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Title

Analysis of adoption factors of environmental practices in viticulture

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Conference Presentation

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Keywords

Environmental practices; environmental innovations; Viticulture, Adoption factors, AFM, Probit.

Research Question

This article analyses how winemakers can seize virtuous viticultural practices for the environment by identifying the main perceptions of the adoption of environmental practices.

Methods

Statistical methods of scoring, multiple factor analysis (MFA) , ascending hierarchical classification; "Probit" model.

Results

Human and environmental health perception, ecotourism activities are positively correlated with the adoption of environmental practices.

Farm size, cost of practice, working time, age, and family status are negatively correlated

Abstract

Analysis of adoption factors of environmental practices in viticulture

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Abstract

In the current debate on agriculture-environment relations, public policy reforms and the increasing environmental

demands of consumers enhanced the awareness of the importance of changing their agricultural practices in order to meet environmental requirements and improve products quality among farmers and in particular among vintners.

For vintners, this renewal of production issues towards triple performance (economic, environmental and product quality) often implies an evolution of the trade, passing both through the adoption of technical innovations in their practices, and by their positioning in relation to society's expectations. Indeed, the implementation of this change is not only conditioned by the demonstration of the economic and environmental benefits of viticultural practices but also by other socio-economic determinants, both internal and external to the farm (Campanelli 2018, Asfaw and Neka 2017, Long et al., 2016, Knowler and Bradshaw 2007).

In the literature, few studies focus on research on determinants of adoption of innovations and practices in the agro-environmental field. However, the analysis of the adoption of environmental technological innovations has highlighted several typologies of determinants (Warda et al., 2018, Asfaw and Neka, 2017, Long et al., 2016, Knowler and Bradshaw 2007) that can be explored in the case of a change in viticultural practices, including legal status, labour, working time, access to financial resources, tax regime, debt rate, integration into professional organizations, etc...

The aim of this article is to analyze how winemakers can seize virtuous viticultural practices for the environment by identifying the main perceptions of the adoption of environmental practices.

This study explores the links (positive or negative) between the adoption of new practices in viticulture and certain variables such as the financial and operational management conditions of the vineyard, income, operating expenses and work-related expenses, taxation, the role of prices, the effect of structural factors (size, mechanization, etc.), the role of information, individual specificities and public interventions, etc.

It will also provide a dashboard of the various factors that can influence the change in practices and which will be intended for the attention of professionals in the wine sector and public policy-makers.

This work, which is part of an Eco3vic research program, was based on quantitative surveys of 88 wine growers in the Val de Loire production area (West of France). The choice of the sample is made by targeting a representative population of the vine growers of the Val de Loire production area. Four criteria were chosen for the choice of respondents : i) the vine growers had to exploit a wine area of more than one hectare; ii) the choice was made to proportion the number of surveys to the number of holdings present on the selected field of study, half in Maine-et-Loire, a quarter in Loire-Atlantique, and a quarter in Indre -and-Loire; (iii) the sample reflects in its proportions the major types of existing marketing, ie one-third of farms selling mainly bulk production to trading and / or a cooperative, with one-third of holdings selling mainly through direct selling (in the cellar, or by deliveries), the last third representing farms having a mixed marketing system between the two previous types; iv) finally, the sample comprises one third of farms with an environmental orientation certified by an "organic farming" or "high environmental value" label of level 3, or by membership in the association and specifications of Terra Vitis, and two-thirds of the so-called "conventional" wineries.

Statistical methods of scoring, multiple factor analysis (MFA) and ascending hierarchical classification were mobilized to identify the different classes of wine growers (adopters / non-adopters). A "Probit" model was then used to explore the links between the adoption of environmentally-friendly viticultural practices and internal and external variables in wine production.

The main factors that influenced the adoption of environmental practices were identified by analyzing the dependent variable (adoption of environmental practices) against 21 selected explanatory variables. This phase allowed us on the one hand to quantify the priority reasons for which the wine growers adopt the different environmental practices; on the other hand, it has made it possible to increase in generality by highlighting the main determinants of the appropriation of an environmental way of conducting the farm.

The results of this research confirm that adoption factors are generally dependent on the context and nature of environmental innovation. The results also show that environmental practices are mainly adopted by wine growers who are sensitive to the problem of human and environmental health. Factors such as the presence of ecotourism activities on the farm and the adherence of trade union activities are positively correlated with the adoption of environmental practices. In fact, 87% of winegrowers with ecotourism activities on the farm have adopted environmental practices. This fairly high percentage reflects the level of awareness of winemakers for the problem of environmental preservation, but also the valuation of this environmental integration as an element of commercial differentiation valued by customers.

Other factors such as farm size, cost of practice, working time, age, and family status (number of dependents) were negatively correlated with adoption. In fact, the regression analysis revealed that the size of the farms had a negative impact and the adoption of environmental practices by growers. The negative sign indicates that as the

size of the farm increases, the likelihood of adopting environmental practices decreases. This is explained by the fact that environmental practices are generally requires more working time and higher opportunity costs which makes the implementation on large farms more difficult.

The effect of the age factor is explained by a better awareness of young winemakers to environmental issues. In addition, older wine growers are more sensitive to the risk of using a new practice and appear to be less concerned with the long-term interests of the farm, while younger farmers are more attracted to the sustainability of their farms.

The results also show that the role of the financial factors and the opportunity costs are key determinants in the process of adopting environmental practices, especially for practices requiring a very large investment in the purchase of equipment.

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This work, which is part of an Eco3vic² research program, was based on quantitative surveys of 88 wine growers in the Val de Loire production area (West of France). The choice of the sample is made by targeting a representative population of the vine growers of the Val de Loire production area. Four criteria were chosen for the choice of respondents : i) the vine growers had to exploit a wine area of more than one hectare; ii) the choice was made to proportion the number of surveys to the number of holdings present on the selected field of study, half in Maine-et-Loire, a quarter in Loire-Atlantique, and a quarter in Indre -and-Loire; (iii) the sample reflects in its proportions the major types of existing marketing, ie one-third of farms selling mainly bulk production to trading and / or a cooperative, with one-third of holdings selling mainly through direct selling (in the cellar, or by deliveries), the last third representing farms having a mixed marketing system between the two previous types; iv) finally, the sample comprises one third of farms with an environmental orientation certified by an "organic farming" or "high environmental value" label of level 3, or by membership in the association and specifications of Terra Vitis, and two-thirds of the so-called "conventional" wineries.

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² This work was carried out as part of the ECOCONCEPTIONS (ECOCONCEPTIONS Collectives en Viticulture pour l'accompagnement au changement de pratiques) research project funded by the Agence de l'environnement et de la maîtrise de l'énergie (ADEME-France) and carried by the École Supérieure d'Agriculture Angers Loire (ESA-Angers). Its purpose is to design a comprehensive participatory ecodesign approach to viticultural technical routes to encourage the adoption by winegrowers of practices that are considered to be less impactful on the environment from the perspective of life cycle assessment methods (LCA) method.

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