ABSTRACT

ELRISA RAMADHANI. The Study of Fertilizers Application for Production of Two Soybean Varieties under Organic Saturated Soil Culture in two Cropping Seasons. Under direction of MAYA MELATI and SANDRA ARIFIN AZIZ.

Organic farming is an agricultural production system which is based on biological recycling. Saturated soil culture (SSC) is a cultivation technology that provides and maintain continuous irrigation in the channel with water depth kept constantly and makes soil layer in saturated condition. The objective of the research was to determine the influence of organic fertilizer on the productivity of two varieties of soybean (Anjasmoro and Wilis) in organic saturated soil culture in two cropping seasons. The experiments were conducted at experimental station of Bogor Agricultural University, Cikarawang, Dramaga, from December 2009 to February 2011. The experiments were arranged in two experimental designs. The first crop season experiment used Split plot design with six replications. The main-plot was organic fertilizer that consisted of chicken manure only (20 ton/ha), chicken manure (10 ton/ha) + C. pubescens (4.2 ton/ha) and chicken manure (10 ton/ha) + T. diversifolia (4.2 ton/ha), while the sub-plot was soybean varieties consisted of Anjasmoro and Wilis. The soybean productivities were not affected by the application of chicken manure, C. pubescens, dan T. diversifolia with consecutive values of 1.90, 1.83, and 1.94 ton/ha. Wilis productivity (1.98 ton/ha) in the first crop season was higher than productivity of Anjasmoro (1.80 ton/ha). The second crop season used Split-split plot design with three replications. The main-plot in the second crop season was fertilizer dosage consisted of 50 and 100% of first season dosage, the sub-plot was the type of organic fertilizer that consisted of chicken manure only, chicken manure + C. pubescens and chicken manure + T. diversifolia, while the sub-sub-plot was soybean varieties consisted of Anjasmoro and Wilis. Dosage of fertilizer, types of organic fertilizer and variety did not affect the productivity. Plants with 50 and 100% fertilizer dosage produced 2.41 and 2.55 ton seed/ha, respectively. Yield of plants with the application of chicken manure, C. pubescens, and T. diversifolia were 2.45, 2.50, and 2.49 ton seed/ha, respectively. Variety of Anjasmoro and Wilis produced 2.50 and 2.45 ton/ha respectively. Productivity of soybean in the second cropping season was higher than that in the first cropping season. Productivity of soybean added with chicken manure, C. pubescens and T. diversifolia and productivity of Anjasmoro and Wilis were 22.44, 26.80, 22.09, 28 and 19.18% respectively higher than those in the first cropping season. These experiments concluded that any of those three fertilizers can be used in producing organic soybean in saturated soil culture. The second cropping season only needed half of fertilizer to cultivate organic soybean. The use of any of those organic fertilizer in saturated soil culture can be applied to improve the productivity of soybean.

Key words: Chicken manure, Centrosema pubescens, Tithonia diversifolia, Anjasmoro, Wilis, green manure