Annual Weed Management in Cotton with Reduced Costs

Reagan Noland

The objectives of this research were to 1) determine efficacy of commonly used preemergent herbicides at different preplant timings and following crop safety, 2) investigate cost efficient herbicide strategies, and 3) host a weed-oriented Extension event for direct grower assistance identifying weed species and management options. Timing (March, April, May) of Valor and Direx applications pre-plant in cotton were evaluated. Weed control ratings from June, 2025 indicated that the addition of Direx improved both broadleaf and grass control in situations where Valor alone was not sufficient, although Valor alone largely provided excellent suppression of small-seeded broadleaf weeds. Evaluation of cost-efficient early post-emergence herbicide strategies indicated that the addition of Group 15 herbicides improved grass control later in the season. A trial assessing tank mixes with grass herbicides did not indicate any tank-mix antagonism between liberty and Group 1 herbicides (i.e. clethodim), but residual herbicides were essential to achieve the best long-term grass control. The planned field tour of this project was rained out this year, but results were presented and discussed at fall cotton tours in Tom Green and Runnels Counties and other extension events. Extension publications and resources on informed annual weed management in cotton are in development.

Timing of Valor and Direx applications pre-plant in cotton

This trial was coordinated at the Southern Rolling Plains Research and Demonstration Farm at Wall, TX. Valor was applied (3 oz/ac) with or without Direx (16 oz/ac) to small plots in randomized complete block design (RCBD) on March 20, April 14, and May 12. Roundup and/or Aim were used at different points to try to manage emerged weeds in newly treated plots, but the long duration spanned by these treatments made clear objective comparison challenging. Complete weed control assessments were conducted for treatments to-date in mid-May, and for all treatments in mid-June (at planting). Part of this objective was to gauge crop safety relative to later applications of Valor. With the rain we had this year, no phytotoxicity or other damage to the cotton crop was observed. This will be good information for our planned Extension outputs, but is context-specific to a wet year. We plan to continue work on similar objectives in future years to represent different environmental conditions.

Ratings in May (before the May application effects were apparent) indicated that timing (March vs. April) did not affect weed control to-date ($P > 0.1$). Both Valor and Valor+Direx were equally effective for grass control (mean = 86%), however the addition of Direx did significantly improve broadleaf weed control (99.3%) compared to Valor alone (97.2%) (Figure 1).

Weed control ratings in June indicated a timing × treatment interaction for grass control, where Direx included in the April application improved grass control by 47% (Figure 2). Among the other application timings, Direx inclusion did not significantly affect control for either broadleaf or grass weeds. Based on the low cost of diuron, one management implication of these findings is that including Direx with Valor/Flumi is likely a cost-efficient strategy to increase weed control, particularly in instances where Valor alone was not sufficient. Another practical management implication is that Valor/Flumi application was safe for the cotton crop, as late as ~30 days

before planting, although the context of drier years needs to be represented in developing broad recommendations for West Texas.

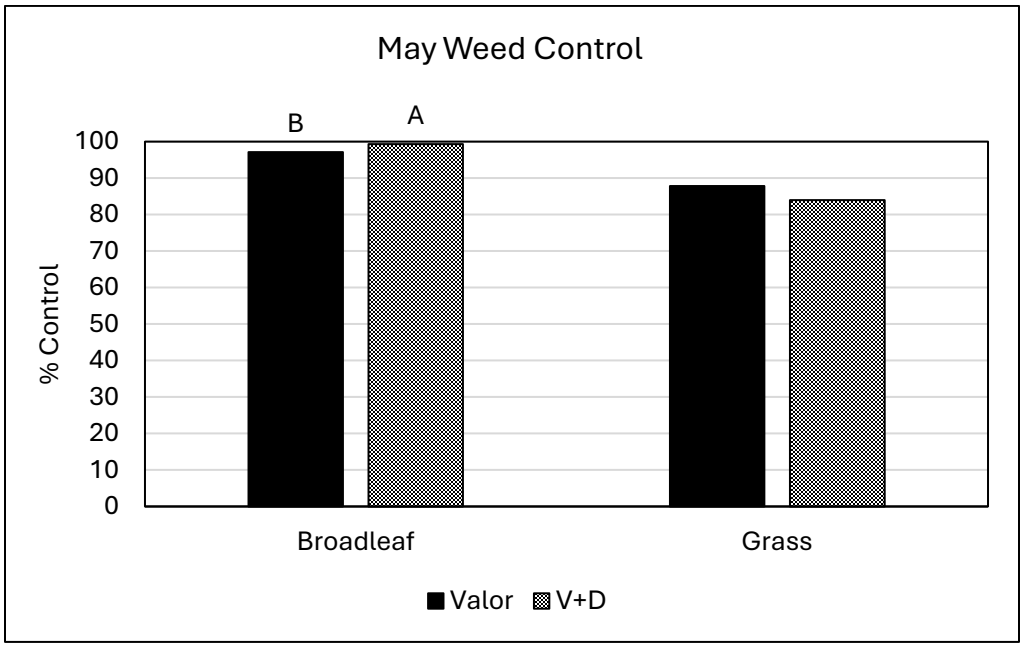

Figure 1. Weed control in May relative to preceding Valor (+ Direx) applications.

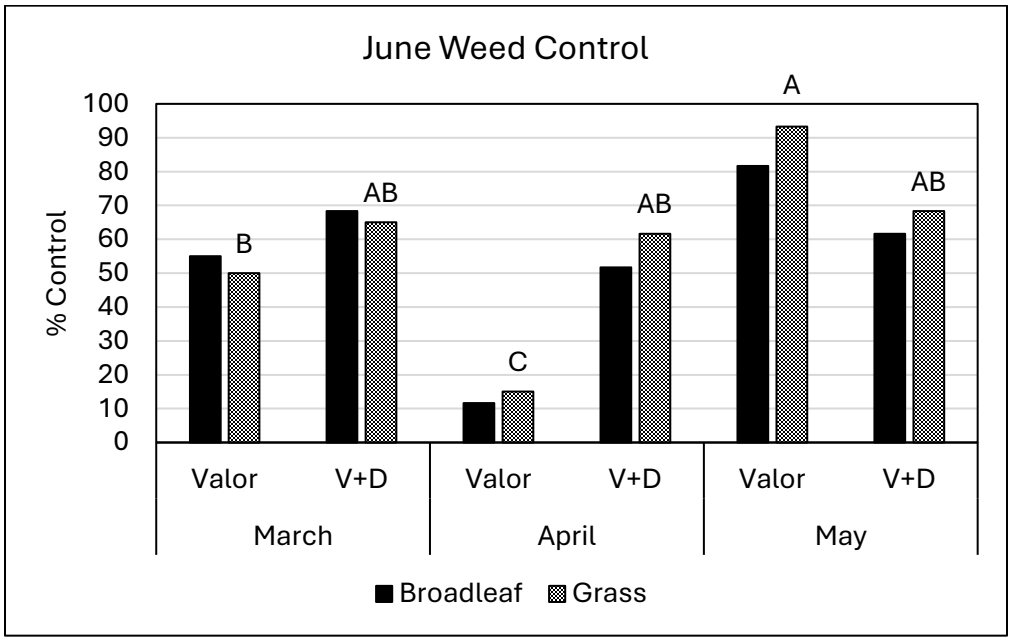

Figure 2. Weed control in June relative to preceding Valor (+ Direx) application timings.

Cost-efficient at-plant / post-emergence herbicide strategies

The initial planting of this trial resulted in inconsistent establishment due to marginal moisture at planting (this site had to be plowed and re-bedded in June right before planting and compromised our planting moisture), followed by the flooding (>10" of rain received at the farm on July 4th). The plot area had remained clean due to dry conditions prior to the flood, so treatments were initiated on the flush of weeds that came in mid-July. One trial compared different AMS rates with Liberty as this has become a locally relevant focus with our water quality, and the addition of Dual or Outlook with Liberty. An additional trial specifically assessed grass control implications within Liberty-based systems. Tank-mix antagonism has been reported for some grass herbicide combinations with Liberty, so we tested clethodim with and without Liberty, as well as Round-up inclusion with Liberty. The addition of Group 15 herbicides improved grass control late-season (Figure 3). Tank mixing clethodim and Liberty did not appear to reduce clethodim efficacy, although neither treatment provided sustained grass suppression as the Group 15 inclusions did (Figure 4).

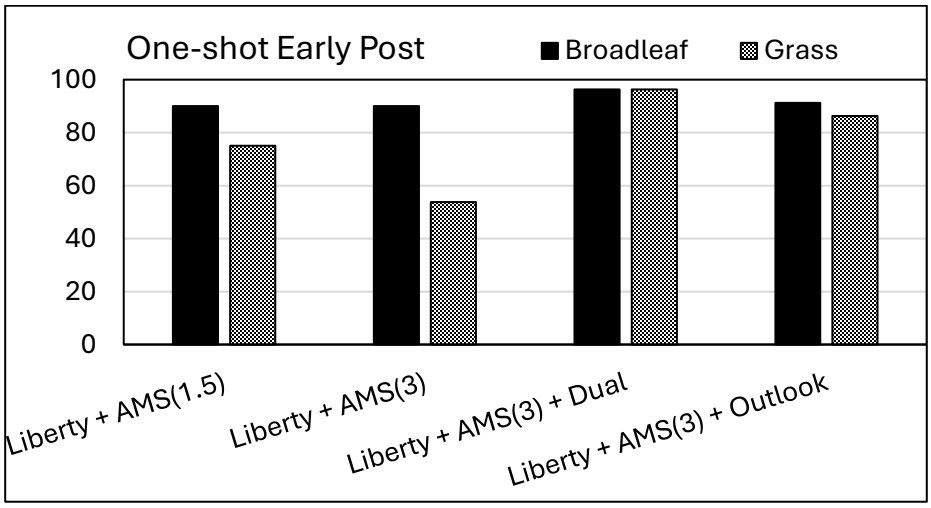

Figure 3: Improved broadleaf and grass control with inclusion of Group 15 herbicides.

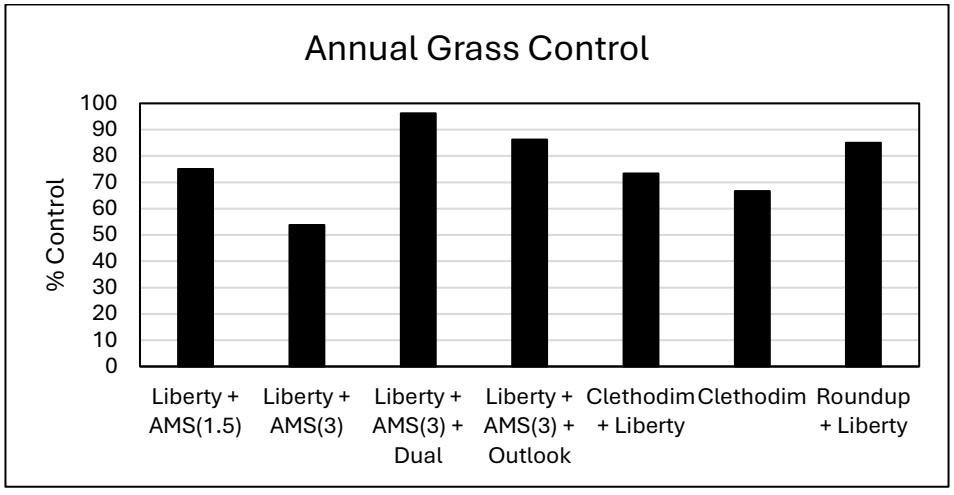

Figure 4. Early POST herbicide treatment effects on late-season grass control.