objectif végétal
Research, Education and Innovation in PAYS de la LOIRE

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Objectif Végétal
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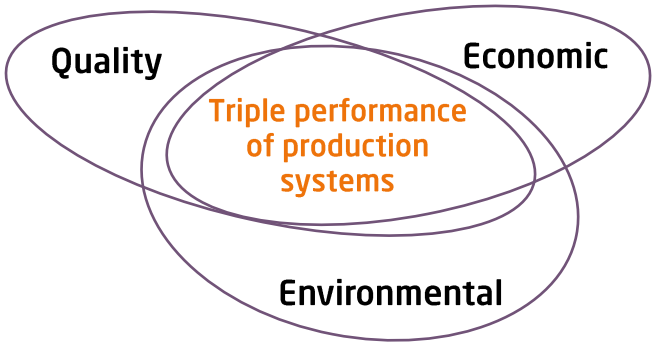
SFR 4207 Angers
Qualité et Santé du Végétal
Quasav

n°9

Achieving triple performance by eco-quali-design
The case study of Wine sector



The ability to **jointly** take account of all these dimensions will be a key factor for

- **innovation**,
- **differentiation**,
- **competitiveness** of French agricultural and food production.

Last update: January 2018

The word of ADEME (the French Agency for Environment and Energy Management)

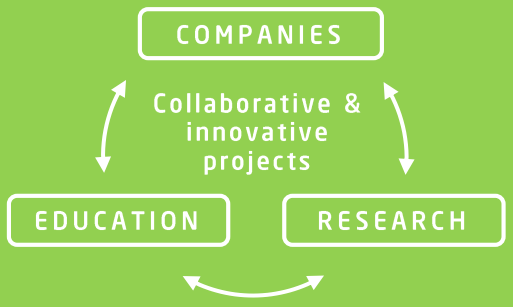
Vincent Colomb
Environmental Assessment Engineer (LCA)
for Food Products
Ademe
(Agency for Environment and Energy Management)

The **fight against climate change** and the necessary **ecological transition** will lead to **deep changes** in the food supply of French people and in the agricultural sectors. Driven by the **market** and encouraged by **public authorities**, agricultural and agri-food businesses must seize this opportunity by offering products that combine taste, nutrition and health with environmental and social performance. The Food General Assembly will be another step in this direction.

Some operators are already in action, sometimes with the support of ADEME, mobilising their technical and organisational know-how: here omelettes (Daucy), there sugar (Cristal Union) or even certain appellations of Vin de Loire and the Champagne sector. Using **scientific tools for environmental performance assessment**, they make changes in their practices from the field to the plate, **quantify their progress in a transparent manner** and get involved in "**eco-design**" approaches. This work raises questions of agricultural practices, technology, modes of collaboration and innovation, economics, etc. These are all topics that are conducive to **active collaboration between the fields and research**. In Anjou, teams from the ESA (Ecole Supérieure d'Agricultures, Angers) are at the forefront of the subject, an opportunity that is to be seized by all regional players.

Looking for partners ?

Three contacts to help you build your projects and support them:



Christel Renaud-Gentié, head of eco-quali-design topic
USC GRAPPE (ESA-INRA),
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Anna Pineau, contact to support your R&D projects and put you in touch
anna.pineau@vegepolys.eu

Tanegmart Redjala, close interface with the laboratories of the Research Federative Structure Quasav.
tanegmart.redjala@univ-angers.fr

This issue has been produced with the contribution of an editorial board: F. Jourjon (ESA), A. Perrin (ESA), C. Renaud-Gentié (ESA), V. Colomb (Ademe), D. Vazel (Association Terra Vitis), R. Renard (Cave Robert et Marcel), T. Redjala (RFI Objectif Végétal).

THIS PROJECT IS CO-FUNDED BY THE EUROPEAN REGIONAL DEVELOPMENT FUND

Eco-quali-design

is **designing** and **developing** a product
- ➢ by integrating **environmental aspects** and **quality**,
- ➢ with the objective of **reducing negative environmental impacts** throughout the **product's life cycle**.

The concept was developed in Angers by the **GRAPPE** Group of Research in Agri-Food Products and Processes (ESA-INRA) for the Eco-quali-conception© of agricultural and food production systems. Researchers are developing well-equipped approaches adapted to the needs of **high value-added production chains** committed to **quality labels**, such as the **Wine sector**. These procedures are established at different scales, from the **plot** to the **farm** and then to the **territory**.

How to evaluate the double performance on a plot?

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→ **Development of a tool** to **evaluate the dual environmental and quality performance of agricultural technical management routes**, within the framework of the **QUALENVIC project - QUALENVIC - QUALITY, ENVironnement, Consumers** (2012-2016, *CASDAR fund*)

QUALENVIC

- ✓ Coordinated by **USC GRAPPE (ESA-INRA)** and conducted with **20 research and development partners**
- ✓ An **original objective**: to provide producers and consultants with methodological and technical keys to accompany the change of practices towards a dual environmental and quality performance
- ✓ A particularly welcome approach for agricultural products with **quality labels (AOC)**
- ✓ An analysis of consumers' **perceptions** of **environmental labeling** on their products.

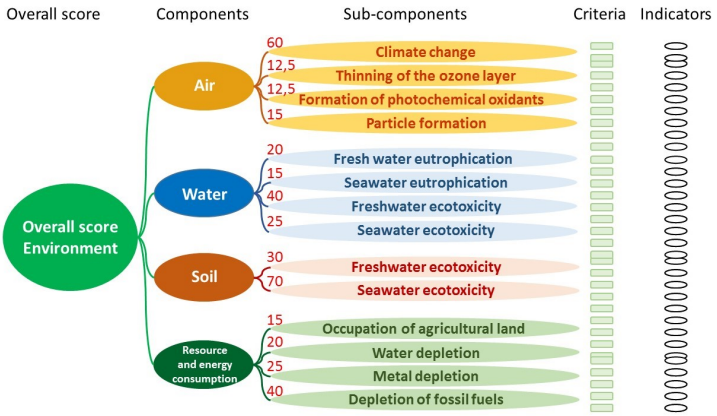
S. Beauchet

Sandra Beauchet completed her thesis (**GRAPPE**, 2013-2016, *funded ADEME and Région Pays de la Loire*), as part of the **QUALENVIC** project. She has developed a **multi-criteria method for evaluating vineyard technical management routes which combines both**:

✓ Environmental assessment

by LCA applied to vineyard technical management routes

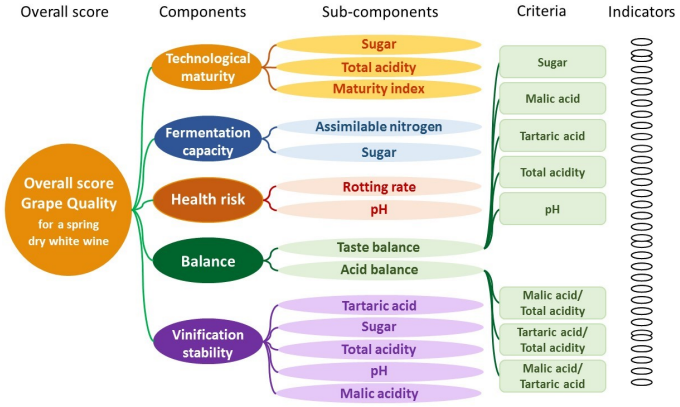
Tree for environmental assessment of crop management techniques



✓ Quality assessment

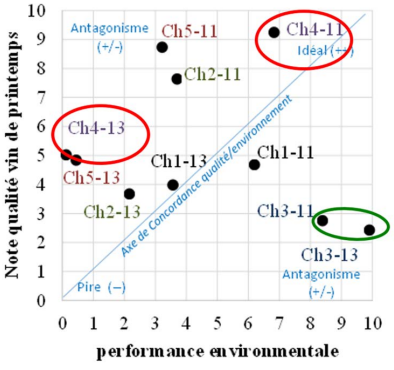
of grape berries, by physico-chemical analysis

Tree for evaluating the quality of the Chenin grape variety for the production of spring dry white wine.



Evaluations are carried out on the basis of indicators: raw data from field surveys or measurements on grapes. They are **aggregated into criteria** and then into **sub-components**, themselves aggregated into **components**, which when combined give the overall rating in the form of a **score of 0 to 10**.

It is the **CONTRA-QUALENVIC** calculation tool (under excel), developed from the CONTRA method (Inra COLMAR), which allows **aggregation**, according to **decision rules and weightings defined with experts**.



Eco-efficiency matrix of the 5 technical management routes observed for Chenin blanc for spring dry white wine in 2011 (noted "11") and 2013 (noted "13").

By crossing the **Quality** and **Environment** scores, it is possible
- to visualise how the technical management routes studied are in relation to each other
- to follow the progress of an management route after changes in practices
- to observe interannual variations

The plots followed belong to the **AOC Muscadet, Anjou / Saumur / Touraine**. The method has made it possible to **identify promising technical management routes** for **improving environmental performance while guaranteeing the quality of the grapes**. The Ch4 plot in 2011 bears witness to this.

QUALENVIC project also provided an opportunity to study

Perception of environmental labeling on products

Professionals in the wine industry: strong reservations about environmental labeling, BUT a marked interest for
- ✓ environmental certification procedures for companies
- ✓ LCA as a tool to help decision makers decide on practices to move towards an eco-design approach

Consumers: **made aware** of eco-labels **BUT**:
- ✓ **lost** because of the diversity of ecolabels as they only know outside the Organic Agriculture logo
- ✓ environmental sensitivity **dependent on their involvement** with the product and the environment
- ✓ considering the **AOC** and the **terroir** as a guarantee of environmental respect

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From evaluation to eco-quali-design

How to design dual performance technical management routes?

→ **Development of a collective eco-quali-design approach.**

A. Rouault

Anthony Rouault's thesis (GRAPPE, 2015 - 2018, *funded by ADEME and the Région Pays de la Loire*) aims to create and test a collective eco-quali-design approach of vineyard technical management routes, i. e. **at the plot scale.**

This approach **integrates the two quality and environmental performance objectives**, based in particular on the evaluation tool developed in the QUALENVIC project.
The approach **follows a co-design process with winegrowers and their advisors**.

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3 objectives :

✓ **Raising awareness** and **involving** winegrowers in eco-design initiatives.	✓ Thinking with winegrowers about **environmental impacts.**	✓ **Collectively eco-designing** technical management routes that - are more environmentally friendly - preserve the quality potential of the grapes.

The approach is implemented with **two groups of winegrowers** during sessions of three workshops.

A. Rouault is developing **original tools** that will make it possible
→ **ownership** of LCA results by participants
→ **real-time evaluation of collectively designed technical management routes**.

How to achieve economic performance through eco-quali-design?

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→ **Development of an on-farm eco-quali-design approach**, including **co-design with stakeholders** and a **socio-economic dimension**, through two projects:

- ➢ ECO³VIC project - ECOCOnception COllective in Viticulture to support the change of practices (2017-2020, *funded by ADEME*)
- ➢ **SCALE project** (2018-2019, *funded by University Bretagne-Loire*): **Magdalena Czyrnek Delêtre** will develop the LCA on an operational scale.

ECO³VIC project, led by the USC GRAPPE (ESA-INRA) and the **LARESS (ESA)**, is in close contact with the stakeholders in the wine industry: consultants, winegrowers, cooperatives.

- ✓ Creation of a database of practices including **production costs** and **environmental performance**,
- ✓ Integration of the **economic dimensio**n into the collective eco-design of technical management routes
- ✓ **Farm-scale approach**
- ✓ Analysis of the **socio-economic barriers and levers** to change practices
- ✓ Objective of **transferring the process** to regional advisors and technicians

This project includes A. Rouault's thesis work on collective eco-design.

LARESS : Social Sciences Research Unit (ESA)

Eco-quali-design, a promising tool for the ecological transition!

→ **Perspective of developing an approach to build systems at the scale of a territory**, making it possible to combine: impact mitigation, climate change adaptation and quality preservation.

From 2018, the **AVATEC project** (*ERDF fund*) will set up an approach to **support producers in changing practices at the level of a territory** (AOC) based on the development of environmental assessment by **LCA at the level of the territory.**
The process will be carried out in collaboration with ecologists. It will contribute fully to the agro-ecological transition process by taking into account the multi-functionality of the territory, for example by setting up hedgerows in favour of biodiversity.

→ **Innovation at the territorial level and for the group**

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OFFERS TO COMPANIES

Examples of topics for collaboration

- **Involve consumers** in the eco-design of wine-making technical management routes
- Decline the eco-quali-design approach and tools in viticulture, **to answer regional specificities**
- Decline the eco-quali-design approach **for a new plant sector**
- **Accompany groups** such as AOCs, in the choice of eco-efficient practices for their specifications.

SUCCESS STORY – Research tools for eco-efficient practices in agriculture

Dr Marguerite Renouf
University of Queensland, Australia

« "The Great Barrier Reef is seriously threatened by water quality, particularly because of the **intensive agriculture** including **sugarcane** production. Under societal and governmental pressures, producers have changed their practices. As an expert in the eco-design of agricultural production systems, **I have developed a tool** (LCA calculator) **to verify that the change made has been beneficial to the environment, which is also combined with economic evaluations**. This work was carried out **in collaboration with local sugarcane stakeholders**. The evaluation was positive, which strongly encourages producers to continue improving their practices.

In 2016 and 2017, my 18 months at USC GRAPPE enabled, on the basis of the tool developed on sugar cane, the development of a **LCA calculator for wine technical management routes** in order to accelerate the search for eco-efficient practices. This new **software makes environmental assessment of alternative farming practices faster and easier**."

Sugarcane field, Queensland

Vineyard, Pays de la Loire

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Training for enterprises

- Contact us for **à la carte training courses**
  Example: Eco-design tools and methods in viticulture (including LCA)

Catalogue online: groupe-esa/formation-tout-au-long-de-la-vie

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Services

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Céline Brasse
Head of the studies unit
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Objectif Végétal, Research, Education & Innovation in Pays de la Loire is a regional program (2014-2019) established by the Pays de la Loire Regional Council and that involves the teaching and research institutions (Université d'Angers, leader of the program, Agrocampus Ouest, ESA, Inra, Université de Nantes) as well as the international French cluster Végépolys.
Objectif Végétal program mainly aims to reinforce the visibility of the regional centre for education and basic research, to boost translational research and reinforce the processes of economic valorization of research findings, and to develop international partnerships.

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