INFLUENCE OF LOCALIZED IRRIGATION ON FRUIT PRODUCTION AT RESEARCH STATION FOR FRUIT GROWING CONSTANTA

INFLUENȚA IRIGĂRII LOCALIZATE ASUPRA PRODUCȚIEI DE FRUCTE LA S.C.D.P. CONSTANȚA

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Abstract. *The irrigation present checked supply of soil with supplementary water quantities from one got in natural mode for heaved level and stability insurance of fruit production. In Dobrogea conditions, zone with a deficit pluviometric regime, under 500 millimeters yearly rainfall, the growthing and development trees not can be conceived without irrigation. In this paper is reproduced the localized irrigation influence over fruits production to apricot. The remarks were making in 2003-2005 period at Research Station from Fruit Growing Constanta. Experience was of bifactorial type, with factor A-cultivar and factor B-watering variant. Experimental plot contained two apricot cultivars with ripening early (NJA 42 and Tudor) and your localized irrigation variants: V1 and V2 – drip irrigation (Tack and Tipaz dripper type), V3 and V4 – micro sprinkler irrigation (M1 and M2 micro sprinkler type). The results obtained in irrigation variants were compared with one obtained in non irrigate variant (V0). So, in irrigation variants fruit quantity varied between 38.47 kg x tree^{-1} (2004) and 62.62 kg x tree^{-1} (2003) as against non irrigate variant, where this varied between 29.8 kg x tree^{-1} (2004) and 42.3 kg x tree^{-1} (2003). The water factor insurance constitutes and important element in production process of trees.*

Rezumat. *Irigarea reprezintă aprovizionarea controlată a solului cu cantități suplimentare de apă față de cele primite în mod natural în scopul asigurării stabilității şi nivelului ridicat al producției de fructe. În condițiile din Dobrogea, zonă cu un regim pluviometric deficitar, sub 500 mm precipitații anual, creşterea şi dezvoltarea pomilor nu poate fi concepută fără irigații. În această lucrare este prezentată influența irigării localizate asupra producției de fructe la cais. Observațiile au fost efectuate în perioada 2003-2005 în cadrul Poligonului de Cercetare al S.C.D.P. Constanța. Experiența a fost de tip bifactorial, cu factorul A-soiul şi factorul B-varianta de udare. Parcela experimentală a cuprins 2 soiuri de cais cu coacere timpurie (NJA 42 şi Tudor) şi 4 variante de udare localizată: V1 şi V2 – irigare prin picurare (picurător Tack şi Tipaz); V3 şi V4 – irigare prin microaspersiune (microaspersor M1 şi M2). Rezultate obținute în variantele irigate au fost comparate cu cele obținute în varianta neirigată. Astfel, în variantele irigate cantitatea de fructe a variat între 38,47 kg/pom (2004) şi 62,62 kg/pom (2003) cu varianta neirigată unde aceasta a variat între 29,8 kg/pom (2004) şi 42,3 kg/pom (2003). Asigurarea factorului apă constituie un element important în desfăşurarea procesului de producție a pomilor.*

Water is vegetative factor of which depend largely measure processes growing and production deploy of trees. The trees irrigation applies with continuity aim to an optimal level of needed wet for each phase. The experimental results for fruits production demonstrated as apricot plantations, durables and productive with big economic efficiency obtained only in irrigation conditions. Localized irrigation consists in main slow administration of water in root system zone.

The results obtained after researches demonstrated as through localized irrigations application recorded production bigger increments than in classic irrigation methods case (*Halevy I., 1972, Iancu M. and Ionescu P., 1981, Ruggiero C., 1991*).

The researches effectuated in Dobrogea (*Grumeza N. and collaborators, 1979*) to point out important and irrigation efficacy over to the principals tree species from zone.

The paper proposes to point out the localized irrigation effect over production process of apricot tree from Dobrogea.

MATERIAL AND METHOD

The experimental scheme was following:

Factor A – apricot cultivar: a1 – NJA 42 cultivar and a2 – Tudor;

Factor B – irrigation variants: b1-no irrigation; b2- drip irrigation (Tack dripper); b3- drip irrigation (Tipaz dripper); b4- micro sprinkler irrigation (M1) and b5- micro sprinkler irrigation (M2).

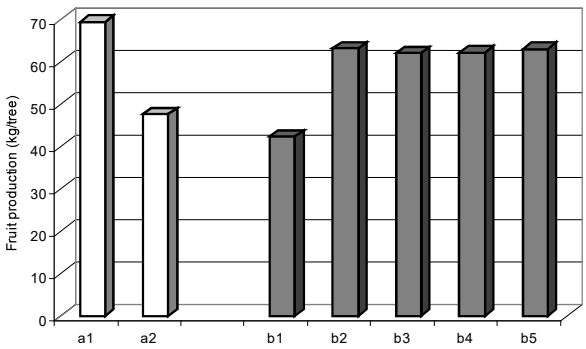
The biological material consisted of two early apricot (NJA 42 and Tudor) grafting on wild apricot. The drip irrigation realized with two types of drippers, respectively Tack and Tipaz. Norm of watering was of 180 m^3xha^{-1}. The debit to a dripper was of 4.0 $lxhour^{-1}$. The drippers were disposed on watering pipe at distance of 1.00 m between them. Watering pipe was manufactured from plastic material with outward diameter of 18 millimeter.

The micro sprinkler irrigation realized with two types of micro sprinklers, respectively M1 and M2. Norm of watering was of 300 m^3xha^{-1} for M1 and 600 m^3xha^{-1} for M2. The micro sprinklers were coupled on watering pipe from plastic material of different distances, respectively 3.00 m in micro sprinkler M1 case and 6.00 m in micro sprinkler M2 case. The irrigation applied in May- August period and watering norm varied for drip irrigation between 540-900 m^3xha^{-1}, for micro sprinkler irrigation M1 between 900-1500 m^3xha^{-1} and for micro sprinkler irrigation M2 between 1200-2400 m^3xha^{-1}.

RESULTS AND DISCUSSIONS

The localized irrigation effect over fruits production was followed on a period of three years, respectively 2003-2005. Yearly, the fruits production obtained in irrigate variants was compared with fruit production obtained in no irrigation variant.

In 2003 year (Figure 1), the localized irrigation application conducted to procurement an averages fruits production, in absolute values, of 62.6 kg/tree comparative with 42.3 kg/tree how obtained in no irrigate variant. For irrigation variants, the registered values of fruits production did not very much differentiated. These diversified between 62.1 kg/tree and 63.2 kg/tree.



Legend:

Factor A:
a1- NJA 42 cultivar
a2- Tudor cultivar

Factor B:
b1- no irrigation
b2-drip irrigation, Tack dripper
b3-drip irrigation, Tipaz dripper
b4-micro sprinkler irrigation, micro sprinkler M1
b5-micro sprinkler irrigation, micro sprinkler M2

Fig. 1. The cultivar influence and irrigation variant on fruit production (kg/tree) at apricot tree in 2003 year

As regards the cultivars studies, fruits production obtained was bigger to NJA 42 cultivar (a1), respectively 69.4 kg/tree comparative with Tudor cultivar (a2) where this was of only 47.6 kg/tree.

The localized irrigation effect materialized in 2003 year through the procurement to a fruits production what represented a percent of 148 % comparative with no irrigate variant (b1).

In the next year (Figure 2), through the localized irrigation application resulted fruits average production, in absolute values, of 38.5 kg/tree comparative with no irrigation variant where this was of only 29.8 kg/tree.

The biggest fruits production, in irrigation variants obtained in b2 variant, respectively 40.0 kg/tree, while the smallest was of 37.1 kg/tree in variant b4.

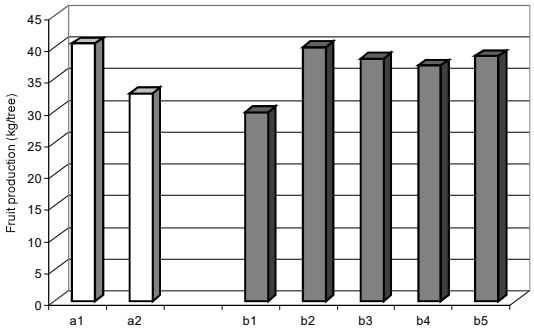
Concerning at cultivars studies, the most heaved of fruits obtained whole to NJA 42 cultivar (a1), respectively 40.6 kg/tree comparative with Tudor cultivar (a2) where this was of 32.8 kg/tree.

Through localized irrigation application obtained fruits production what represented a percent of 129% comparative with no irrigation variant.

In hindmost study year (Figure 3), in irrigation variants obtained fruits average production, in absolute values, of 48.5 kg/tree comparative with 39.2 kg/tree how obtained in no irrigation variant (b1).

The biggest fruits production, in irrigation variants, they obtained in b2 variant, respectively 49.5 kg/tree, while the smallest was of 47.3 kg/tree acquired in variant b3.

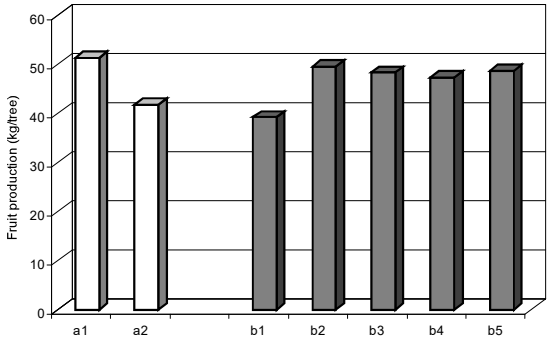
In cultivars studies case, as and preceding years, the biggest production obtained whole to NJA 42 cultivar (a1), respectively 51.3 kg/tree comparative with 41.8 kg/tree how obtained to Tudor cultivar (a2).



Legend was identical with one from Figure 1.

Fig. 2. The cultivar influence and irrigation variant on fruit production (kg/tree) at apricot tree in 2004 year

Through localized irrigation application, the fruits production acquired represented 124 % comparative with no irrigation variant (b1).



Legend was identical with one from Figure 1.

Fig. 3. The cultivar influence and irrigation variant on fruit production (kg/tree) at apricot tree in 2005 year

CONCLUSIONS

The watering tree constitutes one of the most important technological links. The results obtained through localized irrigation application to point out that tree species studied value irrigation water well, contributing to a substantial increase of fruits productions.

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