

BEHAVIOUR OF VARIOUS ROOTSTOCKS ON DIFFERENT TRELLISING SYSTEMS IN IAȘI VINEYARD

COMPORTAREA UNOR SOIURI DE VIȚE PORTALTOI CULTIVATE PE DIVERSE MIJLOACE DE SUSȚINERE ÎN PODGORIA IAȘI

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Abstract. The appearance of the phylloxera on the European continent has in time led to a radical change in the system of vine propagation and cultivation, namely the transition to grafted vine-growing and the use of phylloxera -resistant American species as rootstocks. Cultivated in general to obtain cuttings for the rooting and grafting of grape varieties, rootstock varieties are an important factor in wine production. Therefore, the establishment of specific technological links for rootstock cultures should be the focus of specialists in viticulture. In the present study, during the year 2017 three varieties of rootstocks were studied, namely Berlandieri Riparia Kober 5 BB, Berlandieri Riparia Selection Oppenheim 4 and Chasselas Berlandieri 41 B, all cultivated in the ampelographic collection of USAMV Iași. Each of these varieties was trellised on the following systems: a 4 legged pyramid, a monoplane trellis with diagonal vine training and a T-shaped horizontal trellis. Following the studies, it was found that although the length of the canes was higher at pyramid training, the percent to the length of the matured wood was registered in the monoplane trellis with diagonal vine training. The weakest results were registered in the lead in T-shaped horizontal trellis.

Key words: rootstocks, different trellising systems, production of cuttings

Rezumat. Apariția filoxerei pe continentul european a determinat în timp o schimbare radicală a sistemului de înmulțire și cultură a viței-de-vie, respectiv trecerea la sistemul de viticultură altoită și utilizarea speciilor americane, rezistente la filoxeră, drept portaltoi. Cultivate în general pentru obținerea butașilor în vederea înrădăcinării și altoirii soiurilor de viță roditoare, soiurile de portaltoi constituie un factor important al producției viticole. Prin urmare stabilirea verigilor tehnologice specifice culturi vițelor portaltoi trebuie să stea în atenția viticultorilor. În lucrarea de față au fost studiate, pe parcursul anului 2017, trei soiuri de vițe portaltoi și anume: Berlandieri Riparia Kober 5 BB, Berlandieri Riparia Selecția Oppenheim 4 și Chasselas Berlandieri 41 B, cultivate în colecția ampelografică a USAMV Iași. Fiecare din aceste soiuri au fost conduse pe următoarele sisteme de conducere a vițelor: piramidă cu 4 butuci, spalier monoplan cu conducerea oblică a lăstarilor și spalier orizontal în formă de T. În urma studiilor efectuate se constată că deși lungimea coardelor a fost mai mare la conducerea pe piramidă, procentul de lemnului maturat a fost cea mai mare la conducerea sub formă de spalier monoplan cu conducerea oblică a lăstarilor. Cele mai slabe rezultate s-au constatat la conducerea sub formă de spalier orizontal sub formă de T.

Cuvinte cheie: portaltoi, sisteme de conducere, producție de butași

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INTRODUCTION

Multiplication or reproduction in plants is a fundamental biological process, its basis being heredity (genetic information). In viticulture, the purpose of multiplication is determined by maintaining valuable attributes/quality of varieties and ensuring the need for plants for the establishment of vineyards (Corbean, 2011). The rootstock plantation is one of the important nursery production sectors that provide rootstock cuttings for grafting. The rootstocks come from American vineyards and are characterized by higher demands on climatic factors compared to *Vitis vinifera*: long vegetation (≥ 190 days) and high heat demand (active thermal balance ≥ 3100 °C), higher temperatures in August and September when mature tissues mature (> 21 °C and 180 °C respectively) (Dobrei *et. al.*, 2017).

MATERIAL AND METHOD

The measurements were carried out in the Ampelographic Collection of the Faculty of Horticulture, located on a land with a slope of about 3%, on a cambic chernozem soil. The varieties of rootstocks used in the Iasi vineyard are taken into account, namely Berlandieri x Riparia Kober 5 BB, Berlandieri Riparia Selection Oppenheim 4 and Chasselas Berlandieri 41B. Planting distances of 2.2 / 1.8 m, with the monoplane trellis with diagonal vine training, a 4 legged pyramid and a T-shaped horizontal trellis. The average planting density is 2500 plants / ha. Cutting was done in 1-2 cm spurs on all three support systems. The determinations made were the average number of shoots /vine, the total length of the shoot, the useful length of the shoot, % of the matured wood, % of the cuttings, the number of cuttings /vine, the number of cuttings / hectare calculated. Soil and vine maintenance works are those specific to the industrial viticultural ecosystem.

RESULTS AND DISCUSSIONS

When choosing the trellising means for the rootstocks, it is necessary to take into account a number of factors, namely the possibility of ensuring the maximum length of the shoot and, implicitly, of the matured wood; the intensity of secondary shoots and their growth; the possibility to harness the radiant heat of the soil; ease of execution of agro-technical works; the losses caused by climatic accidents (hail, early autumn freeze) (Amaradei, 2010).

The average number of shoots per vine (tab. 1) depended on the genetic nature of the varieties ranging from 9-12 shoots in the case of varieties like Berlandieri x Riparia, a high vigour variety and 8-10 shoots in the case of Chasselas x Berlandieri 41 B, medium vigour variety.

The length of the shoots was higher at the pyramid system in all varieties (7.19-5.23 m), and the smallest in the T-shaped horizontal trellis (4.18-3.43 m).

Table 1
Productive characteristics of studied vine rootstocks

Specification	Berlandieri x Riparia Selection Oppenheim 4			Berlandieri x Riparia Kober 5 BB			Chasselas x Berlandieri 41 B		
	diagonal vine training	Pyramid	T Horizontal training	diagonal vine training	Pyramid	T Horizontal training	diagonal vine training	Pyramid	T Horizontal training
Average no. shoots/vine	10	11	9	11	12	10	9	10	8
Total length of shoot (m)	5.64	6.66	5.21	5.94	7.19	5.43	4.89	5.23	4.57
Useful length of shoot (m)	4.96	5.53	3.96	5.29	6.11	4.18	4.40	4.50	3.43
Percentage of matured wood	88	83	76	89	85	77	90	86	75
Percentage of losses from pruning	15	18	20	13	19	21	13	15	18
No of cuttings/vine	14	15	10	15	17	11	13	12	9
Calculated no of cuttings/ha	135000	145500	125000	137500	142500	127500	132500	130000	122500

The total length of the matured wood was highest in the case of the pyramid trellising system (6.11 – 4.50 m) while the lowest was in the case of T-shaped horizontal system (4.18-3.43 m).

The highest percentage of matured wood was recorded in the monoplan trellis systems with diagonal vine training (over 88%), while low values (75-77%) were specific to the T-shaped horizontal system.

Cutting losses were within the specific limits (15-20%), the fewest being recorded for the Kober 5 BB and 41 B varieties in the form of a vertical trellis with diagonal vine training (13%) and the largest ones in the Kober 5 BB, which is extremely vigorous, led as the T-shaped horizontal trellis (21%).

The number of cuttings per vine and implicitly the production per hectare were below the species specifics given the ancient position to the northern vineyard culture limit of the Iasi vineyard. In vigorous varieties, the light exhibition favoured large pyramid-producing productions, namely 145500 vines/ha at SO₄ and 142500 vines/ha in Kober 5 BB. In the middle-sized variety 41 B the largest production was in the form of a vertical trellis with diagonal vine training of the shoots 132500 vines/ha.

CONCLUSIONS

1. The useful length of the shoot was the largest in the form of pyramids, and the smaller one in the T-shaped horizontal system with the horizontal direction of the shoots.

2. Cuttings were the most quantitative in vigorous varieties in the form of pyramids, while the lead in the form of a vertical trellis with diagonal vine training, more suited to middle-vigour varieties.

3. T-shaped horizontal treadmill leads to smaller vegetative growths with productions below the specific of the varieties, often the growth of main shoots being slowed by strong secondary growth.

REFERENCES

1. **Amaradei Elena, 2010** - *Cercetări privind obținerea butașilor de portaltoi prin conducerea liberă pe sol și comportarea acestora în scoala de vițe și în plantația de vie pe rod*. Teză de doctorat, USAMV București
2. **Corbean D.G., 2011** - *Tehnologii noi de producere a materialului săditor viticol, în podgoria Târnave*. Teză de doctorat, USAMV Cluj-Napoca
3. **Dobrei A., Rotaru Liliana, Dobrei Alina, 2017** – *Viticultură, Ampelografie, Oenologie*. Editura Solness, Timișoara