Instrumentation for Variable-Rate Lateral Irrigation System

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Crops in the Southern United States are generally produced in fields which are known to have a high degree of variability in soil type, topography, water holding capacity and other major factors which affect crop production. A variable-rate lateral irrigation system was developed for site-specific application of water to match crop needs. A GPS receiver is used to determine the position of the lateral irrigation system in the field. A variable speed control system allows the lateral to move quickly over wet spots and slow down over dry spots. The lateral system is controlled by the nozzle-pulsing technique for variable-rate water application. The nozzle pulsing technique to adjust irrigation rate worked very well. The average water application rate error was less than 2%. There was a strong correlation between soil electrical conductivity (EC) and soil water holding capacity. Therefore, the EC measurements could be used for irrigation scheduling decisions.