

# SHOOT AND LEAF GROWTH RESPONSES TO LIGHT MICROENVIRONMENT AND SUBSTRATE IN RASPBERRY AND BLACKBERRY CULTIVARS.

INFLUENȚA CONTROLULUI LUMINII ȘI A SUBSTRATULUI DE  
CULTURĂ ASUPRA CREȘTERII ȘI ALTE TRĂSĂTURI LA  
UNELE SOIURI DE ZMEUR ȘI MUR

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*Abstract: Raspberry and blackberry bush are cultivated species in the North East of Romania, but the two species occupy small areas and small productions are recorded. For this reason, the discipline of Fruit Trees culture has conducted an experiment to determine the most appropriate technological chains for raspberry and blackberry bushes, and that cultures to become profitable.*

*Key words: Raspberry, Blackberry, Technological chains.*

*Rezumat: Zmeurul și murul sunt specii cultivate în zona de Nord Est a României, dar cele 2 specii ocupă suprafețe reduse, iar producțiile înregistrate sunt mici. Din acest considerent, în cadrul disciplinei de Pomicultură s-a realizat un experiment pentru a stabili cele mai adecvate verigi tehnologice, astfel încât cultura zmeurului și murului să devină rentabilă.*

*Cuvinte cheie: zmeur, mur, agrotehnica.*

## 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 Ruvî) 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 and 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 (Fig 1 and 2).

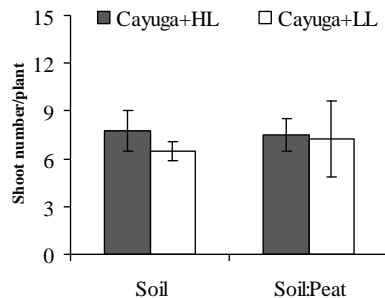


Fig.1 – Shoot number/plant-Cayuga variety

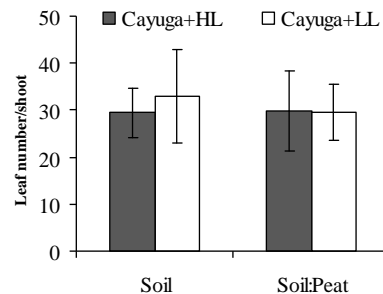


Fig. 2 – Leaf number/shoot-Cayuga variety

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 (Fig. 3 and 4).

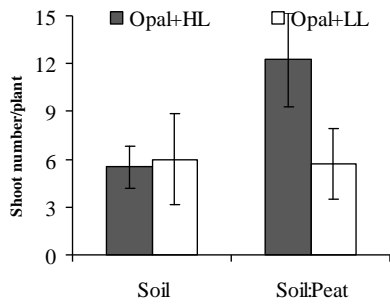


Fig.3 – Shoot number/plant-Opal variety

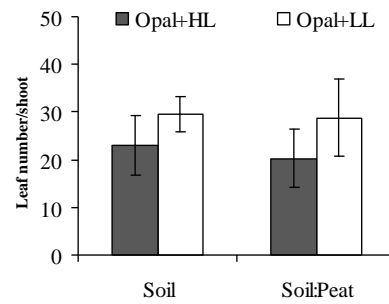


Fig. 4 – Leaf number/shoot-Opal variety

Variety Ruvi reacted in the same way at the light factor on both types of substrate . Both leaf number and shoot length were higher in reduced light (Fig. 5 and 6).

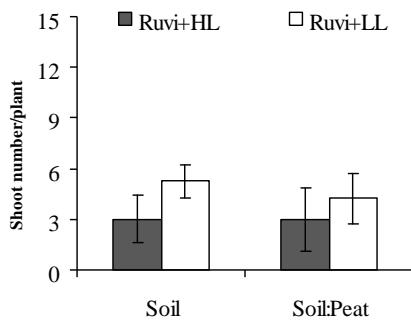


Fig.5 – Shoot number/plant - Ruvi variety

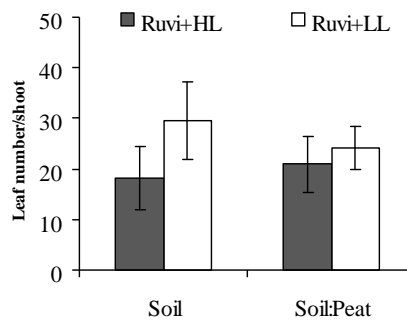


Fig. 6 – Leaf number/shoot - Ruvi variety

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 (Fig. 7 and 8).

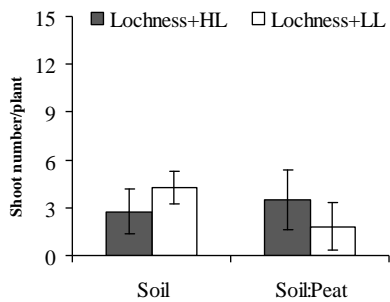


Fig.7 – Shoot number/plant-Lochness variety

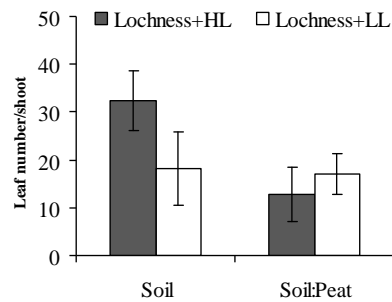


Fig. 8–Leaf number/shoot-Lochness variety

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 (Fig. 9 and 10).

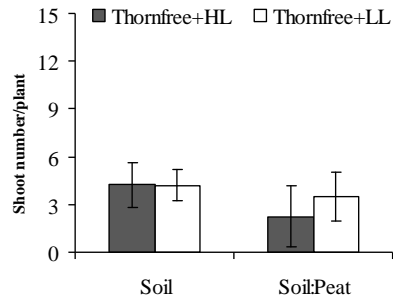
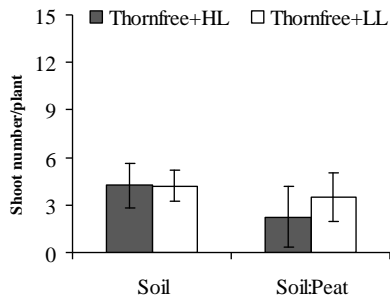


Fig.9–Shoot number/plant-Thornfree variety Fig.10–Leaf number/shoot-Thornfree variety

### 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 Ruvii 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.

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