

STUDIES ON THE METHOD OF REACTION OF APPLE VARIETIES IN DORMANT EYES GRAFTING AT THE S.C.D.P. VOINEȘTI, DÂMBOVIȚA

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Abstract

In the success of plantations of trees, rootstock sometimes has a crucial role, since it depends on the exploitation of different varieties of soil types, growth vigor, fruit entry, resistance to climatic conditions, the longevity of trees and not least the quality and quantity of fruit production.

In general, the requirements they have to soil, the rootstock can increase or decrease the area of the extension of crop variety and can be profitable or unprofitable. Apple, like other fruit species, is a cross-fertilized plants (pollen to pollinate with other apple species) heterozygous. This feature makes it impossible to multiply in the seed production purposes.

Biology Fund of the species Malus domestica also comprises the largest number of stock generative and vegetative especially compared to other fruit species. Rootstocks are wild species or their hybrids with cultivated varieties, each with a number of features that further enhance the heterogeneity of the species.

To maintain a variety of acquired traits, by vegetative propagation is necessary. The most used is the branch or bud grafting with rootstocks posted on the official list approved and included as allowed for propagation. Currently it uses two large groups of stock. Those grown from seed and rootstock also called generative propagated by vegetative especially by ant hill method of marcoting.

Keywords: rootstock vegetative, generative rootstocks, grafting.

1. INTRODUCTION

Grafting is an operation of "plant surgery", which requires for success a series of biological and technical conditions.

The technical requirements are very important for successful grafting and concerns:

-The qualification of the personnel performing the work;

-Cleanliness of the simbiotrs and tools;

-Speed operation of grafting and bonding;

Grafting period is included in all years from August 1 to 31. To determine the behavior of different varieties of apple In the sleeping eye grafting in order to facilitate the study, the period of grafting is divided in the first period August 1 to 15 and the second part of the period August 16 to 31. To determine the behavior of different varieties of apple in the grafting of the sleeping eye, covered by the studies were presented these next objectives:

- Monitoring the behavior of grafting different varieties of apple in the sleeping eyes from Voinești, Dambovita

- Optimal timing of grafting according to each variety.

2. MATERIAL AND METHODS

Farm surveys in Izvoare were made on the following varieties of apple: Generous, Florina,

Starkrimson, Jonathan, Golden Spur, Idared Redix, Ciprian, Mutsu were grafted on the rootstock MM 106.

Grafting with buds (eyes)dormant.

Dormant bud grafting is practiced mainly in the field I of trees nursery school and secondary in young plantations. In the nursery, grafting is done to multiply valuable varieties of trees and inside plantations only for regrafting fruit varieties with low productivity and poor quality. This graft has the advantage that it runs slightly faster and over a longer period of time, gives a high proportion of branches to save attachments and graft. Rootstock produced from seed is a juvenile, a cutting or rooted slips. Graft is a normal developed vegetative bud together with a portion of the leaf stalks 8 to 10 mm and a bark-shaped support shield 2.5 -3.0 cm long. On the bottom of the shield (entire length) is a thin strip (such as cigarette paper) wood tissue that keeps the bud graft latent (sleeping) until the following spring.

Pocket knives are used for grafting , universal oculars , tree shears, pruning, marble and stones for sharpening knives and belts, hoes, cotton cloth bag, raffia, or strips of lime policlorvinil 40cm long , 12 mm wide and 0.06 to 0.1 millimeters thick, branches slips, wooden or enameled dishes, boxes, labels, twine and nursery records.

Grafting with sleeping bud includes four main operations, namely cutting and peeling bark of rootstock, detaching the grafting bud shield, the

introduction of rootstocks shield into place and tying the two partners.

Care after grafting

After 10 to 15 days after grafting, the graft if "caught" ribbed portion is easily detached. If the stalks remain trapped and wiggles, it means that the grafting failed.

Before the arrival of winter frosts remove or loosen the connection made when grafting to allow thickening of seedlings. Thickening vegetation is going to end in phenophase wood cooking, when tissues are impregnated with substances backup (thickened cell membranes, and also to juveniles). Late juveniles and then absolution cause weakening of the right break point of grafting. Before the first frosts of autumn injured part should be covered with soil (mound) to be protected from winter frosts come. When grafting was done too early, especially in hot, rainy autumns, part of the growing buds start slips further in the autumn. They are covered in winter "ripe" and there is a danger to freeze. To avoid the vegetation is a good measure praşilelor or even suppression of seed plants that are springing up quickly (rape) among rows of trees school after graft were caught. If, however, some slips in growth starting in August and September, their peak suppression is indicated (above that of the 3rd, 4th leaf). It stops the growth and fosters substance storage reserves. Late autumn, those seedlings are covered with earth (mound).

Comments

- To ensure a high percentage of grafting we can graft attachment to two slips per rootstock, the opposing positions and different heights (2-3 cm apart).
- During grafting, scion shoots are kept in the shade, wrapped in wet rags or in wood, plastic or enamel (upright base immersed in water 3-4 inches).
- Distance between graft and link is no more than 1-2 trees because cambial tissues oxidize easily, thereby reducing the percentage of attachment.
- Sunny and warm days, grafting is done only between 6- 10 and 16 -20 hours and on cloudy throughout the day.
- On rainy days is prohibited grafting.

3. RESULTS AND DISCUSSIONS

All apple varieties studied (GENEROUS, FLORINA, STARKRIMSON, JONATHAN, GOLDEN SPUR, IDARED, REDIX, CIPRIAN, MUTSU) were grafted on the rootstock MM 106. The study was monitored at each variety, depending on the time of grafting (1-15 VIII 16-31 VIII), the

number of grafted trees and the number of trees delivered. In Tables 1, 2, 3 are marked all data obtained during the three years of study.

Table 1 - 2007

Nr. crt.	Variety grafted	Port graft	Time of grafting	Nr. of grafted trees in 2006	Nr. of delivered trees in 2007	Percentage of holding (%)
1.	Generos	MM 106	1-15 VIII 16-31 VIII	5600 4280	3200 2485	57 58,1
2.	Starkrimson	MM 106	1-15 VIII 16-31 VIII	1500 2800	840 2005	56 72,6
3.	Florina	MM 106	1-15 VIII 16-31 VIII	7880 8050	5400 5320	68,5 66
4.	Jonathan	MM 106	1-15 VIII 16-31 VIII	2900 3280	1570 2050	54,1 62,5
5.	Golden spur	MM 106	1-15 VIII 16-31 VIII	4630 -	3520 -	76 -
6.	Idared	MM 106	1-15 VIII 16-31 VIII	900 400	530 170	59 43
7.	Redix	MM 106	1-15 VIII 16-31 VIII	4260 -	3520 -	83 -
8.	Ciprian	MM 106	1-15 VIII 16-31 VIII	1800 4630	1450 3520	81 76
9.	Mutsu	MM 106	1-15 VIII 16-31 VIII	800 -	600 -	75 -

Table 2 - 2008

Nr. crt.	Variety grafted	Port graft	Time of grafting	Nr. of grafted trees in 2007	Nr. of delivered trees in 2008	Percentage of holding (%)
1	Generos	M M 106	1-15 VIII 16-31 VIII	6630 6400	4210 4350	63, 4 67, 9
2	Starkrimson	M M 106	1-15 VIII 16-31 VIII	7560 3210	4880 2580	64, 5 80, 3
3	Florina	M M 106	1-15 VIII 16-31 VIII	8580 4240	6360 3010	74, 1 70, 9
4	Jonathan	M M 106	1-15 VIII 16-31 VIII	1860 3580	1190 2370	63, 9 66, 2
5.	Golden spur	M M 106	1-15 VIII 16-31 VIII	1320 2750	510 1300	39 47
6.	Idared	M M 106	1-15 VIII 16-31 VIII	1350 -	1050 -	78 -
7.	Redix	M M	1-15 VIII 16-31	- 1420	- 1140	- 80

		106	VIII			
8.	Ciprian	M M 106	1-15 VIII 16-31 VIII	700 1290	590 980	84 76
9.	Mutsu	M M 106	1-15 VIII 16-31 VIII	1360 -	940 -	60 -

Table 3 - 2009

Nr. cr. t.	Variety grafted	Port graft	Time of grafting	Nr. of grafted trees in 2008	Nr. of delivered trees in 2009	Percentage of holding (%)
1.	Generos	MM 106	1-15 VIII 16-31 VIII	1850 7560	998 4500	53,9 59,5
2.	Starkrimson	MM 106	1-15 VIII 16-31 VIII	2940 9800	1330 5800	45,2 59,1
3.	Florina	MM 106	1-15 VIII 16-31 VIII	9430 6990	5510 3940	58,4 56,6
4.	Jonathan	MM 106	1-15 VIII 16-31 VIII	3840 3300	1730 1900	45 57,5
5.	Golden spur	MM 106	1-15 VIII 16-31 VIII	4100 1400	2600 900	63 64
6.	Idared	MM 106	1-15 VIII 16-31 VIII	2920 1300	2520 900	86 70
7.	Redix	MM 106	1-15 VIII 16-31 VIII	1100 1100	800 820	73 75
8.	Ciprian	MM 106	1-15 VIII 16-31 VIII	950 1150	700 710	74 62
9.	Mutsu	MM 106	1-15 VIII 16-31 VIII	1130 550	770 360	68 65

The analysis of climatic conditions in the Research Station located in Voinesti states:

1. The resort is located in the center of the Dâmbovița fruit basin, with favorable conditions and representative trees.
2. The area occupied by orchards is located and organized in such a way that allows the execution of all mechanical work.
3. Climatic conditions are favorable to apple cultivating:

- Annual average temperature 8.8 ° C, sufficient rainfall (over 700 mm annually), provides the best conditions for development and fruit-bearing trees;
- Low temperatures that occur in winter and late spring frosts affects only a small extent for fruit production;

- The area is located on the Dambovitza River valley, amongst the hills, protected from winds;

- Hail damages the orchards especially when it occurs during July or August. In this area such meteorological phenomena have been rare.

On the basis of climate and tradition it can be said that in this area apple finds favorable conditions for growth and fruition.

Analyzing the results in terms of grafting at Izvoare Farm 2 - Voinesti have found that:

- Watching the years 2007, 2008, 2009 regardless of weather conditions the percentage for fixing was higher in the second half of the graft 16 to 31 August compared with the first period August 1 -15 (Tables 1, 2, 3) :

- on the variety Generous, percentage of grip ranged from 58.1% in 2007 and 67.9% in 2008.
- on Starkrimson percentage of grip ranged from 59.1% in 2009 and 80.3% in 2007.
- on Florina clamping percentage ranged from 56.6% in 2009 and 70.9% in 2008.
- on Jonathan, the percentage ranged from 57.5% holding in 2009 and 66.2% in 2008.
- on Golden Spur, the percentage of grip ranged from 47% in 2008 and 64% in 2009.
- on Idared, clamping percentage ranged from 43% in 2007 and 70% in 2009.
- on Redix percentage of grip ranged from 75% in 2009 and 80% in 2008.
- on Ciprian clamping percentage ranged from 62% in 2009 and 76% in 2008 and 2007.

Comparing the results of grafting (the percentage of attachment) distinguished on two stages (1-15 August and 16 to 31 August), we can say that the varieties Ciprian and Florina have obtained best results after grafting in the first period in all years study:

- In 2007, Florina variety-68.5% (compared to 66% in the grafting of the second period); variety Ciprian-81% (compared with 76% grafting of the second period);
- In 2008, Florina variety-74.1% (70.9% compared to the grafting of the second period); variety Ciprian-84% (compared with 76% grafting of the second period);

• In 2009, Florina variety-58.4% (56.6% compared to the grafting of the second period); variety Ciprian-74% (compared with 62% grafting of the second period).

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4. CONCLUSIONS

❖ The data analysis shows that the variety with the highest percentage of grafting in terms of attachment are the varieties Florina and Ciprian Voinesti during all three years studied.

❖ Variety with the lowest percentage of grip after grafting (45% - 66.2%) in terms of variety Voinesti is Jonathan.

❖ Although lots analyzed were located in the same plot so on the same type of soil, the same climatic conditions and the grafting were performed with the same team of workers, results showed that the percentage of attachment depends primarily on the variety.

In particular we have the following conclusions:

• in the Izvoare nursery belonging to Voinesti SCPP and in local climatic conditions, the best time for grafting is between August 16 to 31 all years both in terms of normal climate conditions and in dry years.

• the varieties Florina and Ciprian behaved differently from the other varieties in that they had large percentages of grip in the first period of grafting. For this reason we consider necessary to carry out further observations on a longer period of time.

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