



Changing land use to alternative crops: A rural landholder's perspective



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ABSTRACT

Alternative crops, combined with modern farming methods, are integral parts of the new agricultural model and dominant priorities of agricultural policy. The new conditions created in the internal and global markets of agricultural products indicate significant opportunities for growing alternative crops and for the introduction of modern farming practices and processing. The present study aims to assess the factors that determine the landholder's decision to uptake an alternative crop. Primary data were gathered through a quantitative survey (in-depth interviews) with landholders in two remote and less-favored prefectures of Northeastern Greece, and were analysed through a logistic regression model. The results indicate that the most significant determinants for adopting an alternative crop involve the scientific support to farmers, the development of product demand in the market, the creation of agricultural cooperatives, the development of promotional campaigns for the alternative products, the education and knowledge regarding alternative crops, and the landholder's satisfaction with income. On the contrary, negative factors to their decision refer to exports development, product subsidies, landholder's age, membership to a cooperative in its current form, and satisfaction with pesticides prices. Despite the dominance of conventional agriculture models and varieties, the new favorable investment conditions can spur the promotion of alternative crops.

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1. Introduction

The challenge of balancing food production with protecting the environment has risen due to the environmental crisis and health issues. Accordingly, agricultural productions have shifted towards a more diversified and sustainable form, while there is also a growing consumer demand for healthier and quality foods and products stemming from demographic changes and health concerns (Janick et al., 1996). A sustainable agriculture employs new cultivation techniques and procedures to qualitatively differentiate from conventional agriculture, forming an indisputable system that meets all the criteria of sustainable environmental management (Padel et al., 2002). This form of agriculture "... maintains its productivity and usefulness to society indefinitely, being at the same time, resource-conserving, socially supportive, commercially competitive, and environmentally sound" (Ikerd, 1990).

Apart from an environmental friendly agricultural production, the orientation has also moved towards the development of economically viable alternative crop choices for farmers, obtaining support from recent policy schemes. These schemes under the Common Agricultural Policy (CAP) has shifted from supporting the increase in yields and decrease in production costs for traditional crops to effectively respond to market demands, to protect the environment (sustainable agriculture) and to ensure product quality and food safety (Mattas et al., 2015). Actually, recent policy measures subsidize the implementation of alternative farming systems, affecting the quality of agricultural products and the impact of agricultural practice in the environment.

The reformed CAP encourages high-quality production, through a number of mechanisms like financial incentives for the adoption of European or national integrated management systems that certify the quality of agricultural products, support of organic farming and various ways that will make agriculture more environmentally friendly (Papadopoulos et al., 2015). The second Pillar of the new CAP provides a coherent and sustainable framework for the development and modernization of farming systems through alternative crops that includes farmer's organization, supported actions

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for organizing production, improve and preserve product quality, enhance the marketing of the product, prevention and management of crisis and environmental protection.

The decision of whether to adopt an alternative crop (e.g. dogwood, pomegranate, blueberry, goji berry, snails, stevia, sunflower, switch grass etc.) is affected by market characteristics, socio-economic factors and risk management behavior issues. Certainly, prior to adoption, farmers must analyze the economic and social costs of such decision, the required farming practices and the obtained benefits. The identification and comprehension of the factors that farmers consider when deciding about land use change, resource allocation and farming activities may assist the implementation of policy-supporting schemes for the promotion of such crops. The production of alternative crops could result in economic growth in rural areas, decrease farming cost and increase the economic viability of producers (Brummer et al., 2001; De La Torre Ugarte et al., 2003).

Apart from any advantages obtained, it is worth mentioning that farmers are extremely risk averse when consider the market uncertainty and the inexperience of growing a new alternative crop and one topic that has received less attention is the farmer's willingness to adopt these crops. Such a decision is often associated to various types of risk factors related to production, prices, farm finance, state policy schemes and overall business risk (Jensen et al., 2007). These factors significantly affect each farmer's decision-making process and therefore, their estimation may offer a clear picture of where policy measures should target and which production aspects can be further supported.

Farmers in the European Union (EU) comprise a special socio-economic category that has played a key role in European integration and it should be of particular interest how their production contributes most effectively to the economic and social development. Still, within a context of intense urbanization, being a farmer is not considered as attractive, whereas the agriculture income in the EU was gradually reduced in the last ten years, accounting for only 40% of non-agricultural income (European Commission, 2012). Therefore, supporting the rural population and providing incentives to farmers, particularly the youngs, consist a key target within the CAP, providing funds for the purchase of land, machinery and equipment, and developing educational programs for the adoption and fostering the use of modern technologies and production methods. Given the desire of landholders to engage in primary production, especially in agriculture, along with the dynamics of alternative crops, the research and policy proposals should be oriented towards the specific features of these crops. It is worth mentioning that a large part of landholders at the studied prefectures (Rodopi and Evros) consider that the future development of regions must be based on agriculture and they are willing to invest nearly all or a fraction of their property to alternative crops (Tsantopoulos et al., 2014).

Based on the aforementioned, the objective of this paper is to identify and estimate the factors that influence landholder's willingness to adopt an alternative crop. The quantitative data obtained from two remote and less-favored areas were analyzed through a logistic regression model. The innovativeness of the study lies on the fact that it estimates landholders' perceptions in remote and less-favored areas, which however have a significant production orientation towards energy crops. It is worth mentioning that the cultivated land of sunflower increased significantly in the recent years, mainly cultivated in northern Greece and in particular, to the areas of the Evros prefecture. More than 54% of the total cultivated land with energy crops in the region refers to areas of Evros (Mattas et al., 2015). The remainder of the paper includes a theoretical background regarding alternative crops and the determinants of farmer's decision-making to adopt such crops, followed by a description of the data collection process and the method-

ology employed. Furthermore, the result's discussion is provided together with conclusions and implications.

2. Theoretical background

A key issue for the future rural development is whether alternative farming methods, including alternative crops, will be able to ensure the production of sufficient quantities of food, bearing in mind the needs of the farmers and within a context of general economic recession. Overall, alternative agriculture and alternative crops are placed in the spotlight of current rural development policies. The growth of modern agriculture-intensive resource use has multiplied the performance of major crops, such as wheat, rice and corn, at about 2.6 with 3.6% per year over the last 50 years. This increase is more due to the higher yields per hectare and to a lesser extent to the increase of arable land (FAOSTAT, 2011). However, this progress has been achieved through the use of high energy consumption of resources and generating significant adverse environmental effects (Tilman et al., 2001). On the other hand, alternative agriculture includes a set of farming and management practices aimed at the environmentally friendly production, especially avoiding the use of synthetic fertilizers and pesticides and supporting the fertility of soils.

Specifically, the alternative agriculture includes both new environmental-friendly farming methods, such as organic agriculture, and new alternative crops, which have been named to reflect the farmer's endeavour to seek for alternatives to conventional farming in order to protect their income. Alternative crops include varieties that have specific characteristics, they provide important perspectives for exploitation, they have sufficient adaptation capacity in various climatic conditions and at the same time, they are characterized by less variability in yields from year to year, mainly due to a wider range of crops used in contrast to conventional agriculture (Chappell and LaValle 2011). It could be argued that the recent debt crisis in Europe and especially in Greece may consist an opportunity for growth of these crops, taking into account the global trend of promoting alternative and organic forms of agriculture. Examples of these alternative crops include aromatic and pharmaceutical plants (blueberry, basil, ipoffaes, aloi, aronia, dogwood) subtropical plants (snails, avocado, banana, prickly pear, date palm, Manco, lotus) and fodder plants.

Robertson and Swinton (2005) report the major advantages of alternative crops as follows: (1) they support the economic viability of especially the smaller-scale farms, (2) they are able to meet the modern nutritional needs, (3) they can maintain or improve the resources on which they depend, focusing on soil protection, nutrients recycling and biodiversity protection, (4) they can provide an opportunity for farmers to exploit their knowledge and skills, (5) they can resist to market volatility, (6) they can make more efficient use of non-renewable resources, and (7) they can incorporate, as appropriate, the natural biological cycles and pest management tools in production practices. Another significant advantage of alternative crops is the limitation of their environmental footprint, mainly as regards the release of greenhouse gases into the atmosphere and fewer energy resources requirements (Niggli et al., 2009).

Within this context, a part of pertinent literature has investigated the motivation of farmers regarding the decision-making process concerning the adoption or not of alternative crops, highlighting the economic and environmental incentives as the most important. Specifically, in the more developed countries of Europe and North America, the environmental concerns seem to have a significant influence on the views of farmers (Dubgaard and Sorensen, 1988). This is due to the fact that the rural population is adequately informed about the benefits of alternative agriculture, and that in

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