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Experiences in organic agriculture: How to stimulate a transition to agroecologically based agricultural systems

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***Abstract*—** *This study surveyed a total of 15 farmers from the Association of Organic Producers and Producers of the São Francisco Valley (APROVASF), to investigate what motivates or motivated the adhesion of these farmers to the organic production system and what were the problems encountered in maintaining the activity. It is noteworthy that the main difficulties reported were phytosanitary management, production of internal inputs, keeping the records and controls required for organic certification and maintenance of updated organic activity. Thus, it is necessary the promotion and strengthening of public policies that enable the conversion of their agricultural activities and the building of sustainable agroecosystems.*

I. INTRODUCTION

Agroecology presents different interpretations that complement each other when addressing agricultural production and field issues, being discussed beyond academia, and seen as science, agricultural practice, sustainable production and, among others, a perspective of socioeconomic inclusion [1] [2] [3]. With a view to food production, its agricultural practices and sustainable production also support some systems recognized as agroecologically based, such as the organic system, recognized worldwide, with representation through the International Federation of Organic Agriculture Movements (IFOAM), as well as having a legal framework in Brazil, which regulates the production of organic food in the national territory.

Since 2001, the Ministry of Health of Brazil has continuously made available on its website, as well as being reported in the main media in the country, results of the analysis of pesticide residues in food, carried out through the Program for the Analysis of Pesticides Residues in Food (PARA). Cases of poisoning due to the use of pesticides, as well as the occurrence of cancer favored by the presence of residues in the human body, are recurrent in scientific studies and in the care of poisoning centers throughout the country. In this scenario of distrust regarding the quality of the food offered, part of the population demands products with guaranteed origin, seeking to consume pesticide-free vegetables and animal products, finding in food with "organic seal" the guarantee of a product without pesticides, healthy and safe for family consumption. Thus, the demand for this type of product is growing, as well as increasing the adhesion of producers, when observed that in 2012, at the time of the first official registration of organic farmers and ranchers in Brazil, the number registered with the Ministry of Agriculture,

Livestock and Supply (MAPA) had around 5,934 producers [4] and today it is around 25,296 [5], although still timid when considering the diversity of foods that could be offered, as well as the number of people attracted to the cause.

Some studies show that producers are unsure of trying to convert or transition to agroecological practices [6] [7] and, seeking to understand and suggest strategies that enable the adhesion of producers to agroecologically based production systems, we sought to hear, through a questionnaire, the members of the APROVASF, which actively participates in the weekly organic fairs in the municipalities of Juazeiro and Petrolina.

APROVASF has 24 members, 12 men and 12 women, 3 of whom are registered as professionals in agricultural sciences, 2 only sell products of organic origin and the others produce in the municipalities of Juazeiro (BA) and Lagoa Grande and Petrolina (PE) and they sell their respective vegetable and fruit crops in the local market. Cultivated land varies in size between 0.23 and 10 hectares.

II. MATERIALS AND METHODS

The research is classified as exploratory and descriptive, and the data presented were collected using the Google Forms tool and had the objective of investigating the perception of the participants regarding the role of producer and/or trader of foods from organic production systems. A bibliographical review was carried out, with consultation of books published in areas related to the proposed theme and scientific articles in several databases, through the Capes and Scielo journal portal.

Twenty-two multiple-choice questions were prepared, eight with an option to complement answers and one open, available in the APROVASF group, existing in the WhatsApp instant messaging application, through a Google Forms link.

The questions aimed to identify the motivation of respondents to get involved with the organic food production system, to know the ease and obstacles experienced by certified organic producers, such as support received, job and income generation, full dedication, recognition of social image, type of agricultural exploitation, difficulties in the field production system and in compliance with legislation, perception of conventional and organic agriculture, availability of technical assistance, perception of change in life, access to rural credit and knowledge of the legislation.

III. RESULTS AND DISCUSSION

The questionnaire was answered by 17 associates, that is, 15 farmers and 2 organic food traders. Among the farmers, only three members, 2 men and 1 woman, produce food and only sell to merchants, the others, 5 women and 7 men, both produce and sell their products to grocery stores and markets by themselves, as in the organic fair in the municipalities.

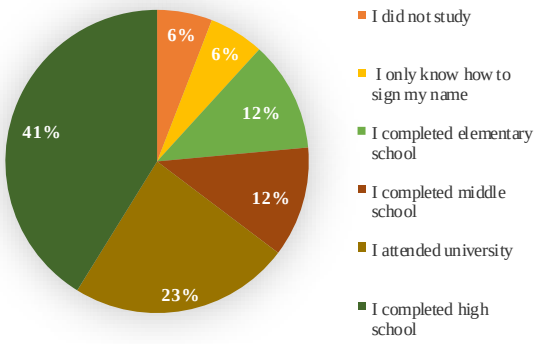

Fig. 1: Educational background of surveyed participants from APROVASF.

The group is quite heterogeneous in terms of education level (Fig. 1), with 7 associates with higher education, 4 with secondary education, 2 with complete elementary education and 2 with incomplete. One responder only knows how to sign their name, and another declared not to have studied. Among the professionals with higher education, 3 are agronomists, 2 are environmental managers, 1 business administrator and 1 mechanical engineer.

Studies on organic agriculture and its growth have confirmed a more expressive adhesion of producers with greater formal education, as demonstrated in works conducted in Poland [7], where, among organic farmers, there are more people with secondary education and higher education, including agricultural studies. These authors also claim that producers more likely to be innovative have organic certification and are more qualified and aware of issues related to the environment. However, the shift to organic farming, coming from family farming and low-education farmers, is already expressive, being a trend in Brazil, as the theme ecology and social impact is constantly reflected.

When asked about the support of family and friends on becoming an organic producer, 70.59% said they had been very supported by their family and 52.94% said they also had the support of friends. Only 11.76% of producers said

that the family was indifferent to their initiative and 5.88% had no support at all.

Among the members of the association, 80% of them have their families directly involved in agricultural activities, as shown in Fig. 2, characterizing organic and family farming, although 35.71% of these producers engage in other activities to complement the income of the family.

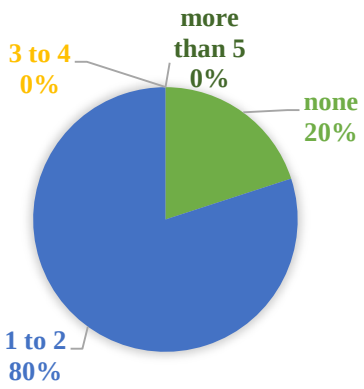

Fig. 2: Involvement of family members in the farming activities.

The results of the survey showed that more than one perspective motivated producers to practice in agroecologically based agriculture, which were focused on social values (Table 1) such as concern with the quality of the food produced, with health and with the environment, predominating on economic factors, as demonstrated in the work of Kociszewski *et al* [7], in addition to the practice of organic agriculture by ideology, as shown in Fig. 3.

Table 1- Social values that APROVASF members would like to Project.

Perspectives	Associates	%
Have a good financial situation	6	35.3
Have a standard of living similar to others in my community	2	11.8
Have a stress-free life	10	58.8
Have a decent, honorable life	11	64.7
Be recognized by everyone	6	35.3
Live in respect and communion with the environment and the beings of this planet	1	5.9
Have a quality life at work and financially.	1	5.9

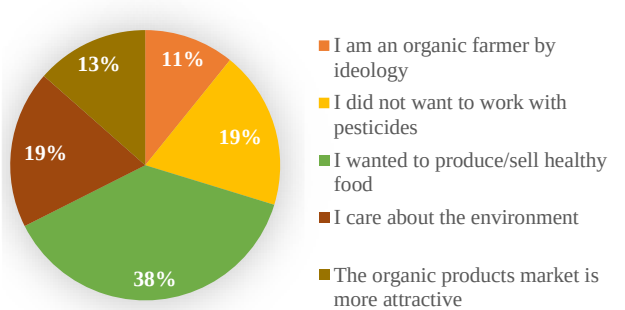

Fig. 3: Producers' considerations for adopting the organic production system.

Agriculture is practiced by all producers of the APROVASF, with 50% of those interviewed cultivating more than 11 crops, diversifying their properties, strengthening their agroecological base. All other producers have more than two crops in the field and only 3 producers practice poultry farming for family consumption.

When asked about the problems faced during the implementation and management of crops, 42.9% of farmers pointed out phytosanitary treatments, when they must deal with possible pest outbreaks, followed by the production of internal inputs (35.7%) such as manure, biofertilizers and/or mixtures for phytosanitary use and, among others, 28.6% mentioned having problems acquiring certified seeds and/or seedlings for planting. . It is noteworthy here that all producers know the time of harvest, as well as how to harvest the food they produce. Fig. 4 graphically presents these results.

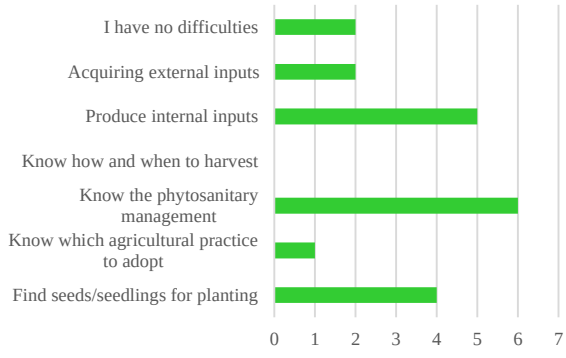

Fig. 4: Producers' answers about the difficulties faced in dealing with the crops.

Among the producers who answered the questionnaire, 71.4% went through the experience of conventional agriculture and when asked to compare the expenses

between the two types of agriculture, 42.9% stated that in the organic production system the cost of production of crops is smaller, as can be seen in Fig. 5.

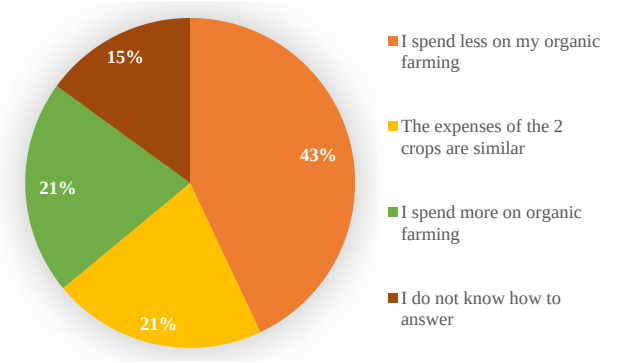

Fig. 5: Producer responses when comparing expenses incurred in conventional and organic crops.

In the question to identify the difficulties of the organic food producer, 53.3% indicated that documenting activities, filing notes and recording purchases and sales, among other procedures called "paperwork for certification", requires effort and a lot of work. 33.3% feel uncomfortable with the criticism received from conventional producers for having adhered to the organic production system. These data are represented in Table 2.

Table 2: Main difficulties encountered by certified organic food producers.

Difficulties	Organic farmers	%
Convince people that the production really is organic	1	5.56
Difficulty in hiring qualified labor	1	5.56
Low marketing demand	1	5.56
There are no difficulties	1	5.56
Deconstructive criticism received from conventional farmers	5	27.78
Respect the certification standards for dealing with crops	1	5.56
Meet document requirements for certification	8	44.44

It is relevant, then, to raise awareness about means and norms of organic production that insert these farmers into an ecological culture, in organic certification and that provide them with better marketing conditions and means. In an essay, Bomfim [8] challenges the educator to make use of a truly emancipatory education, of dialogue and learning with the student in total consonance with the environment in which he is inserted: "... the human being is made in the experience in society, being constantly challenged by socialized nature to transform it and transform itself".

As for technical assistance (TA) of the 15 producers who participated in the survey, only 13 producers answered this question, and 53.85% do not receive guidance from professionals in the agricultural sciences, 7.69% pay for the service, 15.38 % have TA made available by the federal government, since they are land reform settlers, 7.69% have support from the APROVASF technical team and 15.38% are professionals in the area.

When asked about the quality of life based on adhering to the organic production system, with the option of choosing more than one answer, 73.4% of respondents reported seeing a healthier family. As a result, 40% stated that their finances had improved, 20% declared that they were constantly discouraged and 13.3% claimed that expenses in the countryside increased.

As for rural credit, only 1 producer had access to bank financing, however, through a credit line which does not value the benefits, at least environmental, that agroecologically based agricultures promote.

Table 3: Responses from producers regarding the understanding of technical issues of organic production.

Organic production	True	Untrue	Right answer
Organic food, fresh/processed, must be produced following the Brazilian legislation for organic agricultural production system	16	1	True
The use of unauthorized production inputs at any stage of production and/or storage of organic food is prohibited	16	1	True
It is prohibited to use pesticides and synthetic mineral fertilizers	17	0	True
The use of biological control products is prohibited, as well as simple micronutrients and soil correctors, such as limestone and gypsum	1	16	Untrue

As the area is organic, there is no need to use soil and water conservation practices	2	15	Untrue
Biofertilizer tank waste can be disposed of anywhere on the property, once it has been fermented and no longer causes contamination	6	11	Untrue
Organic areas must have windbreaks to protect them from internal and external contamination	15	2	True
There is no need to have documents and record the activities carried out in the organic areas	2	15	Untrue
For the producer to certify his area, just communicate to his association and the city hall, who provide the necessary documents	1	16	Untrue
Among the documents required for certification are: organic management plan, sketch of the area, analysis of the water used on the property, soil analysis and record of activities carried out in the production of crops	17	0	True

Of the 17 survey participants, only 1 responded that they had no knowledge of the Brazilian legislation that deals with organic production, that is, Law 10,831 of December 23, 2003, Decree 6,323 of December 27, 2007 and complementary acts [9] [10]. 14 members said they had intermediate knowledge and 4 said they knew the legislation. In Table 3, referring to practical issues about the legislation, there is an almost absolute understanding of the issues addressed.

IV. CONCLUSION

Despite the difficulties encountered regarding the availability to perform services and use technologies in the organic production system, as well as the lack of technical assistance and rural credit, producers are satisfied with the work developed and acknowledge the improvement in family health. It is noteworthy that agroecologically based agriculture is recognized as interdisciplinary, it goes beyond the rural area, it dialogues with public health, social inclusion and job and income generation, among others. The transformations in the social and economic sphere, triggered by the change in the production system to ecological agriculture, imply the introduction of new knowledge, including agronomic, and these must, above all, seek to bring to the producer a change that makes life constructive and decent. Feasible public, educational, social, and marketing policies, which motivate society to participate in the transition process, and direct the recognition and appreciation of food produced in accordance with the environment, being socially fair, encourage, strengthen and further expand production and consumption of these foods. Therefore, it is recommended:

- To foster agricultural research with a focus on food production through agroecologically based production systems;
- Strengthen educational institutions within the scope of agroecological practices, government agencies, farms, business associations, as well as citizens interested in promoting agriculture in the country to improve the diffusion and promotion of technologies;
- To stimulate knowledge and understanding of the relevant legislation by society, which enables greater security in the existing relations between the countryside and the city;
- To make the agroecological approach explicit in a theoretical and methodological proposal so that technicians have agroecological knowledge to share with families, and
- To train producers and reduce bureaucracy with organic certification to encourage an agroecological transition.

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