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Effect on Soybean Growth by Effluent Rate of Subsurface Drip Irrigation System at Silty-loam Soil

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[Introduction]

Subsurface drip irrigation system provides water directly to the plant's root zone and the water move upward direction by capillary migration. Therefore, soil texture is one of the most important factor to decide right cultivation area for subsurface drip irrigation. This study was conducted to investigate the effect of effluent rate of subsurface drip irrigation system on soybean production at silty-loam soil in Korea.

[Materials and Methods]

The study was carried out at the research field of National Institute of Crop Science in Miryang, Korea. Subsurface drip irrigation system were installed at 40cm depth with 70cm lateral intervals. Subsurface driplines with different effluent rate of 1.0, 1.6, 2.3, 3.5L/hr were installed and sprinkler was used as a control. All plots were automatically irrigated based on soil water sensor.

[Results and Discussion]

Soil water content was well maintained at the target point with different effluent rate of dripline. Height of soybean was significantly lower with 1.0L/hr effluent dripline compared to other treatments, but the thickness of plant or number of tiller was not significant by effluent rate of dripline. The SPAD value was slightly higher at 1.0L/hr dripline, but there was not significantly different. Leaf area of soybean was 9,057cm², which was significantly greater other treatments including sprinkler. Soybean root dry weight, regume number and weight was not significant by dripline effluent, showing that soybean root development was not affected by the effluent rate of dripline. The result of this study indicate that the effluent rate of dripline in subsurface drip irrigation system is important factor for deciding water use efficiency, so the selection of dripline should be considered irrigation method and soil characteristics such as soil texture.

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