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RESEARCH ARTICLE

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COSTS IN THE PRODUCTION OF ORNAMENTAL PLANTS: AN ANALYSIS OF PROFITABILITY, RETURN AND RISK IN THE BEST MIX COMPOSITION

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ABSTRACT

The article presents the costs of producing ornamental plants, comprising a study of the use of a property through the analysis of profitability, risk and return of the mix. Firstly, the historical overview of ornamental plants is made and the market, production is analyzed, and also the types of plants and the influence of the climate on cultivation are shown.It is an applied research, because it relates knowledge together with a problem in order to solve it and, at first, an exploration of documentary sources is made, being carried out in a small property located between Santa Catarina and Paraná, where the data were collected references for the development of research. Tools are used to support the research, which are the Multi-Index methodology and the Monte Carlo and Crystal Ball simulation. To generate the answer to the profitability of ornamental plants, several cost tables were developed culminating in a cash flow to determine the profitability of each type of plant developed in this article, which analyzed 8 types of ornamental plants. And in the end, from the profitability analysis it can be concluded that the biggest revenue was given in the types of plants in which cultivation takes place in 24 months: yucca rostrata, boxwood, formio, dasilirio and podocarpo and the real profit starts in the 3rd year of cultivation..

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INTRODUCTION

The article aims to understand and analyze profitability in the best mix composition in the production of ornamental plants. The purpose of studying the production of ornamental plants is to seek to answer which types of plants are most profitable for the producer, thus generating greater certainty of investment. First, an overview of floriculture was developed and where the panorama of ornamental plants fits. Subsequently, a reflection on the market for ornamental plants and how they are inserted in the global, national and regional market was developed. A demonstration was also developed of how the productive process of ornamental plants takes place and the influence of climatic factors on production. It was also sought to show the types of ornamental plants researched throughout the article, counting with 8 types of ornamental plants and with three periods of productivity, a group of plants has a production at the end of 12 months, another group at the end of 18 months and a production at the end of 24 months. The analysis of the production of ornamental plants was carried out on a property of 1 hectare, firstly the initial costs for the development of the production were analyzed. Subsequently, the cost of materials and utensils, the cost of seedlings, production maintenance and also the revenue that is produced from the various types of ornamental plants were made. And finally, a cash flow was made to see the profitability of the plants' production. The article also sought to use the Multi-Index methodology to support the decision-making process in the acceptance and rejection of the investment process. In addition to having Monte Carlo and Crystal Ball simulation, which are precision tools where forecasts and risk analysis are performed, reducing doubts to make the best decisions about production. From the whole process of analyzing the feasibility of producing ornamental plants, the article developed possibilities for the producer to make the best decisions about profitability and cost in this mix of ornamental plants.

Rationale

The aspects of this section are developed from an overview of floriculture and also puts the scope of ornamental plants in the market. Also noteworthy in this section is the production of ornamental plants and the climate that best adapts to them. Another highlighted point is the type of ornamental plants and, finally, to support the study, the Multi-Index methodology and the simulation of Monte Carlo and Crystal Ball are used.

History of the Garden – Floriculture Overview: Throughout humanity, ornamental plants have always been linked to a beautiful garden. In the history of human beings, the design of a garden has always been very present, human beings in their quest to express their desires and desires often do so through the art world. Artists seek to represent the beauty of human beings and nature. It is in this aspect that gardens appear, which seek to express the beauty that exists in the world. The etymology of the word garden is defined as a closed place destined for delight. Which in a way is the idealization of perfection in the private sphere. In history, the mention of the garden is very old and is present in the writings of the Bible "Now the Lord God had planted from the beginning a garden in Eden, on the east side, in which he placed the man he had formed" (BIBLE , 2010). From the development of civilization, man evolved from his way of life to the way to express his desires and desires. The Gardens of Ancient Egypt (2000 BC) are very ancient accounts of the cultivation of spaces where animals and plants were raised. Another example is the Persian gardens, the Taj Mahal is a garden designed in a Persian style, in the west there are the gardens of Greece that fled from symmetrical lines and approached natural forms, whereas the Roman gardens were a mixture of creativity from the Romans to Greek art, resulting in a large number of statues that were incorporated into the gardens. The Roman gardens were methodical and organized, had walls covered with vines and walls painted with landscapes (deceives the eye, in French). Topiary art emerged in Roman gardens, in this art the Romans used cypresses, boxwoods and dwarf parrots. In the Middle Ages, there were three types of garden: garden of pleasures, utilitarian gardens and the garden of medicinal plants. The first for delight and the other two had a utilitarian character, but all were cultivated indoors, flat and protected by walls covered with vines. The use of regional flora in the decoration of buildings in the Middle Ages stimulated the development of Botany. (OLIVEIRA, COELHO, 2014) The use of regional flora in the decoration of buildings in the Middle Ages stimulated the development of Botany. (OLIVEIRA, COELHO, 2014) The use of regional flora in the decoration of buildings in the Middle Ages stimulated the development of Botany. (OLIVEIRA, COELHO, 2014)

Ornamental Plants Market: From the desire to express beauty, human beings use plants and flowers to be able to enjoy the beauty of nature, which is why man creates his gardens. It is in this search that the plant trade emerges, floriculture emerges and ornamental plants are inserted in the scope of floriculture. Floriculture is understood as a set of commercial activities related to the market of plant species cultivated for ornamental purposes, that is, to beautify, make the environment pleasant. The world trade in flowers and ornamental plants is centered on the European Union, USA and Japan, and Colombia, Ecuador and Costa Rica in Latin America and China in Asia are also highlighted. (BUAINAIN and BATALHA, 2007). Initiated in Brazil by the initiative of Dutch and Japanese immigrants in the state of São Paulo; Germans and Poles in the states of Santa Catarina and Rio Grande do Sul. (SEBRAE, 2015). The main market for agrofloriculture is domestic. The activity of ornamental plants and flowers in Brazil is growing. The production is carried out in the open air or in greenhouses (BUAINAIN and BATALHA, 2007). ANDn 2018, the Brazilian market for flowers and ornamental plants registered an evolution of 10%, moving R$8.1 billion. (GUEDES and PADULA, 2019). The sector consists of small properties, the Brazilian production of flowers and ornamental plants is centered in the state of São Paulo, which holds 74.5% of this production, but is registered throughout the country, with crops in several Brazilian states. (BUAINAIN and BATALHA, 2007). The market in the production chain is mainly for landscaping and gardening and, in second place, cut flowers and foliage. The increase in landscaping and gardening is driven by the dynamism of the national civil construction industry, which has been adding increasing importance to green areas and landscape projects, considered not only as differentials for the enhancement of buildings, but as truly essential to the quality of urban life today and the contemporary consumer culture. (SEBRAE, 2015). The climate allows the state of Santa Catarina to have a varied and quality production. In Santa Catarina, most sales by producers are made directly on the property. Its biggest customers are wholesalers from Santa Catarina and other states that pass through the properties, buying the plants to later resell to medium and small retailers. (SILVA, LOUREIRO, GALDINO, 2020). Flowers and ornamental plants, within the scope of the Brazilian market, present growth prospects and, as a consequence, an attribute for the main segments of the production chain, that is, production, dissemination and commercialization. Attracting new entrepreneurs, as well as Civil Engineering, as a strong ally to commercialization, since the search for green environments is essential for a construction in the middle of a 'stone jungle', that is, large cities where the population needs a green area. In Brazil, the flower and ornamental plant market has two sales lines: added value and mass consumption; it is destined for gardens centers, supermarkets; the one intended for florists. The heart of Santa Catarina's floriculture is based on the arrival of immigrants and the production of fruit trees. Due to these characteristics, the profile of floriculture in the state is more focused on the production of ornamental plants and not so much on the production of flowers. The activity started around the 1950s, with the arrival of German and Italian immigrants, when four outbreaks emerged; the region of Biguaçu, the mountainous region between São Bento do Sul and Joinville, the region of Corupá and the region of Alto Vale do Itajaí, in the cities of Rio do Oeste and Laurentino (CASTÃN, 2002).

Production of Ornamental Plants: The cultivation of ornamental plants initially depends on the purchase of seedlings, as is the case with most of the plants studied in this article, however there is the manual production of boxwood, moray eel, formium and dionella, that is, there is only an expense with the hand. work, as the seedlings can be made from branches already planted. Then, it is necessary to prepare the land for planting, which can be on flat or even steep land, and a back sprayer can be used and to harrow the land there is also the possibility of tools such as a hoe, cutter, shovel, and when the terrain is flat, the help of the tractor is possible, which speeds up and facilitates the work. The costs are mostly labor, agrochemicals and other objects necessary for the sale of ornamental plants. It is important to emphasize the need to have a shady environment to store plants that can be sold within twenty-four hours, called shade, that is, an environment covered by a screen that protects from the sun's rays and heat, in addition to reducing the friction of the rain. The steps that make up the planting of ornamental species are detailed below:

Soil preparation: Initially, the use of a tractor with a harrow is necessary to move (turn) the earth, making it lighter and easier to handle. The correction of the soil is done soon after, relying on fertilization, which balances the pH of the soil. Seedling production: Boxwood, moray eel, formium and dionella seedlings are made from the removal of branches/clumps already planted on the property and the others are purchased. Planting: The planting of species is easy, as it only needs holes of approximately 10 to 15 centimeters deep, with approximate spacing of 30 to 60 centimeters according to the species, as it depends on its amplitude for growth.

Cultivation: The planting of ornamental plants is facilitated by easy maintenance, depending on the plant, pruning is not necessary, unlike boxwood, which needs more or less seven pruning until its commercialization. This can decrease according to the customer's taste, smaller boxwoods, less pruning, larger boxwoods need more work. Irrigation can often be just rain, when it comes to wetter land, however irrigation can also be done manually. Spraying is required for crop cleaning and is needed twice a year.

Harvest: The harvest is relative according to the client's need, however the average of ornamental plants is 12 months to 24 months to be at the harvest point. Once removed from the earth with the help of a shovel and hoe, the plant goes to the shed, which is put in a pot with more soil and then remains in the shade until the arrival of transport comes and takes it to flower shops.

Climate and Temperature Required: The climate for the cultivation of ornamental plants is according to each species, which can be equatorial, semi-arid, subtropical, tropical, Mediterranean, continental, oceanic and temperate. Depending on the climate, the plants look for adequate luminosity, since the presence of the sun is of great importance for the formation of plants, there is also a need, depending on the species, for half shade.

Types of Ornamental Plants: In this article, several types of ornamental plants are analyzed, and the type of plant, scientific name, popular name, size and cycle are specified in the table below.

Mmulti-Index Ethodology

The Multi-Index Methodology aims to support the decision-making process in the acceptance and rejection of investment projects through the use of several indicators, the use of which provides more consolidated information. According to the authors Souza and Clemente (2008, p.125), the structure of the Multi-Index methodology consists of:

- Do not incorporate the risk premium as a spread over the TMA;
- Expressing the project's profitability through the ROIA as an additional return beyond what would be earned by investing the capital in low-risk securities;
- Use environmental analysis to deepen the assessment of the risks involved;
- Confront the expected gains with the perception of risks of each project.

Although the structure of the methodology has been described, the incorporation of risk analysis stands out. Management risk is intended to assess the level of competence of the management group to successfully carry out the project. The business risk associated with conjunctural and non-controllable factors is intended to qualify, even subjectively, the classic PEST, 5 Forces and SWOT analyses. In risk analysis simulation, “one type of simulation in a spreadsheet is the Monte Carlo simulation, which generates random values for uncertain variables, repeatedly, to thus simulate a model” (CHARNES, 2007, p. 6). The Monte Carlo simulator is used to stimulate and simulate problems that may occur in the project, based on a real system and with the aid of a computational tool, so it is possible to obtain solutions to problems that may occur, which with only simple calculations mathematics would not be fully resolved. The model consists of the representation by a range of possible values or “[...] by a probability density function where the values are not considered as simple values; the distributions are classified as normal, uniform, logarithmic and triangular” (PAIXÃO; BRUNI; MARBACK, 2004, p. 8).

On the other hand, simulation using the Crystal Ball simulator provides greater security and convenience, the data used in it must be credible. As with Monte Carlo Simulation, Crystal Ball is a tool with greater precision, where supposed forecasts and risk analysis are performed, reducing doubts in decision-making. Through the process carried out based on the application of the Crystal Ball method, there is more security, because in this procedure, the projection, the probability of achieving the profitability of an enterprise, identify which variables that most affect a forecast, as well as , help maintain competitive advantage, unlike other risk analysis simulation and forecasting programs.

METHODOLOGICAL PROCEDURES

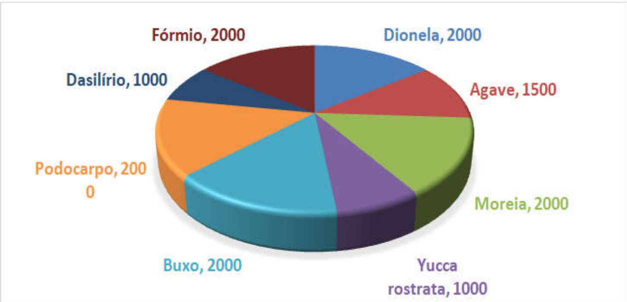
The trade of ornamental plants is growing and is a great opportunity for producers, because landscaping and gardening is a trend nowadays, as the use of decorated spaces or even spaces that refer to nature and the tranquility it provides is on the rise. And for that, the production of the most diverse types of ornamental plants is an attraction for people who want their beautiful garden or a natural space to relax. This work makes a cost analysis of the mix of production of ornamental plants. And it aims to understand whether the production of various species of ornamental plants is viable. For this, a research is carried out on the cost of producing ornamental plants: agave, yucca rostrata, boxwood, moray eel, dasilirium, formium, dionella, podorcarp and from this analysis it is verified whether the production of all these species of ornamental plants is viable or not. As Gil (2008) treats, research is defined as applied, as it relates knowledge to a problem in order to solve it.

This is a documentary research: It is only necessary to consider that the first step consists in exploring the documental sources, which are in great number. There are, on the one hand, first-hand documents, which have not received any analytical treatment, such as: official documents, newspaper reports, letters, contracts, diaries, films, photographs, recordings, etc. On the other hand, there are second-hand documents, which in some way have already been analyzed, such as: research reports, company reports, statistical tables, etc. (GIL., 2008, p. 51). In order to define the objectives of this research, the procedures occur in a descriptive manner, as they expose the costs and the main activities regarding the cultivation of ornamental plants, keeping as a focus and always aiming at the analysis and interpretation of risk levels and return in area farms of 1 (one) Hectare. According to Beuren et al. (2013, p. 81), reports “that in this type of research, statistical techniques are normally used, from the simplest to the most sophisticated”. As for the research procedure, in turn, it is classified as a case study.

Case study research is mainly characterized by the concentrated study of a single case. This study is preferred by researchers who want to deepen their knowledge about a specific case. (BEUREN et al., 2013, p. 84). The research is carried out on the approach to the problem in a quantitative way that “[...] is characterized by the use of statistical instruments, both in the collection and treatment of data” (BEUREN et al., 2013, p. 92) .It is also a survey, “[...] as it raises information that can be useful for more specific future studies or even mapping the reality of a given population or sample of companies in relation to accounting issues” (BEUREN et al. ., 2013, p. 86). The work is based on the data of a farmer in the border region between Santa Catarina and Paraná, through the collection of data on the cultivation of ornamental plants and it targets specific data in specialized references, becoming documentary in nature. The merit of documentary research in studies involving accounting themes, in the sense of verifying past facts that may be useful, not only as a record of memories, but also to help in the present and to glimpse future trends. (BEUREN et al., 2013, p. 90). The temporality in the methodological process has its characteristic classified as being transversal in nature, as the data are considered in a certain period of time. The analyzes based on the collected data refer to 1 (one) Hectare of the cultivation of ornamental plants with productivity quality, cost methods, storage structures, as well as their commercialization in the municipality of Dona Eusébia, in Minas Gerais.

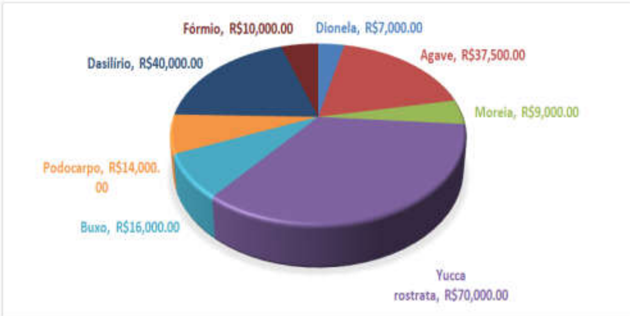
Agricultural Cost of Ornamental Plants - Data Analysis: Data were collected together to the rural producer, located on the border between Santa Catarina and Paraná, through documents presented by her and description of the cultivation process. According to Beuren et. al. (2013, p.136), “it means working with all the material obtained during the investigation process”. The study shows the costs of implementation and costing of 1 (one) Hectare of ornamental plants, considering the period of forty-eight months. The cost approach is understood: seedling costs, initial costs, costs with materials and utensils, cost with soil preparation and maintenance costs. For the purposes of the values listed in the tables below, they were collected based on the local trade specialized in the agricultural sector. As for the time of the tractor, the average value for the region was used. After the data collected, based on the checklist, electronic spreadsheets were used, using the softwareExcel to calculate and calculate indicators. The presentation of the risk and return analysis of the cultivation of ornamental plants, initially the methodology was used multi-index, indicating the main feasibility indicators. Soon after, Monte Carlo simulation was used, through the Crystal Ball software, in which it performed forecasts and risk analysis by probability. In Figure 1, the amount produced on the property is shown in a graph. And in Figure 2, the graph shows the participation in the revenue of each type of ornamental plant studied in the article. The next tables present in their context costs in the agribusiness of ornamental plants: In Table 2, it covers the initial costs such as physical structures, agricultural machinery and implements. Next, Table 3 describes the materials and utensils used during agricultural cultivation, such as: hoe, pots, pruning shears and potting soil. In Table 4, the details are about the costs of each species of seedling, it can be observed that in addition to the purchase of some, there is the possibility of producing from matrices that already exist on the property. Maintenance is carried out monthly, only in terms of labor, as shown in Table 5. Table 6 shows the semi-annual maintenance carried out on the property, including: fertilization, cleaning with agrochemicals, machinery hours. Table 7 shows the description of the products with the quantity produced, the sale value, being broken down that some products are sold from 12 months, 18 months and 24 months and, finally, the total value sold is shown.

group to successfully carry out the enterprise. It is associated with the experiences and knowledge of the production and marketing process that the producer has on the subject, it can be considered as 0.70, which indicates a medium/high risk for the production of ornamental plants. In relation to business risk, it is associated with conjunctural and non-controllable factors and is intended to qualify, even subjectively, the classic PEST, 5 Porter forces and SWOT analyses. It can also be considered as 0.70 where it signals a medium/high risk, compared to a scale from 0 to 1 of the assessment of the 5 forces of Porter. In a risk estimate, the value of 0.70 is considered a maximum production risk, according to the assessment of the perception of competence and ability proposed by Souza and Clemente (2008). NPV (Net Present Value): with respect to the net present value distributed in annual equivalent values for this agribusiness, it is R$8,504.00. ROIA (Additional Return on Investment): ROIA, in an annual analysis is 2.51% which, according to Souza and Clemente (2008), the ROIA of production is being sufficient to offset the risk, as the scale is above 1.



Source: Authors (2021)

Figure 1. Graph of the quantity produced on the propert



Source: Authors (2021)

Figure 2. Revenue Share

Table 1. Identification of plant production

Plant	Changes (bought or made) R$	Numberofseedlings	Sales preparation time (months)	plantedarea m²	Spacingbetween seedlings (cm)	unitsale R$
Agave	2.00	1500	18	600	30	25.00
yuccarostrata	5.00	1000	24	600	40	70.00
boxwood	0.05*	2000	24	600	30	8.00
Podocarp	0.60	2000	24	600	30	7.00
morayeel	0.05*	2000	18	600	30	4.50
Dasilry	3.50	1000	24	600	40	40.00
Formium	0.05*	2000	24	600	30	5.00
Dionel	0.05*	2000	12	600	30	3.50

Source: Authors (2021) *Produced from matrix, branch or tussock.

Table 2. Initial costs

Description	Unit	The amount	New value (BRL/Un)	Total amount (BRL)
Precast shed	m²	400	375.00	150,000.00
Sombrite	m²	50	800.00	40,000
Tractor	H	1	180.00	180.00
Spray		1		13,000.00
TOTAL				203,180.00

Source: Authors (2021)

INTERPRETATION OF RESULTS

To ends for the preparation of calculations aiming at the return and risk indicators, a cash flow was prepared, which can be seen in Table 8. And it was observed in this table that in this first 24-month cycle, the initial investment has not yet been recovered, because adding the investment and costs and subtracting the revenues from them, there is still a deficit in relation to the initial costs. And in the 2nd cycle, 36 and 48 months, the cash flow shows that the investment has already been recovered and that wealth is generated for the owner. In table 9, calculations were made for the purposes of risk and return indices. Table 2 illustrates the perception of management risk and business risk. On management risk, according to Souza and Clemente (2008), it is intended to assess the level of competence of the management

Monte-Carlo Simulation

For predicting variables, NPV (net present value) and ROIA (additional recurring return on investment) were chosen. The number of repetitions to obtain the result was 5,000, after running the simulation it was possible to obtain frequency graphs with the minimum, average and maximum values, among other information. Figure 3 shows that the average for the NPV (Net Present Value) is R$33,573.00, with a minimum value of R$30,658.00 and a maximum value of R$100,831.00.

In Figure 4, it shows that the average for the ROIA (Additional Return on Investment) which on average is 2.48%, with a minimum value of -2.44% and a maximum value of 6.94%.

Table 3. Materials and utensils

Description	Unit	The amount	New Value (BRL/Uni)	Total Value (BRL)
Hoe		1	38.00	38.00
Scissors		1	35.00	35.00
Pan		1	34.00	34.00
Cutter		1	46.00	46.00
Vases		13500	0.85	11,475.00
Earth	m³	6,750	44.00	297.00
TOTAL				11,925.00

Source: Authors (2021)

Table 4. Cost of seedlings

plants	Seedling value (BRL/Un)	Number of seedlings	Total Value (BRL)
Agave	2.00	1500	3,000.00
yucca rostrata	5.00	1000	5,000.00
boxwood	0.05*	2000	100.00
Podocarp	0.60	2000	1,200.00
moray eel	0.05*	2000	100.00
Dasilry	3.50	1000	3,500.00
Formium	0.05*	2000	100.00
Dionella	0.05*	2000	100.00
TOTAL			BRL 13,100.00

Source: Authors (2021) *Seedlings made from property matrices

Table 5. Monthly maintenance cost

Description	Unit	The amount	New Value (BRL/Uni)	Total Value (BRL)
Labor	Days	12	90.00	1,080.00
TOTAL				1,080.00

Source: Authors (2021)

Table 6. Cost of semi-annual maintenance

Description	Unit	The amount	Value (BRL/Un)	Total
Fertilizer	kg	4	110.00	440.00
Agrochemical	L	two	16.50	33.00
Labor	Days	12	90.00	1,080.00
tractor hours	H	1	60.00	60.00
Water	L	150	0.0035	0.53
TOTAL				1,613.53

Source: Authors (2021)

Table 7. Revenue

Description	Quantity produced	Sale (BRL/Uni)	Production time	Total
Agave	1500	25.00	18 months	37,500.00
yucca rostrata	1000	70.00	24 months	70,000
boxwood	2000	8.00	24 months	16,000.00
Podocarp	2000	7.00	24 months	14,000.00
moray eel	2000	4.50	18 months	9,000.00
Dasilry	1000	40.00	24 months	40,000
Formium	2000	5.00	24 months	10,000.00
Dionel	2000	3.50	12 months	7,000.00
TOTAL				203,500.00

Source: Authors (2021)

Table 8. Cash Flow -1st Cycle and 2nd Cycle

Month	Disbursements R$	Recipes R$	Cash flow R$
0	-228,205	0.00	-228,205.00
12	-16,292	7,000.00	-9292.05
24	-45,703	203,500.00	157,796.98
36	-16,292	7,000.00	-9292.05
48	-45,703	203,500.00	157,796.98

Source: Authors (2021)

DISCUSSION

In this article, 8 types of ornamental plants were analyzed (yucca rostrata, boxwood, agave, podocarp, dasilirium, formium, dionella and moray), knowing that there are three periods for the preparation of these plants (12, 18 and 24 months), it was found that The quantity of Dionels produced on the property, with a 12-month production period, is 2000 plants, with a return of R$7,000.00. With the cultivation of agaves, it was found that the production was 1500 plants in 18 months, producing a return of R$37,500.00 at the end of production, however the production of moray eel had a production of 2000 seedlings, generating R$9,000.00 real. The 24-month cycle plants, on the other hand, have a production of 2000 seedlings each

In table 9, calculations were made for the purposes of risk and return indices
Table 1 – Risk and Return Indicators of the Multi-Index Methodology

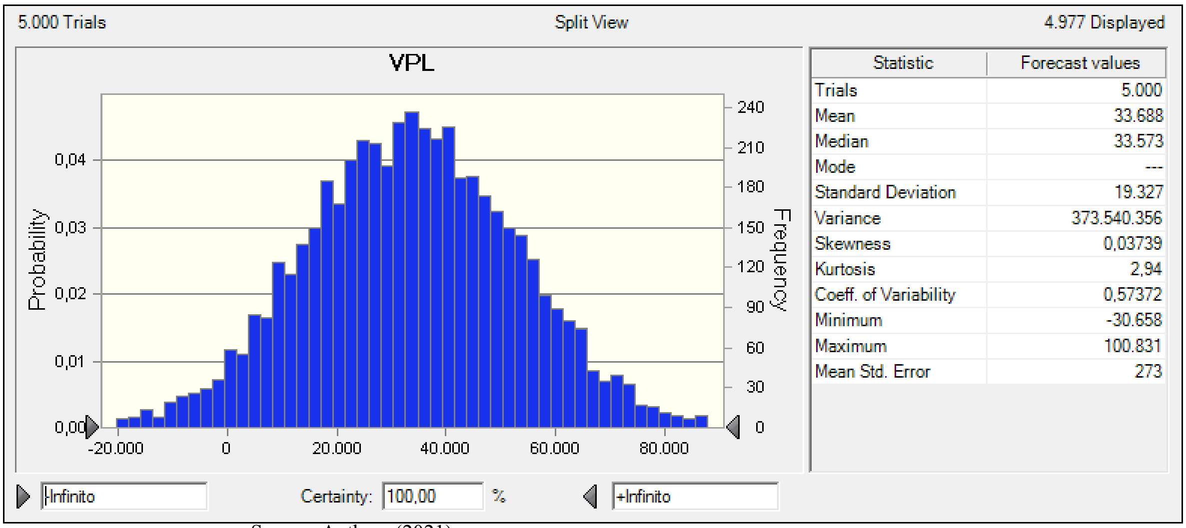
	Present Value of Cash Flow from Investments	R$-326,612.00
	Present Value of Benefits Cash Flow	R4360,628.00
Return	Net present value	BRL 34,017.00
	equivalent NPV ha/year	R$8,504.00
	Benefit/Cost Index	1.10
	annual ROIA	2.51%
	Annual Internal Rate of Return	9.11%
	TMA/TIR Index	43.90%
	Annual Pay Back	14.00
Risk	Pay-Back Index/N	1.00
	Management Risk	0.415
	Business Risk	0.27

Source: Authors (2021)

Table 2. Confrontation of risk and return perceptions for the cultivation of ornamental plants

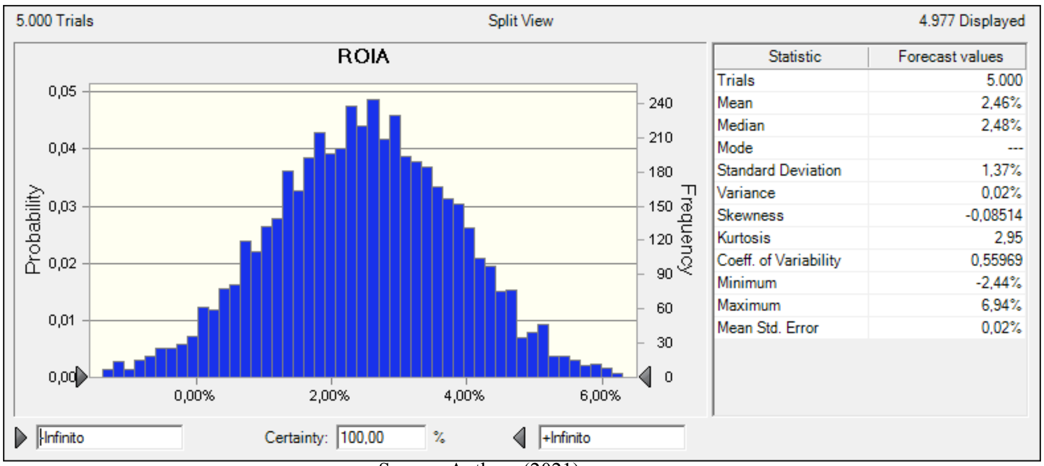
	Low	B/M	Average	BAD	High
Return (ROIA)					
TMA / TIR Index					
Payback Index / N					
Management Risk					
Business Risk					

Source: Authors (2021)



Source: Authors (2021)

Figure 3 - Net Present Value (NPV)



Source: Authors (2021)

Figure 4. Additional Return on Investment - ROIA

type of plant, generating a total return of R$157,796.98 at the end of the cycle. So, from the analysis of this production and profitability, it was found that the initial cost to produce is 228,205.00 reais, including materials, labor, cost of seedlings, land, machine and it is concluded that the revenues with The highest profitability are the plants that have a 24-month cycle, knowing that even the boxwood needing more attention, that is, pruning over the 24 months is the plant that is most commercialized, with the profitability of this plant being R$16,000.00 reals after 24 months. Another important factor in the cultivation of ornamental plants is the ease of production, and some species may be produced from clumps, reducing the purchase cost, such as boxwood, moray eel, formium and dionella. All seedlings are resistant to the typical climate of southern Brazil, they are easy to maintain, which do not need pruning, with the exception of boxwood. In a cultivation of 1 hectare of ornamental plants, it was concluded that the use of outsourcing the agricultural machine (tractor) is more profitable than owning one, due to the high cost of the machine. And with regard to maintenance, it is done monthly at a low cost of R$1,080.00 and every 6 months there is an increase in maintenance with the increase in soil maintenance, totaling R$2,693.53 reais.

CONCLUSION

The article seeks to understand the feasibility of producing different types of ornamental plants and seeks to understand the feasibility of these plants by identifying which are more profitable in the production process. In the analysis carried out in this article, a property of 1 hectare in the interior of Paraná, bordering the state of Santa Catarina, was used from a mix of ornamental plants to understand which types are the best and which are the most viable for production. Based on the cost analysis, it was found that the initial investment for the development of this activity is R$228,205.00 and from the analysis of the cash flow of a total cycle of two years, it was found that at the end of this first cycle, it also recovered the initial investment. Therefore, it appears that the producer will have generated wealth and with it the recovery of investment from the second production cycle, so it is noted that it ends four years after the beginning of the activity. It can be seen from the revenue obtained that the plants with the most profitability are those produced in a total of 24 months, as the cash flow analysis showed that these plants have a higher profitability, generating greater revenue than the 12 and 12 plants. 18 months. So, it is noted that the analysis of plants with the highest profitability are plants produced in 24 months, that is, yucca rostrata, boxwood, podocarp, dasilirium and formium. A point of great relevance is denoted from the analysis of the mix of ornamental plants, whose profitability begins to exist from the 3rd year of plant cultivation and culminating in an even greater profitability in the 4th year.

For producers with small investment and with a property of 1 hectare, the mix of ornamental plants is a great investment alternative, because if the property is smaller than 1 hectare or the investment value is not so large, it is possible to adapt the types plants, thereby reducing the cost of production. It is noteworthy that the profitability starts in real form in the 3rd year, thus envisioning the profit of production.

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