

## STAPLE-BUCTRIL AND STAPLE-ROUNDUP COMBINATIONS

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### Abstract

Herbicide combinations are a routine part of weed control in many field crops and are heavily used in cotton. Combinations such as PRE-POST sequentials, POST-POST sequentials, tank mixes and package mixes are used to obtain multiple benefits and to offset strengths and weaknesses. Some strengths of Staple (pyrithiobac sodium) include pigweed, morningglory and residual control. Some weaknesses of Staple include large cocklebur and grasses. Conversely, Buctril (bromoxynil) is strong on large cocklebur, but weak on pigweed and Buctril has no residual activity. Roundup (glyphosate) is strong on large cocklebur and grasses, but can be weak on morningglory and Roundup has no residual activity. Consequently Staple-Buctril and Staple-Roundup combinations (in their respective herbicide-tolerant crops) would appear to be complementary mixes. These types of combinations were evaluated on a limited scale in 1995 and 1996.

### Buctril-Staple Studies

Buctril was applied at 0.5 lb ai/A (1 qt of 4EC) alone and with 1, 0.5 and 0.25 oz ai/A (1.2, 0.6 and 0.3 oz product) of Staple. Staple was also applied alone at 1 or 0.5 oz ai/A. These treatments were applied twice to the same plots: once when cotton was three inches tall and again when cotton was 6 to 8 inches tall. Nonionic surfactant was included with all treatments, except for Buctril alone, at a 0.25% v/v rate. In 1995, plots received blanket applications of Treflan (trifluralin) at 0.75 lb ai/A, pre-plant incorporated, followed by Cotoran (fluometuron) at 1.2 lb ai/A, preemergence. In 1996, plots received a blanket Treflan application, but no Cotoran.

In 1995, 0.5 oz ai/A of Staple, alone provided inadequate control (<70) of cocklebur; however Buctril and Buctril-Staple mixtures provided 100% cocklebur control. All treatments provided excellent control of smooth pigweed, ivy/entireleaf morningglory, velvetleaf and prickly sida; however with morningglory and velvetleaf, tank mixtures provided slightly more control than one or both of the herbicides applied alone. In 1996 Buctril provided inadequate control of smooth pigweed and Staple provided inadequate control of giant ragweed. However tank all three Buctril-Staple tank mixtures provided greater than 90% control of these weeds. As in 1995, there was a trend for tank mixtures to provide better ivy/entireleaf

morningglory control than either herbicide alone. Crop injury was 5% or less from Staple-containing treatments.

### Roundup-Staple Studies

Three treatments were evaluated in 1995: 1) 0.38 lb ai/A (1 pt) of Roundup applied twice (3-inch stage followed by 6- to 8-inch stage); 2) 0.75 lb ai/A of Roundup plus 1 oz ai/A of Staple applied once at the 3-inch stage of cotton; and 3) 0.75 lb ai of Roundup plus 1 oz ai/A of Staple applied at the 6-inch stage of cotton. These treatments were applied following a blanket application of Treflan at 0.75 lb/A. The "old, white-jug, regular" Roundup was used and non-ionic surfactant was added to all treatments at a 0.5% v/v rate. Four treatments were evaluated in 1996: 1) 0.38 lb ai/A of Roundup applied twice (same as 1995); 2) 0.38 lb ai/A of Roundup plus 1 oz ai/A of Staple applied at the 3-inch stage of cotton; 3) 0.75 lb ai/A of Roundup plus 1 oz ai/A of Staple applied at the 6-inch stage of cotton (same as 1995); and 4) 0.38 lb ai/A of Roundup plus 0.5 oz ai/A of Staple applied twice (3-inch stage followed by the 6-inch stage). No preemergence herbicides were used and the "newer" Roundup Ultra formulation was used without additional surfactant on any treatment.

In 1995, Roundup-Staple mixtures provided excellent short-term weed control; however, cocklebur regrowth was severe. In 1996 adding Staple to Roundup improved pigweed control significantly. When two applications were made morningglory control was 10% higher when 0.5 oz ai/A of Staple was added to 0.38 lb ai/A of Roundup; however the difference was not statistically significant. Crop injury was 9% or less with Staple-containing treatments.

Staple, Buctril and Roundup can provide excellent weed control without being tank mixed with each other; however, none of these herbicides represent a stand-alone weed control program. In some instances, adding Staple to Buctril or Roundup has been advantageous. Half and quarter rates of Staple can be added for roughly \$6.00 and \$3.00/acre respectively (50% band). It may seem illogical to add Staple when a grower is paying an additional \$8 per acre up front for his herbicide-tolerant variety. However, if pigweed have escaped preemergence herbicides in a BXN system, Staple (or a Staple-Buctril tank mix) would be a good control. Likewise, if morningglory or velvetleaf infestations are severe in a Roundup Ready system, Staple had the potential to be helpful.

These data are preliminary and further research is needed. There is some indication that BXN and Roundup Ready cotton varieties have significantly heightened sensitivity to Staple; however, these data are limited, especially for reduced Staple rates.