

Weed Population Dynamics In Overhead And Subsurface Irrigated No-Till Cotton Cropping Systems

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Water is a limiting factor for agriculture in California's San Joaquin Valley, and therefore irrigation efficiency is highly important. Drip irrigation systems have become increasingly popular, and overhead (OH) systems (such as linear and center pivot) are being experimented with to increase irrigation efficiency. These OH irrigation systems are much more common in mid-western U.S. than in California, but in recent years their mechanization, ease of use, as well as compatibility with minimum tillage systems, is drawing attention of researchers and growers. A field study was conducted at the University of California West Side Research and Extension in 2011 and 2012. The experimental design was a randomized complete block and treatment comparisons included sub-surface drip (SSDI) and OH irrigation in no-till Roundup Ready 'Acala' cotton. An application of glyphosate was made one month after cotton planting. The crop was irrigated with the same volume of water, and was monitored throughout the growing season for several parameters. In this report, only information on weed populations is being presented. In both years, weed densities were similar early in the season but in July the densities were higher in the OH than in the SSDI treatment. Weed biomass at crop harvest was greater in the OH than in the SSDI plots. Seedbank samples showed that, although weed densities were lower mid-season in the SSDI plots, more viable seeds were present in this treatment indicating that the seeds failed to germinate because of lack of moisture at the soil surface. The growth, development, and yield of the crop were similar in both systems. Though crop growth and yield was not affected, plots with OH irrigation may require two weed control operations during the growing season to prevent weed seed return whereas one weed control application may be sufficient in SSDI systems.