

DETERMINING THE VOLUME OF THE CROWN V_1 , V_2 AND V_3 OF TWO DIFFERENT COMBINATIONS OF CULTIVARS AND SUB GRAFTING OF APPLE

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Abstract

This report presents a one year research on the determining the volume of the crown V_1 , V_2 and V_3 of the two cultivars and the sub grafting of apples, which are quite widespread in Kosovo and the combinations between them (Idared on M 9, MM 106 and Granny Smith on M 9, MM 106). The experiment is set by the block of four repetitions method. V_1 , V_2 and V_3 are determined by measuring the distance of the occurrence of fruits from the central leader to the periphery of the crown.

In the end are presented the results obtained in these investigations in agro-ecological conditions of Kosovo, specifically in the region of Anamorava, where the average seen in both cultivars on M 9 have reached a lower value in comparison with sub graft MM 106 which is consistent with its inherited traits of sub grafting and cultivars as well as the age of the orchard.

Key words: volume V_1 , V_2 , V_3 , cultivar, sub grafting

1. INTRODUCTION

According to FAO (2010), the ten countries with the highest apple production in the world are: China (33,265,186 t), the USA (4,212,330 t), Turkey (2.6 million t), Italy (2,204,970 t), India (2,163,400 t), Poland (1,858,970 t), France (1,711,230 t), Iran (1,662,430 t), Brazil (1,275,850 t) and Chile (1,100, 000 t).

Apple due to inherited traits, in particular, the ability to adapt to different agro-ecological conditions, high nutritional value, high yields, achieving high positive financial returns as well as a range of other advantages, both in the world as well as Kosovo, is the most widespread type of tree.

For no other type of fruit, are there such great opportunities for the selection of sub grafting and cultivars, such as for apple Zajmi (1997).

In principle, during the selection as well as in the implementation of agro measures and pomotechnic, should define that volume V_1 should be much smaller, volume V_2 should be much bigger because the fruit appear throughout this volume, while volume V_3 should be average, but it should note that, in large measure, these parameters depend on inherited properties of sub grafting and cultivar.

Data on volumes V_1 , V_2 and V_3 we encounter at author Zajmi (1985), agro-ecological conditions of Angers-it France on sub graft M 26 for cultivars Idared and Granny Smith at the end of the fifth vegetation. The author has found that the volume V_1 of the cultivar Idared on M 26 at the end of the fifth vegetation has reached 0.091 m³ while the volume V_2 significantly greater value 0.651, and cultivar

Granny Smith which is also on M 26 volume V_1 has reached values of 0.265 m^3 and for volume V_2 , again significantly higher value of 1.637 m^3 .

Data on the virtues of sub grafts and cultivars we encounter at these authors: Çakalli & Thomai (2005), Gliha (1978), Gvozdenović & Dulić (1982), Gvozdenović (2007), Kapetanović (1984), Krpina (2004), Masseron (1989), Michelesi (1979), Miljković (1991), Mišić (1994), Štampar (1966), Štampar (2009), Trillot et al. (1993, 2002), Vaysse & Landry (2004), Zajmi (1985, 1986, 1996, 1997), Zajmi et al. (2005).

2. RESEARCH FACILITY, MATERIAL AND METHOD OF WORK

2.1 Research Facility

Facility where the research took place was the orchard in the village of Ramnishtë K.K Viti, in the area of 2.8 ha, where there are a total of 14 cultivars. Orchard is set in the autumn of 2006 and is located at an altitude of 425 m.



Photo 1 - Orchard where the research took place

2.2 Material

For research two sub grafting (M 9 and MM 106), and two cultivars (Idared and Granny Smith) were followed. The two cultivars were grafted onto rootstock M 9 and MM 106.

Planting distances are 4 m x 1.3 m in the sub graft M 9, and 4 m x 1.7 m in the sub graft MM 106.

Orchard in question was in 2010 at the age of four years.

The Orchard had a drip irrigation water system.

Kosovo has a moderate continental climate with a coastal impact which penetrates through the valley of the White Drin moderating markedly continental climate elements.

In Kosovo average temperature is 10.3 °C, that of vegetation 16.5 °C, the coldest month is January (-0.9 °C) while the hottest month is July with 20.1 °C.

Regarding the annual rainfall is 744.8 mm, and during vegetation 346.7 mm which shows the need to intervene with supplementary irrigation Zajmi (1996).

When you talk about the conditions when the research took place (2010), for the region of Ferizaj namely village Ramnishte – Viti, then an annual average temperature for 2010 was 11.73 °C, the average vegetation was 18.11 °C, the coldest month was January 0.5 °C while the hottest month was August (23.0 °C) which means compared to the average temperatures of whole of Kosovo, during the research in this area temperatures are presented slightly higher.

Average annual amount of rainfall in 2010 was 790.3 mm while during vegetation rainfall was (293.1 mm), IHK (2012), which means there has been less rainfall compared to the 30 year average rainfall in Kosovo .

Macro elements, pH value, and % of humus before setting up the orchard with the help of fertilization have been, are brought to an optimal level.

2.3 Method of work

Our research refers to specific ecological conditions of Anamorava region.

During our annual survey to determine the volume of crown V_1 V_2 and V_3 regular records of data are kept which are processed and presented in a form of a graph.

Randomly, according to the block method, in January 2010 the trees included in this experiment are set and marked in black colour, exactly 20 cm above the grafting.

This experiment is located in four repetitions. In one parcel five trees are taken for processing for every combination, which means that for one combination twenty trees are used making it a total of eighty trees have been researched .

Method of work for the parameter that has been researched is shown below.

Determination of crown volume V_1 , V_2 , and V_3 , is found by measuring the occurrence of fruit in every fruitful branch.

V_1 - the distance is determined from the head tree to the first fruit to every fruitful branch,

V_2 - the distance is determined from the first fruit to the last fruit of every branch and

V_3 - the distance is determined from the last fruit until the end of a one year growth

Measurements were carried out on 29.08.2010.



Photo 2 - Determination of crown value V_1 , V_2 , and V_3

3. RESULTS

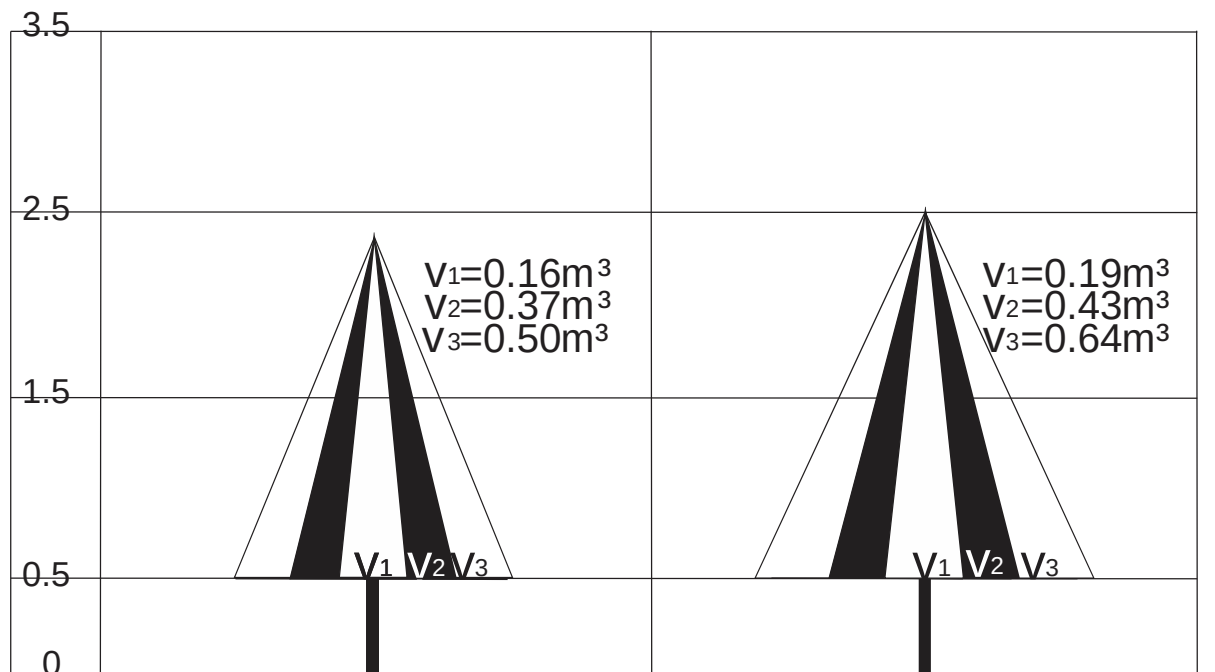
Data for determining the volume of crown V_1 , V_2 , and V_3 researched combinations are shown in the graph 1 and graph 2.

The graphs show that on average the two cultivars on M 9 reached lower values compared to sub grafting MM 106, while the two cultivars grafted onto sub grafting MM 106 have achieved greater volume values with the exception of Granny Smith on MM 106 (V_3 0.25 m³), which may have been influenced by pruning, fruit thinning or some other factor.

Another conclusion can be derived that from all three researched volumes (V_1 , V_2 , and V_3) out of any combinations, volume V_1 has the lowest value then comes volume V_2 , while V_3 reaches the larger size.

Our results for the volume V_1 and V_2 coincide with the author Zajmi (1985) data that volume V_2 has reached values higher than the volume V_1 of the two combinations.

Height in m

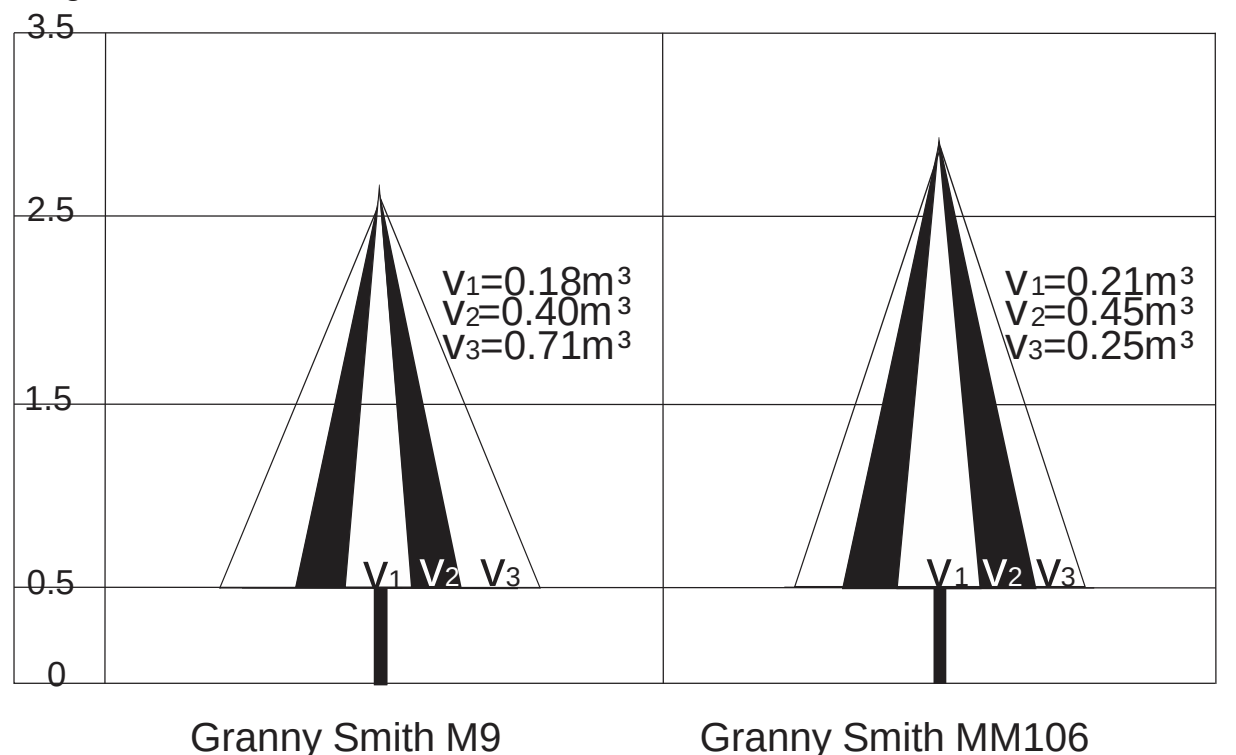


Idared M9

Idared MM106

Graph 1 – Determining the volume of the crown V_1 , V_2 , and V_3 Idared combination

Height in m



Graph 2 - Determining the volume of the crown V_1 , V_2 , and V_3 Granny Smith combination

4. CONCLUSIONS

Based on our one year research conducted in agro-ecological conditions in the facility Ramnishte KK Viti, in the area of 2.8 ha, where only common technology is used in the cultivation of the apple, we can draw this conclusion.

Determining the volume of the crown V_1 , V_2 , and V_3 , both cultivar Idared cultivar Granny Smith, in combination with sub grafting, M 9 and MM 106 indicate that the ecological conditions of the region of Viti, are presented (manifest) inherited properties of sub grafting and cultivars, and their mutual influence.

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