

URBAN GARDENS: CONSERVATION AND ENHANCEMENT OF AGROBIODIVERSITY IN THE MUNICIPALITY OF VARGEM GRANDE, MA



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ABSTRACT

The demand for unprocessed food makes urban spaces a required place for the cultivation and conservation of horticultural plant genetic resources that largely guarantee the valorization of agrobiodiversity, and are associated with a healthier diet. In this perspective, the objective of this study was to survey information on the profile of producers and to characterize the cultivation of vegetables in the backyards of the municipality of Vargem Grande, MA. The methodology used was the application of 40 questionnaires, the approach of the interviewees was made individually and randomly, the questionnaire was structured with objective questions focusing on the socioeconomic aspects of the producers, origin of the seeds, cultivated species, type of substrate, fertilization mode, phytosanitary aspects (weeds, pests and diseases) and harvest. The socioeconomic profile of vegetable producers in the urban perimeter of Vargem Grande, MA is formed mainly by women; aged 30 to 50 years; Married; with a family of more than four people; with an income of more than one, up to two salaries; with complete high school education and as the source of income work without fixed salaries. The most cultivated species are vinegar, chives, coriander, whose seeds are obtained in agricultural stores and planted directly in the soil, using cattle manure. Crops suffer interference from weeds, and harvesting is carried out in the morning and late afternoon, with the main objective of vegetable cultivation being family consumption.

Keywords: Plant genetic resources, Agricultural biodiversity, North Maranhense.

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INTRODUCTION

Population growth and the search for food products of high nutritional value, rapid growth and pleasant flavor, make vegetables an important source of food that deserves attention to be grown in urban spaces (DUARTE et al., 2022; MORETTI, 2003). However, in metropolitan regions, due to the rush of everyday life, there is a decrease in the family's time dedicated to domestic activities and especially to agricultural activities such as growing plants in their backyards (CARVALHO, 2010).

In view of this, the cultivation of vegetables in gardens in urban areas can awaken several motivations such as: a place of spiritual rest; the feeling of rescuing the agricultural culture of people who have lived some relationship with the countryside; the opportunity to obtain savings in the household budget and income generation; and, among others, the desire to democratize the use of urban space and to green the environment of cities and peripheries (MEDEIRO et al., 2021, MELO, 2011).

Valuing urban horticulture would be an option to improve the quality of life of people in urban centers, especially because Brazil has a large part of the population without an adequate diet, and idle urban spaces could have this proposal (VENZKE, 2020a; PESSOA et al., 2006).

Therefore, growing vegetables in domestic backyards ensures the origin and quality of the food consumed, in addition to contributing to the rescue and appreciation of traditional knowledge and conservation of Plant Genetic Resources. In this way, it becomes a responsible attitude that allows maintaining a habit that contributes positively to health and provides an alternative for physical activity and leisure for families and enables the recycling of organic household waste, producing healthy and low-cost food (VENKE, 2020b; CARVALHO et al., 2010).

Considering the geographical dimensions and the favorable climate for the development of agricultural activities in the State, Maranhão becomes a paradox, considering that the State is a major importer of vegetables and information related to the cultivation, consumption and preferences of these products are scarce in the literature.

In view of the above, the objective of this work was to carry out a survey of information on the profile of producers and to characterize the cultivation of vegetables in the backyards of the municipality of Vargem Grande, MA.

MATERIAL AND METHODS

PLACE OF STUDY

The research was carried out in the municipality of Vargem Grande, located in the State of Maranhão, 175 km from the capital, São Luís. Located in the North of Maranhense, with a population of 49.412 inhabitants, of which 54.1% lived in the urban area and 45.9% in the rural area (IBGE, 2010). The climate of the region, according to the Köppen classification, is tropical (AW') with two well-defined periods: a rainy one from January to June, with monthly averages higher than 217.4 mm, and a dry one, corresponding to the months of July to December (CORREIA FILHO et al., 2011).

CHARACTERIZATION OF THE RESEARCH

The methodology used was the application of 40 questionnaires in residences in the urban area of the municipality of Vargem Grande, from February to April 2017. The interviewees were approached individually and randomly, in the morning or afternoon. The questionnaire was structured with objective questions focusing on the socioeconomic aspects of the producers, origin of the seeds, cultivated species, type of substrate, fertilization mode, phytosanitary aspects (weeds, pests and diseases) and harvest.

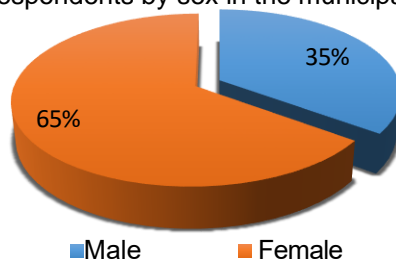
Data analysis was performed using descriptive statistics. The degree of importance of the items mentioned by consumers in each question was defined considering the modal class, and then the relative percentage frequency was obtained.

After the interviews, data tabulation and analysis were carried out, considering the above variables, thus allowing individuals or numerical variables to be approximated in data sets, expressed as percentages, and inferences can be made about the urban production/cultivation of vegetables in the municipality of Vargem Grande, MA.

RESULTS AND DISCUSSION

Considering the socioeconomic profile of the interviewees in the municipality of Vargem Grande-MA, the role of women was found to be preponderant as responsible for the activities of vegetable cultivation in the home gardens, 65% of the interviewees are female and only 35% are male (Figure 1). Oakley (2004) also proved the contribution of women as responsible for maintaining the practice of cultivation in their backyards in the city of Vargem Grande-MA, whether in the search for healthy foods, therapeutic activity, implementation in the family income or care for the health of their families.

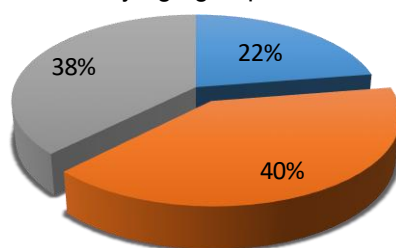
Figure 1: Relative frequency of respondents by sex in the municipality of Vargem Grande-MA, 2017.



The age range of vegetable producers and consumers in urban backyards in the target municipality of the study was determined between 30 and 50 years old (40% of the interviewees), considering this the main group active for production and who generally allocate time to the cultivation of vegetables, in addition to the regular activities of formal work. The second largest contribution was from individuals over 50 years of age, representing 38% of respondents; the smallest portion of the population of Vagem Grande that contributes to the production and consumption of vegetables is in the 18 to 30 age group (22% of the interviewees), which makes it an alarming data considering that parents can exert negative influences on the habit of growing in home gardens and later generations can repeat this attitude of not growing vegetables (Figure 2).

According to Carniello et al. (2010), the most significant rates of inhabitants who cultivated vegetables were found in the age group over 30 years, this fact may be linked to the issue of this generation having had greater contact with the cultivation of plants, due to having lived part of their life in the countryside (Figure 2).

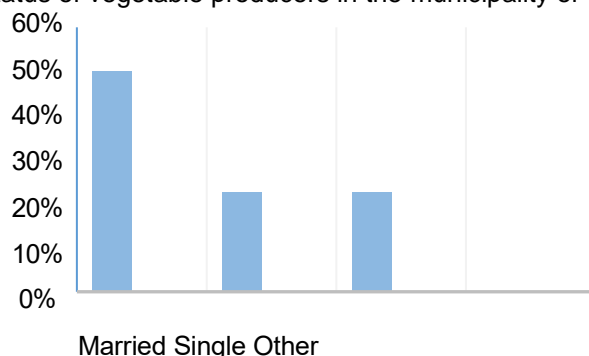
Figure 2: Relative frequency of respondents by age group in the municipality of Vargem Grande-MA, 2017.



■ Between 18 and 30 years old ■ Between 30 and 50 years old ■ Over 50 years old

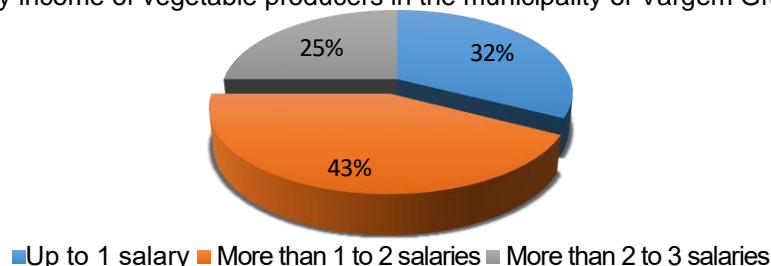
Family participation in the cultivation of gardens in the urban perimeter of Vagem Grande, MA is very effective, as 50% of urban producers are married, while 22.5% are single, and 22.5% have another marital status, that is, widowed, divorced or just live with their partners without being legitimately married (Figure 3).

Figure 3: Marital status of vegetable producers in the municipality of Vargem Grande-MA, 2017.



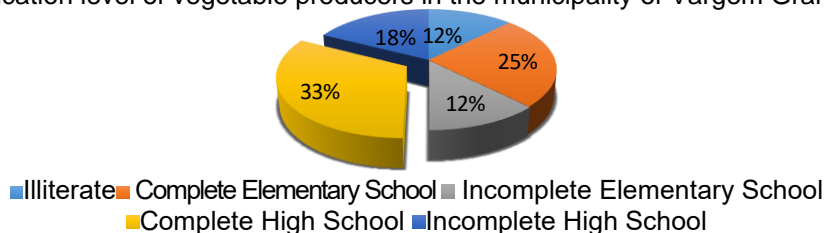
With regard to family income (Figure 4), it was found that 43% of the producers have an income of more than 1 to 2 salaries, 32% with an income of up to 1 salary and 25% have 2 to 3 salaries. It is inferred that the main activity that generates income is not enough to meet the basic needs of most of the interviewees, and the cultivation of home gardens by families in the municipality of Vargem Grande, MA aims to contribute to food and in some cases even as financial aid. As verified by Almeida (2004), describing that from the economic point of view, small production in domestic backyards has contributed to family income, through the reduction of expenses with food and health, exchange networks and eventually the transformation and commercialization of production surpluses, thus ensuring extra income.

Figure 4: Family income of vegetable producers in the municipality of Vargem Grande-MA, 2017.



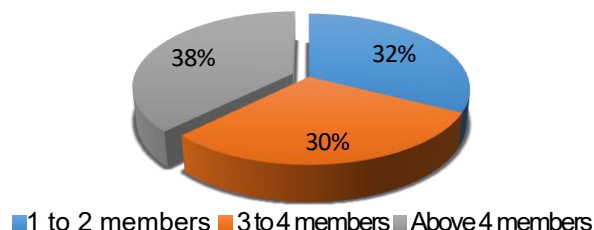
Regarding the level of education of the respondents, 33% have completed high school, 25% have completed elementary school, 18% have incomplete high school, and 12% are illiterate or have incomplete elementary school (Figure 5). Literacy is indispensable for the population, as it facilitates access to information, goods and services, such as health, as well as enabling better living conditions for the person, since the individual with a higher level of education has better opportunities for employment and income (CARNIELLO, 2010).

Figure 5: Education level of vegetable producers in the municipality of Vargem Grande-MA, 2017.



Regarding the number of family members, 38% of vegetable producers have a family group composed of more than 4 people, 32% is 1 to 2 people and 30% 3 to 4 people per family (Figure 6). Bezerra et al. (2008), when analyzing the home gardens in Cáceres-MT, found that the families were made up of 48% adults, mostly with up to six people in the family nucleus and among them, 26.7% were children and 19.8% adolescents and 5.5% elderly, representing a family profile above the Brazilian average of 3 to 4 people per family (IBGE, 2010).

Figure 6: Number of members per family of vegetable producers in the municipality of Vargem Grande-MA, 2017.



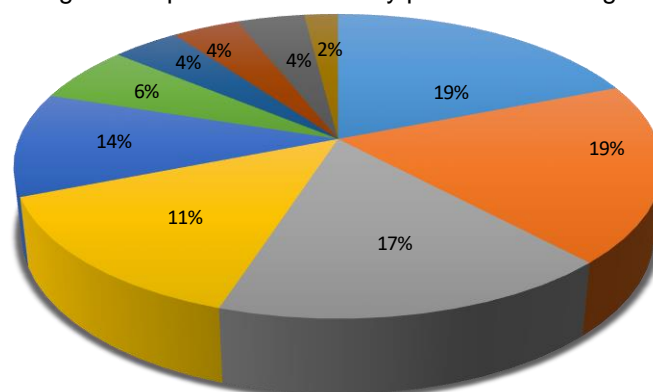
Regarding the origin of family income, it was found that 40% of the interviewees have income from other means (self-employed, day laborers, activities related to agriculture and fishing), 35% are civil servants and 25% are retired. It is known that an individual's income determines their ability to acquire goods and services, and it is observed that a significant portion of producers have an income that is often uncertain, this reason may have motivated cultivation practices in their backyards, agreeing with Oakley (2004), who states that this activity performs important economic, cultural and agroecological functions, it also plays an important role in the financial security of households and helps to reduce dependence on fruits and vegetables from local markets (Figure 7).

Figure 7: Origin of family income of vegetable producers in the municipality of Vargem Grande-MA, 2017.



It was observed that the most cultivated vegetable species in the urban backyards of the municipality of Vargem Grande-MA, are chives (*Allium schoenoprasum* L.) and vinegar (*Hibiscus sabdariffa*), being therefore the most produced by producers with 19% each species, followed by coriander (*Coriandrum sativum*) with 17%, after pepper (*Capsicum* sp.) with 14%, okra (*Abelmoschus esculentus*) 11%, watermelon (*Citrullus lanatus*) with 6%, followed by lettuce (*Lactuca sativa*), pumpkin (*Cucurbita* sp.) and sweet potato (*Ipomoea batatas*) with 4% respectively and watercress (*Nasturtium officinale*) with only 2%. According to Bezerra et al. (2008), evaluating the home gardens of the families of the family health program in Cáceres-MT, they report that the most common vegetable species found were chives with 44.4%, pepper 40%, followed by coriander 33.3%, arugula 28.9% and parsley 24.4 (Figure 8).

Figure 8: Main vegetable species cultivated by producers in Vargem Grande-MA, 2017.

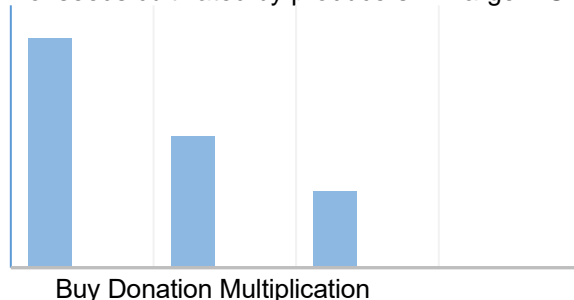


■ cebolinha (*Allium schoenoprasum* L.) ■ coentro (*Coriandrum sativum*) ■ pimenta ■ quiabo ■ melancia (*Nasturtium officinale*) ■ alface (*Lactuca sativa*) ■ abóbora (*Cucurbita* sp.) ■ batata-doce (*Ipomoea batatas*) ■ agrião (*Nasturtium officinale*)

Regarding the origin of the seeds (Figure 9) used by the vegetable producers interviewed in Vagem Grande, MA, 52.5% of the vegetable seeds are purchased in agricultural stores in the city itself, 30% of the seeds are acquired through donations (friends or relatives) and 17.5% reuse seeds or the vegetative parts of the vegetables from

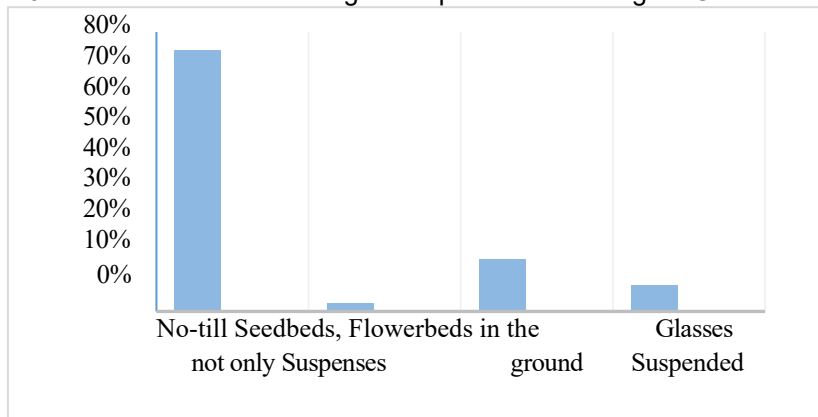
previous crops (multiplication). Multiplication is done mainly in vegetable species that have difficulties to develop by other methods, or because their seeds are difficult to access (BERTALHA, 2010).

Figure 9: Origin of seeds cultivated by producers in Vargem Grande-MA, 2017.



Regarding the cultivation location adopted by vegetable producers in the municipality of Vargem Grande-MA, it was found that vegetable producing families presented specific ways of growing their vegetables (Figure 10), 75% of the interviewees grow vegetables directly in the soil; 15% grow in beds on the ground; 7.5% grow their vegetables in hanging beds and 2.5% grow them in hanging pots; evidencing different cultivation methods. Bezerra et al. (2008) describe that often, in addition to growing crops in the soil, families improvised several containers for the production of vegetables, corroborating Carniello et al. (2010) by saying that any container that contains a certain volume of soil is capable of growing vegetables.

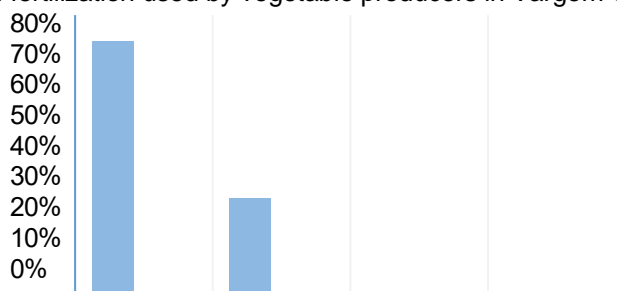
Figure 10: Place of cultivation of vegetable producers in Vargem Grande-MA, 2017.



When asked about the type of fertilization applied (Figure 11), it was found that 27.5% of the interviewees use organic fertilization, and 72.5% of the producers do not use any type of fertilization, this is due to the fact that families are looking for healthier foods,

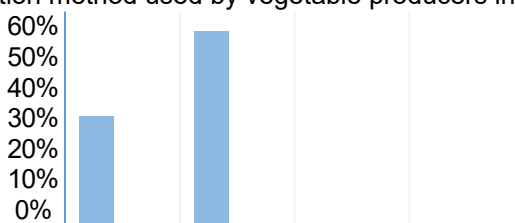
seeking not to use products that may harm the family's health. Vegetable gardens provide those involved with an increase in the consumption of vegetables, making it possible to produce food at a low cost and of good quality, without the use of pesticides and chemical fertilizers, and its cultivation in backyards, especially in developing countries, such as Brazil, where a large part of the population is extremely poor, constitutes an excellent alternative to supplement the diet of poorer families (OAKLEY, 2004).

Figure 11: Types of fertilization used by vegetable producers in Vargem Grande-MA, 2017.



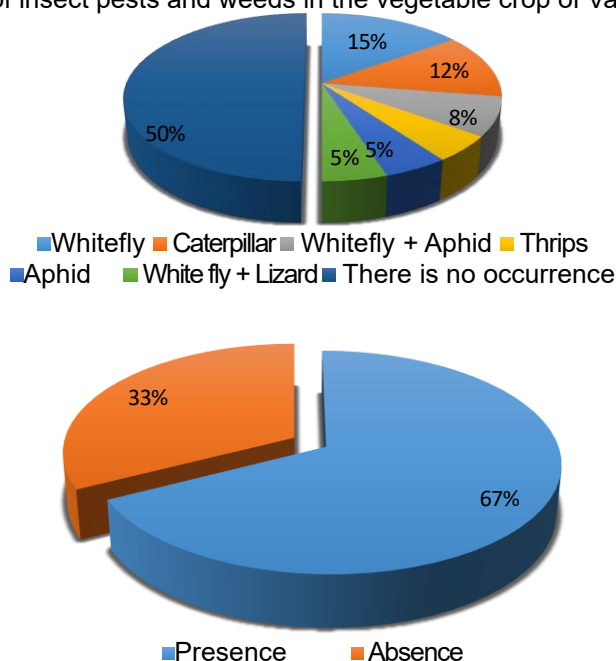
It was found that 36.4% of the vegetable producers in Vargem Grande, MA, fertilize in furrows and 63.6% use another method of fertilizer application, which generally depends on the type of fertilizer used and in which species of vegetable will be grown (Figure 12).

Figure 12: Fertilizer application method used by vegetable producers in Vargem Grande-MA, 2017.



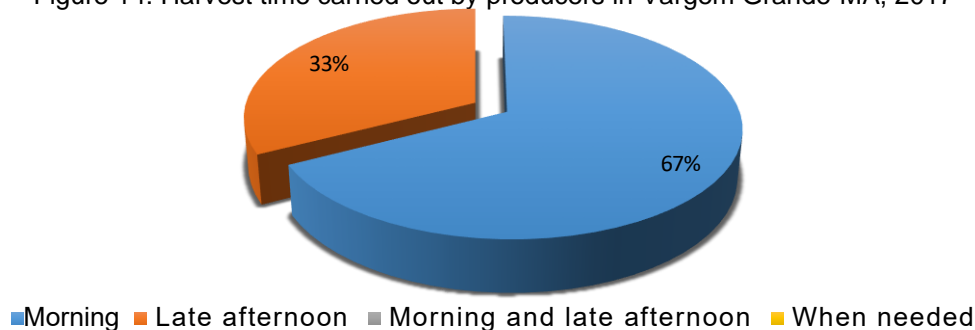
The vegetable producers in Vargem Grande interviewed provided information on the presence of pests and diseases in their crops, in which 15% stated that there is the presence of the whitefly (*Bemisia* sp.) in the production; 12.5% caterpillars; 5% of respondents report that there is aphid (*Aphidoidea* sp.); 5% expose the presence of thrips, 5% of whitefly + caterpillar; 7.5% shows that there is an occurrence of whitefly + aphid; 50% of respondents say that there is no occurrence of pests in their crops. In terms of weeds, 67.5% report that there is a presence of these in their gardens. For Nascimento et al. (2013), in a study carried out in Uberlândia, MG, the occurrence of pests and diseases is the main problem faced by vegetable producers in that municipality (Figure 13).

Figure 13: Percentage of insect pests and weeds in the vegetable crop of Vargem Grande-MA, 2017.



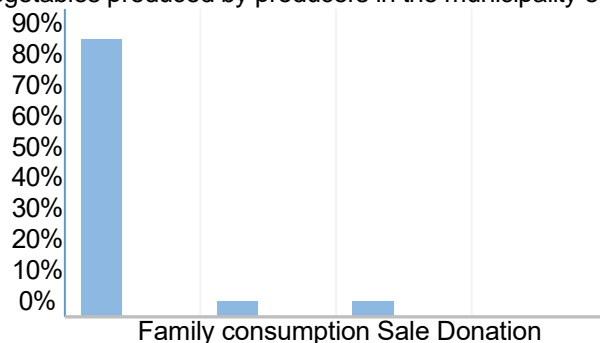
Despite the recommendation that the harvest of vegetables be at the coolest times of the day, the time established by vegetable producers in the municipality of Vargem Grande-MA to carry out the harvests is very diverse, 28% of the interviewees informed that they harvest in the morning and also in the late afternoon, another 25% of the interviewees prefer the end of the afternoon to harvest, Another 25% reveal that they harvest vegetables only when there is a need, that is, when housewives are preparing meals, and only 22% prefer to harvest their crops in the morning. According to (Cenci, 2006) (Figure 14).

Figure 14: Harvest time carried out by producers in Vargem Grande-MA, 2017



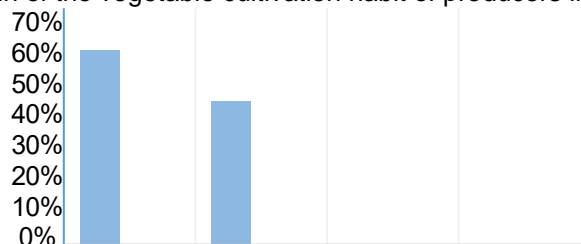
The interviewees revealed that the vegetables produced are intended for family consumption (90% of the producers), and a small part of the vegetables produced are destined for donations to relatives or are sold at the producer's own home (Figure 15).

Figure 15: Destination of vegetables produced by producers in the municipality of Vagem Grande-MA, 2017.100%



Regarding the origin of the habit of growing vegetables, 57.5% of the interviewees responsible for growing vegetables in Vagem Grande, MA is due to the influence of parents who lived or live in the rural area and maintain the habit of planting and harvesting food species, whether horticultural species or not, noting that the parents' cultivation practice can influence the cultivation of their children (Figure 16).

Figure 16: Origin of the vegetable cultivation habit of producers in Vagem Grande-MA, 2017.



According to Bezerra et al. (2008), the form of cultivation and the selection of the species that will be cultivated reflect cultural expressions and the habits of a population. There were also people who did not have a family inheritance of vegetable cultivation, which represented 42.5% of the interviewees, however, other factors, such as the need to consume vegetables by medical indication, satisfaction with the consumption of vegetables or even the ornamental value attributed by some of them, contributed to the motivation for the implementation of vegetable gardens in their backyards (Figure 16).

Among the practices employed by vegetable producers in Vagem Grande, MA for seedling production, three substrate composition patterns were verified; 42.5% of the interviewees use cattle manure + soil, 30% of the interviewees goat manure + soil and 27.5% of the interviewees use an organic palm compost as substrate. According to Godoy and Farinacio (2007), the substrates used for production must provide adequate conditions

for germination and good development of the root system, and must have good texture and structure, adequate pH, fertility and be free of pathogens (Figure 17).

CONCLUSION

The socioeconomic profile of vegetable producers in the urban perimeter of Vargem Grande, MA is formed mainly by women; aged 30 to 50 years, married, with a family of more than four people; with an income of more than one, up to two salaries; with complete high school education and as the source of income work without fixed salaries.

The most cultivated species are vinegar, chives, coriander, pepper and okra, whose seeds are obtained in agricultural stores and planted directly in the soil, without the use of chemical fertilization, but fertilization with cattle manure and soil is more used.

The plants are not affected by diseases and pests that limit crops, however, they are infested by weeds, and the harvest is carried out in the morning and late afternoon and the purpose of cultivation is for family consumption.

The habit of cultivating vegetable gardens in the urban perimeter is due to paternal and maternal influences that try to rescue the activities that were developed in the rural environment lived in the past.

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