THE INFLUENCE OF CULTIVAR x ROOTSTOCK COMBINATION UPON PHYSIOLOGICAL PROCESS AT SOME VARIETIES OF PLUM TREE

INFLUENȚA ASOCIAȚIEI SOI x PORTALTOI ASUPRA UNOR PROCESE FIZIOLOGICE LA UNELE SOIURI DE PRUN

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Abstract. *The knowledge of physiological changes of trees is very important for technological interventions. The knowledge of correlations which are established between successive harvest phenophases and between fruitful and vegetative organs make possible the intervention of technicians for to drive the growing and fruitful phenomenons.*

Cuvinte cheie*: prun, soi, portaltoi.*
Key words: *plum tree, variety, rootstock.*

Reciprocal influence phenomens between partners which mode a graft tree was observing from point of multiple effects, intensity and development mechanism.

This influence can be observed in vigorous, in development of ontogenetic phases, in annual cycle, in quantity and quality of harvest.

For the interpretation of aspects which had are influence of some physiological process, it was beginning an experiment in hill area of Oltenia.

The objectives of research were:

- the effects of variety, of rootstock on of interaction rootstock x variety on photosynthesis and breath process;
- correlations between photosynthesis process, breathing and respective phenophases.

MATHERIAL AND METHODES

The researches was effectuated in 2002-2004 period on a plantation started in 1995 with rootstocks and 7 variety in Craiova, Banu Mărăcine area. The results of this research are based on 2 variety (Tuleu Gras, Renclod Althan) and 3 rootstocks (Oteşani 8, Pixy, Miroval).

The experience was situated after randomized blocks method in 3 repetitions with 10 trees on variants.

The trees ungrafted on respective rootstock were drive as a vessel form - flatten the work being uniform.

Analyses of physiological phenomenons were mode at two graft variety on three rootstocks and they focus at photosynthesis and breath process.

These phenomenons was studied at three final phenophases of vegetative organs and fruits like: the intense growing - up of tillers (CIL), slow and stop of growing up tillers (ICL), start of ripen fruit (IPF).

A plum tree leaf was harvest from tillers situated in the base, middle and in the top of trees, and leafs from these tillers was harvest from the middle of tiller.

The statistical process of individual dates was realised with computer programme CSS Statistics.

The experience was placed at S.D. E. Banu Mărăcine on the brown-red forest soil with middle PH 6,5 - 6,7, modest provided in macro- and microelements. The annual temperature is an average 11,5 -13ºC; the absolute minima temperature was -24,0ºC, without arrive at limit of resistance (–31ºC).

The annual precipitations are 340 - 480 mm, the relative humidity doesn't go down under 70%.

RESULTS AND DISCUTIONS

Analysing the photosynthesis process at the both variety on three rootstocks in three study year, it could be observe that this photosynthesis process is different from association to association (variety x rootstock).

The both variety on Miroval rootstock obtained higher values, a bigger intensity of photosynthesis rootstock at all three final phenophases in all three study years. The variety ungrafted on Miroval realised an average of intensity photosynthesis process in 2004 for 207,7 mg $CO^2/dm^2/h$ at intense growing up tillers (CIL), for 225,4 mg $CO^2/dm^2/h$ at slow an stop of tillers growing up (ICL) and for 234,5 mg $CO^2/dm^2/h$ at beginning of fruit ripe (IPF), fig. 1.

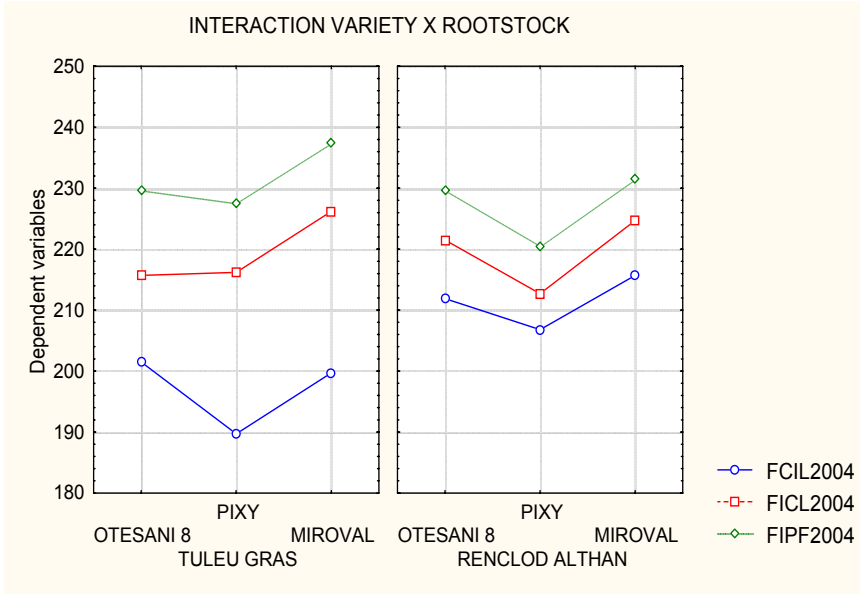

Fig.1 - The intensity photosynthesis process (year 2004)

The bigger values of photosynthesis intensity appears in the moment of slow an stop of tillers growing up (ICL - 225,4 mg $CO^2/dm^2/h$), between two vegetative phases.

Analysing the effect of separate variety on photosynthesis is evidenced the variety witch has a bigger photosynthesis intensity, exactly Renclod Althan in phenophases of intense tillers growing up (CIL – 211,4 mg $CO^2/dm^2/h$) and in the beginning of fruit ripe (IPF – 231,5 mg $CO^2/dm^2/h$) Tuleu Gras variety was the first and Renclod Althan, was the second (table 1).

Table 1

The influence of variety on the photosynthesis process (averages - year 2004)

Rootstock	Variety	CIL2004	ICL2004	IPF2004
....	TULEU GRAS	196,9	219,3	231,5
....	RENCLOD ALTHAN	211,4	219,6	227,2

The effects of separate rootstock underline that Miroval has the biggest intensity of photosynthesis in comparation with Oteşani 8 and Pixy. Pixy rootstock is framing with low values in vegetative phenophases and in generative phenophases (table 2).

Table 2

The influence of rootstock on the photosynthesis process (averages - year 2004)

Rootstock	Variety	CIL2004	ICL2004	IPF2004
OTEŞANI 8	....	213,2	224,4	232,4
PIXY	....	207,0	219,3	228,4
MIROVAL	....	214,6	229,7	236,4

From the point of view of breath, the variety had an intense breath on rootstock Miroval in all three phenophases. In year 2004 at intense growing up of tillers the variety release a medium value by 302,5 mg $CO^2/kg/h$, and slow an stop of tillers growing up a medium value by 312,6 mg $CO^2/kg/h$, and in the moment of start fruits ripen a medium value by 317,1 mg $CO^2/kg/h$.

The intensity of breath process is different in function of variety. So, the Renclod Althan variety has a more intense process of breathing then Tuleu Gras variety in all three phenophases and in all three rootstock.

The both variety had an lower breathing intensity on Pixy rootstock in all three phenophases.

In 2004 at intense growing up of tillers the variety release a medium value by 286,5 mg $CO^2/kg/h$, and slowing an stoping of tillers growing up a medium value by 300,4 mg $CO^2/kg/h$, and in the moment of starting fruits ripen a medium value by 307,6 mg $CO^2/kg/h$.

There are semnificative correlation between phenophases in breathing process.

Analizing the effect of separate variety, we realised that Renclod Althan variety had a bigger intensity of breathing in all three phenophases: the intense

growing up of tillers (CIL), slowing an stoping of tillers growing up of tillers (ICL), the starting of ripen fruits (IPF) (table 3).

Table 3

The influence of variety on the breath (averages - year 2004)

Rootstock	Variety	CIL2004	ICL2004	IPF2004
....	TULEU GRAS	284,0	297,5	303,3
....	RENCLOD ALTHAN	305,0	315,0	323,2

CONCLUSION

1. The intensity of photosintese and breathing depend by intern and extern factors, the process being different from variety to variety, from rootstock to rootstock and from association of variety x rootstock to association of variety x rootstock.

2. The Miroval rootstock gives a bigger vigorous and had an intense influence on photosintese and breath process, the next is Oteşani 8 rootstock.

3. Phenophases ICL (slow amd stpp the growing – up of tillers) from vegetative phenophases had a bigger intensity than CIL (intense growing up of tillers).

4. IPF (the start of ripen fruits) from generative phenophases had a bigger intensity than vegetative phenopohases.

5. Renclod Althan variety was remarking with a bigger intensity in breathing process than Tuleu Gras variety.

6. Between photosynthesis and breathing process was established semnificative and positive correlation.

7. The knowledge of physiological changes of trees is very important for technological intervention. The knowledge of correlation established between successive phenophases harvest and of correlation between fruits body and vegetative permit the of the technicians for control fruits and growing up phenomenons.

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