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Cescospora Leaf Spot (CLS) in Spain

Approach to an Integrated Pest Management according to the Framework Directive on the sustainable use of Pesticides

SIPCAM´s workshop, Milan 20th October 2015

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Introduction

Sugar beet in Spain, the big picture

- area and main crop practises
- yields

Cercospora in Spain

- damages/losses
- strategies for it control What the Directive says? How to fulfill the rules using the current tools?
- resistance

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ASOCIACIÓN DE INVESTIGACIÓN PARA LA MEJORA DEL CULTIVO DE LA REMOLACHA AZUCARERA

A short story…

what useful lessons did I learn in July 1982?

1st lesson

ITALY’s national team won the XXII Football World Cup, in Spain!

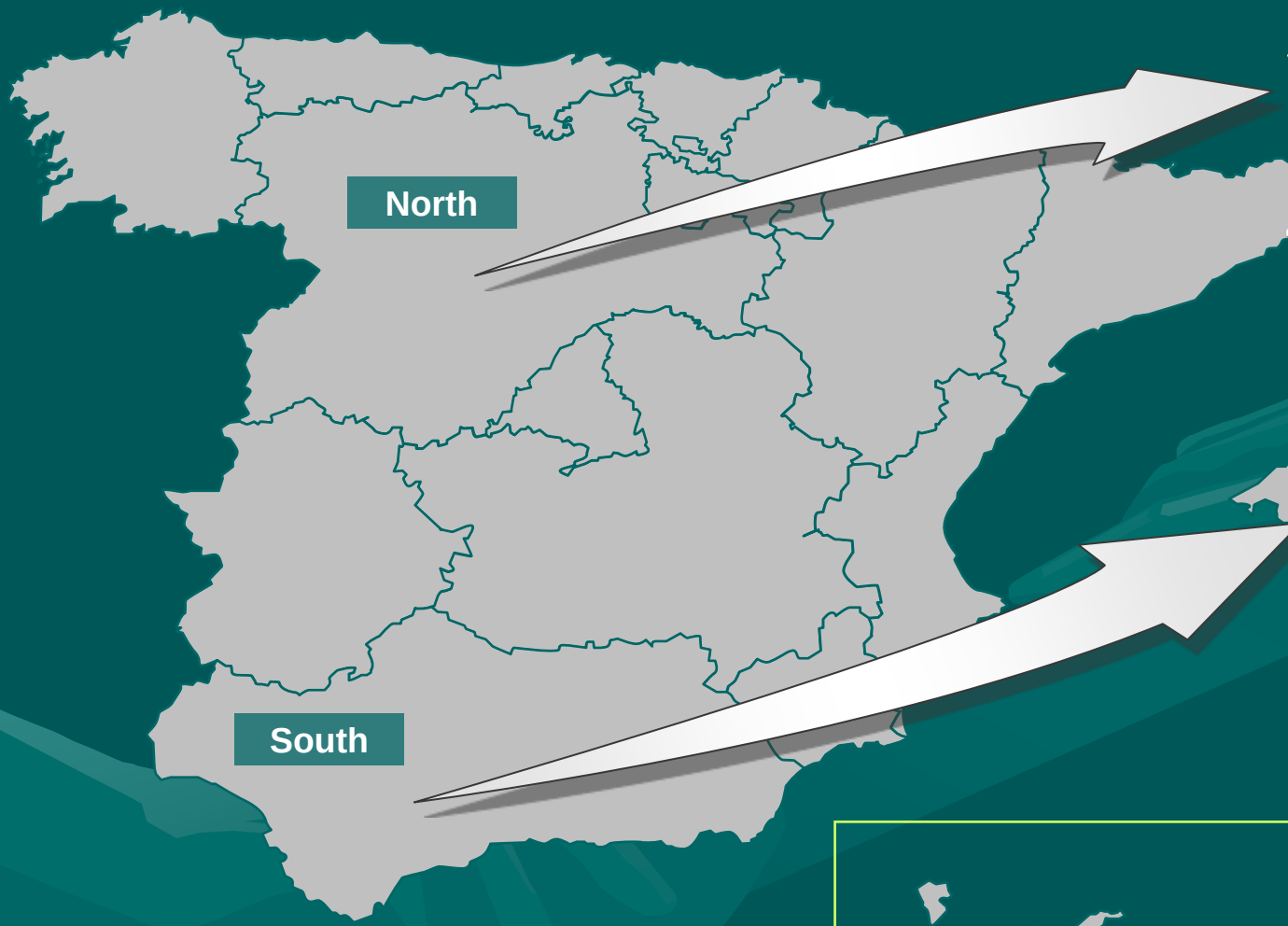
ITALIA 1982

La formazione dell'Italia che, superando la Germania Ovest per 3-1, si aggiudicò il titolo mondiale 1982. In piedi da sinistra: *Dino Zoff, Francesco Graziani, Giuseppe Bergomi, Gaetano Scirea, Fulvio Collovati, Claudio Gentile.* Accosciati: *Bruno Conti, Paolo Rossi, Gabriele Oriali, Antonio Cabrini, Marco Tardelli*

The “catenaccio” tactic

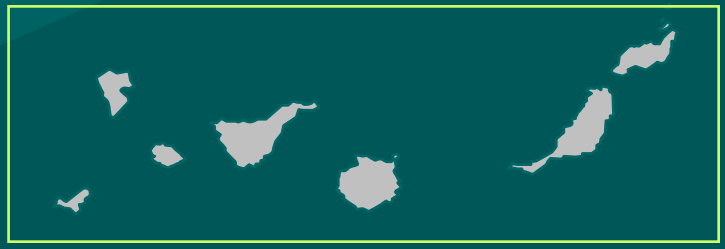

2nd lesson
I finished my degree in agronomy and I had my first action as professional…
Believe me, I learnt the lesson!

Sugar beet in Spain, the big picture

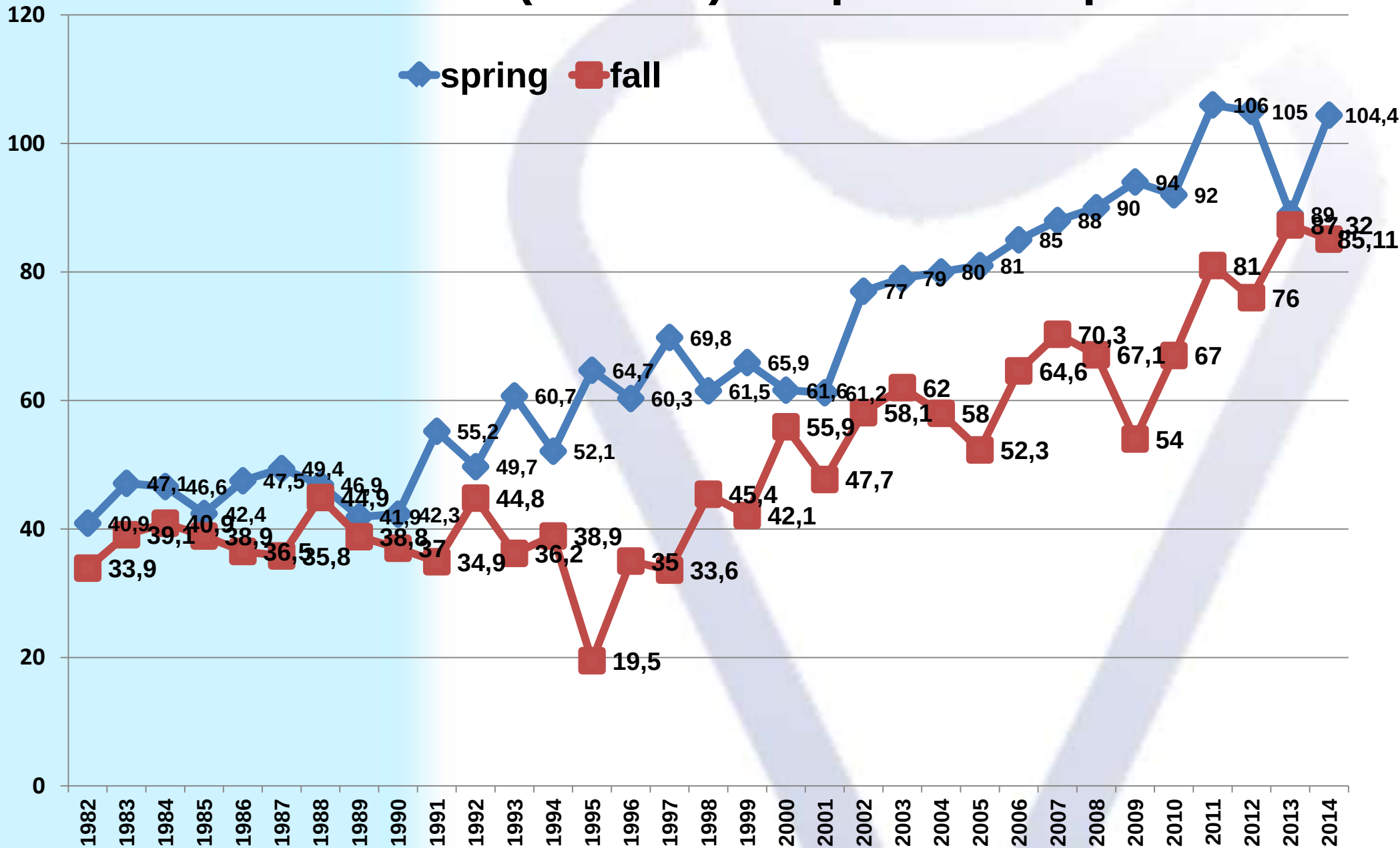


Northern area
Spring sown
30.000 ha
100% irrigated
4 factories

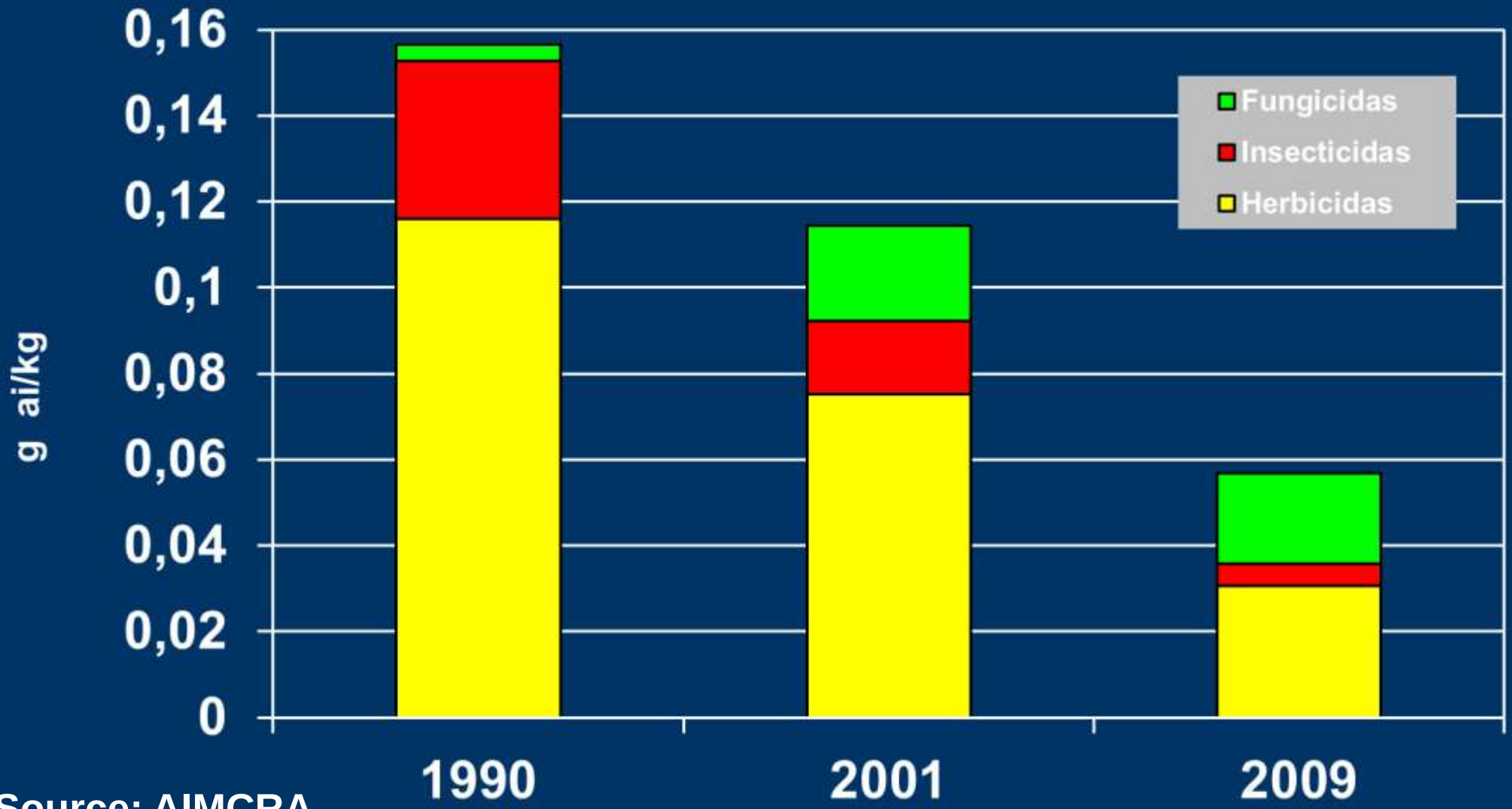
Southern area
Fall sown
8.400 ha
93% irrigated
1 factory



Yield evolution (t 16º/ha) in Spanish crop areas



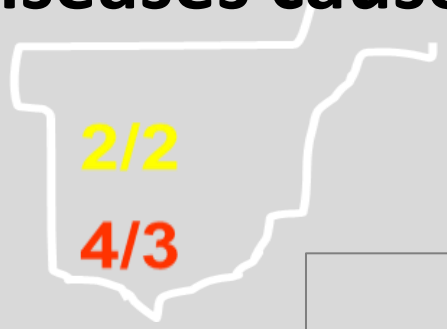
Active ingredient comsumption per kg of sugar beet

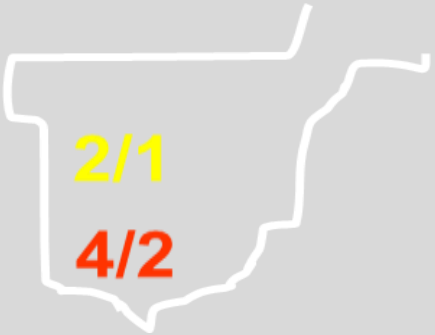


Source: AIMCRA

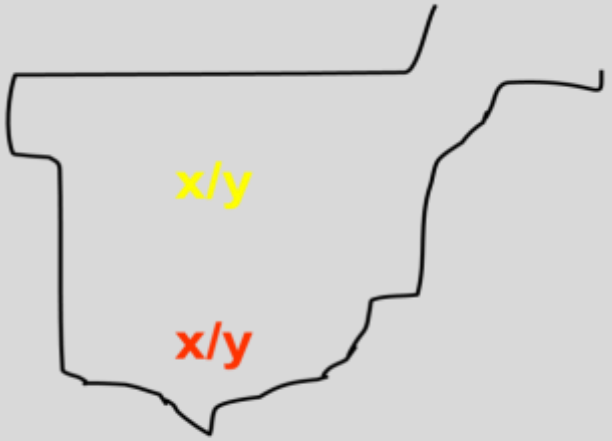

Cercospora in Spain
- damages/losses
- strategies for it control What the Directive says? How to fulfill the rules using the current tools?
- resistance

Complex of foliar diseases caused by fungus in Spain





INTERPRETATION



North

South

x: frecuency (1: slight; 2 moderate; 3 frequent; 4 very common)

y: intensity (1: slight; 2 moderate; 3 severe; 4 very severe)

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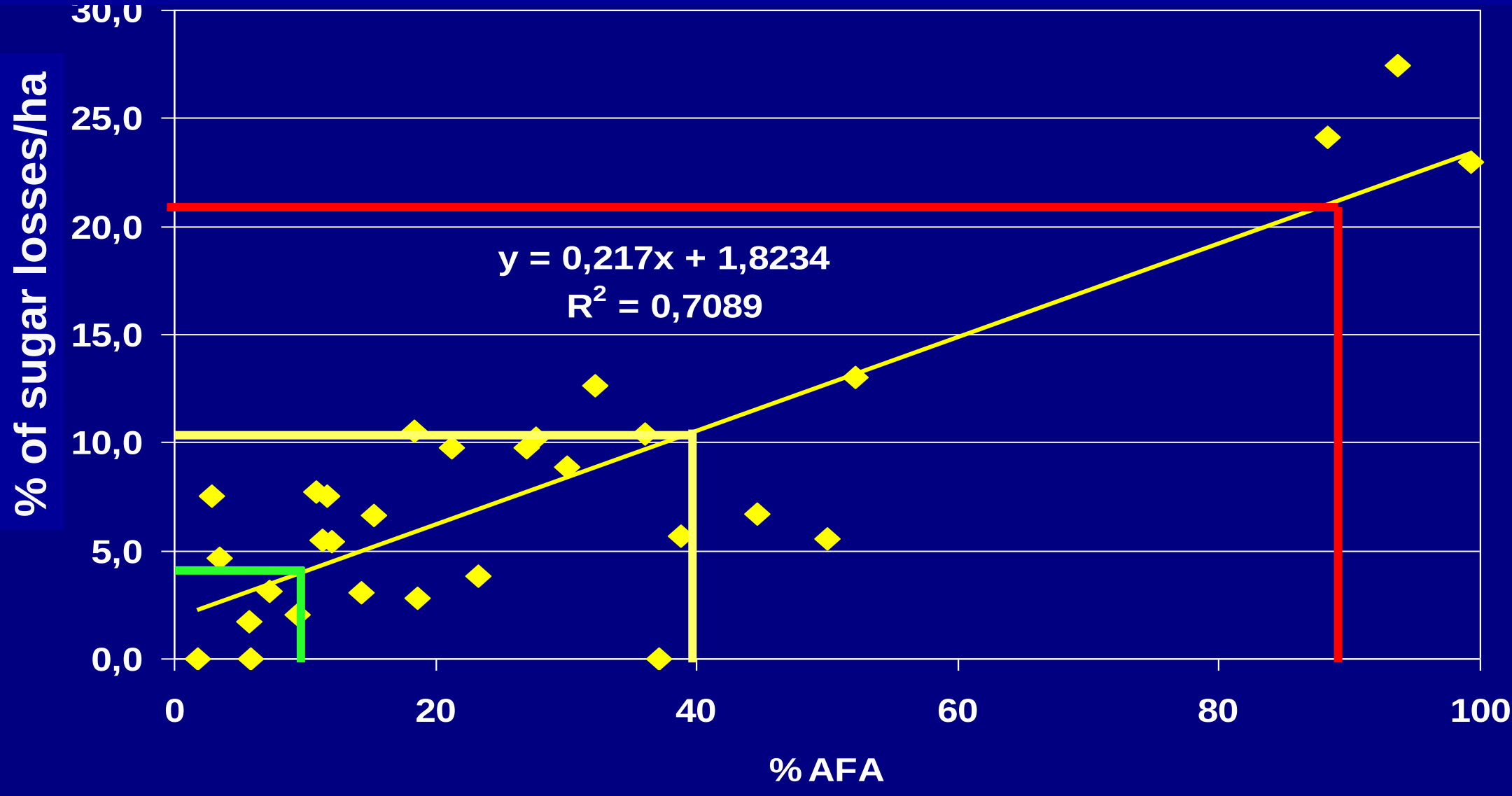
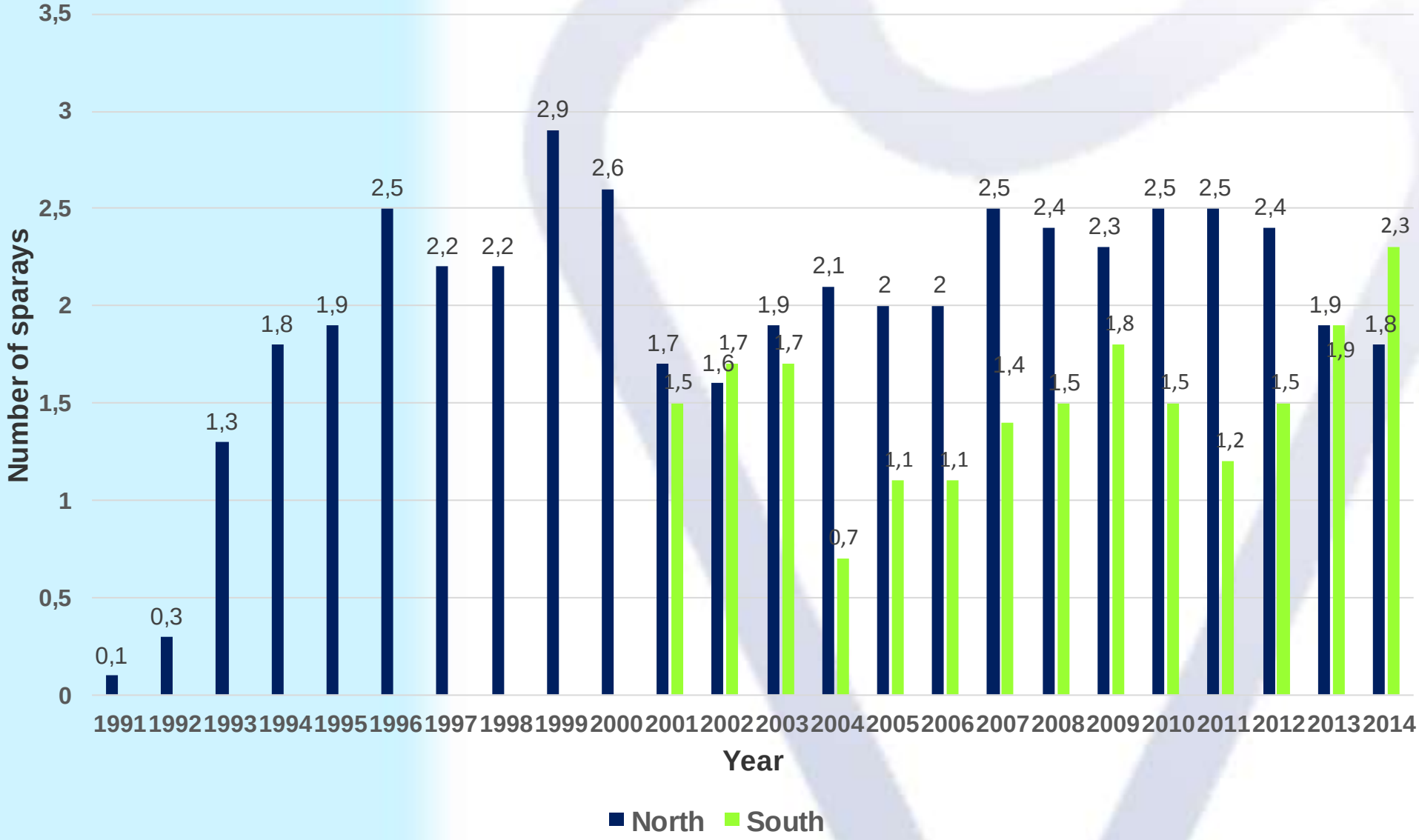
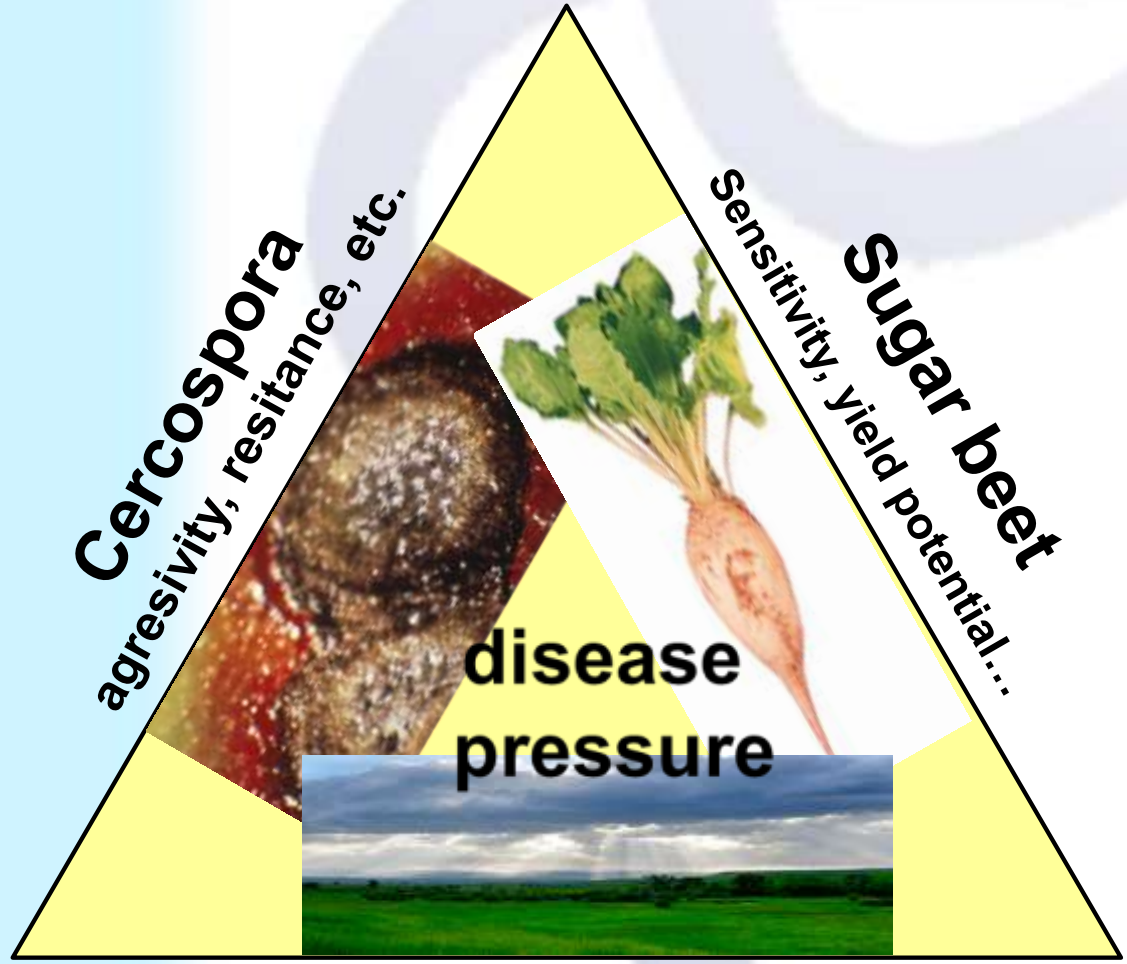
Why we consider Cercospora as a disease? Effect of cercospora attacks, expresed as Afected Foliar Area (%AFA), on yield (% of sugar losses/ha)



Number of fungicide applications throughout the period 1991-2014




Cercospora
agresivity, resitance, etc.
Sugar beet
Sensitivity, yield potential…
disease
pressure
more favourable conditions for the disease
Environment

Framework Directive on the sustainable use of Pesticides

How to apply it on CLS control?

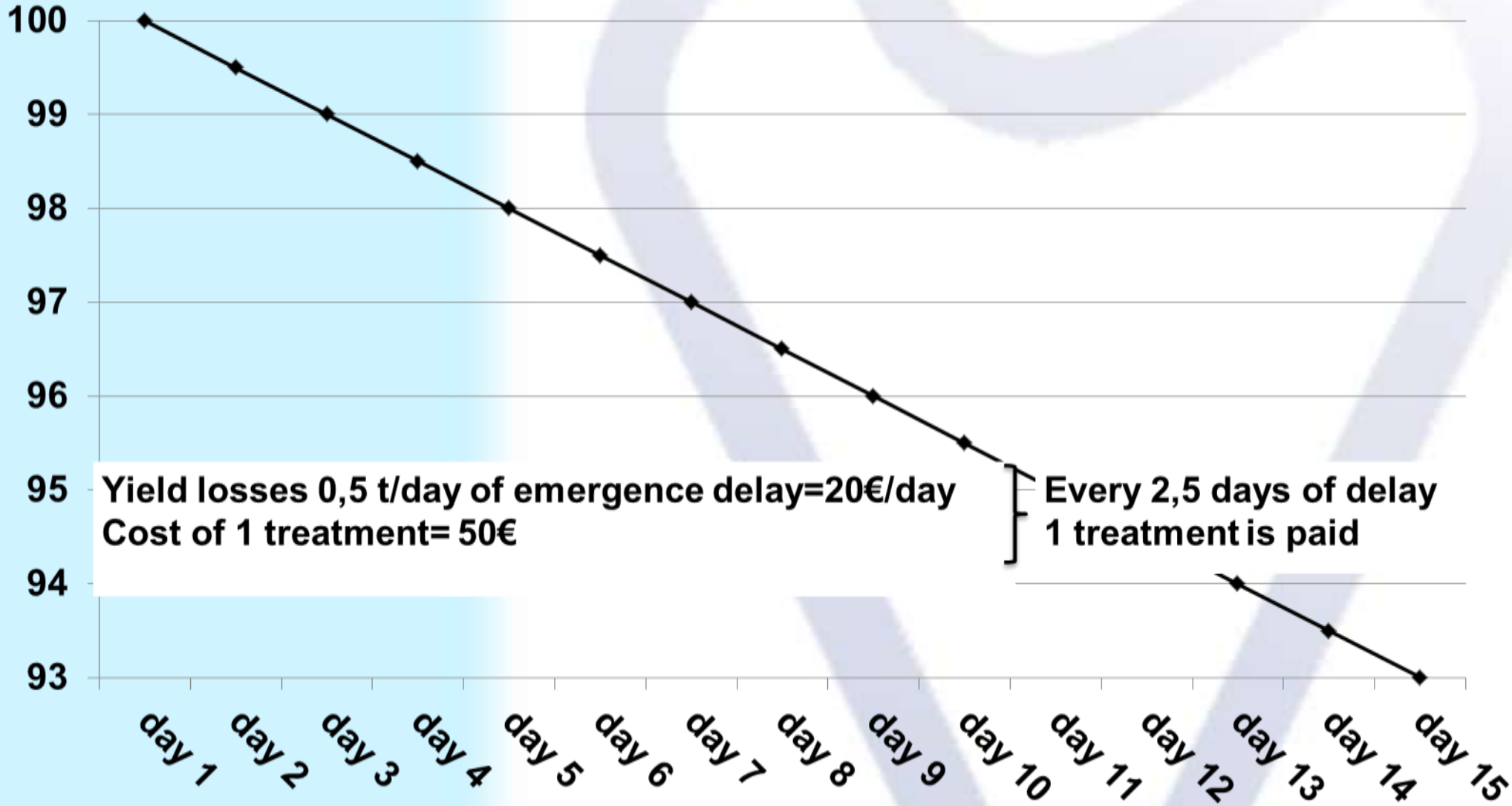
option	comment	effect
1.1 rotation	Especially important if last year's fields had high levels of CLS	***
1.2 sowing date	Symptoms appear later but yield decreases 0,5t/ha/d	*/**
1.3 tolerant cultivars	differences in CLS sensitivity. Easier management on varieties with higher tolerance	***
1.4 fert, irrig, dren		*
1.5 hygiene measures	deep ploughing hastens the breakdown of infected tops, leading to the death of the fungus	?
1.6 protect beneficial org		?
2. monitoring advice		***
3. threshold, climate conditions		***
4. non-chem methods		?
5. specific pesticides least side effects		?
6. reduc doses, reduc freq or partial appl. risk for resistance	Lower effectiveness, depending on the severity	–
7. anti-resist strategies	fewer fungicides available?	***
8. professional user should		?

Three walls to protect the crop against Cercospora

“Catenaccio” tactic

Effect of sowing date in yield and in disease severity

To save 1 treatment, 10 to 15 days of delay in emergency are need.
In terms of profitability (-50€/treatment) we lose 150 to 250 €/ha



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Yield and sensitivity to CLS and PM of the recommended varieties

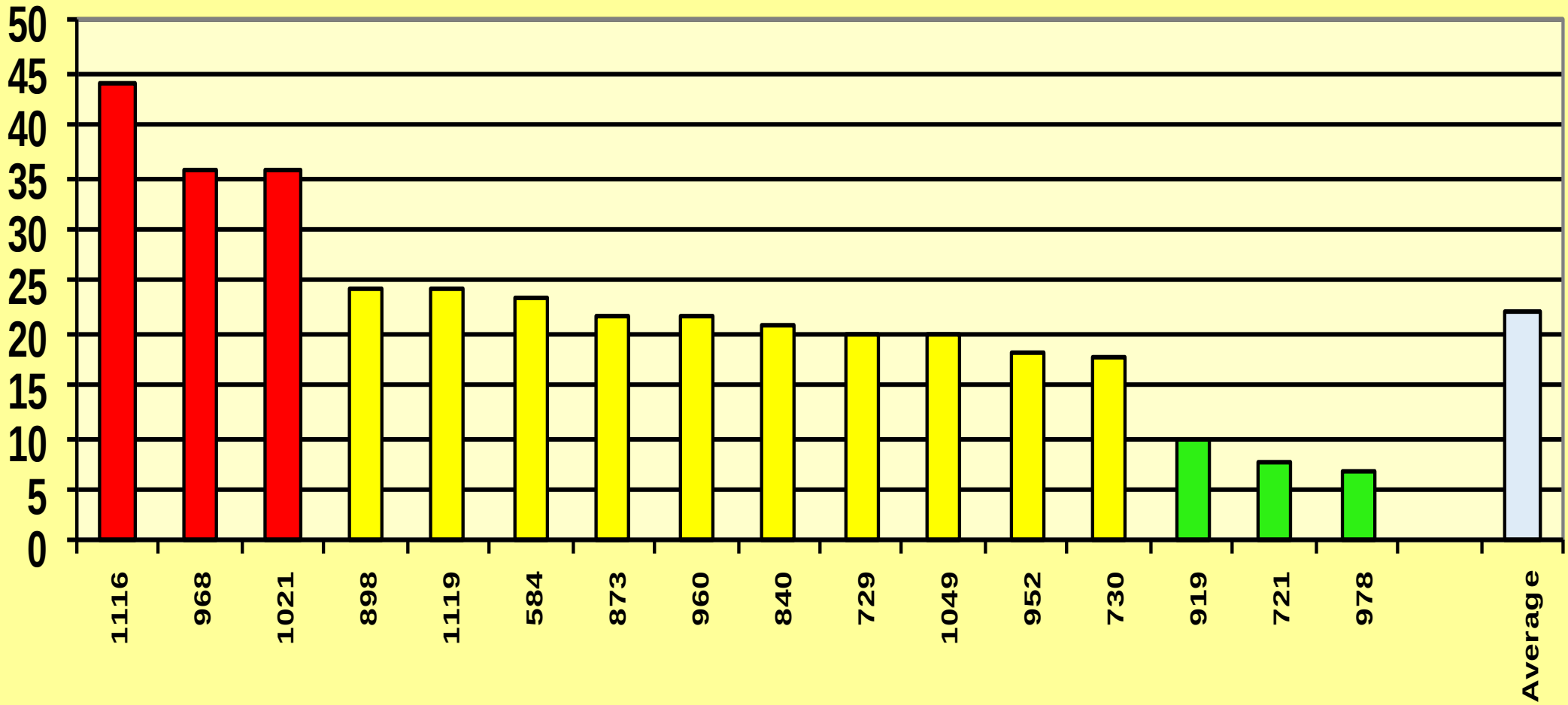
t 16º

Resultados de las variedades recomendadas en valores relativos

Variedad	Casa comercial	Peso	Pol. %	Azúcar/ha	IEA	VTIR-N	Cercospora	Oidio
LUDWINA KWS	KWS	103,98	103,21	107,44	108,64	100,10	Tolerante	Tolerante
NADINA	BETASEED	106,61	101,23	107,91	108,30	100,36	Medio	Tolerante
ISABELLA KWS	KWS	103,80	102,89	106,76	107,96	100,27	Tolerante	Tolerante
NASH	BETASEED	106,05	101,12	107,22	107,85	100,40	Medio	Tolerante
GERALDINA	BETASEED	104,02	102,52	106,73	107,32	99,93	Tolerante	Tolerante
BRITTA	HILLESHÖG-SYNGENTA	103,40	102,33	105,91	106,69	100,27	Medio	Tolerante
ELEONORA KWS	KWS	103,45	102,29	105,81	106,56	100,54	Medio	Medio
ANNIKA	KWS	102,20	102,57	104,83	105,60	100,89	Medio	Tolerante
AMALIA KWS	KWS	98,35	106,47	104,75	105,55	101,18	Tolerante	Medio
SANDRINA KWS	KWS	105,17	99,84	104,95	105,02	100,42	Medio	Medio
ADRIANNA KWS	KWS	101,74	102,00	103,84	104,43	99,95	Medio	Tolerante
PASTEUR	STRUBE	104,03	99,90	103,93	103,92	100,21	Medio	Sensible
THERESA KWS	KWS	99,31	103,37	102,74	103,53	100,30	Medio	Sensible
PARAMO	MARISA-SESVANDERHAVE	104,93	98,70	103,50	103,20	99,82	Tolerante	Tolerante
ARLANZA	MARISA-SESVANDERHAVE	103,45	99,43	102,81	102,83	99,74	Sensible	Medio
ADALINA	KOIPESOL-MARIBO	102,43	100,13	102,62	102,76	100,04	Tolerante	Tolerante

Sensitivity of varieties regarding to *Cercospora beticola*, expressed as Afected Foliar Area

Sensitive, medium, tolerant



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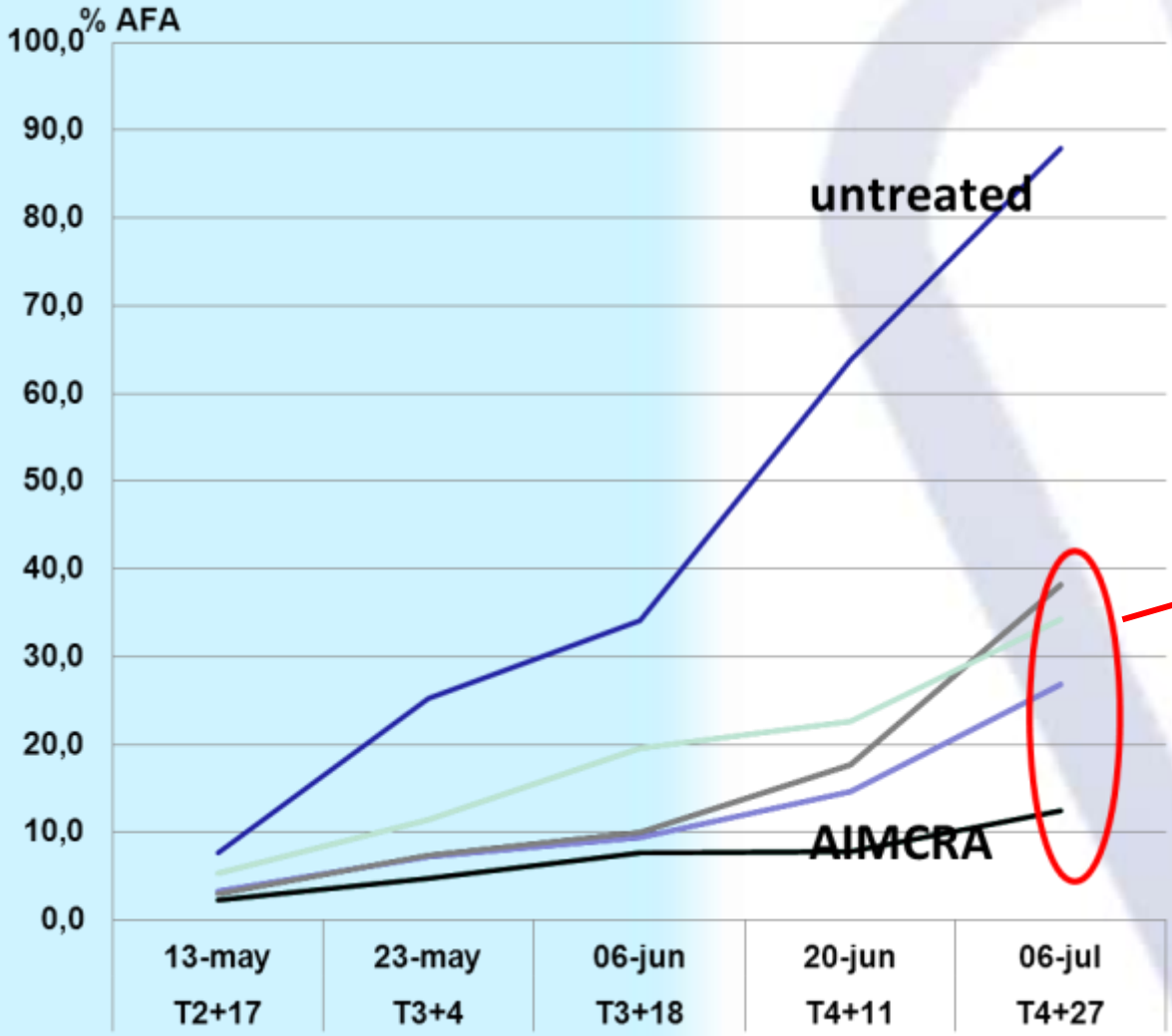
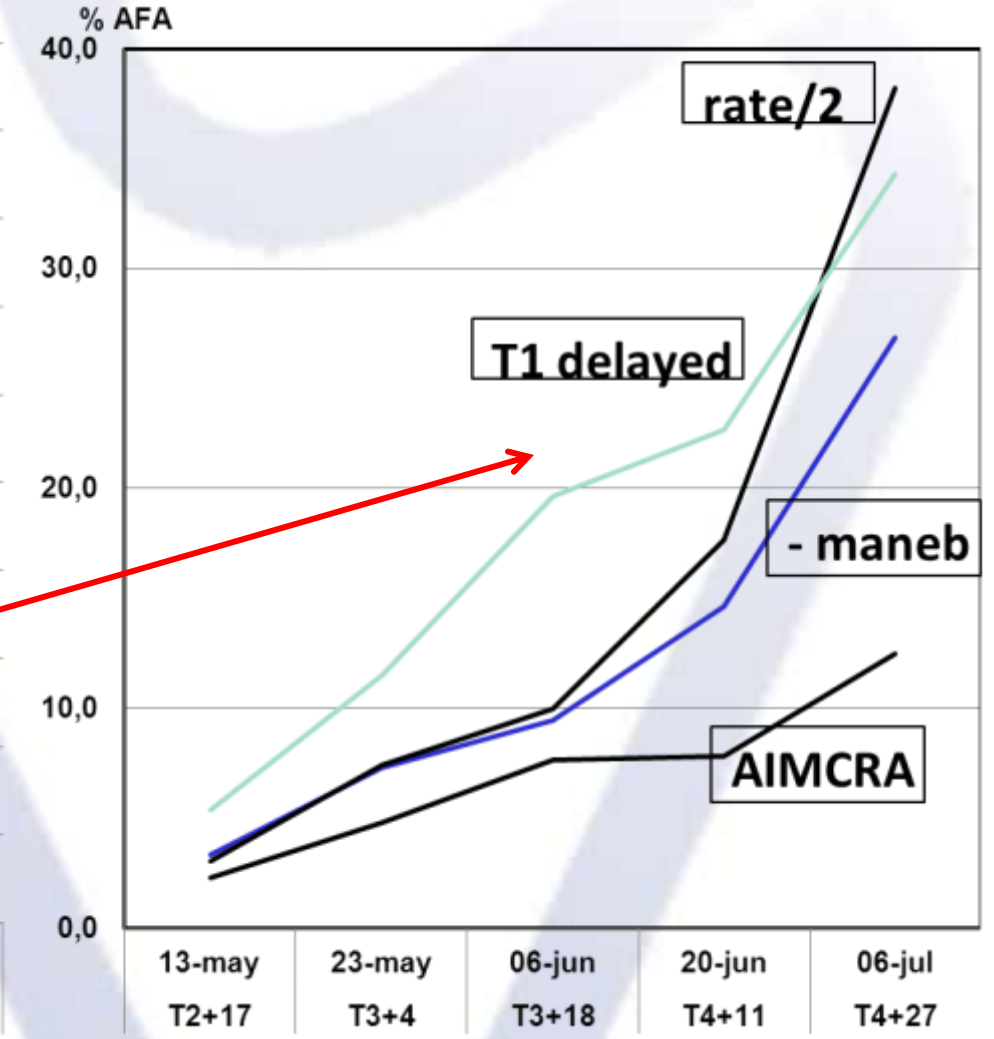
Framework of technicians involved on seasonal advise (some figures)

Crop area in 2011 in ha	45.000
Total number of technician involved in farmers advise	77
ha/technician in average	584
Farms/technician	63
Fields/technician	154
Fields monitored for general advise (3 fields/technician)	231 ★
Checking of sprayers	1.694

★ Monitoring weekly during the risk period, if threshold is reached: SMS to farmers in the closer area

Evolution of *C. beticola*, expressed as Afected Foliar Area (AFA), according to treatments and dates (3 trials)





AIMCRA: antiresistance strategy Escolta+Maneb)/ Spyrale+Maneb

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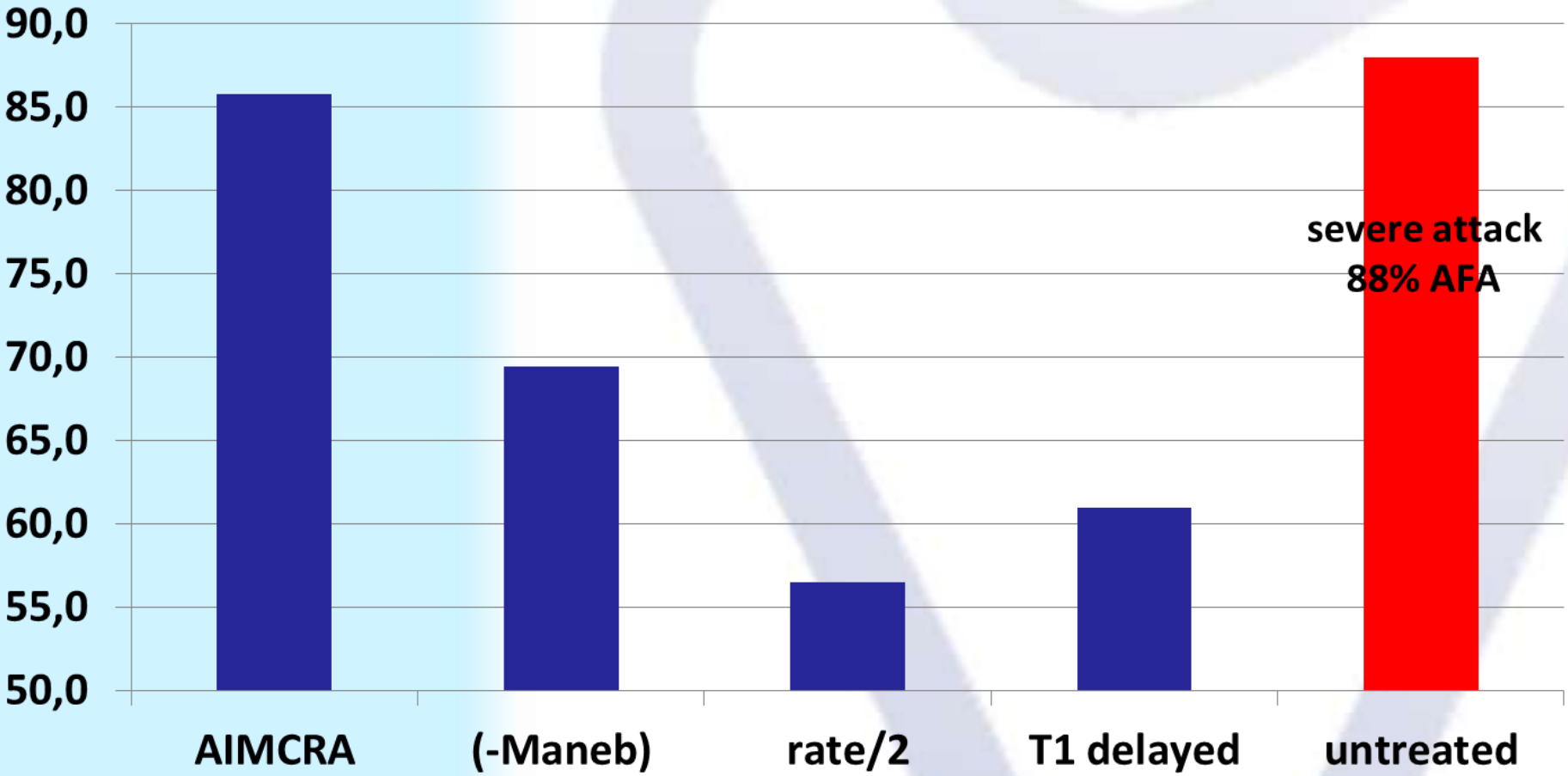
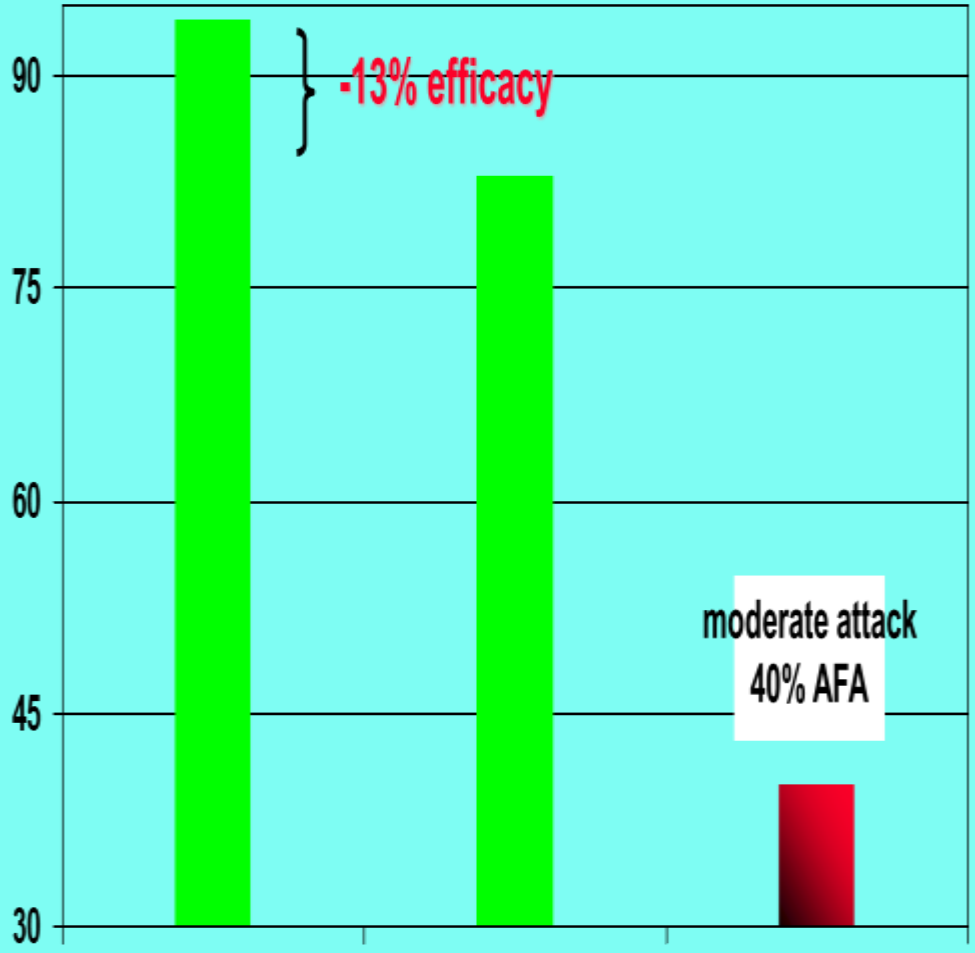
Effectiveness of strategies on *C. beticola*, expressed as %, according treatments (3 trials 2011)



AIMCRA: antiresistance strategy Escolta+Maneb)/ Spyrale+Maneb

MODERATE ATTACK

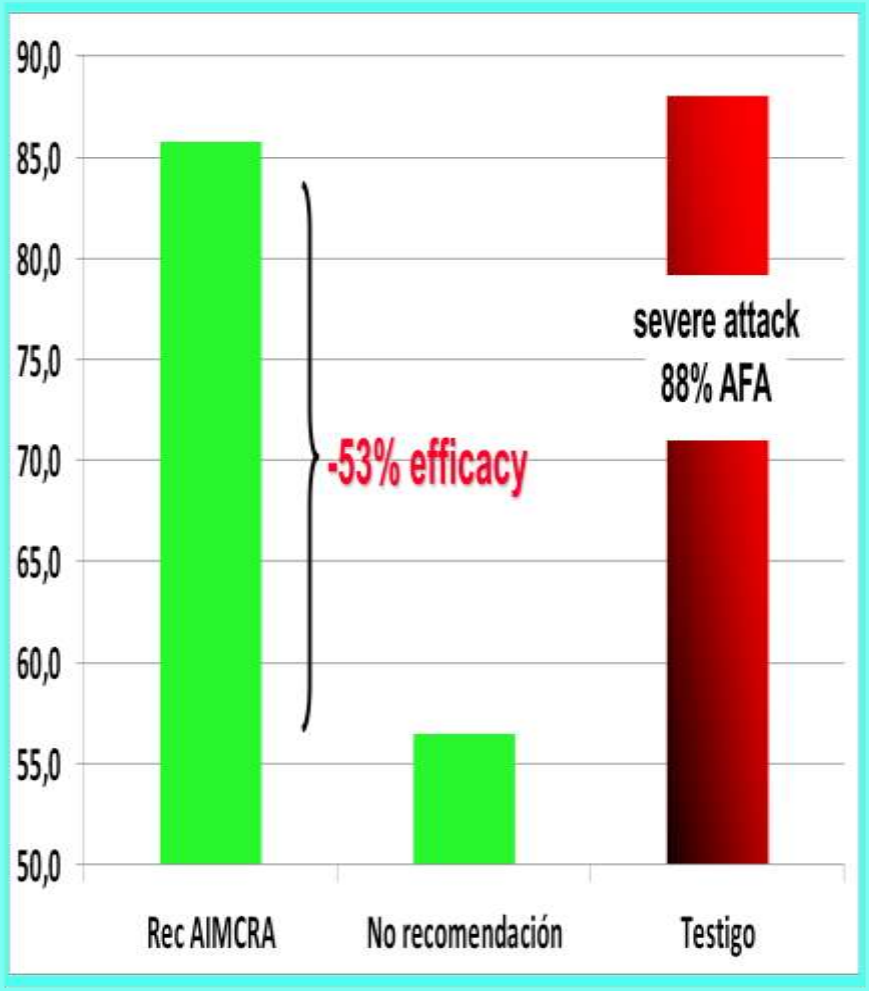
Efficacy of different strategies on controlling Cercospora, expresed as %. (40% Afected Foliar Area AFA, 7 trials)



Rec AIMCRA: anti-resistance strategy (Escolta+Maneb/ Spyrale+Maneb)

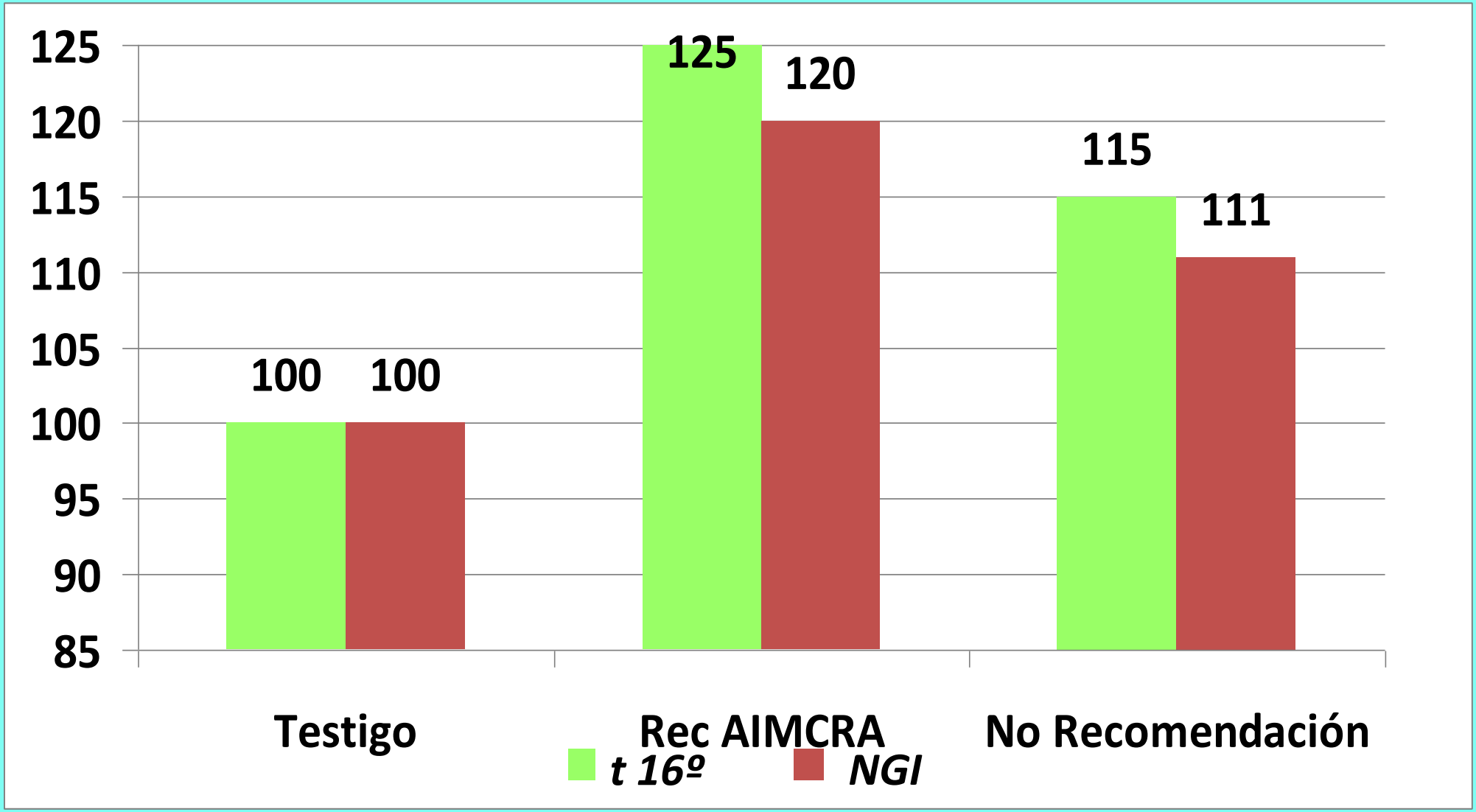
SEVERE ATTACK

Efficacy of different strategies on controlling Cercospora, expresed as %. (88% Afected Foliar Area AFA, 5 trials)



Rec AIMCRA: anti-resistance strategy (Escolta+Maneb/ Spyrale+Maneb)

t 16º and NGI (Net Grower Incomes) according to strategies against Cercospora (5 trials)



Rec AIMCRA: estrategia anti-resistencia (Escolta+Maneb/ Spyrale+Maneb)

RECOMENDACIÓN DE FUNGICIDAS PARA EL CONTROL DE ENFERMEDADES FOLIARES (SIEMBRA PRIMAVERAL Y SIEMBRA OTOÑAL) Eficacia de los fungicidas sobre Oidio, Cercospora y Roya

Enfermedad	Familia de fungicidas	Producto (dosis/ha en kg ó L)	Control[1]	Precio orientativo del producto €/ha[2]
Oidio	Inorgánico	Azufre (6)	****	15,90
	DMI + Morfolina	Spyrale (1)	****	49,00
	DMI + Estrobilurina	Escolta (0,35)	****	48,81
		Retengo Plus (1)	***	33,58
	DMI	Impact (1,5)	****	63,75
		Bumper P (1,5)	***	42,45
Cercospora (riesgo de ataque leve)	DMI + Morfolina+ Dtcm	Spyrale (1) + mancozeb (2) [3]	****	62,00
	DMI + Estrobilurina + Dtcm	Escolta (0,35) + mancozeb (2) [3]	****	61,80
		Retengo Plus (1) +mancozeb (2) [3]	****	46,58
	DMI + Dtcm	Impact (1,5) + mancozeb (2) [3]	****	76,75
Cercospora (riesgo de ataque grave)	DMI + Morfolina + Dtcm	Spyrale (1) + mancozeb (2) [3]	***	62,00
	DMI + Estrobilurina + Dtcm	Escolta (0,35) + mancozeb (2) [3]	***	61,80
		Retengo Plus (1) + mancozeb (2) [3]	***	46,58
	DMI + Bencimidazol + Dtcm	Impact (1,5) + mancozeb (2) [3]	***	76,75
Roya	DMI + Morfolina	Spyrale (1)	*****	49,00
	DMI + Estrobilurina	Escolta (0,35)	*****	48,81
		Retengo Plus (1)	*****	33,58
	DMI	Impact (1,5)	****	63,75

[1] ***** Excelente (Eficacia mayor 95%);
**** Muy Bueno (Eficacia entre 85 y 94%);
*** Bueno (Eficacia entre 75 y 84%).

[2] Precios de la Campaña 2015.

[3] Mezclar siempre con mancozeb 80% (2) o con maneb 80% (2) (Dtcm: ditiocarbamatos). Los precios se refieren a la mezcla.

Two isolates coming from the same field and showing different sensitivity; the isolate 16 needs 1000 times more fungicide than the isolate 15 to obtain similar effect

Isolate 15

Isolate16

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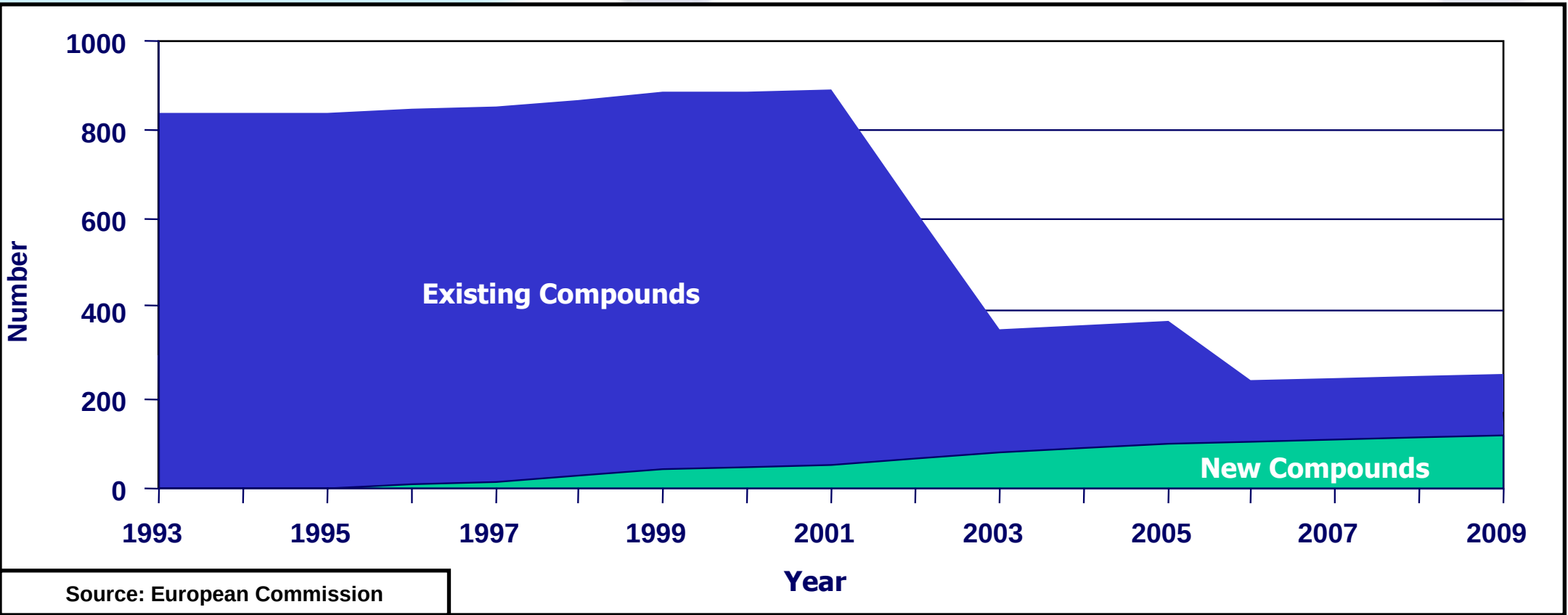
IPM in Cercospora control, has to have into account:

- **ROTATION and other cultural practices, as sowing time, have to be adapted at the local conditions**
- **VARIETIES: yield, sensitivity to diseases**
- **FUNFICIDES: threshold (monitoring diseases and advice when the risk -1st symptoms- appears, time to spray, efficacy, strategies to prevent resistances, lower rates by now seem to be inadequate**

New challenges

- The 750 active ingredients in the past of the European unique registration are now only 250.
- Some strategic ones have disappeared for the beet crop.
- IBS and DTC fungicides are now threatened. It is necessary to study alternative control strategies.



Source: European Commission

New challenges

Active ingredient	Potential loss*
carbendazim	high
cyproconazole	high
difenoconazole	medium
epoxiconazole	high
hymexazol	medium
mancozeb	high
maneb	high
prochloraz	medium
propiconazole	medium
tetraconazole	medium
thiophanate-meythl	medium

* according to DEFRA (Department for Environment, Food and Rural Affairs), CRD (Chemicals regulation directorate)

Other challenges?

Efficient communication
Be able to respond to the sector and society demands

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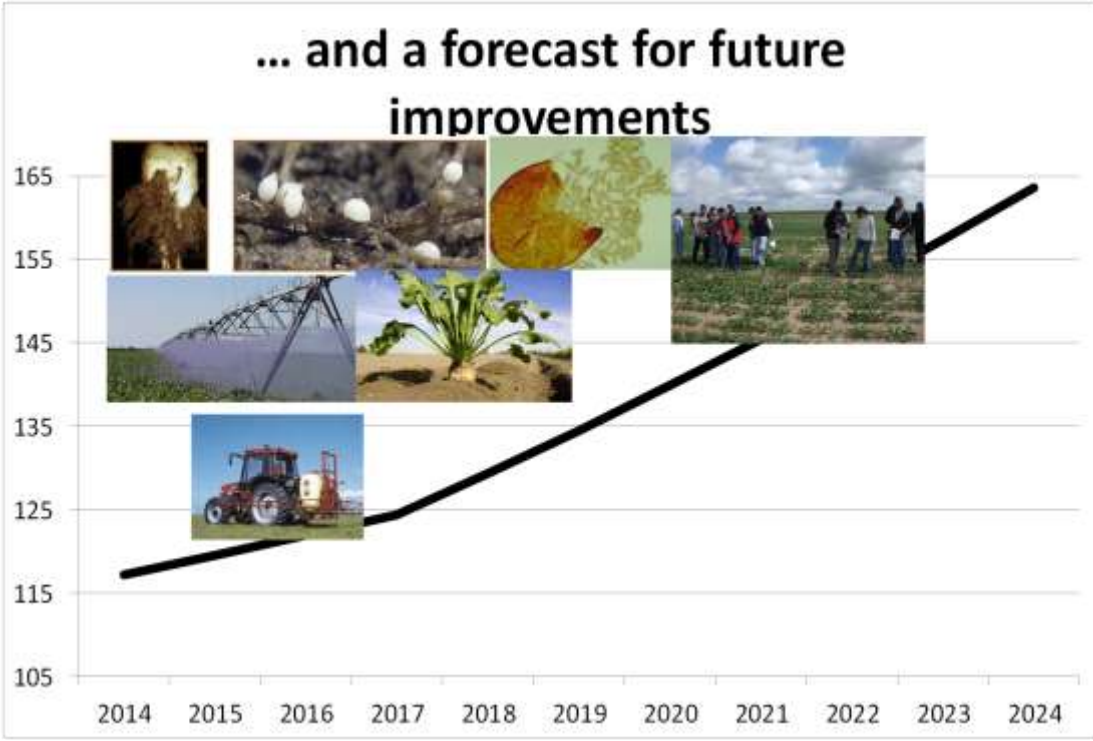
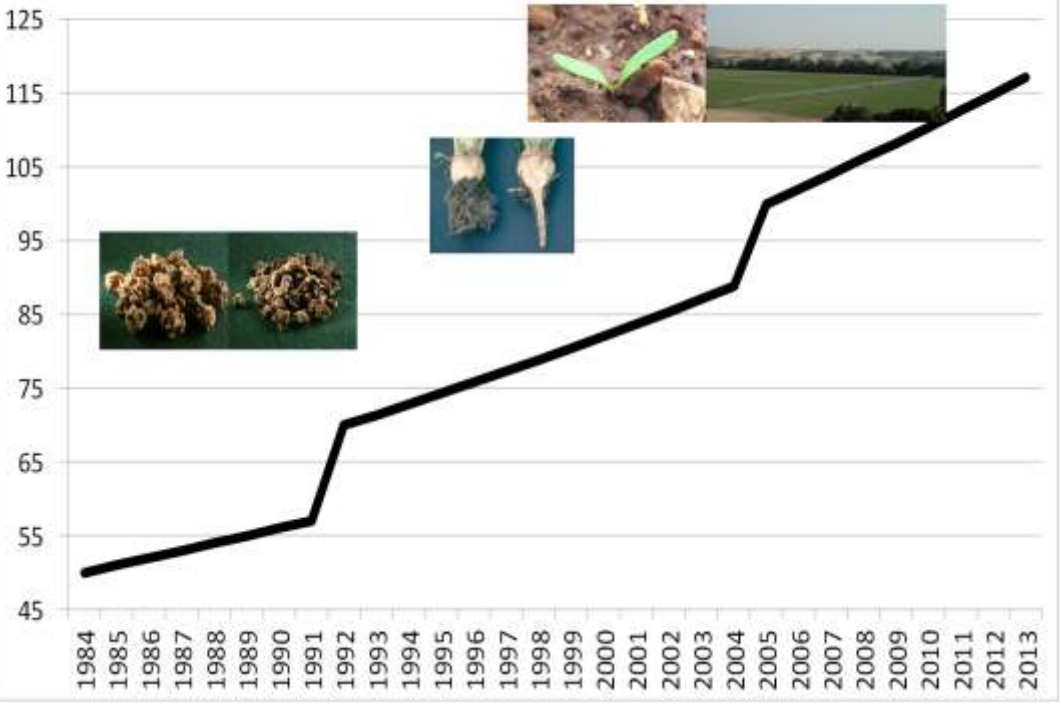
… and a forecast for future improvements



A glance at past successes…




Three Key ideas
Rotation
Varieties
Fungicides (efficacy, antiresistance)

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Thank you for your attention