

ORCHARD PERFORMANCE OF SOME PLUM CULTIVARS GRAFTED ON DIFFERENT ROOTSTOCKS

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INTRODUCTION

- The most common rootstock for plums in Romania is Myrobalan (*Prunus cerasifera*). This rootstock has some disadvantages: large vigor trees, sensitivity to Plum Pox Virus, incompatibility with some cultivars (e.g. Tuleu gras and your progenies), late bearing and intensive suckering.
- At present, a very important role in the intensification of plum orchards has low vigorous rootstocks.
- This is the reason that in Romania (at RIFG Pitesti, RSFG Bistrita and UCv-RSFG Vâlcea), started the breeding program for rootstocks. The main objectives in this program are: low to medium vigour, good ability to vegetative propagation techniques, resistance and/or tolerance to important pest and diseases, adaptability to pedo-climatic conditions of our country, good compatibility with plum cultivars and good influence to precocity, yield and fruit quality.

MATERIAL AND METHODS

- The experimental orchard was established during spring 2015 at RIFG Pitesti – Maracineni, Genetic and Breeding Department.
- Five plum cultivars grafted on three rootstocks were planted in a spacing 4 m between the rows and 3 m between trees, according to the following experimental scheme:
 - Factor A – cultivar, with five graduations (a1-‘Andreea’; a2-‘Pitestean’; a3-‘Romanta’; a4-‘Cacanska lepotica’; a5-‘Jojo’);
 - Factor B – rootstock, with three graduations (b1-‘Mirodad1’; b2-‘Adaptabil’; b3-‘BN4Kr’).
- The experiment was carried out in a randomized block design, in 3 replications with 4 trees per replication. The trees were irrigated and their crowns were flat open center.

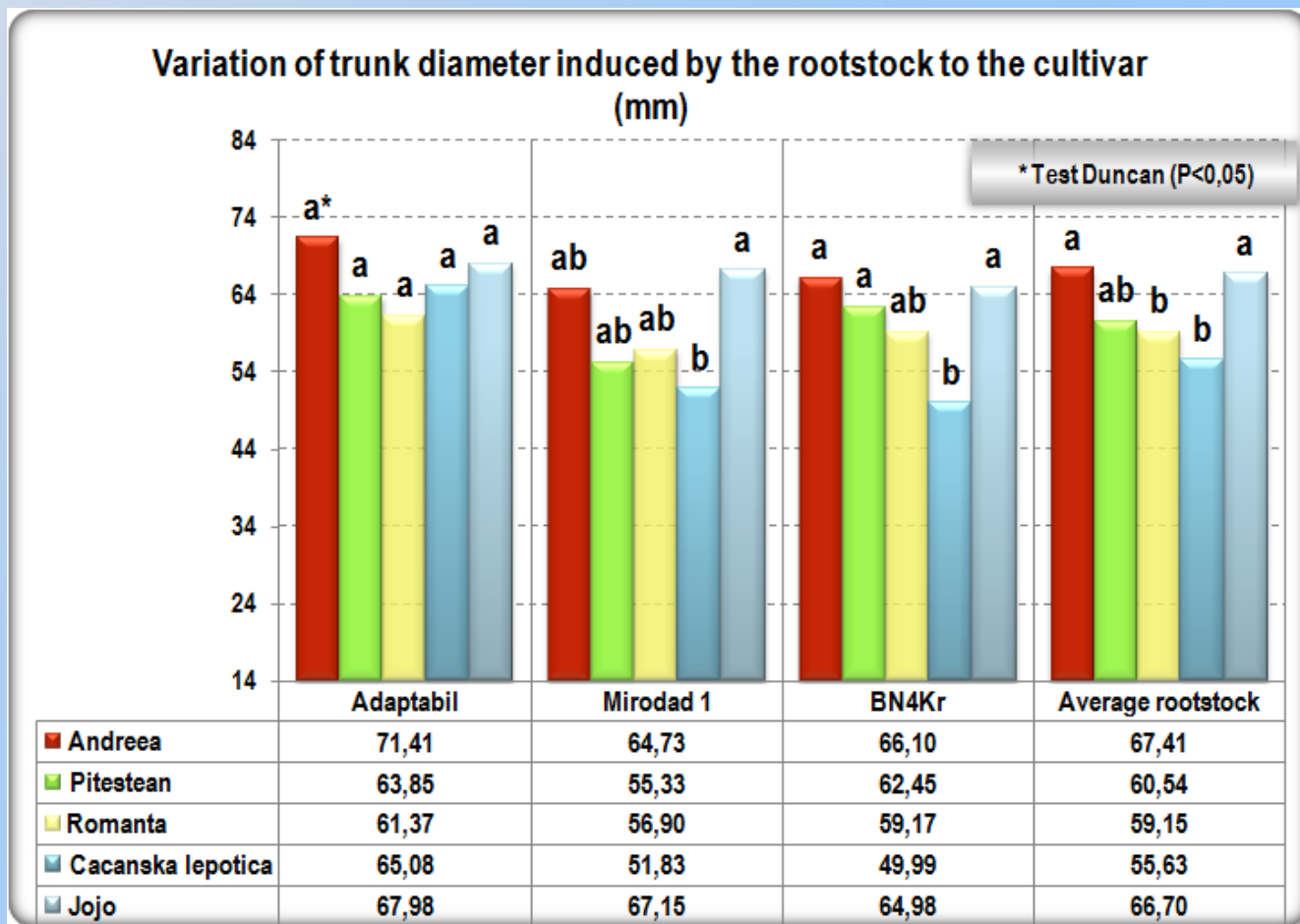
MATERIAL AND METHODS

- The following measurements were carried out:
- tree growth vigour expressed as trunk diameter, in mm, was measured at 30 cm above the soil with digital calipers;
- number of fruits/tree by counting ;
- fruit yield was calculated by multiplied the fruits/tree with average fruit weight, in kg/tree;
- fruit weight was recorded with a balance, in g;
- fruit soluble solids content was measured with a digital refractometer, in % Brix.
- The results of the experiment were analyzed statistically by Duncan's multiple range test at a 0.05% significance level.

RESULTS AND DISCUSSIONS

Tree growth vigour

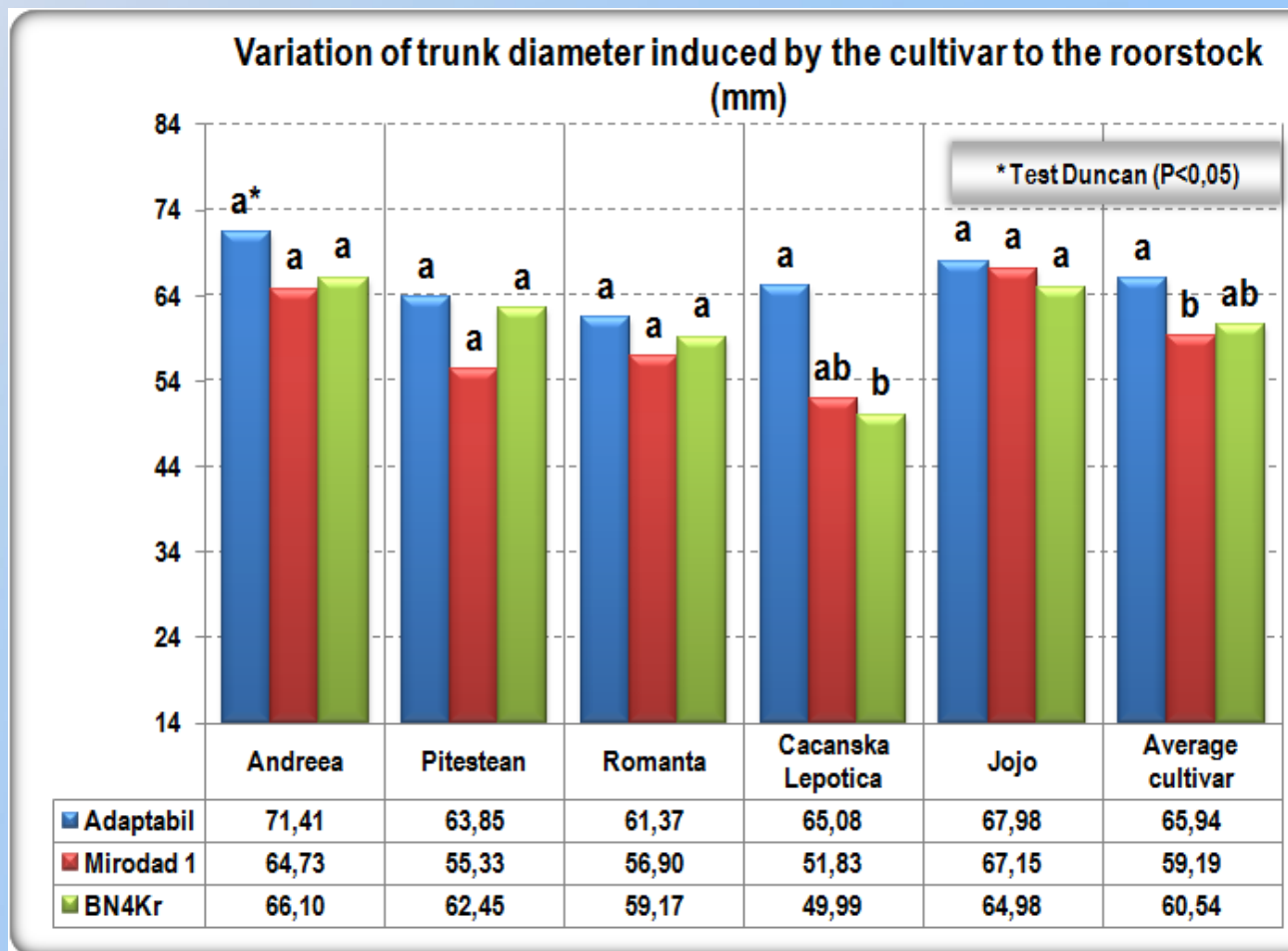
The lowest vigour, expressed by the average trunk diameter, registered 'Romanta' cv. (59.15 mm) and 'Cacanska Lepotica' cv. (55.63 mm), and the highest trunk diameter registered 'Andreea' cv. (67.41 mm) and 'Jojo' cv. (66.70 mm), between these cultivars being significant differences of trunk diameter



RESULTS AND DISCUSSIONS

Tree growth vigour

Regarding the influence of the rootstock to the cultivar, it was found that the lowest trunk diameter was recorded when used 'Mirodad 1' rootstock (59.18 mm), and the highest value was recorded at the varieties which have been grafted on 'Adaptabil' rootstock (65.94 mm)



RESULTS AND DISCUSSIONS

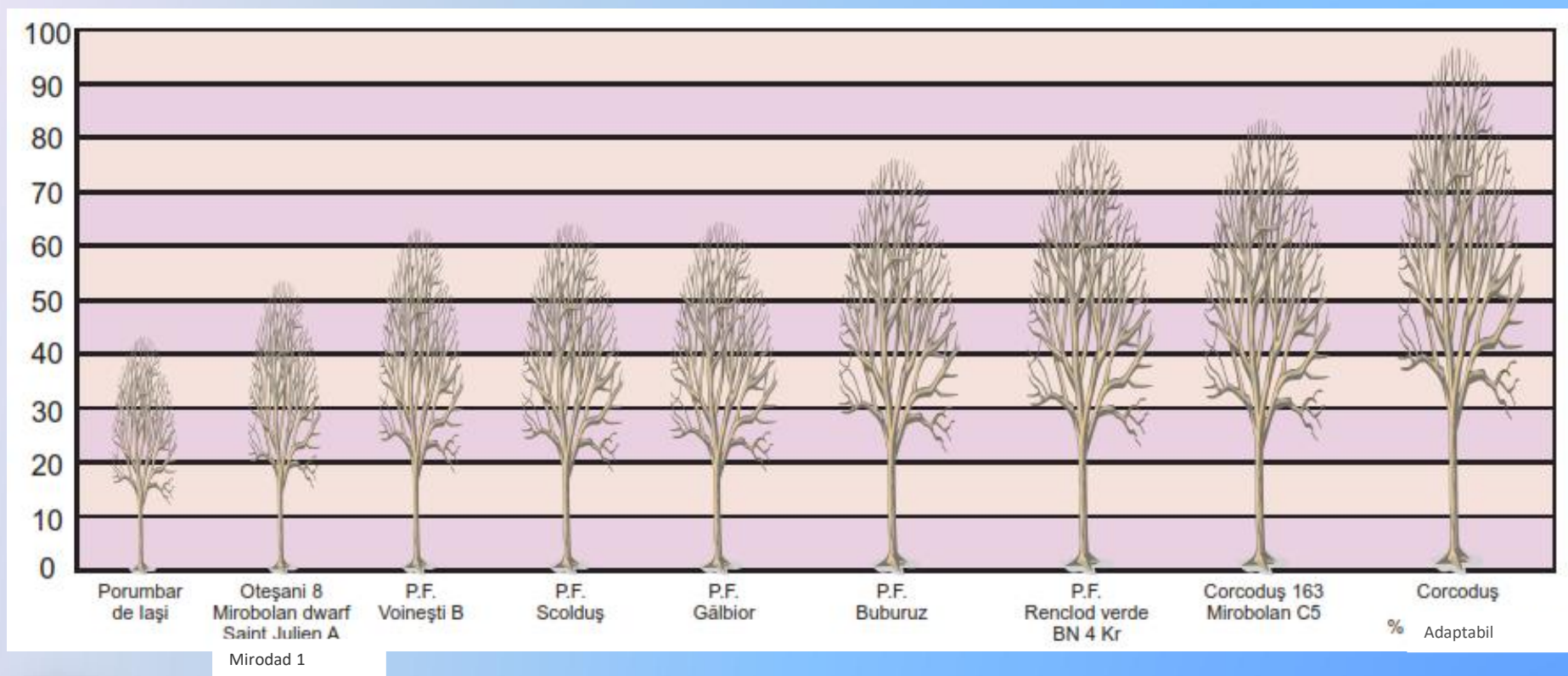
‘Adaptabil’ rootstock induced to the varieties a very high vigour. Dutu et al. (2001) reported the similar data about the vigour induced by the ‘Adaptabil’ rootstock to the peach cultivar ‘Red Haven’.

Butac et al. (2016) reported the similar data about the vigour induced by the ‘Adaptabil’ rootstock to the some plum cultivars. ‘Adaptabil’ rootstock was created for peach. However, all 5 plum varieties grafted on this rootstock did not show incompatibility in the orchard.



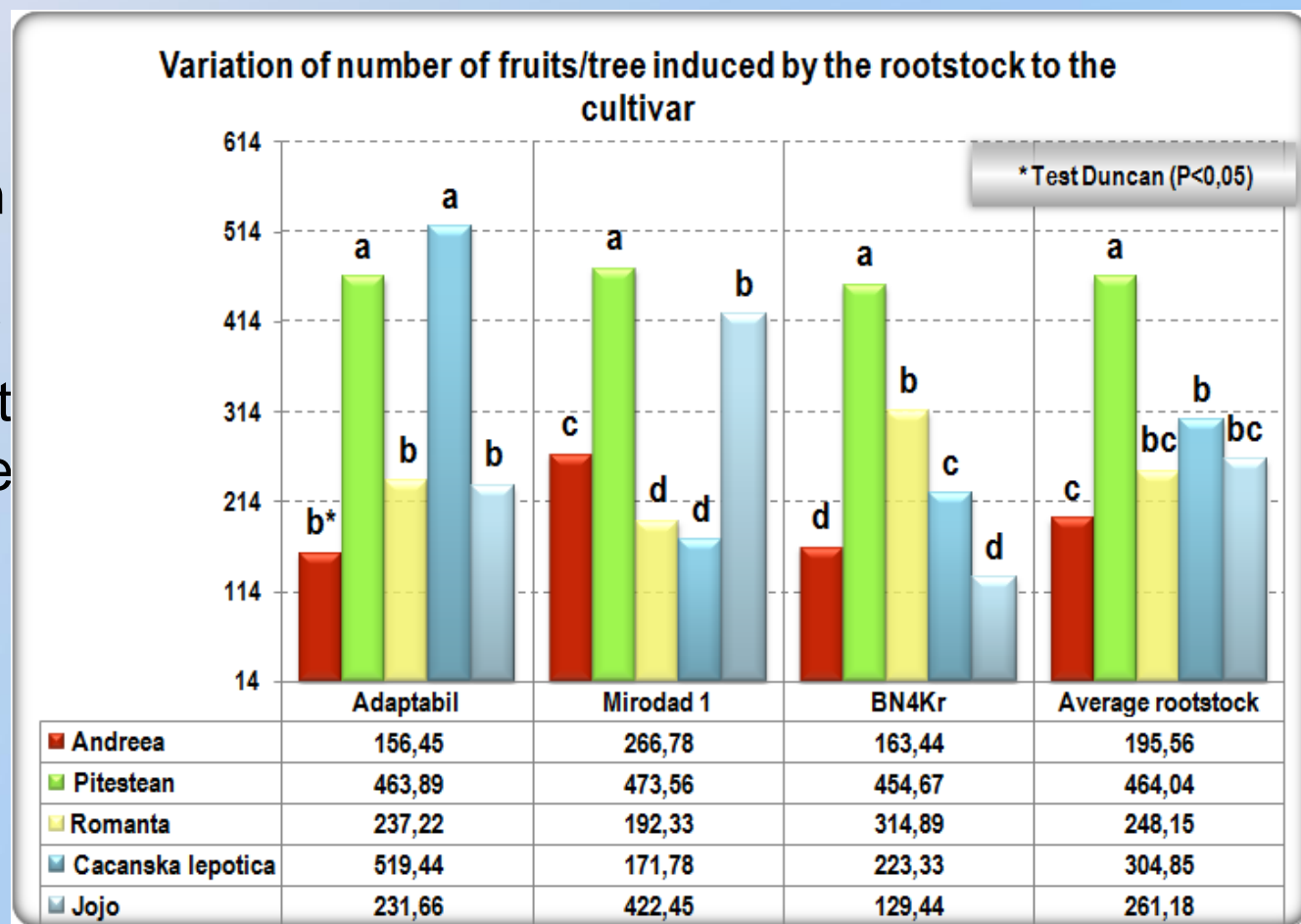
Romanta/Adaptabil

➤ Considering that in this paper we have not studied other rootstocks as a control (eg 'Myrobalan' and 'Saint Julien'), to see the vigor of the rootstocks studied, we have exemplified with this figure. Thus, the 'Adaptabil' rootstock is vigorous like 'Myrobalan', and 'Mirodad 1' is vigorous like 'Saint Julien'.



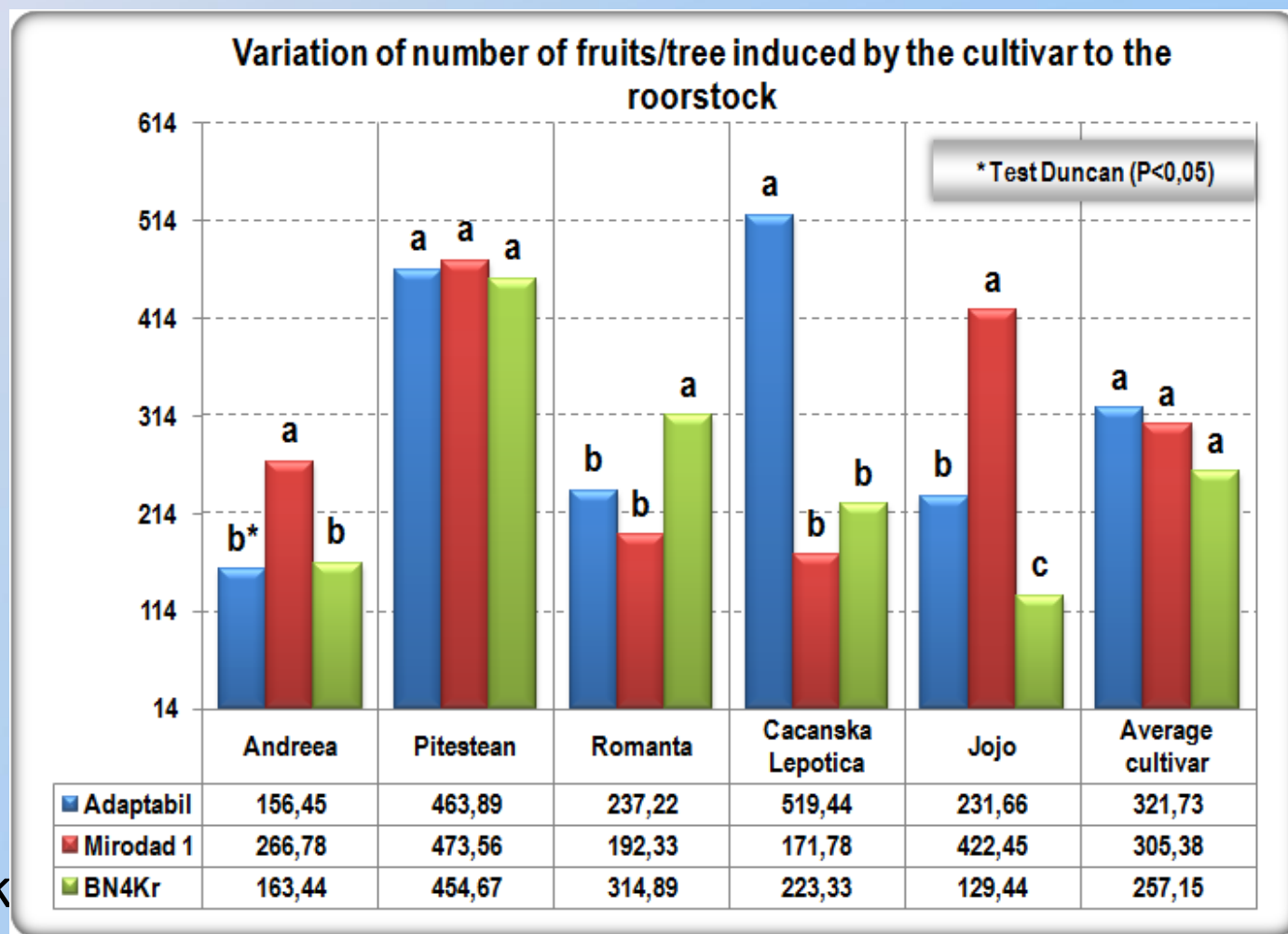
RESULTS AND DISCUSSIONS

Regarding the average number of fruits per tree, it can be observed that in the fourth year after planting, the highest number of fruits/tree was recorded 'Pitestean' cv. (464.03 fruits/tree) and the lowest number was recorded 'Andreea' cv. (195.48 fruits/tree).



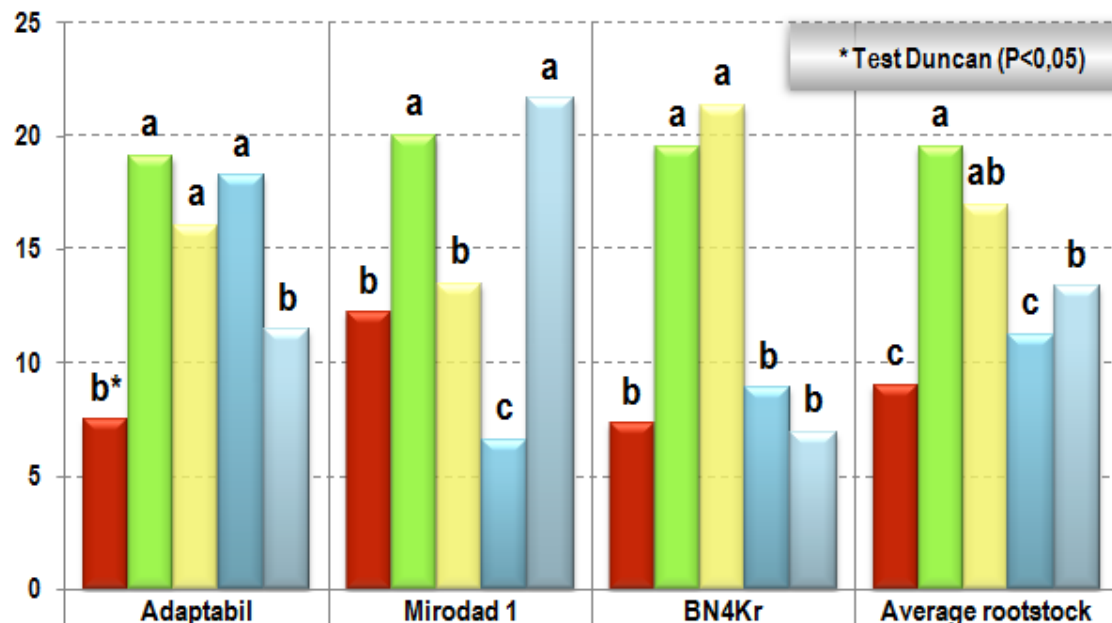
RESULTS AND DISCUSSIONS

- The most fruits have been obtained when the cultivars were grafted on 'Adaptabil' rootstock (321.73 fruits/tree) and the less fruit when using 'Bn4Kr' rootstock



RESULTS AND DISCUSSIONS

Variation of yield induced by the rootstock to the cultivar (kg/tree)

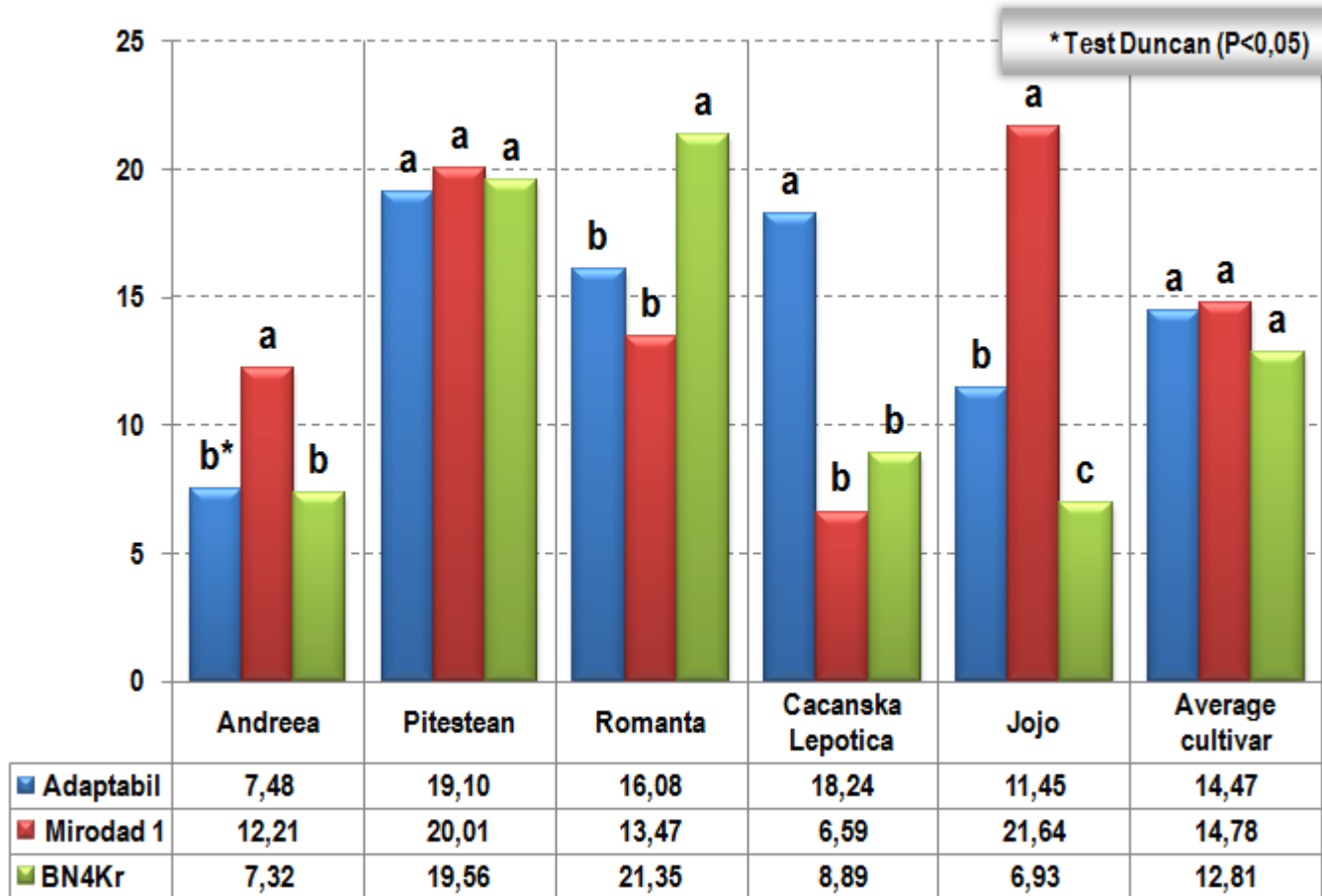


	Adaptabil	Mirodad 1	BN4Kr	Average rootstock
Andreea	7,48	12,21	7,32	9,00
Pitestean	19,10	20,01	19,56	19,56
Romanta	16,09	13,47	21,35	16,97
Cacanska lepotica	18,24	6,59	8,89	11,24
Jojo	11,45	21,64	6,93	13,34

- The highest fruits yield recorded 'Pitestean' cv. with 19.56 kg/tree and 'Romanta' cv. with 16.97 kg/tree.
- The lowest fruits yield recorded Andreea (9 kg/tree).

RESULTS AND DISCUSSIONS

Variation of yield induced by the cultivar to the rootstock (kg/tree)



- The highest fruits yield has obtained when the cultivars were grafted on 'Mirodad 1' (14.78 kg/tree) and 'Adaptabil' (14.47 kg/tree) rootstocks.
- The lowest fruits yield has obtained when the cultivars were grafted on BN4Kr.



Jojo/Mirodad 1

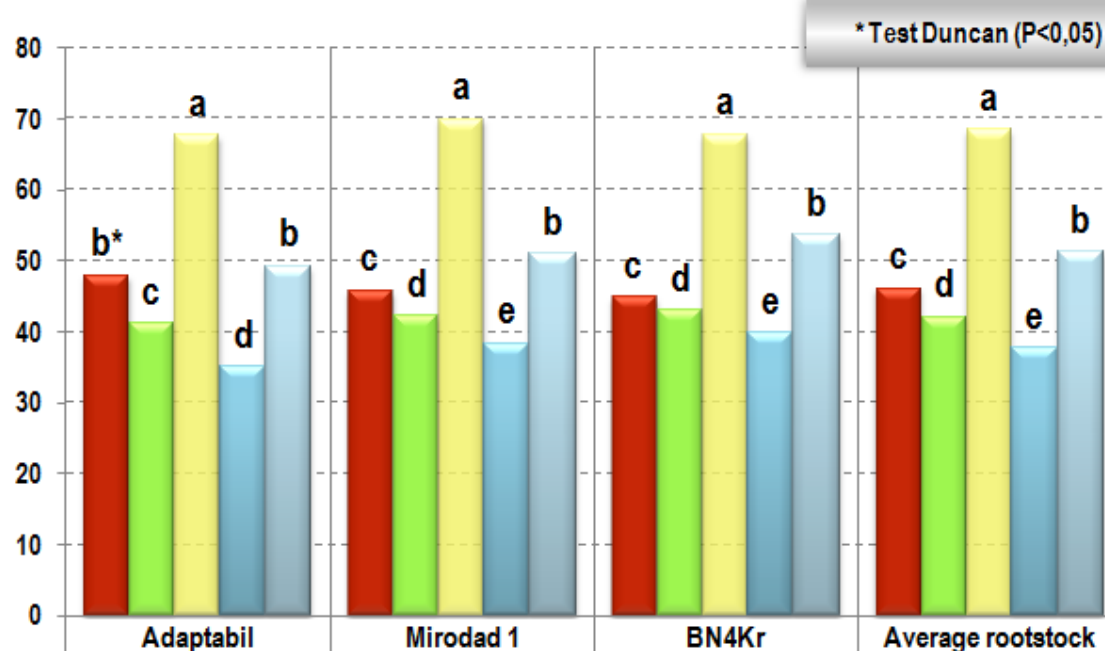


Andreea/Mirodad 1

Romanta/Adaptabil

RESULTS AND DISCUSSIONS

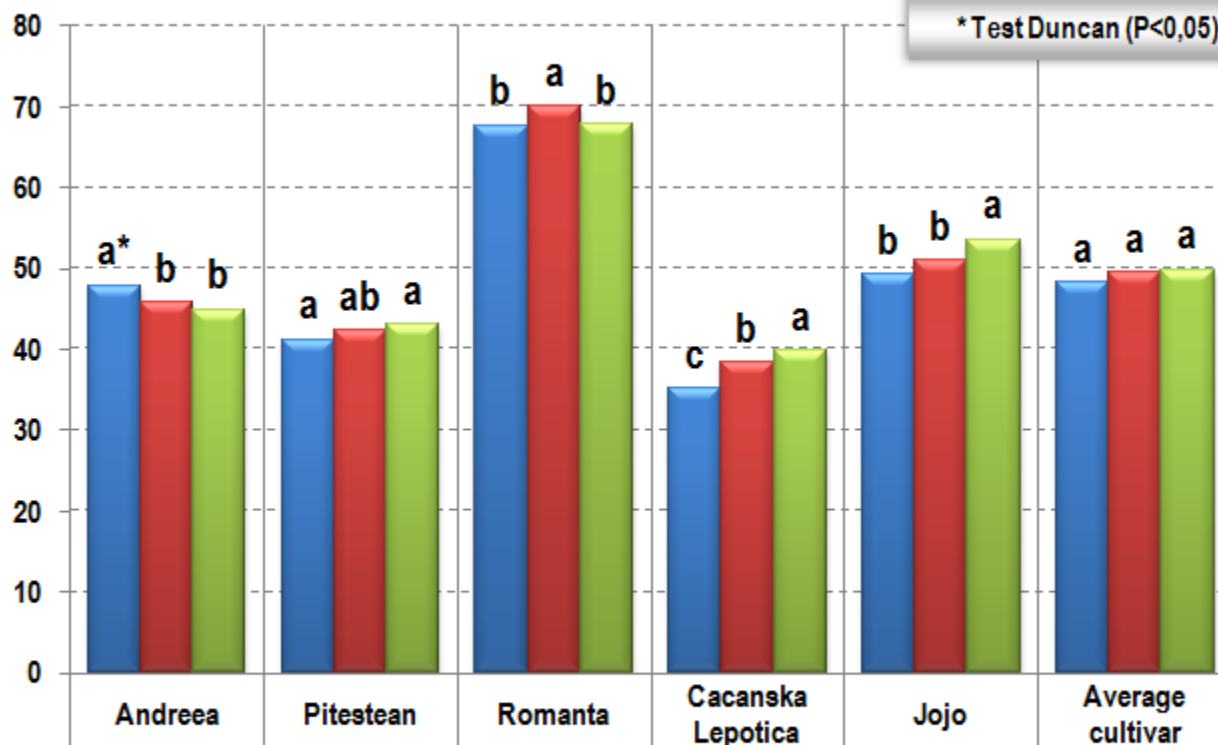
Variation of fruit weight induced by the rootstock to the cultivar (g)



- The highest average fruits weight recorded 'Romanta' cv. (68.52 g) and the lower average values recorded 'Čačanska lepotica' cv. (37.77 g)

RESULTS AND DISCUSSIONS

Variation of fruit weight induced by the cultivar to the rootstock (g)



- The highest fruits weight has obtained when the cultivars were grafted on 'BN4Kr 1' (49.83 g) and 'Mirodad 1' (49.47 g) rootstocks

■ Adaptabil	47,89	41,16	67,73	35,12	49,26	48,23
■ Mirodad 1	45,75	42,25	70,02	38,35	50,98	49,47
■ BN4Kr	44,87	43,03	67,81	39,83	53,62	49,83



Jojo/Mirodad 1

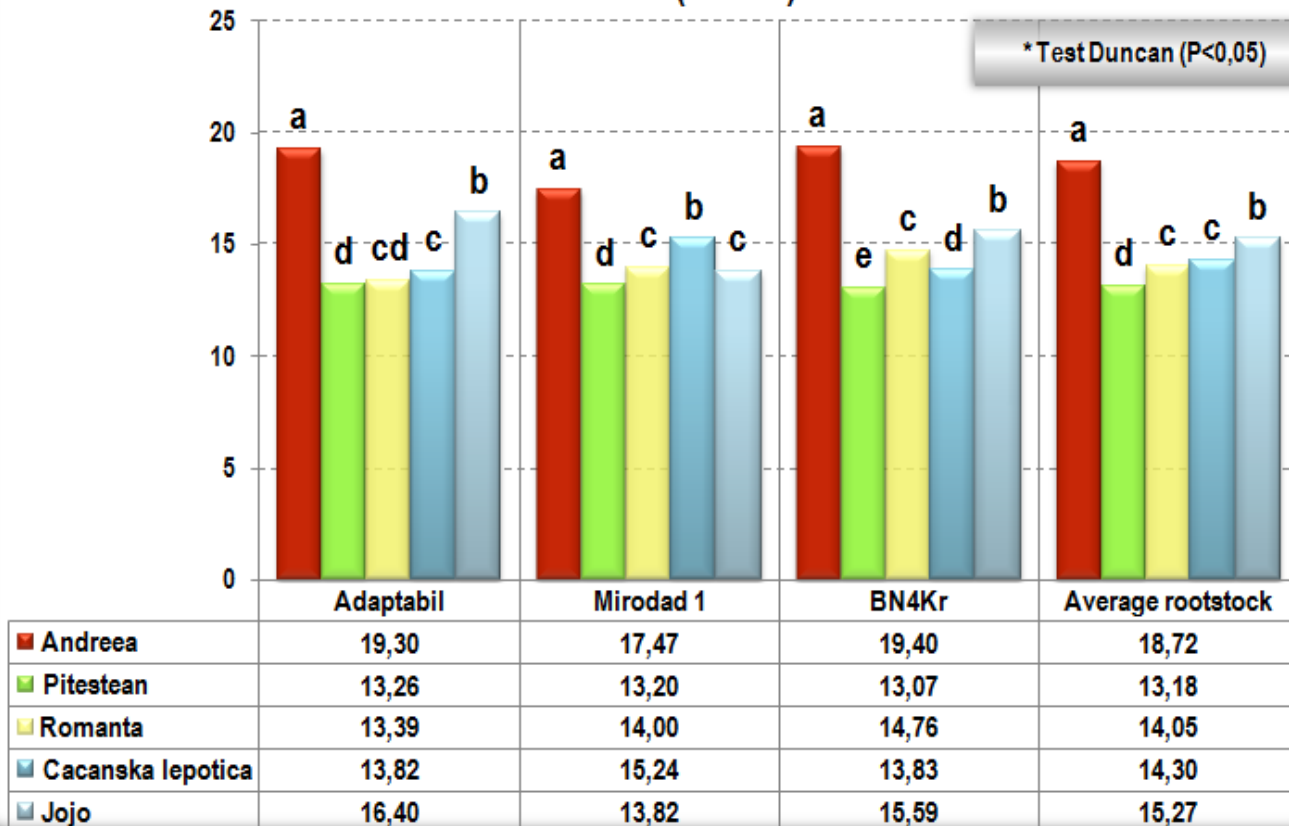


Romanta/Mirodad 1

RESULTS AND DISCUSSIONS

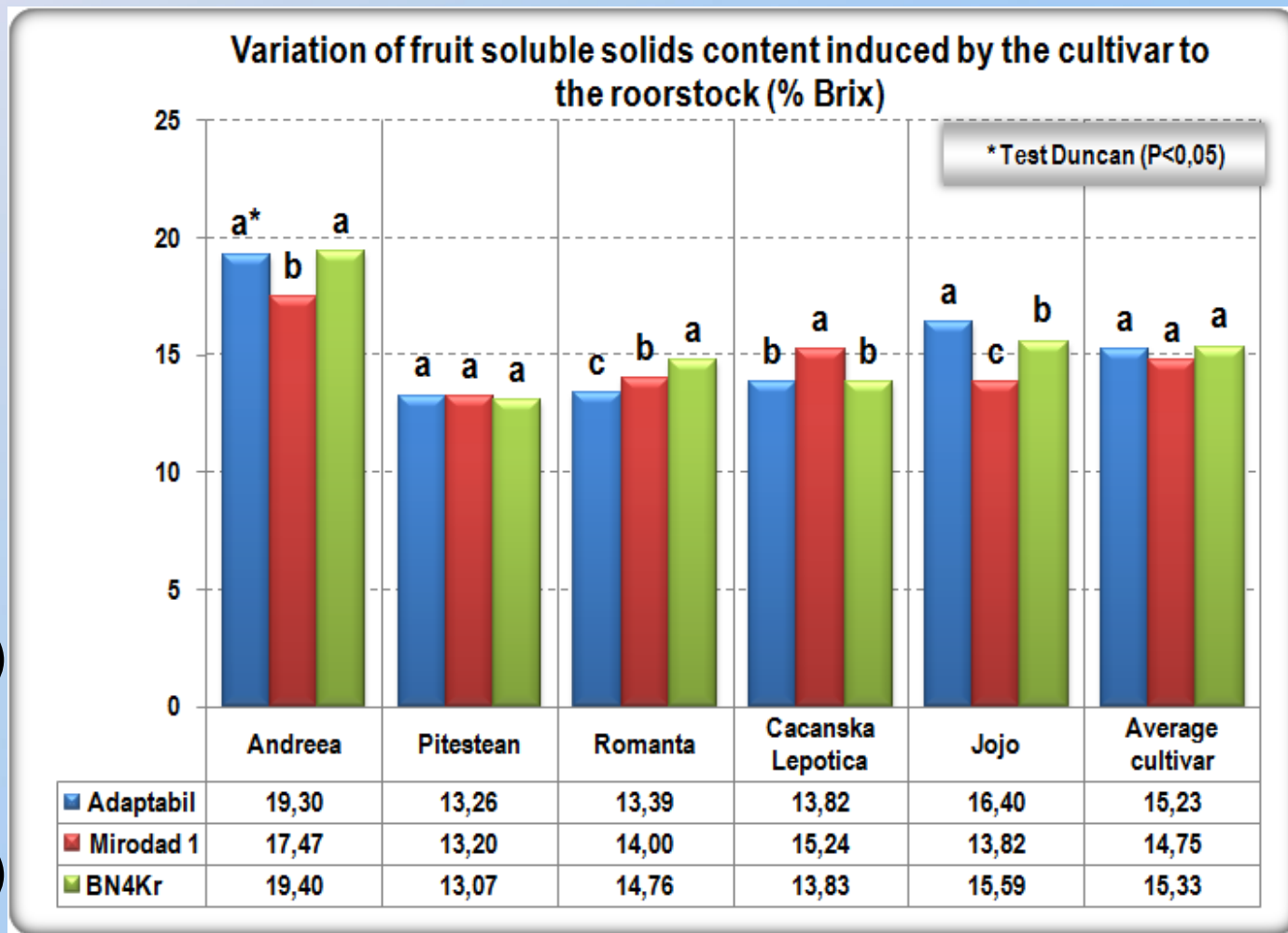
- The highest fruits soluble solids content was recorded at 'Andreea' cv. (18.72 % Brix) and the lowest content at 'Pitestean' cv. (13.18 % Brix)

Variation of fruit soluble solids content induced by the rootstock to the cultivar (% Brix)



RESULTS AND DISCUSSIONS

- The highest fruits soluble solids content has obtained when the cultivars were grafted on 'BN4Kr 1' (15.33 % Brix) and 'Adaptabil' (15.23 % Brix) rootstock





**Andreea/Adaptabil
high sugar content**

CONCLUSIONS

As results of the investigations we found that:

- 'Adaptabil' rootstock induced a very high vigour;
- 'Cacanska lepotica' and 'Romanta' cvs. had the smallest trunk diameter;
- the best production have been obtained when the cultivars were grafted on 'Mirodad 1' and 'Adaptabil' rootstocks;
- from all the cultivars studied 'Pitestean' cv. had a high number of fruits per tree and a high yield (19.56 kg/tree);
- 'Romanta' cv. had the low number of fruit on the tree but the production was high due to the fact that this cultivar has very large fruits (over 65 g);
- 'Cacanska lepotica' cv., although having a large number of fruit on the tree, has a small production due to the fact that this cultivar has small fruit (35 g);
- 'Andreea' cv. had the lowest number of fruits per tree, but with a high fruit soluble solids content (18.72 % Brix).

**THANK YOU
FOR
ATTENTION!**

