

7 - Weed Control in Grain Sorghum

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Weed competition in grain sorghum reduces yields, causes harvesting losses and increases seed content of the soil seed bank. Even light weed infestations in the early growing season will reduce yields significantly. Grain sorghum seedlings grow slowly and are weak competitors to most weeds. Research data have shown that one pigweed plant per 3 foot of row left uncontrolled until sorghum reaches the three-leaf stage will reduce yields by 10 percent. Heavy infestations of grassy weeds may cause up to a 20 percent yield reduction in the first two weeks after sorghum germination. Late season weed infestations have less effect on produced yields, but reduce harvesting efficiency and may reduce harvested yields.

Most grain sorghum is planted in early to mid-April throughout the state to allow flowering prior to a large build-up of midge insects. Although this early planting reduces insect pressure, it adds additional stress to the grain sorghum seedling. Grain sorghum was introduced from the warmer climates of Africa and grows best when soil and air temperatures rise above 70°F. Seedlings stressed from cool and wet soils are much more sensitive to weed competition and herbicide injury.

The most troublesome weeds in Arkansas grain sorghum include johnsongrass, morningglory, pigweed, broadleaf signalgrass, barnyardgrass, prickly sida, crabgrass and sicklepod. There are fewer control options for weed control in grain sorghum than in corn, cotton and soybeans. Grain sorghum lacks tolerance to many of the commonly used grass and broadleaf herbicides, and is occasionally injured even by herbicides labeled for use in sorghum. Unfavorable weather conditions such as cool, wet soils, delayed crop emergence, deep planting, seedling diseases, poor soil physical conditions and poor quality seed may contribute to seedling stress and herbicide injury.

Grain sorghum is almost always included in a crop rotation schedule. Herbicides such as Pursuit, Reflex, Flexstar and Typhoon applied to soybeans the previous year can remain in the soil and cause stand reductions and/or injury to sorghum. Beacon and Accent in corn and Staple and Zorial applied to cotton the previous year can also injure sorghum. Often the carryover herbicide injury is not visible in very young sorghum, but becomes apparent at the 3 to 6 leaf stage of growth.

A combination of cultivation and chemical weed control is usually most effective in grain sorghum. Cultivation can prune roots and cause plant stress if plows are too close to established plants. Effective chemical weed control is dependent upon proper weed identification and matching herbicide rate and timing to the particular weeds. Cool season weeds should be destroyed prior to planting to ensure that crop seedlings emerge competition free. Most winter weeds may be controlled with glyphosate, 2,4-D, dicamba or paraquat. (Refer to Extension MP-44 for additional information.)

Broadleaf weeds may be controlled postemergence, but there are few options for postemergence grass control. Grassy weeds are most effectively controlled with preemergence herbicide applications. Johnsongrass (*Sorghum halepense*) and grain sorghum (*Sorghum vulgare*) are genetically very similar and there are no approved herbicides that will selectively remove johnsongrass from grain sorghum. Even light infestations of johnsongrass in other crops planted the previous year often turn into heavy infestations in grain sorghum due to lack of selective control. Fields with a history of johnsongrass or bermudagrass should not be planted to grain sorghum.

Herbicide programs for effective weed control must be developed based on weed spectrum and soil type. Your county Extension agent receives extensive training on weed identification and weed control technology and is available to assist in developing economical and effective control programs. *Recommended Chemicals for Weed and Brush Control*, often referred to as MP-44, is updated annually to reflect the most current information on herbicide label changes and revised recommendations based on research data. This publication is available from county Extension offices throughout the state.

Effective weed control programs start with clean fields at planting. It is critical to remove existing cool season weeds with cultivation or herbicides prior to planting. Glyphosate or glyphosate in combination with 2,4-D are very effective preplant herbicides.

Atrazine is the basis of most chemical weed control programs in Arkansas grain sorghum. It is estimated that greater than 90 percent of the acres planted receive at least one application of atrazine. In sites where weedy grasses are not a problem, atrazine may be the only herbicide applied. Although atrazine has some activity on grassy weeds, it is considered a broadleaf herbicide. It may be combined with the chloroacetamide herbicides such as Dual II Magnum, Outlook and Lasso to broaden the weed control spectrum. Concept treated seed must be planted if any of the chloroacetamides are to be used. These active ingredients are also sold in premixes with atrazine under different names. Bicep II Magnum and Guardsman Max are examples of atrazine plus chloroacetamide premixes that require Concept treated seed.

Preemergence herbicides are applied after the sorghum has been planted and prior to emergence. The chloroacetamides such as Dual II Magnum are taken into the weedy plants through the emerging coleoptiles and have little or no activity on emerged weeds. These herbicides must be applied before targeted weeds germinate. Atrazine is effective as a preemergence or early postemergence herbicide. Dual II Magnum, Lasso and Outlook primarily control grasses such as crabgrass, barnyardgrass and

broadleaf signalgrass, but also suppress yellow nutsedge and offer some control of pigweeds. Combinations of these products with atrazine as tankmixes or premixes applied preemergence will control most seedling grasses and broadleaf weeds for three weeks.

Rainfall or irrigation is required to incorporate the herbicides with the soil for activity. This is often referred to as “activation” of the herbicide. However, large rains immediately after application may move some of the herbicide into contact with the germinating sorghum seedling and may actually be taken into the germinating seed as it imbibes water. This usually results in delayed emergence and some crop injury. Under good growing conditions, the symptoms are usually only cosmetic and the sorghum resumes normal growth seven to ten days after emergence.

Applying high rates (2 pounds active ingredient) of atrazine preemergence to sorghum is considered to be high risk. Significant stand losses and delayed development of seedlings are common following high rates of atrazine in cool, wet weather. Splitting the atrazine applications and applying no more than 1 pound active ingredient at planting followed by an additional pound early postemergence has proven to be much safer to the sorghum. In fields where grassy weeds are expected to be a problem, a chloroacetamide preemergence alone or in combination with a low rate of atrazine followed by additional atrazine early postemergence is a safe and very effective early season weed control program.

Other herbicides, such as 2,4-D, dicamba, prosulfuron (Peak) and bromoxynil (Buctril) are also effective postemergence broadleaf herbicides for use in sorghum. Paraquat (Gramoxone Max) is labeled for post directed use in larger grain sorghum to control escaped weeds. Considerable crop leaf burn is expected and this option should be used only in salvage situations where grassy weeds were not controlled earlier in the season. (See label for special precautions and injury warnings).

The absence of approved herbicides for late season weed control in grain sorghum often permits escaped weeds to hinder harvesting operations.

Sodium chlorate is an effective harvest aid that will desiccate weeds and improve harvesting efficiency. It should be applied seven to ten days prior to harvest. Other harvest aids are being tested and will be available as labels are granted. County Extension agents have the latest information on labels and use of new chemicals.

Grain sorghum is sensitive to herbicide drift from other crops. Glyphosate, Clincher, Ricestar, Select and propanil are especially damaging to grain sorghum in low rates. Symptoms may range from stand losses to non-uniform growth and delayed maturity. Grain sorghum affected by low rates of grass herbicides often suffers much more damage from midge due to the non-uniform growth and flowering throughout the field.

Herbicide resistant weeds are becoming more of a problem in all crops. Pigweeds with resistance to atrazine are common in other states, but have not been found in Arkansas at this time. Much of the Palmer amaranth in Arkansas is resistant to the ALS mode of action herbicides such as Peak. As more corn and grain sorghum are grown in Arkansas with more dependence on atrazine, triazine resistance is more likely. **If you suspect resistance after a herbicide application, treat with an alternate herbicide and contact your county Extension agent. The University of Arkansas will collect samples and test for resistance. Do not let the weeds go to seed in the field.**