

THE INFLUENCE OF THE WATER FACTOR ON THE QUANTITY OF PLUM PRODUCTION

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Abstract

The purpose of this paper is to identify the role and the importance of irrigation system in a plum yard. Irrigation is the process through which controlled amount of water can be supplied through artificial means such as pipes, ditches, sprinklers etc. the main objectives of irrigation systems is to help agricultural crop growth, landscape maintenance, reduce the effect of inadequate rainfall etc. Therefore, the importance of irrigation systems is very high. Concerning planting plum trees, the first factor to consider is where to plant the plum tree. They tolerate a wide range of conditions but some soil conditions are better than others. Timing is not crucial but again, some times of the year are better than others. The method of planting is important especially the depth. The most important aspect is the irrigation system, in order to obtain a high plum quality.

Key words: classic yard, plum trees, drip irrigation system, soil texture

INTRODUCTION

From the climatic point of view, the perimeter studied falls within the climatic sector of the Western Plain, the climate is moderate continental-temperate, with hot thermal regime, with early deprecation and moderate precipitation. The area falls under the C.f.b.x. after Koppen. The average annual temperature is maintained around 9,2- 9,70 ° C, higher on the low and lower elevations.

Atmospheric precipitation is an important climatic element and one of the main components of the water circuit in nature. The average annual rainfall amounts are between 701-800 mm. The territory is situated in the area of hardwood forest vegetation, under the oak area. In the forests, along with the forest forms, the wild forms of hair, cherry, and apple grow very well, which show that pedo-climatic conditions favorable to these species are fulfilled here. Based on the morphology of the executed soil profile and the laboratory analyzer, the soil was identified as Stable albicol Luvosol, weakly stagnogenized, medium clay.

MATERIAL AND METHOD

The organization and arrangement of the land is aimed at ensuring the conditions of mechanization, fast transportation and the possibility of applying a high technological level. It mainly includes: plotting the land,

establishing the road network and return areas. The area actually planted with plum trees is 10,000 square meters. The planting distances are 4 m on the row and 5 m between the rows. Is a classic plantation, with 500 trees/ha, set up in 2010. The varieties are Centenar, Stanley, Anna Späth, all grafted on wax cherry.

Centenar- The tree is of medium-high force, with globular crown, predominant branches of spur type, resistant to frost and drought. Very productive variety, but androsteril, require pollinators, like Stanley, Anna Späth (Goian M., Sala F., 2002) The large fruit (52 g) of the inverse ovoid shape, the color of the epidermis is ultramarine blue, covered with abundant, gray prussia. The pulp is white-green, consistent with consistency and succulence. The drum is very small and non-stick to the pulp.

The fruit maturing period is 20 July – 10 August (Stanciu Gh., 2009).

The Stanley Tree is quite vigorous, with a crowned spherical crown and almost exclusively buckets on May bouquets. The shoots are brown-green, with small lentils and numerous. (Fassman N., 2017)

The fruit is large or very large, inversely ovoid, elongated, asymmetrical, more convex on the ventral side, where it tends to form a pigeon chest less pronounced than in the Italian game. The skin is dark-purple almost black with a thick blue prussia. The fruit is colored about a month before maturity. The fruit is very appealing, with good transport resistance. Fruits mature in the second half of September.

The pulp is yellowish-green, consistent, succulent, sweet, fine aroma, slightly acidic, non-stick to the kernel. (Chira L., Hoza D., 2007)

Stanley - The Stanley variety is a self-fertile variety, early blooming, it is a very good pollinator for other plum varieties (Silvia, Cacanska Lepotica, Anna Späth, Agen, Pescăruș, Minerva, Dâmbovița etc.). It is of the spur type, it carries on the bouquets of May. The fruit maturing period is 20 August – 30 August (Drăgănescu, Mihuț, 2005).

Anna Späth -In our country it was introduced in the late nineteenth century, and it is now the main variety in commercial and industrial plantations. It bakes late September and October. (Jakubik, 2015)

The tree is of medium force, with spherical crown roots, it breeds on May, it is early, resistant to frost, to drought, to *Polystigma Monilinia* and fumagine, according to aphids resistant, very sensitive to *Ascospora*, tolerant to virosis, give abundant and sustained crops. (Braniște, 1990)

The fruit of 35-47 g, sometimes up to 60 g, inverse-ovoid, flattened at both ends, has thick, greenish-yellow skin on the shaded side, and hunted on the sunny, light blue prussian, suitably thick. The pulp is thick, fleshy, greenish-yellow, sweet, inadequately acidified, slightly aromatic, contains 17-18% dry substance, about 12% sugar, is of good quality for table, drying and industrialization (Wurm L., 2016). The drumbeat holds only 4.4% of the

weight of the fruit and is non-stick to the pulp. The Anna Späth variety is self-fertile lately blooming. It has very good results in the small and medium hills, as well as in the plain. The variety is well suited for intensive planting, is very productive 20-25 t / ha. (Paschold, 2015)

It matures from mid to late September. (Stangl, 2018)

The most common forms of plum crown are: improved pot, superimposed vessel, flattened vessel, pyramid interrupted, rhythm flooring, mixed pyramid, palm tree with oblique arms and thin spindle (Riess Hans, 2016) For the quickest formation of plum crowns, rapid growth in early years, and the ability to issue anticipated quenches. Correct and fast crown formation is very well done by combining the resting cuts with the interventions of the vegetation period, which are also the most recommended (Spornberger, 2014) Thus, the period of crown formation can be reduced by 1 or 2 years.

Cutting, even training, during youth periods will be very limited, limiting to the strict necessity. Since the first years after planting many varieties begin to harvest, and fruit weight curves branches, increasing the insertion angle, even in varieties with a tendency for vertical growth. Also, for these varieties, the extension bits are pinched at the projected branch distance, and if this has not been done, the annual branch will be shorten in the spring (Stănică, Braniște, 2011).

The formation of a crown involves carrying out several successive works: the choice of the skeleton branches, their design and the semiskeleton branches. For this, the plum branches will be placed in the most suitable positions for the crown shape chosen. These branches will be shortened by 10-12 cm, above the place where we want future skeleton branches to form. The other branches, with incorrect positions, will be suppressed at the ring, and the semiskeleton are shortened by 1/3 or 1/2 of their length.

Plum harvesting takes place at the optimum time, which is determined by phenological indicators (fruit color, sum of temperature ranges, number of days from bloom to harvest), physical (pulp firmness, dry substance content, soluble dry substance) and biochemical (Choudhary, 2015) If the fruit is harvested too early, it does not mature completely and there is a sensitivity to storage. The delay in harvesting causes storage and handling risks. The recovery is done manually, with a peduncle, without pulling through a gently twisting the fruit away from blows and injuries. They will be carefully transported from the packaging to the transport. As much as possible, avoid harvesting in the middle of warm, warm days when the temperature of the fruit rises. You should also avoid picking up wet fruits, rain or dew.

Plum is a rustic species, with a wider ecological plasticity that gives it a larger area of favorability than to other tree species (Pinske J., 2017) However, the plum needs irrigation, irrespective of the rootstocks or the

area pedoclimatic culture. Although it resists the drought better than many other tree species, the water deficit manifests itself often during intense fruit growth in Romania's climate, makes irrigation mandatory for fruit quality and the achievement of constant production, especially in high density plants.

Ensuring a water regime optimal on these depth levels can be achieved by dripping with flow rates of 4-8 l/h.

RESULTS AND DISCUSSION

Table 1

Obtained production and production gap

Nr. crt.	Plum variety	Obtained production (kg/ha)		Production gap	
		Non-irrigated	Irrigated	Quantity (kg/ha)	Value (lei)
1	Centenar	19400	22300	2900	4350
2	Stanley	18500	21700	3200	4800
3	Anna Späth	17800	19500	1700	2550

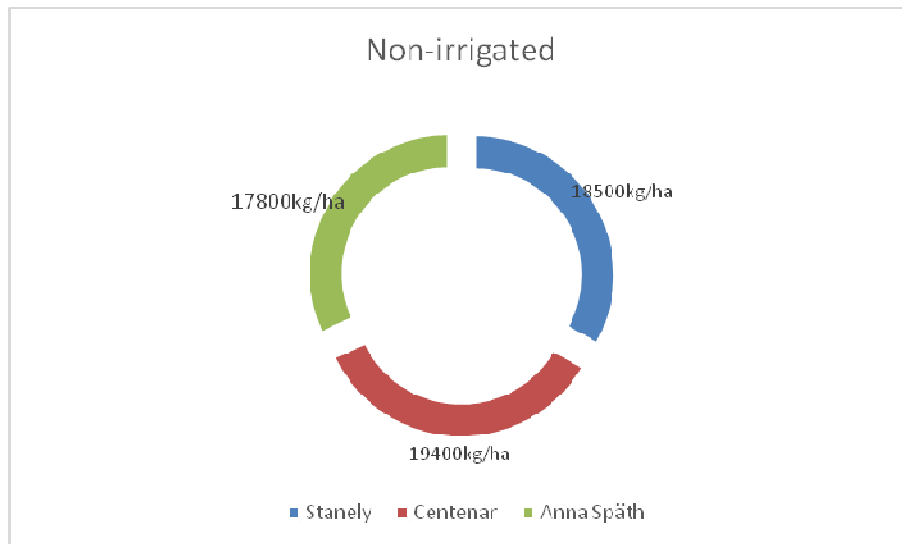


Fig. 1. Plum production in non-irrigated conditions

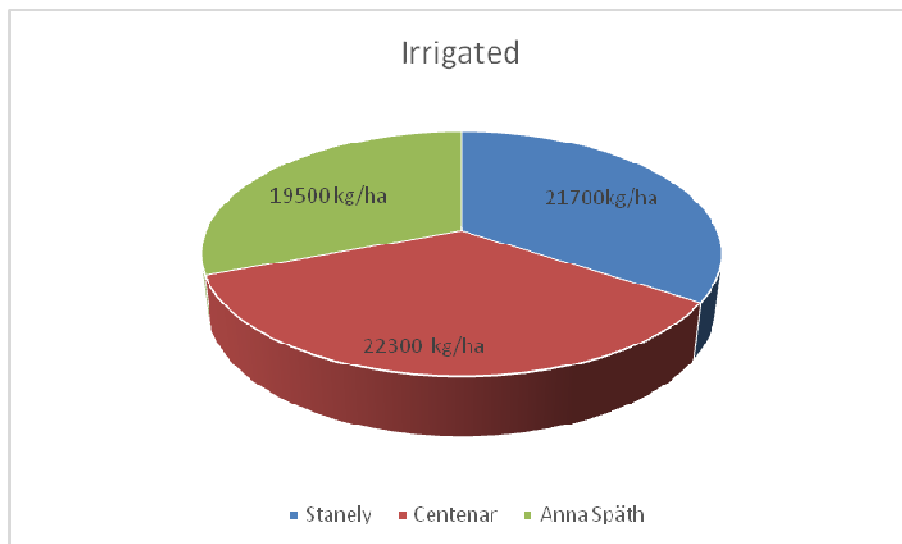


Fig. 2. Plum production in irrigated conditions

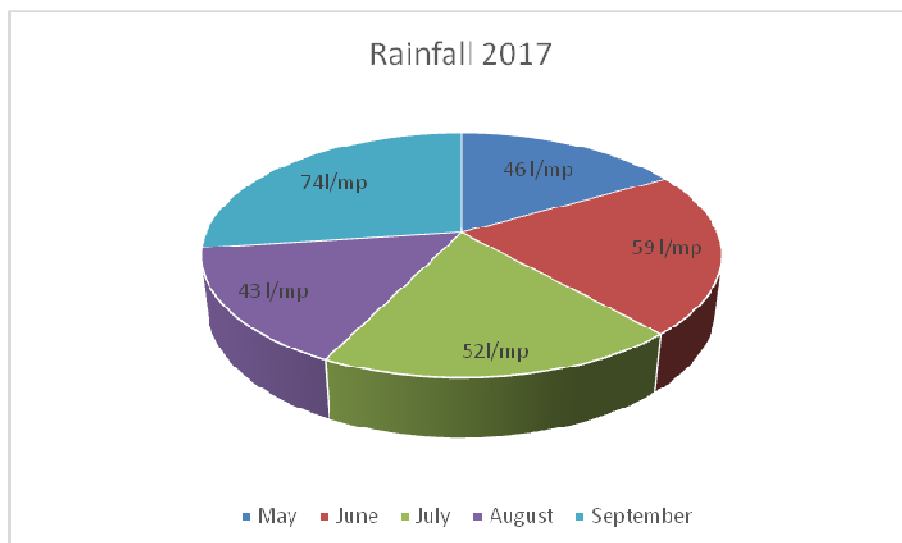


Fig. 3. Rainfall in 2017

There were used drippers with a flow of 4-6 l/ hour and hose with the diameter of 18-20 cm. The equipment is fixed on the tree rows. They have the advantage of allowing continuous moisture intake, a smaller amount of water and labor work. By soil irrigation it is necessary to maintain 60-65% of the water reserve, in the period June- September. There were applied 4 waterings per month (16 entire). The watering norm was of

400m³ / ha. The pump used to pump water has an engine with a power of 5.4 KWh and the water source is its own.

Economic calculations:

16 waterings x 6 hours/ watering= 96 hours

96 hours x 5,4 KWh= 518,4 KWh

1 KWh costs about 0,47 lei

518,4 KWh x 0,47= 243,6 lei

-other costs (salaries, materials, indirect expenses etc. 1500 lei)

Entire expenses per season: 243,6 lei+ 1500 lei= 1743,6 lei.

Plums are valued at an average price of 1.5 lei / kg

Under the same pedoclimatic conditions and applying the same technology, in 2017 are obtained the following productions:

CONCLUSIONS

At all three plum varieties studied, there are significant production increases in irrigated plantations compared to non-irrigated.

For irrigation of one hectare of plum crop is spent on average 1743,6 lei/year.

At the level of expenditures recorded per each hectare , there are registered significant high productions, which far exceed the amount of expenditures recorded per hectare of irrigated plantation.

It is recommended to use the irrigation system for fruit tree plantations, in order to bring significant income increases.

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