

## The Effect of the Pruners' Qualifications on the Biological Productivity in Apple Production

- Original scientific paper -

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**Abstract:** Pruning is a set of precisely defined operations aimed at crown training and controlling fruit tree growth and productivity. Since all cultural practices are basically aimed at the formation and development of buds, the engagement of the skilled labour in pruning is an important factor in better utilisation of biological potential of cultivars with differing types of organogenesis of bearing wood. Studies on the effect of quality of winter pruning on the biological productivity in apple cultivars, Idared, Jonagold and Melrose grown on the M 9 rootstock and trained as slender spindle, at the same level of production investment, showed that yields obtained by applying proper operations, by highly-skilled operators, were higher by 21.14% than those achieved by the less qualified workers. Also, the yield per tree variation was significantly lower with highly-skilled workmen, whereas with insufficiently qualified those it was at the level of partial alternate bearing.

**Key words:** Pruner's qualification, pruning, productivity.

### Introduction

The main prerequisite for the crown productivity improvement is the elimination of the inherent tendency for spontaneous occurrence of crowding and thinning in growth pattern of fruit trees. In practice, this is achieved by reducing growth habit and increasing tree number per unit area. The

maximum value of the crown productivity coefficient (CPC) can be obtained only with the spindle and cordon training systems (CPC = 1). The crown productivity coefficient represents the ratio of the part of the crown undergoing the process of active differentiation of vegetative and generative growth points to the total crown volume, *Prica*, 1986.

The following characteristics determine the spindle form, regardless of the type or modification, *Gvozdenović* and *Mićić*, 1995:

- dominant growth of the central leader, which represents the main scaffold structure;

- the absence of lateral scaffold branches (the strongest lateral branches have the semi-scaffold characters - the thickness at the base is lower by more than 1/2 than the thickness of the central leader at the crotch point).

The differences in pruning of spindle forms in stems of individual cultivars form varietal specificities in the organogenesis of bearing wood and differing structure of productive types of fruiting branches, which make the base for the realisation of bearing potential involve the following: the angle of fruit bearing lateral to the central axis; the age and number of fruit bearing lateral to the central axis; the age and number of fruit bearing laterals and fruiting branches; the duration of optimal fruit bearing and the time of replacing the bearing wood; the length of the stub obliquely cut in the replacement of the fruit bearing lateral, and the time and intensity of operations with summer pruning, *Mićić* and *Đurić*, 1995.

Bearing in mind varietal specificities in pruning of various cultivar/rootstock combinations, this study was aimed at the investigation of the effects of pruners' qualifications on fruiting and other elements of biological productivity in major apple cultivars grown in the plantation.

## Material and Methods

The trial was set up in a production planting of the DP "Plantaže" Gradiška, with 50 trees each in three replicates, with the following cultivar/rootstock combinations: Idared/M 9, Jonagold/M 9 and Melrose/M 9. The planting was established in 1987. The trees were trained to slender spindle, spaced at 1 x 4 m for Idared, and 1.1 x 4 m for both, Jonagold and Melrose. Winter pruning was done by two groups of workmen: I - highly-qualified pruners (B.Sc. Agr.), and II - lower-qualified pruners. In the first period (1990-1992), the preparation of trees was done throughout pruning standardisation to achieve uniformity. The paper presents the data processed for 1993-1994. The same fertilisation, protection and summer pruning measures were applied to both groups of trees in the trial. The analysis

