

The Results of the First Year Study of Basil Subspecies (*Ocimum Basilicum L.*) for the Yield of Dry Mass by the Plants Organs and the Total Yield

Nefrus Çeliku^a, Nikollaq Bardhi^b, Zydi Teqja^b, Albert Kopali^b, Qatip Doda^c, Dilaman Nelaj^d

^aMinistry of Agriculture, Forestry and Water Economy, Republic of Macedonia

^bAgricultural University of Tirana, Albania

^cAgriculture and Food Department of Dibra Prefecture, Albania

^dAgriculture and Food Department of Kukes Prefecture, Albania

Abstract

Basil is one of the aromatic plants with wide range of use. Because of the chemical composition, it is used in perfumery, culinary, food industry, toothpastes, and in the production of soaps, shampoo and medicine. It is cultivated in many countries in the open fields (in warmer climates) and in greenhouses. In Albania, it is been cultivated since 1958 in Levan, Fier for domestic use and for export (Bardhi. N). After 1990 it was cultivated by several farmers in Elbasan, Lushnjë, Fier and Permet. The production of fresh mass is processed by companies of medical aromatic plants for the production of essence and for the production of tomato sauce. Based on the values of use, the three-year study was undertaken for the five subspecies of basil. The study includes five subspecies of basil: Limonez basil (*Ocimum Basilicum lemon*), Napolitan basil (*Ocimum basilicum fogliare*), Red basil (*Ocimum basilicum Roso*), Fino Greco basil (*Ocimum basilicum fino Greco*), and Genovez basil (*Ocimum basilicum genovese*). The study was set up in Toshkez, Lushnje, according the randomized block scheme, with five variants in four repetitions. The biometric measurements were made on the plant height, the yield of floral, the leaf and herbs, and dry stalks. There are observed verified changes among subspecies of basil.

KEYWORDS: Basil, dry matter, floral, herb, leaf, stalk, variant, yield.

INTRODUCTION

The study of medical aromatic plants is a comparatively new field of experimental studies, in field and laboratory. Among the studied plants like sage, mint, sanza (*Gentianae radix*), coriander, oregano, chamomile, it is basil, too (Ceku. K., Bordo.F Group of authors). In this study, there are been included five subspecies of basil. The experiment was set up in five variants and four repetitions. There are been carried out three mowings. The production is dried and are been calculated the respective yields (Gjoni. Z., Kutrolli. F). Study subspecies and their assessment for the production of dry mass and chemical composition and the differentiation between them is a scientific, productive and utilization need, more accurate for the production of each of them. Basil subtypes represent many differences from the shape of the plant indicators, the production of herbs and plant organs, the essence content and their chemical ingredients

(Asllani. U., Anasi S. Emanuel). The difference of dry mass yield by plant organs is the subject of this study, presented in this scientific article.

MATERIALS AND METHODS

Basil is one of medicinal aromatic plants most widespread in the world and in many European countries. In Albania is planted for pharmaceutical and perfumery since 1958 in Levan, Fier. After 1990, at the request of the French market companies (ALB DU CROS) stemmed from specific farmers in some areas such as Fier, Lushnje, Elbasan, Tirana and Përmet. Seeing and recognizing that, basil plant has found wide use in many respects, it was expedient to study this plant for some key aspects, by most typical subspecies in Mediterranean climate.

Purpose: To be experimented in the field several subspecies (five) of basil, with different values of use and content of the essence. To be determined the dry mass yield for each mowing and at the same time, the final yield for the three mowing (especially two, the summer and autumn mowing), as well as indicators of dry leaves, flowers, herb and stalks.

In the study of basil subspecies included five subspecies of basil, namely:

1. Limonez basil (*Ocimum Basilicum lemon*).
2. Napolitan basil (*Ocimum basilicum fogliare*).
3. Red basil (*Ocimum basilicum Roso*).
4. Fino greco basil (*Ocimum basilicum fino greco*).
5. Genovez basil (*Ocimum basilicum genovese*).

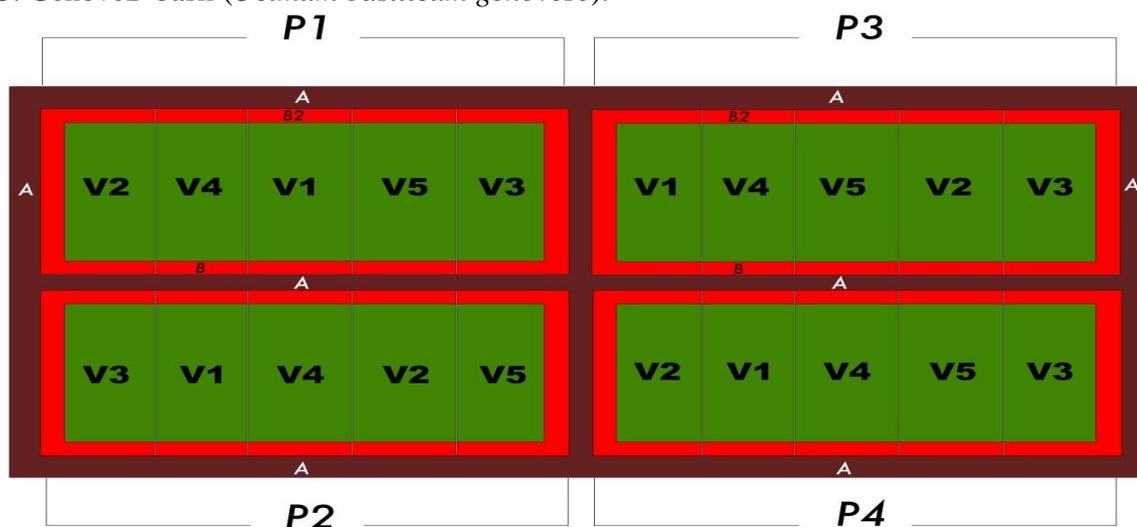


Figure 1. Setting up the experiment to study the subspecies of basil: A= the paths through the experiment, B = the protection area of the experiment, V = Variants (1-5), and P =Repetitions (1-4).

Basil subtypes have different morphological features and therefore the number of plants is provided by features they have. All variants are set up in four repetitions. There are maintained morphological records and mowing is done on stage before flowering. Harvest is done with sickle 5-8 cm height from the ground (first mowing) and they are dried by placing in the net twine, first in the shade and later in the sun, altering and mixing the mass until its complete drying. The technology of cultivation is done by the known practice, while the seedlings are produced with the most innovative methods, with

polystyrol bikerin by planting in greenhouses with central heating. The planting of saplings in the field is done when it is fully grown saplings (after 55-65 days from sowing of seeds). Planting was conducted by man-power (without mechanization), with stakes by placing seedling 1- 1.5 cm deeper than they have been in the seedbed. During vegetation the rrigations and hoeing are made as needed for moisture and the emergence of weeds. Biometric measurements are focused on the following indicators: the yield of dry leaves, the yield of dry flowers, the yield of dry herbs, the yield of dry stalks, and the total yield (leaves + flower + herb + stalks) of the dry mass of each harvest and three harvests.

RESULTS AND DISCUSSION

During the past three years were made the biometric measurements and the calculations of the dry mass production for four indicators: leaves, flowers, herb (leaves and flowers), stalks and the total yield for each scythe and the three harvests (scythes). The first mowing is done in June before flowering stage. It has become the drying of the fresh mass and the respective weighing, counting the performance according to plant organs.

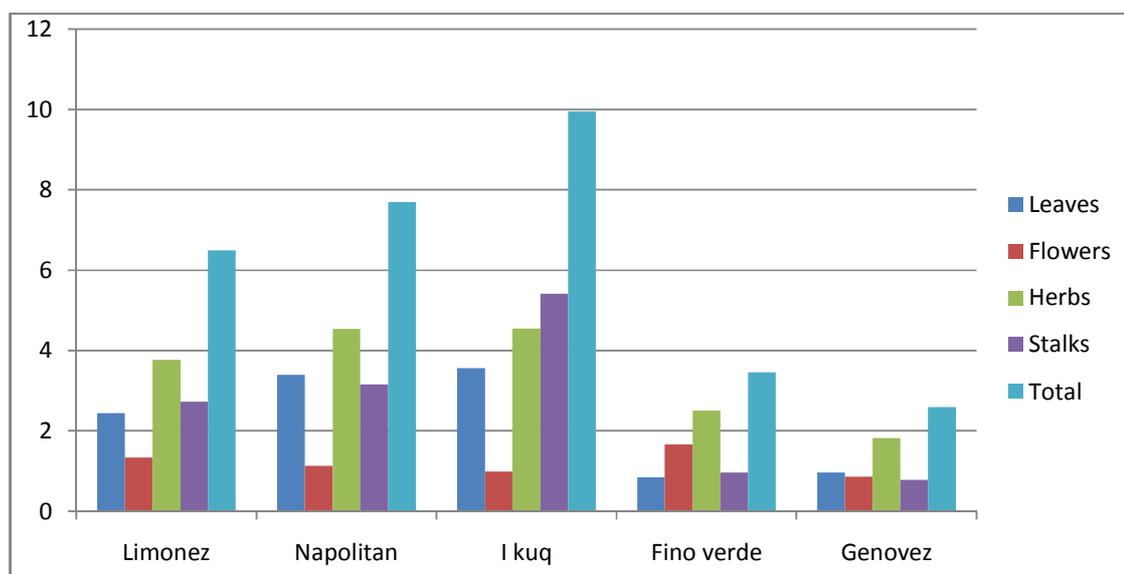


Figure N0.1. The yield of dry mass by plant organs and total for the first harvest (scythe)

The yield of dry leaves in the first scythe was low. The first three subtypes provide higher yields, especially subspecies of red basil Napolitan basil. Likewise, the dry flower production represents almost the same lawfulness, having a difference, wherethe higher yields has the limonez basil. The yield of stalks and general yield represent significant differences and the higher yields are in the subspecies of the Neapolitan basil and red basil and the lower yields are to subtypes of fino verde and genovez basil.

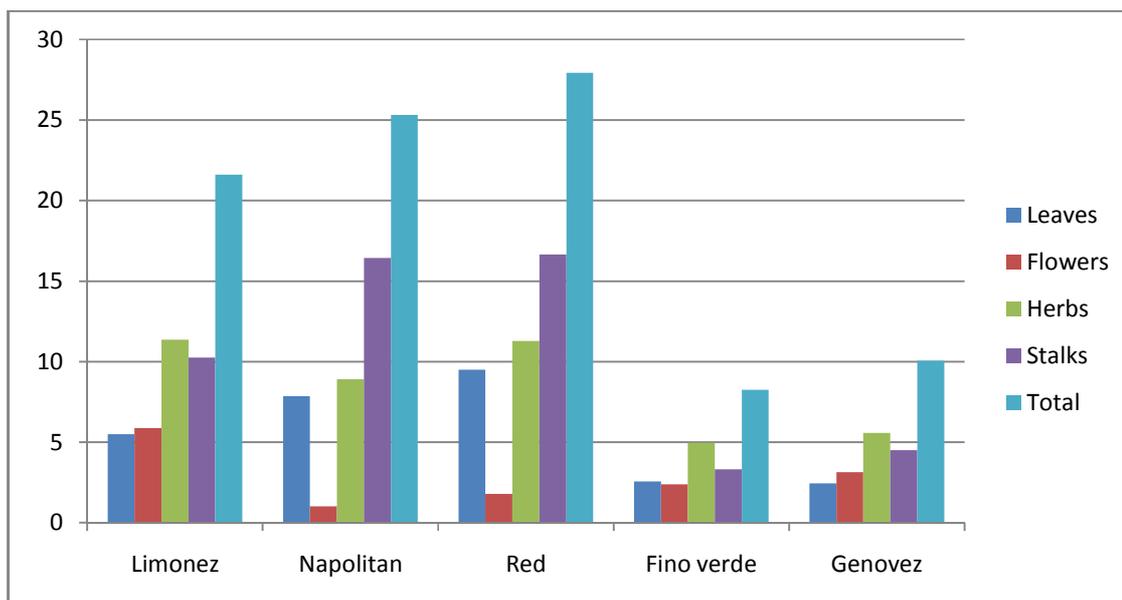
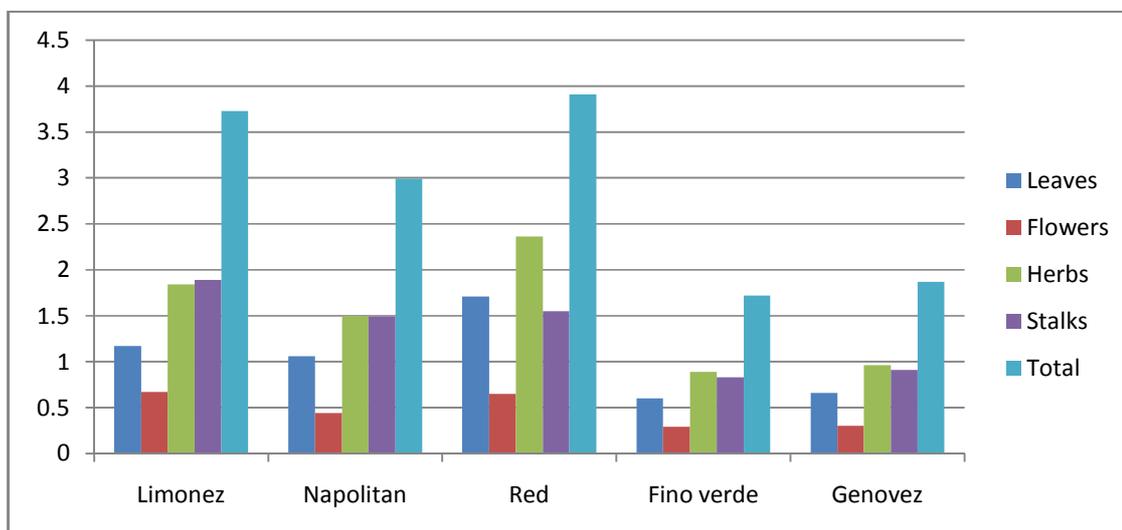


Figure N0. 2. The dry mass yield by plant organs and total yield for the second harvest

The yield in the second scythe is higher for all plant organs and for all subtypes. The performance reaches up to three times higher. Among the subspecies, there are differences statistically verified and, the higher yields have three subtypes of basil: limonez, Napolitan and red basil. The higher yields of flowers has subspecies of limonez basil. The highest yield of stalks of basil have the subspecies of Neapolitan and red basil. This feature reduces the value of subspecies because the essence content of the stalk is with lower and poorer quality.



FigureN0. 3. The dry mass yield by plant organs and the total yield for the third scythe.

In the third scythe is taking a much lower yields, especially in the floral yield. From the perspective of values, the yield is more weak and with the lowest use value.

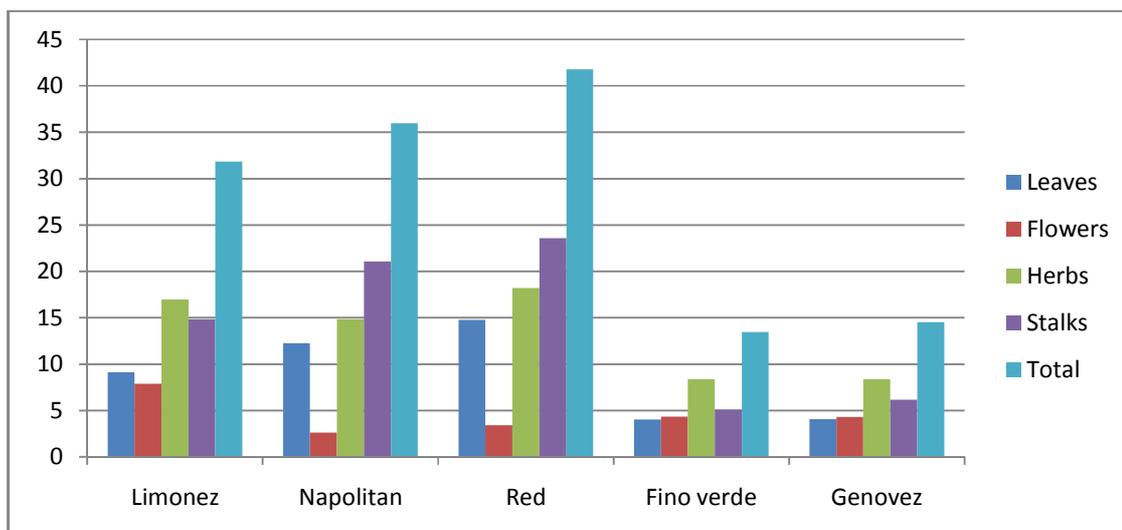


Figure NO. 4.The annual yield of dry mass by plant organs and total yield

From the graphic presentation of the three-year average yield of dry mass by plant organs, it is noted that the first three subtypes provide higher yields in plant organs and overall productivity. The verified differences are been noted in productivity of leaves, herbs and stalks. The dry flower yield is with differences statistically verified, and the highest performance has the limonez subspecies. The overall yield is higher at subspecies of red basil, but with impact from the high content of stalks that manages to be 58% overall yield.

CONCLUSIONS

From the general analysis of the data of dry mass yield by plant organs and total yield, we come to the following conclusions:

- Among the subspecies of basil, there were verified differences of yield by plant organs, leaves, herb, stalks and the general yield.
- Three subtypes of basil: limones, Napolitan and the red basil provide higher yields of dry mass. - The floral yield is different, and the limones basil gives the higher yields.
- The contents of stalks is different to all the subcategories of basil and the higher content has the red basil.
- Depending on the intended use, it can be performed the later harvest to get higher floral yields. Further delay reduces the quality and content of the essence because it will be increased the amount of cellulose and stalks, worsening the quality of herb and overall productivity by reducing the values of use in the food industry and perfumery.

Recommendations

From the study of basil subspecies we would advise that for industrial use to be cultivated the first three subtypes that have the highest performance dry mass of leaves, herbs, stalks and overall productivity. While, for purposes of use in the food industry and perfumery, should be used two other subspecies that have higher yields of flowers and the better content and quality of the essence. Meanwhile, it should be analyzed the performance of essence according to the development phases of the plant to determine the best time of mowing by use purpose and to get better quality of plant organs and essence.

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