

## REZULTATE PRELIMINARE PRIVIND INDUCEREA FORMĂRII DE LĂSTARI ANTICIPAȚI LA SPECIA PRUN (*PRUNUS DOMESTICA* L.) ÎN PEPINIERA POMICOLĂ

## PRELIMINARY RESULTS REGARDING INDUCING OF FEATHERING AT PLUM (*PRUNUS DOMESTICA* L.) IN FRUIT TREE NURSERY

Jakab-Ilyefalvi Zsolt

Research Station for Fruit Growing Bistrita, Romania

### Abstract

Feathered nursery trees have the most important role in the high-density apple planting systems. It is critical to plant well developed feathered, branched nursery trees at the beginning of new fruit orchard establishments. The objective of this paper is to show preliminary results obtained in an experiment of inducing feathering in plum through natural „pinching” or „leaf removal” technique. There is a great difference of the planting material obtained in nursery with or without new branches called „feathers”. The plum planting material is highly sought by professionals, hobby gardeners equally, thus the interest on this species is great. Projecting the crown starting in the nursery, after planting at the final orchard establishment the further forming of the crown is much easier and quicker, greater yields can be obtained, shortening the period of yield appearing time. In 2017 in the nursery of FRDS Bistrita we tried to experiment the „leaf pinching technique” or leaf removal technique of the upper leaves on the top of axis. Applying this method we achieved well branched, feathered young trees of the two studied plum cultivars 'Romaner' and 'Andreea'. The feathering was induced with „pinching” treatment in June 2017. The analysed data showed that an average of 4-7 new feathers formed (63-73,3%) in both cultivars. At 'Romaner' cultivar was registered also a percent of 26.7 % of 1-3 feathers. A greater number of feathers at 'Romaner' cultivar is reduced, just 10 % of the trees had 8 feathers. At 'Andreea' cultivar the most important number of feathers were the trees with 4-7 feathers in 73.3 %. A greater number of feathers were observed at 'Andreea' cultivar, 23.3% of the trees had more than 8 feathers.

**Cuvinte cheie:** lăstari anticipați, frunze terminale, tehnica ruperii frunzelor, prun, soiuri.

**Keywords:** feathers, terminal leaves, pinching technique, plum, cultivars.

### 1. Introduction

Quality of planting material is a key factor in the obtaining of higher yields starting with the first years of cultivation in new orchard establishments or family gardens. In the countries of west and central european zone in the nurseries the planting material is mostly formed by the knip type tree shape but in many other countries like Romania the traditional nursery trees without feathers are formed, due mostly to economical reasons. The traditional nursery trees without feathers have still an impact on the existing market, but in central Europe the tendency is to provide well branched feathered trees (Kviklys, 2006) and it is necessary to experiment also in Romania the inducing of feathering and supplying feathered nursery tree material.

In some fruit tree species the inducing of feathering is harder and depends on many factors like environmental factors (Tromp, 1992), cultivars, feathering inducing techniques (Wertheim, 1978) at apple, pear. In some other species like plum, in several cultivars the inducing of feathering is slight easier and could be effectuated without applying chemical regulators to form lateral branches. The plum has a natural tendency to form lateral branches but when applying other techniques the number of feathers is increased.

The aim of the trial was to investigate the impact of the „leaf pinching technique” in 2017 at plum species (*Prunus domestica* L.) studying several biometrical factors of the feathered, branched young nursery trees.

### 2. Material and methods

At the nursery of Fruit Research Station Bistrita in 2017 it was established a field trial to investigate the impact of the induced „pinching” technique on two plum cultivars 'Romaner' and 'Andreea'.

The pinching technique consisted in the leaf removal of the upper terminal axis leaves from the top, applied in June 2017. The experiment was set up as a standard field trial with a completely randomized block design, with three repetitions, control variant consisted in trees without „pinching”, treatment variants were those with „pinching”, results were analyzed with XLSTAT statistical software with ANOVA model analysis. Experimentally another secondary trial was made to try a stimulation of laterally branching of trees with the cutting back of the axis applied late in August (15.08.2017) in order to see if the cutting has an late impact on feathering of the nursery trees. Results were visually analyzed.

### 3. Results and discussions

The differences of main biometrical characteristics between the control variant and treatment variants can be seen both visually and statistically. In the case of the control variant without „pinching” treatment application, in both cultivars 'Andreea' and 'Romaner' there were observed high growth patterns of 1.70-1.90 m in height, the trees bended under the influence of the wind (Fig. 1). At the treatment variants (Fig. 2) there were formed several well developed lateral branches in the upper part of the nursery trees.

Analyzing the biometrical indicator height of the trees (Fig. 5) we can conclude that the height of 'Romaner' cultivar achieved an average of 148.9 cm and 104.2 cm at 'Andreea' cultivar, the control variant being significantly different as treatment variants 'Andreea' and 'Romaner'. Thus in the feathered trees, height had medium values of 112.93 cm and 98.96 cm, the energy of the trees being probably distributed toward feather formation. Critical in the vegetation period the applying of water and fertilizers to promote and sustain plant development in feathered trees. In control variants at 'Andreea' cultivar, trees achieved very height dimensions (185 cm).

When analyzing the number of feathers we can conclude that treatment variants differ from each other, in 'Andreea' cultivar there were registered an average of 6.7 feathers and in 'Romaner' cultivar 5.4 (Fig. 6). The majority of the trees in both cultivars formed 4-7 lateral branches (63-73.3%). At 'Romaner' cultivar a percent of 26.7 of 1-3 feathers was registered also. A greater number of feathers at 'Romaner' cultivar is reduced, just 10 % of the trees had 8 feathers. At 'Andreea' cultivar the most important number of feathers were the trees with 4-7 feathers in 73.3 %. A greater number of feathers were observed at 'Andreea' cultivar, 23.3% of the trees had more than 8 feathers.

In the case of height of branch offset biometrical indicator analysis, we can conclude that there is a significant difference in the two cultivars, in 'Andreea' lateral branching occurs at an average of 68 cm and in 'Romaner' at 58 cm (Fig. 7).

The thickness (diameter) of trees indicator showed higher values in 'Romaner' cultivar (1.33 cm) close to treatment cultivar 'Andreea' (1.28) and significantly different followed by 'Romaner' treatment (1.21 cm) and lastly 'Andreea' control cultivar (1.10). The thickness indicator showed that feathered trees had relatively close values of 1.28-1.21 cm although significantly different from each other.

We observed in the second trial, visually that after 15.08.2017 the applying of cutting back of the main axis in order to influence and promote lateral branching, is a late intervention date. The method of laterally branching inducing techniques should be applied in June, at least in the beginning of July, but further experiments will give more information's on the appropriate time of agrotechnical interventions.

In the future we will experiment the crown forming techniques and we will study the orientation of the feathers regarding tree formation.

### 4. Conclusions

According to the effectuated researches it was preliminary established that:

- It is possible to obtain well laterally branched nursery trees with 4-7 feathers in plum species (*Prunus domestica* L.) at cultivars 'Romaner' and 'Andreea' with the aim of „pinching” technique;
- Height of trees is slice reduced in laterally branched nursery trees in comparison with the control variant without pinching;
- Cutting back of the main axis in order to promote lateral branching should be effectuated before mid August (15.08.);
- Height of branch offset in the two cultivars in 'Andreea' and 'Romaner' occurs at an average of 68 cm in 'Andreea' and at 58 cm in 'Romaner';
- The thickness indicator showed that feathered trees had relatively close values of 1.28-1.21 cm in diameter although significantly different from each other.
- Pinching technique will be further investigated and experimented at other species and cultivars in the future targeting crown formation techniques and feather orientation study in the crown shape

## 5. Acknowledgments

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## References

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## Tables and figures



Fig. 1. Control variant without feathers



Fig. 2. Nursery trees with feathers



Fig. 3. Height of branch offset measurement



Fig. 4. Thickness measurement of experimental trees

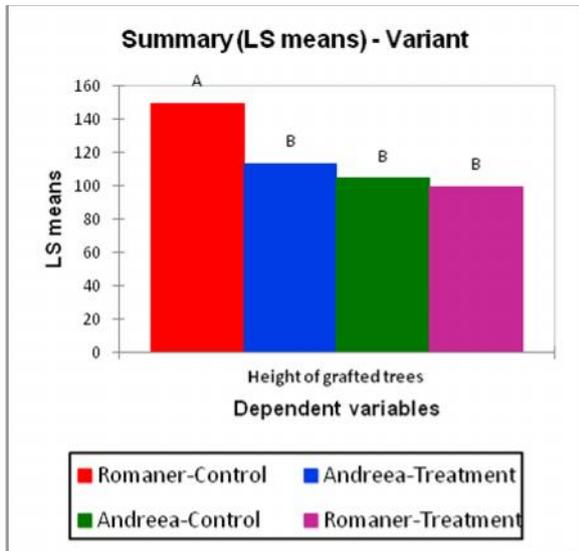


Fig. 5. Height of the treatment vs control trees

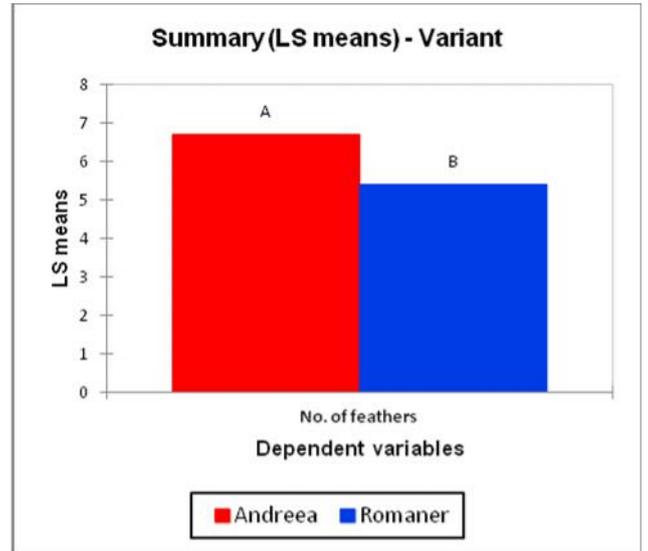


Fig. 6. Number of feathers of experimental trees

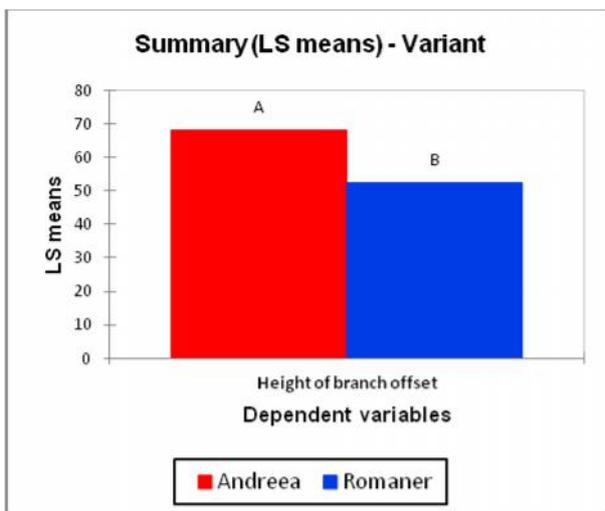


Fig. 7. Height of branch offset in the field trial trees

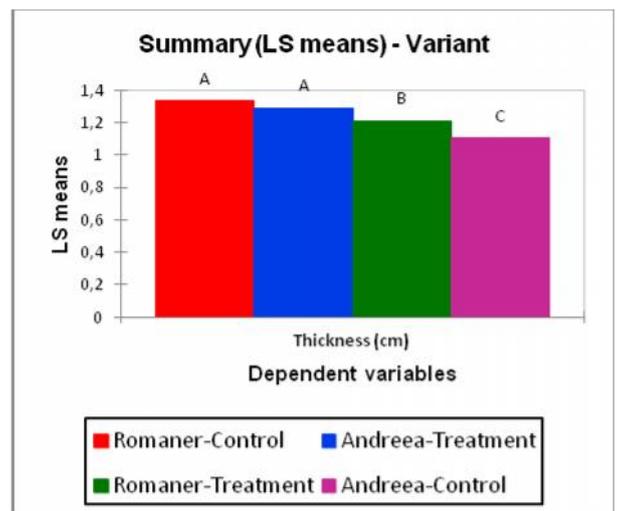


Fig. 8. Thickness of the experimental trees