

IPM in Grapes: Science Meets the Challenge

Presentation of the Grape Posters
(Insects and Pathogens)

IOBC

www.iobc-wprs.org

Carlo Duso



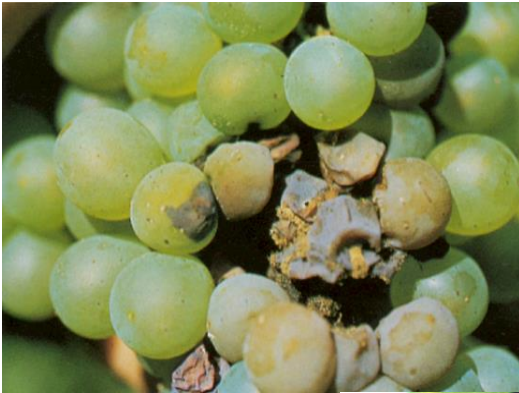
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Plant protection problems in vineyards and Integrated Pest Management (IPM)



IPM has taken the first steps in the 1970s when the main problems were represented by berry moths and downy mildew



Plant protection problems in vineyards and Integrated Pest Management (IPM)



- Intense use of insecticides (OPs) against pests and fungicides (dithiocarbamates) against diseases
- Up to 25 pesticide applications/year
- Concerns for toxicological and environmental effects
- Outbreaks of “new pests”



IOBC (International Organization for Biological Control) promotes IPM



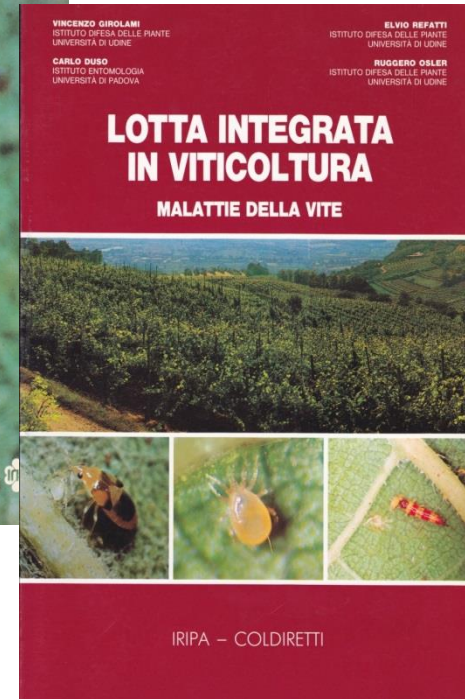
The first meetings of the IOBC Working Group «IPM in viticulture» were organised in the 1970s. The main topics were:

- monitoring and economic thresholds of pests
- natural control of pests
- sex pheromones
- side-effects of pesticides on beneficials
- impact of agronomic practice on pests and diseases

In the 1980s the European Commission as well MS supported the first projects on IPM in viticulture



The first handbooks of IPM in viticulture



Entomologists of the University of Padova at the first European Symposium on «IPM in Viticulture» (Portoferraio, 1985)

IPM in viticulture: successful case-studies that reduced pesticide use



- Mating disruption against berry moths (> 230,000 ha in Europe)
- Models and DSS to forecast and manage pests and diseases
- Biological control of spider mites by predatory mites
- Identification and management of vectors of Grape Yellows (FD and BN)



Stage	Forecast	Appearance calculated by DSS	Field observation
L1	25 May – 6 June	28 May	25 May
L3	11 – 14 June	9 June	11 June
Adult	7 – 13 July	13 July	7 July



The most striking scientific results presented at the last IOBC meetings



- More sustainable techniques of Mating Disruption against berry moths.
- Identification of environmental factors and cultural practices affecting the abundance of emerging pests (e.g. *D. suzukii*, *P. ficus*).
- Advances in the knowledge of vectors of grape yellows and viruses.
- Evaluation of grape varieties resistant to mildews.
- New findings on the role of biocontrol agents and endophytic microorganisms.
- Progress in the studies on Esca complex.

IPM “works with nature”: an exhibition by IOBC, IBMA and PAN (2015)

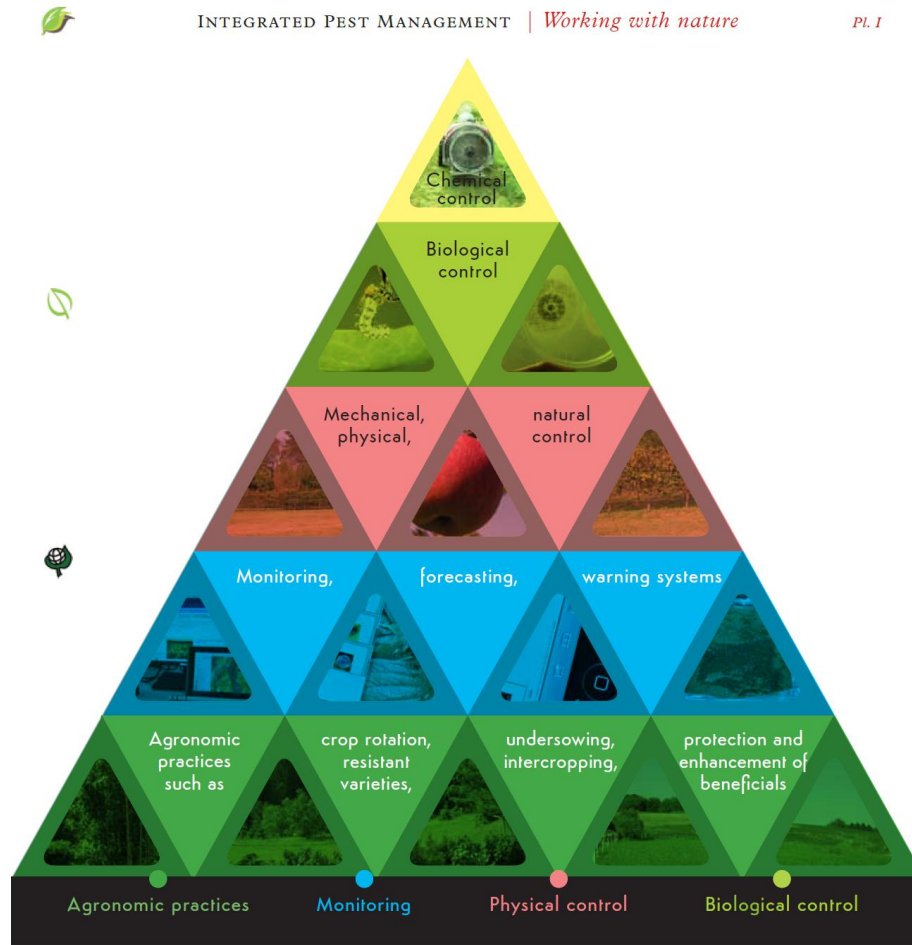


Presentation of 11 posters (e.g. DG AGRI, DG SANTE) with these messages:

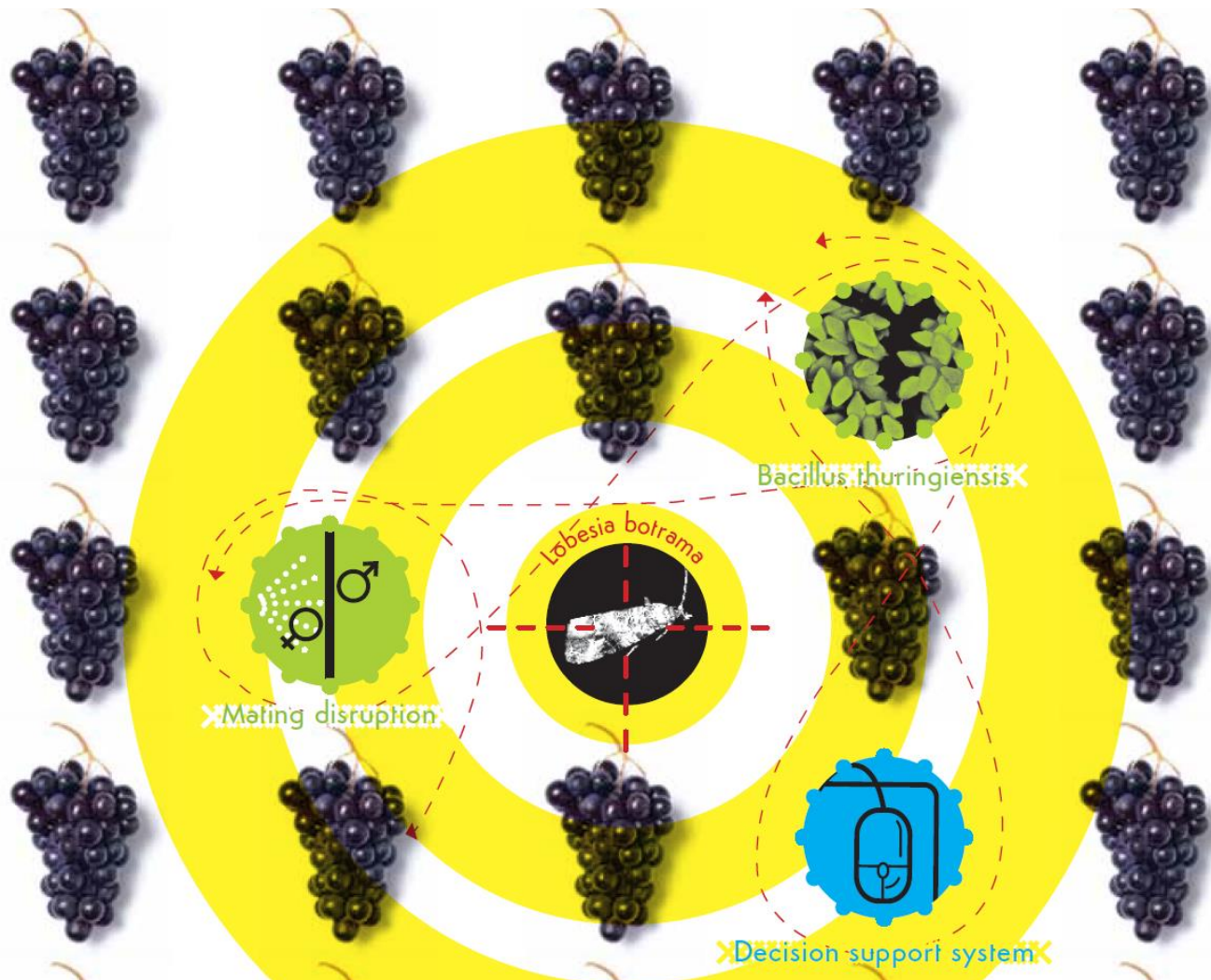
- What IPM means
- How Sustainable Use Directive can be Implemented
- Biocontrol agents and tools should be combined with good agronomic practice
- Agricultural models with low impact but ensuring safe food are available



IPM pillars: agronomic practice, monitoring, physical methods, biocontrol



Lobesia botrana control: Mating Disruption, DSS and *Bacillus thuringiensis*



Progress in the control of berry moths



Mating Disruption: commercial formulations of pheromones mimic the natural chemical blends of females. Male confusion is the result of ambient pheromone concentrations sufficient to hide the trails of calling females (nanograms per cubic meter).

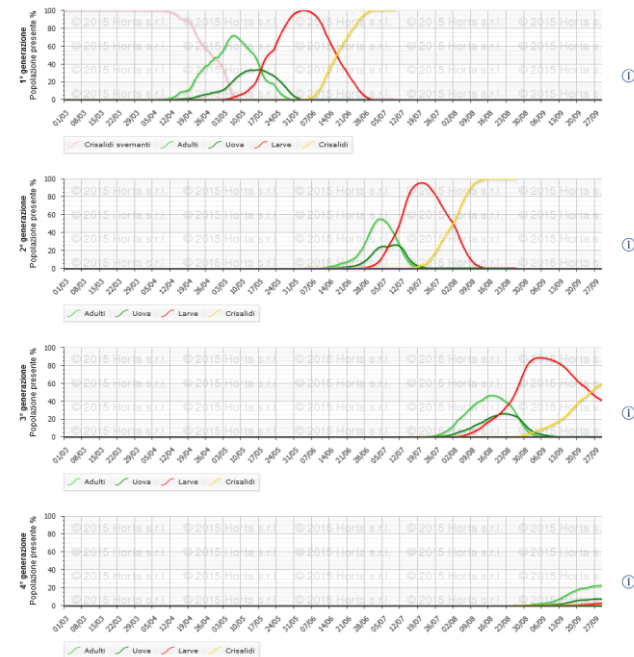


Progress in the control of berry moths



Models and Decision Support Systems

Decision Support Systems integrate forecasting models with data on agronomic and cultural practices and facilitate decisions on pest control.



Progress in the control of berry moths



Bacillus thuringiensis: a naturally occurring bacterium that works as an insect gut toxin. The efficacy of new formulates is comparable to that of conventional insecticides.

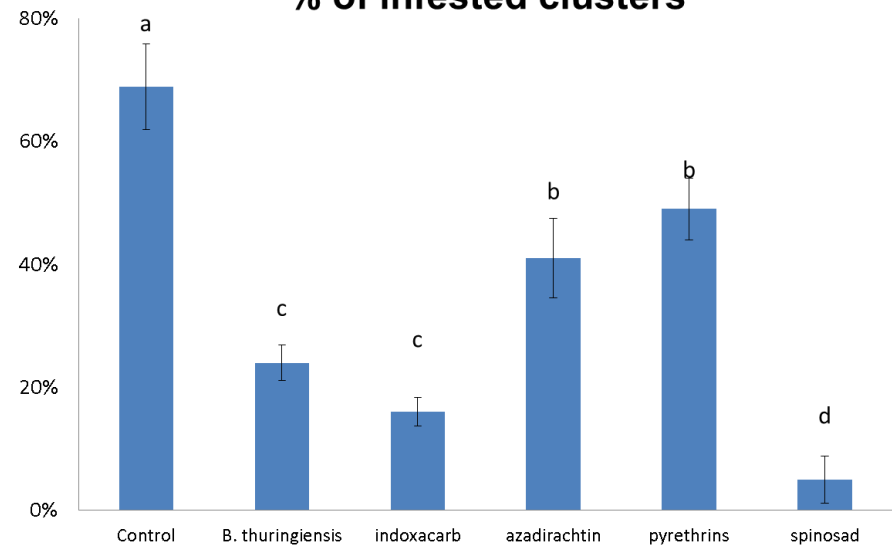


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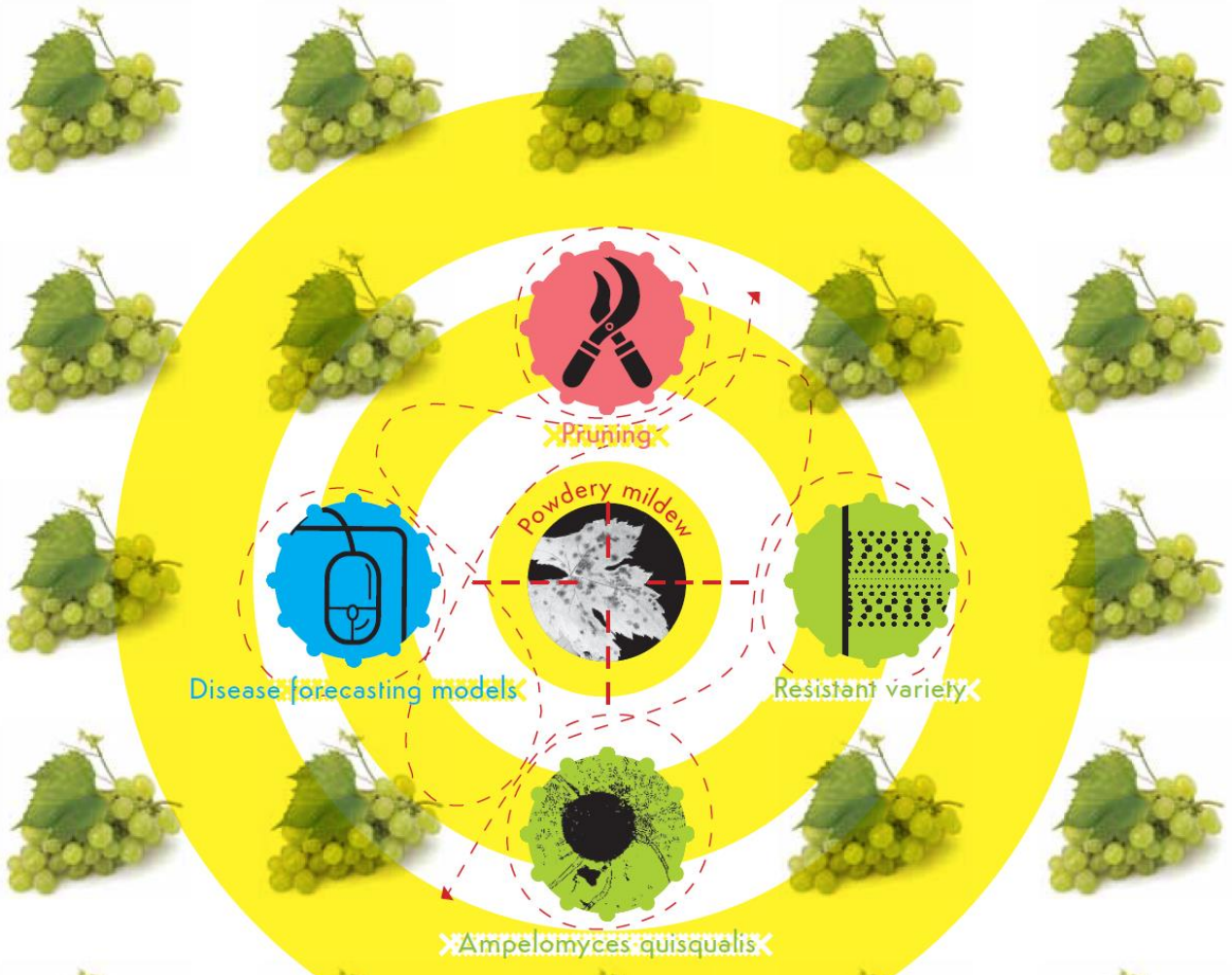


Effects on *Lobesia botrana*

Meolo - 2013
% of infested clusters



Powdery mildew control: integrating DSS, resistant varieties, BCA and pruning



Which new developments can be expected?



Enhancing botanical biodiversity in and near vineyards produces some positive effects on the natural control of pests but evidence is still limited and mechanisms poorly explored

Which new developments can be expected?



New insights on the compatibility between pesticides and biocontrol agents (and pollinators) in conventional and organic vineyards

Which new developments can be expected?



- Management of invasive species (e.g. *Halyomorpha halys*) and of emerging pests (e.g. *Ephestia* spp.) in the framework of climate change
- Development of new tools (e.g. multiple species dispensers) and solutions to implement the Sustainable Use Directive

Which new developments can be expected?



- Investigations on the genetic diversity of downy and powdery mildew and the occurrence of strains breaking the resistance.
- Development of strategies to control both diseases in resistant cultivars according to resistance level and climatic conditions.
- Monitor the status of “secondary” diseases in this framework.

A recent EU project (PURE) has analysed the most innovative tools to manage a number of pests and diseases using less pesticides



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A critical review of plant protection tools for reducing pesticide use on grapevine and new perspectives for the implementation of IPM in viticulture

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However, additional solutions are needed to address old and new problems...

Without research, reducing dependence on pesticides is still a long and winding road



Thank you