ECOLOGICAL AGRICULTURE IN LLEIDA (CATALONIA-SPAIN)

TERESA ANIZ MONTES (Vegetal Defense Association)
JAUME SIO TORRES (Plant Protection Service)

SUMMARY

Ecological Agriculture in Catalonia (Spain) is a small percentage in relation to spanish production. Lleida is the biggest fruit growing area in Spain. The Ecological Fruit growing (E.F.) extension service in Lleida, the main phytosanitary problems, the incidence of pests and diseases in E.F. and Conventional Fruticulture and their solutions are described.

ZUSAMMENFASSUNG

In diesem Beitrag wird die derzeitige Situation der ökologischen Landwirtschaft Kataloniens dargestellt, die einen kleinen Prozentsatz der gesamten Produktion Spaniens ausmacht. Die Organisation der technischen Beratung in der Region Lleida, die das größte zusammenhängende Obstbaugebiet Spaniens umfaßt, wird erläutert. Die Pflanzenschutzprobleme der ökologisch angebauten Obstbäume, die unterschiedlich stark auftretenden Krankheiten und Schädlinge im Vergleich zu den herkömmlichen Anbaumethoden sowie aktuelle Lösungen im Rahmen der ökologischen Landwirtschaft werden tabellarisch aufgeführt.

1. ECOLOGICAL AGRICULTURE IN CATALONIA

The expression "Ecological Agriculture" (A.E.) was born in Catalonia during 1970 but it is known by the society since 1980. Now the area of Catalonia with ecological crop is 3194 ha. There are 200 professional farmers and food industries. 83,53 % of the ecological farmers practise E.A. since 1990. The farmers are young (around 40 years or younger).
The typical organisation of the catalonian agriculture is a family enterprise which owns the land. Land is managed by the head of the family who is helped by other members of the family. The average area is 10 ha without any animal husbandry. It has to be presumed that incomes from other jobs have to contribute to familiar income.
The farmers are used to form associations like cooperatives and syndicates to overcome the difficulties of their small production.
If we look at catalonian agriculture production (conventional and ecological together) we see differents crops. They range from typical mediterranean to continental products. The main products are fruits, cereals and vegetables.
Ecological home market consumes vegetables, cereals, milk, eggs and meat. We can export olives, olive oil, rice, soya, citrics, vegetables and tinned food.

2. FRUIT GROWING IN LLEIDA

2.1. EXTENSION

The SPV (Servei de Protecció dels Vegetals) is the service of Agriculture Departement of Catalan Goverment wich advises the farmers.
ADV (Agrupacions de Defensa Vegetal) is a group of farmers who contract a technician whose income is partly payed by the Catalonian Governement. The specialist helps to solve problems with crop production. This specialists are coordinated by the Plant Protection Service. They have a meeting every week in order to exchange experiences and results. They also plan different strategies about the work which has to be done.
There are 54 ADV´s which practice conventional agriculture in Lleida department which is the most important fruit production area in Spain (apples: 15,680 ha, pears: 14,067 ha, peaches: 10,800 ha). There are twenty ADV´s which controle the pests by the method "Integrated pest Management" (IPM). The ADV called Oliba was set up in May 1992 in order to practice Ecological Agriculture.

2.2. ADV L´OLIBA

The ADV L'Oliba is active in the regions La Noguera, La Segarra, El Pla D'Urgell, Les Garrigues and El Segrià.
The greatest parts of the ADV land are in reconversion. Generally a reconversion is planned to reduce chemical products and to introduce gradually a balance between soil, seeds, crops, etc. This is a reality in some cases (like vegetables, cereals). Others farmers practice integrated agriculture to pass to ecological agriculture.
There are 50 ha of fruit, 35 ha of cereals, 5 ha of olives, 5 ha of almond trees and 5 ha of vegetables in the ADV L'òliba. The pH of soil is high, equally the CaO content while organic matter is always low. Climate is homogeneous (dry and warm summer (temperatures higher than 30°C) and cold winter (freeze) with fog at low areas). Precipitation ranges from 300 to 400 mm in dry regions.

Fruit growers cultivate three species: apples, pears and peaches.
The main fruit varieties are:

Apple: Starking, Group Golden
Pear: Blanquilla, llimonera (Dr Guyot), William's, Alexandrina Drouillard
Peach: Local varieties (Sodanell, Campiel, etc)

At the moment there are no different varieties in ecological and conventional production.

2.3. CROP METHODS

- Prune
Tree fruits are conducted by conventional methods. In a physiological balance. There are problems especially in older orchards to reduce shoot growth.
- Weeds
The farmers only use mechanical methodes. They cut the weeds and they extend it on the field. It acts like green manure.

- **Fertility**

Fertility is based on humus, liquid and solid excrements. They do not come from ecological farms.

- **Machinery**

All the farmers from Lleida have a tractor, a grinder (horizontally and vertically axle), a mower and a sprayer.

- **Vegetal material**

Origin of vegetal material is still generally from conventional Agriculture.

2.4. PEST AND DISEASES: PROBLEMS AND THEIR SOLUTIONS

The incidence of pests and diseases in standard and in ecological fruit growing:

Very high: Surpass Economic Threshold. Applied control methods and surpass the economic injury level.
High: Surpass Economic Threshold. Applied control methods and don't surpass the economic injury level.
Medium: Irregular distribution of pest density. There are orchards over and below the Economic Threshold. Treatments are solution. There are no injuries.
Low: The greater part of the orchards are below the Economic Threshold. Specific treatments are not necessary.

PEAR

PEST	INCIDENCE		METHOD
	STANDARD CHEMICAL	ECOLOGICAL AGRICULT.	
Panonychus ulmi, Koch	LOW	LOW	BIOLOGICAL CONTROL
Quadraspidiotus perniciosus Comst	HIGH	HIGH	DORMANT SPRAYS (Polisulphur Ca)
Cacopsylla pyri, L	HIGH	VERY HIGH	TREATMENT OF SOAP AND BIOL. CONTROL
Hoplocampa brevis Klug	LOW	MEDIUM	RESEARCH
Janus compressus F	LOW	LOW	-
Dasyneura pyri, BCH	LOW	LOW	-
Aphis pomi, De Geer	LOW	LOW	-
Dysaphis pyri Fonsc	LOW	LOW	-
Epitrimerus pyri, Nal	MEDIUM	MEDIUM	SULPHUR AND POLISULPHUR
Adoxophies orana, FR	MEDIUM	MEDIUM	bacillus thuringiensis
Pandemis heparana, Den y Schiff	MEDIUM	MEDIUM	bacillus thuringiensis
Cacoecimorpha pronubrana Hb	MEDIUM	MEDIUM	bacillus thuringiensis

PEST	INCIDENCE		METHOD
	STANDARD CHEMICAL	ECOLOGICAL AGRICULT.	
Cydia pomonella, L	HIGH	VERY HIGH	Granulovirus, bacillus thuringiensis mating disrupt
Leucoptera malifoliella O.G. Costa	LOW	LOW	-
P. blancardella F	LOW	LOW	BIOLOGICAL CONTROL
P. corylifoliella Hw	LOW	LOW	BIOLOGICAL CONTROL
Trips	LOW	LOW	-
Ceratitis capitata Wied	MEDIUM	MEDIUM	NO DEFINITE
Cossus cossus L	MEDIUM	MEDIUM	LOCATED TREATMENTS
Zeuzera pyrina L	LOW	LOW	-
Synanthedon myopaeformis Borkh	LOW	LOW	-
Aphanostigma pyri Chol	MEDIUM	MEDIUM	NO DEFINITE
DISEASES			
Venturia pyrina Aderhold	HIGH	VERY HIGH	COPPER AND SULPHUR
Stemphylium vesicarium Wallr	HIGH	VERY HIGH	NO DEFINITE
Pseudomonas psyringae Van Hall	MEDIUM	MEDIUM	COPPER

APPLE

PEST	INCIDENCE		METHOD AE
	STANDARD CHEMICAL	ECOLOGICAL AGRICULTURE	
Panonychus ulmi, Koch	HIGH	LOW	BIOLOGICAL CONTROL
Quadraspidiotus perniciosus Comst	HIGH	HIGH	DORMANT SPRAYS (Polisulphur Ca)
Eriosoma lanigerum, Hausm	MEDIUM	MEDIUM	BIOLOGICAL CONTROL
Aphis pomi, De Geer	HIGH	LOW	BIOLOGICAL CONTROL
Dysaphis plantaginea, Pass	HIGH	HIGH	NO DEFINITE
Adoxophies orana, FR	MEDIUM	MEDIUM	Bacillus Thuringiensis
Pandemis heparana, Den y Schiff	MEDIUM	MEDIUM	Bacillus Thuringiensis
Cacoecimorpha pronubrana Hb	MEDIUM	MEDIUM	Bacillus Thuringiensis

PEST	INCIDENCE		METHOD
	STANDARD CHEMICAL	ECOLOGICAL AGRICULTURE	AE
Cydia pomonella, L	HIGH	VERY HIGH	granulovirus BT, Mating disrupt
Leucoptera malifoliella O.G Costa	MEDIUM	MEDIUM	NO DEFINITE
Phyllonoricter blancardella F	LOW	LOW	-
Phyllonoricter corylifoliella, Hw	LOW	LOW	BIOLOGICAL CONTROL
Trips	LOW	LOW	BIOLOGICAL CONTROL
Ceratitis capitata Wied	MEDIUM	MEDIUM	NO DEFINITE
Zeuzera pyrina L	MEDIUM	MEDIUM	LOCATED TREATMENTS
Synanthedon myopaeformis Borkh	HIGH	HIGH	LOCATED TREATMENTS
Aculus schlechtendali	LOW	LOW	-
DISEASES			
Venturia inaequalis	HIGH	VERY HIGH	COPPER AND SULPHUR
Podosphaera leucotricha	HIGH	HIGH	SULPHUR

PEACH

PEST	INCIDENCE		METHOD
	STANDARD CHEMICAL	ECOLOGIAL AGRICULTURE	AE
Panonychus ulmi Koch	LOW	LOW	BIOLOGICAL CONTROL
Quadraspidiotus perniciosus Comst	HIGH	HIGH	Dormant sprays (Polisulphur Ca)
Cydia molesta Busck	HIGH	HIGH	Mating disrupt
Anarsia lineatella Zell	HIGH	HIGH	Mating disrupt
Trips	MEDIUM	MEDIUM	NO DEFINITE
Frankliniella occidentalis	MEDIUM	LOW	-
Capnodis tenebrionis	LOW	LOW	-
Myzus persicae Sulz	HIGH	HIGH	-
Aculus cornutus Banks	MEDIUM	LOW	-
Ceratitis capitata Wied	MEDIUM	MEDIUM	NO DEFINITE
Sphaeroteca pannosa var persicae Woron	MEDIUM	MEDIUM	SULPHUR
Taphrina deformans (Berk.) Tul	MEDIUM	MEDIUM	COPPER
Coryneum beijerinkii Oud	MEDIUM	MEDIUM	COPPER

PEST	INCIDENCE		METHOD
	STANDARD CHEMICAL	ECOLOGIAL AGRICULTURE	AE
Monilia laxa Honey	MEDIUM	MEDIUM	NO DEFINITE
Fusicoccum amygdali Delacroix	MEDIUM	MEDIUM	NO DEFINITE

3. PRESENT AND FUTUR SITUATION

The area under ecological production is small but there is a evolutionary process. The percentage has increased every year since 1988.

In Lleida we have the following restricting factors:

- Climate. Lleida is an area where freezes occur frequently in spring with an important reduction of production. Dry summers and high temperatures favour the pests. They have more generations than in Northern Europe countries.

- Pests and diseases. In a small area we have 44.000 ha of fruit orchards. They are very concentrated. There are problems because of contamination from other fields. Especially lepidoptera for example *Cydia pomonella* attack the fruits.
This year was a special one because it was rainy. There were attacks of *Venturia sp.*, *Stemphyllium sp.* and *Monilia sp.*

- Economic problems. All change is a risk.

- There is a lack of experience, technical extension and technology.

- Air pollution and neighbourhood treatments can influence the ecological crop.

- There is little governmental support.

- Another restricting factor is the lacking market.