SICKLEPOD AND MORNINGGLORY CONTROL WITH ROUNDUP ULTRA APPLIED IN A LOW VOLUME, AIR-ASSISTED SPRAY

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Abstract

The efficacy of Roundup Ultra herbicide applied in low volume was investigated in field trials at the Alabama Agricultural Experiment Station, Shorter, Alabama, in 1998. Two weeds of particular importance to Alabama cotton growers, sicklepod [*Senna obtusifolia* (L.) Irwin & Barneby] and pitted morningglory (*Ipomoea lacunosa* L.), were the focus of this research. Roundup Ready cotton was planted in late April along with sicklepod and an 80% mixture of pitted : entireleaf morningglory [*I. hederacea* var. *integriuscula* (L.) Gray]. Smooth pigweed (*Amaranthus hybridus* L.) was also evaluated although it was not planted in the test plots. A factorial experimental design involving herbicide rate, weed size at application, and sprayer type was implemented using plots 2 rows (40 in.) wide and 25 ft. long. Roundup Ultra rates used were 0.125, 0.25, 0.50, and 1.00 lb ai/A. Weeds were sprayed at the 2-leaf and 4-leaf stages. A low volume, air-assisted sprayer calibrated to apply 2 gallons of solution per acre was compared to a conventional, hydraulic sprayer which applied 10 gallons of solution per acre. The air-assisted sprayer combined air with liquid to carry herbicide to target plants. The conventional, hydraulic sprayer used water only as the herbicide carrier. Both sprayer systems were carried on an ATV with nozzles for both spray systems mounted under a spray hood. Data collected included visual crop injury and weed control ratings at 7, 14, and 21 days after treatment on a scale of 0 to 100 where 0 = no injury or control and 100 = crop death or total control, weed biomass, and seed cotton yield.

Control of pitted and entireleaf morningglory was superior with the low volume, air-assisted sprayer regardless of herbicide rate. As herbicide rate increased, morningglory control increased accordingly with both spray systems. Control at the 2-leaf growth stage was better, even at lower rates, than 4-leaf applications where control was mostly unacceptable (<60%). Weed biomass samples support visual ratings in that 2-leaf applications reduced weed biomass by 82% when compared to an untreated control plot. Four-leaf applications reduced weed biomass by 56%. Pigweed control was excellent in this test with all but two combinations giving excellent control (>90%). At the 4-leaf stage, the air-assist sprayer gave superior pigweed control over the conventional system. Seed cotton yields increased as herbicide rate increased regardless of spray system.

Sicklepod control was evaluated in a second test. Control was numerically higher across all treatments when compared to the morningglory trial, with neither spray system giving a clear advantage. Sicklepod control was dependent on rate, with high rates giving superior control. However, biomass samples showed that the air-assist system gave better weed control than the conventional sprayer , especially in the 4-leaf stage where it reduced biomass 85%, compared to a 70% reduction by the conventional system. Seed cotton yields were directly related to the herbicide rate, with all rates yielding significantly higher than the untreated control.

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