

ABSTRACT

THE INFLUENCES OF AVAILABLE SOIL WATER DEPLETION FRACTION TO GROWTHS AND YIELDS OF THREE SOYBEAN (*Glycine Max (L) Merrill*) VARIETIES

By

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The objective of this research was to find out the influences of available soil water depletion fraction to growths and yields of three soybean varieties. This research was conducted in laboratory of Agricultural Engineering of Faculty of Agriculture in Lampung University and in the fields belonging to PT. Great Giant Pineapple (GGP). The research conducted from September 2013 to January 2014. This research used a factorial design in a completely randomized design with the first factor was the available soil water depletion fraction (p), which contained of three treatment levels of (p); they were p_1 (p=0.2 AW), p_2 (p=0.4 AW), and p_3 (p= 0.6 AW). The second factor was soybean varieties containing of three varieties; V_1 = Willis, V_2 = Kaba, and V_3 = Tanggamus, which were repeated three times. Irrigation was conducted when soil water levels was close to or above threshold of available soil water depletion which was determined by measuring water level at gypsum block and ohm meter device. Irrigation was conducted by returning water level to field capacity condition. Treatment of available soil water depletion fraction for the plants influences soybean in growth phase of Willis (V_1) variety, Kaba (V_2) variety and Tanggamus (V_3) variety. Observation data from in week 8 of three showed that the highest stem growth was in Kaba variety (55.87 cm) at p_2 treatment (p=0.4 AW). The highest leave amount was Kaba variety (66.93 leaves) at treatment p_2 (p=0.4 AW). The highest production was in Kaba variety (71,33gr) at treatment p_2 (p=0.4 AW). The highest irrigation necessity was in treatment p_2 with 18 mm water irrigation, and then followed by p_3 with 13.5 mm and finally p_1 with 9 mm. The low irrigation water necessity was influenced by high rainfall level of 578 mm with 32 rainy days during research.

Keywords : soybeans, available soil water depletion fraction, gypsum block