

## THE EFFECT OF IRRIGATION AND MINERAL NUTRITION ON YIELD AND QUALITY OF TOBACCO TYPE BURLEY

### ABSTRACT

The aim of investigation was to study the effect of irrigation and mineral nutrition on yield and quality of tobacco type Burley in the Prilep tobacco producing region. The soil on which the trial was set up was also studied for its water-physical and agrochemical characteristics and the dynamics of the soil humidity was followed in all three years of investigations.

The trial was set up on a diluvial soil type, at the Experimental field of Tobacco Institute in Prilep, using the tobacco type Burley, variety Chulinec. Two factors were investigated: irrigation with two amounts of water (50 and 70% of the field water capacity -FWC) and fertilization with three rates of nitrogen (90, 150 and 240 kg/ha). It might be stated from the results that fertilization applied alone increases tobacco yield by increasing the nitrogen rates from 32.44 to 46.10%. In variants that are only irrigated, the yield increases 8.42 - 10.07%, whereas by application of fertilization and irrigation together, the yield increased by increasing the nitrogen rates and water amounts from 71.85 (N<sub>1</sub>PK+50% of FWC) to 122.37% (N<sub>3</sub>PK + 70% of FWC).

Tobacco quality is, also, significantly increased by application of these cultural practices together.

A considerably good quality was noticed in the variants fertilized with 150 and 240kg N/ha and irrigated with 70% of FWC. Mineral nutrition and fertilization also increase the gross income per hectare. The highest gross income was obtained in the variant N<sub>3</sub>PK + 70% of FWC and it is 226.04% higher compared to the control. According to the economic effect obtained from fertilization + irrigation, the best results were obtained in the variant fertilized with 150 kg N/ha and irrigated with 50 and 70% of FWC. Irrigation + fertilization decrease the substantiality and thickness of the leaf tissue and increase the presence of main vein in relation to the total leaf mass. The nicotine percentage is increased by increasing the nitrogen rates to 150 kg/ha, whereas further increase of nitrogen reduces this percentage insignificantly. Irrigation reduces the nicotine percentage in tobacco. The content of proteins is increased with the increased nitrogen rates (11.44% in the variant N<sub>3</sub>PK) and reduced when the soil humidity is increased (6.82% in the variant irrigated with 70% of FWC).

Fertilization decreases the soluble sugars content and irrigation increases it. Irrigation + fertilization increase the content of mineral matters in tobacco raw from 0.90% in the variant N<sub>1</sub>PK to 18.45% in N<sub>3</sub>PK + 70% of FWC, as compared to the control.

According to the degustational analysis, the best smoking properties were those of the variant fertilized with 150 kg N/ha and irrigated with 50 and 70% of FWC.

Based on the results of investigations, a general conclusion might be drawn that irrigation of tobacco type Burley with 50-70% of FWC and fertilization with 150kg N/ha in a complex fertilizer NPK are economically justified and indispensable cultural practices for the tobacco producing region of Prilep.

UDK: 633.71:631.67/.8(497.7-35)

*Key words:* tobacco, Burley, irrigation, fertilization, yield, quality