

The Influence of Trunk Cutting on Growth and Fructification in Old Sweet Cherry Orchards

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Abstract. In 2010-2011, the investigations were carried out on trees of ‘Germersdorf’ sweet cherry cultivar, grafted on Mahaleb rootstock, planted in 1991, in Cluj-Napoca, Romania. The trunk was cut with a motor chain saw in order to break the flow of assimilates and bio regulators in the phloem of the tree trunk and induce flower bud setting. These treatments were also made in order to reduce vegetative growth on trees that are particularly vigorous. Reducing vigour allows more sun to reach lower fruiting wood, making it more productive. The following treatments were compared: V1 - Control, V2 - Trunk cutting on side with a motor chain saw to a depth of ½ of their diameter, V3 - Trunk cutting, i.e. tree trunks were cut with a mechanic chain saw to a depth of ½ of their diameter, on two opposite sides of the trunk 30 cm apart. Every year the trunk diameter of the investigated trees was measured 10 cm above the upper place of the treatment, the cross-section area and the increases in this area calculated based on these measurements. In addition, the number of flower buds on the spurs was calculated both in cutting trunk variants and in the control. Cutting trunk treatments inhibited increases in trunk circumference, in the first year after the treatment. Stronger influence in V3 treatment was obtained. The number of bearing branches and the yield increased using also trunk-cutting treatments with statistically differences assured as to the control.

Keywords: trunk cutting, motor saw, sweet cherry, vigour, bearing branches

Introduction. Control of the vegetative growth and balance between growth and fructification are one of the most important orchard practices. There are many possibilities for decreasing shoots growth, and increasing fruit set, fruit size. However, most of these, do not distinguish between the different techniques (e.g. girdling vs. scoring), time of application of the technique (Theron and Steyn, 1998). In this paper, we detail a cultural technique, which may help.

Aims and objectives. The research aims to control vegetative growth and fruit set in the ‘Germersdorf’ sweet cherry cultivar and the objectives are to reduce vegetative growth and increase the number of bearing branches, fruit set and, obviously, the yield.

Materials and methods. In 2010-2011 the investigations were carried out on trees of ‘Germersdorf’ sweet cherry cultivar, grafted on Mahaleb rootstock, planted in 1991, in Cluj-Napoca, Romania. The trunk was cut with a motor chain saw in order to break the flow of assimilation and bio regulators in the phloem of the tree trunk and induce flower bud setting. These treatments were also made in order to reduce vegetative growth on trees that are particularly vigorous. Reducing vigour allows more sun to reach lower fruiting wood, making it more productive.

The following treatments were compared: V1 - Control; V2 - trunk cutting on side with a motor chain saw to a depth of 1/3 of their diameter; V3 - Trunk cutting, i.e. tree trunks were cut with a mechanic chain saw to a depth of 1/3 of their diameter, on two opposite sides of the trunk 30 cm apart. The growth of trees was estimated in 2010 and 2011.

Results and Discussion. Cutting trunk treatments inhibited the increase in length of shoots, since in the first year after the treatment. Stronger influence in V3 and V2 treatment was obtained (Tab. 1).

Tab. 1

Synthesis results on the ‘Germersdorf’ sweet cherry cultivar depending on cutting trunk (Cluj-Napoca, Romania, 2010-2011)

Variant	Length of annual shoots (cm)	Number of bearing branches	Yield (kg/ha)
Uncut (Control)	61.7	8.3	5243.3
V2 – cut 1/3	43.3***	13.7***	7476.7**
V3 – cut 1/3 both sides	29.3***	16.0***	10986.7***
LSD 5% =	3.8	0.9	1241.4
LSD 1% =	6.3	1.5	2054.1
LSD 0.5%=	11,7	2.8	3844.7

Cuts through bark and phloem during early spring will temporarily disrupt nutrient and water movement to the vascular system. Poniedzialek *et al.* (2004) reported that the trunk cut with a chain saw decreased on ‘Merlose’ apple cultivar on the trunk sectional area, canopy volume and increased cumulative yield and productivity index.

Data of this paper confirm these results. The number of bearing branches and the yield increased using both trunk cutting treatments with statistically differences assured as to the control.

Conclusions

1. Maintaining an ideal balance between vegetative growth and fruiting in the vigorous cultivar of sweet cherry is difficult and implies many technical possibilities.
2. Often pruning causes further vegetative increase, which unbalances the trees.
3. Cutting the trunk of the old vigorous cultivars of sweet cherry reduces vegetative growth and increases number of short bearing branches and, obviously, the yield of the trees.
4. The best way of cutting proves to be trunk cutting by using a mechanic chain saw to a depth of 1/3 of their diameter, on two opposite sides of the trunk 30 cm apart.

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