From pesticide addiction to ecologically based Integrated Pest Management

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From pesticide addiction to ecologically based Integrated Pest Management

Will not give practical examples of IPM in the EU, because I:

- have worked since 1970 on IPM
- have seen TRUE IPM and biological control applied throughout the world, with pesticide reductions of 95 – 100%, reliable and increasing yields, even in the most expensive cropping systems

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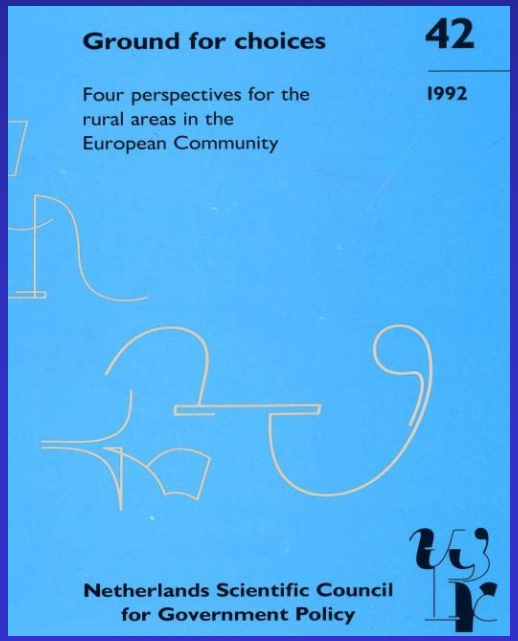
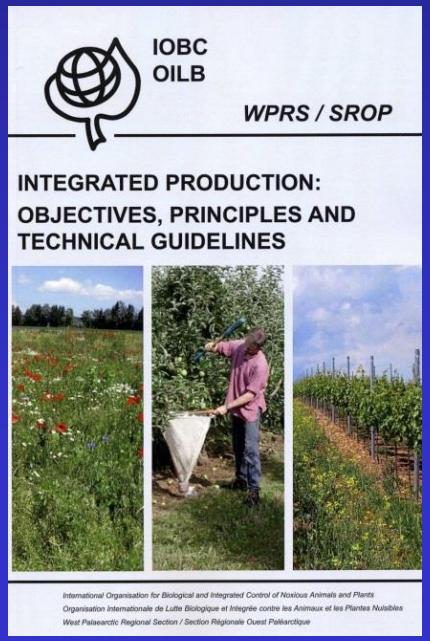
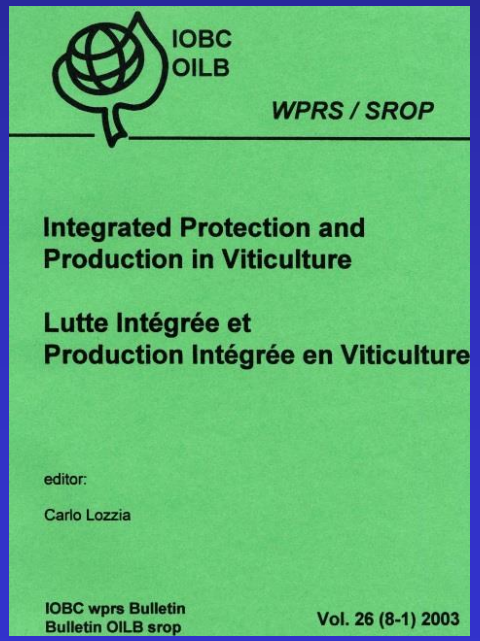
Will not give practical examples of IPM in the EU, because:

- Pesticides can be reduced in volume by 95% TODAY
- True IPM can be used anywhere in the EU TODAY
- All necessary IPM information is easily available at no cost

Thus ...







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Thus ... I will focus on the following questions:

"if IPM is demonstrated to be an efficient/economic method,
(1) why is it not used on a much larger scale ?
(2) why is it absent in most of the National Action Plans of the EU Member States ?

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From pesticide addiction to ecologically based Integrated Pest Management

Scope of presentation

- Agriculture: what went wrong ?
- Attitude of man towards nature
- What is IPM ?
- Will SUD directive realize change from pesticides to IPM ?

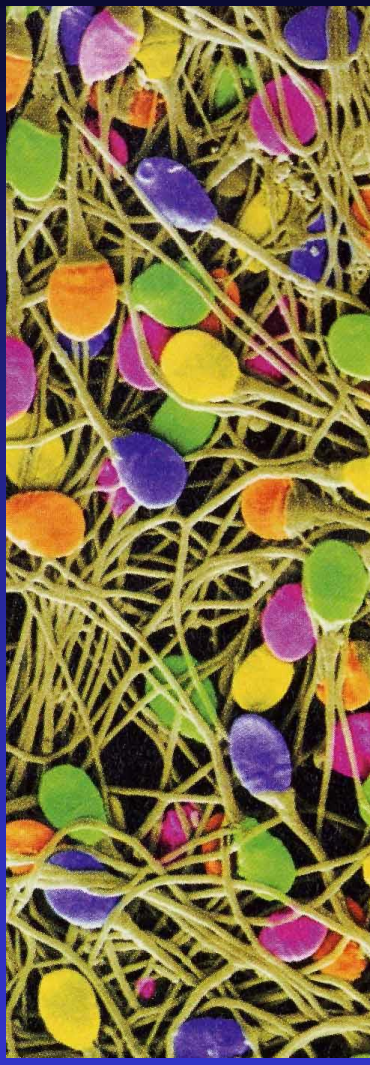
Agriculture: what went wrong?

Agriculture evolved 10,000 years ago
... only 400 human generations

Result: from 6 to 800 million humans in 1800

New agricultural developments after 1800:
breeding, fertilization, pest control etc.

Result: from 800 million in 1800 to 7 billion in 2010 ... only 10 generations



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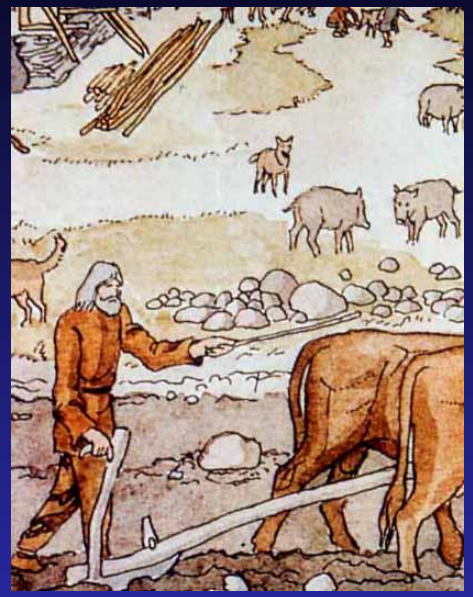
Agriculture: what went wrong?

Positive

- Enormous growth in production:
  - 1800: farmer fed 4, 2010: 120 persons
- Food security, food safety



Agriculture: what went wrong?

Positive

- Enormous growth in production:
  - 1800: farmer fed 4, now 120 persons
- Food security, food safety

Negative:

- Agriculture is major contributor to pollution
  - 40% of pollution relates to agriculture
  - 35% of this caused by pesticides
- Agriculture is major cause of decreasing biodiversity

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Agriculture: what went wrong?

During past 50 years, research drastically changed:

- From holistic farming approaches to extreme reductionism
- Unlimited believe in chemical pesticides for control of pests, diseases and weeds: farmers addicted to pesticides
- Loss of plant resistance to pests totally neglected
- Plant breeding purely aimed at yield (kgs) and cosmetics, not at reduction of pests: plants addicted to pesticides
- Extreme selfish (egotistic) attitude of man

Agriculture: what went wrong?

Unlimited believe in chemical pesticides for control of pests, diseases and weeds resulted in addiction to pesticides by plants, farmers and consumers; addiction was stimulated by governments and industry stating "use them, they are safe" (sic)

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Additional problem strengthening pesticide addiction:

- Food prices went down due to continuous subsidies for pesticides to industry by you and me: industry does not have to pay for large scale pollution of the environment, for extermination of species / reduction of biodiversity, for elimination of the functioning ecosystem services "pest control" and "plant pollination"

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Agriculture: what went wrong?

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Additiona n:

- Food pr s for pesticic es not have to pay t, for exterm ty, for elimina "pest control" and "pl

- Pesticides are irrealistically cheap; should be two to thrice as expensive, resulting in fair competition with biocontrol and IPM

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Attitude of man towards nature

Man as participant - historical role

During first 1,000,000 yrs until start of agriculture

- Man used and was used by nature, part of ecological cycle
- One of the rare organisms in ecosystems

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Man as despot and ruler – recent role

- Cicero (~50 B.C.) developed strict anthropocentrical view: everything in nature exists to the benefit of man, nature is created for man
- Anthropocentrical view generally accepted in 17th Century Bacon (~ 1600), Descartes (~1630): Man is lord and master of nature, which, through technical inventions, should be submittted to him; eradicate all organisms threatening the human world (~ chemical eradication campaigns of today..)

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Attitude of man towards nature

Man as partner – future role?

- Respects intrinsic value of nature, man does not harm nature, his actions are based on ecological knowledge
- But.. we are often utterly ignorant about essential ecological processes
- And.. majority still wants use cheap technologies that are economically attractive but ecologically disastrous

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Attitude of man towards nature

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What does this have to do with agriculture?

- Are we allowed to poison the environment and to decimate biodiversity only for "easy,cheap and dirty" agriculture?
- Is it ethical to kill other life to have a slightly cheaper meal?
- Is there an alternative?

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Sustainable use of pesticides

Ladislav Miko, Deputy Director General for the Food Chain European Commission – SUD meeting June 2012

Objectives of the regulatory intervention at use level:

- Reducing risks and impacts of the use of pesticides
  - On human health
  - On the environment
- Promoting
  - The use of Integrate Pest Management
  - The use of alternative techniques

Health and Consumers

What is IPM ?


30
50
RED ROUTE
CLEARWAY
No stopping
30
GIVE
WAY
Except
local buses
Except
local buses
S1136
S1134
S1138

What is IPM ?

IPM is not: Integrated Pesticide management

IPM is not: Intelligent Pesticide Marketing

IPM is not: Insecticides FIRST, alternatives only as last resort

What is IPM?

Durable, environmentally and economically justifiable system in which pest damage is prevented through the use of natural factors limiting pest population growth, IF NEEDED supplemented with other, preferably non-chemical measures

FIRST: Allow nature to prevent and reduce pest: use ecosystem services (natural control, natural host-plant resistance, cultural methods etc. etc.): they are available for free! and have a value of at least 400 billion US$ per year (COSTANZA et al., 1997)

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Ecosystem service "pest, disease and weed control"

Everywhere where plants grow

Without ecosystem service biological control: no green earth !!

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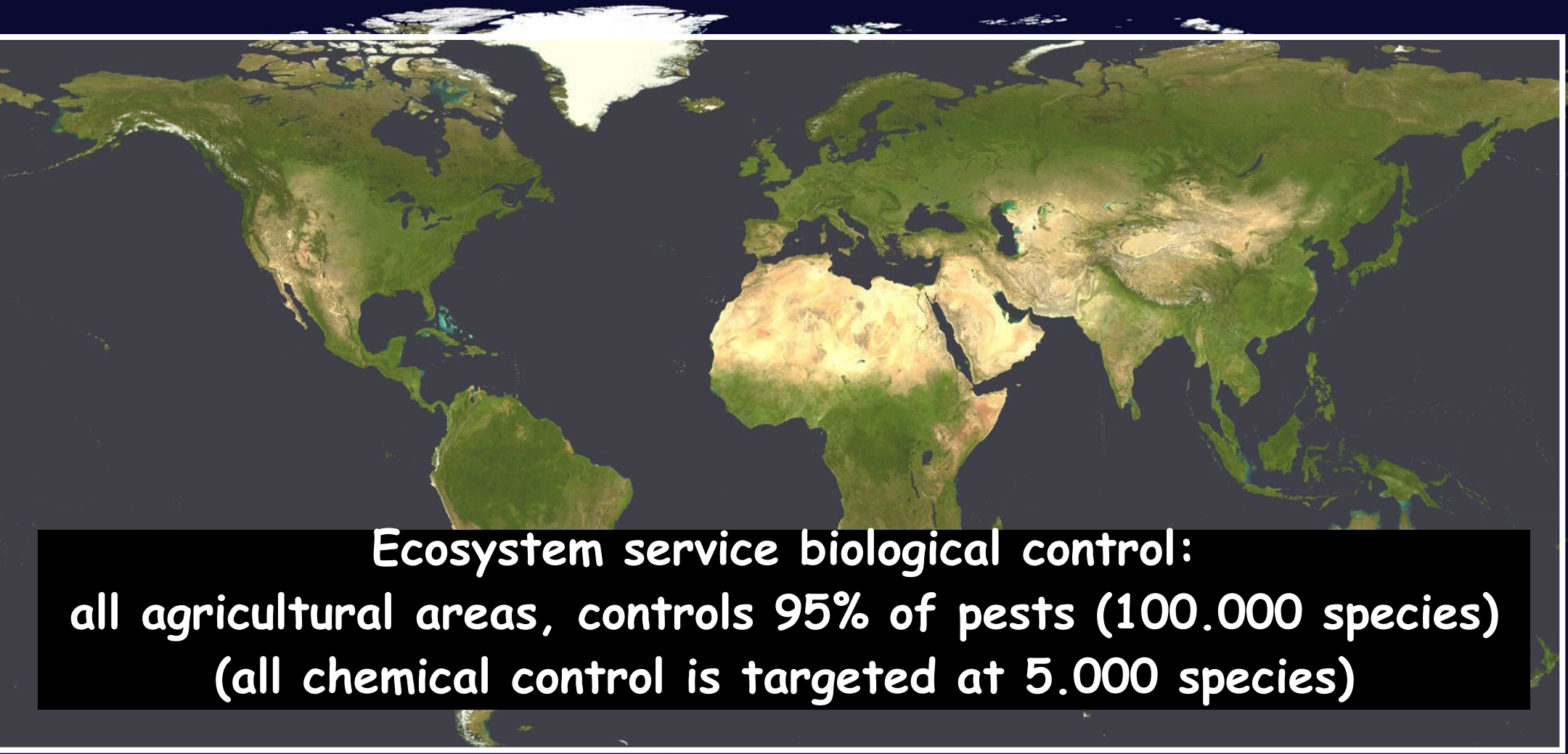
Ecosystem service "pest, disease and weed control"



Ecosystem service biological control:
all agricultural areas, controls 95% of pests (100.000 species)
(all chemical control is targeted at 5.000 species)

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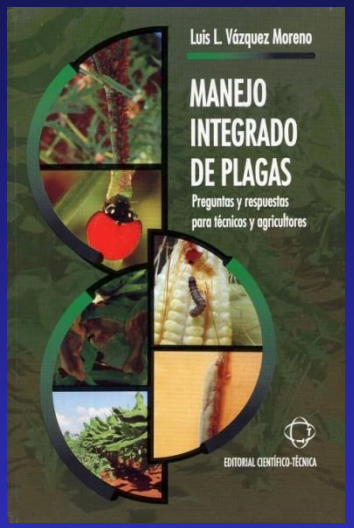
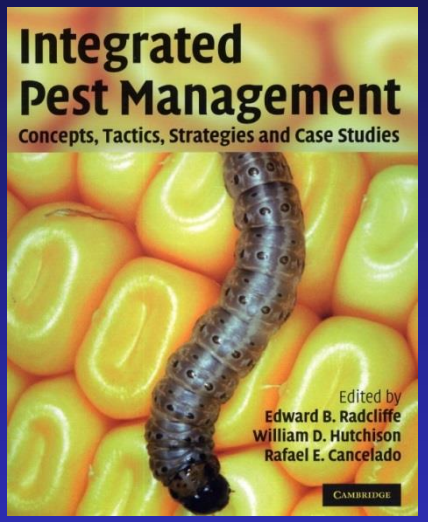
Current use of IPM

Like biocontrol, IPM can always and everywhere be used
IPM is used on a large scale all around the world

International examples:
- IPM in rice in Asia
- Cotton IPM America
- Citrus IPM California
- Malaria IPM Africa

EU examples:
- Fruit orchards
- Vineyards
- Greenhouse crops





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In IPM: Pesticides LAST

Problem: since 1950 agriculture is based on pesticides FIRST

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What went wrong with IPM after 1950 ?

Overuse and misuse of pesticides:

1. Pesticide treadmill: development of resistance, kill of natural enemies, resurgence of pest, and new pests due to kill of natural enemies, new pesticides, more pesticides, more frequent sprays

2. Selection of new plant cultivars under blanket of pesticides leading to "incubator" plants, unable to survive without frequent pesticide applications





What went wrong with IPM after 1950 ?

Pesticides will almost by definition make IPM system unsustainable, because:

- within a few years resistance will develop
- industry loves resistence: patent period on pesticide is limited, replacement with new pesticide is goldmine
- new pesticide might be difficult to integrate in IPM
- pesticides always have negative effects on the environment – even if they are selective (pesticides are there to kill, they are poisons not only for pest)
- primary philosophy of industry is to make profit, NOT to work on sustainability

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Do we really want to change

...

and are we capable to do so ?

EC Sustainable Use Directive 2009/128/EC

"Member states shall take all necessary measures to promote low pesticide-input pest management, giving when ever possible, priority to non-chemical methods, so that professional users of pesticides switch to practices and products with the lowest risk to human health and the environment among those available for the same pest problem…"

Article 14

30 June 2013: MS to report to EC on implementation of IPM

1 January 2014: all professional users to implement IPM

EC Sustainable Use Directive: solution ?

YES, approach sketched in SUD could provide solution

But... difficult to find any of this in plans of MSs

Current plans mainly aimed at "some" reduction of conventional pesticides

Often... yes, we will work on IPM,
.. but first more research and training needed,
.. and not: IPM can be used NOW

EC Sustainable Use Directive: solution ?

What will reaction from EC be to these poor plans?

- Will EC formulate targets and will they be determined by the goals as formulated SUD directive?
- Will EC demand specific indicators for increase in use of true IPM?

EC Sustainable Use Directive: solution ?

What will reaction from EC be to these poor plans?

- Will EC formulate targets and will they be determined by the goals as formulated SUD directive?
- Will EC demand specific indicators for increase in use of true IPM?
- Will EC prohibit use of most polluting pesticides?
- Will EC demand use of environmentally friendly non-chemical alternatives?
- Does EC have enough and the right expertise and the capacity to evaluate NAPs?

EC Sustainable Use Directive: solution ?

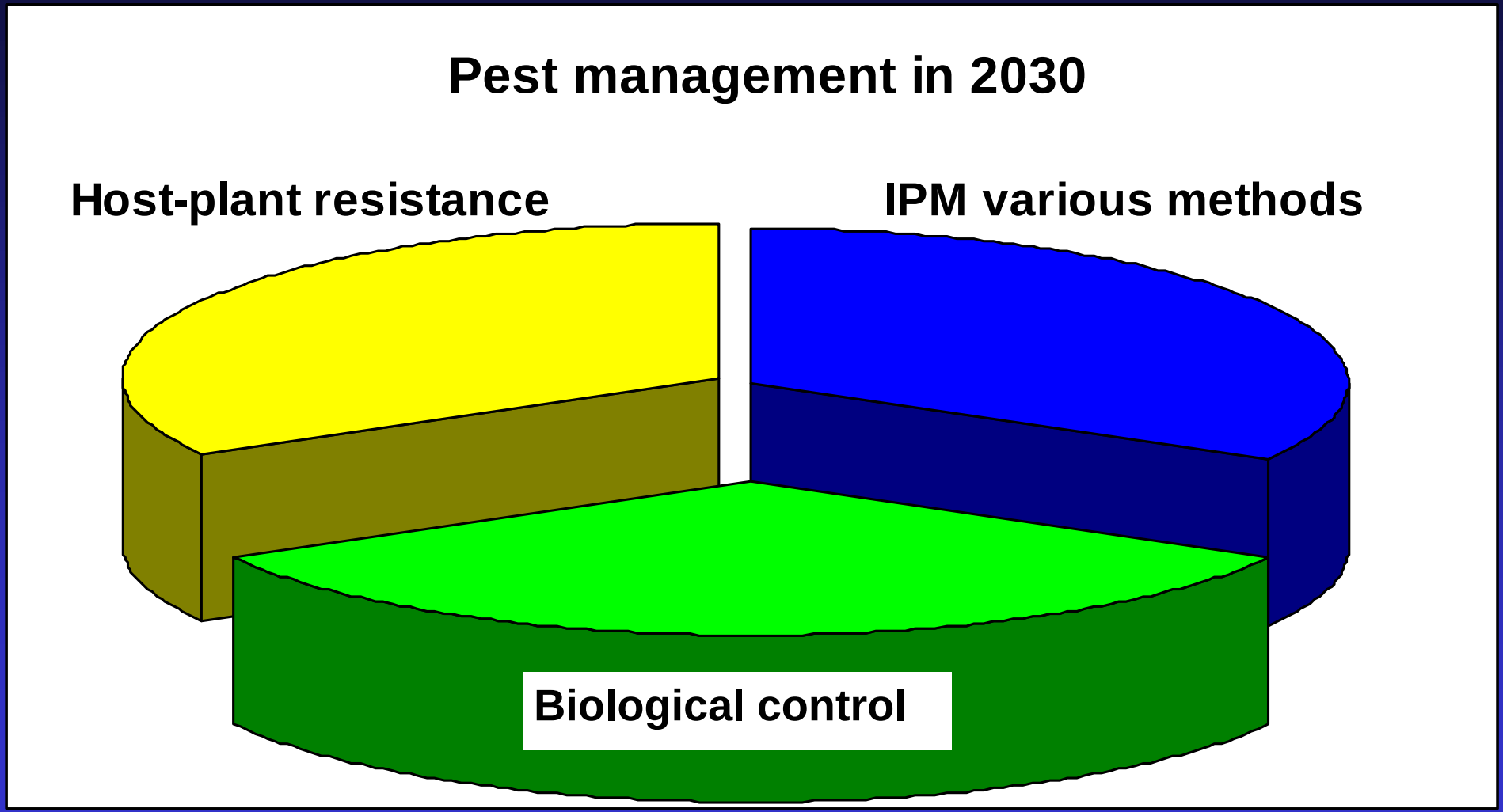
If EC wants to make a change to green agriculture, then:

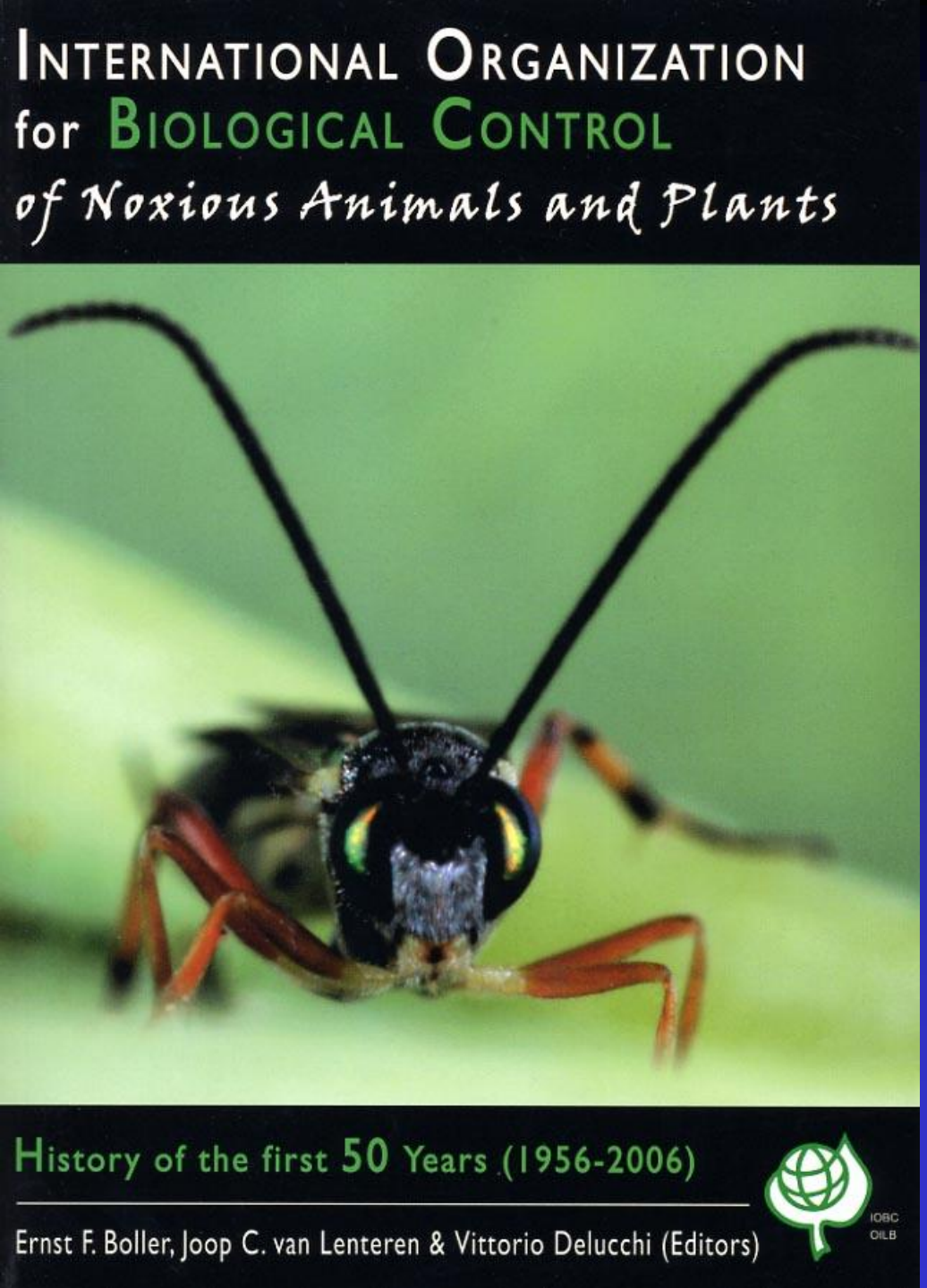
1. Formulate clear targets and indicators for IPM
2. Formulate criteria for Low Risk substances NOW (EC 1107/2009 is 4 yrs old, still no criteria)
3. Identify LR substances now (many in use, many ready for evalution: real boost for IPM)
3. Create fast-track procedure for LR substances
4. Prioritize registration for LR substances, do not..
5. Tailor registration of LRs to their nature, not to synthetic pesticides

SUD, together with others, might cure the pesticide addiction

- Retailer demands: IPM is a positive option, strongly restrict pesticide use, prescribe use of alternatives, surpass all National Action Plans and current EC/MSs regulations
- Reporting of illegal use and too high residue levels by NGOs result in change choice by consumers
- Pesticide scandals resulted in quick and large scale uptake of IPM and biocontrol (e.g. Spain, Almeria)

SUD, together with others, might cure the pesticide addiction with as result:





IOBC is the only worldwide organization representing biological control in global, regional and national organizations for more than 50 years

We offer you our knowledge at www.IOBC-Global.org

We ask you to become member and share your experience with us: we need you !!

Choice for Biological Control is logical: Chemical and Biological Control compared

	Chemical control*	Biological control
Number of ingredients tested	> 2 million	3,500
Success ratio	1 : 200,000	1 : 10
Developmental costs	300 million $	2 million $
Developmental time	10 years	10 years
Benefit / cost ratio	2 : 1	2.5/500 : 1
Risks of resistance	large	small
Specificity	very small	very large
Harmful side-effects	many	nil/few

* = data from chemical industry

Factors hampering implementation of Biocontrol and IPM

Funding of research in BiCo/IPM: very limited

Farmers' attitude: why if chemicals are available

Viewpoint of the chemical industries: negative

Role of governments/EU: talk instead of do

IPM programme for tomato in North Europe

10 insect / mite pests	15 natural enemies
2 nematode pests	resistant cultivars, soilless culture
5 fungal diseases	biocontrol (antagonists), climate management, resistant cultivars
1 bacterial disease	pathogen free seed, soilless culture
2 virus diseases	resistant cultivars, biol. vector control

pollination

bumble bees >

PESTICIDE TREADMILL

THERAPEUTICS

Broad spectrum chemicals

Heavy reliance on pesticides

Little emphasis on ecosystem

By definition unstable and unsustainable

PESTICIDE TREADMILL

Heavy reliance on pesticides

Little emphasis on ecosystem

THERAPEUTICS

Broad spectrum chemicals >>>>>

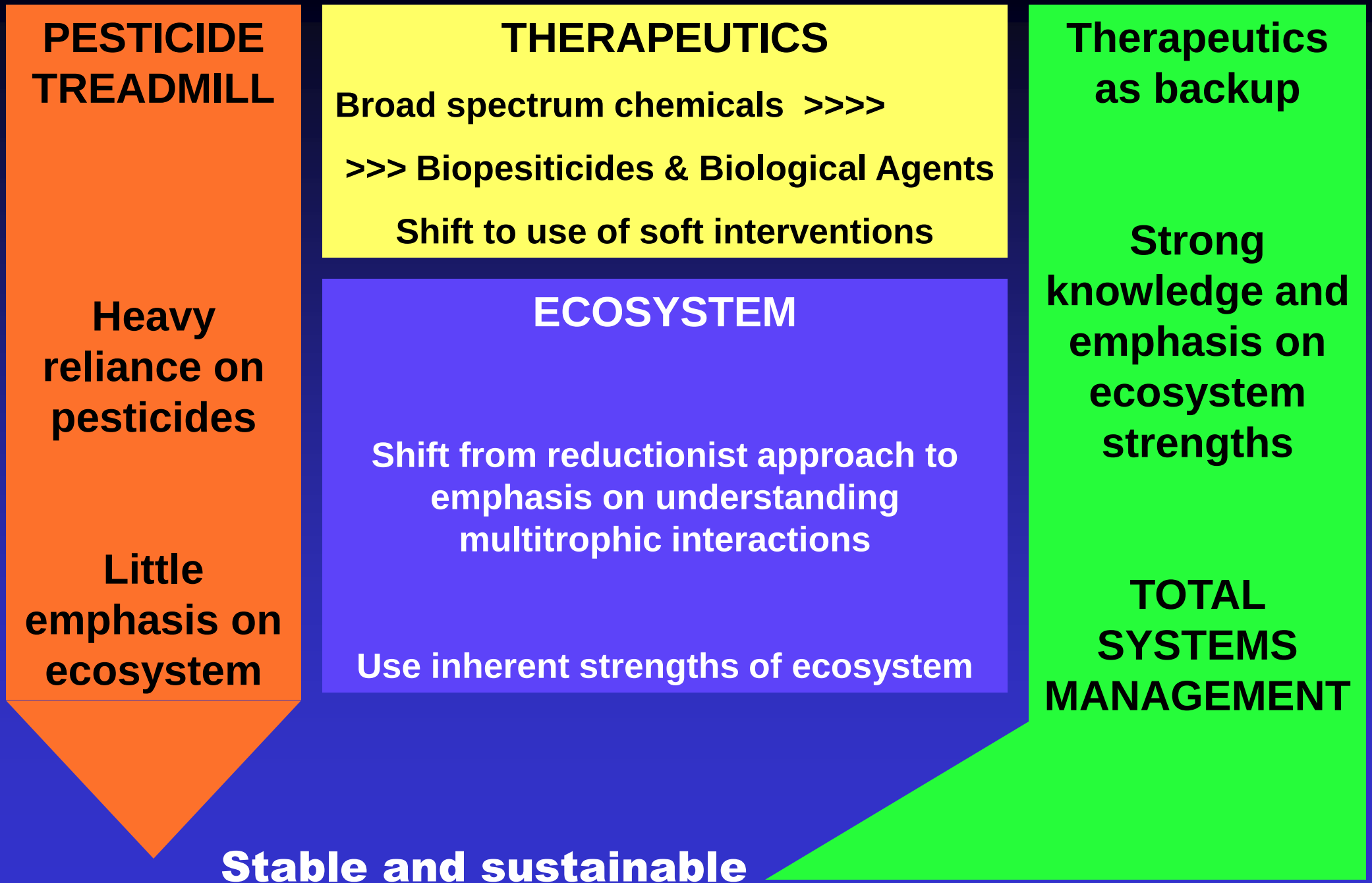
>>>>Biopesticides & Biological Agents

Shift to use of soft interventions

ECOSYSTEM

Shift from reductionist approach to emphasis on understanding multitrophic interactions

Use inherent strengths of ecosystem


PESTICIDE TREADMILL
Heavy reliance on pesticides
Little emphasis on ecosystem
THERAPEUTICS
Broad spectrum chemicals >>>>
>>> Biopesiticides & Biological Agents
Shift to use of soft interventions
ECOSYSTEM
Shift from reductionist approach to emphasis on understanding multitrophic interactions
Use inherent strengths of ecosystem
Therapeutics as backup
Strong knowledge and emphasis on ecosystem strengths
TOTAL SYSTEMS MANAGEMENT
Stable and sustainable

Man and agriculture

What is Biological Control ?

Biological control: the use of an organism to reduce populations of another organism (animal pests, diseases and weeds)