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THE STUDY OF BASIL SPECIES (*Ocimmum basilicum L*) IN PERONDI-BERAT, ALBANIA

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Abstract

Basil (*Ocimmum basilicum L*) is one of the plants that has been associated with antiquity for various purposes. The eugenol basil subspecies (*Ocimmum gratisimum L*) is associated with numbing of the dental nerve, which continued to be used because it did not cause tooth blackening, which occurs when other chemical substances are used. Over time, it has been widely used in the kitchen to produce various dishes, especially for foods that are high in fat (fatty meats such as lamb, pork, etc.). It is also used for dietary soup for people with stomach problems. It has found widespread use as a disinfectant and air freshener for environments by cultivating it in pots and keeping it in rooms or other environments. The most pervasive and economically profitable use is in perfumery and cosmetics.

The experiment was set up in 2024 in Perondi - Berat, Albania. Five types of basil that are the most widespread and used in the world were included in this experiment. Biometric measurements were taken, and three harvests were made. In all three harvests, weighings were made to produce leaves, flowers, herb (leaves + flowers), stems, and total yield.

Keywords: *Basil, leaves, flowers, perfume, cosmetics, herb, yield*

1. Introduction

Basil (*Ocimum basilicum L*) is one of the aromatic and medicinal plants that is used for many purposes: pharmaceutical, culinary, cosmetic, perfumery, and medicine. Considering the value of its use, it was considered reasonable to study the five most widespread types of basil.

2. Methodology of scientific work

Since the basil plant has been used very widely and in many directions, it was considered reasonable to study some aspects and indicators of production.
Objective: To experiment in the field with the five most widespread basil species with different values of use and essence content. To determine the yield for each mowing and the final yield for all three mowings. Meanwhile, laboratory analyses will be performed according to standard methods.
In the study were included:

1. Basil for salad (*Ocimum basilicum di lattuca L*).
2. Viennese basil (*Ocimum basilikum vjeneze L*).
3. Violet basil (*Ocimum basilicum violeto L*).
4. Basil fino greco a palla (*Ocimum basilicum fino greco, a palla L*).
5. Genovese basil (*Ocimum basilicum genoves L*).

Basil varieties have different morphological traits, and the number of plants is predicted according to the traits they have. All variants are set up in four repetitions.

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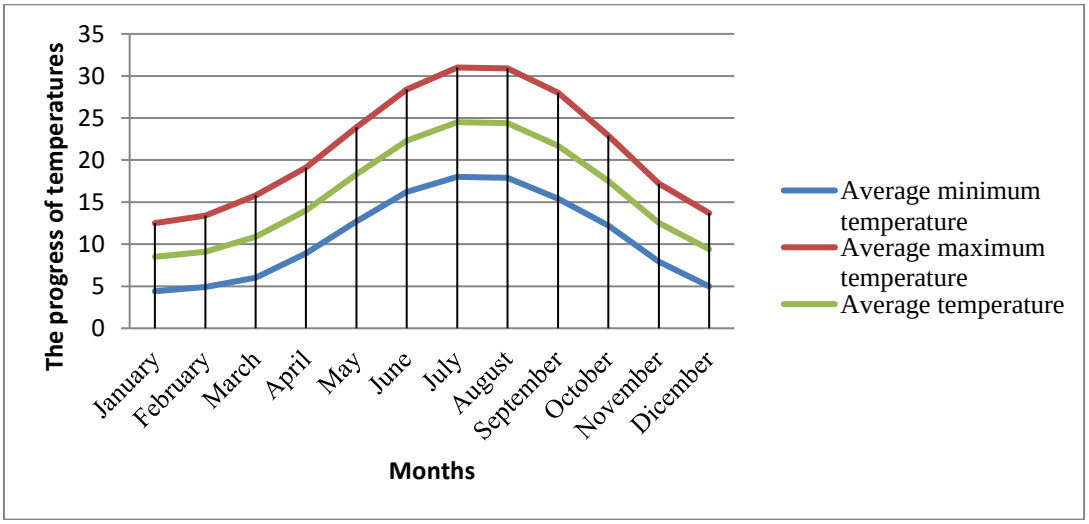
Morphological records will be kept, and harvesting will be done at the flowering stage. Harvesting will be done with a 5-8 cm height of the branches. Cultivation technology will be done according to known practice, while seedlings will be produced using the latest methods, with polystyrene bilayers and planted in solar greenhouses.
The planting of seedlings in the field will be done when the seedlings have grown fully (after 55-65 days). Planting will be done manually (without mechanization), with stakes placed 1 - 1.5 cm deeper than what was in the seedbed. During the vegetation, irrigation and fertilization will be done according to the need for moisture and the removal of weeds. Weighings were made for the three mowings, and calculations were made for the yield and the different parts of the plant: leaves, flowers, herbs (leaves + flowers), stems, and total yield (leaves, flowers, and stems).

3. Results and their interpretation

The experiment for the study of basil was set up in Perondi, Berat, according to a randomized block design with five variants and four repetitions.

3.1. Climatic conditions where the experiment was set. The experiment was set up in accordance with the methodology in the administrative unit of Perondi, Berat.



Graph no. 1: The monthly progress of the multi-year average temperatures in Berat

The annual temperature profile is suitable for growing in the basil area of Myzeqe. One concern is the summer period with temperatures above 30^0°C, which is prolonged, causing plant stress. Due to the conditions of decreasing temperatures in autumn, the growth of the plant begins to be inhibited, reducing production in the third mowing and significantly reducing the quality of the production. In order to better clarify the influence of temperatures, we are presenting the annual regime.

Average annual regime of climatic indicators in Berat. Table No. 1

No.	Indicators	Multi-year average
1	Average annual temperature	16.1
2	Average annual minimum temperature	10.7
3	Average annual maximum temperature	21.5
4	Days with temperature > 7^0 C	338.4
5	Days with temperature < 0^0 C	14.3

6	Days with temperature > 30^0 C	61.5
7	Annual rainfall (mm)	936.7
8	Maximum 24-hour rainfall (mm)	131.6
9	Rainy days per year	107.4
10	Solar illumination per year (hours)	2675.4

3.1.2. The rainfall

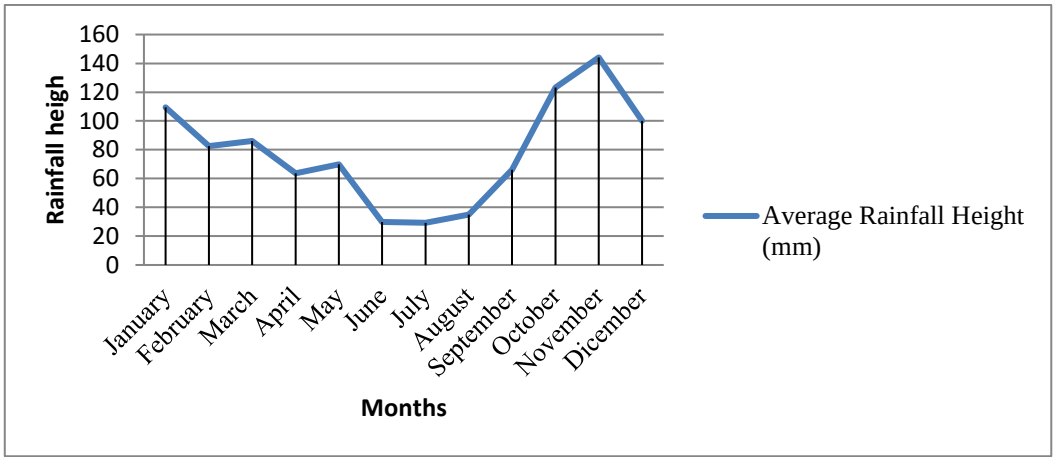


Chart No. 2. Monthly progress of rainfall in Berat.

Rainfall has an abnormal distribution compared to the needs of the plant, so during the June-August period, there is a lack of water for basil. For this reason, four irrigations are carried out, especially during June, July, and August.

3.1.3. Solar irradiance (hours)

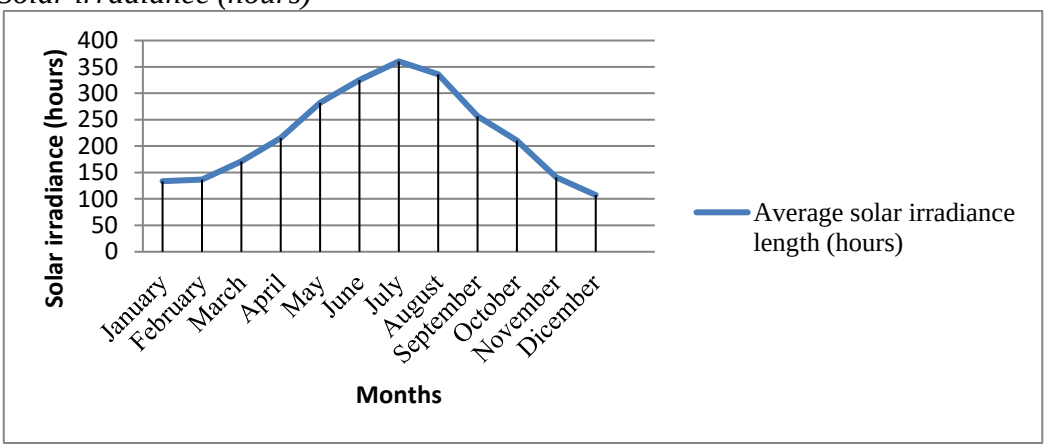


Chart No. 3. Monthly progress of solar irradiance (hours) in Berat.

The solar irradiance is suitable for basil cultivation. For normal development, 2200 - 2300 hours of sunlight are needed. This requirement is well met in the conditions of Myzeqe in general and Perondi, Kuçova in particular, positively affecting the quality and development of basil by extending its production period up to three mowings in separate years.

3.1.4. Soil analyses

The soil in which the experiment was set up was analyzed and the indicators are: aqueous pH 6.95, saline pH 6.7, K.E. 0.100, Humus 2.2 %, Nitrogen 0.14 %, Phosphorus ppm 11.6,

Potassium ppm 13.27, CaCO3 1.64 %, sand 36.6 %, loam 31.3 %, and clay 32.1 %. These are suitable soils for the cultivation of basil

3.2. The technology parameters of basil in the field

3,2.1 The parameters of planting

Table No. 1

No	Types of basil	Distance between rows in centimeters	Number of plants in a row	Total number of plants	Area for each repetition m2
1	Basil for salad	80	20	320	52
2	Viennese basil	80	20	320	52
3	Violet basil	80	20	320	52
4	Basil fino greco a palla	60	15	575	52
5	Genovese basil	60	15	575	52

3.2.2. Soil preparation: The first tillage was done in September 2023 to a depth of 31 - 35 cm, and in March 2024, tillage was done to a depth of 26 - 30 cm and was followed by two millings. Before the second tillage, 20-20-20 chemical fertilizer was used at a dose of 3 kg/ha and 200 kg/ha of well-rotted organic fertilizer.

3.2.3. The planting in the field: Planting in the field was carried out with stakes, placing the seedlings according to the predetermined distance in the scientific methodology.

3. 2. The study of basil types: The study included five types of basil: basil for salad, Viennese basil, violet basil, basil fino greco a palla, and genovese basil. The seeds were obtained from the Italian company "Larosa Emanuele" based in Andria in the Puglia region. The experiment was set up for one year, 2024 in Perondi, Berat.

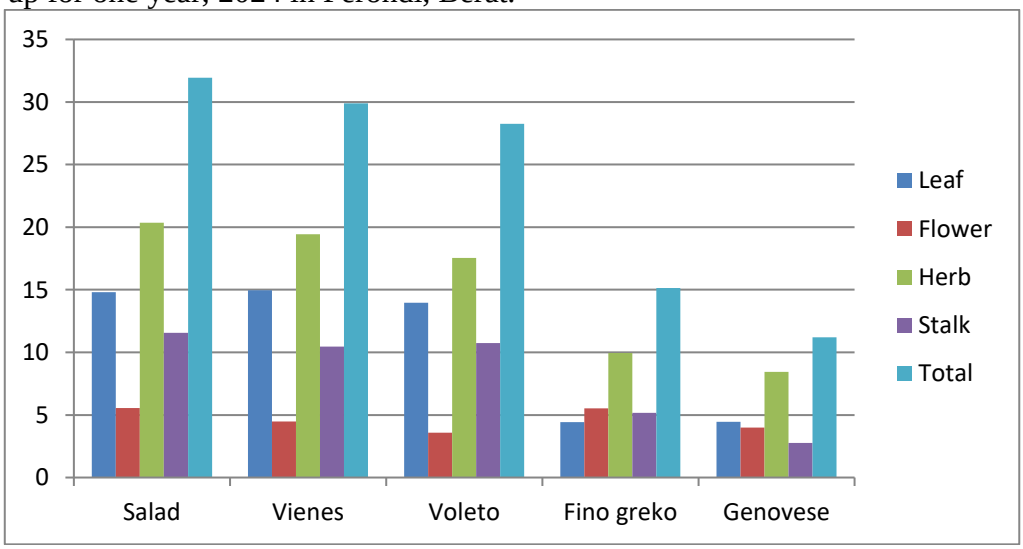
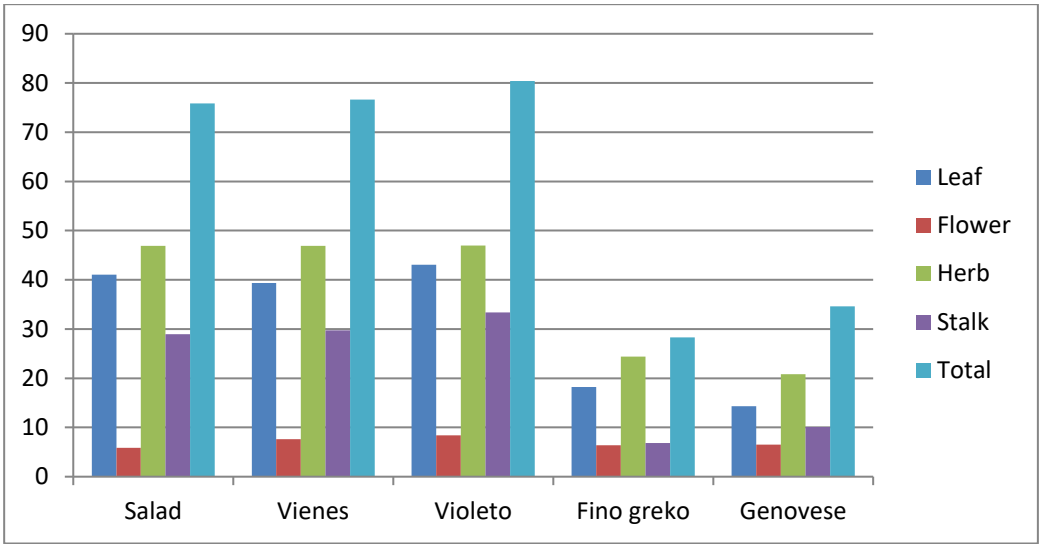


Chart. No. 4. Data on the yield of fresh mass by plant organs for the fist harvest

The first mowing of the first year presents significant differences between basil subspecies. The first three species give higher production of leaves, herbs, stems, and total yield, while flower yield shows differences not confirmed by statistical processing (Dmv: leaves 0.05 = 0.28, 0.01 = 0.36, flowers 0.09, 0.13, herbs 0.49, 0.68, stems 1.47, 1.98).



Graph. No.5. Data on the yield of fresh mass by plant organs for the second harvest

The second mowing gives a higher yield than the first mowing in all plant organs and in all five types of basil, but a lower yield of flowers. This feature makes the quality of the herb weaker due to the inappropriate ratio of plant organs (Dmv leaves 0.05 =2,226, 0.01 =2.874, flowers 0.08, 0.11, herb 3.37, 4.72, stems 4.56, 5.894).

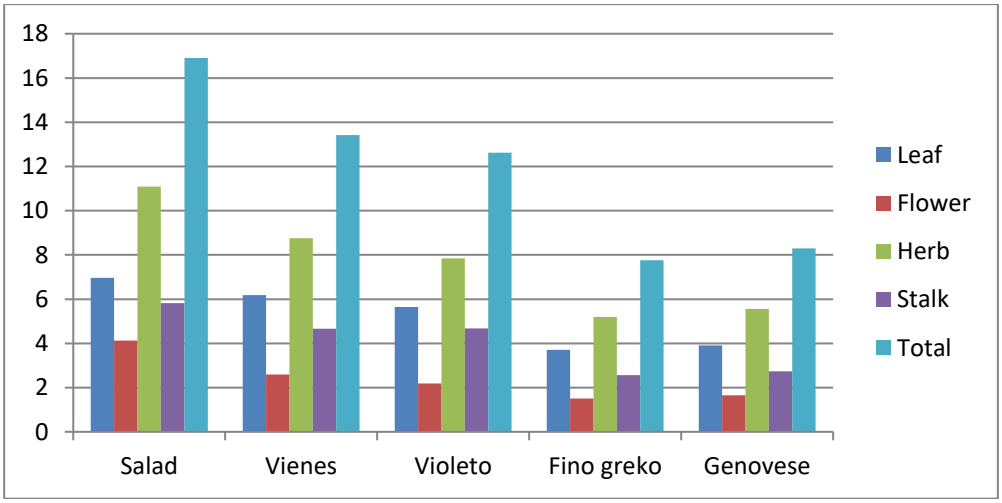


Chart. No. 6 Data on the yield of fresh mass by plant organs for the third harvest

The third harvest gives the lowest yield for all plant organs and all types of basil, with low herb quality. For experimental purposes, it has been weighed and calculated, but for industrial purposes, it requires special processing or fresh distillation because during natural drying, it is damaged and fermented. To preserve the quality of the herb, artificial drying must be done (Dmv 0.05 = 987, 0.01 = 1.213, flowers 0.763, 0.954, herb 0.55, 0.76, stem, 1.114, 1.456).

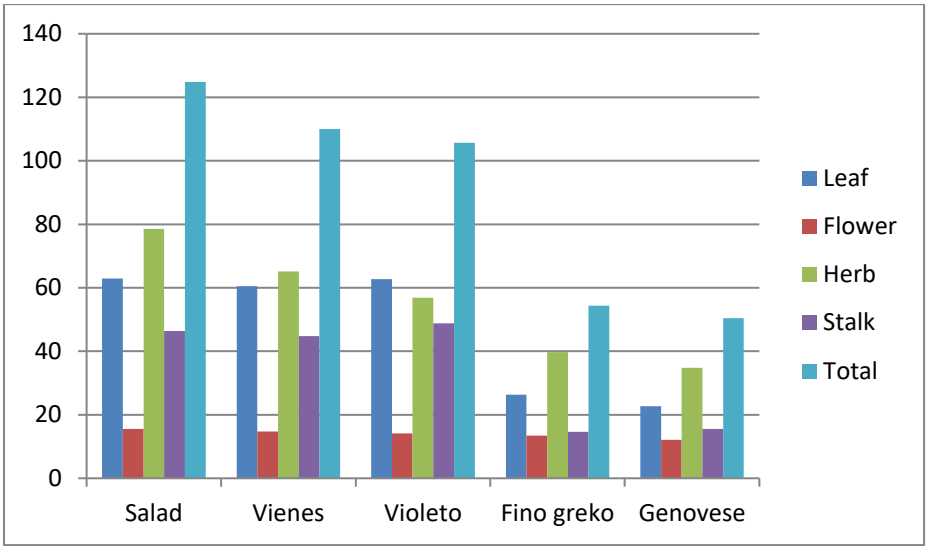


Chart. No.7. Data on total fresh mass yield by plant organs

The yield data for the three varieties clearly show that the first three types of basil (salad, vienes, and violeto) give higher yields of leaves, herbs, stems, and total, while there are no statistically significant differences in the yield of flowers. In the two subspecies of basil: fino greco a palla and genovese, there is a better ratio of plant organs, with flowers and leaves occupying the greatest weight (Dmv 0.05 = 0.5, 0.01 = 0.8).

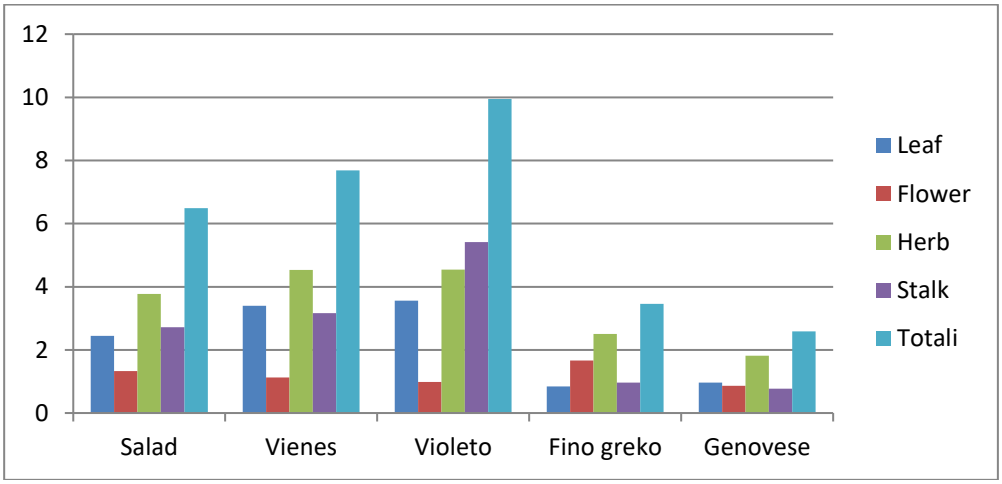


Chart No. 8. Dry matter yield by plant organs and total yield for the first harvest

The yield of dry leaves in the first harvest is low. The first three subspecies give higher yields, especially the basil subspecies viennes and violeto. Likewise, the production of dried flowers presents almost the same pattern, with a difference where the highest yield is given by basil for salad. The yield of stems and the total yield present obvious differences and are higher in the basil subspecies for salad, violeto, and viennes, and lower in the basil types fino greko and genovese.

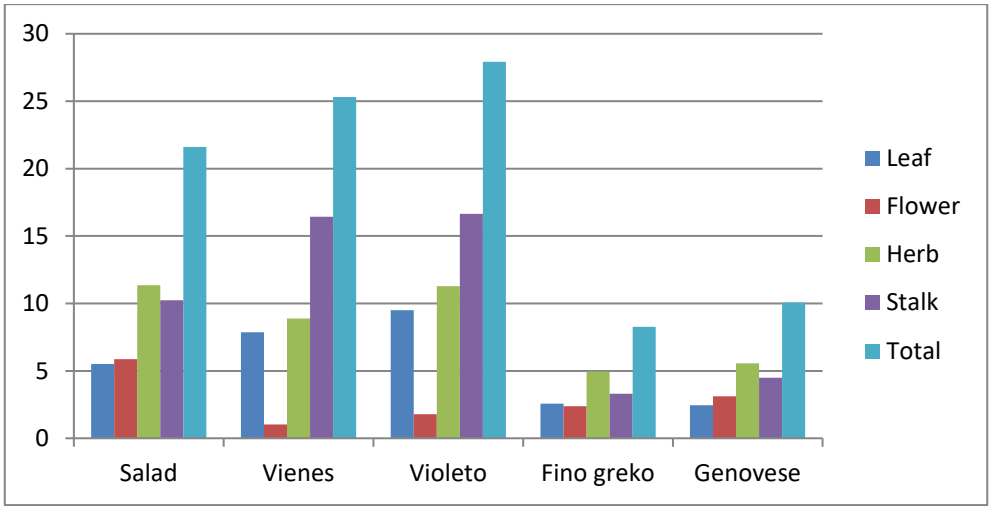


Chart No. 9. Dry matter yield by plant organs and total yield for the second harvest

The yield in the second harvest is higher for all plant organs and for all varieties. The increase in yield is up to three times higher. There are statistically proven differences between varieties, and the highest yield is achieved by three types of basil: salad, Vienna, and violeto. The highest flower yield is achieved by the subspecies viennes, salad, fino greko and genovese. The highest yield of stems is given by the varieties of basil for salad, Viennese, and Violeto. This characteristic reduces the value of the varieties because the essential content in the stems is lower and of poorer quality

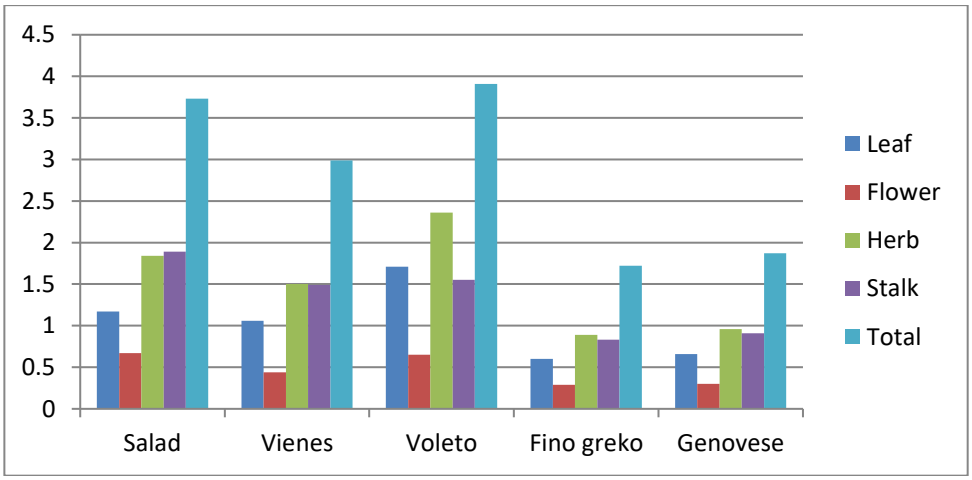


Chart No. 10. Dry matter yield by plant organs and total yield for the third harvest

In the third harvest, a much lower yield is obtained, especially the flower yield. From a value point of view, it appears weaker and with low utility values.

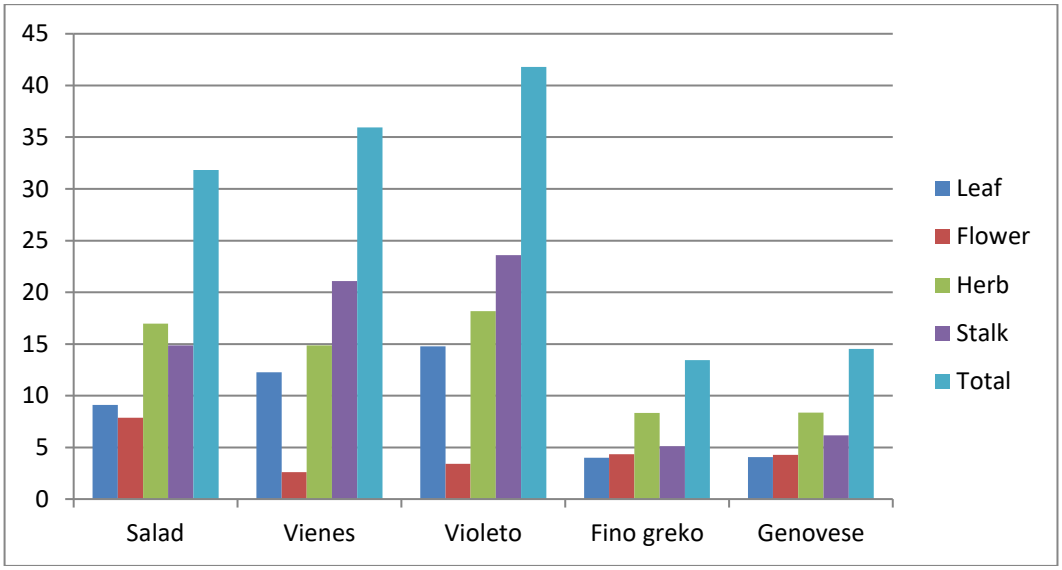


Chart No. 11. Annual dry matter yield by plant organs and total yield

From the graphical presentation of the average annual dry matter yield by plant organs, it is noted that the first three species give higher yields in plant organs and total yield. Proven differences are in the yield of leaves, herbs and stems. The yield of dried flowers is statistically proven and the highest yield is in the Viennese and Violeto varieties. The total yield is higher in the Violeto basil variety but is influenced by the high content of stems which can reach up to 58% of the total yield.

4. Conclusions and recommendations

4. A. Conclusions

From the analysis of the yield data of fresh and dry matter by plant organs and total yield for the five basil species, we can draw the following conclusions:

1. Among basil species, there are proven differences in yield according to plant organs: leaves, herb, stem, and total yield.
2. The three types of basil: salad, viennes, and violeto give the highest yield of fresh and dry matter by plant organ and in total.
3. The other two types, "Fino Greco" and Genovese, give higher yields of flower organs.
4. The highest stem content is different in all types of basil and is highest in violet basil.
5. Depending on the intended use, later harvesting may be done to obtain a higher flower yield.
   Further delay in harvesting leads to an increase in the number of stalks, reducing the quality of the herb.

4. B. Recommendations

From the study of basil types, we recommend that for industrial use, the following basil types should be cultivated: salad basil, Viennese basil, and violet basil, because they give a higher yield of fresh and dry leaf mass. While for the food and perfume industry, the Fino Greco and Genovese basil types should be cultivated because they give a higher yield of flowers.

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