

2008 RESEARCH SUMMARY

ARKANSAS CORN AND SORGHUM BOARD

Title: Development of Effective Weed Control Programs with Crop Safety

Investigators: Dr. Kenneth Smith, Extension Weed Scientist, SEREC Monticello
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Crop: Grain sorghum

Status: New project in 2007

OBJECTIVES AND ACCOMPLISHMENTS:

The funding allowed the weed science crews to conduct, six at Southeast Branch Experiment Station, Rohwer, one field trial at Pine Tree Branch Experiment Station, Colt, and one field trial at Main Experiment Station in 2008. Specific objectives to be answered in the field trials were:

1. To evaluate weed control programs in twin row vs single row grain sorghum.

A study was initiated at Rowher and Fayetteville for the past 3 years to reduce herbicide applications and increase grain sorghum yield by reducing safe sites for weeds. The factorial experiment evaluated three plant populations (80,000, 110,000, and 140,000 plants/A), two row spacings (single and twin rows on 30 inch beds), and three herbicide programs (Aatrex, preemergence (PRE), Aatrex + S-metolachlor (Dual II Magnum), PRE, and Aatrex + Dual II Magnum, PRE, followed by (fb) Aatrex at 4-leaf grain sorghum. At 80,000 and 110,000 plants/A, the twin row production system improved grain sorghum yield. The twin row system gave 20% better large crabgrass and broadleaf signalgrass controlled by 9 weeks in the Aatrex only herbicide program. At 140,000 plant/A, no differences were noted between row spacing or weed control programs. Twin rows at 80,000 and 110,000 plants/A, regardless of herbicide program, improved grain sorghum yield. The twin row planting technique has shown potential to enhance grain sorghum profitability.

2. To evaluate various herbicides and application techniques for improved annual grass control in grain sorghum.

We continue to search for better grass control products in grain sorghum. Paramount (quinclorac) shows some promise, but moisture requirements and off-target movement can make it somewhat inconsistent. Our experiments continue to indicate that split applications give the most persistent annual grass control. The first application should be a PRE herbicide (fb) a 2- to 4-leaf postemergence application.

3. To provide information on new herbicides entering the market as to their effectiveness and fit in Arkansas grower programs.

The new or potentially new herbicides for grain sorghum are S-metolachlor, atrazine, and mesotrione (Lumax or Lexar both are different ratios), carfentrazone (Aim), and Paramount. Lumax or Lexar applied at 10 to 14 days prior to planting (PPL) or PRE at the correct rate for soil texture provided excellent (95 to 100%) control of Palmer amaranth and broadleaf signalgrass and good control (85 to 94%) of pitted and entireleaf morningglory and prickly sida. The 10 to 14 day PPL treatments were less injurious. Aim preharvest at 0.016 lb ai/A plus Defol 5 (Na Chlorate) plus COC at 1% v/v both provided 100% desiccation of morningglory which was 70% better than Roundup. Aim post-directed at 0.008 lb/A controlled all small weeds under the 14-inch grain sorghum. Paramount at 0.375 lb ai/A PRE provides excellent crop tolerance and morningglory control but does not provide full-season Palmer amaranth control. Also, lack of soil moisture for activation of PRE herbicides drastically reduced weed control. The conventional herbicides Dual II Magnum or Bicep II Magnum applied PRE still provide excellent control, but an additional follow-up postemergence treatment at 2- to 4-leaf grain sorghum generally improves late-season weed control.

PUBLICATIONS:

Doherty, R.L., K.L. Smith, J.A. Bullington, and J.R. Meier. 2008. Grain sorghum: weeds: herbicides: options? Abstr. AR Crop Prot. Assoc. 12:2.