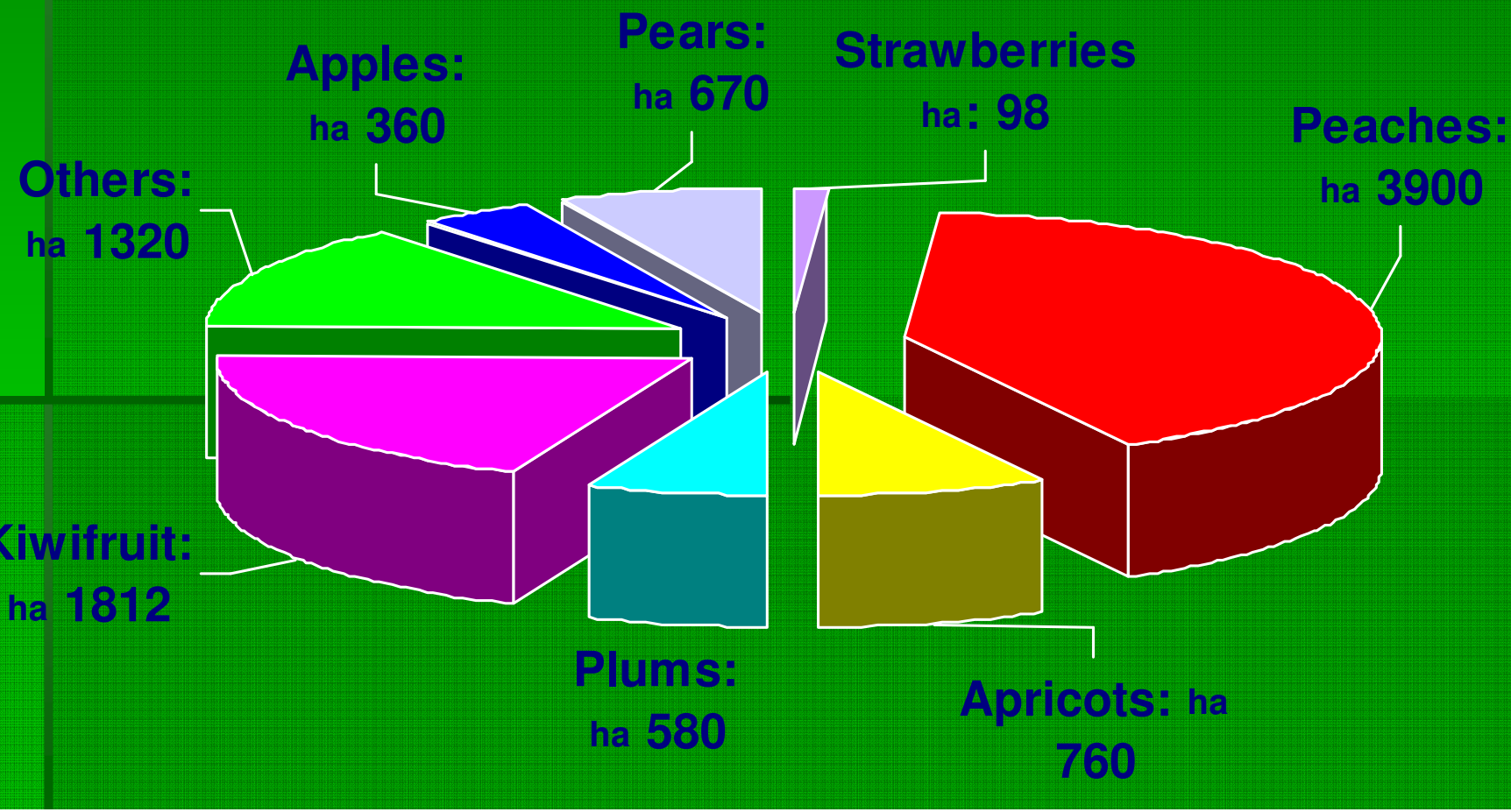
Apofruit Italia: example from farmers'association/cooperative from Emilia Romagna on integrated crop and pest management or other alternatives to chemical crop protection

Gianni Ceredi

- A Cooperative with 3500 Grower-members
- 40 years history
- Strong presence on the territories

APOFRUIT Cooperative

Total fruit area: 9500 ha



The Apofruit context

- 3500 growers
- Over 9500 ha of orchards
- At least 15 species grown
- Different areas of cultivation
- The need to guarantee quality and safety standards for consumers
- The necessity to reassure growers with efficient elements to solve health plant problems

In this context an adeguate
management in the use of agrochemicals
is a priority

In concrete terms, the synthetic active ingredients
can be both a necessity and an opportunity
but they can also represent a risk

There are several factors that make us overuse agrochemicals

- Diffusion of sensitive varieties to pathogens
- Diffusion of unealthy nursery plants
- Repeated use of pesticides which can create resistance incidents
- Poor knowledge of insects and pathogens biology
- Poor knowledge of agrochemical action processes
- Tendency to force productivity levels through excessive and inappropriate use of agricoltural practices
- Use of agrochemicals instead of alternative pest management techniques
- Poor use of techiques useful to chemical pest management
- Absence of a systematic and indipendent control network which keeps constantly monitored the presence of agrochemical residues on productions

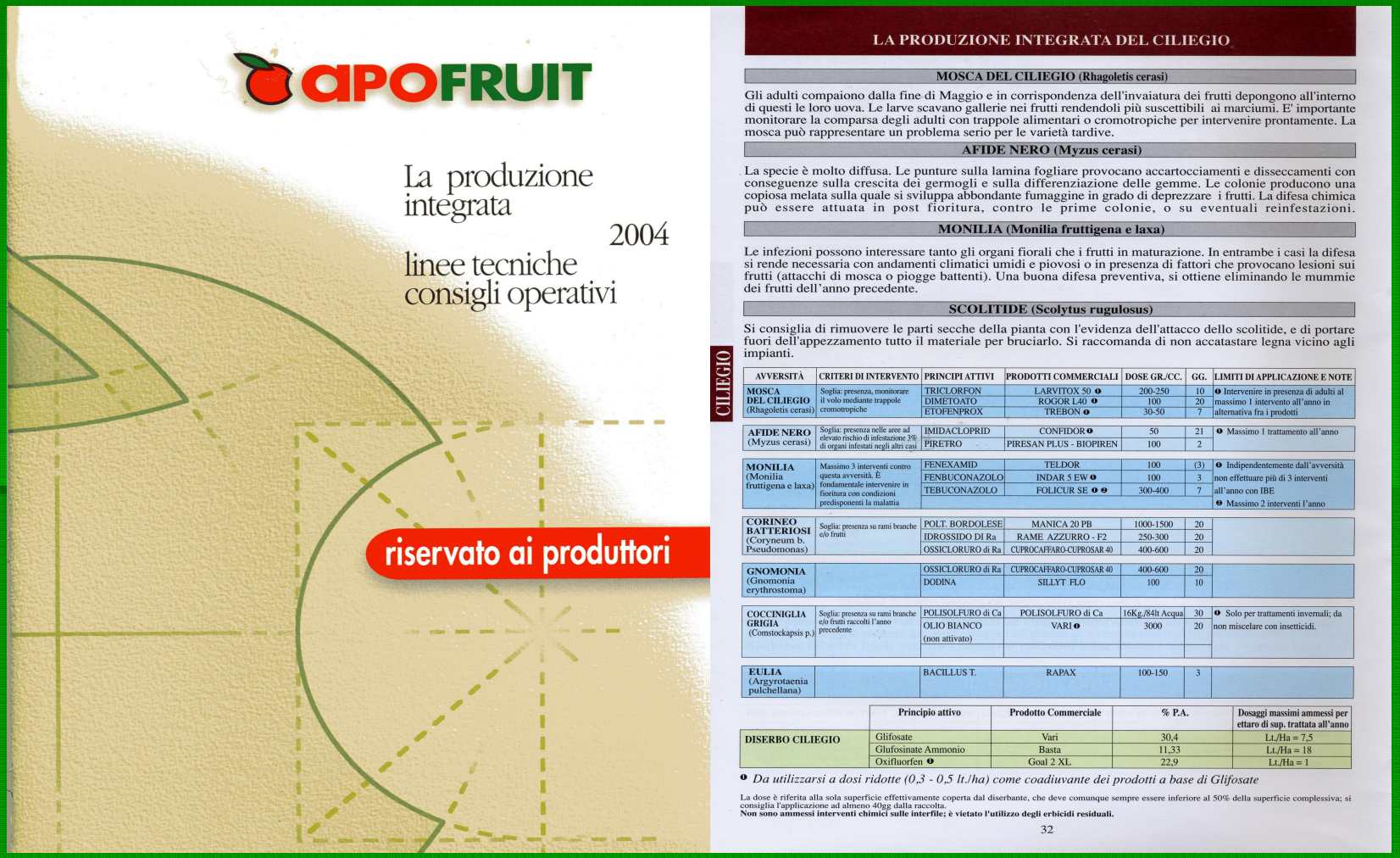
The first important step towards the decrease of the use of the synthetic agrochemicals was the application of the concept of integrated production.

For more than 20 years Apofruit has been able to give its products a particular Hallmark by a constant training and updating of growers from our agricoltural experts team, which operates in close contact and collaboration with research and experimenation institutes in the region.

It may seem a banality but a more sensible and therefore limited use of agrochemicals is the consequence of awareness of problems and a careful use of altenative/complementary pest management techiques.

Just some typical elements of our way of doing integrated production :

The annual drafting of a operative technical lines and advices for our growers



APOFRUIT

La produzione integrata

2004

linee tecniche consigli operativi

riservato ai produttori

LA PRODUZIONE INTEGRATA DEL CILIEGIO

CILIEGIO

MOSCA DEL CILIEGIO (Rhagoletis cerasi)

Gli adulti compaiono dalla fine di Maggio e in corrispondenza dell'invaiatura dei frutti depongono all'interno di questi le loro uova. Le larve scavano gallerie nei frutti rendendoli più suscettibili ai marciumi. E' importante monitorare la comparsa degli adulti con trappole alimentari o cromotropiche per intervenire prontamente. La mosca può rappresentare un problema serio per le varietà tardive.

AFIDE NERO (Myzus cerasi)

La specie è molto diffusa. Le punture sulla lamina fogliare provocano accartocciamenti e disseccamenti con conseguenze sulla crescita dei germogli e sulla differenziazione delle gemme. Le colonie producono una copiosa melata sulla quale si sviluppa abbondante fumaggine in grado di deprezzare i frutti. La difesa chimica può essere attuata in post fioritura, contro le prime colonie, o su eventuali reinfestazioni.

MONILIA (Monilia fruttigena e laxa)

Le infezioni possono interessare tanto gli organi fiorali che i frutti in maturazione. In entrambe i casi la difesa si rende necessaria con andamenti climatici umidi e piovosi o in presenza di fattori che provocano lesioni sui frutti (attacchi di mosca o piogge battenti). Una buona difesa preventiva, si ottiene eliminando le mummie dei frutti dell'anno precedente.

SCOLITIDE (Scolytus rugulosus)

Si consiglia di rimuovere le parti secche della pianta con l'evidenza dell'attacco dello scolitide, e di portare fuori dell'appezzamento tutto il materiale per bruciarlo. Si raccomanda di non accatastare legna vicino agli impianti.

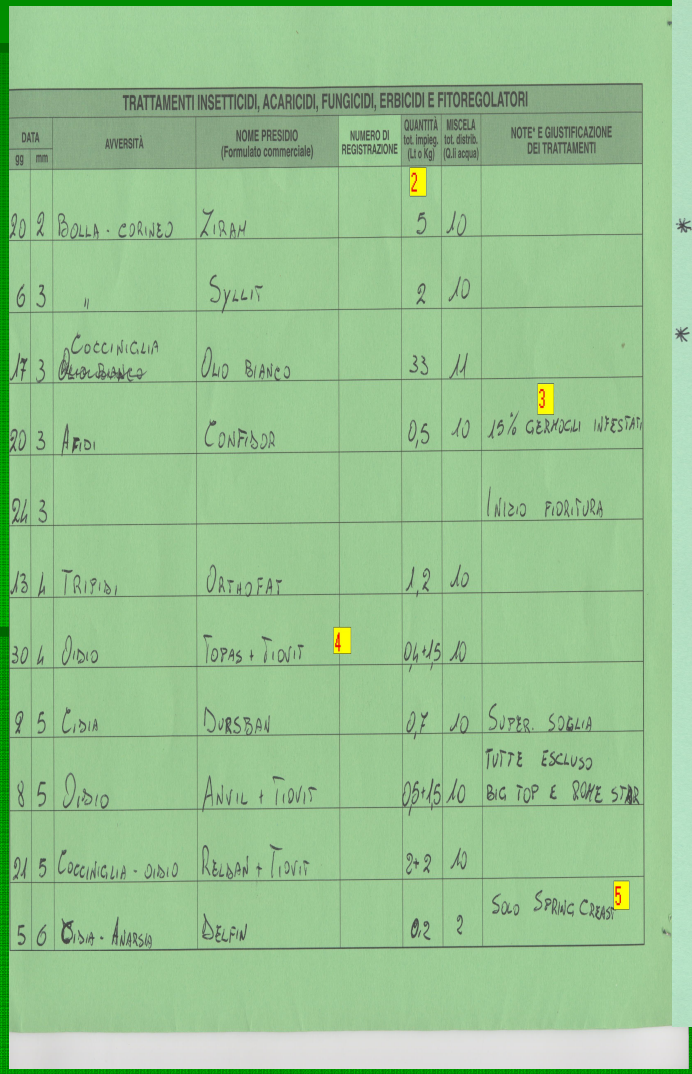
AVVERSITÀ	CRITERI DI INTERVENTO	PRINCIPI ATTIVI	PRODOTTI COMMERCIALI	DOSE GR./CC.	GG.	LIMITI DI APPLICAZIONE E NOTE
MOSCA DEL CILIEGIO (Rhagoletis cerasi)	Soglia: presenza, monitorare il volo mediante trappole cromotropiche	TRICLORFON	LARVITOX 50 ❶	200-250	10	❶ Intervenire in presenza di adulti al massimo 1 intervento all'anno in alternativa fra i prodotti
		DIMETOATO	ROGOR L40 ❶	100	20	
		ETOFENPROX	TREBON ❶	30-50	7	
AFIDE NERO (Myzus cerasi)	Soglia: presenza nelle aree ad elevato rischio di infestazione 3% di organi infestati negli altri casi	IMIDACLOPRID	CONFIDOR ❶	50	21	❶ Massimo 1 trattamento all'anno
		PIRETRO	PIRESAN PLUS - BIOPIREN	100	2	
MONILIA (Monilia fruttigena e laxa)	Massimo 3 interventi contro questa avversità. È fondamentale intervenire in fioritura con condizioni predisponenti la malattia	FENEXAMID	TELDOR	100	(3)	❶ Indipendentemente dall'avversità non effettuare più di 3 interventi all'anno con IBE ❷ Massimo 2 interventi l'anno
		FENBUCONAZOLO	INDAR 5 EW ❶	100	3	
		TEBUCONAZOLO	FOLICUR SE ❶ ❷	300-400	7	
CORINEO BATTERIOSI (Coryneum b. Pseudomonas)	Soglia: presenza su rami branche e/o frutti	POLT. BORDOLESE	MANICA 20 PB	1000-1500	20	
		IDROSSIDO DI Ra	RAME AZZURRO - F2	250-300	20	
		OSSICLORURO di Ra	CUPROCAFFARO-CUPROSAR 40	400-600	20	
GNOMONIA (Gnomonia erythrostoma)		OSSICLORURO di Ra	CUPROCAFFARO-CUPROSAR 40	400-600	20	
		DODINA	SILLYT FLO	100	10	
COCCINIGLIA GRIGIA (Comstockapsis p.)	Soglia: presenza su rami branche e/o frutti raccolti l'anno precedente	POLISOLFURO di Ca	POLISOLFURO di Ca	16Kg./84lt Acqua	30	❶ Solo per trattamenti invernali; da non miscelare con insetticidi.
		OLIO BIANCO (non attivato)	VARI ❶	3000	20	
EULIA (Argyrotaenia pulchellana)		BACILLUS T.	RAPAX	100-150	3	

	Principio attivo	Prodotto Commerciale	% P.A.	Dosaggi massimi ammessi per ettaro di sup. trattata all'anno
DISERBO CILIEGIO	Glifosate	Vari	30,4	Lt./Ha = 7,5
	Glufosinate Ammonio	Basta	11,33	Lt./Ha = 18
	Oxifluorfen ❶	Goal 2 XL	22,9	Lt./Ha = 1

❶ *Da utilizzarsi a dosi ridotte (0,3 - 0,5 lt./ha) come coadiuvante dei prodotti a base di Glifosate*

La dose è riferita alla sola superficie effettivamente coperta dal diserbante, che deve comunque sempre essere inferiore al 50% della superficie complessiva; si consiglia l'applicazione ad almeno 40gg dalla raccolta.
Non sono ammessi interventi chimici sulle interfile; è vietato l'utilizzo degli erbicidi residuali.

The growers must record all the agricultural practices on a specific form…



TRATTAMENTI INSETTICIDI, ACARICIDI, FUNGICIDI, ERBICIDI E FITOREGOLATORI

DATA gg	DATA mm	AVVERSITÀ	NOME PRESIDIO (Formulato commerciale)	NUMERO DI REGISTRAZIONE	QUANTITÀ tot. impieg. (Lt o Kg)	MISCELA tot. distrib. (Q.li acqua)	NOTE* E GIUSTIFICAZIONE DEI TRATTAMENTI
					2		
20	2	BOLLA - CORINEO	ZIRAM		5	10	
6	3	"	SYLLIT		2	10	
17	3	COCCINIGLIA OLIO BIANCO	OLIO BIANCO		33	11	
20	3	AFIDI	CONFIDOR		0,5	10	15% GERMOGLI INFESTATI 3
24	3						INIZIO FIORITURA
13	4	TRIPIDI	ORTHOFAT		1,2	10	
30	4	OIDIO	TOPAS + TIOVIT 4		0,4+1,5	10	
2	5	CIDIA	DURSBAN		0,7	10	SUPER. SOGLIA
8	5	OIDIO	ANVIL + TIOVIT		0,5+1,5	10	TUTTE ESCLUSO BIG TOP E ROME STAR
21	5	COCCINIGLIA - OIDIO	RELDAN + TIOVIT		2+2	10	
5	6	CIDIA - ANARSIA	DELFIN		0,2	2	SOLO SPRING CREST 5

Cidia Anarsia

6 RILIEVI ESEGUITI

DATA gg	DATA mm	DESCRIZIONE (campionamenti o catture trappole) C_1	C_2	C_3			A_1	A_2	A_3
6	4	0	0	0			0	0	0
13	4	10	3	1			0	0	0
20	4	35	15	23			0	2	0
27	4	18	30	15			1	0	0
4	5	10	8	5			0	0	0
11	5	2	2	5			1	0	1
18	5	5	4	0			1	2	2
25	5	0	1	2			4	0	1
1	6	0	2	1			2	0	1
8	6	16	7	10			2	3	9
15	6	16	5	14			1	0	0
22	6	15	25	13			0	2	1
29	6	14	19	24			4	1	0
6	7	47	53	46			4	0	1
13	7	14	18	24			5	4	1
20	7	44	38	50			7	4	8
27	7	32	23	26			2	6	4
3	8	38	17	19			5	3	5

INDICE DI MATURITÁ* E RACCOLTA 10

Rilievo gg	Indice mm	CULTIVAR	VALORE Ind.	VALORE Mat.	Unità MS	Data racc. gg	Data racc. mm
		Spring Crest				17	6
		Ribe Star				25	6
		Ambra				30	6
		Royal Glory				2	7
		Big Top				10	7
		Maria Laura				12	7
		Rome Star				31	7
		Fayette Rosse				4	8

*: obbligatori solo per L.R. 28/99, per alcune specie; NB: la data di raccolta deve essere sempre riportata

PIOGGE 7

DATA gg	DATA mm	mm pioggia	DATA gg	DATA mm	mm pioggia
3	3	45			
4	4	37			
10	4	20			
21	4	11			
2	6	5			
5	7	12			
29	7	5			
1	8	15			

DATI NON RICH. DA 217/91

IRRIGAZIONE PIENO CAMPO gg	IRRIGAZIONE PIENO CAMPO mm	QUANTITÁ (mm o mc/ha)	IRRIGAZIONE LOCALIZZATA Periodo dal gg	dal mm	al gg	al mm	frequenza irrigazioni media (in giorni)
			10	5	15	6	3
			15	6	10	8	2
21	7	9 35	Solo Fayette R. sotchiura				

DATI NON RICH. DA 217/91

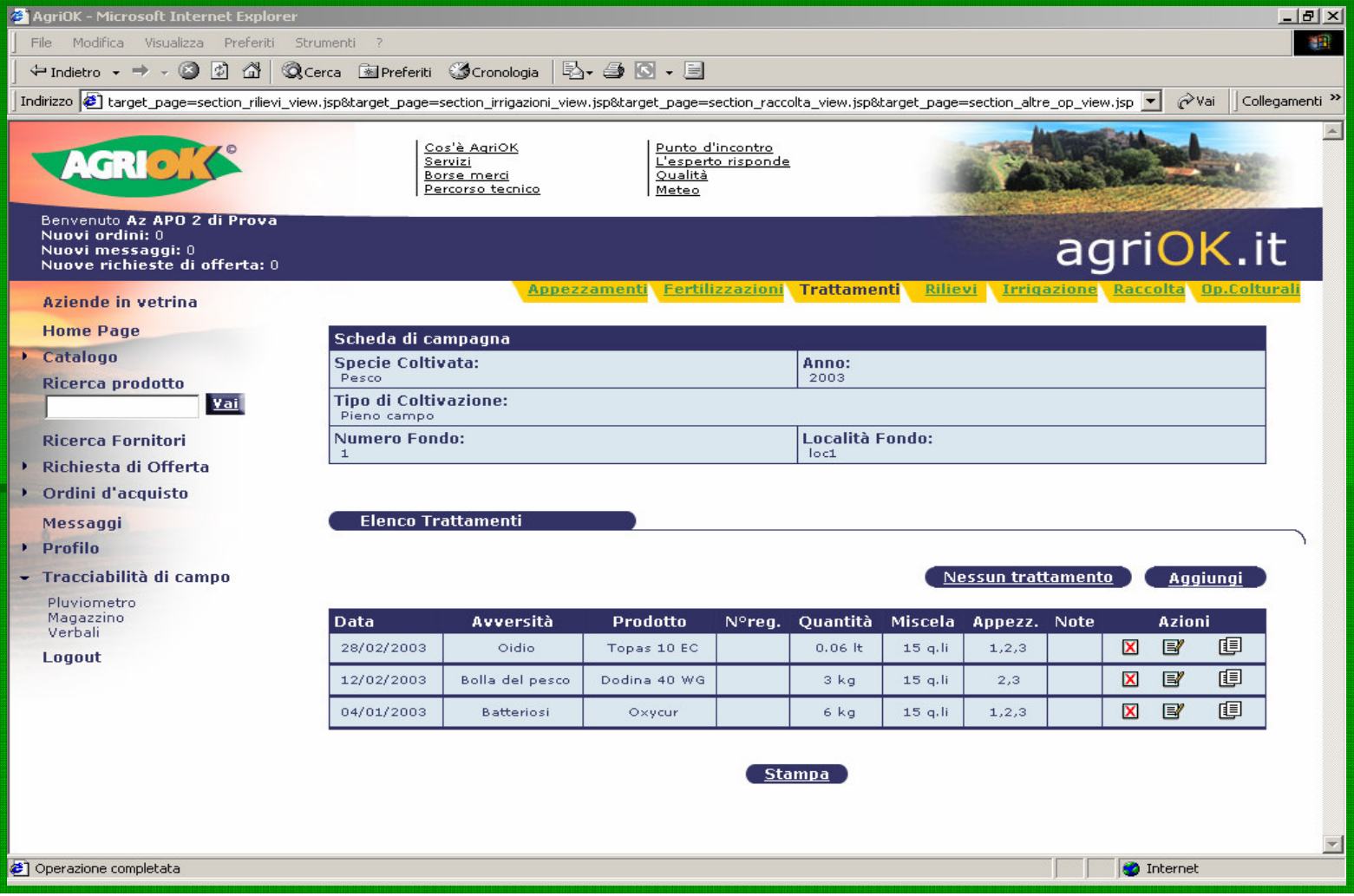
ALTRE OPERAZIONI COLTURALI (se richieste dai disciplinari)

gg	mm	operazioni

Dichiaro di avere riportato nella presente scheda tutte le operazioni colturali eseguite nell'appezzamento.

Data: 11/3/03 11 Firma del Responsabile aziendale:

and Apofruit, in collaboration with “Agriok”, has computerized all the data from more than 300 farms on a specific database…



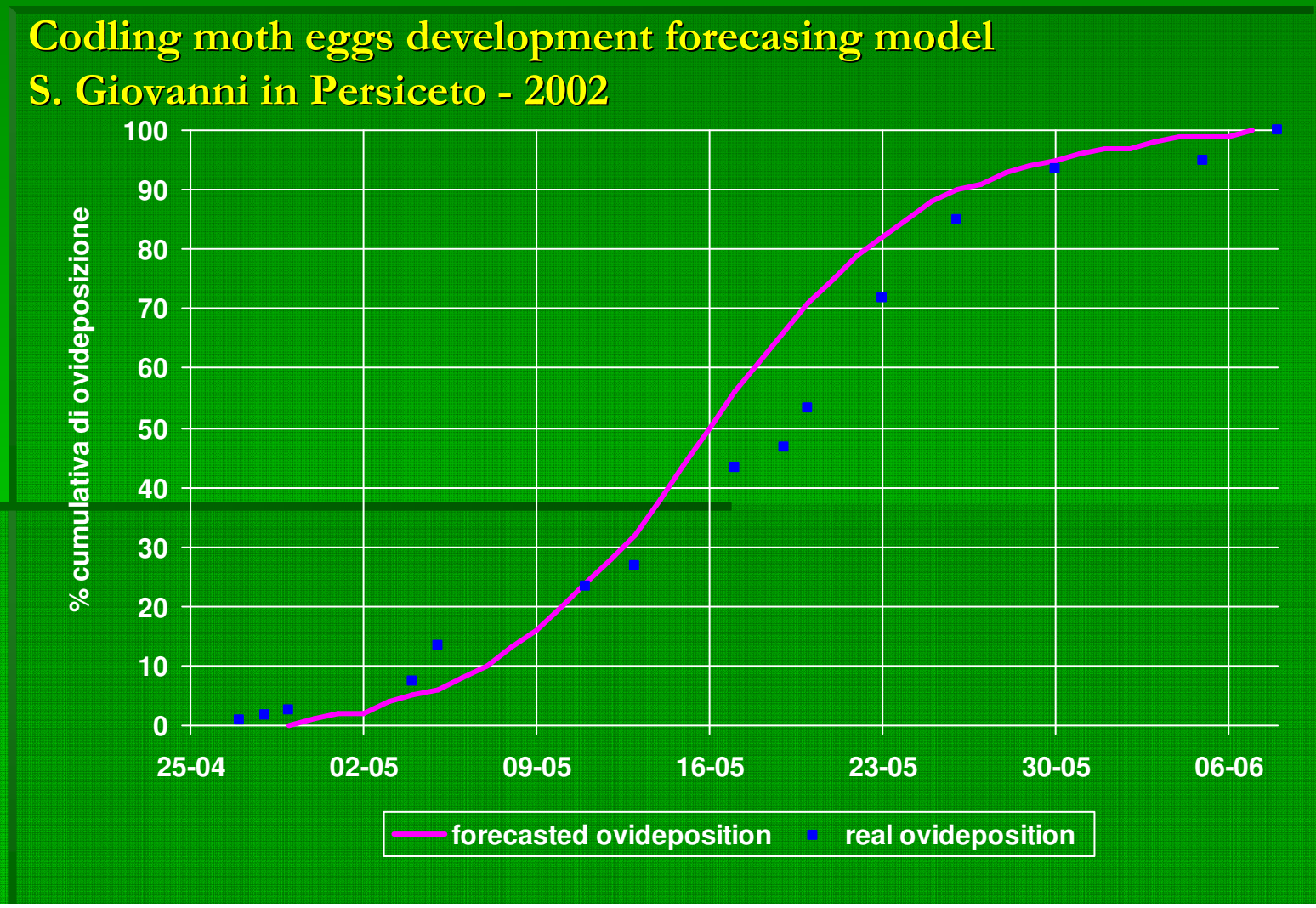
Application of appropriate agricultural practices: (green manure, ground cover, crops rotation, solarization)

Use of insects for the control of mites on strawberries

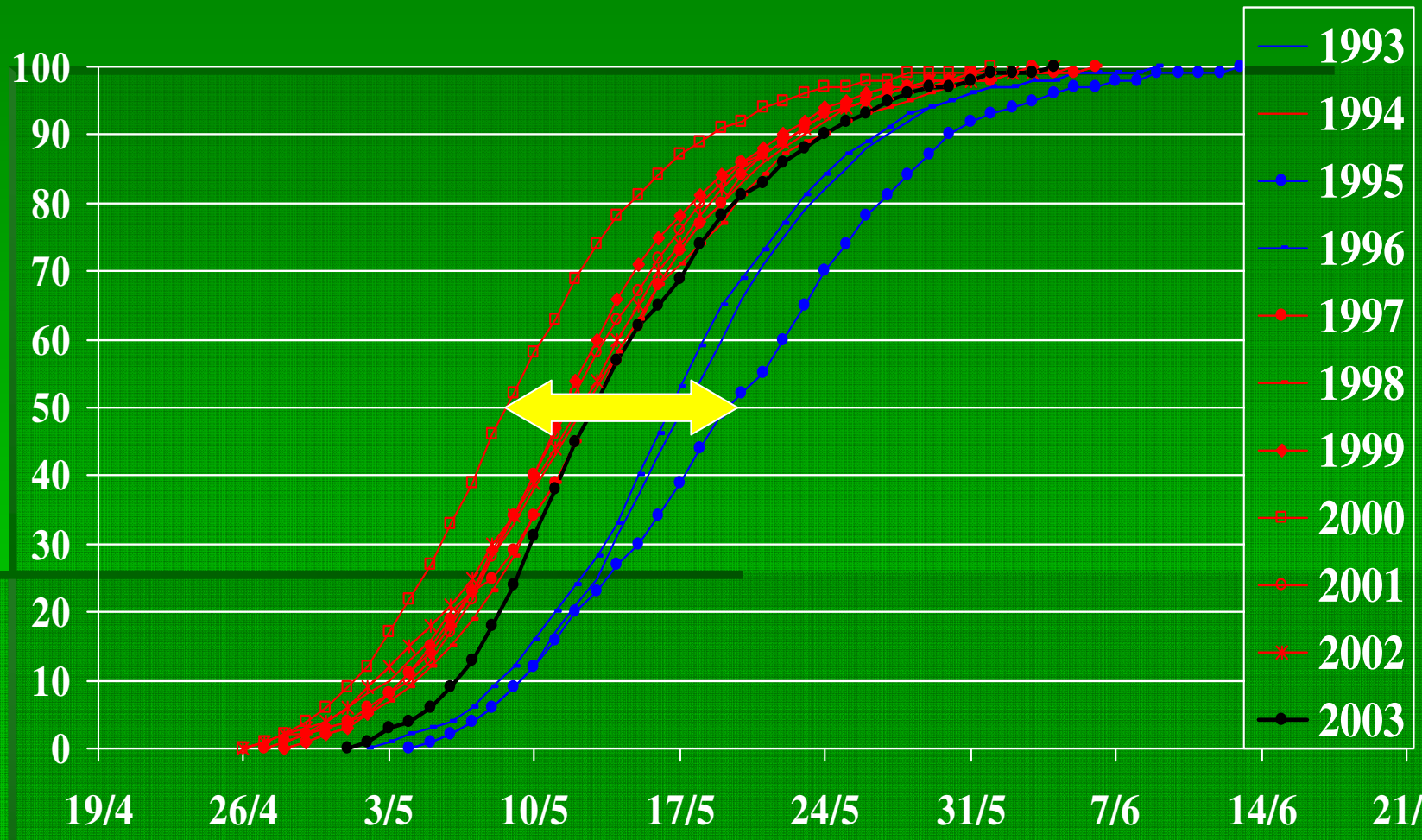
In 2006 we freed more than 2.3 m. of P. persimilis

Regular and common use of monitoring systems tools for many key insects and pathogenic agents

Use of forecasting models in the biologycal developement of many insects and pathogenic agents



Different weather conditions affecting *Codling moth* ovideposition (S. Agostino (Fe) - 1993-2003)



The reduction of agrochemicals use for fungicidal purpose has shown to be less effective as it is more difficult to anticipate the pathogenic agents epidemiology through the forecasting models use.

Against fungal diseases we generally take action in advance often thinking of post harvest preservation.

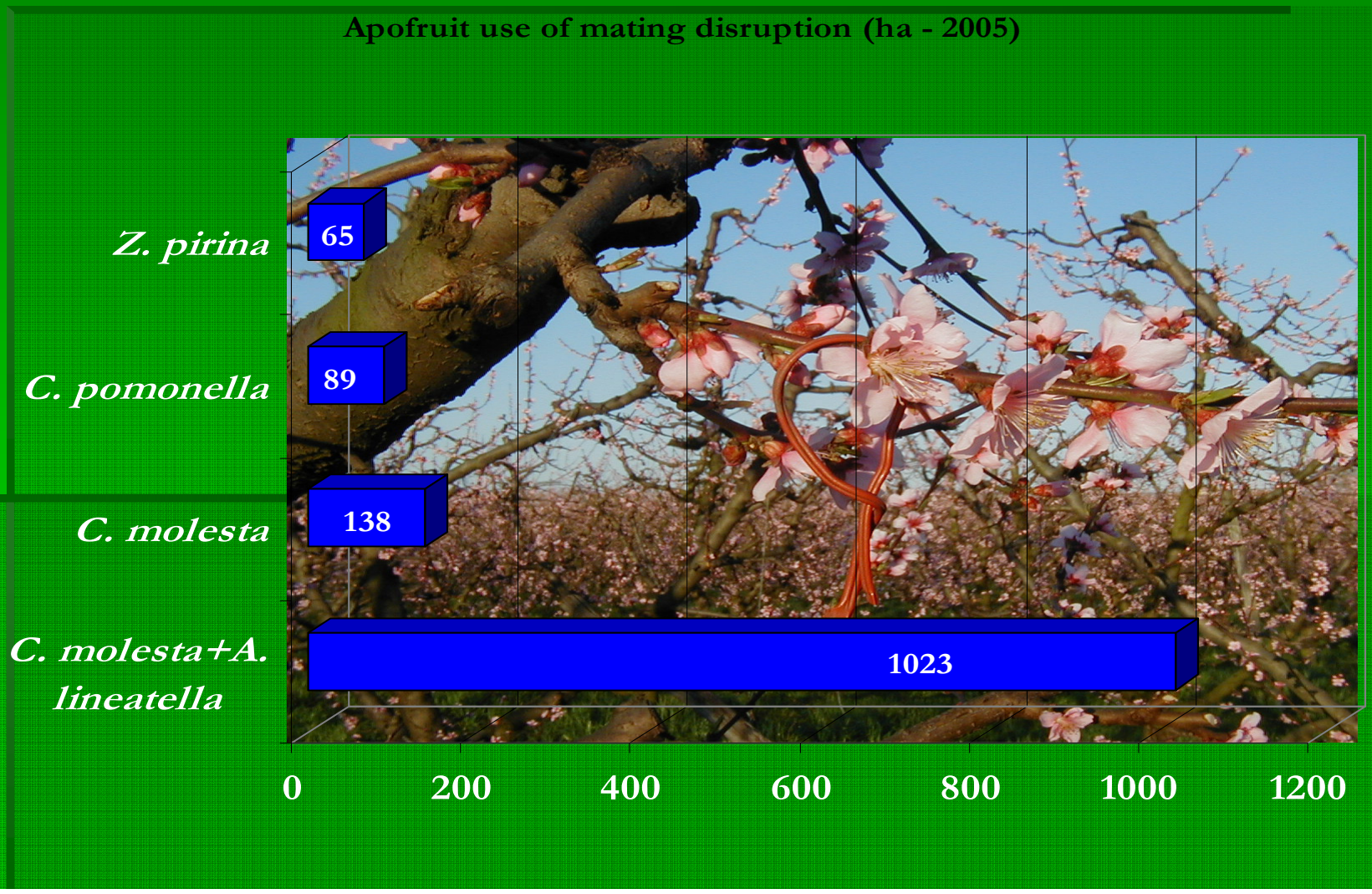
However, also in this case, there are elements that can help us to reduce the use of chemicals :

Better knowledge of pathogenic agents and their epidemiology

Deeper knowledge of allowed active ingredients expecially on their persistence and their mechanism of action

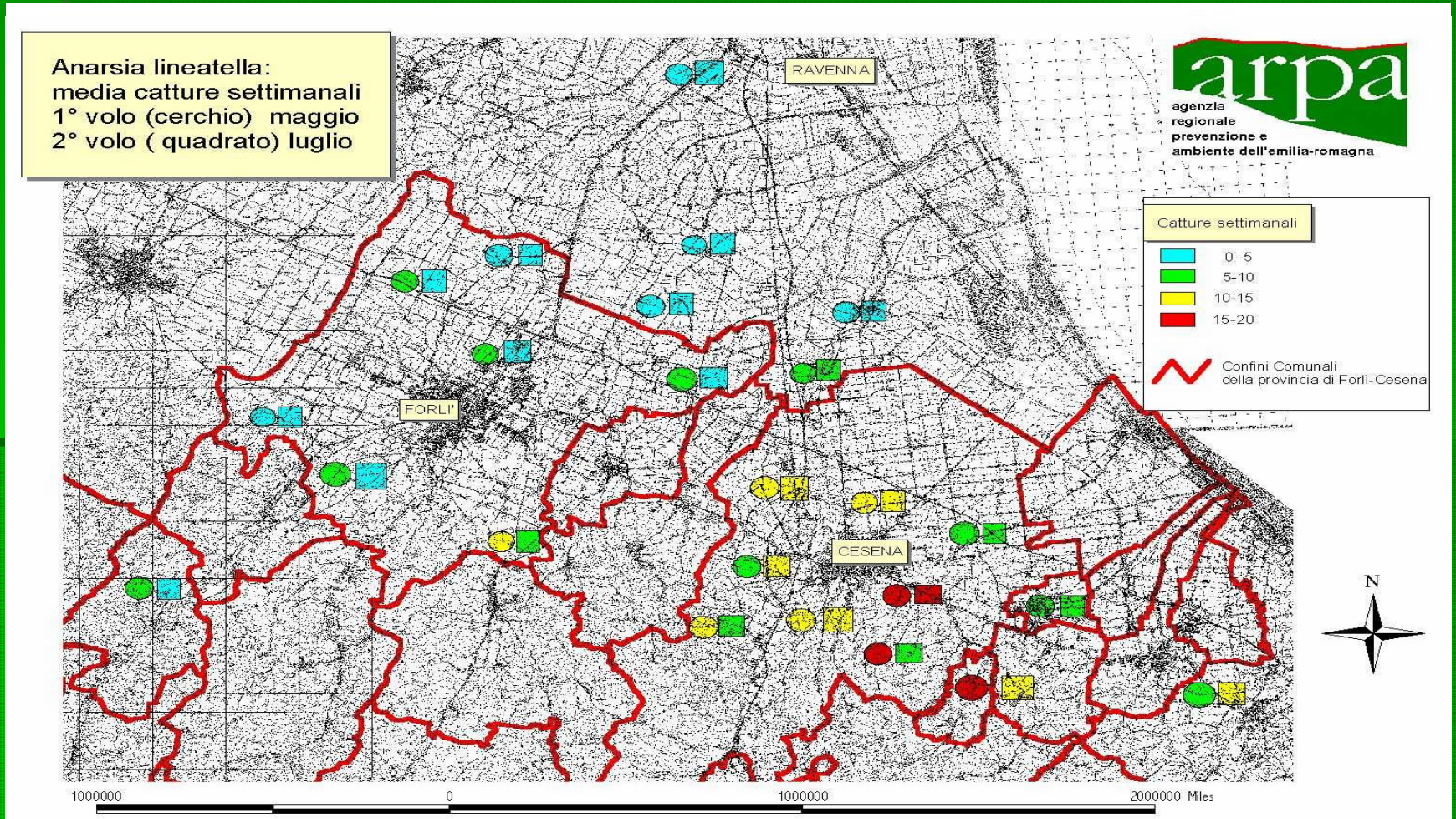
The right overlap of these two factors usually lead to a more correct and less frequent use of synthetic agrochemicals

A research for an integrated approach to solve the health plant problems includes the use of alternative means to chemicals like mating disruption for some Lepidoptera



Concerning this we reproduce a research done by Apofruit in collaboration with ARPA (Environmental and prevention agency of Emilia Romagna) in the years 2001/2002:

- **At first we have monitored the presence of OFM and PTwB on our territory using pheromons monitoring traps**



Then we compared the use of pesticides against OFM and PTwB in peach orchards (400 farms, half of them using m.d.)

Integrated farms :

Varieties	Average amount of agrochemical products (kg/ha)				
	B. t.	Phosforates	I.G.R.	Etofenprox	Total
Early	1.2	0.7	0.3	1.2	2.2
Intermediate	1.2	3.0	0.6	1.2	4.8
Interm./Late	1.2	4.0	0.6	2.4	7.0
Late	2.4	6.0	0.9	2.4	9.3

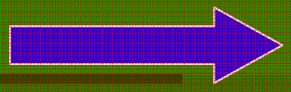
Integrated farms with m.d:

Varieties	Variation in % of agrochemical products used and Average amount of agrochemical products (kg/ha)				
	B. t.	Phosforate	I.G.R.	Etofenprox	Total
Early	0.0%	- 83%	- 81%	- 88%	0.32
Intermediate	+100%	- 75%	- 83 %	- 86%	1.02
Interm./Late	+ 100%	- 58%	- 71%	- 58%	2.9
Late	+150%	- 46%	- 65 %	- 46%	4.8

The need to guarantee our fruit and vegetables
from the active ingredient residue problem at the harvest,
lead us to closely and deeply examine the residue behaviour
of the allowed chemical molecules

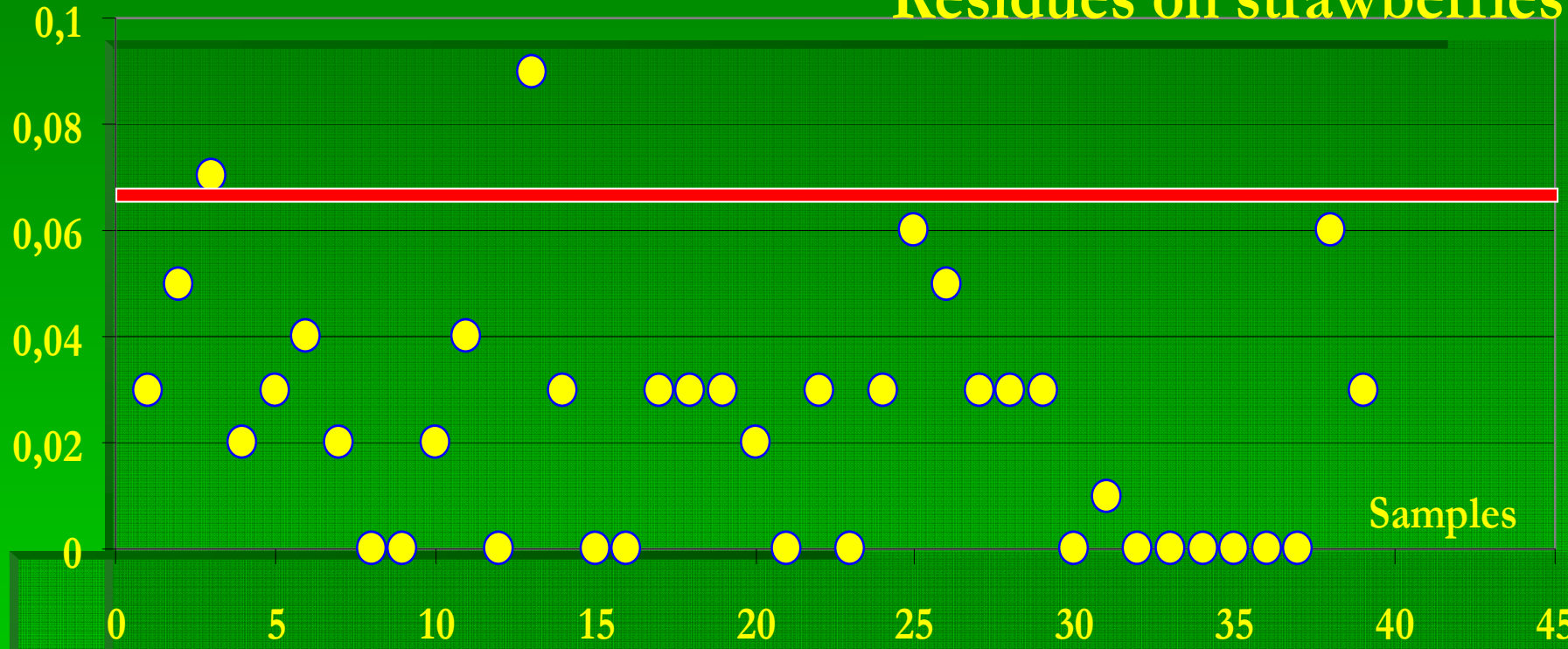
Although accepted by the integrated prodution lines,
when a new active ingredient is introduced
in the national crop protection scene, always makes it
necessary for our organisation to determine its
real degradation trend

An example: Fludioxonil
Ciprodinil



Grey mould (strawberries)
Brown rot (peaches)

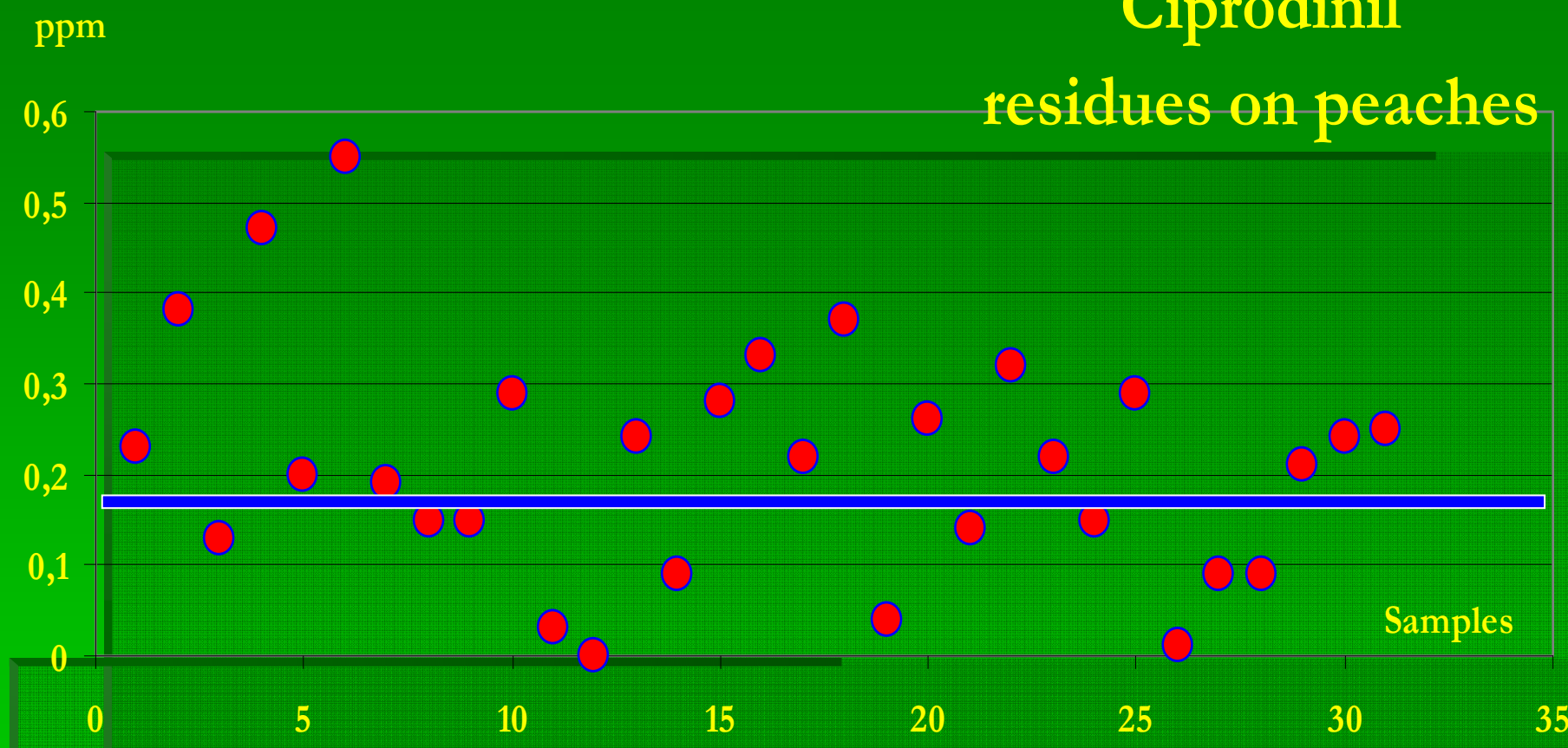
Ciprodinil
Residues on strawberries



l.m.r. : 2.0 ppm

0.66 ppm (30% l.m.r.)

Ciprodinil residues on peaches



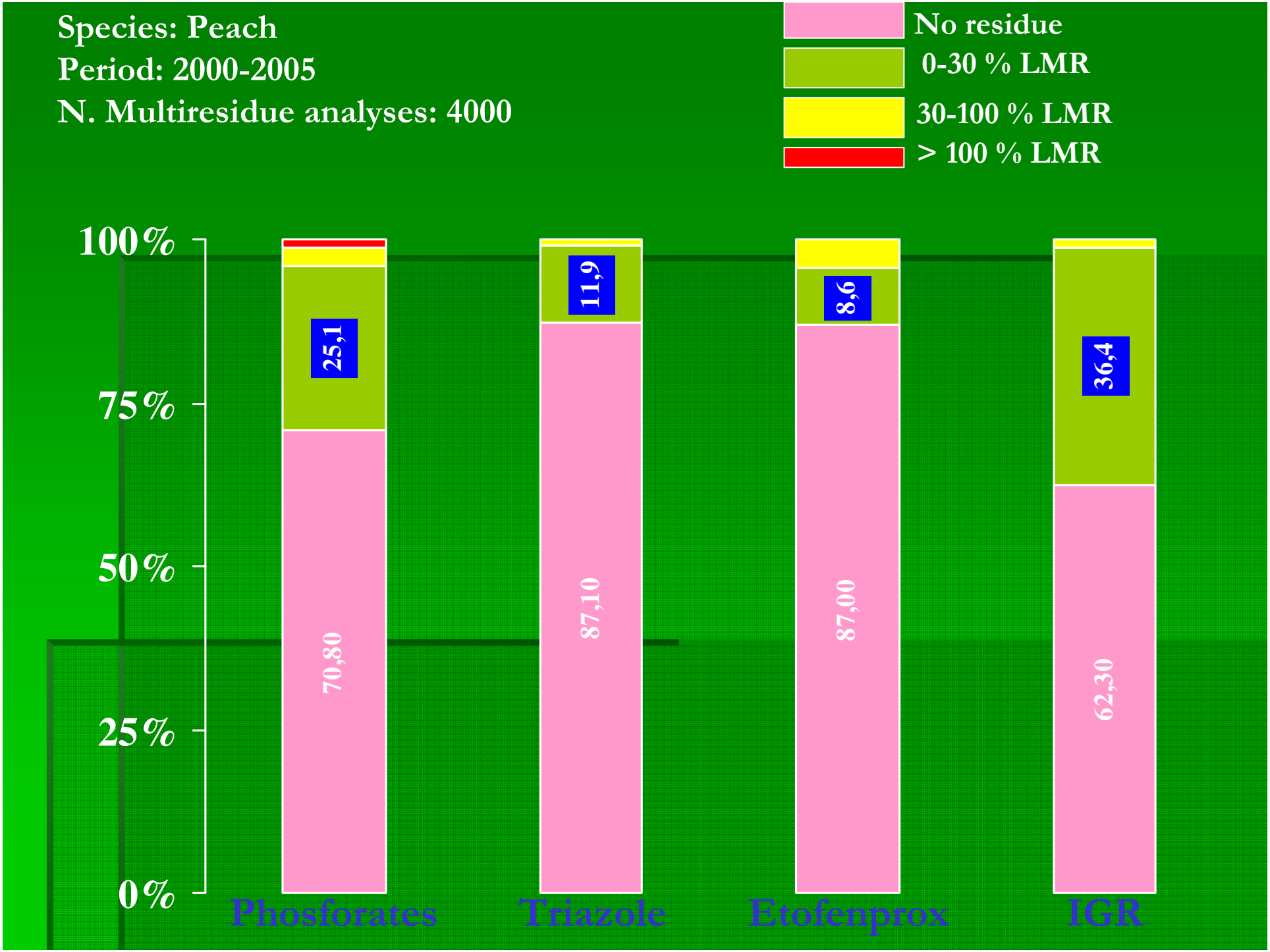
l.m.r. : 0.5 ppm

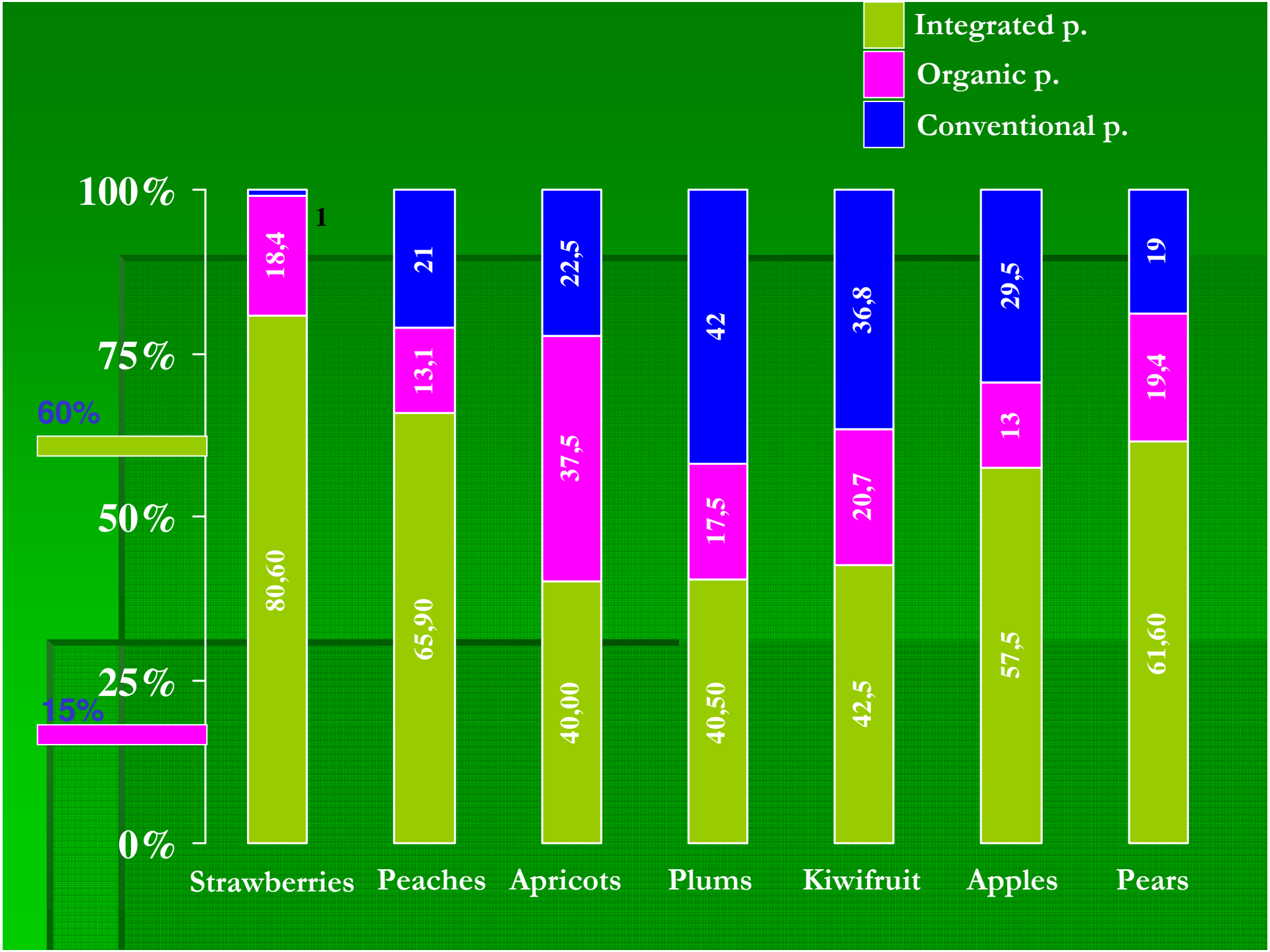
0.17 ppm (30% l.m.r.)

Moreover, through a systematic plan of sampling, we keep constantly monitored the presence of agrochemicals residues in our productions

Taking peaches for example, over the last 6 years we have carried out over 4000 multiresidue analyses, performed on samples taken at harvest

The results of this permanent commitment is highlighted by the percentage of negative results…


Species: Peach
Period: 2000-2005
N. Multiresidue analyses: 4000
No residue
0-30 % LMR
30-100 % LMR
> 100 % LMR
100%
75%
50%
25%
0%
25,1
70,80
11,9
87,10
8,6
87,00
36,4
62,30
Phosforates
Triazole
Etofenprox
IGR


Integrated p.
Organic p.
Conventional p.
100%
75%
60%
50%
25%
15%
0%
1
18,4
80,60
21
13,1
65,90
22,5
37,5
40,00
42
17,5
40,50
36,8
20,7
42,5
29,5
13
57,5
19
19,4
61,60
Strawberries
Peaches
Apricots
Plums
Kiwifruit
Apples
Pears

Conclusion:

With my short presentation I tried to show you some aspects of our philosophy that lead to a correct management of pesticide use.
Nevertheless, I would like to highlight that our choice needs a **strong** and **constant** effort from an economical, organizational and cognitive point of view.

This big effort creates an environmental and health benefit that affects both producers and consumers.

Still, the absence of a real awerness of this penalized in some way our experiences

In our country the production of fresh fruit and vegetables is fragmentary and the association producers have limited possibilities to force and influence the choices

At the same time, these associations do not collaborate enough with each other but they tend to compete

It would be good to create and consolidate a real effective network on these issues among producers, associations of producers, research centres, O.G.D. institutions of control both public and indipendent.

This kind of network would allow us tu use all the available resources and organizations like ours could concentrate mainly on the production of quality fruit and vegetables

At the same time it would be hoped a strong spreading action on “quality” from regional and national institutions

In this context organisations like ours continue their commitment on quality productions but are continuosly subjected to a strong pressure from different sectors that are not sensible to these issues and they only have speculative interests