

# Viticulture, Landscape and Functional Biodiversity: Agronomy, Ecology, Sociology and Economy!

Maarten van Helden<sup>1</sup>, Josépha Guenser<sup>2</sup>, Emma Fulchin<sup>2</sup>, Joël Rochard<sup>3</sup>, Benjamin Porte<sup>3</sup>

<sup>1</sup>Bordeaux Science Agro, Univ. de Bordeaux, ISVV, 1 Cours Général de Gaulle 33170 Gradignan, France. [m-vanhelden@enitab.fr](mailto:m-vanhelden@enitab.fr); <sup>2</sup>Vitinnov, 1 Cours Général de Gaulle 33170 Gradignan, France. <sup>3</sup>IFV, 12, rue Sainte Anne, 75001 Paris, France

**Abstract** The European Life+ program BIODIVINE focuses on the conservation of general biodiversity in viticulture landscapes across Europe. Many such landscapes have a long history and strong dominance of viticulture that has created remarkable landscapes. The conservation of biodiversity in such landscapes, without impacting the landscape aesthetics and without constraints for farmers (costs, loss of surface) is challenging. Efficient communication is needed to convince farmers to adapt new practices. Ecosystem services such as conservation biological control can be used to convince farmers but supporting data are not always convincing. Better results can be achieved by focusing primarily on agronomic and economic reasons for landscape management.

The use of ground cover inside and around plots, hedgerow planting, sowing fallow plots with fodder crops all have clear agronomic amenities that should stay the primary objective for the farmer.

Training farmers and personnel, and involving local stakeholders, help to increase awareness. Finally efficient external communication on landscape actions can be included in marketing strategies, but care should be taken to avoid greenwashing.

**Key words:** Viticulture, *Landscape project management*, biodiversity, France.

## Introduction

Conservation of biodiversity in agricultural landscapes depends on semi-natural habitats (Duelli & Obrist, 2003, Billeter *et al.*, 2010). In historical high quality wine production areas (appellations d'origine contrôlées, AOC), sometimes even recognized as cultural landscapes (UNESCO), semi-natural habitats are often still decreasing because of economic pressure, resulting in an increase in vineyard surfaces. Farmers, citizens, politicians and other stakeholders do become aware of the continuous loss of general biodiversity, but fear of economic constraints and lack of knowledge on ecological and agronomical impacts are inhibiting factors for conservation actions. Experience obtained through environmental action plans in several wine-growing areas in France, presented in this paper allowed us to improve the impact of such actions, resulting in more efficient communication, implication and organisation of stakeholders and a considerable increase in conservation actions.

## Material and methods

### *Project site description and results*

Landscape action plans for biodiversity conservations were launched in several wine production areas in France since 1997. Table 1 lists 8 such actions and gives information on total surface and vineyard surface, project leaders, territorial limit of the project, primary goal, conservation actions (types of actions and quantity achieved so far), stakeholders involved as pilots or consultants in the action, the type of communication used in the project and a (subjective) note on the efficiency of each of these projects to initiate conservation actions.

Table 1: List of French 'landscape scale' projects in viticulture and their main characteristics.

Site	Total surface and (vineyard) (ha)	Territorial limit	Main goal	Duration	Project leader	Organisations implicated in project management (P = Pilot, C = Consult)						Conservation actions achieved since start year			Communication		'Success rate'
						Farmers	Policy makers	interbranch org.	Landscape architect	Scientists	Nat. cons. Org.	Hedges (km)	Fallow plots and Meadow (ha)	Vineyard Ground cover (ha)	Internal	External	
Barbanne	650	Watershed	Water + Pesticide red.	2000-2004	Plant protection service	P	P	-	-	-	-	-	-	-	P	-	-
Engranne	13000 (8000)	Watershed	Species conservation <sup>7</sup>	2008-ongoing	Chamber of agriculture	C	P	-	-	-	C <sup>2</sup>	0 (150 <sup>1</sup> )	0	0	B <sup>8</sup>	-	-/+
Saumur-Champigny	6000 (1500)	Appellation	Functional biodiversity	2006-ongoing	Farmers union	P	P	-	-	P	C	20	-	2 <sup>3</sup>	BP <sup>8</sup>	BP	++
Saint Emilion <sup>4</sup>	12000 (8000)	Appellation	General biodiversity	2009-ongoing	Farmers unions	P	P	C	P	P	C	10	8	2	AB <sup>8</sup>	B	+++
Limoux <sup>4</sup>	42000 (7800)	Appellation	Nature conservation	2005-ongoing	Wine trade union	P	-	P	-	-	P	2	Not yet	4	B	B	+
Costières de Nîmes <sup>4</sup>	15000 (4500)	Appellation	Species conservation <sup>5</sup>	2008-ongoing	Farmers union	C	-	P	C	-	C	1	0(90 <sup>1</sup> )	3	B	B	+
Villegouge	972 (380)	Nature 2000	Species conservation <sup>6</sup>	2010-ongoing	Nat.Cons. Org.	-	P	-	-	-	P	0,3	Not yet	Not yet	B	B	?
Bourgogne <sup>4</sup>	800 (600)	Micro-region	General biodiversity	2010-ongoing	Individual farmers	P	-	C	C	P	C	Not yet	Not yet	Not yet	AB	Not yet	?

1 = Existing meadows were included for low input management contracts

2 = Organisation implicated in later stage during project.

3 = ground cover management was experimented, lower mowing frequencies were observed

4 = Sites participating in the Life+ Biodivine program (mostly already implied in projects before)

5 = Little Bustard (*Tetrax tetrax*) ; 6= bats; 7=European mink (*Mustela lutreola*) and European freshwater crayfish (*Austropotamobius pallipes*)

8 = presence of a moderator dedicated to the project

## Results and Discussion

From the information on these different projects we can extract a certain quantity of information in order to improve efficiency of such action, useful for future or ongoing actions. A more thorough scientific analysis could be done if more projects are included, but this was not tempted here. We consider here the *amount of conservation actions achieved* by the farmers (in a certain

amount of time) as a measurement of ‘success’, even though this is clearly not a guarantee of the actual success to achieve the goal of the action (biodiversity, pesticide reduction ...).

*Territorial limit:* In all ‘landscape’ actions the final objective is to change (improve) the management of the landscape through the action of local actors: mainly wine growers that generally are organised locally in organisations such as appellations. An efficient territorial and social anchoring is necessary to ensure local commitment. Therefore existing and well identified territorial networks are more suitable than ‘ecological’ (scientific) landscape units such as watershed or nature conservation areas and even reinforce local identity!

*Main Goal:* Farmers in France are strongly pushed towards more sustainable management. This often is felt as an additional imposed constraint and costs. Therefore it is of primary importance that the action should not be felt as a constraint. Farmers should be able to identify themselves in the action as a positive ambition. Pesticide reduction (negative goal) or Species conservation of ‘cryptic’ species such as bats (Villegouge) or European mink (Engranne) are not efficient goals to motivate farmers since they are felt as externally ‘imposed’ constraints. General biodiversity or functional biodiversity are more efficient to raise awareness and interest.

*Project leader:* The same element of (negative) constraint versus (positive) ambition is linked to the choice of the project leaders. If the farmers or farmers’ representatives are present in the project from the very start, preferably as project leaders or even initiators, this clearly increases the motivation of farmers to play an active role in the project rather than to ‘submit’ themselves.

*Pilot committee and steering committee:* In most projects a limited number of organisations are involved in the management of the project to allow efficient management. It is important that the actual landscape managers (farmers, land owners, land managers) are present in the pilot committee. We are convinced that the presence of scientists and landscape architects is a positive contribution to the credibility of projects. This pilot committee should be assisted by a ‘scientific and technical steering’ committee that includes *all* other stakeholders and allows these to contribute as ‘consultants’ providing ideas and suggestions, while avoiding the risk of ‘imposing’ constraints to the landscape managers, leading to desistance or excluding partners.

*Conservation actions:* AOC Viticulture is a financially rewarding activity. This means that farmers tend to plant as much surface as possible. Acceptable conservation actions should not consume vineyard surface, and useable surface for such actions should be identified and accepted by the farmers. Because of the existing landscape (topography, history) and soil characteristic AOC areas often are composed of many small plots, resulting in an important amount of interstitial space (often > 10%) slopes, roads etc. (Porte et al. 2011 this meeting), that can be partially used for actions such as hedgerows and grass strips. Normally a certain amount of plots (often around 4%) is laying fallow between uprooting and replanting on which seed mixtures can be implemented. Intra-plot ground cover is also contributing to general biodiversity. Other areas can sometimes be identified such a garden and parks of wineries and specific conservation actions can be developed.

*Communication:* General biodiversity is not a major concern for farmers. Even though they are aware of the possible negative impact of their management, they are not ready to adapt their techniques just for the sake of biodiversity. Therefore internal communication should focus on the agronomic benefits of conservation actions, and the possibility to adopt management strategies that are a real direct benefit for the farmer and which can also have a positive impact on biodiversity. Example: Sowing legume fodder crops on fallow plots has several agronomic benefits (erosion, N fixation etc.) and also provides pollen and nectar for bees and other insects. Frequent communication (newsletters etc.) including positive testimony of farmers on actions is a key factor. As for external communication it is clear that the positive contribution of the farmers to biodiversity is always put forward, allowing attracting interest of potential clients (through wine tourism and press information). Care should be taken to avoid greenwashing in this stage, conservation actions should be done before farmers start selling green-labelled bottles

to their clients!

### ***Motivation = Sustainability***

From the projects listed in the table it seems that the most 'efficient' programs are projects managed by the farmers but that have a multi-stakeholder approach, and only if the projects are focussing on 'positive' contributions of the actions on the farming activities and economic results. Nature conservationists and scientist implied in such programs should also take this into account in order to prioritize actions that are acceptable by the farmers. Once this first step is made, their ideas on landscape management are much easier adopted by the farmers.

In the Saumur-Champigny project the amount of hedgerows planted per year has tripled, starting with farmers volunteering in the first two years (2-3km / year) and then changing to actively recruiting farmers to plant hedges at previously identified sites to improve landscape connectivity, in the last few years (7-9km/year).

The new French 'national biodiversity strategy' (MEDDTL, 2011) clearly shows that policy makers have become aware that 'awareness raising' and motivation of local stakeholders is THE key factor for efficient actions, our observation fully agree with this.

Therefore landscape project fit into the classic 'sustainability schedule' (Adams, 2006) seeking a good balance between economic, social and environmental impact.

Clear positive results as far as biodiversity are not always readily obtained, but these projects have a long term planning and goal. Therefore sustainability of the action is essential and obtained only if economic constraints are taken into account (1) and if we also aim a social impact (2), which is to improve territorial anchoring of local stakeholders.

*Side effects:* Landscape actions based on a 'positive' entry such as biodiversity often allow tackling other environmental risk such as pesticide transfer through 'biodiversity' hedgerows reducing spray drift. This can be a useful argument for financial partnerships.

### **Acknowledgements**

Data provided and discussed with Philippe Bourdens, Céline Forget, Lucile Chedorge, Denis Fetzman, Lucile Stanicka, Marie-Anne Simonneau

### **References**

- Adams, W.M. (2006). "The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century." Report of the IUCN Renowned Thinkers Meeting, 29–31 January 2006. Retrieved on: 2009-02-16.
- Billeter., R., J., Liira, D., Bailey, R., Bugter, P., Arens, I., Augenstein, S., Aviron, J., Baudry, R., Bukacek, F., Burel, M., Cerny, G., De Blust, R., De Cock, T., Diekötter, H., Dietz, J., Dirksen, C., Dormann, W., Durka, M., Frenzel, R., Hamersky, F., Hendrickx, F., Herzog, S., Klotz, B., Koolstra, A., Lausch, D., Le Coeur, J. P., Maelfait, P., Opdam, M., Roubalova, A., Schermann, N., Schermann, T., Schmidt, O., Schweiger, M.J.M., Smulders, M., Speelmans, P., Simova, J., Verboom, W.K.R.E., van Wingerden, M., Zobel and P.J. Edwards (2008), Indicators for biodiversity in agricultural landscapes: a pan-European study, *Journal of Applied Ecology*, 45: 141–150.
- Duelli, P. and M.K. Obrist (2003), Regional biodiversity in an agricultural landscape: The contribution of seminatural habitat islands, *Basic and Applied Ecology*, 4:129-138.
- MEDDTL (2011) Stratégie nationale pour la biodiversité 2011-2020.  
[http://www.developpement-durable.gouv.fr/IMG/pdf/SNB\\_2011-2020WEB.pdf](http://www.developpement-durable.gouv.fr/IMG/pdf/SNB_2011-2020WEB.pdf)
- Porte, B., Rochard, J., van Helden, M., Guenser, J., Fulchin, E., 2011. GIS for planning conservation actions in viticulture landscapes, *IOBC Bulletin*. this meeting.