Vol. 64, p. 14-39, jul./dez. 2024. DOI: http://dx.doi.org/10.5380/dma.v64i0.87271 e-ISSN 2176-9109

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Granting of credit in organic family production

Concessão de crédito na produção familiar orgânica

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Article received on August 17, 2022, final version accepted on March 12, 2024, published on August 23, 2024.

ABSTRACT: Despite the relevance of credit lines for the development of organic production system activities, the access by producers, especially family producers, to specific lines for this purpose is still extremely low. Therefore, this study aims to analyze the reasons why organic producers do not have access to government financial credit lines, in particular, from the Brazilian Program for Strengthening Family Agriculture´s (PRONAF) "Green Lines". As to the methodology, this is an applied and descriptive research, which integrates quantitative and qualitative approaches with non-probabilistic sampling due to its accessibility and convenience. An electronic questionnaire was sent via WhatsApp application to 2,325 producers included in the National Register of Organic Producers, and the data obtained underwent statistical and content analysis. The data showed that most producers carry out organic production activities with their own resources and that the most prominent reasons for not taking out credit in specific credit lines for organic production are linked to the credit granting process. Furthermore, the findings indicated a necessity to reassess the granting lines, aiming to make them more commercially attractive and less bureaucratic, considering the specificities of producers and the organic production system.

Keywords: organic agriculture; family farming; Green PRONAF; National Register of Organic Producers.

RESUMO: Não obstante a relevância das linhas de crédito para o desenvolvimento das atividades do sistema de produção orgânica, o acesso, por parte dos produtores, especialmente os familiares, por linhas específicas para tal fim ainda é extremamente baixo. O presente estudo teve por objetivo analisar os motivos que levam os produtores orgânicos a não acessarem as linhas de crédito governamentais, em especial, as linhas do PRONAF denominadas "Linhas Verdes". Metodologicamente, trata-se de uma pesquisa aplicada e descritiva,

que integra abordagens quantitativa e qualitativa, com amostragem não probabilística por acessibilidade e conveniência. Um questionário eletrônico foi encaminhado via aplicativo WhatsApp a 2.325 produtores constantes do Cadastro Nacional de Produtores Orgânicos, sendo os dados obtidos submetidos às análises estatística e de conteúdo. Os resultados evidenciaram que grande parte dos produtores desenvolve suas atividades de produção orgânica com recursos próprios e que os motivos mais destacados para a não contratação de crédito nas linhas de crédito específicas para a produção orgânica estão ligados ao processo de concessão do crédito. Adicionalmente, os dados obtidos sinalizaram a necessidade de revisão das linhas, visando torná-las negocialmente mais atrativas e menos burocráticas, considerando as especificidades dos produtores e do sistema de produção orgânica.

Palavras-chave: agricultura orgânica; agricultura familiar; PRONAF Verde; Cadastro Nacional de Produtores Orgânicos.

1. Introduction

Family farming accounts for about 74% of the labor force in rural areas, and is known by its socioeconomic diversification and pluriactivity (Del Grossi; Marques, 2010). Over the past few decades, this agricultural technique has not only become crucial at a national level but has also played a key role in ensuring food security. It is pivotal in providing a significant portion of the food consumed in Brazil and in preventing the mass migration of people from rural areas. Nevertheless, as a result of the production model implemented in Brazil, family farming has been overlooked in the march for progress. It is facing challenges that put its survival at risk, particularly in terms of economic sustainability and livelihood in rural areas.

In this context, the emphasis is on the significance of embracing organic production as a viable option for family agriculture. The livelihood of family farmers (Almeida, 2017) is uplifted by better income, health, and food security, as well as by greater profits from the added value of certified products. Conversely, certain aspects of this production system may hinder its acceptance, such as cost of adapting infrastructure during conversion, maintenance difficulties during the transition period, certification costs, lack of technical assistance, among others.

Moreover, organic production is on the rise among family farmers thanks to the certification processes designed for this particular group. In Brazil, certification can be obtained through three different methods: the participatory collateral system (SPG), the Social Control Organizations (OCS), and a private certification conducted by third-party Conformity Assessment Organizations (OAC) (Soares *et al.,* 2021). The first two certifications were introduced to primarily assist family producers involved in the direct or regional sale of organic products. They account for 48% of the total certifications in Brazil (Organis, 2021).

Evidence suggests that the production and consumption of organic products are on the rise in Brazil and globally (Lourenço; Schneider, 2022). According to the 2015 report by the International Federation of Organic Agriculture Movements (IFOAM, 2023), Brazil is ranked 12th in terms of organic production area. There is an estimated total organic production area of 1,283,054 ha, which includes land still in process of conversion. Over the past decade, there has been a 37.6% incre-

ase, securing Brazil the 9th position globally among the countries with the highest growth rate (IFOAM, 2023).

Brazil has become the leading organic market in Latin America in terms of demand, according to data from IFOAM (2023), indicating notable growth in the past few years. According to the Organic Promotion Association, the organic market experienced a fourfold increase in sales between 2003 and 2017 (Organis, 2021).

Traditionally, rural credit has been the key element of agricultural policy in Brazil, intended to enhance productivity and increase income. Nonetheless, family farmers in Brazil have uneven access to the credit lines offered by the Brazilian Program for Strengthening Family Agriculture (PRONAF), with a prevalence of borrowers from the South Region. Access is very limited in other Federation Units.

The scenario worsens when assessing adherence to specific criteria for organic production, specifically the ”Green Lines” (Linhas Verdes) (PRONAF Floresta, PRONAF Agroecologia, PRONAF Semiárido, and PRONAF ECO). A number of states have no operational contracts at all, and some have only minimal contracts when compared to the vast number of producers in the National Register of Organic Producers (Cadastro Nacional de Produtores Orgânicos in Portuguese - CNPO). Additionally, the financial disbursement is minimal when compared to national credit policy indicators. This is also evident in other PRONAF financing models that focus on the modernization of family farming (Aquino *et al.*, 2021).

Under these circumstances, it is highly essential for family producers to have access to specialized credit lines for organic production, enabling them to enter and thrive in the organic production sector while they obtain the associated benefits.

Therefore, the benefits of access to credit in promoting agricultural activities and its essential role in developing productive endeavors, especially in the conversion and maintenance of organic production systems has become evident. Consequently, we must ask: what reasons could justify producers not adhering to apparently appropriate lines specifically created for this audience?

As a result, this research sought to investigate how organic rural producers view the process of securing rural credit. The objective was to determine the reasons behind producers not adhering to “apparently appropriate” lines aimed specifically at this category. Throughout the process, the farmer's view on the adequacy of the credit lines was validated, the debt profile was assessed, and the obstacles and aids were noted.

2. Theoretical reference

2.1. Advantages of family farmers adopting organic agriculture

Brazilian family farming serves as a model for creating jobs in rural areas, generating income, supplying the local market, preserving the environment, and producing a wide variety of crops and products (Del Grossi; Marques, 2010).

Thus, it is important to emphasize the acceptance of organic production as a feasible choice for small-scale family agriculture. It enables increased profits by enhancing the value of certified products, with minimal alterations to their production process. Family farmers rely on their

own resources, practice polyculture, work on small plots of land, and rely heavily on manual labor for production.

Organic food production emerges as a substitute for expanding current activities on the property. The existence of small rural properties can play a crucial role in maintaining price stability in the local market and ensuring food and nutritional security for both producers and consumers (Tabarro; Feiden, 2016).

Still, the abundance of land and the prevalence of monocultures pose limitations on the enhancement of conversion and diversification, as well as on the promotion of investment and technological innovation. Scarce availability of seeds and sanitary products can drive up production costs in organic systems beyond those of conventional systems, creating significant obstacles for the industry (Tabarro; Feiden, 2016).

However, certification in Brazil is available in three different formats, with two aimed at family producers who make up the majority of the sector. They are:

a) through a Participatory Compliance Organism (OPAC), which would be a Participatory Collateral System (SPG), and

b) via direct sales, through registration with a Social Control Organism (OCS).

According to Organis data from 2021, most producers in all regions, except the South Region, received private certifications. The main feature is IBD, the top certifier of organic and sustainable products in Latin America and the 100% Brazilian company certifying organic and biodynamic products; Ecocert, the current largest certification body globally, of French origin, and Tecpar, a national certifier (Table 1). While these are the primary certifiers, there are additional ones not listed in Table 1 due to their limited involvement in the national arena. They are: IMO, Kiwa BCS, Chão Vivo, Agricontrol, Genesis and others. The certification sector in Brazil is predominantly national (83.81%), consisting of private certifications from IBD, Tecpar, OCS, and OPACs. ECOCERT, a foreign-capital company, is responsible for the remaining 16.19% of certifications. The analysis revealed that out of the total 15,329 producers consulted, 52% were audits, while 48% utilized OCS and OPACs.

Oliveira *et al*. (2019) argue that within this framework organic products are seen as a viable option to provide a unique product with significant value. They meet the needs of consumers and create supplementary earnings for the producers. According to Ayuya *et al*. (2015), certified producers have a lower likelihood of being multidimensionally poor compared to family producers who are not involved in the organic certification process.

According to Altenbucher *et al*. (2018), farmers benefit from organic production primarily because of enhanced soil quality resulting from decreased use of harmful chemicals and reduced expenses on inputs. As a result, production costs are lowered and the reliance on moneylenders is reduced, giving smallholder farmers the opportunity to enhance their livelihood.

Campanhola and Valarini (2001) present five reasons why organic agriculture is among the top choices for small farmers to enter the market. The primary argument concerns the production scale: Unlike commodities, organic products can be sold directly to consumers or through cooperatives. A se-

Table 1 - Number of production units by certification and regions in Brazil.

North		Northeast		Center-West		Southeast		South	
1 IBD	752	1 IBD	1764	1 ECOCERT	163	1 IBD	1113	1 ECOVIDA	4980
2 ECOCERT	512	2 POVOS DA MATA	343	2 OPAC CERRADOS	155	2 ABIA	572	2 ECOCERT	1030
3 ASPROC	131	3 ECOCERT	304	3 IBD	122	3 ECOCERT	73	3 IBD	932
4 ACS AMAZÔNIA	46	4 COOFAM	125	4 ARPA	55	4 ORG. SUL DE MINAS	254	4 TECPAR	781
5 MANIVA	41	5 ECO BORBOREMA	114	5 ATIX	45	5 AOC	203	5 COCEARGS	319

Types of certification		
Audit	7946	52%
OPAC	7089	46%
OCS	294	2%
Total	15329	100%

In black, Certifiers by audit; in red, Participatory Compliance Organisms (OPAC); and, in blue, Social Control Organisms (OCS).
Source: Soares *et al.* (2021).

cond point to consider is that organic products possess unique market features, appealing to a specific and discerning group of customers who are prepared to pay higher prices for these goods. The third aspect concerns integrating small farmers into local or global networks for promoting organic products, which requires their participation in organized associations or cooperatives. The fourth point discusses the availability of niche products (like vegetables and medicinal plants) that typically do not attract big agricultural investors since they are traditionally grown by small-scale farmers. The final argument to mention is the diversification in production.

Additionally, Campanhola and Valarini (2001) highlight a few benefits of small farmers engaging in organic agriculture, including:

it is viable in small areas and allows small-scale production;

encourages productive diversification in the business;

promotes reduced dependence on external inputs;

abolishes the use of pesticides;

increases soil biodiversity;

promotes greater commercial value of the organic product compared to the conventional one;

allows extended shelf life during the post-harvest period;

It's easier for farmers who are not using modern agricultural technologies to start using them.

2.2. Credit for organic and family farming

The creation of PRONAF on June 28, 1996, through Decree No. 1,946 (Brazil, 1996), was intended to provide credit and support to family producers. The guidelines of the Program were provided by Mattei (2014, p. 77).

> a) production financing: the program allocates resources annually for funding and investment, and finances rural productive activities in almost all municipalities in the country;
> b) financing of infrastructure and municipal services: provides financial support to municipalities in all regions of the country to carry out infrastructure works and basic services;
> c) training and professionalization of family farmers: promotion of courses and training for family farmers, municipal counselors and technical teams responsible for implementing rural development policies; [and]
> d) financing of research and rural extension: allocation of financial resources for generation and transference of technologies to family farmers. (free translation)[1]

In order to qualify for PRONAF credit lines, the farmer must meet the criteria of being classified as a family farmer as defined by Law No. 11,326 of July 24, 2006 (Brazil, 2006). According to this law, family farmers are identified as individuals conducting activities in rural areas, owning a land area of up to four fiscal modules, utilizing family labor, and earning income from their own enterprise, and having their business or enterprise managed by relatives. Besides farmers, this classification encompasses foresters, aquaculturists, extractors, fishermen, indigenous groups, *quilombolas*, and agrarian reform settlers.

In his work, Delgado (2012) points out that PRONAF is specifically targeted at family farming, with its funding predominantly allocated to food crops, especially corn.

Fornazier and Vieira Filho (2013) pointed out that public policies, particularly in the realm of credit, enabled many producers to utilize modern agricultural resources. Indeed, the shift in the technological base is driving the demand for increased investment in agriculture. As a result, having access to the latest technologies often depends on obtaining credit, which is not accessible to everyone.

As per the World Bank (WB, 2023), financial limitations in agriculture are still widespread, costly, and unevenly allocated, thus hindering small farmers' ability to compete effectively. The constraints are a result of not having collateral and being hesitant to use risk assets as collateral when they are crucial for livelihood.

Green PRONAF credit lines were established in 2003 to promote the organic production system, which not only contributes to improving the health

[1] a) financiamento da produção: o programa destina anualmente recursos para custeio e investimento, financiando atividades produtivas rurais em praticamente todos os municípios do país; b) financiamento de infraestrutura e serviços municipais: apoio financeiro aos municípios de todas as regiões do país para a realização de obras de infraestrutura e serviços básicos; c) capacitação e profissionalização dos agricultores familiares: promoção de cursos e treinamentos para os agricultores familiares, conselheiros municipais e equipes técnicas responsáveis pela implementação de políticas de desenvolvimento rural; [e] d) financiamento de pesquisa e extensão rural: destinação de recursos financeiros para a geração e a transferência de tecnologias para os agricultores familiares.

of consumers, producers and rural workers, but also adds environmental preservation and protection.

The aim of these unique financing options (PRONAF Floresta, PRONAF Agroecologia, PRONAF Semiárido, and PRONAF ECO) is to enhance the sustainable utilization of rural natural resources. Their focus is on encouraging the adoption of conservationist practices and sustainable technologies to quicken the transition from conventional, traditional, and modern agriculture to sustainable agriculture. Moreover, they are given technical aid in relation to loans and projects executed in family production units (Klering *et al*., 2010).

Nevertheless, the establishment of the "Green Lines" did not prove sufficient in facilitating the approval of PRONAF credit initiatives aimed at supporting agroecological production systems. The PRONAF Agroecologia line, for instance, was little accessed (Sambuichi *et al*., 2018).

2.3. Producer´s access to PRONAF "Green Lines"

According to Gazolla and Schneider (2013), the demand and performance of PRONAF "Green Lines" contracts are minimal compared to the resources provided and the access to other PRONAF lines.

The Central Bank of Brazil (BCB) data analysis of the historical series from 2015 to 2022 revealed that there are states with minimal contract activity, and in some cases, no operations at all (notably, Distrito Federal and Roraima). In spite of this, there is a substantial number of organic producers (Federal District with 261 and Roraima with 41 organic producers) that are part of the CNPO administered by the Ministry of Agriculture and Livestock (MAPA).

Table 2 showcases information obtained from the Central Bank of Brazil (BCB) regarding the development of Green PRONAF operations contracting in the past six years. Evidence suggests that the number of operations has been decreasing since 2018, in contrast to the trend observed in credit lines for conventional production.

TABLE 2 – Evolution in the volume and value of PRONAF "Green Lines" contracted operations.

Year	Amount	Value (R$)
2016	419	131,838,434.40
2017	603	209,953,026.70
2018	748	312,566,022,.0
2019	704	412,884,578.00
2020	709	384,905,637,.0
2021	619	449,231,781.10

SOURCE: Adapted from BCB (2022).

Gazolla and Schneider (2013) point out the reasons for the low demand and unimpressive results of Green PRONAF: lack of knowledge among farmers about the lines; shortage of technical support for eco-friendly projects; high costs of the organic certification process required by audit; and bureaucratic difficulties in accessing credit from banks.

TABLE 3 – PRONAF “Green Lines” operations stratified by line.

PRONAF lines	Amount	Contracted value (R$)
Semiárido	1,491	953,903,424.80
Eco	1,678	792,896,680.40
Floresta	620	332,488,731.80
Agroecologia	437	39,610,919.45
Total	4,226	2,118,899,756.45
2021	619	449.231.781,10

SOURCE: Adapted from BCB (2022).

Indeed, the barriers to obtaining credit included: inadequate project presentation spreadsheet formatting, undefined application goals, personnel shortages, and a lack of employee knowledge about green credit lines and the hesitance to support agri-environmental projects that were not a primary focus for the agencies (Aquino *et al*., 2021).

According to Campanhola and Valarini (2001), out of the ten challenges organic family farmers encounter, rural credit access could address at least four of them: the expenditure on adapting infrastructure, the maintenance challenges during the transition phase, the certification costs, and the absence of technical support.

3. Methodology

The present study is a blend of applied and descriptive research, incorporating both quantitative and qualitative methodologies. A non-probabilistic sampling was chosen for its ease of accessibility and convenience, with participants opting in voluntarily. Data collection involves the distribution of questionnaires to producers via WhatsApp.

3.1. Identification and selection of producers for implementation and development of the rural credit assessment instrument

Among the 26,840 producers in CNPO-MAPA, 2,325 Brazilian organic producers were chosen for this study. Their cell phone number had been registered in the "Contact" field of the spreadsheet (for sending the questionnaires via WhatsApp application). No producers were found to have duplicates, and none were identified as extractivists or food processors based on the given filters:

- Filter 1 – Remove producers from other countries, remaining: 25,468.
- Filter 2 – Remove processors, agroindustry and extractivists, remaining: 14,199.
- Filter 3 – Remove producers with no telephone information in the list, remaining: 5,349.
- Filter 4 – Remove producers who do not own a cell phone in “Contact”, remaining: 2,712.
- Filter 5 – Remove producers who do not have WhatsApp, remaining: 2,325.

In summary, 12,641 producers were disqualified because of their production characteristics and/or location, and 11,487 producers were excluded due to registration process deficiencies and insufficient information on the MAPA website, and 387 for not using WhatsApp.

Data collection was carried out through an electronic questionnaire designed on the Google Forms platform, modeled after the instrument utilized by Sales (2020). Both the research invitation and questionnaire were dispatched to the chosen producers via the WhatsApp application.

The final instrument was made up of 31 items, covering the following topics: sources of financial resources used in production; whether or not seeking rural credit; level of effort to obtain rural credit; factors behind producers choosing alternative rural credit lines over organic-specific ones; possible obstacles and/or opportunities for access to rural credit and obstacles encountered in adopting organic production.

3.2. Data analysis

The data was processed and analyzed using descriptive statistical methods and content analysis. The study involved calculating measures of central tendency (mean), dispersion (standard deviation), and coefficient of variation.

Concerning content analysis, the reports of the researched producers were structured, analyzed, and classified into broader thematic categories through systematic methods.

The non-parametric chi-square test was employed to assess the difference between the observed absolute frequency of a categorical variable and the expected frequency distribution. This enabled a quantitative assessment of the correlation between the study's findings and the anticipated distribution for the phenomenon. All statistical analyzes were carried out using Microsoft Excel, version 2010, and R Program, version 4.1.2.

To investigate the factors contributing to the limited credit access for organic producers in the "Green Lines", the following questions were chosen for statistical and content analysis:

- 24. “Have you ever tried to access or contract an official rural credit operation?”;
- 26. “What factors influenced your decision to go for different rural credit options rather than specific ones for funding organic production?"; and
- 27. “What were the reasons that prevented or led you to not even try to obtain rural credit for your production?”.

Additionally, three hypotheses were outlined, which are:

- Hypothesis 1 – for personal reasons (having enough capital or fearing getting into debt, for example);
- Hypothesis 2 – due to characteristics of the credit lines (not considering the profile of producers, rates, terms and grace periods, for example); and
- Hypothesis 3 – due to difficulties inherent to the process of obtaining credit (lack of knowledge of the lines or necessary documents, lack of specialized technical support for preparing projects, for example).

The NVIVO program was utilized to analyze questions 24, 26, and 27 of the section dedicated to financial issues and credit access. The corpus included a text with 743 occurrences (words, forms, or terms), with 80.8% being excluded or combined due to being counted only once, having fewer than three letters, or being alike.

The NVIVO word cloud analysis visually displays words in varying sizes based on how frequently each word appears in the interviewees' reports.

4. Results and discussion

4.1. Demographic data, profile of properties, distribution of Federation Units and producer´s perception regarding organic production activity

When it comes to demographic data, our findings show that male respondents were in the majority (70%). Regarding age, the majority of producers were above the age of 40 (68%). In terms of education, 46.5% have achieved a bachelor's or postgraduate degree, showing a discrepancy from the information gathered in the 2017 Agricultural Census. Additionally, in terms of marital status, 78.9% of individuals are either married or in a cohabitation relationship. A majority (54.36%) of the primary income received prior to initiating production at the establishment came from rural production activities like farming and farm work.

In terms of the monthly family income generated from agricultural and livestock activities at the business, over half of the respondents reported earning between two and four times the minimum wage. Concerning monthly family income from non-agricultural activities (casual work, paid employment, handicrafts and small agro-industrial activities, such as, making sweets, sausages and food preserves), 33.5% of respondents reported not having one, while 32% reported receiving an income equivalent to two to four minimum wages. On average, four people rely on this family income for their living expenses.

When it comes to the property's Gross Annual Revenue (RBA), the majority of respondents indicated revenue up to R$50,000.00 (fifty thousand reais) (56%), while only 8% reported revenue exceeding R$500,000.00 (five hundred thousand reais). The percentages closely align with those obtained from examining organic production exclusively (question 6). This further supports the likelihood that 92% of respondents meet the Gross Revenue (GR) requirement for PRONAF eligibility.

In terms of property sizes, as indicated in Table 4, 70% of properties are below 20 ha, with a majority falling within the range of 2 to 5 ha (36% of properties) – a statistically significant finding based on the chi-square test.

Considering the information in Table 4, the reality under examination resembles the results from the 2017 Agricultural Census (IBGE, 2017). It highlighted the prevalence of small agricultural properties in Brazil, varying from 0 to 10 ha, indicating that this is also a common feature of organic production producers. It has also been noticed that, even though the areas are small, farmers allocate a significant portion of their land solely for organic production. The observation was made within a range of 2 hectares, where the organic production area accounted for an average of 70%.

TABLE 4 – Characterization of the area size-activity relationship in organic production units.

Size (ha)	Average area (ha)	Number of properties	Average organic area (ha)	Organic percentage (Average)
Up to 2	1.4	26	0.98	70%
From 2.1 to 5	3.4	36	2.08	61%
From 5.01 to 10	7.72	35	3.857	50%
From 10.01 to 20	14.47	32	7.45	51%
From 20.01 to 40	29.01	28	9.85	34%
Over 40	161.45	35	50.76	31%
Total		192		

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

The features described earlier would be appropriate for almost all productive properties eligible for PRONAF. To meet the classification requirements, it is essential to limit the area to no more than four fiscal modules, which in Brazil can vary from 20 to 440 hectares as per Law No. 8,629 dated February 25, 1993 (Brazil, 1993).

In relation to organic production on the properties, as indicated in Table 5, fruits, vegetables, and cassava are the most common crops, found on over half of the properties. It's worth mentioning the lack of coffee and the bottom placement of soy among the top ten cultivated items, which differs from MAPA's report highlighting these products as significant organic crops in Brazil.

This difference could be attributed to the amount of output (an aspect not addressed in the question at hand), the respondent's ability to select multiple items, irrespective of the production area, or these being the primary products produced.

In terms of the volume of organic products grown per farm and the variety of production, the majority of those surveyed indicated that they have a diverse or highly diverse output. These data support the information shown in Table 5, where the average number of products manufactured per respondent exceeded four.

When it comes to RBA, only 4% of participants surpass R$ 500,000.00 (five hundred thousand reais) – the limit for classification in PRONAF –, while the majority (63%) of properties have inco-

TABLE 5 – Organic products produced.

Organic production	Amount of producers	Participation (%)
Fruits	161	19
Vegetables	147	18
Cassava	125	15
Corn	108	13
Bean	106	13
Others	80	10
Honey	38	5
Eggs	32	4
Milk	23	3
Soy	13	2
Total	833	100

Significant by the chi-square test at a probability of 5%.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

mes of up to R$ 50,000.00 (fifty thousand reais). Hence, even though the spreadsheet provided by MAPA does not specifically identify the beneficiaries of PRONAF, it is believed that the majority of the respondents meet the criteria for classification, even though there are other factors to consider.

The findings further confirm that the attributes of organic production (use of own inputs, polyculture, possibility of production on small properties and intense use of physical force in production, for example) align well with the traditional methods practiced by farmers. They also confirm the decision to offer a larger number of credit lines for organic

production through PRONAF, in line with the needs of the producers.

As to the creation of new planting, management, or manufacturing techniques on their properties, 67% of survey participants reported having developed such processes on their properties. This demonstrates that organic producers are eager to incorporate new methods into their production practices.

Producer associations and the local Technical Assistance and Rural Extension Company (EMATER) were identified by 89 producers as the key organizations that offered support in the development of new techniques. Input suppliers and universities were mentioned the least as supportive, with only 22 producers referencing them (Table 6).

The fact that only 9% of participants did not receive any support highlights the substantial

TABLE 6 – Organizations that supported the development of new techniques in production units.

Organization	**Amount**	**Percentage (%)**
Producer´s association	49	17
EMATER	40	14
Others	30	10
SENAR	26	9
None	27	
Cooperative	23	8
Neighboring producers	24	8
EMBRAPA	16	6
Secretariat of Agriculture	16	6
Private technical assistance	16	6
University	13	4
Input supplier	9	3
Total	289	100

Significant by the chi-square test at a probability of 5%.

KEY: EMATER – Technical Assistance and Rural Extension Company; EMBRAPA – Brazilian Agricultural Research Corporation and; SENAR –National Service for Rural Learning.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

backing (91%) that organizations provide to organic producers in developing new production techniques.

As to the difficulties in adopting organic production on properties, despite the support of several organizations and with specific credit lines for financing organic production (Table 7), the most latent difficulty refers to the lack of financing. The primary challenge identified by 29% of respondents is the insufficient funding.

TABLE 7 – Main difficulties in adopting the organic production system.

Variable	Amount	Percentage (%)
The primary challenge is the lack of financing.	59	29
The primary challenge is uncertainty in marketing.	34	17
The primary challenge is the lack of specialized technical assistance.	29	14
The primary challenge is the lack of training and qualification to conduct this type of production.	21	10
The primary challenge is the development of systems and standards.	12	6
The primary challenge is the conversion period for the System.	5	3
The primary challenge is the conversion cost.	5	3
Others.	37	1
Total	165	100%

Significant by the chi-square test at a probability of 5%.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

For organic production, the most specific credit lines typically mandate technical assistance for project preparation and for activity monitoring. That means, these credits are production-oriented, ensuring the producer gets technical assistance when utilizing them. Lack of adherence among them is the reason behind the absence of technical assistance, training, and qualifications, which poses the biggest challenge for 24% of respondents.

Even though Campanhola and Valarini (2001) emphasized the deadline and cost of conversion as significant challenges for adopting the organic production system, only 3% of respondents cited them, placing them respectively at last and third-to-last positions in Table 7.

4.2. Social capital, learning and institutional arrangements

The World Bank stated (WB, 2023) that when producer organizations work together, they can cut down on transaction costs in markets, have a stronger voice in national and international policy forums, and wield more influence in the market, being essential for smallholders to achieve competitiveness.

Thus, social capital plays a vital role in the proper functioning of collective actions, particularly when taking into account the features of organic production systems and Social Control Organizations (OCS) (Darolt *et al*., 2016). According to the data in Table 8, producers generally have positive perceptions of social capital, with all averages exceeding 7 and exhibiting low standard deviation, except for question 20e. This demonstrates uniformity in the responses, indicating a consensus among all producers.

TABLE 8 – Perception of social capital in productive Properties, according to the grade of agreement with the statements.

Question	Average grade	Standard deviation
20a – I personally trust the people I come into contact with when carrying out collaborative activities.	8.69	1.37
20b – I maintain close personal relationships with members of partner organizations.	8.29	1.57
20c – Much of our communication is done in informal gatherings and meetings.	8.39	1.61
20d – I am confident that these relationships will be long-lasting.	8.67	1.41
20e – I modified my property's production processes due to projects developed in collaboration with an organization.	6.89	2.52
20f – Sharing a common language makes it easier to communicate our preferences.	8.00	1.60
20g – Collaborating with our partners to solve problems is crucial for the success of our partnership.	8.78	1.29
20h – Similar experiences on both sides can enhance collaborative problem-solving.	9.04	1.03
20i – Our partners and we are aligned in our vision for agriculture and enhancing production conditions.	8.69	1.28

KEY: '1' means ‘Strongly disagree' and '10' means ‘Strongly agree’.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

Even though the results demonstrate a positive social interaction among producers, there are evident difficulties related to learning. The assessment in Table 9 indicates that producers from other areas, the producers' association, and the internet were the only ones with scores above 7. Only the internet and producers from different areas showed a low standard deviation, suggesting a diversity in responses.

TABLE 9 – Sources of information used to improve and diversify production.

Questions	Average grade	Standard deviation
21a – Information from neighboring producers.	6.55	2.47
21b – Information from friendly producers in other locations.	7.90	1.60
21c – Information from Cooperative.	6.05	3.12
21d – Information from internet.	7.64	1.74
21e – Information from EMATER.	5.00	2.87
21f – Information from EMBRAPA.	5.13	3.01
21g – Information from the organic producers´ association.	7.61	2.37
21h – Information from the university.	4.93	2.88
21i – Information from NGO.	4.27	2.93

KEY: '1' means ‘Strongly disagree' and '10' means ‘Strongly agree’.

KEY: EMATER – Technical Assistance and Rural Extension Company; EMBRAPA – Brazilian Agricultural Research Corporation and; NGO – Non-Governmental Organization.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

4.3. Lines, public policies and organizations to support obtaining official credit

The discussion surrounding public policies for family farming has become one of the most debated issues in Brazilian literature. Analyzing these producers' access to such policies has been highly relevant in this study, particularly for those involved in seeking credit for financing organic production. The basis of this association was predominantly shaped by the productive ideology implemented in the 1960s and 1970s, resulting in a weakened class of family farmers and the increase in disparity in relation to large producers (Mattei, 2014).

Nonetheless, it is essential to verify the classification of organic producers involved in PRONAF and, as a result, in the "Green" PRONAF programs before conducting the analysis.

According to the Rural Credit Manual - MCR-10-2 (BCB, 2024), PRONAF beneficiaries are farmers and rural producers defined by Law No. 11,326 of July 24, 2006 (Brazil, 2006) and must also satisfy certain conditions.

a) at least 50% (fifty percent) of the family's gross income must come from the business´s agricultural and non-agricultural exploration;

b) must have obtained gross family income in the last 12 (twelve) months of normal production prior to the DAP or CAF-Pronaf request, of up to R$500,000.00 (five hundred thousand reais).

According to Table 10, 49 participating producers (23.79%) do not meet the criteria set by MAPA and MCR for family producers, including property size (4 fiscal modules), agricultural income predominance, and Gross Family Revenue.

TABLE 10 – Percentage of producers not classified as eligible for PRONAF.

Prerequisite	**Did not meet**
Gross Family Revenue up to R$500 thousand	8
Area explored up to 4 fiscal modules	2
Predominance of agricultural income	39
Total producers not included	49
Percentage of producers not included	23,79%

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

Regarding the prerequisites of living in or near the property, labor from the family itself and management by the person or relatives, when analyzing the data obtained in the research (monthly income, family members engaged, and variety in products), as well as the characteristics of the organic production system, it is implied that they are met.

In the Organis study (2021), the participatory certification relationship can also be compared with these results. This study found that 15,329 producers were consulted, representing 48% of those certified through OCS and OPACs for family producers. This shows that family farmers are taking on a bigger role in organic production.

As indicated in Table 11, the majority of respondents (65%) use their own resources to conduct their activities. According to the chi-square test, this data underscores the critical issue of limited rural credit access, which is vital for organic producers to make substantial investments in their properties.

The outcome displayed in Table 11 is in line with the findings of previous studies, specifically in terms of the poor demand and negligible performance of Green PRONAF (Gazolla; Schneider, 2013). The use of PRONAF resources for activity development was only reported by one respondent. In an effort to understand the underlying causes for the lack of interest among producers in rural credit lines designed for organic production, they were invited to share their perspectives whether they attempted to access; if they plan to access; if they made an attempt but could not access; and if they were able to access rural operations on organic and conventional lines.

Table 12 reveals that only 9% of producers opted for rural operations in organic production, with 25% utilizing conventional methods and 42% not seeking rural credit. Out of these, 17% plan to get a loan, while 25% have no intention of obtaining a loan – this is valuable information, as per the chi-square test.

One of the research goals was to understand why 42% of respondents did not attempt to access

TABLE 11 – Sources of financial resources used in production.

Variable	Amount	Percentage (%)
Own resources.	132	65,0
Rural credit in public banks.	22	10,8
Rural credit in private banks and credit cooperatives.	14	6,9
Bank credit not related to rural credit (CDC, credit card, overdraft).	9	4,4
Relatives and friends.	8	3,9
Credit and/or inputs in producer cooperatives.	6	3,1
Rural credit in public and private institutions.	2	1,0
Loan sharks.	1	0,5
State funding lines.	1	0,5
PRONAF.	1	0,5
Others.	7	3,4
Total	203	100

Significant by the chi-square test at a probability of 5%.

KEY: CDC – Direct Consumer Credit; and, PRONAF - Brazilian Program for Strengthening Family Agriculture´s.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

TABLE 12 – Information about contracting or attempting to contract a rural credit operation.

Variable	Amount	Percentage (%)
I have contracted rural operation (Organics line).	17	9
I have contracted rural operations (Other lines).	48	25
I tried, but could not (Organics line)	30	15
I tried, but could not (Other lines).	18	9
I didn´t even try.	49	25
I haven´t tried, but I intend to.	33	17
Total	195	100

Significant by the chi-square test at a probability of 5%.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

rural credit operations, as 29% stated that the main obstacle to adopting the organic production system is the absence of credit.

The results presented in Figure 1 indicate that a significant number of respondents put in a substantial amount of effort to secure a rural credit operation, with more than 50% reporting an effort level above 7.

Figure 1 confirms the difficulties involved in the credit acquisition process, as discussed by Aquino *et al*. (2021). The challenges include poorly formatted project presentation spreadsheets, undefined application goals, staff shortages, and employees' lack of knowledge about green credit lines and their resistance to fund agri-environmental projects that were not considered a priority by the agencies, among others.

The choice to explore different rural credit lines instead of dedicated lines for financing organic production (Table 13) was driven by several factors. The lack of knowledge about the lines (36%), bureaucratic barriers (18%) and insufficient technical assistance to make the proposal (16%) were the most cited.

Except for the high costs, the findings align with those of Gazolla and Schneider (2013), who emphasized the low demand and negligible performance of Green PRONAF. They mentioned farmers' lack of knowledge and lack of publicity about the lines; the lack of sufficient technical assistance to develop ecologically based projects; the expensive costs of the organic certification process via audit and the bureaucratic challenges in accessing credit from banks.

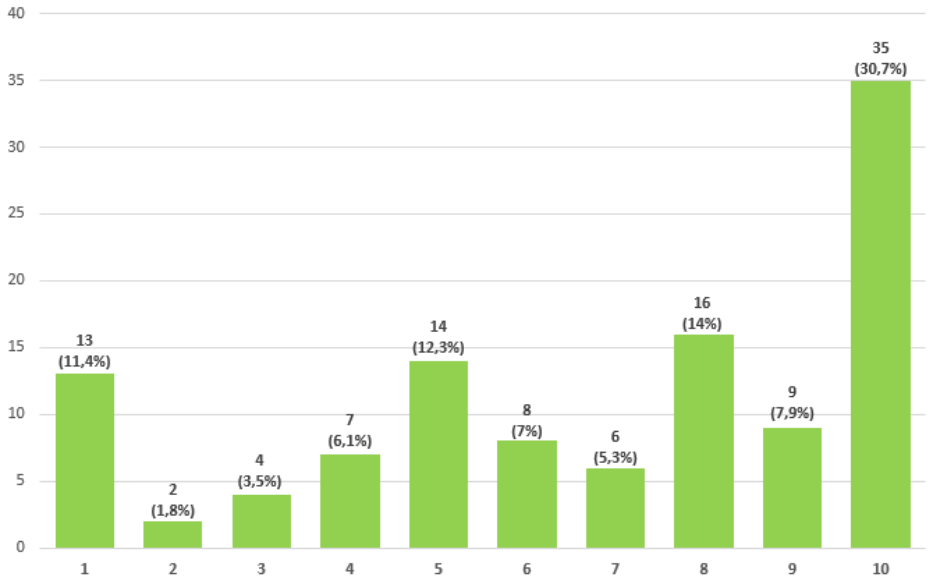

FIGURE 1 – Degree of effort made to contract a rural credit operation.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

TABELA 13 – Motivos que levaram os produtores a optar por demais linhas de crédito rural em detrimento das linhas específicas para financiamento da produção orgânica.

Variable	Amount	Percentage (%)
I did not know the lines.	37	36
I found the lines unattractive.	6	6
I found it more bureaucratic.	19	18
I changed lines as advised by Technical Support.	1	1
I changed lines upon recommendation from the bank.	4	4
I did not find technical assistance to make the proposal.	17	16
I hired/tried in “Organic lines”.	6	6
Others.	14	13
Total	104	100

Significant by the chi-square test at a probability of 5%.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

Producers who indicated they had not attempted to access the credit lines were asked to provide the reasons behind their decision. This enabled producing data for analyzing the significance of hypothesis 1. In question number 24, while only 49 respondents mentioned they had not attempted to access rural credit, a total of 162 individuals answered the question. As a result, we decided to present data from the complete group of respondents (Table 14).

The results analysis revealed a range of reasons why respondents chose not to pursue credit, with the main factors being having sufficient funding and a lack of technical assistance. The percentage was equally low for both, at 13.5%. However, the land issue (2.5%), delayed rural operations (2.5%), and lack of collaterals (5%) were the least cited by respondents, a noteworthy result from the chi-square test.

Figure 2 displays producers' opinions on the relevance of specific credit lines for organic production in promoting their production.

While 20% of respondents rated the lines as inadequate with a score of 1, approximately 70% of respondents rated them as 5 or higher – considered positive and showing that the lines are suitable for promoting organic production. This result is in line with those in section 4.2.1 on property areas, production activities developed and income, which enable most respondents to be included in PRONAF and most of the lines for organic production being destined for farmers relatives.

Table 15 displays the assessment of the performance of public Technical Assistance and Rural Extension (ATER) organizations; Private Technical Assistance, Financial Institutions, and Institutions, Organizations and Public Organisms supporting organic agriculture in terms of their performance in supporting obtaining official credit by producers.

TABLE 14 –Reasons that prevented or led producers to not even try to obtain rural credit for production.

Variable	Amount	Percentage (%)
I do not require financing as I am well-funded.	22	13.5
Lack of assistance to prepare de proposal.	22	13.5
Others.	21	13.0
I don´t know where to start (the process is confusing).	16	10.0
I don´t have the necessary documents (license, water grant, CAR, DAP).	16	10.0
I have restriction.	14	8.5
Delay.	14	8.5
I tried/succeeded in contracting.	11	7.0
Amount provided does not meet my needs.	10	6.0
I have no collaterals.	8	5.0
I have rural operations behind schedule.	4	2.5
I have a land issue, my land is not legalized.	4	2.5
Total	162	100

Significant by the chi-square test at a probability of 5%.

KEY: CAR – Rural Environmental Registry; and, DAP – Declaration of Aptitude for PRONAF.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

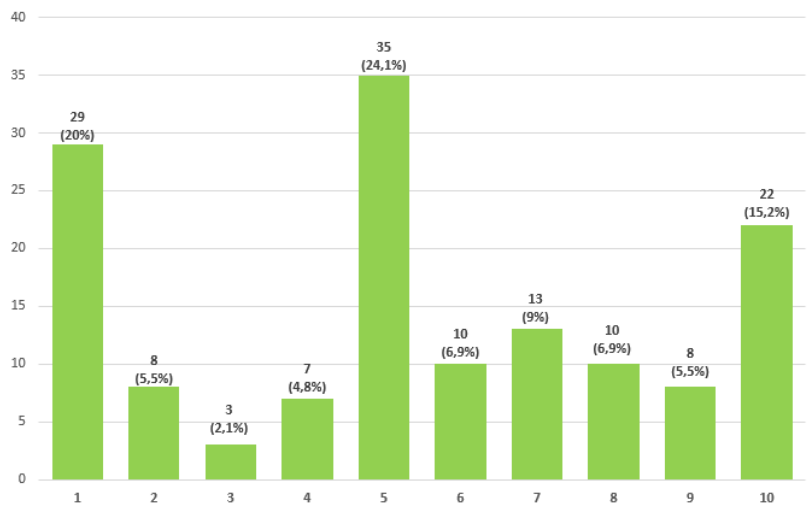

FIGURE 2 – Degree of adequacy of specific credit lines for organic production to boost production.

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

TABLE 15 – Assessment of the performance of entities in supporting obtaining official credit.

Questions	Assessment					
	Excellent (%)	Good (%)	Regular (%)	Poor (%)	Very poor (%)	None (%)
30. What is your assessment of Public Technical Assistance (ATER) performance regarding assistance in securing official credit?	4.49	21.91	30.90	25.28	17.42	-
31. How do you assess the performance of Private Technical Assistance in your location?	8.94	24.39	40.65	13.01	13.01	35.26
32. How do you assess the effectiveness of Financial Institutions in providing Rural Credit in your area?	5.26	17.37	38.42	21.58	17.37	-
33. How do you assess the effectiveness of institutions, organizations, and public bodies that promote organic agriculture in terms of spreading information and facilitating access to official rural credit operations?	3.35	11.17	44.69	-	40.78	

SOURCE: Developed using information obtained from organic producers who were part of the research and are documented in the National Organic Producers List (CNPO).

The analysis of the presented data revealed that ATERs were poorly evaluated by producers, with 42% of assessments falling into the poor or very poor category. The next group to be mentioned were institutions, organizations, and public organisms that back organic agriculture, with 40% showing poor or very poor results. Private Technical Assistance received its highest evaluation, with 73% of assessments falling under the categories of excellent, good, and regular. As to Financial Institutions, 65% were rated excellent, good and regular. The data serves as an alert about the deficiency of private technical aid, or the lack of familiarity with it among 35% of producers. The importance of this number is noteworthy, especially for its key role in the rural credit granting process by financial institutions, and for being the highest-rated among the entities that were examined.

4.4. Qualitative and quantitative analysis of the hypotheses

To investigate why producers are not following designated credit lines for organic production, responses to questions 26 and 27 were deemed more important and sorted based on the hypotheses, parameters and operational definitions for categorizing the answers (Table 16).

In the first hypothesis, responses centered around personal reasons were categorized, including: “Personal decision not to rely on the system”; "I do not need"; “Limited time to explore better credit options”; “I am not ready to solely focus on organic production”; among others.

Hypothesis 2 was assigned to responses that dealt with the lack of collaterals, restrictions, delays in payment, and insufficient documentation. The

TABLE 16 – Thematic categorization and operational definitions.

Hypotheses[1]	Thematic categorization	Operational definitions
1	Personal reasons	Grouped responses revealed that organic producers refrain from seeking credit in specific organic sectors for personal reasons (fear of debt, skepticism towards the credit system, being well-funded, and other personal attributes).
2	Credit lines characteristics	Grouped responses indicated that organic producers are reluctant to obtain credit from exclusive organic sources due to the challenges posed by the characteristics of these credit options. Difficulties include: inadequacy to the profile of producers, especially non-agricultural income, negotiating conditions for the lines (fees, deadline and grace period), inadequacy regarding production characteristics (costs, type of labor used, items subject to financing) and the required documentation.
3	Characteristics of the credit obtaining process	Responses were grouped indicating that organic producers do not seek credit in exclusive organic lines due to the difficulties inherent in the process of obtaining credit. Examples are: lack of knowledge of the necessary lines and documents, lack of specialized technical assistance for preparing projects, bureaucratic actions of banks and other institutions (where they do not find a favorable scenario) or delay in releasing credit.

[1] Hypothesis 1: organic producers do not take credit for the growth of their businesses because of their personal traits; Hypothesis 2: Organic producers are not interested in obtaining credit for the expansion of their activities because of the limitations of the existing options; and Hypothesis 3: Organic producers encounter difficulties in obtaining credit from specialized sources to grow their businesses.

main challenge in all reports is the credit line, which can be altered to benefit the producers, as seen in cases involving treasury risk (such as PRONAF A).

Hypothesis 3 comprised all the observations linked to the credit granting procedure: lack of familiarity with the lines (lack of publicity), delays and insufficient support in technical assistance, as well as change upon recommendation by the bank.

In Table 17, the data is displayed showing the breakdown of responses to questions 26 and 27 from the 174 participants.

Responses linked to the hypotheses mentioned earlier were analyzed using the NVIVO application, revealing the connectivity between occurrences through the visual representation presented in the

TABLE 17 – Number of respondents according to the categorization of hypotheses 1, 2 and 3.

Hypotheses[1]	Number	Percentage (%)
1	21	12
2	66	38
3	87	50
Total	174	100

[1] Hypothesis 1: organic producers do not actively seek credit to develop their activities due to personal characteristics; Hypothesis 2: organic producers do not seek credit to develop their activities due to the characteristics of the existing lines; and Hypothesis 3: organic producers do not seek credit in exclusive lines to expand their activities due to the difficulties inherent in the process of obtaining credit.

Word Cloud, as shown in Figure 3. The highlighted terms in the figure were the most cited: "assistance", "unknown", "well-funded", "documentation", and "bureaucratic (“assistência”, “desconhecia”, “capitalizado”, “documentação” e “burocráticas”, in portuguese).

FIGURE 3 – Word cloud on the reasons for not accessing credit.
Source: prepared by the author.

Organic producers highlighted the significant role of technical support in gaining access to credit, as evidenced in the results presented in Table 17. Hypothesis 3 stands out in this table as the most pertinent factor influencing the lack of credit access for organic producers. Emphasis should be placed on the fact that technical assistance –

whether public or private extension technical assistance – is crucial for the development of an economic viability project needed for securing credit from financial institutions.

Thus, the structure formed and the themes included in the construction of the textual corpus, as well as the link or connection between the words or those that appear highlighted, are closely associated with the significance and pertinence of technical support and the distribution of credit lines to enhance access to credit for small-scale organic producers.

Therefore, a more comprehensive insight into the subject was achieved, particularly focusing on the common reasons highlighted by producers, such as the absence of technical support in project preparation and unfamiliarity with the guidelines being the most significant.

5. Conclusions and recommendations

The adoption of organic production is considered a significant alternative for family farming. Nevertheless, important barriers hinder the adoption of this system, such as the lack of financing, which was initially identified as the main obstacle to implementing organic production.

The primary findings suggest that the majority of respondents engage in production tasks utilizing their own resources. Despite facing a major obstacle in the form of limited financing, they are eager to secure credit and believe that PRONAF's “Green Lines” are suitable for fostering their business, as they possess the right qualifications. This phenomenon is particularly noticeable when considering the scale of the properties, the RBA, and non-agricultural earnings.

We noticed that 76% of participants belong to the family producer category. The reasons why family organic producers are unable to access credit

lines for organic production were identified. As a result, it can be inferred that the factors concerning the credit acquisition process (Hypothesis 3) were the most significant, with the credit lines' features (Hypothesis 2) and personal traits (Hypothesis 1) following closely behind. The findings show that family farmers are progressively incorporating organic production into their context and practices.

Therefore, the primary reasons for not choosing to use credit were identified as: the lack of technical assistance for the preparation of the project, lack of knowledge of the lines and the fact that the producer is well-funded. The quantitative and qualitative analyses complemented each other, with the comparison showing a strong correlation, thus confirming the information presented.

There was a clear distinction in the actions of EMATER and the producer associations as to promoting the adoption of new techniques. Despite this, the respondents gave them low marks for their access to official rural credit.

Producers were seen putting in a significant amount of effort to secure credit, suggesting that the entire process needs to be reevaluated to enhance the producer's experience.

In conclusion, the research has contributed to enhance our knowledge of the topic. In order to bring more dynamism to the sector, it is suggested that future research should focus on the availability of skilled technical support for the development of agroecological projects, as well as on the expansion of this knowledge by both governmental and private organizations.

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