

## **EFFECT OF THE SUBSTRATE COMPOSITION ON PIGMENT CONTENT AND PHOTOSYNTHETIC PRODUCTIVITY OF BASIL**

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Basil - is an aromatic herb in the Lamiaceae family, which is grown all over the world. This can be explained by a farm value of this culture. Basil is used in cooking, medicine and cosmetics as well as an ornamental culture.

In Ukraine basil is cultivated in small areas, but the demand for this herb is increasing annually. It serves as a motivation for the development of new technologies for growing basil in greenhouses, which contributed to raising productivity. The substrate is one of the most important technological elements of basil cultivation in greenhouses.

This research was conducted under greenhouse conditions according to conventional methods in the 2014 – 2015 years. Two basil varieties of native selection were used in the research: Bad`oryi with green leaves and Filosoф with purple leaves. For the preparation of peat and mineral substrates peat moss and perlite in different proportions have been used. The variant with pure peat was the control one. In the course of research the content of chlorophyll and carotenoids, leaf area, plant weight and net productivity of photosynthesis have been determined.

It was established that Bad`oryi variety accumulated the highest level of chlorophyll (13 % more than in the control variant) and carotenoids (15,8 % more than in the control variant) in substrate consisted per 60 % of peat and 40 % of perlite. By increasing the percentage of perlite in the substrate the level of pigments was decreasing.

Filosoф variety accumulated the highest level of chlorophyll (23 % more than in the control variant) and carotenoids (19,5 % more than in the control variant) in substrate consisted per 40 % of peat and 60 % of perlite.

Introduction of perlite in the substrate increases the weight of plants. An optimal substrate for Bad`oryi variety was the one which was composed per 60 % of peat and 40 % of perlite. In this variant the weight of plant at the budding phase was increased per 21,4 %, and at the flowering phase - per 45,2% as compared with the control one. An optimal substrates for Filosoф variety were those, that contain 40 and 60 % of perlite. In these variants the weight of plant at the budding phase was increased per 24,9 %, and at the flowering phase - per 34% as compared with the control one. Two-factor analysis showed that a decisive influence on the weight of plants of both varieties at the budding phase the substrate factor had.

The substrate as well effected on basil leaves area. The increasing of leaf area was occurring with the increasing the percentage of perlite in the substrate up to 40 % for Bad`oryi variety and up to 60 % for Filosoф variety.

Net photosynthetic productivity was higher for Filosoф variety per 8.7 % and changed depending on the substrate. Both varieties has highest net photosynthetic productivity in the substrate consisted per 60 % of peat and 40 % of perlite. In these variants net photosynthetic productivity was increased per 37 % in Bad`oryi variety and per 21,4 % in Filosoф variety as compared to the control one. The share of the impact of substrate factor on the net photosynthetic productivity was decisive (95,3 %), cultivar factor lost significance under meaningful interaction between these factors. Starting from the budding phase to the flowering phase the net photosynthetic productivity was lower but the tendency to increase net photosynthetic productivity under increasing the percentage of perlite in the substrate persisted.

While researching the correlation between the levels of pigments and net photosynthetic productivity established. The correlation coefficient was: 0,92 for Bad`oryi variety and 0,94 for Filosoф variety.

**Keywords:** basil, substrate, pigments, leaf area, net photosynthetic productivity.