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Compost and its use in floriculture - a solution for the domestic waste (B)

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Abstract

In nature, there doesn't exist the term of residue, there are successive cycles of living materials, between birth and death, where, what means residue for a species there constitute food or utilizable resource for other species. There human being, through his creative nature, has crucially contributed to the nature's degradation, outrunning millions of years of biological evolution and producing residues, that nature is no more able to assimilate and transform. A solution to this fundamental problem would be the creation of ecological industries and technologies, through which one's own residues are drawn, obtaining other biodegradable products, which can be reintroduced into nature - one of these solutions is the composting.

Keywords: compost, floriculture, domestic waste

1. Introduction

In nature, the waste notion is not known. Successive cycles of live materials, between birth and death, where what represents waste for a specie is food or useful resource for another are well known in nature. By his creative nature, the man decisively contributed to nature degradation, outrunning millions of years of biological evolution and producing waste which nature cannot assimilate or transform. The creation of organic industries and technologies represents a solution for this fundamental problem. This will allow the prelevation of their own waste and obtaining biodegradable products that could be reintroduced in nature. The composting is one of these technologies. The compost represents a humic organic fertilizer made up of mixture from vegetal and animal waste, together with soil, yard dust, garbage, peat, lime, sludge, and ash, which were submitted to a biological transformation process in aerobe and anaerobe fermentation conditions. The compost componence may include: straw waste, husks, creeping potato steam, leguminous steam and sheath, weeds, tree leaves harvested in autumn, yard garbage, broken bones, domestic waste, altered feed and food, wrinkled potatoes thrown up in spring from silo, faeces, poultry manure, wood sawdust, marc of grabs, sludge from the station of residual water depuration from towns.

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The importance of composting results from at least two reasons: economical and organic.
The economical criteria is took into consideration because the composting helps to reducing the waste quantities and economy of storage spaces. The composting represents the waste valuation that requires the lowes energy consumption. The compost substitutes a large quantity of chemical fertilizers, which helps society in economizing founds that although would be invested in chemical industry. The compost represents a less expensive method of improving the soil structure and a very good fertilizer for agriculture and horticulture, especially. The compost is a valuable organic fertilizer, rich in plants nutritional elements, and also valuable for soil mixtures used in horticulture.

From the organic criteria point of view, we must notice that by composting, the organic matter penetrates in the biological cycle, composting being a natural recycling process. The energy, which plants took from the soil for emergence will be returned again in soil. By composting, lots of waste that although would be stored will be reduced. The composting helps to avoid the emission of deposit gases (because reduces the stored waste quantities) and is integrant part of the system of waste economy (in economical and organic conditions). By composting, the organic charge is avoided because the burnings predominantly release CO_2. By composting, the nitrogen makes strictly organic bounds. This has the advantage of maintaining the soil fertility and constant humidity. The composting is a suitable organic method for improving soil fertility and food resource for plants. By composting use, the peat formation is avoided.

In horticultural practice, the term culture substrate designates the material support where the plants develop their roots and also represents the main feed resource.

Due to their origin, of different clime and soil areas, the decorative plants have high requirements against components and traits of the culture substrate. For the plants originary from the temperate areas, cultivated in our country in free air, the term is identified with the soil, with natural traits, well settled from one area to another. Generally speaking, the soils from the teritory of our country correspond to the requirements of majority of the annual, biennial and perennial plants, which can be cultivated in the field. The farmer may select the suitable plants for certain soil types or improve some soil traits corresponding to specific requirements (amendaments, organic matter supplements, etc.). According to prefereces towards the granulometric componence of the soils, the decorative plants may be grouped as follows:

- for the heavy soils: *Althaea*, *Chrysanthemum*, *Dianthus*, *Iris*;
- for the moderate soils: *Heliotropium*, *Callistephus*, *Salvia*;
- for the light soils: *Gladiolus*, *Polyanthes*, *Centaurea*.

On heavy soils, plants with strong radicular system and some plants with rhizomes are usually cultivated, and on light soils, bulb plants and those with superficial roots.

The problem of the substrate is more complicated for the plants with origin in warm areas, cultivated in greenhouses or apartments, usually in conteiners which unfavorable influence the development of the radicular system. In order to satisfy a large variety of requirements of these plants, substrates artificially made up or soil mixtures are used. A series of substrates or ”soils” which differ through their chemical and physical traits are used for their preparation.

The substrates used in floriculture and legumiculture may be divided in natural and artificial, and compost is part of the natural category. They have similar properties with soil, are rich in decomposing organic matter and humus, with numerous microbial flora and unstable physical and mechanical structure. They are used only when they were previously prepared.

2. Material and method

The research was performed in production greenhouses of the society RER Ecologic Service Oradea S.A., where there are produced:

- flower and plant transplants destined to green spaces decoration: *Begonia*, *Salvia*, *Viola*, *Tagetes*, *Gazania*, *Petunia,* etc.;
- pots’ plants destined to indoor decorations: *Asparagus*, *Ficus*, *Camelia*, *Azaleea* etc.;
- floral species valuated as cutted flowers destined for bouquets and floral arrangements: *Freesia*, *Dianthus*, *Chrysanthemum*, *Iris*, *Rosa* etc.

We mention that the peat was replaced with compost obtained within the above mentioned society from vegetal waste, with very good results in mixture with other soil types. In this way, the peat was replaced. Because the mixture receipts necessary for producing the nutritional substrate for flower transplants are avalilable only in certain technological conditions and for

certain flower species, the research aimed the comparative study and formulation of optimal mixtures, which contain the (RO-1) compost obtained through the fermentation of the vegetal waste within the production sector.

This type of the (RO-1) compost has the following advantages:

- is a concentrate product easy to be transported;
- low energy consumption is obtained;
- improves the nutritional values with rich organic matter component (35-40%), nitrogen (1-1,25%), phosphorus (1-1,5%) and potasium (0,5-1%) of dry matter;
- is loose, without smell and free of pathogens, which creates the best conditions for the growing and development of the flower plants and transplants.

The trials were organized in 6 variants (V_1-V_6), with V_1 control (peat + unique mixture). *Begonia semperflorens* Link. et Otto was the studied specie, with green leaves and steams, and *Begonia semperflorens atropurpurea* with red leaves and steams. The observations were performed both in the field and protected.

3. Results and discussions

The experimental results obtained and interpreted by the average of the experimental years, reveal that the different proportion of the component elemenets of the used mixture (table1) significantly influenced the root growing, and (RO-1) compost presence had synergic influence for both *Begonia* species (tabels 2 and 3).

Table 1. The component share in performing the experimental mixtures

Variant	The share		
	Peat	Unique mixture	Compost (RO-1)
V_1	1/3	2/3	-
V_2	1/3	1/2	1/3
V_3	-	2/3	1/3
V_4	-	1/3	2/3
V_5	1/3	-	2/3
V_6	-	1/2	1/2

Concerning the plant height, the colet diameter, and number of leaves formed before plantation, the best results were obtianed in variants V_4 and V_6 where RO-1compost was part of the substrate combination in 1/3 or 2/3 partially or totally replacing the peat (tables 2 and 3).

In experimental variant V_3 the plants had a slower rythm of growing with a smaller number of normally developed leaves. This can be the result of a lowest capacity of the water retention in the mixture, which induced an unfavorable effect on the plants growing and number of leaves.

Table 2. The evolution of Begonia semperflorens Link et Otto plants within the experimental years

Variant	Height (cm)	Colet diameter (mm)	No. of leaves formed before plantation	Plant weight (g)
V_1	13.25	4.00	3.50	12.75
V_2	13.75	4.50	3.00	13.50
V_3	15.50	4.25	3.75	14.00
V_4	20.25	5.25	4.75	17.00
V_5	17.25	4.75	3.75	15.50
V_6	25.25	6.25	5.00	18.50

Table. 3. The evolution of Begonia semperflorens atropurpurea plants within the experimental years

Variant	Height (cm)	Colet diameter (mm)	No. of leaves formed before plantation	Plant weight (g)
V_1	7.5	3.50	2.75	12.75
V_2	10.0	3.50	3.00	13.50
V_3	10.5	3.00	3.50	14.75
V_4	13.4	4.75	4.25	15.00
V_5	11.5	3.75	3.25	13.00
V_6	15.0	4.75	5.00	16.00

During all experimental period, the *Begonia* culture technology was strictly respected, except the supplementary fertilizations, with the aim of emphasizing the influence of the tested substrates, compost especially.

4. Conclusions

Begonia semperflorens is one of the most valuable species with the largest use for the decoration of green spaces and private gardens. It is very appreciated for the large colour palette of the leaves and flowers and for the long lasting decoration capacity. It can also be used for realizing vegetal carpets, frames and mosaics, single or in combination with other species of similar size, decorative by their flowers or leaves.

Begonia is very appreciated as pot flower, in flower stands, for the decoration of the porches, balconies and indoors, etc.

The observation performed on *Begonia semperflorens*, demonstrates the possibility of obtaining very good quality implants when the peat

is totally or partially replaced by the RO-1 compost.

The use of the RO-1 compost for preparing nutritional substrates positively influences the growing of the *Begonia* implants, supplying plants with good development and superior quality during entire vegetation period.

The best results obtained in *Begonia* implants were recorded for the variants where the RO-1 compost occupied a share of 2/3 and 1/3, totally or partially replacing the peat.

The nutritional substrate where RO-1 compost represents 2/3 share supplyies the *Begonia* plants with loose and permeable rooting environment.

The RO-1 compost constantly supplyies sustainable and balanced feeding conditions for *Begonia* plants, which will have superior quality and abundant flowering during all decoration period.

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