Biocontrol in Selected Crops Number 1: Grapevine

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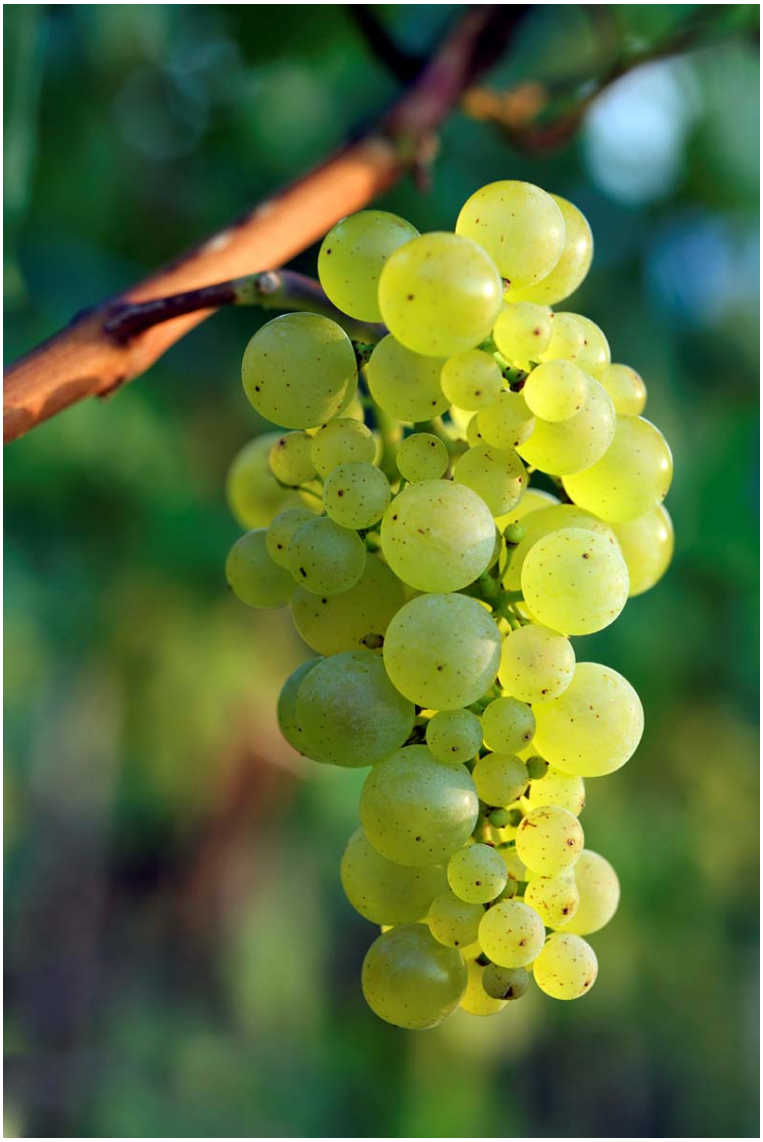

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Food Quality and Safety
6TH FRAMEWORK
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Grapevine in European agriculture

> 5.2 million hectares in Europe (65% of the world's total).
> The main countries for grapevine production are Italy, France and Spain. Smaller producing countries are Germany, Austria, Hungary and Romania.
> The grapevine acreage is stagnating in Europe, though newer countries have started production, such as England, The Netherlands and Belgium.
> The production trend is oriented towards quality rather than quantity.
> The sector's main problems :
> Competition with imported wines from the Americas and South Africa.
> Emerging or uncontrolled diseases, such as esca.
> The requirement for zero pesticide residues.

Main production threats in grapevine production

> Pests: grapevine producers are faced with a wide variety of pests occurring under all climatic conditions. While berry moths remain the most important, localised and sporadic mite outbreaks are difficult to control.
> Pathogens: four major pathogens can be identified. *Botrytis cinerea* (grey mould), *Plasmapora viticola* (downy mildew) and *Erysiphe necator* (powdery mildew) are the most permanent and serious diseases. The new strobilurins fungicide group provides good control of all these diseases, though resistance develops very fast, necessitating alternative treatments with copper or other products. Trunk diseases such as esca and *Eutypa* are of increasing concern in most vineyards.
> Weeds: a very large number of weeds occur in vineyards, although the trend is to keep cover between the rows and clean chemically or mechanically only the line of plantation.
> Insects**:** many insects and mites affect grapevine. The most important are the grape berry moth (*Eupoecillia ambiguella/Cochylis*) and the European grapevine moth (*Lobesia botrana/Eudémis*).

Table 1: Registered available biocontrol solutions

Pest	Microorganism	Macroorganism	Semiochemical for	Natural product extracts
Insects				
Grape berry moth	*Bacillus thurigiensis (Bt)*		Sex confusion	Spinosade
European grapevine moth	*Bt*		Sex confusion	Spinosade
Thrips				Spinosade
Leaf rollers				Spinosade
Pathogens				
Eutypa lata	*Trichoderma atroviride*			
Esca				
Botrytis cinerea	*Bacillus subtilis*			
Downy mildew				
Powdery mildew				

SWOT analysis

> Strengths: biocontrol products are usually user and environment friendly.

> Weaknesses: used alone, their efficacy is considered lower than competitive chemicals. They need to be used at a lower level of infestation (threshold).

> Opportunities: easier registration.

> Threats: high cost and complicated to use.

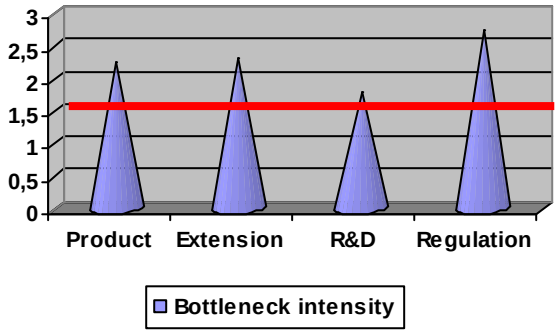

Table 2 (below): Bottleneck by country. Graph 1 (right): Average assessment of bottlenecks

Bottleneck / Country **Key: X = Low, XXX = High** **Average assessment = total / no. of countries x number of attributes**	Chile	Germany	France	Italy	Netherlands	Switzerland	Hungary	Average assessment
Regulations								
Regulations not adapted to BCAs	XX	XX	XXX	XXX	XXX	XXX	XXX	
Registration costs too high for target market	XXX	XXX	XX	XXX	?	XX	XX	
Regulations not harmonised between MS	XXX	XXX	X	X	?	X	?	
Average Regulations	**8**	**8**	**6**	**7**	**7**	**6**	**7**	**2.72**
Research and development								
R&D lacks open field programmes	XXX	X	X	X	XXX	XXX	XXX	
Screening not adapted to commercial fitness	XX	X	XX	XXX	XXX	XX	XXX	
Concept efficacy not adapted to biologicals	XXX	X	X	XXX	X	XX	XX	
Intensive R&D directed toward chemicals		X	XX	XX	XXX	X	X	
Intensive R&D in breeding for resistance		X	X	X	XXX	X	X	
Average R&D	**8**	**5**	**7**	**10**	**13**	**9**	**10**	**1.77**
Extension & Education								
Lack of extension and promotion for the use of BCAS	XXX	X	XX	XX	XXX	XX	XX	
No train the trainers programmes	XXX	X	XX	XX	XXX	XXX	XX	
Lack of demonstration schemes	XX		XXX	XX	XXX	XXX	XX	
Average Extension & Training	**8**	**2**	**7**	**6**	**9**	**8**	**6**	**2.30**
Product attributes								
Product complicated to use	XX		XXX	XX		XX	X	
Product too specific	X		XXX	X		X		
Integration difficult	XXX		XX	X		XX	X	
Time consuming	XX		X	X		XX	XX	
Efficacy inconsistent	XXX		XXX	XX		XXX	XXX	
Effect overly influenced by environmental factors	XXX		XXX	XXX		XXX	XX	
Lack of dedicated DSS	XXX		X	XXX		X	XX	
Average product attributes	**17**		**16**	**14**		**14**	**11**	**2.25**

Recommendations for biocontrol in grapevine

Research and development

Technical institutes should look deeper into integrating biological and chemical control.

> Weed control is a big gap to be explored, both on the plantation row and in the control of invasive weeds (glyphosate resistant).

> Develop the concept of integrating pheromones and insecticides to protect vineyards when heavy pest infestations occur.

> Develop the concept of integrating prevention methods with bacterial antagonists associated later with curative fungicide treatments.

> Reinforce research on alternatives to copper and sulphur.

> Set up 'new application thresholds' adapted to the use of biologicals.

Policy makers and regulation

> Reinforce the trend towards zero pesticide residues.

Education, training, communication

> Involve farmers' organisations in the promotion of alternative protection systems.

> Demonstration plots, especially in reputable vineyards.

> Training courses.

Industry and distribution

> Development of more user friendly biological products.

> Make available application 'kits', including decision support tools.

> Active promotion (demonstrations, lectures, training etc).

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About ENDURE

ENDURE is the European Network for the Durable Exploitation of Crop Protection Strategies. ENDURE is a Network of Excellence (NoE) with two key objectives: restructuring European research and development on the use of plant protection products, and establishing ENDURE as a world leader in the development and implementation of sustainable pest control strategies through:

> Building a lasting crop protection research community

> Providing end-users with a broader range of short-term solutions

> Developing a holistic approach to sustainable pest management

> Taking stock of and informing plant protection policy changes.

Eighteen organisations in 10 European countries are committed to ENDURE for four years (2007-2010), with financial support from the European Commission's Sixth Framework Programme, priority 5: Food Quality and Security.

Website and ENDURE Information Centre:

www.endure-network.eu

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