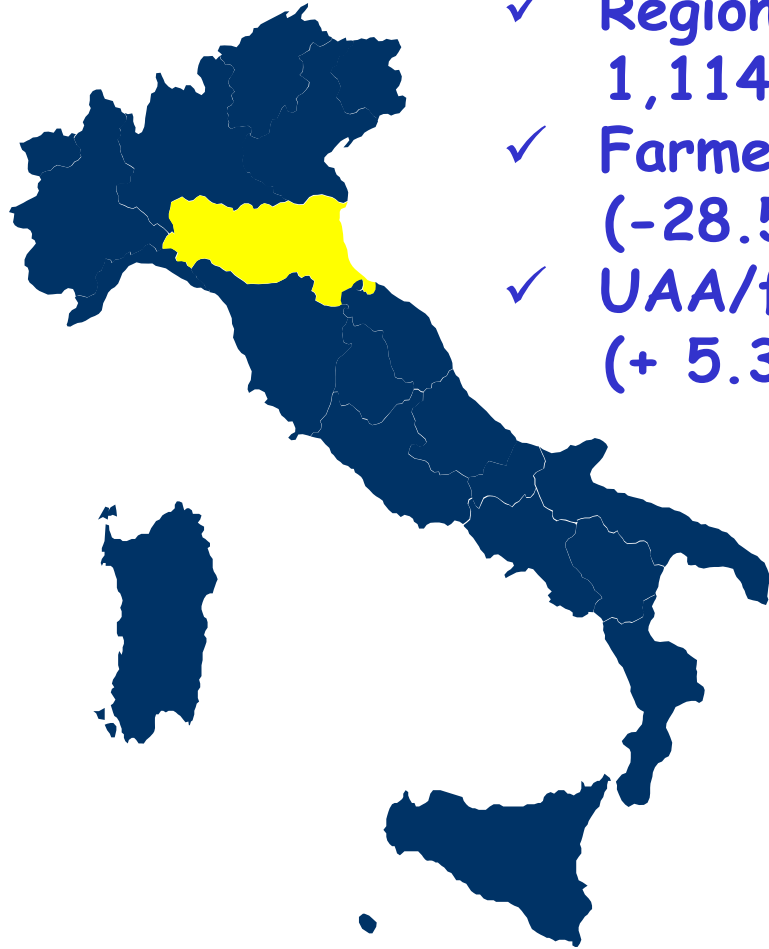


IPM in Emilia-Romagna: experiences from large-scale implementation of IPM with support from the region

Tiziano Galassi
(Phytosanitary Service)

Emilia - Romagna Region



- ✓ Regional UAA (utilized agricultural area): 1,114,000 ha
- ✓ Farmers: 108,000 (-28.5% compared to 1990)
- ✓ UAA/farmer average: 13.6 ha (+ 5.3 compared to 1990)

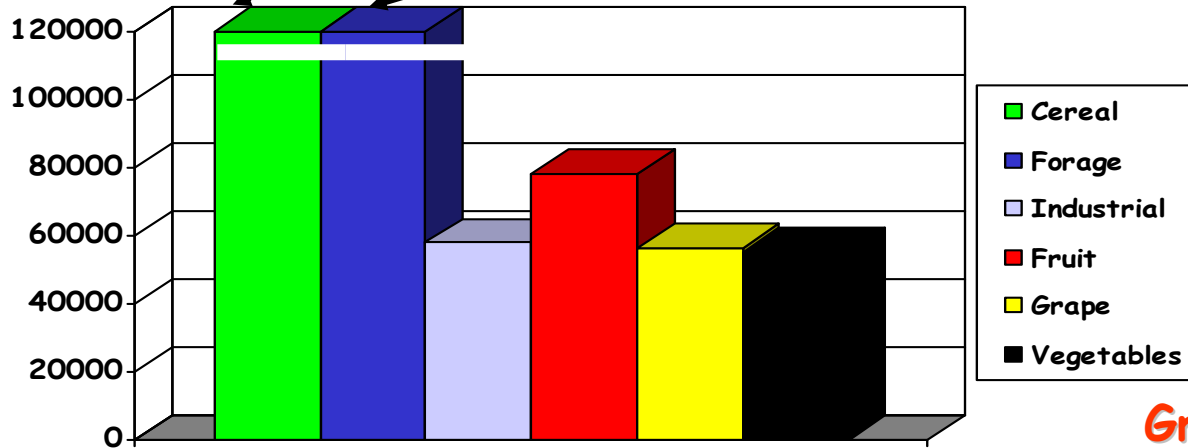
Nine provinces

Population in region : 3,929,000
Total regional area : 22,123 km²
Population density: 178 people/km²

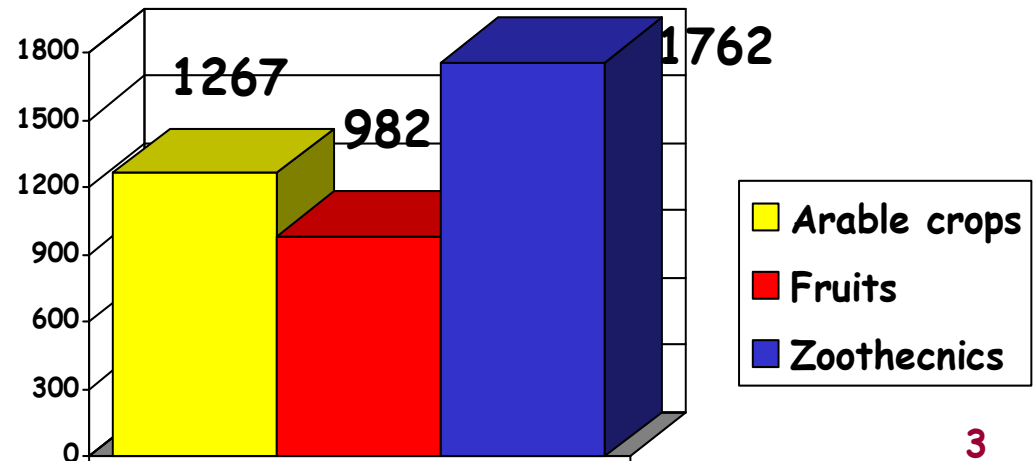
Agriculture in Emilia Romagna Region

UAA : 1,101,524 ha

402.895 451.175



Gross marketable production
4,011 M€



Euro (million)

Emilia - Romagna Region

Food - industry

"Parmigiano Reggiano"

consorzio di tutela

5.480 farmers

512 dairies



"Prosciutto di Parma"

consorzio di tutela

189 farmers



Firms



Emilia - Romagna Region

DOP and IGP products



**In Emilia-R. there are 25 DOP e IGP products
(= 15% of the DOP e IGP national products).**

Emilia - Romagna Region

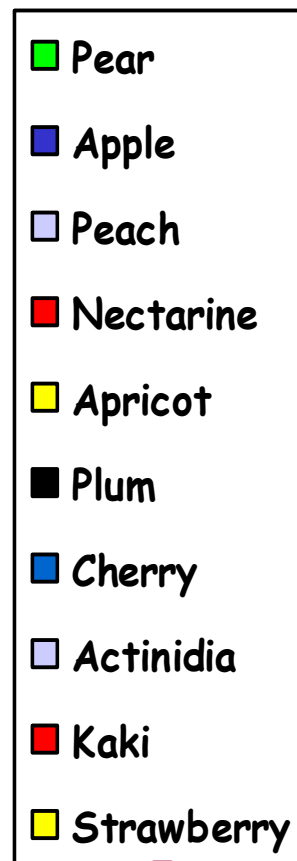
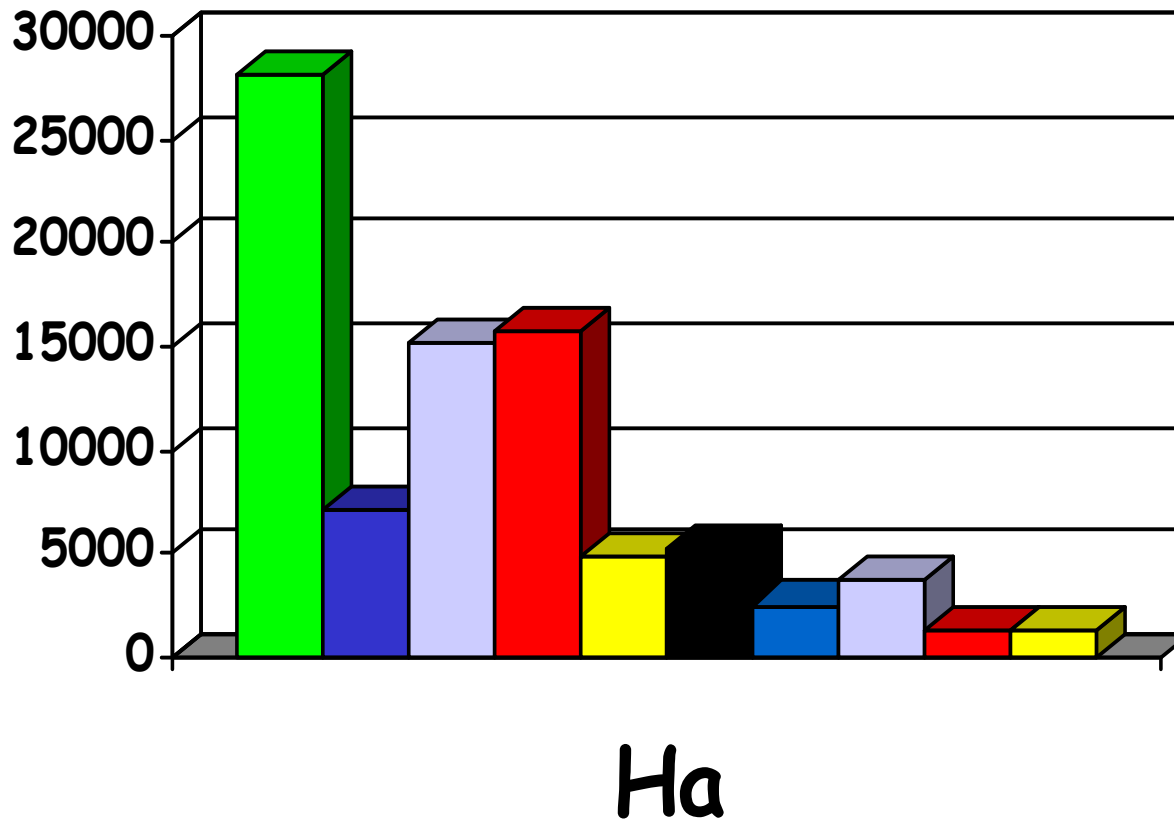
OP and AOP work in Region (UE 1234/2007)

AFE	FERRARA
AGRIBOLOGNA	BOLOGNA
AINPO	PARMA
APO CONERPO	BOLOGNA
APOFRUIT ITALIA	CESENA
ARP	PIACENZA
ASIPO	PARMA
CHIARA	FERRARA
CICO	FERRARA
CIO	PARMA
CIOP	FERRARA
COPADOR	PARMA
EUROPFRUIT	CESENA
MODENESE ESSICAZIONE	MODENA

FINAF	BOLOGNA
GEAGRI	FERRARA
GRANFRUTTA ZANI	FAENZA
LA DIAMANTINA	FERRARA
MINGUZZI	RAVENNA
MODERNA	MODENA
OP FERRARA	MODENA
OPOE	BOLOGNA
OROGEL FRESCO	CESENA
PEMPACORER	RAVENNA
ROMANDIOLA	FAENZA
VEBA	FERRARA
FUNGHI delle TERRE di ROMAGNA	RIMINI

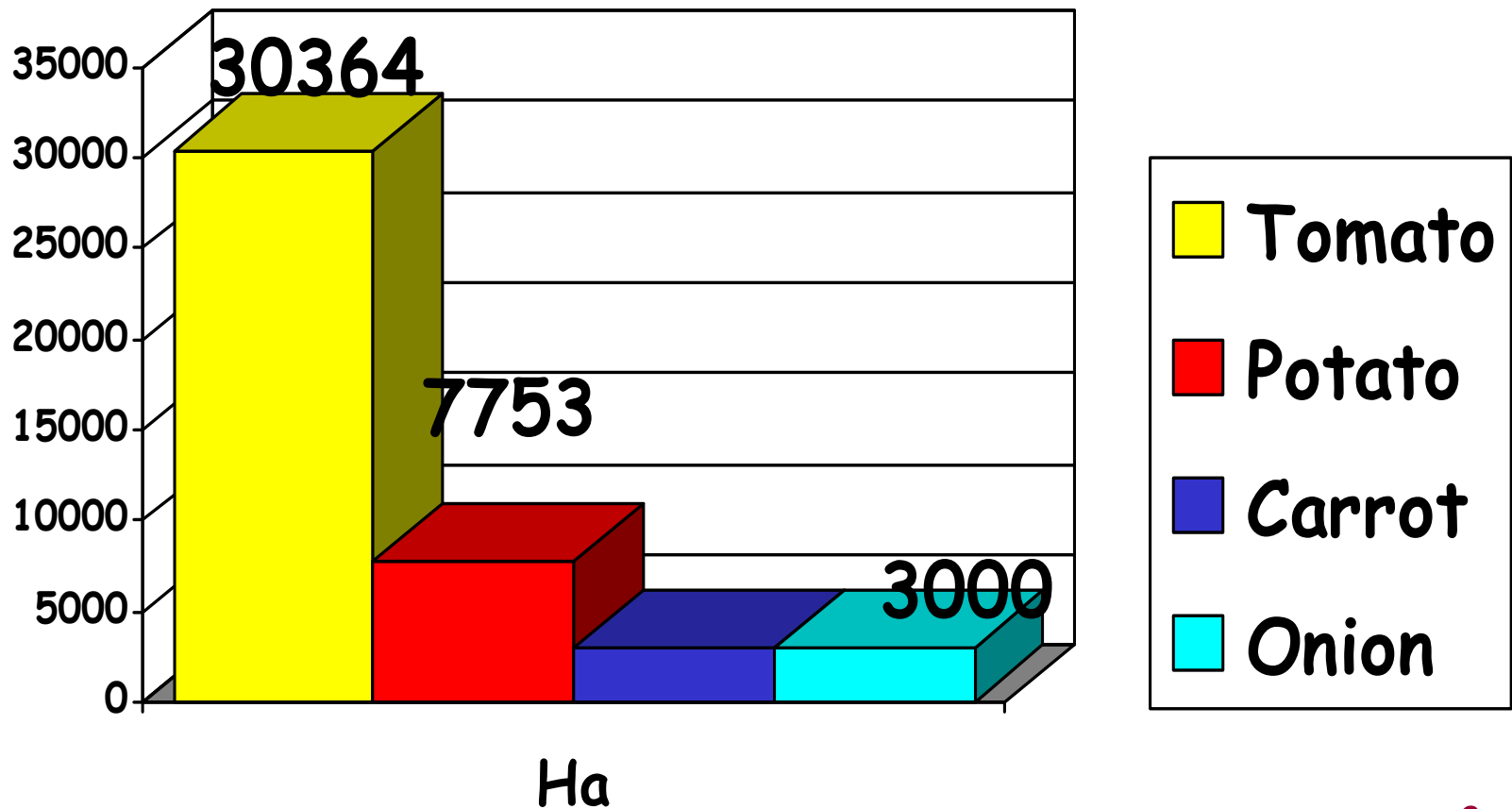
Emilia - Romagna Region

ASU Fruit: 83,733 ha



Emilia - Romagna Region

ASU Horticultural: 64,000 ha



Estimated ORGANIC area

- Organic certified area: 85.000 ha
- About 7,7% of the total regional ASU

What we do in the Emilia – Romagna Region



**QUALITY
ASSURANCE OF
TECHNICAL
REGULATIONS**









**ASSURANCE ON THE
CORRECT
APPLICATION
OF THE **IPM**
THROUGH ADEQUATE
SUPPORT TO FARMS**

Started in the mid-1970s

Reduction and rationalisation of pesticide use:

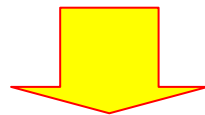
- ◀ safeguarding farmers' health
- ◀ safeguarding consumers' health
- ◀ reduction in environmental impact

I.P.M.

OBJECTIVES	MAIN CONCERN			
	Company	Producer Association	Distribution System	Farms
Reduce environmental impact				
Safeguard producers' health				
Safeguard consumers' health				
Controlled production quality				

With contract: almost 150,000 ha
about 15-20% of total UAA

- ✓ fruit 29,122 ha - (44% of total)
- ✓ vegetables 23,097 ha - (47% of total)



Total estimated influence on
60-65% of horticultural land

IPM - Visibility

Regional
Label



Organic
Label



IPM and Organic farming are the starting point for the traceability of our production



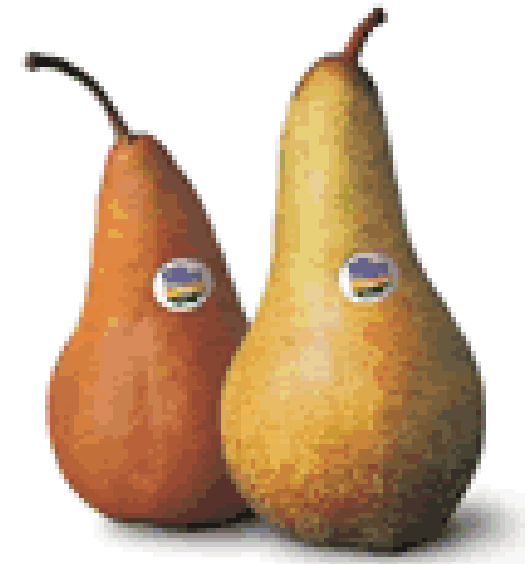
Produced by: Matthew Clark Brands Ltd.	
SSCC: 35010134	S123456 9
Production Site: SM Line: LING1	QTY: 55 BBE: 08.08.2001
EAN-TRADE-NO: 05010134001298	
000543 Ice Dragon Cyder PMP 12 x 1L	
Lot / Batch 7295	Works Order: 9786543
	
0105010134001298(99)3501013451234569	
	
(99)000543(240)9786543(21)S123456(23)7295(37)0055	

New Labels (DOP and IGP)

*Pesca e
Nettarina di*
romagna
IGP



Pera dell'
**emilia-
romagna**
IGP



In our region there are also many

"IPM PRIVATE LABELS"

All people work together for any
technical aspects in the

**REGIONAL IPM ORGANIZATION
SYSTEM**

Principles and Criteria in IPM

"EC Decision" - No. C(96) 3864 dated 30/12/96

Promotion of phytosanitary protection with reduced impact on man and the environment while allowing for economically acceptable production

Development of correct pest management based on two decisions

Evaluation of the need for intervention and choice of best time

Rationalisation of protection methods

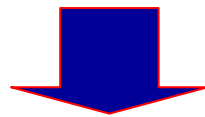
The limitation or ban of the use of certain phytosanitary products is dictated by:

- ✓ **toxicological aspects**
(toxicological class risk phrases)
- ✓ **environmental aspects**
(negative effects on non-targeted organisms, water, land and persistence in the environment)
- ✓ **carry-over effect and residues in produce**
- ✓ **selectivity as regards beneficial organisms**
- ✓ **risk of selecting resistant populations**

RISK PHRASES THAT LIMIT THE USE IN IPM

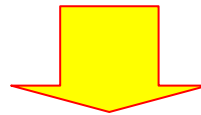
- ✓ R 40 Limited evidence of carcinogenic effect
- ✓ R 60 May impair fertility
- ✓ R 61 May cause harm to unborn child
- ✓ R 62 Possible risk of impaired fertility
- ✓ R 63 Possible risk of harm to the unborn child
- ✓ R 68 Possible risk of irreversible effects
- ✓ R 48 Danger of serious damage to health by prolonged exposure

- National Committee for IPM (since 1997): verifies coherence of regional regulations with IPM principles and criteria
- “National Guidelines for IPM” defined by the National Committee for IPM for 117 crops



- ✓ Voluntary certification of integrated production: UNI regulation no. 11233 of 3 May 2007 (i.e. private system)
- ✓ National system for integrated production quality: D.M. no. 2722 of 17 April 2008 (i.e. public system)

“National Guidelines for IPM”



www.politicheagricole.it/SviluppoRurale

Frame: “Linee Guida Nazionali Produzione Integrata”
2008-2009 - 15/09/2008

Components of IPM system

Research and experimentation



Regulations for integrated production



Relations with the market

IPM system

Relations with industry



Technical support to farmers



Support systems for advisors



Coordination of technical support



- € 1,150,000 for research in 2002
Now € 500,000 - 600,000
- 130 - 150 research programmes

- Transfer of results:
 - ✓ field visits
 - ✓ internal meetings (at least 15 per year)
 - ✓ public meetings (4-5 every year)
- Rapid implementation of innovations
in the regional regulations for IPM with
immediate practical application

Devising solutions:

- Evaluation of biological solutions
- New strategies
- Comparison of pesticides
- Selectivity of pesticides

Resistance management

- Peronospora
- Ticchiolatura
- Maculatura bruna
- Oidio cucurbitaceae
- Carpocapsa
- Cydia molesta
- Tignola vite
- Aphids
- Weeds

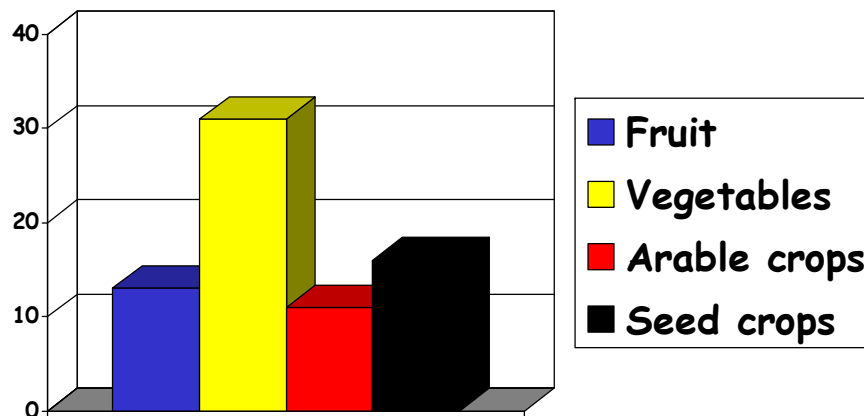
New problems

- Giallumi vite
- Tignola patata
- Reduction of insecticides availability
- Nottue on arable crops
- Carpophages management

Development of new prediction models

Eco-toxicological evaluation of pesticides

- Herbicide persistence in the soil
- Pesticide database



No. of crops with regional regulations:
71

- ✓ Reference documents for regional agro-environmental policies
- ✓ Based on the results of research
- ✓ Reference documents for stakeholder debates

E.g.: Regulation on integrated protection of “Potato” against cryptogams

Disease	Criteria for disease control	A.S	Limitation of use
Phytophthora infestans	<p><u>Agronomic interventions:</u></p> <ul style="list-style-type: none"> - use of seedling tubers which are definitely healthy - choice of varieties which are not very susceptible - elimination of plants born from seedling tubers that were left in the ground from previous years - wide rotations - balanced manuring - adequate sowing distance to avoid excessive density of plants and of the development of the aerial parts <p><u>Chemical interventions:</u></p> <ul style="list-style-type: none"> - first treatment when the environmental and cultivation conditions are favourable for infection (rain, fog, high relative humidity and temperature between 10 and 25°C) - for the following applications you can either repeat them after 6-10 days depending on the persistence of the products used, or follow the evolution of the disease on the basis of climatic parameters 	<p>Copper products Dodina Fosetil Al+ Cu oxycloride Fluazinam Cimoxanil (1) Metalaxil-M (2) Benalaxil (2) (Benalaxyl M(2)+ Mancozeb)(7) Dimetomorf (3) Iprovalicarb (5) Zoxamide-Mancozeb (6)(7) Mancozeb (7)</p>	<p>(1) Maximum three times per year (2) Maximum three times per year with phenylamides only in Xi formulations (3) Maximum three times per year (5) Maximum three times per year (6) Maximum three times per year (7) Maximum three times per year. Suspend interventions 21 days before harvest.</p>
Alternaria solani	<p><u>Agronomic interventions:</u></p> <ul style="list-style-type: none"> - wide rotations - use of healthy seedling tubers <p><u>Chemical interventions:</u></p> <ul style="list-style-type: none"> - specific interventions against this pathogen are only necessary in the case of infection of young plants as the anti-peronospora products usually used are also effective against early blight 	<p>Copper products</p>	

E.g.: Regulation on integrated protection of “Tomatoes” against cryptogams

Disease	Criteria for disease control	A.S	Limitation of use
Phytophthora infestans	<p>Protection to be started on the basis of the weekly bulleting issued by the province.</p> <p>These bulletins are issued taking into account the I.P.I. (Infection Potential index) forecast model and the aerobiological measurements and measurements of the pilot fields.</p> <p>The use of copper products is to be preferred especially in the initial phase as they fight peronospora and also have a bacteriostatic action. In high humidity conditions the use of systemic products is recommended while in the period close to the harvest it is better to use products with a short safety interval.</p>	<p>Copper products Dodina Metalaxil-M (1) Benalaxil (1) (Benalaxyl M(1)+Mancozeb)(9) Dimetomorf (2) Cimoxanil (3) Azoxystrobin (4) (6) (Pyraclostrin (5)(6) + Metiram (9)) Fosetil Al Iprovalicarb (7) Zoxamide- Mancozeb (8) Mancozeb (9) Metiram (9)</p>	<p>(1) Maximum 3 times per year with phenylamides (2) Maximum 3 times per year (3) Maximum 3 times per year (4) Maximum 2 times per year independently from the adversities (5) Maximum 3 times per year independently from the adversities (6) Maximum 3 times per year independently from the adversities (7) Maximum 3 times per year (8) Maximum 3 times per year . (9) Maximum 3 times per year independently from the adversities Suspend interventions 21 days before harvest.</p>
Alternaria solani	<p><u>Agronomic interventions:</u></p> <ul style="list-style-type: none"> - use of healthy seedlings - wide cultivation rotation - avoid stagnating water and limit irrigation <p><u>Chemical interventions:</u></p> <ul style="list-style-type: none"> - specific interventions are not usually necessary as those anti-peronospora are also effective against these diseases - for serious cases and in particularly humid areas a treatment is recommended when the first symptoms appear and a second one after 8-10 days 	<p>Copper products Azoxystrobin (1) (3) (Pyraclostrin (2)(3) + Metiram (4)) Difenconazole (5)</p>	<p>(1) Maximum 2 times per year independently from the adversities (2) Maximum 3 times per year independently from the adversities (3) Maximum 3 times per year independently from the adversities (4) Maximum 3 times per year independently from the adversities Suspend interventions 21 days before harvest. (5) Maximum 3 times per year</p>

Regional level

Regional coordination of technical support and “emergency” management (at least 30 meetings per year)

Provincial level (9 provinces)

Provincial coordination for the definition of communication programmes (at least 320 meetings per year) with 230 weekly provincial bulletins issued by:

- ✓ leaflets
- ✓ SMS
- ✓ internet bulletins
- ✓ articles in local newspapers

WEATHER

Service provided by the regional Agency for environmental protection (Arpa): hourly temperatures (definition of km 5x5), forecast of temperatures for the next 3 days, precipitation forecast

COLTURA		CRITTOGAME	FITOFAGI
ARBOREE	Albicocco	Oidio, Monilia	Anarsia
	Ciliegio	Corineo, Monilia	Afidi, Mosca, Archips, Eulia
	Melo	Ticchiolatura, Oidio	Carpocapsa, Ricamatori, Eulia, C. molesta, Afidi
	Olivo	Occhio di pavone	Mosca, Tignola
	Pero		Carpocapsa, Ricamatori, Eulia, C. molesta, Afidi,
	Pesco		
	Susino		
	Vite		
ERBACEE	Frumento		
	Riso		
	Bietola		
ORTICOLE	Asparago		
	Carota		
	Cipolla		
	Cucurbitacee	Peronospora, Oidio	Afidi, Raghetto rosso
	Fagiolino	Botrite, Ruggine, Sclerotinia,	Afidi, Raghetto rosso, Piralide, Nottue
	Fragola	Oidio, Zitia, Vaiolatura, Batteriosi, Botrite, Antracnosi	Afidi, Raghetto rosso
	Lattuga	Peronospora, Botrite, Sclerotinia,	Afidi, Tripidi, Nottue
	Mais	-	Piralide
	Patata	Peronospora, Alternariosi	Dorifora
Pomodoro	Batteriosi	Afidi, Nottua gialla	











Monitoring in 2006

**More than 26,400 controls
on 396 fields**







Diseases



In use: 10

-  Cercospora della bietola
-  Ruggine bruna del frumento
-  Oidio del frumento
-  Peronospora della cipolla
-  Peronospora della patata
-  Peronospora del pomodoro
-  Ticchiolatura del melo
-  Maculatura bruna del pero
-  Colpo di fuoco batterico
-  Peronospora della vite








Being developed: 6

-  Oidio della vite
-  Botrite della fragola
-  Bolla del pesco
-  Oidio del frumento
-  Septoria del frumento
-  Fusariosi del frumento





Insects



In use: 8

-  Tignoletta della vite
-  Carpocapsa
-  Tignola orientale del pesco
-  Eulia
-  Pandemis cerasana
-  Tignola del susino
-  Anarsia del pesco

Being developed: 4

-  Dorifora della patata
-  Psilla del pero
-  Afidi colture orticole
-  Liriomyza huidobrensis

Advisors (*)	395
Coordinators (*)	12
Support activities (public)	11

(*) Private with money from Region

Farm monitoring,
monitoring network and outputs of forecast models

Regional coordination meetings:
about 30 meetings per year

Diffusion
via
internet

Provincial coordination meetings:
about 320 meetings per year

Integrated production bulletins:
about 230 per year

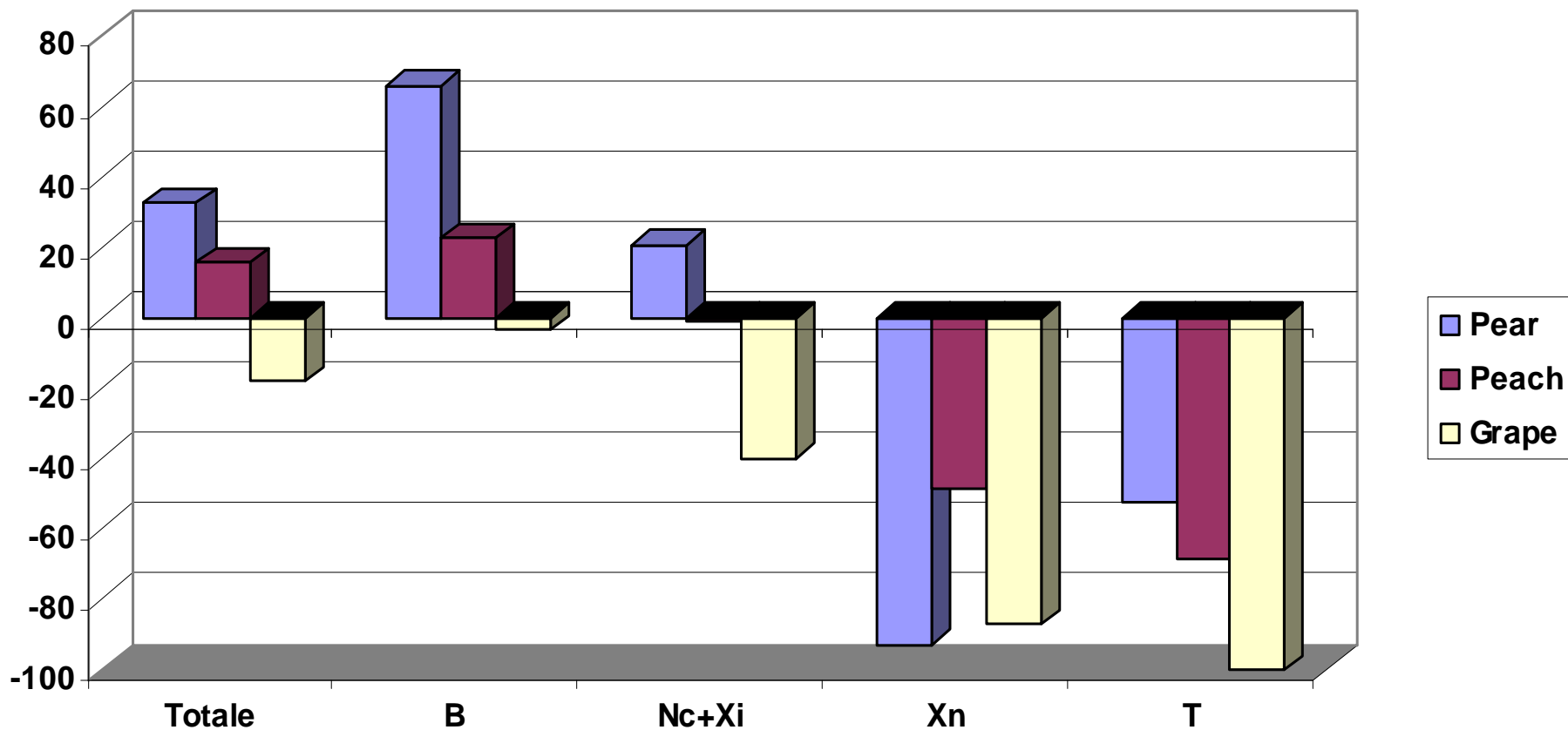
Advisors'
visits

 leaflets
 internet, telephone
 local newspaper etc.

Farms

Impact evaluation of IPM programme (toxicity class of insecticides) 2003

Differences as % between IPM farms and traditional ones



Pesticides

- According to the crop, 20-35% reduction in the amount used
- Improved impact on humans and the environment:
 - between 70 and 90% reduction in pesticides with high acute toxicity
 - between 40 and 95% reduction in pesticides with high chronic toxicity
- strict respect for residue limits

IPM - Some results: Chronic risk

IPM of Emilia-Romagna Region	INSECTICIDES IN ITALY - CRONIC RISK - ACTUAL SITUATION				
	Active ingredient	R 40	R 60 - 62	R 61 - 63	R 68
Not in use	Propargite	X		X	
	Spyrdiclofen	X			

IPM of Emilia-Romagna Region	HERBICIDES IN ITALY - CRONIC RISK - ACTUAL SITUATION				
	Active ingredient	R 40	R 60 - 62	R 61 - 63	R 68
Not in use	Bromoxinil			X	
	Chlortoluron	X		X	
	Diuron	X			
	Ioxinil			X	
	Isoproturon	X			
	Molinate	X	X		
Only Xi formulation and only mais	Isoxaflutolo			X	
Only rice	Bensulfuron-metile			X	
In few crops	Clorprofam	X			
	Fluazizop-p-butile			X	
Only on beans, green beans,	Linuron	X	X	X	
In IPM	Propizamide	X			

IPM - Some results: Chronic risk

IPM of Emilia-Romagna Region	FUNGICIDES IN ITALY - CRONIC RISK - ACTUAL SITUATION				
	Active ingredient	R 40	R 60 - 62	R 61 - 63	R 68
Not in use	Bromoconazolo			X	
	Clorotalonil	X			
	Dinocap			X	
	Epossiconazolo	X	X	X	
	Fenarimol		X	X	
	Fluasilazolo	X		X	
	Folpet	X			
	Kresoxim-metile	X			
	Protioconazolo			X	
	Carbendazim	X			
Only Xi formulation	Ciproconazolo			X	
	Miclobutanil			X	
	Tebuconazolo			X	
Only peach and post harvest	Tiofanate metile				X
Peach only in winter - Pear and apple only 2 time/year	Captano	X			
Only 1 time/year pear, cabbage	Iprodione	X			

Pesticide residuals

- Normally who applies IPM reduces:
 - total residuals
 - residual of singol pesticide
- any problem regarding limitation MRL and ArFD
- It is possible to increase numbers of pesticides residual

- ✓ Anticipated some measures in the "Framework Directive on Sustainable Use of Pesticides":
 - inspections of sprayers
 - replacement of the most hazardous a.i. by those less hazardous
 - training of the farmers on use of most dangerous pesticides; only farms with licences can buy best dangerous pesticides.

Effect of application (Dir. 91/414) on IPM in Emilia-Romagna (Survey on DPI 2004 - 2007)

Active ingredient	Apple		Pear		Peach	
	Conventional	IPM	Conventional	IPM	Conventional	IPM
Number in 2004	141	59	177	56	113	51
Number in 2009	110	66	100	59	93	57
OUT - Annex I	45	10	89	9	32	10
% Riduction	32	17	50	16	28	20
New	14	10	12	10	13	10

New regulation will replace by direttiva 91/414

- Our approach has been confirmed:
 - all pesticides are not equal

- It's very important:
 - organic agricultural area increase
 - IPM area increase
 - quantitative reduction in pesticide use
 - reduction or banning of the most dangerous pesticides against environment, consumers, farmers and bystanders

New regulation will replace by direttiva 91/414

- We would like to increase attention to quality of the PPP :
 - CMR cronic effects,
 - POP
 - PBT

- We hope to get shortly:
 - PPP cut off list
 - PPP list of the candidates for substitution

“Directive aiming to determine a E.U. framework on the sustainable use of pesticides”

IMP - COMPULSORY LEVEL:

- We would like to increase basic studies, basic guidelines and extention service:
 - Weather Service
 - Forecasting Service for the most important diseases and pests
 - Monitoring disease and pest Service
 - Coordination of the warning activities
 - Farm information planning

“Directive aiming to determine a E.U. framework on the sustainable use of pesticides”

IPM - VOLUNTARY LEVEL:

- We would like to increase our IPM system where we have more attention on quality of the pesticides
- It is very important:
 - increase the area where farms apply a high IPM level
 - give an award to companies that apply IPM
 - increase the value of IPM agricultural products

"Quality of our products"

- We would like to increase the safety of our agricultural products
- We have a great attention to the new commercial solutions:
 - reduce the % of MRL (total and for single PPP)
 - reduce the % of ArFD (total and for single PPP)

"Quality of our products"

- Our studies on residual PPP:
 - monitoring of the most frequent pesticide residue in our area.
 - definition of the pesticide residual curve for the most important PPP used in our region
 - set up a forecasting model able to predict the PPP residue in relation to timing of pesticide applications.

"Quality of our products"

- Our study on residual PPP:
 - a sample of Abate fetel pear is analyzed in order to study the correlation between the number of residual pesticides and ArFD level. We would like understand if reduction of the number of residual pesticides is correlated with the safety of the fruit.
- This approach is very important approach.

"Quality of our products"

- Investigation of the effects of the pear protection strategy (Abate Fetel) where the goal is the achievement of 4 residual pesticides:
 - side effects on pesticides resistance
 - side effects on bioversity
 - side effects on increasing use of PPP in the first phase of the crop
 - respect of the label of PPP
 - respect of the safety study on PPP

"Quality of our products"

- First results on our pear Abate Fetel sample indicate:
 - on arithmetic mean there isn't a good ArFD correlation between the samples with only 4 PPP residuals and the samples with more than 4 PPP residuals;

"Quality of our products"

- We believe it is very important:
 - to examine together these results;
 - to extend the analysis to a more extensive fruit area
 - to collaborate with skilled Research Institute in order to investigate the interaction effects between several PPP.

- The quality of our production is the principal goal of our work.

- We hope it is possible to have new collaboration.

- So it will be able to find practicable solutions for increasing the safety for:
 - consumers;
 - bystanders;
 - environment;
 - farmers.



Thanks... for your attention