

F Propagation and growing techniques

F1 Effect of different propagation methods in yield formation of plum cultivars

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The experiment was established in spring of 1998 at the Polli Horticultural Institute (PHI), South-Estonia with 9 plum cultivars: 'Emma Leppermann', 'Wilhelmine Späth' (German origin), 'Duke of Edinburgh', 'Queen Victoria' (England's origin) and four cultivars of Estonian origin- 'Märjamaa', 'Noarootsi Punane' (both are landraces), 'Polli munaploom' and 'Vilnor' (two latter are bred at the PHI), 'Liivi Kollane Munaploom' is a landrace originated in a larger territory from Baltic to Belarus. The trees were propagated (1) on the *Prunus cerasifera* Ehrh. rootstock and (2) *in vitro*, by tissue-culture method. The first yields in 2001 didn't differ significantly between the propagation methods. The next 2002 year, the trees propagated on rootstock produced better yield, but in 2003 vice versa, the tissue-culture-trees were more productive. General conclusion is that during three crop-years means of the propagation methods were not significantly different. Among cultivars only 'Märjamaa' and 'Queen Victoria' trees on the rootstock were more productive than tissue-culture-trees. In fruit mass, trunk cross-sectional area and crop index were not significant.

F2 Growth of plum fruitlets in relation to time and climatic conditions

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Fruitlets of four plum cultivars were sampled and weighed at the first and fifteenth of the months July and August during 13 years. The cultivars were 'Ive', 'Mallard', 'Opal' and 'Victoria'. In addition, time of flowering, date of harvest and fruit size at harvest was recorded. The observations were correlated with each other, and with climatic parameters.

In years with high fruit weight the first of July, the weight was also high later in July and in August. No clear correlations were found between weight in the summer and weight at harvest. For all cultivars the weight of fruitlets was high up to August in years with early flowering. The time of flower opening was closely related to temperatures in April and May. In years with high temperatures in May and June, fruit ripening was early.

F3 The effect of the planting distance and rate of complex mineral fertilizers on plum cv Čačanska Lepotica yield and fruit size

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Under the conditions of heavy alluvial soil, moderately acid (pH 5.9), low in humus (2.65%), with total N 0.13%, moderate in K₂O (20.4 mg/100 g) and proper in P₂O₅ (15 mg/100 g), the effect of different planting distances (4 x 0.7 m; 4 x 0.85 m; 4 x 1 m) and various rates of fertilizers (8:16:24) - 400; 600; 800; 1,000 kg/ha, in V planting system (4-6 year old planting under cv Čačanska Lepotica) was studied.

F4 Propagation of some *Prunus* rootstocks by hardwood cutting on composed rooting substrates

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Cutting can be an efficient propagation method for different *Prunus* rootstocks. The paper presents some new aspects of the basal heating techniques on hardwood cuttings rooting. Some new released Romanian *Prunus* rootstocks: CPC, CT169, C5 (*Prunus cerasifera*) and Otesani 11 (*Prunus insititia*) were compared with some well known rootstocks: Mirobolan 29C (*Prunus cerasifera*), Pixy (*Prunus insititia*), Myran and Ishtara (*Prunus* hybrids) on the rooting process. The hardwood cuttings were treated with alpha naphthyl acetic acid (3,000 ppm). Composed rooting substrates, double layers: wood flour + perlite; wood compost + perlite and cotton waste + perlite were used. Hot water was used as heating agent in a closed circuit. The rooting percentage and the quality of formed roots were strongly influenced by specie, variety, substrate type used and basal and atmospheric temperature.

F5 Reflective mulch (Extenday®) in plum orchards (*Prunus domestica* L.) – preliminary results

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The fruits in the lower and inner part of the canopy of fruit trees are less mature with less surface colour and poorer fruit quality than fruits from the upper and outer part of the tree canopy. This is mainly due to less light in the canopy. Methods to increase the amount of light in the lower part of fruit trees, e.g. by covering the soil with a reflective mulch, would give more evenly developed fruit of higher quality and reduce the number of pickings.

Experiments with a woven plastic mulch, Extenday®, have been performed in the experimental plum orchard at Planteforsk Ullensvang Research Centre in Western Norway. The cultivars used were 'Excalibur' and 'Prinlew'. The row distance in the orchard was 5 m using a 4 m wide reflective mulch being stretched between the rows, attached to the trees by elastic bands. The soil was covered from early June (2 weeks after bloom) until mid September. Temperature in the lower and upper part of the trees were measured during the growing season. The fruit quality of the plums were analysed for important fruit quality factors.

Temperature in the canopy and over the trees in plots with reflective mulch and control plots showed no significant temperature rise over the reflective mulch.

The reflective mulch had a strong positive effect on fruit quality. Fruits from trees with reflective mulch underneath had higher content of soluble solids, less titratable acidity and improved ground and surface colour compared fruits from control trees. The improvement was more prominent in fruits from the lower part than from the upper part of the tree. The reflective mulch had no significant effect on fruit firmness compared to controls.

The reflective mulch had a negative effect on the grass turf underneath the mulch. The grass growth were poor, and a part of the grass sod was killed.