Results Regarding the Influence of Plum (*Prunus Domestica*) Fruit Thinning over Production and Fruits Firmness

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Bulletin UASVM Horticulture 71(2) / 2014

Print ISSN 1843-5254, Electronic ISSN 1843-5394

DOI:10.15835/buasvmcn-hort:10636

Abstract. The removal of the excess fruit can be done in three stages: in the bud stage, by cuts, in the blossom stage, by chemical treatments and in the period when the fruit start to grow, through chemical treatments or through hand-thinning. In this study, chemical thinning was applied to flowers when 80% were open. The study took place in fruit-growing ecosystems Călăcea and Steluța, different ecosystems in terms of climate, by analyzing 7 varieties of plum. On these varieties were conducted determinations regarding thinning influence on: flower pollination (%), fruit weight (g) and fruit firmness (Kgf/cm²). In Călăcea fruit-growing ecosystem, regardless the treatment, 'Tuleu Timpuriu' variety registered the highest percentage of binding/ fertilized flowers (28.66%), and in Agroindustrială fruit-growing ecosystem, the highest percentage was obtained by 'Vinete Românești' variety (29.16%). Analyzing fruit firmness, in Călăcea fruit-growing ecosystem, regardless the treatment, 'Stanley' variety registered the highest fruit firmness (36.95 kgf/cm²), and in Agroindustrială fruit-growing ecosystem, the highest values for fruit firmness were obtained by 'Stanley' (36.55 kgf/cm²). Analyzing fruit weight, in Călăcea fruit-growing ecosystem the highest fruit weight (g) was registered by 'Stanley' variety (48.05g), and in Agroindustrială fruit-growing ecosystem the highest values for fruit weight were obtained by 'Nectarină Roșie' variety (53.41 g).

Keywords: *concentration, fruit quality, superior quality, thinning flowers, thinning fruits*

Introduction. Fruit size depends mostly on the total number of fruits on the tree (Webster, 2000). Giving the fact that plum have a tendency to produce a large number of flowers, and a great number of fruits also, thinning is crucial (Wilkie *et al.* 2008; Dagar *et al.* 2012).

Aims and objectives. Present study aims to highlight the results of chemical thinning for two different ecosystems in terms of climate. In Călăcea ecosystem, the annual medium temperature in the last 10 years was 11, 2°C and rainfall quantity in the current year was 562 mm. For Agroindustrială ecosystem the annual medium temperature in the last 10 years was 12,1°C and rainfall quantity in the current year was 501.1 mm.

Materials and methods. Experience was conducted from 2013 to 2014. The study took place in fruit-growing ecosystems Călăcea and Steluța, and were analyzed 7 varieties of plum

(,Tuleu timpuriu', 'Stanley', 'Gras Ameliorat', 'Anna Spath', 'Tuleu gras', 'Vinete Românești', 'Vinete de Italia' and 'Nectarină roșie'). Determinations regarding the influence of thinning have been made for these varieties on: flower pollination (%), fruit weight (g) and fruit firmness (Kgf/cm²). Chemical thinning was applied to flowers when 80% were open, with the following products: Ethrel, 0.01% concentration, Cosavet 80 DF, 5% concentration, Sulphur 80 WG and Sulfomat 80 PU, 5% concentration. Fruit weight was measured by using electronic scale and fruit firmness was determined by penetrometer method with laboratory penetrometer setamatic 17200-6 controller. Of each variety were analyzed 100 fruits, and the results were processed by ANOVA test.

Results and Discussion. Regarding fecundation percentage, both factors and also their inte-

reaction have a very important influence, beginning with the variety ($F = 615.821$, $p < 0.000$), treatment ($F = 341.006$, $p < 0.000$) and variety x treatment interaction ($F = 32.254$, $p < 0.000$). In Călăcea fruit-growing ecosystem, regardless the treatment, 'Tuleu Timpuriu' variety registered the highest percentage of binding / fertilized flowers (28.66%), followed by 'Stanley' variety (26.33%), 'Gras Ameliorat' variety (18.23%) and 'Anna Spath' variety (14.03%). In Agroindustrială fruit-growing ecosystem, the highest percentage was obtained by 'Vinete Românești' variety (29.16%), followed by 'Nectarină Roșie' variety (28.08%), 'Vinete de Italia' (26.08%), 'Stanley' (24.78%) and 'Tuleu Gras' variety (15.6%). Regardless the variety, in Călăcea fruit-growing variety the highest percentage of fertilized flowers was registered in the case of Cosavet (27.08%), and Sulfomat (26.91%) treatments, and the lowest percentage was registered by the variant with no treatment applied (13.76%). In Agroindustrială fruit-growing ecosystem, treatments with Cosavet (31.58%) and Sulphur (30.59%) registered the highest percentages of fertilized flowers, and the lowest percentage was obtained by the variant with no treatments applied (16.13%). Analyzing fruit firmness, the two factors, together with their interaction have a very signifying influence, beginning with the variety ($F = 510.903$, $p < 0.000$), variety x treatment interaction ($F = 110.1302$, $p < 0.000$) and treatment ($F = 60.448$, $p < 0.000$). It can be observed that in Călăcea fruit-growing ecosystem, regardless the treatment, 'Stanley' variety registered the highest fruit firmness (36.95 kgf/cm²), followed by 'Anna Spath' variety (35.58 kgf/cm²), 'Gras Ameliorat' variety (26.69 kgf/cm²) and 'Tuleu Timpuriu' variety (25.81 kgf/cm²). In Agroindustrială fruit-growing ecosystem, the highest values for fruit firmness were obtained

by 'Stanley' (36.55 kgf/cm²), being followed by 'Vinete de Italia' variety (31.76 kgf/cm²), 'Vinete Românești' (28.39 kgf/cm²) variety, 'Nectarină Roșie' variety (26.05 kgf/cm²) and 'Tuleu Gras' variety (24.97 kgf/cm²). Concerning fruit weight, both the factors and their interaction have a very signifying influence, beginning with the variety ($F = 432.948$, $p < 0.000$), and continuing with the treatment ($F = 108.106$, $p < 0.000$) and variety x treatment interaction ($F = 50.179$, $p < 0.000$). It can be seen that regardless the treatment, in Călăcea fruit-growing ecosystem the highest fruit weight (g) was registered by 'Stanley' variety (48.05g), being followed by 'Anna Spath' variety (42.62 g), 'Gras Ameliorat' variety (39.12 g) and 'Tuleu Timpuriu' variety (33.67 g) and in Agroindustrială fruit-growing ecosystem the highest values for fruit weight were obtained by 'Nectarină Roșie' variety (53.41 g), followed by 'Tuleu Gras' variety (34.86 g), 'Stanley' variety (33.27 g), 'Vinete de Italia' variety (32.4 g) and 'Vinete Românești' variety (17.73 g).

Conclusion. Studying the two fruit-growing ecosystems, climatic differences can be observed in the same production technology. Giving the results, it can be observed that production, an important parameter, depends on the number of fruits on the tree. A higher number of fruits/ tree mean inferior quality, reserves exhaustion and last but not least, a decrease in trees cold resistance.

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