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**Progress Report To
National Peanut Board
North Carolina Peanut Growers Association**

TITLE: Management of Palmer Amaranth and Other Problematic Weed Species in Peanut

DEPARTMENTS: Crop Science

LEADERS: John Wilcut and David Jordan

Research was conducted in North Carolina during 2007 at the Upper Coastal Plain Research Station, the Central Crops Research Station, and at one on-farm site to compare control of Palmer amaranth (> 8 inches tall) with combinations of Cobra or Ultra Blazer and 2,4-DB. A relatively small percentage of the population at each location was resistant to the ALS (acetolactate synthase)-inhibiting herbicides Cadre, Pursuit, and Strongarm. Regardless of whether or not resistance is suspected, soil-applied and postemergence herbicides are needed to adequately control Palmer amaranth. This is especially true if herbicide resistance is suspected. Increasingly, growers are faced with how to manage large weeds that have escaped previous herbicide applications. Research in the southeastern U.S. has demonstrated that applying the protox (PPO)-inhibiting herbicides Cobra and Ultra Blazer four to five days after application of 2,4-DB is more effective than simultaneous application of PPO inhibitors and 2,4-DB. When combinations and sequential applications of these herbicides were compared in North Carolina, very little difference in control was observed (generally less than 60%). Relatively poor control by PPO-inhibiting herbicides at this stage of weed control was expected (> 8 inches tall.) Interestingly, sequential applications of 2,4-DB alone were as effective as sequential application of PPO-inhibiting herbicides and 2,4-DB or with mixtures of these herbicides. These results suggest that while complete control of large Palmer amaranth could not be obtained by any of the herbicide combinations, to avoid injury from PPO-inhibiting herbicides later in the season when escaped weeds are common, sequential applications of 2,4-DB may be a safe and effective option when weed suppression and not complete control is the only possibility. This result would certainly not be the case if PPO-inhibiting herbicides were applied when Palmer amaranth was small (3 inches or less.) However, when resistant weeds are noted in the field they are generally large and above the peanut canopy at a size when PPO inhibitors are ineffective.

In other trials, strategies to control ALS-resistant common ragweed were compared in both peanut and cotton. Combinations of Valor SX and Gramoxone INTEON or mixtures of Cadre and Cobra were relatively effective in managing these populations when compared with Strongarm only or Strongarm followed by Cadre (ALS inhibitors only.) However, timeliness of application is critical to control common ragweed with Gramoxone INTEON or Cobra, and Valor SX is often applied at 2 oz/acre, a rate that does not always provide complete weed control but does avoid injury.

Palmer amaranth and common ragweed have historically been difficult to control in peanut without effective ALS-inhibiting herbicides. During the mid 1990s through the mid 2000s growers could use Cadre, Pursuit, or Strongarm to control these weeds. However, resistance to these herbicides has increased the need to apply PPO inhibitors like Cobra, Ultra Blazer, and Valor SX. While these herbicides are currently effective when applied in a timely manner, there

is great concern that overuse could result in selection for biotypes that are resistant to multiple mechanisms of action.

IMPACT STATEMENT:

Results from these experiments continue to reinforce the need to avoid letting herbicide resistance weeds, especially Palmer amaranth and common ragweed, from becoming established in fields. When they do become established, timely herbicide applications in an intensive weed management program will be necessary to minimize impact of these resistant and problematic weeds in peanut.