

Roundup Ready Cotton in California

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In 1998, 7000 acres of DP-6100 Roundup Ready Cotton were grown in California through private and public agronomic testing under the direction of the San Joaquin Valley Cotton Board. Grower experiences in the first year of commercial use were very positive, with excellent weed control and few if any problems with cotton injury or loss of yield due to improper application timing. One of the greatest advantages indicated by growers was the reduction, and in some cases, complete elimination of hand hoeing resulting in considerable cost savings.

It should be noted that Roundup Ready (or any other herbicide tolerant) cotton has given the cotton grower nothing new, but rather has provided another option or tool for weed control and an additional system to be used in resistance management. Previously, available options which have provided effective control include selective grass herbicides Poast, Fusilade and Prism and the over the top broad leaf herbicide, Staple. Preplant dinitroaniline herbicides will remain the foundation of any weed management system including Roundup Ready cotton. Monitoring weeds, field by field, sprayers and sprayer calibration as well as proper application timing will remain important concerns. Application timing becomes more important with the use of the Roundup Ready system. Another important point to keep in mind when considering the use of Roundup Ready cotton is to select varieties with proven agronomic traits, then select the technology. It is not a good choice to select a variety with the Roundup Ready gene which has poor yield potential or no verticillium wilt resistance for example.

Besides the grower acreage grown in 1998 a number of research studies were conducted to evaluate cotton tolerance to both over the top and post directed applications and evaluate efficacy of various weed species. A summary of the results are as follows:

Roundup applied to seedling annual morningglory provided excellent season long control through harvest when applied over the top of 2 to 3-leaf DP6100RR cotton and followed by one post directed treatment when the morningglory had 10 to 15-inch vegetative runners. Results of the 1998 studies are similar to 1997 and again show that one over the top application of Roundup is not adequate to effectively control annual morningglory.

Studies in 1998, as in 1997, continue to indicate the extreme importance of limiting over the top applications of Roundup to no later than the 4-leaf stage. Final plant mapping data indicated mishapened bolls and reduction of boll retention, especially at the 9 and 12-leaf stage of application. Seed cotton yields showed a significant reduction at the 9 and 12-leaf stages.

Evaluations of post directed treatments of Roundup (following over the top applications at the 2 and 4-leaf stage) at the 6, 8, 10, 12, and 14-leaf stage indicated yield reductions with the greatest reductions occurring with two post directed treatments of Roundup at the 8 and 10, 8 and 12, and the 10 and 14-leaf stage. Single post directed treatments did not reduce yields as great as the post directed treatments, but all post directed treatments reduced yield to some

degree. Results of this study indicate that post directed treatments of Roundup should be applied with a hooded spray to minimize spray coverage to the lower part of the cotton plant. It appears small amounts of Roundup on the lower portion of the cotton plant is enough to translocate into fruiting structures, causing pollen sterility and ultimately yield reductions.

When Staple was applied over the top in combination with Roundup to DP6100RR cotton in the 2 to 3-leaf stage there was no adverse effect to cotton growth, development and yield. All treatments containing Staple produced the same visual symptoms as when applied to non Roundup Ready varieties. There was no advantage in tank mixing Staple and Roundup for the control of nightshade and shepherds purse. One hundred percent control of each weed species was achieved with Staple and Roundup alone and as a tank mix. Roundup provided acceptable control of nutsedge when applied alone or in combination with Staple. Staple has no activity on nutsedge.