

## SCIENTIFIC ARTICLE

# Ornamental plant market in Dona Euzébia – MG: production, commercialization and impact of the COVID-19 pandemic

Mariana Cruz de Souza<sup>1</sup> , Mariana Ribeiro Oliveira<sup>1</sup> , Michele Carla Nadal<sup>1</sup> ,  
Patrícia Duarte de Oliveira Paiva<sup>1</sup> , Michele Valquíria dos Reis<sup>1\*</sup> 

<sup>1</sup> Universidade Federal de Lavras, Escola de Ciências Agrárias de Lavras, Departamento de Agricultura, Lavras-MG, Brazil

## Abstract

With the occurrence of the COVID-19 pandemic, different areas were affected, with positive or negative effects, as a function of the conditions imposed above all by gardening activities. This brought effects on the production of ornamental plants. In this context, the objective of this study was to analyse the situation of production, commercialization and the impact of the COVID-19 pandemic on the ornamental plants market in the city of Dona Euzébia-MG. A questionnaire with objective and discursive questions was applied to the city producers (30). The production of seedlings in Dona Euzébia is economically and socially important. Most producers have properties with 5 hectares, are in activity for a range of 5 to 19 years and have between 2 to 5 employees. With the onset of the pandemic, the market for seedlings and ornamental plants in Dona Euzébia was positively modified, with an increase in plant sales, which led to changes in production and in the sales process. During the period, producers took all measures to prevent the spread of the virus. The interviews showed that ornamental plants were among the main species cultivated and among the most sought during the pandemic period analyzed in this study. Furthermore, despite the restrictions and the uncertain scenario, there is optimism among producers, especially in terms of post-pandemic sales.

**Keywords:** changes in production, coronavirus, horticulture, marketing changes.

## Resumo

### Mercado de plantas ornamentais em Dona Euzébia - MG: produção, comercialização e impacto da pandemia COVID-19

Com o surgimento da pandemia do COVID-19 os mercados das mais diferentes áreas foram atingidos, positivamente ou negativamente. Neste sentido, o objetivo deste trabalho foi analisar a situação de produção, comercialização e o impacto da pandemia do COVID-19 sobre o mercado de plantas ornamentais da cidade de Dona Euzébia-MG. Diante disto um questionário com perguntas objetivas e discursivas, foi aplicado aos (30) produtores da cidade. A maioria dos produtores possui propriedades com 5 hectares, estão em atividade no intervalo de 5 a 19 anos e possuem entre 2 a 5 funcionários. Com o surgimento da pandemia, o mercado de mudas e plantas ornamentais em Dona Euzébia foi modificado positivamente, sendo relatado o aumento na comercialização de plantas, o que gerou alterações na produção e no processo de vendas. Durante o período, os produtores adotaram todas as medidas de prevenção contra a disseminação do vírus. As entrevistas mostraram que as plantas ornamentais estavam entre as principais espécies cultivadas e entre as mais procuradas durante o período de pandemia em que este trabalho analisou. Além disso, apesar das restrições e do cenário de incertezas, há um otimismo dos produtores do município especialmente nas vendas pós pandemia.

**Palavras-chave:** alterações de comercialização, alterações na produção, coronavirus, horticultura.

## Introduction

Dona Euzébia is known for the production of young plants of ornamental, forest, and various fruit species, especially citrus, responsible for supplying several Brazilian cities (Sousa and Souza, 2019). According to Varella (2021), the municipality is the largest producer of this group of young plants in the state of Minas Gerais and the second largest producer in the country. Currently, more

than 300 species of seedlings of fruit, ornamental and forest plants are produced. The city has more than 330 nurseries registered with the Ministry of Agriculture and of these 105 registered with. Furthermore, it has a large number of nurseries and species varieties, which are produced and sold on site and in other regions through street vendors.

Located in the Zona da Mata Mineira, the municipality has a population of 6,527 inhabitants. Since its emergence as a village in 1928, the population has

\*Corresponding author: [michele.reis@ufla.br](mailto:michele.reis@ufla.br)

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been dedicated to the young plants production sector, the main local economic activity (PMDE, 2021). Despite the clear importance of the sector for the local economy and its contribution to the country, there is no detailed information on production and commercialization from the municipality of Dona Euzébia.

In addition, at the end of 2019, a new viral disease, the coronavirus (COVID-19), rapidly spread worldwide (Velavan and Meyer, 2020). Recognized as a pandemic by the World Health Organization (WHO), its spread led to the adoption of drastic restrictive measures such as social isolation (Dias et al., 2020). Its occurrence impacted the social and economic structures of several countries (Schuchmann et al., 2020).

The economic damage hit different sectors, including Floriculture and Ornamental Plants. During the period when the main means of commercialization, such as flower shops and garden center, were closed, sales were reduced, which resulted in worrying losses for national retailers and producers (Anacleto et al., 2021).

This impact was intense during the first moments but, with market strategies, the Floriculture sector reached the resumption of commercialization. In May 2020, flower shops and garden center in Brazil were authorized to reopen after recommendation by the Ministry of Agriculture, Livestock and Supply. In this context, it can

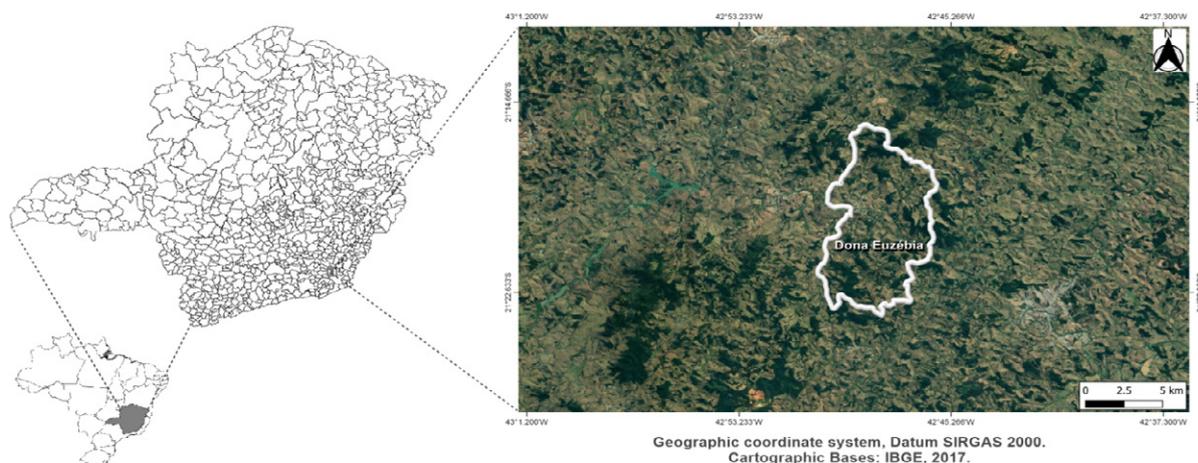
be estimated that the average closing of flower shops and garden center was 20 days, varying in different regions of Brazil. Campaigns to encourage the consumption of flowers, dissemination of information related to the sector and the enhancement of activities such as delivery allowed to circumvent the damage caused by the pandemic (Reis et al., 2020b; CEAFLOR, 2021).

Furthermore, with remote work and social isolation, people spent more time indoors, and thus began to worry about making the environment more pleasant. Seeking this transformation, plants were incorporated into the decoration, contact with vegetation became more valued, and the increased demand for plants resulted in an increase in their sales (Reis et al., 2020a).

Thus, the objective of this study was, through a questionnaire with objective and discursive questions, to know the profile of production and commercialization of ornamental plants in the city of Dona Euzébia and to describe the impact of the pandemic on the market.

## Material and Methods

The municipality of Dona Euzébia is located in the state of Minas Gerais in Region II of the Zona da Mata Mineira (Figure 1), at coordinates 21° 18' 59" S and 42° 48' 38" W (Sousa e Souza, 2019).



**Figure 1.** Location of Dona Euzébia.

The city has an area of 70,231 km<sup>2</sup>, with 6,527 inhabitants, and the GDP per capita is R\$ 10,152.58 (PMDE, 2021).

Initially, a data survey was carried out with the Department of Culture and Tourism and with EMATER, both present in the municipality. These data were collected in order to obtain current information about the establishment and social and economic development of the city. A total of 30 producers were interviewed.

The questionnaire was designed with simple language to avoid any doubts about interpretation. The objective was

to obtain information on production, services and the way they are sold, with a view to analysing the impact of the pandemic on the local trade in plants.

The questionnaire was applied in person (following biosafety protocols) and also online, through a specific link that directed the respondent to a form on the Google platform (Google Forms), consisting of 20 questions ranging from objective to discursive (Table 1). The questionnaire was available throughout January 2021. The access link was available through email and social network.

**Table 1.** Questionnaire - Seedling commercialization in the municipality of Dona Euzébia during the pandemic.

Questions	Answer options
1. Property/Company name	Free answer
2. Cultivation area/commerce area	Free answer
3. Time of activity in the company	Free answer
4. Number of employees	Free answer
5. Main cultivated species	Ornamental Fruit Trees Ornamental and fruit Ornamental and trees Fruit and trees Ornamental, fruit and trees
6. Does your company sell other products? Which ones?	Free answer
7. Does the company provide services for the implementation of gardens, orchards, etc.?	Yes No
8. How is commercialization done?	Physical store Online store Street commerce Distributors All options above
9. For online sales, which digital platform do you use for marketing?	Specialized website Instagram Facebook WhatsApp All options above I don't sell online Other: _____
10. Did you close your business at some point during the pandemic? If so, how long?	Free answer
11. How many employees did you have before the pandemic? And now?	Free answer
12. What were the main changes adopted for the pandemic period?	Free answer
13. Have your sales changed during the pandemic period?	Not changed Increased Decreased
14. If they increased, on a scale of 0 to 10, how would you rate that increase?	Free answer (0 being "a little" and 10 being "a lot")
15. If they decreased, on a scale of 0 to 10, how would you rate that decrease?	Free answer (0 being "a little" and 10 being "a lot")
16. Have your sales changed during the pandemic period?	Physical store
	Increased   Decreased   Not changed   I do not sell
	Online store
	Increased   Decreased   Not changed   I do not sell
17. Was there any variation in the selling prices of your products?	Yes, the price increased Yes, the price decreased There was no variation
18. What were the most sought species during this period?	Free answer
19. During this period, have there been changes in the regions where your products are sold? What are the main regions where your products are marketed?	Free answer
20. In your opinion as a producer/seller, what will the seedling trade in Dona Euzébia be like after the pandemic?	Free answer

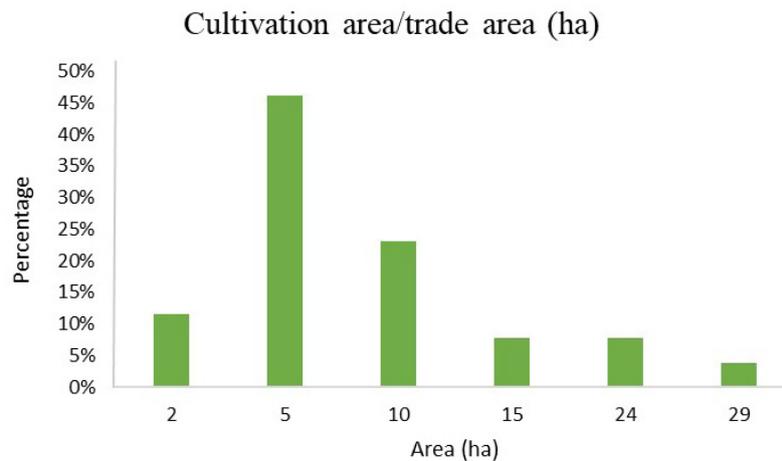
The target audience was the production and sales managers and/or the owners of active companies in the municipality: production nurseries, warehouse farms and commercial stores. For unbiased results and self-preservation, respondents were not identified.

The collected data were compiled and analysed using the Excel spreadsheet application. To explore the opinion of producers about the market, the text analysis tool TagCrowd was used, which indicates the frequency of terms originating a cloud of words (TagCrowd, 2021). The results were presented through graphics or images, and interpreted.

## Results and Discussion

### Trade and production profile

Of the 30 producers interviewed, most were small producers (58%) with up to 5 ha (Figure 2). Similarly, data from characterizing ornamental plants producers, indicate that most properties have between 3 and 5 ha of production (Shiroto et al., 2016; Vidal et al., 2021). However, it is observed that there is a tendency for producers to have larger properties, perhaps due to the type of product - seedlings for gardens, which demand larger areas. It is observed that 23% have properties with 10 ha and a total of 43% have areas with 10 ha or more.

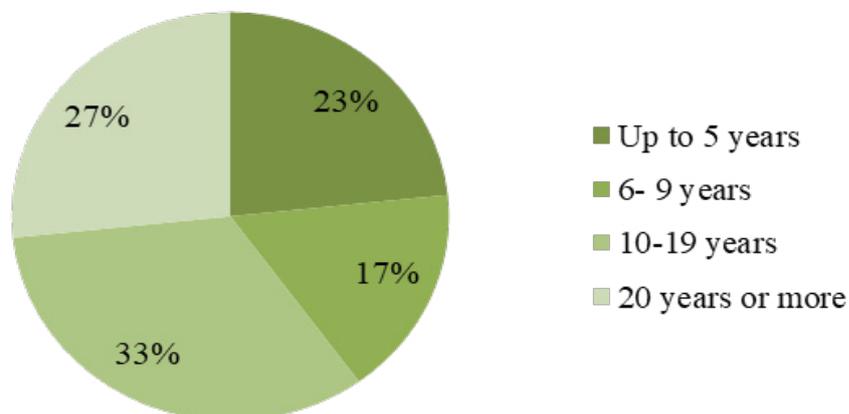


**Figure 2.** Cultivation area/trade area (ha) of the companies analyzed in Dona Euzébia-MG.

This fact can be explained by the low spatial demand of the produced species. This becomes one of the primordial points in the production of fruit and ornamental young plants, the producer achieves great financial return in a reduced production space (Junqueira and Peetz, 2018). Furthermore, this variation in the size of companies between small and large producers is common in the flower

and ornamental plant production sector in Brazil (Reis et al., 2020a).

Among the producers interviewed, 50% have been active for more than 10 years, 33% active between 10 and 19 years and 27% active for more than 20 years. It is worth mentioning that new producers have also started their activities in the region in the last 5 years (23%). (Figure 3).



**Figure 3.** Time of activity (in years) of the companies analysed in Dona Euzébia-MG.

This diversity in the time of activity reported by companies in the questionnaire demonstrates the importance of the sector. With the national development of flower production, new producers emerge (Reis et al., 2020a), which reinforces the diversity of activity time reported by companies in the questionnaire.

The profile of the responses indicates that most properties with a large territorial extension are those that have been in activity for the longest time, that is, the largest lands are concentrated in the hands of the oldest producers. According to the municipal history, seedling production has been set in the city for over 50 years (Leite and Rodrigues, 2006).

As for the number of employees, 48% of companies have 2 to 5 employees, followed by 13% having 6 to

10 employees, 16% with 11 to 19, 10% with a number between 20 to 39 and 13% above 40 employees (Figure 4).

The survey revealed a total of 323 employees among the 30 producers interviewed, demonstrating the relevance of creating direct jobs with the production of young plants in Dona Euzébia. In this context, seedling production plays an extremely important role in local development, being the basis of the municipal economy (Leite and Rodrigues, 2006).

Assessing the species produced, 57% of respondents produce both ornamental and fruit plants and trees, followed by 23% who produce ornamental and fruit plants (Figure 5).

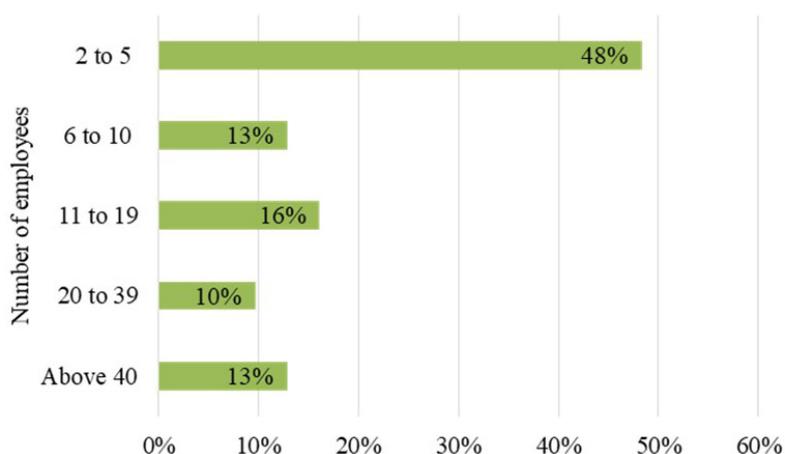


Figure 4. Number of employees of the companies analyzed in Dona Euzébia-MG. Source: the authors (2021).

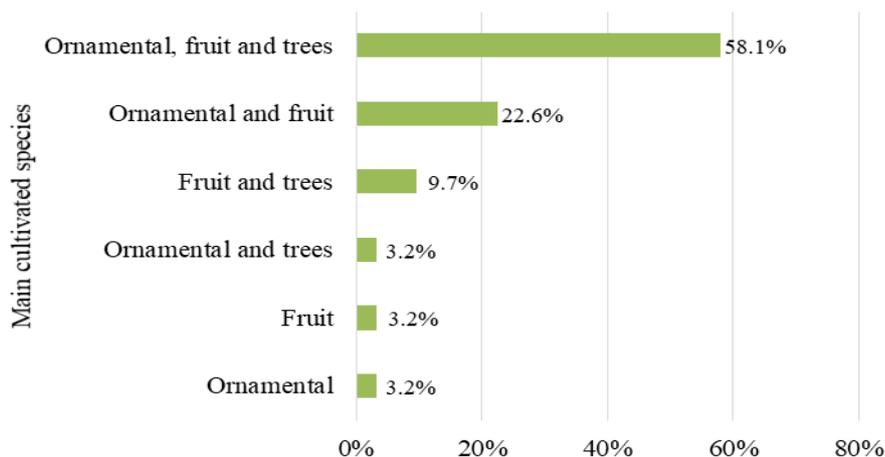


Figure 5. Main groups of species cultivated by the companies analyzed in Dona Euzébia-MG. Source: the authors (2021).

Most producers in Dona Euzébia produce the three categories of species simultaneously: ornamental, fruit and trees. Among them, 83% also sell other products such as substrates, vases, decorative stones and other items related

to gardening. The others, on the other hand, have not chosen to do another type of marketing.

Most companies sell other types of products related to gardening; from this fact, it is possible to assume that

the commercialization of other products is related to gardening services such as the implementation of gardens. However, when asked if the company provided services for the implementation of gardens, orchards, etc., 73% of producers answered that they do not provide this type of service, while only 27% confirmed the provision.

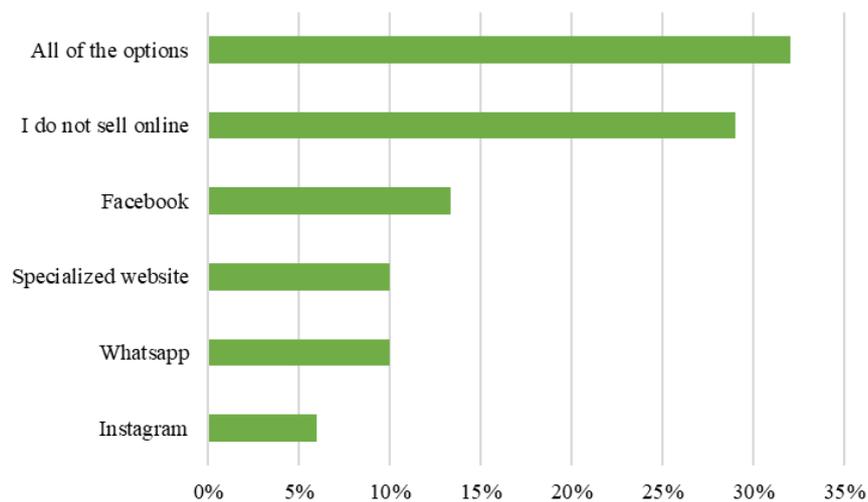
During the interview, some producers claimed that they did not provide gardening services since they required a large amount of labor. According to the president of the association of producers, “(...) the city developed this culture due to the great increase in the provision of landscaping services”, that is, there is indeed the provision of this type of service, but it is outsourced.

The activities of the companies interviewed are concentrated on seedling production and sales, as well as on large-scale sales to distributors. The commercialization of these producers is quite diversified,

with the majority combining physical stores, online platforms, street commerce and distributors (73%); only 27% of retailers use only physical stores.

In general, companies bet on the use of more than one marketing strategy, and e-commerce is one of the alternatives that stood out during the pandemic (Anacleto et al., 2021). Physical stores are a segment in sales with great significance in the market for flowers and plants, and there is a national growth in this marketing medium (Smorigo and Jank, 2019).

The use of different forms of commercialization allows for greater distribution of products and sales dynamics, directly influencing sales. For online sales, 13% of respondents used Facebook as a sales outlet, 10% preferred specialized websites, 10% used WhatsApp and 6% Instagram. Another 32% used all these platforms described, while a total of 29% did not make any type of online sale (Figure 6).



**Figure 6.** Digital platforms used for online sales in the companies analysed in Dona Euzébia- MG.

The market flow is entirely influenced by the consumer's profile; therefore, it is extremely important that producers be always aware of strategies that facilitate the purchase. The habit of consuming flowers through the online system is still not as expressive in Brazilian regions, but it is a market tending to progress and should be further explored (Reis et al., 2020a). Online marketing in the city was initially due to the closing of flower shops and other flower market center; this alternative emerged as a way to facilitate sales, as happens with food products. This form of commercialization was successful as people sought to keep their house a more pleasant environment with the presence of plants and flowers. This trend grew over the months during the pandemic.

### Impacts of the pandemic

Despite the inconvenience caused by the pandemic, most agricultural businesses in Dona Euzébia were not brought to a standstill. Among them, only 13% closed and

discontinued their activities, the other 87% remained active during the pandemic.

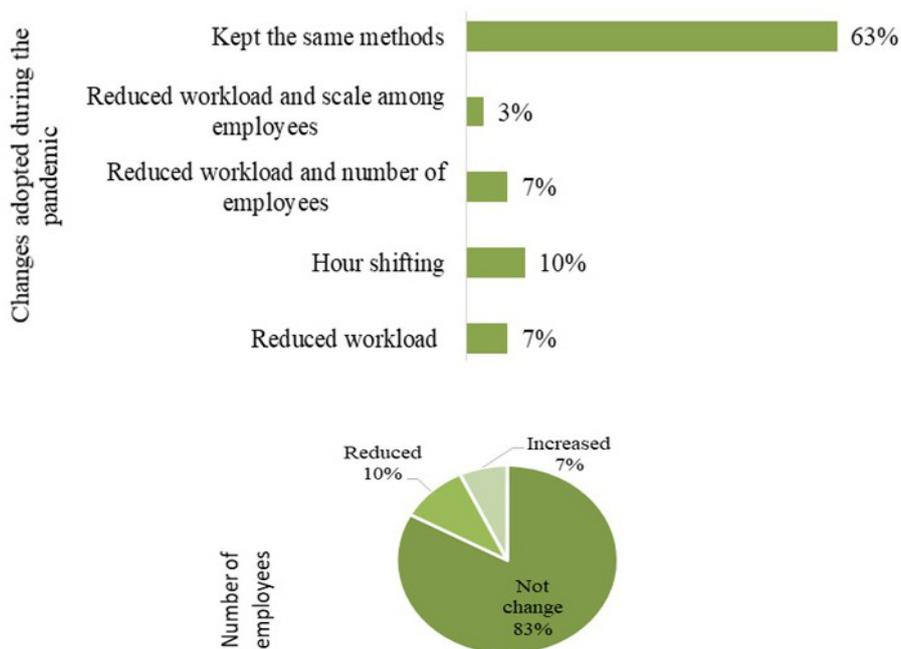
However, the closing period among respondents who stated this fact was 15 to 30 days, that is, they closed only in the first month for fear of the events. As it was a very short period of time, it did not significantly affect their business.

During the pandemic caused by COVID-19, the government of Minas Gerais created the “Minas Consciente” plan, with the objective of assisting in the recovery of the economy in the State cities. According to this plan, municipalities with less than 30,000 inhabitants, such as Dona Euzébia, adopted the “yellow range” (opening of non-essential services following safety protocols); the adoption of this “range” possibly helped producers and traders not to close their businesses at a time when the trade in flowers and ornamental plants was restricted from functioning due to inspection (MG.GOV, 2020).

Among the 30 companies, 83% did not change the number of employees during the pandemic period, 10%

had this number reduced and 7% increased the number of employees (Figure 7B). Most producers had a stability in the number of employees. This information is associated with the number of sales (Figure 9), which remained intact and in some cases increased; thus, it would not be justified to lay off employees. The scenario for the cut flowers sector showed another situation: many companies laid off employees while production was compromised.

Due to the situation of the pandemic, all producers adopted the restrictive measures imposed by the World Health Organization (WHO), such as the use of masks, asepsis and social distance. The main changes listed by the producers through the responses were related to complementary changes such as reduction in workload, hour shifting, scale among employees and reduction in employees (Figure 7).



**Figure 7.** Main complementary changes adopted by the producers of Dona Euzébia- MG during the pandemic.

As for the adopted changes, a relation can be made to the data referring to the cultivation area and the number of employees. It is observed that most producers have a relatively large cultivation area when compared to the number of employees, and this would imply that the activities carried out by the employees were conducted with considerable distance, in addition to the fact that the activities are carried out in open areas. These facts explain the permanence of the same habits of most producers.

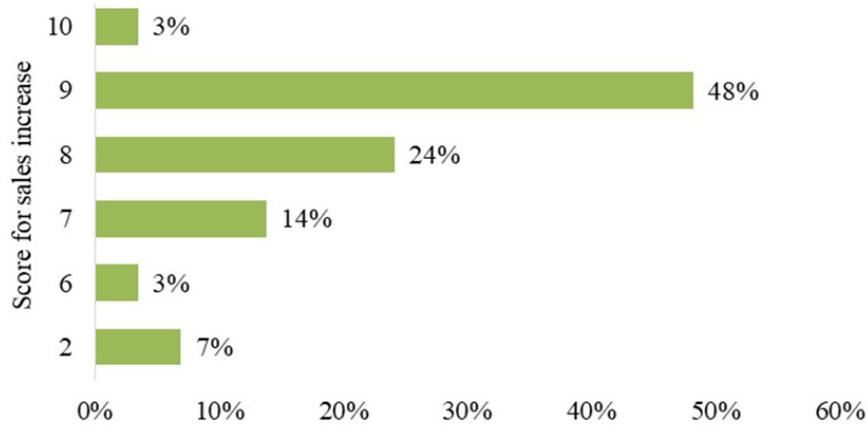
For sales, the crisis started by the pandemic did not reach the municipality. There was an increase in sales in 94% of the properties surveyed. The remaining 6% of

producers said that there was no change in sales and no salesperson responded that sales decreased.

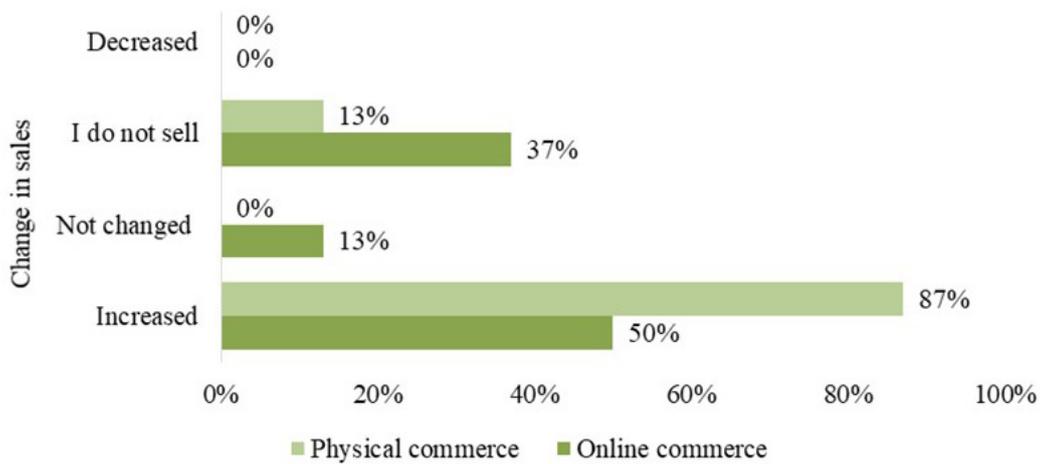
Among the producers that responded positively to an increase in sales in the pandemic, 72% rated 8 and 9 (Figure 8).

The scores given by the producers to the increase in sales confirm that the municipality of Dona Euzébia maintained its activities in the ornamental plant market during the pandemic and that this increase was relatively large.

Among the types of sales, those that grew the most were for physical commerce, corresponding to 87% of companies and, for online sales, the increase was reported by 50% of companies (Figure 9).



**Figure 8.** Scores referring to the increase in sales during the pandemic in Dona Euzebia- MG.



**Figure 9.** Sales regarding physical and online commerce in Dona Euzebia- MG.

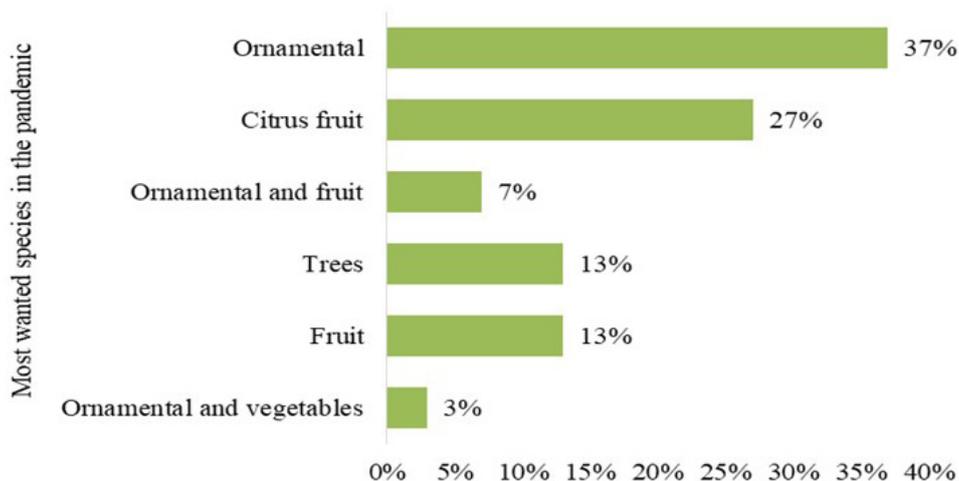
These numbers are correlated with the increase in demand for plants during the pandemic. The increase in online commerce is related to the increased use of online platforms as a form of marketing (Anacleto et al., 2021).

For product price variation, 87% of salespeople reported that prices increased and, according to 13%, there was no price variation.

The increase in prices reported by producers is associated with the increase in demand for plants in the market; this fact is explained by the law of supply and demand, which relates

prices to the increase in demand by consumers and market offer for a given product (Sant and Xavier, 2019). Another argument is related to the initial losses caused to the sector, making the products even more valued, besides the difficulty in finding the necessary inputs for young plants production.

Among the commercialized species, ornamental plants were the most sought during this period with 37%, fruit and citrus with 27%, native with 13%, only fruit with 13%, ornamental and fruit with 7% and 3% ornamentals and vegetables (Figure 10).



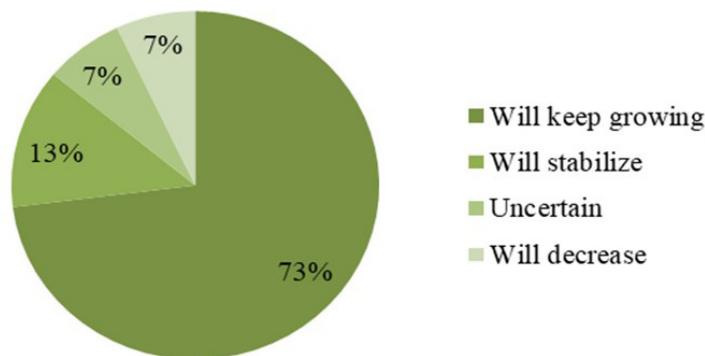
**Figure 10.** Most wanted species during the pandemic in Dona Euzébia- MG.

Most of the sales recorded for ornamental plants would be possibly associated with the search for “easy” plants, which occupy a smaller space and could compose the internal environment of the houses. This is due to the fact that people started to stay more and more within them, both as a function of remote work and social isolation (Mendes et al., 2020).

Plants play an important role in maintaining the interaction of people with nature, in addition to composing environments by altering them aesthetically (Reis et al., 2020a). There was no change in the commercialization and distribution regions of salespeople. Only 3% of producers reported the introduction of new regions: São Paulo and Piauí.

The national sale of flowers and ornamental plants is largely concentrated in the Southeast region (Junqueira and Peetz, 2018). Most salespeople reported that their sales were also more concentrated in this region. In addition, other reported trading regions were: Paraná, Mato Grosso, Maranhão, Piauí, Pará and Tocantins.

Producers were also asked about the scenario for the post-pandemic plant market. Most were optimistic; 73% believe that young plants commercialization will continue to grow, 13% of producers said that commercialization will stabilize, 7% said it was an uncertain situation and 7% believed commercialization would decrease (Figure 11).



**Figure 11.** Producers opinion on how the post pandemic seedling commerce will be in Dona Euzébia- MG.

When analyzing the terms used by producers, it is clear that this optimism encompasses most responses. The words “continue” (19) and “growing” (18), which are actually linked, were the most representative. The

number of terms representing pessimism towards trade was small: words like “decreasing” and “uncertain” were used only twice and three times by respondents (Figure 12).



Figure 12. Keyword frequency diagram via TagCrowd (2021).

The answers showed that most producers believe in the increase in young plants commercialization in Dona Euzébia. A possible correlation for producers to believe in this increase is the growth in sales of flowers and ornamental plants nationwide.

This increase has been followed in recent months and is seen with optimism by the president of the Brazilian Institute of Floriculture (IBRAFLOR), Kees Schoenmaker, especially on commemorative dates, representing a high revenue for the sector across the country. For these dates, the predicted increase is mainly in ornamental plants which, since the beginning of the pandemic, were the group of plants that showed the greatest commercial growth (IBRAFLOR, 2021).

## Conclusions

Seedling production in the municipality of Dona Euzébia is of great economic and social importance, as it creates income and employment. A large quantity and diversity of young plants are produced in the city. As for the profile of the producers, most of them have properties with 5 hectares, are in activity for a range of 10 to 19 years and have between 2 to 5 employees.

The market for young plants and ornamental plants in the municipality of Dona Euzébia was modified by the COVID-19 pandemic, and producers reported an increase in plant sales, resulting in changes in production and in the sales process.

During the pandemic, most producers kept their businesses open, adopting all measures to prevent the spread of the virus. Ornamental plants are among the main species cultivated and among the most sought during the pandemic period.

The Southeast region is the one with the greatest distribution of young plants produced in Dona Euzébia. Most producers believe in a continuous growth in the young plants market from Dona Euzébia and are optimistic for the post-pandemic moment.

## Author Contribution

**MCS:** survey design, questionnaires application statistical analyses, and manuscript writing; **MRO:** questionnaires application, statistical analyses, and manuscript writing **MCN:** questionnaires application, statistical analyses, and manuscript writing; **PDOP:** interpretation of the results, manuscript writing, and review; **MVR:** idea, project and survey design, questionnaire application, interpretation of the results, manuscript writing, and review.

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