Conventional services for organic farmers? Attitudes of organic and conventional producers towards extension education

Chrysanthi Charatsari[a], Afroditi Papadaki-Klavdianou[a] and Alex Koutsouris[b]

[a] Dept. of Agricultural Economics, School of Agriculture, Aristotle University of Thessaloniki: chcharat@agro.auth.gr; papklavd@agro.auth.gr
[b] Dept. of Agricultural Economics & Rural Development, Agricultural University of Athens: koutsouris@aua.gr

Keywords*:* extension services, agricultural education, organic farmers, information seeking, advisory work

Abstract

Notwithstanding the substantial development of organic farming in Greece, little is known about organic farmers' rapport with extension education services. The main objective of this paper is to shed new light on such relationships by exploring organic producers' satisfaction from extension providers and their willingness to participate in agricultural education programmes. Data were drawn from a study in Northern Greece. After a random sampling procedure, two groups of farmers (130 conventional producers and 128 organic growers) participated in the study. Descriptive statistics and binary analysis were employed in order to provide a basic overview of the data. In addition, two models of Complementary log-log regression analyses - one for each group of farmers - were created in order to depict the predictors that significantly contribute to farmers' willingness to participate in agricultural education activities. The results indicate that organic farmers are not satisfied with advisory work; such dissatisfaction is illustrated in their low frequency of communication with extension providers, especially those of the public or cooperative sector. The above mentioned gap, on the one hand, urges organic farmers to seek information from other members of the rural community and, on the other hand, motivates them to search for knowledge through their participation in agricultural education programmes. This finding is reinforced by the higher organic farmers' willingness to participate in agricultural education programmes as compared to that of their conventional counterparts. As the Complementary log-log regression model revealed, this willingness is explained by farmers' need to learn about soil management, marketing issues and sustainable practices. Conclusively, the results lend general support to the argument that extension services in Greece remain 'traditional-conventional oriented', having failed to establish ongoing relationships with organic farmers.

1. Introduction

Organic agriculture in Greece has gained a prominent position in the agri-food supply chain over the last decade. During 2002-2007 the organic cultivated area has increased by 362.8% (Charatsari, 2011: 72). Such an expansion primarily owes to the financial support for the conversion to and continuation of organic production offered by the E.U. (Stolze and Lampkin, 2009), the better prices and the secure market for organic produces (Kizos et al., 2011; Alexopoulos et al., 2010). The ongoing growth of the organic sector is confirmed by the increase of organic land by 16.6% during the 2007-2009 period (FiBL, 2011). Alongside this increase, the number of organic producers has also grown significantly by 64.6%.

The development of organic agriculture has shifted the focus of contemporary academic research towards a variety of topics regarding, for example, farmers' motivations in adopting

organic farming (Alexopoulos et al., 2010; Dimara et al., 2003), the comparison of economic returns between organic and conventional farming (Tzouvelekas et al., 2002; Tzouvelekas et al., 2001) and the environmental benefits derived from organic farming (Litskas et al., 2011; Solomou and Sfougaris, 2011). Surprisingly, there is a lack of research addressing the channels through which Greek organic farmers' access knowledge on organic agriculture. Thus far, relevant to the topic research concerns the differentiation between organic and conventional producers as far as information search strategies (Charatsari, 2011: 335) and the use of the available information sources (Charatsari et al., 2009); organic farmers have also been found to prefer to base their decisions on their experience rather than seeking advise from extensionists (Siardos and Lioutas, 2010).

Given this context, the purpose of this research is to investigate organic farmers' satisfaction from the existing advice providers/ extension services. In a service context, satisfaction is similar to overall evaluations of service quality (Gustafsson et al., 2005). The advice/extension providers examined are the Public Extension Service, the agricultural/rural cooperatives and the private agronomists (see: Discussion). This study also examines the frequency of communication with these providers and organic growers' willingness to participate in agricultural education programmes as well.

The next section provides a brief overview of the literature relating to the questions addressed in this paper. Next the methodological approach is provided, followed by research findings and the concluding remarks.

2. Conceptual development

Organic agriculture is a farming system which is low-input in terms of the use of agrochemicals but high-input in terms of knowledge and skills (Ban et al., 2006; Lind, 2000). The latter owes, among others, to the fact that organic farmers are obliged to comply with more regulatory constraints, while they also face higher competition and rapid changes (Darnhofer et al., 2010). Nevertheless, organic farmers lack technical information (Alonso and Guzmán, 2010), extension providers with expertise in organic farming (Middendorf, 2007) and, overall, organic farming specific advisory services (Kaufmann et al., 2011).

This could be attributed either to the fact that extension services have been developed around the conventional model and therefore lack the necessary competencies required to meet the particular needs of organic growers, or to the specific mindset of organic farmers.

As Egri (1999) argues, organic and conventional farmers have dissimilar patterns of information seeking behaviour. This seems reasonable since farmers, depending on their needs, tend to adopt different extension information products (Jones et al., 2010) and diverse information-seeking behaviour (Lwoga et al., 2011). However, the influence of farmers' satisfaction with the available extension sources in the formation of this behaviour is still uninvestigated. Recent studies have shown that organic producers use a variety of information sources (Park and Lohr, 2010), much more than those used by their conventional counterparts (Demiryurek, 2010). However, there is no evidence whether this is the result of organic farmers' dissatisfaction from the extension services or it constitutes a form of their habitual behaviour. In addition, this study investigates to what extent the organic producers' willingness to participate in agricultural education programmes emerges as an alternative - versus extension - solution in order to acquire the knowledge they need.

3. Methodological framework

This study followed a quantitative approach. A structured questionnaire was used as the survey's instrument. The questionnaire was designed and pre-tested in a pilot study in order to test instrument's face and content validity. After minor corrections, the final instrument was

built, in a way that it can accurately measure the desired variables. After a simple random sampling procedure two groups of farmers were collected. The first group comprised 128 organic farmers (O.F.) and the second 130 conventional farmers (C.F.) all coming from Northern Greece.

The collected data were processed using PASW Statistics 18.0 for Windows. Descriptive statistics and binary analysis (Mann-Whitney's U, Spearman's rho, t-test and Pearson's Chi Square) were employed in order to provide a basic overview of the data. Two models of Complementary log-log regression analyses were also created in order to investigate the contribution of farmers' learning needs in their willingness to participate in agricultural education programmes. This type of regression analysis, also called ordinal regression, can be used for analysis of dichotomous and ordinal outcomes from either a clustered or longitudinal design (Hedeker and Gibbons, 1996). The link function of the Complementary log-log model is: $\log[-\log(1-\pi)]$ (McGullah, 1980).

A probability level of 0.05 was considered as statistically significant for all analyses.

4. Results

The total sample consists of 258 farmers. No statistical differences were observed between the two groups of farmers as far as gender (Chi square=0.253; p=0.615), age (U=7,919.000; p=0.494), education (U=7,265.000; p=0.071), farm size (U=7,472.000; p=0.137), farm income (U=8,231.000; p=0.875) and geographical distribution (Chi square=3.503; p=0.477) are concerned. Males constitute 74.8% of the sample and females 25.2%. Approximately 28% of the respondents are between 41-50 years old, 23.3% are 31-40, and 17.8% are 51-60. The respondents appear to be poorly educated as only 11.6% of the total sample has post-secondary education. The largest proportion of participants (74.4%) declared an income from agriculture between €9,000 and €15,000 (per year).

Organic farmers appear to be more dissatisfied from advisory support when compared with their conventional counterparts (Table 1). The lowest scores of satisfaction concern the advisory work provided by cooperatives and the public extension service. As an expression of their dissatisfaction, a considerable part of organic farmers (25%) disregards the advice offered by these services. This lack of satisfaction is also illustrated in organic farmers' low frequency of communication with either private (rho=0.528; p=0.000), public extension (rho=0.621; p=0.000) or cooperative agronomists (rho=0.285; p=0.001).

Table 1. Differences between organic and conventional farmers concerning satisfaction with advisory work

Source of advisory work	Mean scores*		Mann-Whitney's test
	O.F.	C.F.	
Private agronomists	3.13	3.64	U=5,898.000; p=0.000
Cooperative services	1.13	1.80	U=5,549.000; p=0.000
Public extension services	1.31	1.63	U=7,089.500; p=0.010

** Range: from a low of 1 to a high of 5*

Among the abovementioned sources, both organic and conventional farmers prefer to seek support from (i.e. communicate with) private agronomists; with the exception of 'private agronomists' the rest of advice providers have a mean score lower than 2 on the 5-point

scale, indicating a low level of use/communication. Furthermore, in all cases, the frequency is significantly lower for organic farmers (Table 2). By contrast, organic producers seek advisory support more frequently than conventional farmers from other members of their social milieu and farmers' associations, or try to find information through media such as the television or magazines (Table 3).

Table 2. Differences between organic and conventional farmers concerning the frequency of communication with advice providers

Source of advisory work	Mean scores*		Mann-Whitney's test
	O.F.	C.F.	
Private agronomists	3.46	4.03	U=5,516.000; p=0.000
Cooperative services	1.10	1.94	U=5,445.000; p=0.000
Public extension services	1.45	2.13	U=4,801.000; p=0.000

** Range: from 1 (Never) to 5 (Very often)*

It is remarkable that organic farmers consult more frequently other farmers than cooperative (t=28.624; df=127; p=0.000), public (t=22.140; df=127; p=0.000) or private extension providers (t=4.594; df=127; p=0.000). This stance emerges as a result of their dissatisfaction from the advice offered by such providers (rho=-0.206; p=0.020, rho=-0.213; p=0.016 and rho=-0.263; p=0.003 respectively). On the contrary, the analysis revealed that the high mean score attributed to magazines is not affected by the dissatisfaction from private (rho=-0.03; p=0.974), public (rho=-0.063; p=0.481) or cooperative providers (rho=-0.014; p=0.871), thus confirming that it concerns an attitude rather than an alternative way to obtain advice or information.

Table 3. Differences between organic and conventional farmers concerning the use of various information sources

Source	Mean scores*		Mann-Whitney's test
	O.F.	C.F.	
Other farmers/counterparts	3.95	3.18	U=4,933.500; p=0.000
Family/friends	3.97	3.34	U=6,162.000; p=0.000
Radio	1.92	1.93	U=7,947.000; p=0.507
TV	2.15	1.87	U=6,737.500; p=0.005
Newspapers	2.87	2.72	U=7,572.500; p=0.196
Journals/magazines	4.14	1.38	U=544.500; p=0.000
Farmers' associations	3.39	1.45	U=2,020.000; p=0.000

** Range: from 1 (Never) to 5 (Very often)*

Furthermore, the low frequency of communication with advice providers (private, cooperative or public sector agronomistst) has pushed farmers to seek knowledge through their participation in agricultural education programmes (U=6,412.500; p=0.004, U=5,309.000; p=0.000 and U=6,947.500; p=0.043 respectively), whereas also increases their willingness to participate in such activities in the future (rho=-0.263; p=0.000, rho=-0.222; p=0.000 and rho=-0.181; p=0.004).

In this respect it is also shown that the proportion of organic farmers (70.3%) and conventional growers (11.5%) who have participated in agricultural education programmes is significantly different (Chi square=92.313; p=0.000). In addition, organic farmers express a higher willingness to participate in such programmes (U=4,599; p=0.000) as compared to their conventional counterparts. In particular, 87.5% of organic farmers reported 'very high' or 'high willingness' to participate, while the relevant percentage for the group of conventional producers is 49.2%.

In order to investigate which educational needs (see: Table 4) drive farmers' willingness to attend education programmes, two models of Complementary log-log regression analyses, one for each group of farmers, were created. Willingness to participate in agricultural education programmes was used as the response variable, while the nine educational needs were used as predictors.

For the group of organic farmers the -2 log-likelihood values for the baseline model and the final model yielded a Chi square (249.095) which is statistically significant (p=0.000). The Pearson and likelihood-ratio chi square statistics confirmed the good fit of the model. Pseudo R-squared measures are high enough to confirm the good predictive power of the regression model. Cox and Snell's R2 (0.857), as well as the R2 values of Nagelkerke (1.000) and McFadden (1.000) indicate that the regression model fits well the data.

As the parameter estimates reveal (Table 4) only three predictors contribute significantly to the model (marketing issues, sustainable practices, soil management). Given that in all three cases the coefficients are positive, the relationship between the predictors and the response variable is positive. In other words, farmers' need to learn about marketing issues, sustainable practices and soil management techniques increases their willingness to participate in agricultural education programmes. The other six variables' contribute little to the model.

The -2 log-likelihood values for the intercept only model and the final one for the group of conventional farmers (Chi square=374.995; p=0.000) as well as the pseudo R2 statistics (Cox and Snell's R2=0.944; Nagelkerke's R2=1.000; McFadden's R2=1.000) confirm that the regression model give adequate predictions. Pearson's Chi square shows that the model fits well the data. As Table 4 illustrates, conventional farmers' willingness to participate in agricultural education programmes is explained by their desire to learn about sustainable practices (p=0.000), E.U. programmes on agriculture (p=0.000) and financial planning (p=0.015). As this desire increases, so does the willingness to participate in agricultural education programmes.

Table 4. Parameter estimates for the Complementary log-log models

Threshold and location parameters	O.F.			C.F.		
	Estimate	**Wald**	**p**	**Estimate**	**Wald**	**p**
Threshold						
Unwillingness				2.579	4.755	0.029
Low willingness	8.521	9.072	0.003	6.366	28.378	0.000
Moderate willingness	14.694	29.716	0.000	8.275	41.965	0.000
High willingness	19.243	37.967	0.000	9.777	51.501	0.000
Location						
Pest control	0.093	0.039	0.844	-0.327	1.451	0.228
Cultivation practices	0.182	0.535	0.465	0.106	0.146	0.702
Soil management	0.738	3.944	0.047*	-0.293	0.960	0.327
Sustainable practices	1.304	4.447	0.035*	1.336	22.419	0.000*
E.U. programmes on agriculture	-0.003	0.000	0.987	1.045	16.195	0.000*
Financial planning	0.266	1.474	0.225	0.462	5.976	0.015*
Marketing issues	1.981	37.193	0.000*	0.040	0.062	0.803
Post-harvest management	-0.054	0.072	0.789	0.062	0.268	0.605
Applied technology in agriculture	-0.230	2.115	0.146	-0.099	0.568	0.451

** Significant at a probability level of 0.05*

5. Discussion

The aim of this study is to examine organic farmers' relationship with extension education services. Over the years, quite some research efforts have been devoted to the examination of the preferences of organic farmers towards advisory work/extension. Herein, we broaden this literature by highlighting the moderating role of farmers' satisfaction on the frequency of communication with advice/extension providers as well as its influence on organic producers' willingness to participate in agricultural education programmes. Our findings reveal that organic farmers are dissatisfied from the advisory work offered by both cooperative and public extension services. Although previous research has underlined the shortcomings of the public extension service (Papaspyrou et al., 2009) vis-à-vis meeting farmers' needs, this article on the one hand highlights that these are more obvious in the case of organic agriculture and, on the other hand, that cooperatives are also unable to satisfy organic farmers' demands. In contrast, organic growers' satisfaction from private providers is marginally positive but significantly lower than that of conventional producers.

As it has been argued by Koutsouris (1999) and Alexopoulos et al. (2009), in Greece, non-formal agricultural education, including various kinds of extension activities and short-term training for farmers (Coombs and Ahmed, 1974), faces serious shortcomings. Since the access to the EEC/EU in 1981 the Public Extension Service got heavily involved in fulfilling the increasing administrative bureaucratic tasks of the State (implementation of the CAP policies and control of subsidies); public extensionists were thus gradually transformed into almost typical civil servants working in office. Therefore, extensionists became severely restricted vis-à-vis the provision of advice to Greek farmers; information was provided to those of the farmers who actively sought it albeit in a rather fragmented, inadequate and inefficient manner. The vacuum created was filled by private agronomists either working for private companies or establishing local commercial enterprises promoting, in both cases, all kinds of farm supplies.

As a result farmers contact more frequently private agronomists in order to buy inputs as well as to learn the guidelines for their application and/or get advice on farming. On the contrary,

public extensionists are mostly confined in bureaucratic tasks concerning the CAP subsidies and programmes. In parallel, the public sector's educational function was restricted to short-term educational programmes (150 hours) offered by the Organisation of Agricultural Vocational Education, Training and Employment (DEMETRA) in the local DEMETRA's Centres for those who were eligible for participation in the E.U. schemes (Charatsari et al., 2011). Finally, the cooperatives mainly operate as dealers thus facilitating their members to have access to inputs; nevertheless, the range of inputs and advice provision is much more restricted as compared to private agronomists-dealers.

Hence the differential preferences and satisfaction farmers show vis-à-vis these three types of extension providers. The lower levels of contact and satisfaction shown by organic farmers can be attributed to the weaker knowledge base on organic farming on the part of the Greek agronomists as well as to the lack of specifically organic inputs on the part of private agronomists. Further to this, Labarthe's (2005) argument on the tendency of private agronomists to customise their services to their most frequent clients should be taken into account. In this respect, due to the interdependence between the demand and the supply of advisory services (Labarthe and Laurent, 2009), private agronomists are more likely to tailor their services to conventional farmers' demand.

As a result organic farmers seek knowledge through multiple channels within the rural communities, such as their colleagues, members of their family or immediate social environment and farmers' associations. This finding is consistent with research findings (Oladele, 2010; Padel, 2001) underscoring that organic farmers build extensive networks to diversify information sources (Darnhofer, 2010). Although Agunga and Igodan (2007) argue that this behaviour is a consequence of farmers' willingness to share their experiences and knowledge with one another, the current study suggests that it is dissatisfaction from advice/extension providers that stimulates such a behaviour.

An issue that merits further examination concerns the finding that magazines are the most frequently used information channel for organic producers while is the most rarely used source for conventional growers. However, the analysis revealed that such a high usage rate of magazines by organic farmers is not explained by their dissatisfaction towards advice/extension providers but is rather an expression of a particular habitual behaviour.

An interesting finding further underlining the difference between organic and conventional producers in their knowledge seeking behaviour concerns the participation in agricultural education programmes. Seven out of ten organic farmers have attended at least one programme, while the corresponding percentage for conventional producers is 11.5%. In addition, the two groups differ significantly in terms of their willingness to participate in such programs. As the two regression models reveal, this willingness is explained by the different learning needs on the part of each group of farmers. Especially for the group of organic growers significant predictors are their need to learn about the marketing of their produces, sustainable practices and soil management. Such needs are the outcome of the very weak, peculiar marketing, especially as far as organic produces are concerned, structures in Greece (Alexopoulos et al., 2010) and the aforementioned overall country's poor knowledge base on organic farming. On the other hand, conventional farmers' needs may be explained due to the demands cross-compliance makes on farming (re: sustainable practices), the significant contribution of various kinds of financial support, provided through the CAP, to farmers' income and investments (re: EU programmes) and the need for better farm organisation and management (re: financial planning).

Given that the influence of farmers' interaction/communication with advice/extension providers on their participation in agricultural education activities has not been dealt with in agricultural literature, this piece of work provides strong evidence for the existence of an

inverse relationship between the two variables. In other words, a key finding of this study is that, in Greece, agricultural education services appear as an alternative to the current advisory/extension services.

6. Conclusions

In Greece, an overall strong demand on the part of farmers for non-formal agricultural education has been recently established (Charatsari, 2011: 153; Alexopoulos et al., 2009). Our findings further indicate the existence of a latent demand on the part of organic farmers for organic-tailored extension services. In other words, organic producers' needs are not satisfied by any of the existing advice providers. Hence, advice/extension providers must turn to/ target the organic farming segment by changing their services' features, such as their knowledge base and communication methods.

In their current form, advice providers in Greece, including both the bureaucratic and subsidies-oriented public extension service as well as the profit-oriented private agronomists, seem, on the one hand, to be largely 'conventional-oriented' and, on the other hand, to have failed to obtain and sustain a satifactory relationship with organic farmers over time. The revealed dissatisfaction on the part of organic farmers implies that advice/extension providers - especially the public and cooperative services which are meant to operate in terms of 'public goods' - need to improve their performance in order to satisfy the needs of their organic customers and therefore to assist them in the attainment of their goals.

A significant contribution of this study concerns our understanding of organic farmers' information seeking behaviour. However, the work presented here has a number of limitations. In the first place, given that the identification of the antecedents of (dis)satisfaction was beyond the scope of this piece of work, research aiming at the investigation of the service relationship attributes on shaping such a perception is deemed necessary. In addition, the moderating effects of farmer's demographics (i.e. gender, age, income, education) on the relationships addressed were not examined. A further limitation of the current study concerns the measurement of the farmers' 'frequency of communication' with advice/extension providers. Farmers participating in this study were called to report on such a frequency based on the subjective meaning they attach to it. It is the opinion of the authors that the 'absolute' frequency (i.e. the number of visits per month or per year) certainly depends on the size, the production orientation, the intensification as well as the geographical location of the farm enterprise. Additional research could further examine the validity of our results by using exact measurements for the frequency of communication or satisfaction scales for the indirect calculation of farmers' satisfaction with extension services. Moreover, since farmer-to-farmer communication has been found to be a significant mode of information diffusion in the organic segment, future research should examine the quality of the information diffused thereby.

Overall thus, future research could be undertaken in order to explore the validity of as well as to expand on our findings, on the one hand, in other areas of the country and, on the other hand, with farmers' groups practicing other forms of sustainable agriculture, such as ICM farmers.

To conclude, this piece of work uncovered an inverse relationship between, on the one hand, farmers' contact with and satisfaction from various extension providers and, on the other hand, their participation (and willingness to participate) in agricultural education programmes. Particularly organic farmers being disappointed by extension providers' ability to match their expectations are urged to participate in agricultural education programmes. In this vein, further research could expand this framework by including other key-variables in order to improve the picture of farmers' knowledge seeking behaviour.

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