

# Shoot and leaf growth responses to light microenvironment and substrate in raspberry and blackberry cultivars

Dascalu M., Caulet R.P., Morariu A., Negrea R., Pascu D., Sfichi-Duke L.  
U. .A.M.V. Iași

## Introduction

The dependence of shoot behavior and leaf area on light microenvironment and substrate was examined in three cultivars of red raspberry (Opal, Cayuga and Ruvi) and two cultivars on blackberry (Thornfree and Lochness), growing on an experimental field from June to October 2011. Plants were cultured in two conditions of light, namely 100% sunlight and 25% sunlight and two conditions of growth substrate, namely soil and a soil/peat mixture. Several parameters such as leaf area, number of shoots, and number of leaves per shoot, photosynthetic pigments and photosynthetic capacity were analyzed. All raspberry cultivars developed larger leaves on a soil/peat mixture than on soil. Contrary, blackberry cultivars showed smaller and less leaves on a soil/peat mixture than on soil, mainly in shade conditions. Among raspberry cultivars, Opal showed the highest number of shoots in full sunlight on a soil/peat mixture. Genotypic variations in the accumulation of photosynthetic pigments and photosynthetic capacity in response to substrate and light in response were also found. The significance of light and substrate conditions on raspberry and blackberry growth and development is discussed.

## Material and method:

The experience was made, from 2011, in the experimental field of Fruit trees culture  
The species studied were:

1. Raspberry with varieties: Opal, Cayuga and Ruvi
2. Blackberry with varieties: Thornfree and Lochness

Both varieties have been grown on a mixture of soil - peat (50:50), both under natural light conditions as well as shading (shade net) (25 %). Each variety was an experimental variant, and for each was taken 5 repetitions.

Biometric measurements were made on leaf size, number of shoots per plant, average number of leaves on the shoot. Also, to plant photosynthetic capacity expressed by determining spectrophotometric of chlorophyll (Lichtenthaler method) and photosynthesis rate with your LICOR 2000.

## Results and discussions:

Analyzing the number of shoots emitted at **variety Cayuga** could observe that when using soil - peat substrate, their number and number of leaves on the shoot are similar. In daylight conditions, appeared more shoots when using soil as substrate and leaf number increased when the amount of light was diminished (A).

For the **variety Opal** can be seen a significant increase in the number of shoots in case of plants grown in soil-peat substrate. Number of leaves on shoots was higher in case when the light was diminished (B).

**Variety Ruvi** reacted like the light factor on both types of substrate. Both leaf number and shoot length were higher in reduced light (C).

For blackberry, the **variety Lochness** shoots number was lower when compared to normal soil cultivation on the version that the light was dimmed, and in case of soil - peat substrate, the phenomenon is reversed. Number of leaves was higher in soil cultivation variant with natural light (D).

**Variety Thornfree** recorded approximately the same values for the number of shoots on the ground cultivation. For shading, the number of shoots on soil-peat substrate was higher. Leaf number was relatively equal for cultivating the soil, and their number increased in shade (E).

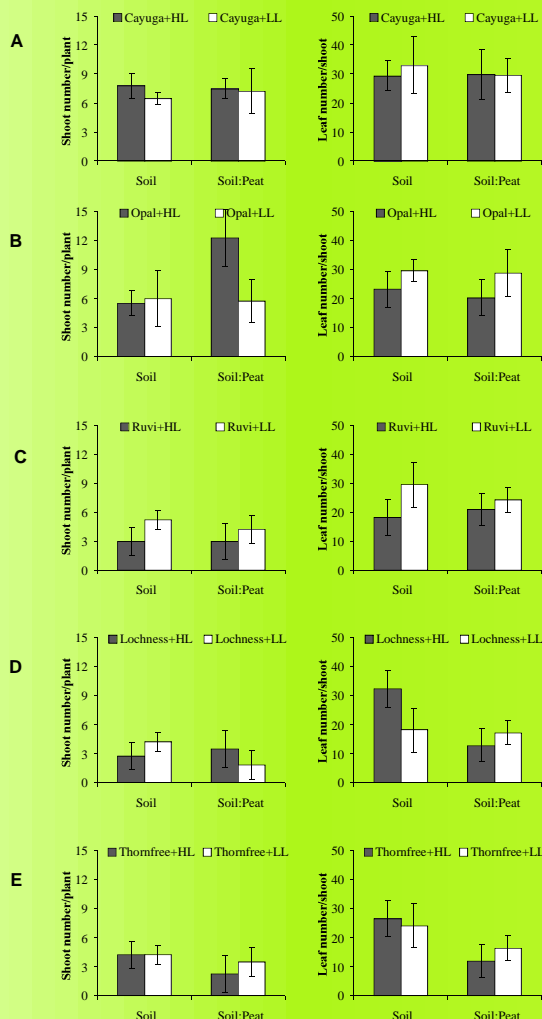


Fig. 1 - Relations between shoot and leaf number / plant

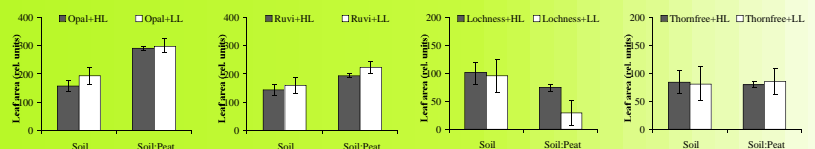


Fig. 2 - Leaf area on raspberry and blackberry plants

## Conclusions:

1. Both species and all varieties have different reactions depending on the substrate used and how enlightening the aerial part.
2. In low light conditions, is recommended Opal and Ruvi raspberry varieties cultivation, they managed to form a vegetative biomass to compensate the absence of this factor.
3. Cayuga raspberry variety and blackberry varieties are recommended to be grown in sunny areas, on all soil types.

## References:

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