

## ORNAMENTAL VEGETABLE GARDENS IN A FAMILY SYSTEM

### GRĂDINI LEGUMICOLE ORNAMENTALE IN SISTEM FAMILIAL

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**Abstract.** *Ornamental vegetable gardens have a long history on the European continent. The design of the gardens is different due to influences originated from customs and traditions, which represent important elements in their composition and are reflected in the vegetable growing methods and species used. The purpose of this paper is to analyse the opportunities that these gardens have and to satisfy the nutritional and aesthetic needs of a family. To reach the aim and proposed objectives a series of experiments and case studies were conducted. By combining the owners underlined nutritional needs from our previous studies and the obtained results from our experiments, applicable solutions were created for family vegetable gardens. From a therapeutic point of view this type of landscape design helps maintain cultural identity, encouraging communication and socialization between members of a community. The obtained results show that the studied family gardens situated in urban areas have a positive influence on the sustainability of the community maintaining a "heathy life style" for its inhabitants.*

**Key words:** vegetable gardens, sustainability, community, aesthetics.

**Rezumat.** *Grădinile legumicole ornamentale prezintă o lungă istorie pe continentul European. Influențele datorate diferitelor tradiții și obiceiuri sunt elemente distincte în cadrul acestora, reflectându-se prin modalitatea de cultivarea a legumelor și prin speciile utilizate. Scopul acestei lucrări științifice este de a analiza oportunitățile pe care astfel de grădini le oferă și de a satisface nevoile estetice și nutriționale ale unei familii. Pentru îndeplinirea scopului și a obiectivelor propuse au fost realizate o serie de experimente și studii de caz. Prin combinarea nevoilor nutriționale evidențiate de către proprietari în cadrul studiilor anterioare și a rezultatelor obținute în cadrul experiențelor au fost create soluții ce pot fi aplicate cu ușurință în cadrul grădinilor familiale. Terapeutic vorbind, astfel de amenajări peisagere contribuie la menținerea identității culturale încurajând comunicarea și socializarea între membrii unei comunități. Rezultatele obținute în cadrul acestui studiu arată că grădinile familiale situate în zone urbane contribuie activ la menținerea unui „stil de viață sănătos”, având o influență pozitivă asupra sustenabilității comunității.*

**Cuvinte cheie:** grădini legumicole, sustenabilitate, comunitate, estetic

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## INTRODUCTION

Vegetable gardens in an allotment system have a long history in Europe, ever since the industrial revolution, when people migrated to cities, in the 19th century, this type of gardens were called “workers gardens” or “poor’s’ gardens”. During the two world wars, this type of gardens were known as “victory gardens” and supplied fresh vegetable for city inhabitants who were isolated from the country side. In time, allotment gardens became gardens for hobby, for recreation or education, with more functions (Tei and Gianquinto, 2010).

In some cities, such as Paris and Montreal, allotment gardens have in their composition four types: vegetable gardens, community gardens, collective gardens, shared gardens and family gardens. Based on the study done by Pourias (2014), the surface of the garden varies from 2 m<sup>2</sup> to 500 m<sup>2</sup> for a shared garden. The size of the plots for individual gardens (family gardens) was between 25-200 m<sup>2</sup>.

In the United Kingdom of Great Brittan and Ireland the allotment gardens were created for residents and were called “pleasure gardens”. This type of gardens were not opened for the large public, but only for residence who paid a monthly sum (<http://www.ladbrokeassociation.info.html>).

In Romania, vegetable gardens in allotment systems (family gardens) have large plots from 90 m<sup>2</sup> to 500 m<sup>2</sup> or more depending if the garden is situated in a peri-urban area. Community gardens or collective gardens are small, about 10 m<sup>2</sup>, situated near the residential building and are mainly used for flowers and decorative shrubs.

Because of the fact that vegetable gardens in allotment systems have evolved from their initial functions, as food providers, in our days the impact that this type of gardens has on human health, on society and the environment are very important. The process of sustainability is taken into consideration worldwide. The increase of agro-biodiversity, food safety and the benefits that family gardens have are underlined by many studies (Taylor and Lovell, 2014; Pawlikowska-Piechotka, 2012; Gosh, 2014).

To increase sustainability of vegetable gardens in allotment systems, we have to take into consideration the agricultural systems used. Because of the fact that an intercropping system has multiple advantages and contributes to increase sustainability of the vegetable gardens, it also gives the possibility to cultivate more crops on the same plot size (Mousavi and Eskardari, 2011).

The purpose of this study is to analyze the necessities and opportunities regarding vegetable cultivation in home gardens in the N and NE of Romania, and to increase their ornamental value by using an intercropping system. By applying correct crop technology and landscape design rules, elements of the sustainability process, such as cultural identity, life style and education it can be increased, as it was revealed in similar studies regarding the benefits of vegetable gardens in allotment systems.

Besides the ornamental value, one of the main objectives of this study was to give a multi-functionality to the proposed vegetable gardens by taking into consideration results from our previous studies.

## MATERIAL AND METHOD

To reach the aim and objectives of this research a series of case study were analyzed and some experimental trials were carried out. The studied home family vegetable gardens are situated in different areas of the country, presented in detail by Galea (2016), represented a starting point, giving essential information about the type of vegetables used in Romanian family gardens. Based on these results, three experimental ornamental vegetable gardens were done in the experimental field of Thevegetable growing Department from the farm of the Agronomy University of Iasi, in 2015 and 2016.

The proposed vegetable gardens had o area between 20 m<sup>2</sup> and 100 m<sup>2</sup>, designed in a geometrical style, using design and aesthetic rules. The three family gardens were evaluated by a panel of 20 experts. Using a survey with 17 questions, with a scale from 1 to 5, in which 1 represented highly disagree, 2 represented disagree, 3 represented neutral, 4 represented agree and 5 highly agree.

In the composition of the survey the following were taken into consideration: the proposed species; the combining method; the succession of plants; plant ornamental layout; garden functions: educational, ecological, cultural and ornamental; the influence of the intercropping system regarding the degree of weeds, pest and disease attack.

The achieved results from evaluating the three ornamental vegetable gardens by the panel of experts was then assessed using SWOT analysis to determine the degree of general agronomical and ornamental value of the proposed family gardens. Due to the SWOT analysis, the strengths and opportunities of the gardens were underlined.

By combining people experiences on their own home gardens and the experimental results we got some solutions to enhance the interest of urban and peri-urban people for family gardens.

## RESULTS AND DISCUSSIONS

Based on the results of our previous studies regarding landscaping design in family vegetable gardens we were able to determine the needs of a family when it comes to vegetables, which species are used and how people interact with each other when it comes to exchange of products or seed (Galea *et al.*, 2016). Also, by underling the weaknesses on the studied gardens we were able to propose solutions to transform them into strengths or opportunities and apply them in the three proposed ornamental vegetable gardens.

### a. Case study 1.

The first experimental family vegetable garden studied has an area of 20 m<sup>2</sup> and is designed in a geometrical style, respecting crop technology and landscape design principles for the proposed species. Based on compositional elements such as rhythm, symmetry and prime axis the vegetable garden

decorates trough the flower created using May King and Lollo Rosa lettuce (fig.1).

Using an intercropping system, the garden gives to opportunity to decorate for a longer period due to the combining method and plant succession. The vegetable garden has combined lettuce+ spinach+ onion+ lavender+ red orach in the first part of the year and runner bean + celery+ autumn carrot+ lavender in the second part of the year.



**Fig. 1** Detail of the vegetable garden in the first part of the year-vegetable carpet

After the evaluation of the vegetable garden (fig. 2.) the respondents considered that the chosen species were well adapted to the pedo-climatic conditions of the area and were easy to care of. Also, they found the garden to be ornamental and economic.

As it is presented in the second figure, the last question regarding the educational role of the garden in forming the young generation with the necessary skills to grow their own vegetables, the garden obtained the highest number of positive responses (highly agree).

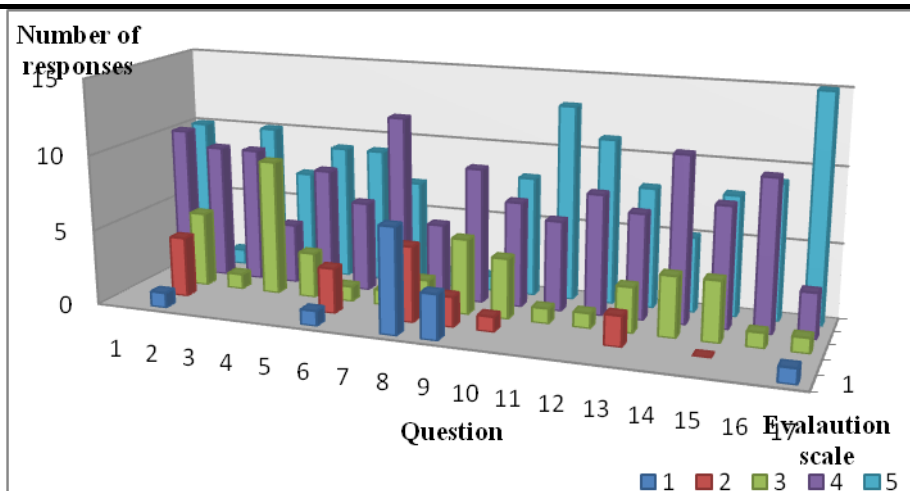


Fig. 2 Survey response analysis

Using SWOT analysis for the evaluation of the survey the strong points, the weak point, the opportunities and threats were revealed (tab. 1).

Table 1.

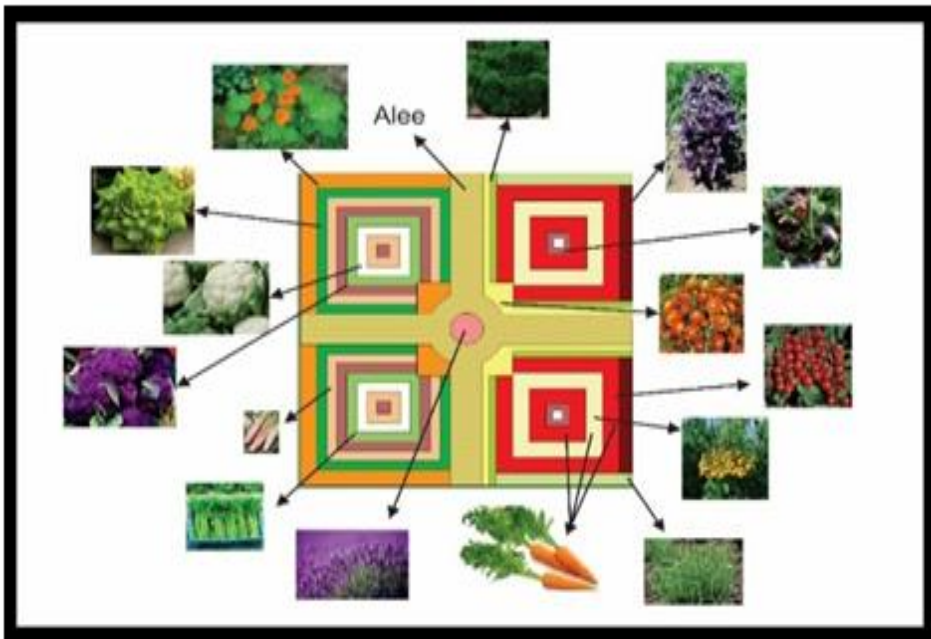
**SWOT Analysis- First study case**

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>the proposed species were well adapted to the area and were easy to care for;</li> <li>the ornamental vegetable garden was economical;</li> <li>the garden has a high ornamental and recreational value;</li> <li>the degree of weeds was low due to the intercropping system;</li> <li>a lower risk for diseases attack due to the combing method;</li> <li>the garden assures fresh vegetables for a long period.</li> </ul>	<ul style="list-style-type: none"> <li>medium productivity;</li> <li>a low number of species used;</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>educational function for the young generation.</li> </ul>	<ul style="list-style-type: none"> <li>moderated plant needs regarding soil nutrients for the combined species;</li> <li>the possibility of incompatibility side-effects due to plant combination</li> </ul>

Based on the results obtained from the Swot analysis, the vegetable garden has many functions from recreational to aesthetic, combining the fulfilled need for fresh vegetables with sport activities in nature.

**b. Case study 2.**

The second vegetable garden was conceived as part of a community garden, it is an ornamental element, from where people can harvest their own fresh vegetables. It has a surface of 100 m<sup>2</sup> and its design is based on combining 20 horticultural plants with the purpose of multiple functions. The main axes divide the garden into 4 squares underlining its geometrical design (fig. 3).



**Fig. 3** 2D Detail of the vegetable garden plan

In its composition the vegetable garden had 3 combinations of plants:

1. Lollo Rosa lettuce+ cherry tomatoes (yellow, red and striped purple) + French marigold+ leaf parsley + basil (green and purple);
2. cauliflower (green, white, purple) + celery+ tropeolum;
3. lettuce+ beans+ tropeolum;
4. cherry tomato + carrots (in the second part of the year);

The results of the survey revealed that the majority of answers were situated between 4 and 5 on the evaluation scale. The only question that had significantly different answers was number 8, which is a control question and presents that the combination of species can increase the competition for nutrients (fig. 4).

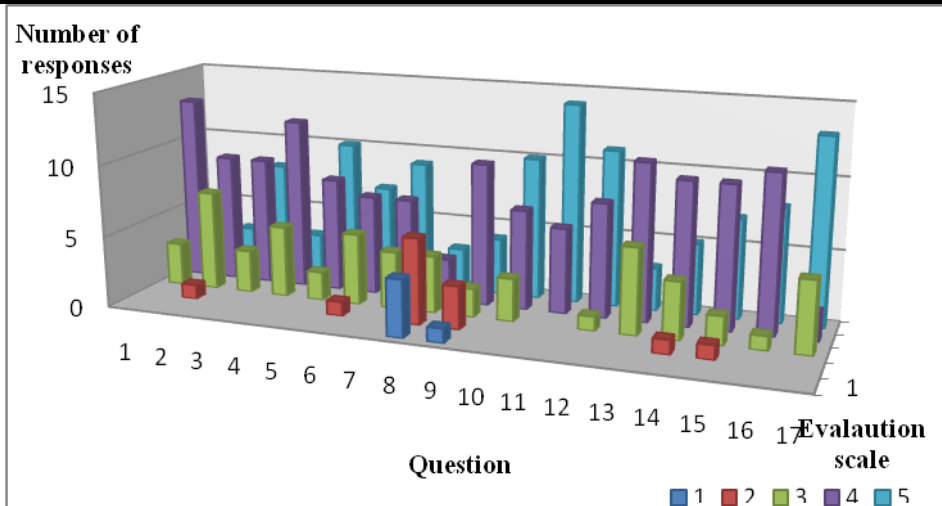


Fig. 4 Survey response analysis

The responses from the survey done by the 20 specialists were then analysed using SWOT analysis and the strong points and opportunities were unlined (tab. 2).

Table 2

**SWOT Analysis- Second study case**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>the chosen species are well adapted to the area and easy to care for;</li> <li>high ornamental and recreational value;</li> <li>a lower risk for diseases attack due to plant combination;</li> <li>a relatively large number of species used in the garden;</li> <li>cultural function;</li> <li>favourable conditions for useful entomofauna;</li> <li>alternative methods of plant protection.</li> </ul>	<ul style="list-style-type: none"> <li>side-effects due to plant combination;</li> <li>the degree of weeds in the garden if proper care is not done in time.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>horticultural education for the young generation;</li> <li>fresh vegetables for a long time;</li> <li>incourages comucation in the community.</li> </ul>	<ul style="list-style-type: none"> <li>economical rentability.</li> </ul>

Due to the use of vegetables and companion plants with important roles in plant protection favourable conditions were created for useful insects in the garden.



**c. Case study 3.**

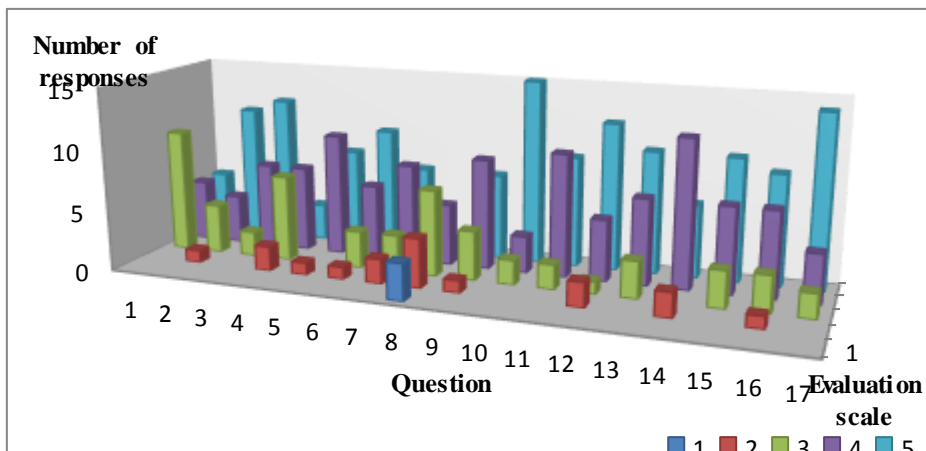
The third vegetable garden is designed in a mirror style, with a surface of 48 m<sup>2</sup>. The main alee separates the garden in two equal rectangles. Combining landscape instruments with plant technology and by respecting plant nutrients conditions, the proposed design creates coloured perspectives, symmetry and equilibrium in the garden (fig. 5).



**Fig. 5** Garden detail

For the design there were used 16 plants (lettuce, spinach, runner bean, pepper, tomato, carrot, celery, egg plants, leaf parsley, lavender etc.) in 10 different combinations.

The survey underlined the interest that the participants showed regarding the multitude of species used and the large number of function that the garden possess (fig.6).



**Fig. 6** Survey response analysis



The highest response rate was at question number 10 which underlined the high number of species used in an intercropping system in the garden compared to other systems.

Based on the response of the survey using SWOT analysis we determined the high point of the garden and the opportunities that it brings us (tab. 3).

Table 3

### SWOT Analysis- Third study case

Strengths	Weeknesses
<ul style="list-style-type: none"> <li>• the chosen species are well adapted to the area;</li> <li>• high ornamenatal and recreational value;</li> <li>• a lower risk for diseases attack due to plant combination;</li> <li>• a relatively large number of species used in the garden;</li> <li>• altenative methods of plant protection;</li> <li>• economical rentability;</li> <li>• high biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>• care practices for the used plants;</li> <li>• plant nutrient uptake.</li> </ul>
Opportunites	Threats
<ul style="list-style-type: none"> <li>• horticultural education for the young generation;</li> <li>• encourages communication in the community.</li> </ul>	<ul style="list-style-type: none"> <li>• side-effects due to plant combination;</li> <li>• the degree of weeds in the garden if proper care is not done in time.</li> </ul>

The analysis revealed that the third garden was the most appreciated one due to its many strengths.

## CONCLUSIONS

The results of the study revealed that family vegetable gardens in the urban and peri-urban area in an intercropping system help the general sustainability of the community, contribute to a “healthy life style” uniting communities and preserving cultural identity.

By using an intercropping system, the gardens had a low risk of disease attack, assuring fresh vegetables for a long time.

The gardens have ornamental value and encourage recreation and spending time in nature and also help teach the young generation about horticultural practices.

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