

Edlira KUKALI,
Kristina ATILIO, Anarita LEVA¹

GRAFTING TO IMPROVE THE CHARACTERISTICS OF SAPLING OF GRAPEVINE CULTIVARS

SUMMARY

Through this paper we convey the conducted researches with simultaneous callusing and rooting through grapevine grafting in cultivars as “*Shesh i bardhë*”, “*Shesh i zi*”, “*Tajga*”, “*Victoria*” and “*Cardinal*”. 20 cm long antiphyloxeric grafts in 1103 P, treated with paraffin wax, installed in 500 cc (coconut) substrate in a bench. Temperature of degrees 26. Afterwards, grafts treated in the basal part for 7 seconds with NAA-1 2g.l⁻¹.

The callosity formation in the scion wound and at the base have been significantly affected by applied hormone (P <0001). In cv. “*Shesh i bardhë*” it has been observed the best regeneration of callus (98%) and significant changes (1:47 LSD. P = 0.05). 2g.l⁻¹ NAA concentration has had a clear improved callus induction, an augmented 27 % radices’ stimulation, which was higher than that of the Control. Meanwhile, this concentration has favored the merismatic activity and the proliferation of vegetative buds.

Cultivar has had strong correlative links with the callusing percentage (r = 0734), the rooting percentage of (r = 0567), and a weak link with the number of roots (r = -0237).

The obtained results represent an interesting source for the growth of reproduction coefficient and time reduction of sapling preparation.

Keywords: cultivar, stimulation, rooting capacity, scion, antiphyloxeric, sapling

INTRODUCTION

Applying propagate with copula for improving agronomic indicators of grapes. Experiments for improving the grapevine, through grafting with pencil and copula provides simultaneous formation of the callus and rooting.

The production of grapes sapling in Albania performed in two ways:

- (i) Classical methods; calluses in crates with warm rooms,
- (ii) Cold calluses in trenches with sand.

Compliance and the occupation of the components are depending on the genetic material and thermal and moisture regimes. Regimes are important

¹ Eldira KUKALI, (corresponding author: ekukali@ubt.edu.al) Department of Horticulture, Agricultural University of Tirana, Koder Kamez, Tirana, Albania, Kristina ATILIO, Anarita LEVA National Research Council Trees and Timber Institute, Sesto Fiorentino, Italy

because they affect quality to produce callus, as a biological necessity realizes union with rootstock and scion, appearance based on radicals.

However, biological indicator (final) is the opening of buds and vegetative growth due to strong tissue structures in the grafting point. Temperature plays a basic role in the formation of callus and connection between two components. Callus pace of production at different temperatures is not the same, less than 5 degrees is weak, while in grade last 5-10 months. With increasing temperature above 5 degrees increases the rate of formation of callus reaching great speeds at a temperature of 18-20 degrees. Where the grade exceeds 32 ° C slowly callus, over 40 degrees while the parenchyma tissue cells begin the dehydration and dry.

During the grafting process, *callus* formed, which are undifferentiated cells that bind the scion and rootstock together. These cells differentiate into specialized cells that form a new xylem (water and nutrient pathway) and phloem (sugar pathway) within the graft union.

Grafting techniques can used to produce complete grapevines or top-work varieties in the field.

Callus cells are very soft and delicate. In the absence of moisture, air-dry them significantly affecting the success of grafting. For this coverage with clippings grafting mastics, is illustrates. In addition, callus is a suitable ground for the development of different organisms, touching various diseases, eliminated by plastic film and connecting countries to cut coverage with Mastic

This method of plant propagation also shortens the time to production of the desired new crop, using the existing variety as a rootstock. Several grape varieties at the Agricultural Albanian University have successfully grafted onto selected rootstocks using this technique.

Bench grafting of rootstocks and scions (copulate) has economic and scientific interest. Simultaneously realizes callus-flowering-anchoring, sapling done for 90 days. Modification of technical parameters, biometric, and grafting with the increase in vase Plas film

Advantages of this method: Quick multiplication, High weighting, Saving germ plasma, The roots are 40-45 cm length and full preparation of sapling lasts a year. Beam production (%) fluctuated from 25 to 45% referred to 100 planted graft.

MATERIAL AND METHODS

Scheme of the experiment and technology

In February, the cultivars “*Shesh i Zi*”, “*Shesh i Bardhe*” and “*Tajga*” grafted; Omega on P1103 rootstock.

Treatments have been experimented:

Treatment 1 - grafts (no stimulation, no connections, no paraffin);

Treatment 2 - ANA grafting 2g / 1 + Paraffin;

Treatment 3 - ANA grafting 2g / 1 + + Plasfilm paraffin.

Graft were planted in polyethylene vases 200 cc 8-10 cc. were immediately placed in the basic multiplication Bank, heated 17 ° C. Segment of

the grafted pieces in the bank environment. Air temperature of 26⁰C by a thermostat type 41S T302 WH. For each treatment were 20 grafts.

- Height of rootstocks;
- 20 cm (\pm 1cm) plus the length of the pen Scion;
- 35 days calluses, rooting rootstock and sprouting of scion;
- 30 days, which coincides up to March 30, acclimatized in several conditions.

Indicators:

1. Number of pieces based callus,
2. Number of callus graft,
3. Number of graft open,
4. Height of seedlings to full-blown,
5. The number of roots in cut base.

Statistical analysis

For the realization of any treatment, changes made to each other proceedings and modeling variance with research inputs test TYKEY - All Kramer and pears. (SAS/STAT 2008).

The end of the year then performed statistical analysis and preparation of conclusions drawn of the effect of preparations for each treatment. Through this study we reached a conclusion and made recommendations for the application of best treatment.

RESULTS AND DISCUSSION

Effect of grafting on the percentage method of catching seems to have stimulated quite different percentage. Through variance values (LSD 1.99 HSD, alpha = 0.05), has resulted: paraffin version with links and expresses the highest percentage of grafting with the conception of a dominant position versus other treatments. Treating unrelated results + paraffin has the lowest 50%

Results obtained in control have resulted in lower position, initially.

She has gone to zero in terms of the definitive roots.

Then it is found that graft regimes applied to the conditions callus series, have shown similar phenomena; around 10-15 days has been drying the wound caused by cutting. Meristematic activity calluses tissue differentiation, through increasing the volume of phloem and parenchymatous cells and cortex adjacent grafting to the wound sclerenchymatous ring.

After 30 days, under control temperature, regime on the basis of rootstock, observed in base of segment, becoming the first differentiations rooting, within the mass of homogeneous callus cell clusters formed with greater activity in the form meristematic axis, which grow in both sense (and out). This is clear and forms the vascular cylinder surrounded by skin and associated with vessels in the center and phloem, xylem. These are white and very numerous.

This moment clearly distinguished anatomical structures of the radices, as phloem, xylem the periderm and the marrow.

Table 1. Number of callus graft, anchored and opened for cultivars Square black, white plaza and taiga, the vine

<i>Shesh i bardhë</i>			<i>Shesh i zi</i>			<i>Tajga</i>		
Control	Plas film + paraffin	Paraffin	Control	Plas film + paraffin	Paraffin	Control	Plas film + paraffin	Paraffin
12b	19 a	20 a	10b	17b	17b	11b	18b	18b
6c	13b	19 a	6b	11b	17 a	5c	10 b	18 a
3.6e	7.1c	11.3b	2.8e	6.6b	10.4b	3.3e	9.2b	16.4a
4e	9 b	16 a	3e	7b	15a	4e	7b	16a
12b	26c	32 a	10.2b	22d	29b	11.5b	30b	33 a
12b	19 a	20 a	10b	17b	17b	11b	18b	18b
6c	13b	19 a	6b	11b	17 a	5c	10 b	18 a
3.6e	7.1c	11.3b	2.8e	6.6b	10.4b	3.3e	9.2b	16.4a

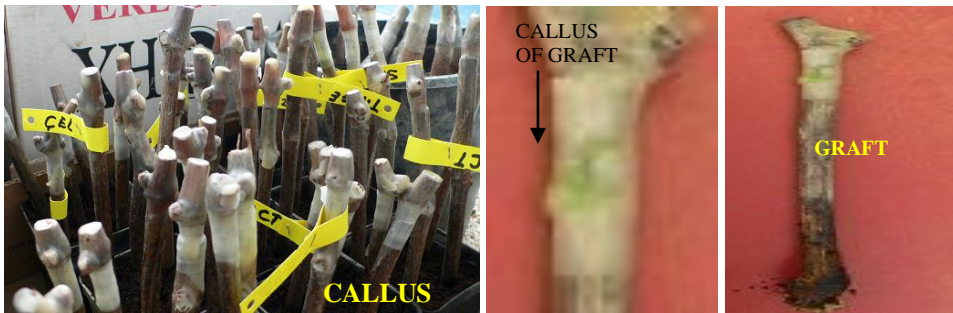
(For each treatment were planted in 4 repeat graft 20)

Compliance determines the degree of harmony between the two components, and depends on the nature and level meristematic their bio-physiological. The large number of graft to callus treatment was to Paraffin and plasfilm. Grafts are better occupied the Shesh I Bardhe and the Tajga. The greatest number of roots of cv Tajga. The callus on based of graft, no changes. Compliance and the occupation of the components is depending on genetic material and mainly thermal and moisture regimes as important biological factor

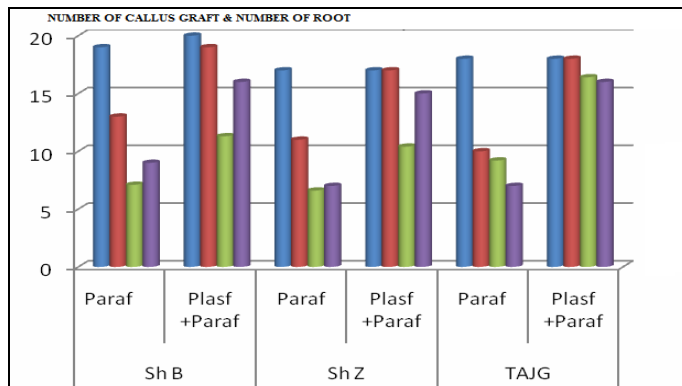
Phenomena of morphological changes of the base that it copes vegetative and wound grafting have developed in parallel at the same time. This has been done time for planting in tranpiant or politely sac with organic substrate. In general, grafting success was dependent on the botanical proximity of two components, especially cambium contact and activity of rootstock cambium, environmental conditions, grafting techniques, touch from viruses, and pests, the time of grafting and protection components after grafting who have been under control and have not been influences.

This method has provided the best line of both bills layers of components that constitutes one of the main factors of success of grafting, which have been carefully first peak to the two components have the same thickness.





When the grafting required, separating easily from wood hulls. It is important to the rootstock. Biological factors have been the indicator and expressed relations between anatomical and physiological processes rootstock and scion article. Compliance expressed in the stuffy stock has determined the degree of harmony between the two components, and was under the influence of nature meristematic and their physiological level. Specificity of metabolism to the extent stated callus, the percentage of catching and simultaneous differentiation of the radicle.

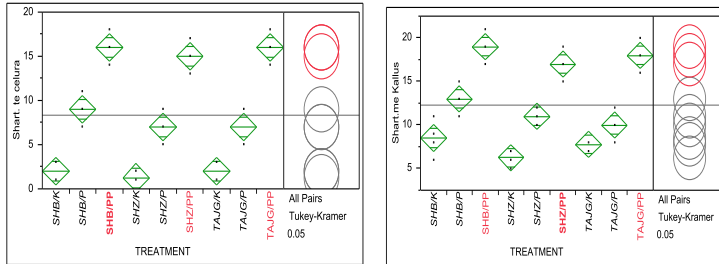


Graphic 1. Number of callus graft and number of roots for each treatment

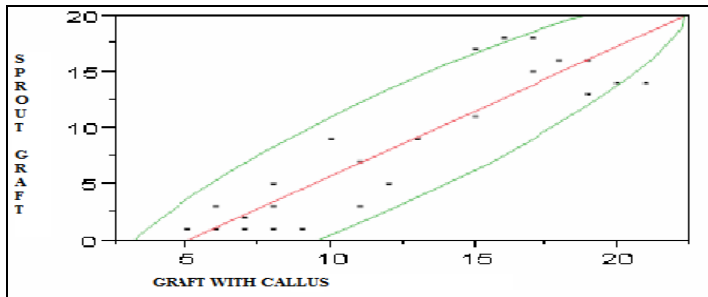
Analysis of variance, of number, of presents open graft frequency, Distribution and dominance of the third treatment in connection with three cultivars verified by TUKEY LSD 3.12 and confirms the influence of biological and technical factors. In the high percentage of fishing: *Shesh I Bardhe* "80%", *Shesh I Zi* "75%", *Taiga* 80% with Plas film + paraffin.

According to trials conducted 95% success rate, *Bench grafting* Omega, Vineyards can effectively used to convert unprofitable grape varieties into a vineyard that has the potential for higher returns.

Graft to callus for $P = 0.90$ confirms that the number of callus pieces with the graft affects the number of full-blown.



Graphic 2, 3. ANOVA for sprout scion numbers and root numbers for each treatment.



Graphic 4. Regression, number of sprout graft



Figure 1. The steps of performing the experiment

The highest quality callus has stimulated communication between components and the opening of the pen.

With regression analysis, has defined relations between the number of graft with callus as factor and the number of graft full-blown like averaged cultivars to find the biological functional relationships between them.

R^2 as a proportion of the variation coefficient is varied from (0.44) to (0.8) of the variation and 80% line represents the point of treatment

Regression modeler analysis expressed and confirmed that the opening of explants averages at all times are linear and have been climbing in 80% of their dependent biological factors that have caused the callus of wound of graft. Confirming the opening as the final process, the product of callus and differentiation meristematic.

CONCLUSIONS

Biological indicator has been the emergence of seedling and vegetative growth and strong tissue structure in point of grafting.

Reduction of sapling preparation time up to 75 days is a result of harmonization bio- physiological Scientific and technical factors.

Sapling is seasoned and capable of creating a new vineyard, as well as other effects for multiplication of the conservation of the grapevine germ plasma.

This method is rapid multiplication is performed in every time and has a high coefficient multiplication.

REFERENCES

- Bailey, L.H. 1914. *The nursery-book, a complete guide to the multiplication of plants*. Macmillan, New York.
- Bailey, L.H. 1928. *The standard cyclopedia of horticulture*. Macmillan, New York.
- Barker, T. 1951. *The country-mans recreation, or the art of planting, grafting*, Early English Books Online.
- Leinfelder, M.M, and I.A. Merwin. 2006. *Rootstock selection, preplant soil treatments, and tree planting positions as factors in managing apple replant disease*. HortScience41:394–401.
- Nelson, S.H. 1968. *Incompatibility survey among horticultural plants*, Intl. Plant Prop.Soc. Comb. Proc. 18:343–393.
- Rieger, M. 2006. Grapes—Vitus species (cited 10 January 2008). Available at www.uga.edu/fruit/grape.html.
- Wilson, P.M.W. 1952. *Distribution of solanaceous Alkaloids in some new graft combinations*, New Phytol. 51:260–263.

**Edlira KUKALI,
Kristina ATILIO, Anarita LEVA**

KALEMLJENJE U CILJU POBOLJŠANJA OSOBINA MLADICA KULTIVARA VINOVE LOZE

SAŽETAK

U ovom radu predstavljamo sprovedena istraživanja istovremenog ožiljavanja i ukorjenjivanja sorti vinove loze kalemljenjem i to “*Shesh i bardhë*”, “*Shesh i zi*”, “*Tajga*”, “*Victoria*” and “*Cardinal*”. Antifilokserični kalemi dužine 20 cm u 1103 P, tretirani su parafinskim voskom, i postavljeni u 500 cc supstrata u sudu. Temperatura je iznosila 26 stepeni. Nakon toga, kalemi su 7 sekundi tretirani u bazalnom dijelu sa NAA-1 2g.l⁻¹.

Na formiranom kalusu koji nastaje na zasječenom izdanku i u osnovi značajno je primjenjen hormon (P <0001). Kod sorte “*Shesh i bardhë*” uočena je najbolja regeneraciju kalusa (98%) i značajne promjene (1:47 LSD. P = 0.05). 2g/l-1 NAA koncentracija je imala vidno unaprijeđenu indukciju kalusa, pojačanu stimulaciju korjena na 27%, što je više nego kod kontrole. U međuvremenu, ova koncentracija je blagotvorno uticala na aktivnosti meristema i širenje vegetativnih pupoljaka.

Kultivar ima jake korelativne veze sa procentom ožiljavanja (r = 0734), i procentom ukorjenjivanja (r = 0567), a slabe veze sa brojem korjena (r = -0237).

Dobijeni rezultati predstavljaju zanimljiv izvor za rast koeficijenta reprodukcije i skraćivanje vremena potrebnog za pripremu mladica.

Ključne riječi: kultivar, stimulacija, mogućnost ukorjenjivanja, sadnica, antifilokserični, mladica