +30.4 |
| cereals | +2.9 | +2.3 | +1.9 | +1.9 |
| land use | | | | |
| arable land | -3.8 | -3.5 | -3.6 | -3.4 |
| – conventional | -3.9 | -3.7 | -3.8 | -3.4 |
| – organic | +0.1 | +0.1 | +0.3 | +0.3 |
| grassland (without alpine grassland) | +4.8 | +4.6 | +4.6 | +4.4 |
| crop production conventional | | | | |
| – cereals | -3.8 | -3.8 | -3.6 | -3.6 |
| – protein crops | -4.9 | -4.4 | -4.5 | -4.5 |
| – oilseeds | -4.7 | -4.6 | -4.5 | -4.5 |
| – forage crops | -3.8 | -3.6 | -3.7 | -3.7 |
| crop production organic | | | | |
| – cereals | +1.6 | +1.8 | +1.5 | +1.9 |
| – protein crops | +7.7 | +7.9 | +9.2 | +9.5 |
| – oilseeds | -0.9 | -0.4 | -0.8 | -0.7 |
| – forage crops | -2.9 | -3.0 | -2.4 | -2.6 |
| heads of conventional livestock | | | | |
| cattle | +1.5 | +1.4 | -0.1 | -0.1 |
| male cattle | -2.5 | -2.5 | -1.1 | -1.0 |
| female cattle | +2.4 | +2.3 | +0.1 | ±0.0 |
| pigs | +0.2 | +0.3 | +0.4 | +0.2 |
| heads of organic livestock | | | | |
| cattle | +0.8 | +1.0 | -0.4 | -0.2 |
| male cattle | -2.0 | -2.1 | +0.4 | +0.2 |
| female cattle | +1.2 | +1.4 | -0.5 | -0.3 |
| pigs | +4.8 | +4.1 | +3.5 | +3.2 |

Source: Own calculations based on prices of OECD (2004).

Note: Comparisons are made to Agenda 2000 in 2003. 50,000 additional suckler cow premium entitlements are shared among owners of heifers. Additional funds for the programme for rural development (17 million € annually from modulation) are not accounted for in total transfers.

4. Discussion and conclusions

In this paper we have argued that at the EU level there is some commitment to further promote organic farming. As the recently introduced action programme suggests, the focus will move from a supply to a demand stimulation approach. However, we assume that the support of organic farming in agri-environmental programmes will likely not be reduced in future. As the examples of Denmark and Sweden show, there is ample room to support this way of farming in many EU Member States.

We analysed how organic farming might respond to changes after the 2003 CAP reform and to likely modifications of the new programme for rural development at regional and sector level. Our model results capture the Austrian agricultural sector for which detailed farm data are made available. Model results suggest that organic farming will become more attractive to farmers after the 2003 CAP reform. A main reason is that premiums are targeted to specific processes and management activities within agri-environmental programmes. As intended, subsidies for organic products stimulate their provision. The overall reform effect on products is that organic output declines to a lesser extent than conventional output. Thus the 2003 CAP reform is likely to reach two goals, namely the reduction of outputs while simultaneously making farming more environmentally friendly by increasing the share of organic farming.

Organic farms are affected by the abolition of production linked premiums in the crop sector as other farms. But, the reaction is slightly different, organic crop production is little expanding whereas conventional production diminishes. This observation from the crop sector does not hold for livestock production. We expect that the production of organic beef will be reduced, however, to a far lesser extent than the output of conventional beef. We do not think that this will have price inducing effects because currently a large share of organic beef is marketed in conventional distribution channels.

The new programme for rural development, due to be implemented in 2007 will make several adjustments necessary. In Austria, we expect that the volume of axis-2 measures (agri-environment and transfers for less-favoured areas) will be reduced. According to the model results, it is expected that a shift of premiums to other measures will not affect organic farming significantly, given that premiums for organic farming do not change. We assume that this is a likely scenario because the political commitment to strengthen organic farming is strong. We expect that premiums for those measures will be reduced where environmental goals are already reached after two programme periods.

Our results are contingent upon a very important assumption. We assume that price wedges between conventional and organic products remain at the same level as observed in previous years. This assumption seems to be justified by two reasons:

- The Austrian and EU action programmes for organic farming strive to boost demand for organic products. If a demand side effect materializes, we expect prices at current levels.
- Organic products are free of GMOs. Thus consumers get an additional attribute *for free* when they buy organic food. This is likely to stimulate demand among consumers concerned about GMO food. This effect can only be realised if consumers are aware of this attribute.

Previous studies about the effects of the 2003 CAP reform for Austria show that the per-capita income effects are likely to be relatively small. To boost organic farming was not explicitly among the reform objectives. Our results show that the output of organic products is likely to increase. This is consistent with the goal of strengthening sustainable farming and thus fully compatible with the reform objectives. However, observations in Austria show that the limiting factors of further market penetration with organic food are not essentially supply related, but demand driven including a lack of separate distribution channels, organised marketing and processing, standardized labelling, and information of consumers. The follow-up programme for rural development should specifically address these demand gaps and not further increase output stimulating measures.

References:

- BMLFUW (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft) (2003a). Aktionsprogramm Biologische Landwirtschaft 2003-2004; available at: gpool.lfrz.at/gpoollexport/media/file/BIO-AKTIONSPROGRAMM_03-04.doc (August 2004).
- BMLFUW (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft) (2003b). Grüner Bericht 2002 (Agricultural Policy Report 2002), BMLFUW, Vienna.
- CEC (Commission of the European Communities) (2001). The Agricultural Situation in the European Union, 2001 Report, Brusseles.

- CEC (Commission of the European Communities) (2002). Analysis of the possibility of a European Action Plan for organic food and farming. SEC(2002). 1368, Brussels 12.12 2002: http://europa.eu.int/comm/agriculture/qual/organic/plan/consult_en.pdf
- CEC (Commission of the European Communities) (2003) . Commission staff working document. EU rural development monitoring data - synthesis report for 2001.SEC(2003) 1482, Brussels, 12/12/2003.
- CEC (Commission of the European Communities) (2004a). European Action Plan for Organic Food and Farming, COM(2004)415 final, Brussels. Available at (August, 2004): http://europa.eu.int/comm/agriculture/qual/organic/plan/index_en.htm
- CEC (Commission of the European Communities) (2004a). Proposal for a Council Regulation on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), {SEC(2004)931}, COM(2004)490 final, 2004/0161(CNS), Brussels, 14.7.2004. Council of the European Union, 2004, Press Release of the 2611th Council Meeting Agriculture and Fisheries, Lux-embourg, 18 October 2004, 13129/04 (Presse 286).
- Cypris, C. (2000). Positive Mathematische Programmierung (PMP) im Agrarsektormodell Raumis. Schriftenreihe der Forschungsgesellschaft für Agrarpolitik und Agrarsoziologie, 313, Bonn.
- Dantzig, G.B. and Wolfe, P. (1961). The Decomposition Algorithm for Linear Programs. *Econometrica*, 29: 767-778.
- Dima, S. J. and Odero, A. N. (1997). Organic Farming for Sustainable Agricultural Production, *Environment and Resource Economics*, 10, 177-188.
- Eder, M., Dalmolin, R. and Altrichter, G. (2002). Standarddeckungsbeiträge und Daten für die Betriebsberatung im Biologischen Landbau 2002/2003, Wien.
- Eurostat, (2003). Organic Farming in Europe. A sustained growth over the period 1998-2000. *Statistics in focus. Environment and Energy*, Theme 8, 2/2003. Eurostat, Luxembourg.
- FAPRI-Ireland-Partnership, (2003). The Luxembourg CAP Reform Agreement: Analysis of the Impact on EU and Irish Agriculture. Teagasc Rural Economy Research Centre, October 14th 2003, Dublin.
- Fischler, F. (2003). Speech delivered at the CAP Reform Committee on Agriculture and Rural Development, Brussels, 2003, Press Release Rapid, DN: SPEECH/03/356, Date: 9 July 2003, http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=SPEECH/03/356|RAPID&lg=EN&display=.
- Freyer, B., Eder, M., Schneeberger, W., Darnhofer, I., Kirner, L., Lindenthal, T. und Zollitsch, W. (2001). Der biologische Landbau in Österreich – Entwicklungen und Perspektiven, *Agrarwirtschaft* 50 (7) 400-409.
- Greek Presidency (2003). Presidency Compromise in Agreement with the Commission, <http://register.consilium.eu.int/pdf/en/03/st10/st10961en03.pdf>.
- Häring, A.M., Dabbert, S., Aurbacher, J., Bichler, B., Eichert, C., Gambelli, D., Lampkin, N., Offermann, F., Olmos, S., Tuson, J. and Zanolli, R. (2004). Organic farming and measures of European agricultural policy Organic Farming in Europe: Economics and Policy, Volume 11. University of Hohenheim.
- Heckelei, T. und Britz, W. (1999). Maximum Entropy Specification of PMP in CAPRI. CAPRI Working Paper, University of Bonn.
- Howitt, R.E. (1995). Positive Mathematical Programming, *American Journal of Agricultural Economics*, 77, 329-342.

- Lee, D.J., and Howitt, R.E. (1996). Modelling Regional Agricultural Production and Salinity Control Alternatives for Water Quality Policy Analysis. *American Journal of Agricultural Economics*, 78: 41-53.
- McCarl, B.A. (1982). Cropping Activities in Agricultural Sector Models: A Methodological Proposal. *American Journal of Agricultural Economics*, 64: 768-772.
- OECD (Organisation for Economic Co-operation and Development) (2004). *Agricultural Outlook 2004-2013*, OECD, Paris.
- Offermann, F. and Nieberg, H. (2002). Does organic farming have a future in Europe?, *EuroChoices*, 1, 12-17.
- Önal, H. and McCarl, B.A. (1989). Aggregation of Heterogeneous Firms in Mathematical Programming Models. *European Journal of Agricultural Economics*, 16 (4): 499-513.
- Önal, H., and McCarl, B.A. (1991). Exact Aggregation in Mathematical Programming Sector Models. *Canadian Journal of Agricultural Economics*, 39: 319-334.
- Paris, Q., and Arfini, F. (1995). A Positive Mathematical Programming Model for the Analysis of Regional Agricultural Policies. *Proceedings of the 40th Seminar of the European Association of Agricultural Economists*, Ancona.
- Pietola, K.S. and Lansink, A.O. (2001). Farmer response to policies promoting organic farming technologies in Finland, *European Review of Agricultural Economics*, 28, 1-15.
- Röhm, O. (2001). *Analyse der Produktions- und Einkommenseffekte von Agrarumwelt-programmen unter Verwendung einer weiterentwickelten Form der Positiven Quadratischen Programmierung*. Schaker Verlag, Aachen.
- Röhm, O. und Dabbert, S. (2003). Integrating Agri-Environmental Programs into Regional Production Models: An Extension of Positive Mathematical Programming. *American Journal of Agricultural Economics*, 85: 254-265.
- Schmid, E. and Sinabell, F. (2005). Evaluation of Decoupling Scenarios in a Rural Development Context: Results for Austria. Paper Presented at the 89th EAAE Seminar, 3rd - 5th February 2005. Department of Economics, Faculty of Economics at the University of Parma.
- Schmid, E. and Sinabell, F. (2003). The Reform of the Common Agricultural Policy: Effects on Farm Labour Demand in Austria. Working paper, Nr.: 101 W-2003, Department of Economics, Politics and Law, University of Natural Resources and Applied Life Sciences Vienna.
- Semos, A.V. (2002). Organic Farming in the European Union under Common Agricultural Policy, *Quarterly Journal of International Agriculture*, 41, 207-224.
- Sinabell, F. and Schmid, E. (2003). Die Entwicklung von Österreichs Landwirtschaft bis 2015 (development of the Austrian agricultural sector until 2015). In: D. Kletzan, F. Sinabell and E. Schmid, *Umsetzung der Wasserrahmenrichtlinien für den Sektor Landwirtschaft – Ökonomische Analyse der Wassernutzung*, Österreichisches Institut für Wirtschaftsforschung, Wien.
- Vogel, St. und Bichlbauer, D. (1992). Motive zur Umstellung auf biologischen Landbau - erste Projektergebnisse zur Diskussion. Diskussionspapier Nr. 9-W-92 des Instituts für Wirtschaft, Politik und Recht, Universität für Bodenkultur Wien.
- Weinschenck, G. (1990). Strategies to reduce surplus production and environmental burdens, *European Review of Agricultural Economics*, 17, 215-230.