

# No-Till Weed Control with Conventional and Roundup Herbicides Applied Over-the-top of Roundup Ready Soybean

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An experiment was established on a silt loam soil (sand 31%, silt 56%, clay 13%) with 1.2% O.M. and pH 5.6 in 1994 and 1995 at the Delta Research and Extension Center, Stoneville, MS. Roundup Ready® soybeans (from Asgrow 5403 background) were planted May 6, 1994, and May 1, 1995, with a John Deere 7100 planter without coulters. No supplemental irrigation was used.

The 1994 experiment was designed to compare conventional-till and no-till soybean systems using low and normal (recommended) inputs for weed control with conventional preplant and preemergence herbicides and Roundup 4E postemergence over-the-top. Plots were two rows 40 inches wide by 40 feet long. A randomized complete block design with four replications was used. There were four Roundup 4E postemergence treatments: 0.375 lb ai/A applied 4 times, 0.56 lb ai/A applied 2 times, and 0.75 lb ai/A applied 2 or 3 times. Each treatment was broadcast applied to both conventional till and no-till plots with a tractor-mounted boom sprayer in 10 gal/A spray volume. Induce surfactant was used with Roundup 4E at 0.5% v/v. All other herbicides were applied in 20 gal/A broadcast. Induce surfactant was used with Roundup D-Pak at 1% v/v and Latron AG-980 or Activate Plus surfactant were used with Gramoxone Extra at 0.5% v/v. The conventional-till plots were disk harrowed in early November 1993 (2 times for normal input) and again in April 1994 shortly before planting. Plots were not cultivated. In mid-March, Roundup D-Pak was applied at 0.5 lb ai/A (low input) or 0.67 lb ai/A (normal input) to no-till plots as a "burn-down" treatment to destroy winter weeds. Treflan (0.75 lb ai/A) was applied to the conventional-till normal input plots before the April disking at which time the no-till plots received an application of Gramoxone Extra at 0.5 lb ai/A (low input) or 0.94 lb ai/A + Lexone 0.25 lb ai/A (normal input). At planting, Sencor + Gramoxone Extra was applied at 0.25 + 0.75 lb ai/A (low input) or 0.375 + 0.75 lb ai/A (normal input) to a 20-inch band on the row on the conventional-till plots. On the no-till plots, Sencor was applied alone preemergence at 0.375 (low input) or 0.5 lb ai/A (normal input).

Plots used in 1994 were consolidated into 4 rows each and soybeans were planted no-till in 1995. Roundup 4E was applied over-the-top to the same areas as in 1994; low and normal rate treatments were made at 0.5 and 0.75 lb ai/A 3 times. Applications were made to continuous no-till soybeans

and first year no-till soybeans. An application of Gramoxone Extra at 0.94 lb ai/A was made to the entire area on November 14, 1994, for initial "bum-down" of winter weeds. This was followed on March 10 with Roundup D-Pak applied for "bum-down" of winter weeds at 0.65 lb ai/A (low input) or 0.8 lb ai/A (normal input). At planting, Sencor + Gramoxone Extra was applied at 0.25 + 0.75 lb ai/A to low input plots and at 0.375 + 0.94 lb ai/A to normal input plots. No pre-plant tillage or cultivation was used in 1995. All herbicides were applied broadcast with a tractor-mounted boom sprayer in 10 gal/A spray volume for Roundup and in 20 gal/A for all other herbicides.

In 1994, soybeans from each plot were harvested while in 1995 the two center rows of each plot were harvested with a Massey-Harris 8 plot combine. Yields were adjusted to 13% moisture and reported as bushels/A.

Weed and soybean stand counts and weed control ratings (0-100%) were obtained during both years for an evaluation of herbicide efficacy and crop injury.

Winter weed control in early April 1994, was 85 to 93% with preplant Roundup with no difference between 0.5 and 0.67 lb ai/A in no-till. Conventional-till plots disked 1 or 2 times the previous November resulted in 46 to 79% control by early April 1994. In 1995, Roundup at 0.65 or 0.8 lb ai/A controlled winter weeds 97+% at 28 days after treatment with no difference between rates in no-till.

In 1994, summer annual weeds were controlled better (10 to 38%) in conventional-till as compared with no-till using preemergence treatments of Sencor and Gramoxone applied tankmixed or sequentially. In 1995, the preemergence application of Sencor + Gramoxone tank mix controlled summer annual weeds 93 to 99% in early May.

Summer annual broadleaf weeds in 1994 were controlled 75 to 93% 6 days after two applications of Roundup at 0.56 or 0.75 lb ai/A or with three applications at 0.375 lb ai/A. Lowest control was with the no-till at 0.563 lb ai/A. Annual grasses were controlled 94 to 100% at the same date. In 1995, Roundup at 0.5 lb ai/A controlled summer annual broadleaves from 73 to 86% 17 days after the first application, 93 to 97% 15 days after the second application, and 81 to 84% 14 days after the third application. At the 0.75 lb ai/A rate, control was as 90 to 99%, 97 to 99%, and 94 to 97% respectively.

Rhizome johnsongrass control in 1994 ranged from 97 to 100% 34 days after one application of Roundup at 0.56 or

0.75 lb ai/A and 14 days after the second application at 0.375 lb ai/A. Control in mid-August ranged from 93 to 100% after two applications of Roundup at 0.56 lb ai/A, two or three applications at 0.75 lb ai/A, or four applications at 0.375 lb ai/A. Tillage had no effect on control.

In 1995, johnsongrass was controlled 92 to 97% 8 days after one application and 99 to 100% 14 days after the third application at 0.5 lb ai/A. The respective control for the 0.75 lb ai/A rate was 96 to 99% and 100%. In late-July (24 days after the last treatment) control was 96 to 100% and was not affected by rate of application.

Soybean yield averaged 36.4 bu/A in no-till and 22.9 bu/A in conventional-till in 1994. In 1995, soybean yield in continuous no-till averaged 31.4 bu/A and in the first year of no-till the yield averaged 36.8 bu/A.