

## Weed Control Programs in Arkansas Corn and Grain Sorghum

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### Season-long Weed Control Programs in Corn

We have developed and tested several herbicide programs for use in Arkansas corn. We have tested single shot approaches at various timing. We have also tested various full season programs with two or more application. We can achieve season-long control using either approach, but using multiple applications is more forgiving and allows a broader window of application. There is a move in the market to try to from the triazine chemistry for weed control, but our research has shown that this is still the most effective method and is cost efficient.

On a clay soil, there were only four of 16 herbicide programs to provide season-long control of glyphosate-resistant Palmer amaranth, pitted morning glory, and broadleaf signal grass. These programs were 1) 1 qt/A Cinch ATZ, PRE fb 22 oz/A Rdp Power Max + 1.5 qt/A AAtrex, V2 corn, 2) 3 qt/A Lexar, PRE, 3) 3 oz/A Capreno + 2 qt/A AAtrex + 22 oz/A Rdp Power Max, V4, and 4) the same program as #3 with 1.5 pt/A Dual II Magnum, PRE. Each of these treatments yielded 196 to 239 bu/acre. There was no (0%) control of glyphosate-resistant Palmer amaranth with sequential applications of Rdp Power Max, resulting in yields comparable to the non- treated control.

On a silt-loam soil, several programs provided season-long control of glyphosate-resistant Palmer amaranth, pitted morning glory, and barnyard grass. These programs were: 3 oz/A Corvus PRE fb 3 oz/A Laudis + 22 oz/A Ignite, 6 oz/A Balance Flex PRE fb 3 oz/A Laudis + 22 oz/A Ignite, 96 oz/A Lexar PRE fb 22 oz/A Ignite, 16 oz/A Dual Magnum + 32 oz/A Aatrex PRE fb 22 oz/A Ignite, and 32 oz/A Cinch ATZ PRE fb 48 oz/A atrazine + 22 oz/A Rdp. Each of these treatments provided at least 90% control of all weed species.

All HPPD herbicides alone (Callisto, Balance Flexx, Capreno, or Laudis) were fairly weak on Palmer amaranth. The addition of Dual II Magnum to each product generally improved control of Palmer amaranth; however, control was often greatest with the addition of AAtrex. Each HPPD herbicide in combination with AAtrex failed to provide season-long Palmer amaranth control, but when used in a program with mid-season broad spectrum herbicide season-long control could be achieved.

When 24 oz/A Dual Magnum was applied PRE fb any of the HPPD herbicides + 22 oz/A Rdp applied to 20" corn; season-long control was achieved. These programs provide some options for not using atrazine, but these options will require precise timing to achieve optimum control.

### Injury with Safened SU Herbicides Applied at Different Timings

When counter was applied in-furrow at planting, a subsequent application of Resolve Q was injurious to corn, regardless of application timing (20, 30, or 40 days after planting). Realm Q and Steadfast caused injury to corn when applied at 20 or 30 days after planting when Counter was applied in-furrow, but the 40 day application did not result in injury levels different from plots not treated with Counter.

When rimsulfuron was applied at 0.0156, 0.0313, or 0.0471 lb ai/A there was a reduction in the number of total kernels regardless of the application timing. When rimsulfuron was applied to 12" and 20" corn there was a reduction in the number of kernel rows at 0.0313 and 0.0471 lb ai/A. There was also a reduction in the number of kernel rows at 0.0156 lb ai/A when applied to 6" corn. The crop response to rimsulfuron is variety sensitive. Since most seed companies do not state sensitivity to SU herbicides on the bag, it is important to check with seed company representatives prior to using rimsulfuron.

### **Soil Residual Control**

When applied PRE: 96 oz/A Lexar, 26.5 oz/A Dual Magnum + 64 oz/A Aatrex, 64 oz/A AAtrex, 21.3 oz/A Dual Magnum, 7 oz/A Callisto, 48 oz/A Warrant, 80 oz/A Harness Xtra, 2 oz/A Zidua, 3 oz/A Fierce, 15 oz/A Verdict, 6 oz/A Balance Flexx, 5.6 oz/A Corvus, 3 oz/A Capreno, 96 oz/A Outlook, 8 oz/A Anthem, 4 oz/A Realm Q, and 1.25 oz/A Resolve Q provided greater than 90% control of Palmer amaranth at corn tasseling (60 days after treatment).

### **Post-Harvest Pigweed Control**

A high level of pigweed control was obtained through the first killing frost when AAtrex plus various HPPD herbicides were applied in combination with Ignite at the V8 stage of corn using drop nozzles. However, some escapes (varying degrees) occurred in all plots, and it appears that these escaped pigweeds produced viable seed prior to a killing frost (Oct. 19 in Fayetteville), albeit samples are still being processed. At least this year, which was characterized as hot and dry following mid-August harvested corn, either tillage (disking) or Gramoxone immediately following harvest was effective in preventing seed production by those plants that emerged as the corn began to mature. These trials will be repeated because in a year with rainfall in late August or early September, it is possible that a single application of a non-residual herbicide or disking may not prevent seed production when emergence occurs soon after harvest.

### **Weed Control Programs in Grain Sorghum**

Zidua, a new herbicide being developed by BASF, was injurious to grain sorghum when applied at planting; however, the grain sorghum had recovered by the end of the season, with an average yield comparable to plots treated with Dual II Magnum PRE followed by AAtrex POST. Zidua provided effective control of Palmer amaranth, pitted morning glory, prickly sida, broadleaf signal grass, and barnyard grass throughout the growing season. Zidua has a similar mode of action to that of Dual II Magnum; however, its length of control appears to be longer than that of Dual. No POST-only program provided yield equivalent to the standard program of Dual II Magnum followed by AAtrex. This was likely a result of the high weed density at the test site which resulted in yield loss prior to the POST applications as well as the inability to completely control all weeds with the POST herbicides evaluated. Of the POST herbicides evaluated, none alone or in combination with AAtrex provided yields higher than a single application of AAtrex at the V2 stage of sorghum. These data show the importance of at-planting, effective residual herbicides in protecting yield potential of grain sorghum. Lexar and Lumax applied PRE were the only two herbicides still providing excellent barnyard grass and pigweed control 35 days after planting. However, when grain sorghum was planted and allowed to reach two leaf stage prior to herbicide treatment, no herbicide provided greater than 65% barnyard grass control. This emphasizes the importance of utilizing a metolachlor containing product at planting for early season grass control. However, single pass PRE programs also failed to control late season germination of barnyard grass and pigweed.

The ACCase grain sorghum program has been delayed due to complications in the right-to-market agreements. In anticipation of the return of this technology, we have initiated a screening project to determine the extent of ACCase resistant Johnson grass in the state.