

INFLUENCE OF TECHNOLOGICAL FACTORS UPON YIELDS OF PEPPER CULTIVATED IN FIELD

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Abstract. *Hence the aspects above, this thesis aim is the respond of some Romanian agriculture demands, presenting solutions for natural conditions of Transylvania Plane, between hills region, which could be used in time for pepper crop cultivated in field, regions with similar natural regime, on the assumption of standards imposed by efficiency, flow, productivity, excluding the risks of a agriculture ecosystems, facts that have to be consider for a suitable and viable agriculture.*

Keywords: variety pepper, irrigation regime, fertilization type, water consume.

INTRODUCTION

Ancient practice, irrigations come along continuous vegetable crops; highest and constant yields could be getting with applying an irrigation regime, appropriated pedological and climatic conditions; non-observance of this condition leads inherently to a negative impacts upon yields and other issues, regarding soils evolution (erosion and salinization), high energy consume and operating expenses (DÎRJA *et al.*, 2003; LUCA *et al.*, 2008).

After Goldberg *at al.* (1976) quoted by GRUMEZA and KLEPȘ (2005) microclimate near by of plant is adjusted through two factors: energetic balance and aerodynamic transfer phenomenon; by subdividing this two could be mentioned interdependent elements which influence directly: solar radiation, precipitation, temperature, insolation, air humidity, wind speed and developed stage of plant.

The demands regarding water, in general are lower at blossoming, ageing of fruits and seeds. Lack of water from soil determines yield reducing and quality depreciation. So, because of excessive developing of mechanic tissues (APAHIDEAN, 2003).

Peppers need a larger quantity of water than other types of peppers, SOMOGYI (1974), following a study said that from 315 ml of water, chili peppers produce 1 g dry weight, unlike other varieties of peppers that need 298 ml of water for the same amount of dry matter.

Pepper crop in the field will be irrigated only when daily minimum temperature exceeds 20 ° C, and after watering the seedlings planted will not apply a second watering than with increasing soil temperature (DOMUȚA, 2009); INDREA (2009) recommends 3-4 weeks after planting is not wet, to allow deeper rooting.

MATERIAL AND METHOD

The geographic location of the experimental field is given by the following geographic coordinates 46°35'20" north latitude and 23°34'22" east longitude, with a maximum altitude of 560 m in the Black Sea quota system, situated in the north east of the village Plaiuri (formerly Hășmaș in Hungarian Tordahagymas), Petreștii de Jos commune, Cluj county; located in western Transylvania Plateau, in submountainous basin in southwestern Transylvania Plain. The village is mentioned in 1381 as Hagymas mezew (Field with onions) and then 1435 - Poss. Hagymas; 1456 - Poss. Haghmas, the multi yearly average temperature (8.77 ° C), the amount of rainfall is 537.57 mm. In terms of climate regime, the experimental field has values close to the II favorability zone (pepper culture finding themselves strongly in zones I and II).

Methods for determining water consumption were the direct method of soil water balance and indirect methods, such as Thornthwaite method and method-Sammani Hagreaves after the original equation (1985) and amended by Trajkovic (2007), depending on specific weightings northern hemisphere, the latitude 46°.

Methods for determining the irrigation system were to: determine the rule of watering, flow swath taking into account distance, track length and duration of splashing, when applying each watering, watering number, the time between waterings, and the quantity total irrigation water to be administered according to two thresholds taken as factors in experience.



Fig. 1. Biological material used

In making observations were chosen five kinds of peppers approved for production in Romania: Green sweet pepper - OPAL, long green pepper - FEHER, long red pepper, red sweet pepper - CALIFORNIA WONDER, bell pepper – SPLENDID (Fig.1).

Green sweet pepper - OPAL - the vegetation period of 110-120 days, with early productions. Growth and high regeneration capacity. Can be grown in field and protected areas. Production capacity of 45-57 t / ha.

Long green pepper - FEHER – with a 110-120 precocity, with early productions. Regenerative capacity is high, quickly renewed. It can grow in the field

by planting seedlings or direct, but also in greenhouses and conservatories. Large production capacity.

Long red pepper – with a vegetation period of 110-120 day, early productions. It is recommended for field crops, and greenhouses. Production potential 35-45 t / ha.

Red sweet pepper – CALIFORNIA WONDER – late productions, with a vegetation period of 120 -135 days. Recommended for cultivation in the field. Low growth and regeneration capacity. High production capacity.

Bell pepper - SPLENDID – late productions, with a vegetation period of 150-160 days. Recommended for field cultivation. It has a slow growth and regenerates hard. Production capacity of 50-55 t / ha.

RESULTS AND DISCUSSION

The quantitative characterization of water use by the culture of peppers were taken the total amount of water consumption determined by the direct method, the values obtained by indirect methods have been used as benchmarks for comparison.

Water consumption caused by the direct method of soil water balance in 2010 were the highest values recorded in both regimes of irrigation, 50% IUA with a value of 4874.42 m³/ha, respectively 4222, 07 m³ / ha at 80% of the IUA.

Water consumption obtained by indirect methods Thornthwaite and Samana Hargreaves, after the original equation (1985) and amended by Trajkovic (2007) recorded higher values 6358.77 m³/ha, respectively 5817.03 m³/ha, than those determined through direct method in the experimental year 2009.

It was found that in 2011, that at the system of irrigation ceiling of 80% of IUA were obtained among the highest values, indicating that in these conditions the plants have "household" best the water.

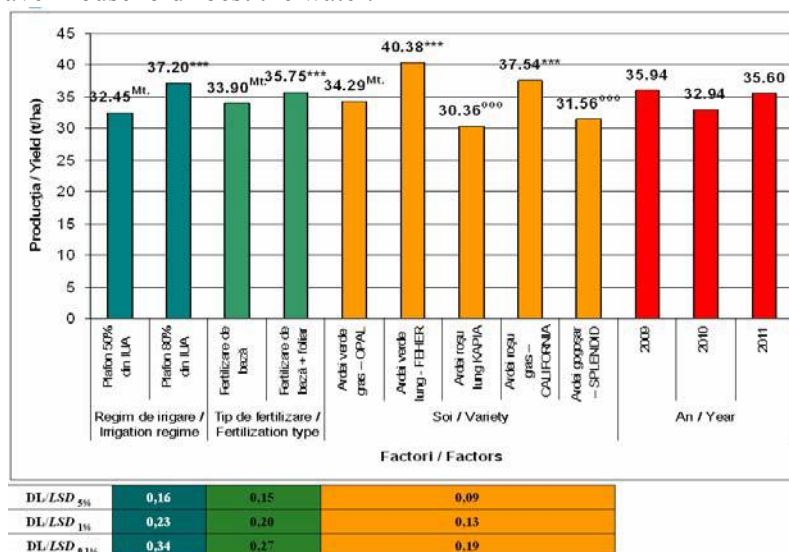


Fig. 2. Average yields obtained after the factors were conducted in experimental field conditions

As you can see from the previously chart provided statistical difference of 4.70 t / ha recorded in the period 2009-2011 the application of irrigation system maintenance irrigation ceiling to 80% of IUA is significantly distinct approach to the production obtained from an irrigation system ceiling of 50% of the IUA, in relative terms achieving a production increase by 14.6% higher (Fig. 2).

When analyzing the influence of the fertilization mode over the production mode obtained in the period 2009-2011, the difference of 1.85 t / ha is significantly positive for the average production from the application of basic fertilization combined with the foliage, in relative terms the increase of production was 5.5% higher.

The statistical interpretation of the influence of variety on production obtained in the period 2009-2011 has been considered a witness to the variety of experience average production OPAL pepper in this period.

Long green peppers FEHER variety shows a very significant positive difference, statistically assured, from the green pepper variety OPAL (Mt.) in value of 6.09 t / ha, in relative terms is higher by 7.8%.

Another very significant positive difference to the witness is registered to CALIFORNIA WONDER red pepper variety, in this case is 3.25 t / ha, in relative terms with a production increase of 9.5%.

Kapia long pepper variety compared to the control period 2009-2011 recorded a very significant negative difference of 3.93 t / ha, statistically, in relative terms was 11.5% lower.

The recorded difference at SPLENDID bell pepper variety of 2.73 t/ha over the OPAL sweet green pepper it is very significant negative, statistically assured, but with a production increase by 8% smaller in relative terms.

Looking at the overall total average production recorded in 2009-2011, 2010 had a production increase by 8.4% lower in relative terms, and the difference of 3.00 t / ha is very significant statistically as negative, to the production recorded in 2009.

The year 2011 recorded a very significant negative statistically, 0.34 t / ha, compared to production conditions recorded in 2009.

Conclusions

Looking at the overall total average production recorded in the period 2009-2011, in 2010 the average production for growing peppers in the field, cultivated from the influence of irrigation and fertilization conditions reported in the five varieties is 32.94 t / ha is the smallest, to the production recorded in 2009 (35.94 t / ha) and to production in 2011 (35.60 t / ha).

Following statistical analysis of the influence of irrigation regime on total average production (2009-2011) of field grown peppers, it was concluded that the yields obtained in irrigation system maintenance ceiling to 80% of IUA were very significantly higher at this threshold resulting in an average of five varieties of peppers 37.20 t / ha, compared with yields from the watering regime ceiling of 50% of IUA (32.45 t / ha).

Following the statistical interpretation of the influence of fertilization on the production method of total average (2009-2011) of peppers in the field ensured statistically that by applying a basic fertilization treatment combined with foliar achieved a very significant positive difference to the average production (35.75 t / ha) compared to production in terms of performing only basic fertilization (33.90 t / ha).

When analyzing the influence of variety on total average production (2009-2011) pepper crop in the field, it was concluded that FEHER long pepper varieties and CALIFORNIA WONDER red pepper have a very significant positive production increase, registering average yields of 40.38 t / ha, respectively 37.54 t / ha, compared with OPAL green pepper variety (34.29 t / ha). Long red peppers and SPLENDID bell pepper varieties recorded lower production of 30.36 t / ha, respectively 31.56 t / ha.

In the climatic conditions of 2011 the varieties of OPAL green peppers and KAPIA long red pepper had the best development, and higher values than in previous years: OPAL green pepper variety in 2011 recorded an average of 35.11 t / ha in 2009 compared with 34.09 t / ha respectively in 2010 to 33.67 t / ha, KAPIA long red pepper variety in 2009 recorded a yield of 31.23 t / ha, in 2010 an average of 27.73 t / ha and in 2011 an average of 32.11 t / ha. FEHER long green pepper variety in 2009-2011 recorded the highest yields compared with the other four varieties of peppers, values range from 37.89 t / ha (value obtained in 2010) and 43.08 t / ha (in 2009).

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