Changing agricultural systems in the context of “compatible” agriculture. The Spanish “experience”

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Appendix
1 Introduction

One of the goals of the CAPRI project consists of analysing the possible environmental impact of the agricultural policies. Some of these policies are being designed to improve the sustainability of the agricultural systems. Before the assessment of such policies, it seems useful to identify which approaches are being followed in each country to support compatible agricultural systems. The present paper deals with the birth of agro-environmental policies in Spain. Our aim is reviewing the changes in farms’ production methods that are required in exchange of support in the framework of agro-environmental measures.

It is important to note that our intention is not to provide a complete overview of all the policy measures that, taking into account the interdependence between agriculture and environment, try to avoid environmental damages. Here we are only interested in those policies that have a higher impact on production methods, which could be evaluated through the framework to be defined under the CAPRI project.

Furthermore, this paper is not under the scope of the Common Market Organisation in the sense that there are policies, such as the set-aside, that may be indirectly beneficial for the environment, but their main focus is not environmental-related.

A different story is that derived from the measures that are more directly targeted to environmental objectives. These policies form the main concern of this paper.

In terms of addressing agro-environmental concerns, the CAP has a short story since, in 1985 and for the first time, the EEC included environmental objectives in Regulation EEC 797/85 on improvement the efficiency of farm structures. That regulation allowed the Member States to support farming practices more respectful with nature, but it had limited application in Spain. The present paper attempts to describe the main policy measures that can have a direct impact on production methods in order to protect the environment.

Major steps have been taken in Spain with:

(i) The application of Regulation EC 2078/92 in the context of CAP reform, and
(ii) The transposition of Directive EEC 676/91 on nitrates

and the present paper will mainly deal with both regulations, although we will mention other policy measures that, at the regional level, may have some impact.

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1 Therefore, our paper does not attempt to provide a comprehensive overview of environmental policies, that indirectly affect agricultural systems. Rather it includes a complementary information to that supplied by the Special issue on “Agriculture and environment”, recently published by DG VI (CAP Working Notes).
**Regulation EC 2078/92** defined a specific set of measures to support different methods of agricultural production that would be compatible with environmental protection and the conservation of rural space. Spain started to apply such Regulation, as other EU Member States did, but it was not until 1994 that a comprehensive environmental program was submitted by Spain to the EU with the objective of implementing Regulation EEC/2078/92.

The main measures included in the program are the following:

1. Promotion of ecological agriculture
2. Protection of species in danger of extinction, supporting genetic variability
3. Farmer’s environmental education and training
4. Support to extensive farming in arable crop areas
5. Strengthening of the National Parks.
6. Humid Areas
7. Bird Life Protected Areas

While the first four sets of measures have a nation-wide coverage, the last three are zone specific. Actually, measures 1, 2, 3, 4 and 6 are those that produce higher impact on the agricultural systems and the present summary will not refer to measures 5 and 7.

In Spain, the last update of normative developing Regulation EC 2078/92 is represented by two Royal Decrees (RD)\(^2\):

\[\text{RD 51/1995 of January 20th sets a regime of horizontal (agricultural sector-wide) measures to support agricultural practices compatible with the protection and conservation of natural space, and}\]

\[\text{RD 928/1995 of June 9th is applicable to certain wetlands. It sets up a regime of aids to support practices compatible with environmental protection, the conservation of the natural space and of wild birds}\(^3\).\]

As far as **Directive EEC/676/91** on nitrates is concerned, it accounts also for some changes in agricultural production methods. This Directive has been transposed to Spanish legislation through RD 261/1996 of 16th of February on water protection against the pollution caused by nitrates coming from agrarian sources. This RD made it compulsory for each Spanish Region’s\(^4\) authorities to elaborate a document, the Code of Good Agricultural Practice (CGAP), in which hypothetical farming scenarios that could reduce pollution caused by nitrates should be specified. After its publication, the CGAP, whose application originally was voluntary, became compulsory for all farms located in “vulnerable” zones.

One important difference between Regulation 2078/92 and the CGAP is that while the first

\(^2\) RDs are Government’s decisions that do not require the Parliament’s approval.

\(^3\) The wetlands which this RD refers to are the Spanish Wetlands that are included in the List of Wetlands of International Importance, specially as habitats of aquatic birds (Ramsar Convention) and the Special Protection areas for Birds (ZEPAs) and the Natural Parks as well that are excluded from the object of our study. Some areas defined by Regional Administration are also contemplated.

\(^4\) We refer to “Autonomous Community” (Comunidad Autónoma) which is the administrative unit which corresponds to the Region concept at level NUTS 2.
allows for payments to compensate farmers for the implementation of production changes, the reduction of the nitrate pollution through the CGAP do not include any explicit system of economic incentives.

The present paper looks at the changes in the actual production systems that the Spanish legislation proposes in order to achieve the goal of having a new “compatible” agriculture. In the first place, we will draw the main objectives of agri-environmental policies, as represented by Regulation 2078 and Directive 676. Afterwards we will summarise the farming commitments that are thought to meet such objectives, according to the framework of Spanish legislation. Finally, we will make a short mention to other policy measures that, under EU schemes, are being influential on production methods, at the regional level.

Remember that our target is to contribute for the identification of changes in farming methods that could be assessed within the CAPRI model, in the context of environmental analysis. This note does not intend to carry out the policy evaluation of the measures in practice but a short description of them. Any evaluation of policies will involve the definition of alternatives. However, before setting the possible alternatives there is a need for clarifying what is currently done in practice in Spain.

2 Objectives of policy measures

1) Making a bid for an extensive agriculture

In fact, the promotion of extensive practices in cereal areas has been the most important measure in terms if resources allocated (86 per cent of total Spain, corresponding to Regulation EEC 2078/92).

- **Preserving the traditional fallow lands** (RD 51/1995. of January 20th), according to regional rates. This includes the use of stubble for cattle and bird feeding.

- **Converting arable crop areas in pastures.** This measure is applicable in the wetlands defined in RD 928/1995.

- **Upkeeping the lands that were abandoned during the last five years** (RD 928/1995).

2) Protecting the flora and the fauna in extensive agriculture, by reducing the use of productive factors (RD 51/1995 and RD 928/1995).

3) Supporting organic farming, which leads to the cropping of agricultural products endorsed by the corresponding regulating Council (see RD 51/1995)\(^5\).

4) Reducing nitrogen pollution in water. This involves identification of the areas under

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\(^5\)The decision of the Commission of 14th November 1994(94/923/CE) defines all the ecological criteria for granting the ecological accreditation to soil improvements.
risk of pollution by detecting high nitrogen levels and the assessment of “vulnerable” areas where the drainage could cause pollution. In vulnerable areas, action programs for preventing and reducing pollution have to be designed, according to the CGAP.

3 Summary of conditions

Next, we describe the basic conditions to be fulfilled by farmers who comply with Spanish legislation. The enclosed annex presents a summary of the practices and the corresponding payments at which Spanish farmers can apply under Regulation 2078/92 and Directive 676/91.

3.1 Making a bid for an extensive agriculture

The different measures involve for farmers to comply with requirements during a five-year term. Next, we summarise the main “rules”, according to the different objectives mentioned in the last section.

3.1.1 Preserving the traditional fallow lands (RD 51/1995).

This has been the most popular practice chosen by Spanish farmers who applied for support under Regulation (EEC) 2078/92 (over 80 per cent of support to compatible agriculture).

§ Keeping as a fallow land an area of, at least 5 hectares. This area can rotate among all the surface of the holding which does not include the lands that are to be put in set aside in a voluntary or a compulsory way, under Regulation (EEC)/1765/92 (CAP reform).

§ Burning stubble is forbidden in the whole holding

§ The use of plant protection products of chemical origin is forbidden in all the areas where these measures are applied during the period of non-culture.

§ The stubble should be kept during a period not below 5 months (or 7 months when the weather makes it possible). This is thought for the profit of wild birds and the pasturing of the cattle. The rests of the harvest have to be buried at the appropriate moment.

§ Livestock units per hectare will not exceed 0.5 LU in the non-cultivated surface.

§ Fallow land must be worked at the end of the winter. This must be done superficially and by keeping the ground level.

§ Every Region must set a calendar with the limit dates for labouring and pasturing. This calendar is annual and its application is compulsory.

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6The annexes 1 and 2 of RD 1541/1994 of July 8th set the upper limits allowed for pollution.
3.1.2 Converting arable crop areas into pastures (RD 928/1995)

Applicable to wetlands included in the Ramsar list and to zones of Special Protection for birds (ZEPAs).

- Five percent of arable land has to be substituted for pastures sown with indigenous varieties. Covered area has to be over 1 hectare.

- In the areas where stopping labouring allows spontaneous regeneration of natural pasture, the process should be supported by phosphoric and nitrogen fertilising and adequate pasturing.

- Setting limits on fertilising per Ha:
  - Phosphoric: 70 FU
  - Potassic: 40 FU
  - Nitrogen: 30 FU

- The maximum and minimum livestock density of the eligible holding should be the ones fixed by the Region’s authorities.

- Total livestock in each holding should not be increased.

- A harvest can be authorised in some exceptional cases at the end of the spring or in the early summer, keeping in mind the characteristics of the lifecycle of the fauna in the region.

- Not removing the indigenous trees and cultures in transformed areas.

- Pasturing has to comply with the calendar set by the Region’s authorities.
3.1.3 Upkeeping the lands that were abandoned during the last five years (RD 928/1995)

This norm is applicable to ZEPAs.

In pastures with a risk of forest fires

a) Kept total livestock must be limited. A pre-fixed pasturing calendar should be respected

b) The forested areas have to be cleared and attention should be paid to the mechanical trimming in lands with high slope.

Abandoned areas of permanent cultures

Mechanical clearance will be allowed only to maintain the trees. Fertilising can be allowed below 30% of the level considered normal in the region.

3.2. Protecting the flora and the fauna in extensive agriculture, by reducing the use of productive factors.

3.2.1 Rearing of endangered breeds

An aid is given to farmers with animals included in a list of indigenous breeds in danger of extinction (RD 51/1995).

3.2.2 Horizontal measures in wetlands

Applicable to wetlands included in the Ramsar list and to ZEPAs (RD 928/1995):

General conditions:

- Fertilising must be rational (only the “AAA” fertilisers are allowed).

- The use of armoured protected seeds is compulsory, without phytosanitary products.

- The burning of stubble is forbidden. Harrowing of the spontaneous vegetation should be limited. At least 1% of the farm’s agricultural area should be allocated to this type of vegetation.

- Each Region should draw a calendar of farming practices for every year and every area. Harvesting cereals at night is forbidden.

Complementary conditions (involving additional payments)

a) Nitrogen fertilising and plant protection products should be reduced at least by 15 per cent, with an upper limit of 60 Kg/Ha in Nitrogen and 1.5 Kg/Ha of active matter in herbicides, per year. Nitrogen fertilising will be allowed with manure, straws and rests of harvests.
b) The labouring of stubble should be rational, which includes the pinking of the straw and its burying. Raising of stubble will take place according with the established calendar by the Region’s authorities.

c) The percentage of the total area allocated to fallow lands should represent a bigger percentage than the one that would be applied in the context of the Common Organisation of the Market. The minimum area to be increased is one Ha.

d) Alternative cultures to the traditional cultures in the zone must be allocated anywhere in the farm and should occupy at least 3 per cent of the total area. Preference must be given to dried pulses and cereals of long cycle.

e) Small lots of land are to be covered by species of ecological interest, with the aim of conserving the biodiversity.

3.2.3 Specific conditions to traditional crops in wetlands

Rational fertilising and plant protection

Rice production

a) 10 per cent reduction in the use of fertilisers and phytosanitaries and substitution of fertilisers for complexes of slow liberation.

b) Substitution of chemical treatments for biological treatments with pheromones and the use of treatments of toxicological index “A”. The aim is protecting birds and aquatic species.

c) Mechanical control of weeds, in special with the technique of covering with mud by means of premature flooding (following an adequate calendar).

Other cultures:

a) Reduction of at least 10% of nitrogen fertilisers that are used and progressive elimination of manure applications. The maximum dose of fertilisation permitted is 110Kg of Nitrogen/Ha.

b) Use of treatments with Toxicological Index “A”

Preservation of traditionally flooded cultures

Rice:

a) Preservation of the culture in areas that are next to ponds or substitution of other cultures for rice.

b) Conservation of the facilities for retaining water such as small floodgates and dykes. The aim of the measure is stabilising the water table for the flooding of rice fields during the period between November and March.
In any case, the burning of stubble is forbidden and straw has to be incorporated to the soil.

**Pastures:**

a) Preservation of the flooded pastures or substitution of annual crops for indigenous fodder plants which are resistant to salinity and to flooding. Limiting the harvest of the pastures according to the biological conditions of the vegetal and animal species that need to be preserved.

b) A complementary payment can be granted when indigenous livestock (maximum 1 LU per hectare) uses these pastures.

3.3 Supporting organic farming (RD 51/1995).

The following conditions are requested for farms during a five-year period:

- Soil fertility is improved or preserved through the culture of green pulses, green fertilisers and organic fertilisers.

- Chemical fertilisers included in part A of Annex II of Regulation (EEC)/2381/94 of the Council is forbidden except for explicit authorisation of the responsible organism.

- In other lots of the same holding where the methods of ecological agriculture are not used, the cultivation of the same species as those subjected to ecological agriculture is forbidden (as given by RD 1852/1993, of October 22, on agricultural ecological production).

- The use of chemical pesticides for plant protection should be avoided. In case of necessity, phytosanitary problems will be fought with products authorised by Regulation (EEC) 2092/91 of the Council.

3.4. Reducing nitrogen pollution in water

According to RD 261/1996, of February 16, which implements the Nitrate directive, a set of good practices is recommended for reducing nitrogen levels from farming activities. The different regions are also working on the preparation of action plans that will make some practices compulsory for farms located in a pre-fixed list of “vulnerable zones”. Next, we present a brief summary of what may be understood as a good practice, according to the CGAP:

3.4.1 Setting limits to the amount of manure applied to the soil

The limit of manure is set in order no to apply a corresponding amount of nitrogen over 170 Kg per year. However, during the first four years of the program, the corresponding regional organisms will allow for different levels, based on objective conditions such as long term cycles, cultures with high demand for nitrogen, high rainfall in vulnerable areas, and soils with high capacity of nitrogen loss.
3.4.2 Defining periods in which the application of fertilisers is advised

The nitrogenous fertiliser should be applied as close as possible to the time the nitrogen is absorbed by the plant. This reduces the risk of having the nitrogen washed away with the leaking water. It will depend in every case on the phenological state of the plant and on the type of fertiliser. We enclose table 1 as an indication.

Table 1

<table>
<thead>
<tr>
<th>PERIODS IN WHICH THE APPLICATION OF FERTILISERS IS NOT ADVISED</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPES OF FERTILISERS</td>
</tr>
<tr>
<td>i,l,m</td>
</tr>
<tr>
<td>j,k,n,p</td>
</tr>
<tr>
<td>a,b,c,d,e,f,g,h</td>
</tr>
<tr>
<td>Non cultivated soils</td>
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<tr>
<td>All year round</td>
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<tr>
<td>All year round</td>
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<tr>
<td>All year round</td>
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<tr>
<td>Fall-Winter cereals</td>
</tr>
<tr>
<td>From sowing to harvest</td>
</tr>
<tr>
<td>From sowing to the beginning of budding</td>
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<tr>
<td>From before the sowing to the beginning of the budding</td>
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<tr>
<td>Spring cereals</td>
</tr>
<tr>
<td>From the sowing to the harvest</td>
</tr>
<tr>
<td>From the sowing to the preparation of the soil for the next culture</td>
</tr>
<tr>
<td>When the cereal is more than 50-60 cm high</td>
</tr>
<tr>
<td>Industrial cultures</td>
</tr>
<tr>
<td>From the sowing to the harvest</td>
</tr>
<tr>
<td>From the sowing to the preparation of the soil for the next culture</td>
</tr>
<tr>
<td>At the lay-by of the culture</td>
</tr>
<tr>
<td>Vegetables</td>
</tr>
<tr>
<td>From a month before the sowing until after the harvest</td>
</tr>
<tr>
<td>From 15 days before the sowing until after the harvest</td>
</tr>
<tr>
<td>Not after the plantation, not before irrigating, except for g).</td>
</tr>
<tr>
<td>Tree plantations</td>
</tr>
<tr>
<td>During the vegetative stop until one month before the winter start of growth</td>
</tr>
<tr>
<td>During the vegetative stop until 15 days before the winter start of growth</td>
</tr>
<tr>
<td>From the end of the fall until the beginning of budding</td>
</tr>
<tr>
<td>Pastures that have not been pastured for more than 6 months</td>
</tr>
<tr>
<td>During the vegetative stop until one month before the winter start of growth</td>
</tr>
<tr>
<td>During the vegetative stop until one month before the winter start of growth</td>
</tr>
<tr>
<td>From the end of the summer until just before the end of the winter</td>
</tr>
</tbody>
</table>

Types of fertilisers:
- a-Fertilisers with N only in a nitric form
- b-Fertilisers with N only in an ammoniac form
- c-Fertilisers with nitric and ammoniac N
- d-Fertilisers with N in an urea form
- e-Fertilisers with N only in an organic form
- f-Fertilisers with organic and mineral N
- g-Fertilisers of slow N liberation
- h-Inhibitors of the enzymatic activity
- i-Bovine manure
- j-Bovine lisier
- k-Pig lisier
- l-Ovine manure
- m-“Gallinaza”
- n-Compost
- p+C14-muds of depurating facilities


3.4.3 Limiting fertilising in sloppy fields
The fields with slopes below 3 per cent are considered flat fields and no specific measures are adopted. A 20 per cent slope is normally set as limit for fields of permanent labour although this limit depends also on other factors that can interfere in the infiltration of water in the soil. For instance, covering with herbs a plantation of trees favours drainage while soils of clay texture disfavour it. The risk of washing away is more important for fertilisers in liquid forms. That is why it is advised to bury them or not to use aspersion cannons with high pressure.

3.4.4 Limiting fertilising in flooded and frozen lands

In the soils frozen only on the surface, alternating ice and thawing, during the day, the distribution of any kind of fertiliser is possible. In the soils that are completely frozen, snowed or flooded, fertilising is not advised due to the bad conditions of infiltration.

3.4.5 Limiting fertilising in lands that are close to the water flows

A margin between 2 and 10 meters wide should be left without fertilisation next to the water flows. The systems of fertirrigation should work so that there will not be dropping at less than between 2 and 10 meters of distance from the water flow.

To reduce the risk of contamination of underground waters, the effluents and the organic residues, should not be applied at less than 35 to 50 meters away from a fountain, well or perforation that provides water for human consumption or that is going to be used in dairies.

3.4.6 Managing rotation systems in a rational way.

It is intended to minimise the uncovered area during the rainy period: a minimum cover of vegetation will absorb the nitrogen before it is washed away.

Examples of Alternatives:

“White” fallow land/cereal/uncultivated land/pasture
Cereal/ White fallow land
Cereal/ “green” fallow land
Several alternatives with sunflowers
Other more complicated alternatives for specific dry and humid areas.

Previous Cultures need to be also kept in mind to increase the production. Table 2 picks up the effect of a previous culture on the current crop yield.

<table>
<thead>
<tr>
<th>Previous crop</th>
<th>Wheat</th>
<th>Barley</th>
<th>Maize</th>
<th>Sugar beet</th>
<th>Potatoes</th>
<th>Rape</th>
<th>Lucerne</th>
<th>Sunflower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>R</td>
<td>B</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
<td>G</td>
</tr>
<tr>
<td>Barley</td>
<td>G</td>
<td>G</td>
<td>VG</td>
<td>B</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
<td>G</td>
</tr>
<tr>
<td>Maize</td>
<td>G</td>
<td>G</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
<td>G</td>
<td>VG</td>
<td>VG</td>
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<tr>
<td>Sugar beet</td>
<td>VG</td>
<td>VG</td>
<td>VG</td>
<td>B</td>
<td>-</td>
<td>G</td>
<td>VG</td>
<td>VG</td>
</tr>
<tr>
<td>Potatoes</td>
<td>G</td>
<td>G</td>
<td>-</td>
<td>-</td>
<td>B</td>
<td>-</td>
<td>VG</td>
<td>G</td>
</tr>
</tbody>
</table>
Rape | R | R | - | - | - | G
---|---|---|---|---|---|---
Lucerne | G | VG | - | B | B | VG
Sunflower | G | G | G | VG | VG | R | VG | B

VG Very Good. Yield reduction below 5 per cent
G Good. Yield reduction between 5 and 15 per cent
R Regular. Yield reduction between 15 and 30 per cent
B Bad. Yield reduction over 30 per cent

Source: Code of Good Agricultural Practice. Ministry of Agriculture (Spain)

It is also advisable to bury the rests of the previous cultures. They have to improve the characteristics of the soil and increase its water retention ability. It is advised to protect the fallow lands from erosion sowing it with leguminous.

3.4.7 Setting fertilising plans according to each farm. These plans should be reflected in register books.

3.4.8 Preventing the pollution of the water caused by the run-off (horizontal movement) and by leaking (vertical movement of the waters) in irrigated areas.

Prevention will take place according to the characteristics of the area. Risk of pollution is less important in areas with clay soils, not very permeable and with high cationic capacity, over 60 or 70 cm deep, with the phreatic layer over 20 m deep and with little slope.

Traditional irrigation by flooding is not advised in areas where the risk of pollution is high or moderate.

In clay soils, long irrigating turns are not advised in order to avoid the formation of deep cracks through which water can leak.

In the case of the fertirrigation, to prevent pollution, the fertiliser should not be added to the irrigation system until 20-25% of the total volume of the water has been poured in. The fertirrigation should be completed when 80-90% of the water has been poured in.

In localised irrigation, in order to correct the high saline concentration in the surface of the “bulb” it is convenient to vary periodically the volumes of water and the irrigation times.

4 Other agri-environmental measures

Apart from the different measures implemented under Regulation (EEC) 2078/92 and Directive (EC) 676/91, we will mention other policy measures, relevant for Spain, that could correspond to CAPRI scenarios to be evaluated from the environmental point of view.

Integrating environmental concerns in the “Mediterranean” Common Market Organisations

- In the failed proposal on the reform of the wine sector (see Commission COM 94/117) the permanent abandonment of wine-grapes areas was limited in areas where maintenance and reconstruction of vineyards is important. This would imply that the
evaluation of uprooting measures would need to distinguish between zones, according to their sensitivity to erosion and other environmental aspects.

- The operational funds established by the new Common Market Organisation for fruit and vegetables include the support of programmes targeted to promote environmentally friendly production techniques, respect of pesticide legislation and organic farming. This can justify the definition of, for example, “organic horticultural systems”, under the CAPRI framework.

**Rural development programmes**

Rural areas falling under the scope of Objective 1 and Objective 5b are benefitted by environmental measures related to agricultural infrastructure, which may have a significant impact on production systems. For example, the Operative Programme “Agriculture and Rural Development” of the Region of Valencia, finances a range of measures (cofinanced by the EU in a 70 per cent), such as the elimination of manure from pig production, the transformation of areas of traditional irrigation to localised irrigation, the integrated pesticide prevention, and the research for farming practices that involve a reduction of fertilising and phytosanitary products (eg. bromure of methilus).

**Integrated Plague Control**

A legal framework for the pesticide use restriction has been issued by the promotion of Farmers’ Associations for Integrated Treatments in Agriculture (ATRIAS). The objective of the ATRIAs is to promote Integrated Plague Control, aiming particularly at

- rationalizing pesticide use, and
- promoting biological and other non-polluting crop management methods

The programme also includes an incentive plan to promote the use of “soft” products (such as pheromones and biological insecticides) and application machinery.

At the end of 1993 there were over 300 ATRIAs, covering over 500,000 hectares, nut with significant weigh in Mediterranean crops, such as citrus, fruits, protected horticulture, rice, cotton and vineyards, where the main use of pesticides is located.

**Horizontal measures**

Regulations (EEC) 866/90 and (EEC) 2328/91 grant investment aids for protecting the natural environment, including organic farming.

The compensatory allowances for the farmers in less favoured areas (Directive EEC/268/75) show an environmental aspect in the sense that maintaining agricultural activities in mountain areas protect the cultivated landscape and avoid erosion. Note that less favoured areas account for a significant part of total agricultural area in many regions. **Because the objectives of agricultural policies may differ between disfavoured and not disfavoured agricultural areas, it would be of interest to distinguish agricultural systems between both types of areas.** This involves a challenge for the CAPRI project, because within a particular administrative region, both kind of areas exist.
5 Discussion related to CAPRI

The review of legislation has allowed us a rough identification of “compatible” agricultural systems, which are being encouraged in Spain under the framework of CAP measures. As far as the CAPRI project is concerned, such identification is important in order to determine the policy scenarios to be evaluated in the context of a simulation model that aims to analyse the integration of environmental objectives in the agricultural policies.

From the background described in this paper, it would make sense to follow the next steps:

§ First, formulating a proposal of “compatible systems”, which would draw on the agricultural systems described in the present paper, selecting out of them, those that can be understood as more relevant or representative in the different Spanish regions and,

§ second, defining such systems in a way that is meaningful for the way the CAPRI equations are specified. This will involve the exact description of the systems in terms of input coefficients, restrictions of the programming models, etc.

As regards to the first step, the compatible systems may well be the result of combining two dimensions:

(1) Sensitivity of the affected zone (region) as regards environment. Thus the compatible systems could be studied in special areas such as:

(1.1) Special Protection Areas (Birds Directive)
(1.2) Vulnerable Zone (Nitrate Directive)
(1.3) Less favoured areas (covered by compensatory allowances, according to Regulation 2328/91)
(1.4) Areas covered by zonal agri-environmental action (Regulation (EEC) 2078/92), eg. wetlands.

(2) Agricultural practices environmentally friendly that are actually or potentially implemented

(2.1) Extensification: low input level and less intensive breeding (Regulation (EEC)2078/92).
(2.2) Upkeeping of fallow land and of abandoned crop areas ((Regulation (EEC)2078/92).
(2.3) Good agricultural practices for limiting nitrate fertilising (Nitrate Directive)
(2.4) Control of Nitrate spreading by animal production (eg. Directive on integrated pollution prevention, controlling intensive rearing of poultry and pigs).
(2.5) Good use and control of pesticides
(2.6) Organic farming (Regulations (EEC) 2092/91 and 2078/92)
(2.7) Move to more efficient methods of irrigation

7 In the present paper we rather use the term “system” instead of “activity”, although under the CAPRI framework the systems may well become activities of the simulation model.
For example, for central Regions of Spain, the cereal productive systems could be broken down in two groups: “extensive” and “traditional”, the first group including the agricultural system followed by farms that comply with compatible production methods (eg. Regulation (EEC) 2078/92). For Mediterranean and Southern Regions, a system for “organic horticulture” could be evaluated. In many Spanish regions, it would also make sense to study a system called “extensive sheep and goats of indigenous breeds”. Normally, such systems will mainly correspond to special areas corresponding to dimension (1).

However, one practical problem is derived from the need for describing such systems in meaningful concepts and coefficients. This will require a methodological work on the modelling side, which only will be clarified when the CAPRI model basic philosophy has been agreed. Therefore, the technical (quantitative) description of the “compatible systems” will be probably best undertaken while the main CAPRI methodological concepts are being defined, in a feed back process.
Appendix

Summary of practices and payments

(Maximum payments in national currency)

1. Making a bid for an extensive agriculture

1.1 Preserving the traditional fallow lands (RD 51/1995).

5,500 pesetas/hectare + up to 40 per cent more when green pulses are sown.
Payments are modulated according the area covered in any farm:

<table>
<thead>
<tr>
<th>Area Covered</th>
<th>Percentage of Maximum Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below and equal to 50 hectares</td>
<td>100 per cent</td>
</tr>
<tr>
<td>Next 50 hectares</td>
<td>80 per cent</td>
</tr>
<tr>
<td>Next 100 hectares</td>
<td>70 per cent</td>
</tr>
<tr>
<td>Area over 250 hectares</td>
<td>No payment</td>
</tr>
</tbody>
</table>

1.2 Converting arable crop areas into pastures (RD 928/1995)

35,000 pesetas/hectare

1.3 Upkeeping the lands abandoned during the last five years (RD 928/1995)

In pastures with a risk of forest fires

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Extensive pasturing practices (limitation to maintained livestock)</td>
<td>hectare</td>
<td>13,000 pesetas</td>
</tr>
<tr>
<td>b) Clearance of forested areas with risk of fires</td>
<td>hectare</td>
<td>30,000 pesetas</td>
</tr>
</tbody>
</table>

Abandoned areas of permanent cultures 18,000 pesetas/hectare

2. Protecting the flora and the fauna in extensive agriculture, by reducing the use of productive factors.

2.1 Indigenous breeds in danger of extinction

10,000 pesetas per Maintained Livestock Unit

2.2 Horizontal measures in wetlands

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Unit</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>General conditions</td>
<td></td>
<td>9,000 pesetas/hectare</td>
</tr>
</tbody>
</table>

Complementary conditions

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Reduction in fertilising</td>
<td></td>
<td>10,000 pesetas/hectare</td>
</tr>
<tr>
<td>b) Rational labouring of stubble</td>
<td></td>
<td>9,000 pesetas/hectare</td>
</tr>
<tr>
<td>c) Increase in fallow area</td>
<td></td>
<td>22,000 pesetas/hectare</td>
</tr>
<tr>
<td>d) Alternative cultures to the traditional cultures</td>
<td></td>
<td>25,000 pesetas/hectare</td>
</tr>
<tr>
<td>e) Species of ecological interest</td>
<td></td>
<td>40,500 pesetas/hectare</td>
</tr>
</tbody>
</table>

2.3 Specific conditions to traditional crops in wetlands

Rational fertilising and plant protection

Rice production

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit</th>
<th>Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Reduction in the use of fertilisers and phytosanitaries</td>
<td></td>
<td>10,000 pesetas/hectare</td>
</tr>
</tbody>
</table>
b) Substitution of chemical treatments for biological treatments 30,000 pesetas/hectare
c) Mechanical control of weeds (Rice crop) 25,000 pesetas/hectare

**Other cultures:**

a) Reduction of nitrogen fertilisers in other cultures 25,000 pesetas/hectare
b) Rational management of phytosanitary products in other cultures 25,000 pesetas/hectare

**Preservation of traditionally flooded cultures**

**Rice:**

a) Preservation of the rice culture in areas that are next to ponds 20,000 pesetas/hectare
b) Conservation of the facilities for retaining water (rice culture) 10,000 pesetas/hectare

**Pastures:**

a) Preservation of the flooded pastures 30,000 pesetas/hectare
b) Indigenous livestock 10,000 pesetas/hectare

3. **Supporting ecological and biological agriculture (RD 51/1995).**

The minimum subsidised area is in brackets.

- Non irrigated arable crops (5 hectares) 20,000 pesetas/hectare
- Irrigated arable crops (1 hectare) 25,000 pesetas/hectare
- Vegetables (0.5 hectares) 40,000 pesetas/hectare
- Greenhouse cultures (0.3 hectares) 75,000 pesetas/hectare
- Olives and vineyards (5 hectares) 45,000 pesetas/hectare
- Non irrigated fruit crops (5 hectares) 35,000 pesetas/hectare
- Irrigated fruit crops (1 hectares) 60,000 pesetas/hectare
- Pastures (15 hectares) 15,000 pesetas/hectare

Farmers who already follow ecological agriculture will receive the 60 per cent of the maximum payment during 5 years.

Farmers who are introducing ecological agriculture practices will get:

- First year 100 per cent of maximum payment
- Second year 80 per cent of maximum payment
- Third year 60 per cent of maximum payment
- Fourth year 60 per cent of maximum payment
- Fifth year 60 per cent of maximum payment

4. **Reducing nitrogen pollution in water**

No payments have been set up until now. Recommendations are described in the Code of Good Agricultural Practice. Binding Action Plans have to be designed by the Regions and will become compulsory in “vulnerable areas”.
List of CAPRI Working Papers:

97-01: Britz, Wolfgang; Heckelei, Thomas: Pre-study for a medium-term simulation and forecast model of the agricultural sector for the EU

97-02: Britz, Wolfgang: Regionalization of EU-data in the CAPRI project


97-04: Meudt, Markus; Britz, Wolfgang: The CAPRI nitrogen balance

97-05: Löhe, Wolfgang; Britz, Wolfgang: EU's Regulation 2078/92 in Germany and experiences of modelling less intensive production alternatives

97-06: Möllmann, Claus: FADN/RICA Farm Accountancy Data Network Short Introduction

97-07: Löhe, Wolfgang: Specification of variable inputs in RAUMIS

97-08: María Sancho and J.M. García Alvarez-Coque: Changing agricultural systems in the context of “compatible”agriculture. The Spanish “experience”

97-09 Helmi Ahmed El Kamel and J.M.García Alvarez-Coque: Modelling the supply response of perennial crops is there a out when data are scarce?