

GRAIN SORGHUM WEED CONTROL

Introduction

Weeds can exert serious pressure on young grain sorghum through competition for water, nutrients and light. If allowed to compete through mid- to late-season, many weeds can grow taller than grain sorghum and reduce yields, delay maturity and hinder harvesting. In most fields, a season-long weed control program is needed for successful grain sorghum production.

Grain Sorghum and Johnsongrass

Do not plant grain sorghum in fields which are heavily infested with johnsongrass. Johnsongrass is a very vigorous competitor for water, nutrients and light. The weed is closely related to grain sorghum, and it harbors several diseases and insects which attack grain sorghum. No herbicides are available to adequately control johnsongrass in grain sorghum. **Do not apply and avoid drift of Accent, Accent Gold, Beacon, Option, or Steadfast to grain sorghum, as these herbicides will severely injure or kill grain sorghum.**

Atrazine and Water Quality

Atrazine label restrictions regarding mixing, loading and application are discussed below. These restrictions are part of the overall ground and surface water contamination risk reduction measures. Atrazine users are strongly encouraged to follow these guidelines to comply with the label, and to share in the responsibility of preserving the future of this extremely valuable grain sorghum herbicide. **These restrictions, and the Restricted Use Pesticide designation, apply to all formulations of atrazine and all package mix products which contain atrazine.**

Mixing, Loading and Application - Atrazine may not be mixed/loaded or used within 50 feet of all wells, including abandoned wells, drainage wells and sink holes. Atrazine may not be mixed or loaded within 50 feet of intermittent streams and rivers, natural or impounded lakes and reservoirs. Atrazine may not be applied aerially or by ground within 66 feet of the points where field surface runoff enters perennial or intermittent streams and rivers or within 200 feet around natural or impounded lakes and reservoirs. If atrazine is applied to highly erodible land, the 66-foot buffer of setback from runoff entry points must be planted to grain sorghum, seeded with grass, or another suitable crop.

Application rates - All soil applications prior to crop emergence -

- * **Highly Erodible Soils** (as defined by NRCS) - If conservation tillage is practiced (at least 30 percent residue coverage at planting), apply a maximum of 2 lbs. a.i./acre. If residue coverage is less than 30 percent, apply a maximum of 1.6 lbs. a.i./acre.
- * **Soils Not Highly Erodible** - Apply a maximum of 2 lbs. a.i./acre.

WARNING: These are the rates as listed on the AAtrex label, and they exceed the amount of atrazine recommended preemergence (in Bicep II Magnum, Bullet or Lariat) on grain sorghum by The University of Tennessee. **Grain sorghum, and particularly no-till grain sorghum, may be injured by preemergence applications of atrazine.** To reduce chances of injury, atrazine applications should be delayed until the crop has emerged.

Postemergence applications

If no atrazine was applied prior to grain sorghum emergence, apply a maximum of 2 lbs. a.i./acre. If a postemergence treatment is required following an earlier herbicide application, the total atrazine applied may not exceed 2.5 lbs. a.i./acre/calendar year. Postemergence applications to grain sorghum must be made before grain sorghum exceeds 12 inches in height.

Salvage Control of Large Weeds

A late-season rope wick application of glyphosate may be used to control johnsongrass or tall weeds, such as pigweed or giant ragweed, which extend at least 12 inches above grain sorghum. Adjust wiper height to prevent contact with the crop. Refer to the labels and the wick manufacturer's suggestions for rates, proper set-up and operation. This treatment is useful primarily to improve drydown and harvest conditions, because large weeds have already reduced crop yields.

BURNDOWN HERBICIDES RECOMMENDED FOR NO-TILL GRAIN SORGHUM*

Burndown Herbicide	Rate/Acre Broadcast		Remarks
	Active Ingredient	Formulation	
Gramoxone Inteon (Paraquat) (u)	0.5-0.75	32 – 48 ozs.	Use the higher rate to kill sod or where hard-to-kill plants are present. Weeds more than 6" tall may not be adequately controlled. Always add surfactant (0.5 gal./100 gals. of spray mix) and apply in 20-30 gals. of water per acre.
Touchdown/others* (Glyphosate 3ae)	0.75-1.5 lbs. (a.e.)	32-64 ozs. 3ae	Better control of smartweed than Gramoxone Inteon. Use the low rate on small, easy-to-kill annual weeds. Increase the rate on larger weeds and most perennials. See labels for additional information.
Roundup PowerMax* (Glyphosate 4.5ae)		22-43 ozs. 4.5ae	

(u)- *Restricted Use Herbicide*

* NOTE: *Several brands of glyphosate have become available in recent years. Products differ in terms of concentration, rates, addition of surfactant and registration on Roundup Ready crops. Always read the label before application.*

PREEMERGENCE HERBICIDES FOR GRAIN SORGHUM*

Herbicide	Rate/Acre Broadcast		Remarks
	Active Ingredient	Formulation	
Bicep II Magnum (u) (contains 2.4 lbs. Dual II Magnum + 3.1 lbs. Atrazine per gallon)	sandy loam: do not use silt loam: 0.95- 1.5 lbs. silty clay loam: 0.95-1.5 lbs.	sandy loam: do not use silt loam: 1.3-2.1 qts. silty clay loam: 1..3-2.1 qts.	Use 1.3-2 qts./A on soil with OM less than 1%. Controls most annual grasses and many broadleaf weeds. Do not use unless your seed has been treated with Concep or Screen seed safener.
Cinch (S-metolachlor)	sandy loam: 0.96-1.27 lbs. silt loam: 1.27-1.43 lbs. silty clay loam: 1.27-1.6 lbs.	sandy loam: 1.0-1.33 pts. silt loam: 1.33-1.5 pts. silty clay loam: 1.33-1.67 pts.	Recommended on overflow areas or fields where variable soil textures prevent preemergence application of atrazine. Will control most annual grasses and some broadleaf weeds. Use only with Concep or Screen safened seed. Use postemergence herbicides for broadleaf weed control.
Cinch ATZ (u) (Cinch plus Atrazine)	sandy loam: do not use silt loam: 2.2- 2.9 lbs. silty clay loam: 2.2-2.9 lbs.	sandy loam: do not use silt loam: 1.6-2.1 qts. silty clay loam: 1.6-2.1 qts.	Do not use on soils containing less than 1% organic matter. Controls most annual grasses and many broadleaf weeds. Do not use unless your seed has been treated with Concep or Screen seed safener.
Lariat or Bullet (u) (contains 2.5 lbs. Lasso + 1.5 lbs. Atrazine per gallon)	sandy loam: 2.5-2.75 lbs. silt loam: 2.75-3.75 lbs. silty clay loam: 3-4 lbs.	sandy loam: 2.5-2.75 qts. silt loam: 2.75-3.75 qts. silty clay loam: 3-4 qts.	Controls most annual grasses and many broadleaf weeds. Do not use unless your seed has been treated with a seed protectant containing the active ingredient flurazole. Use the higher rate for each soil texture in conservation or minimum tillage systems. See label.
Dual II Magnum (S-metolachlor)	sandy loam: 0.96-1.27 lbs. silt loam: 1.27-1.43 lbs. silty clay loam: 1.27-1.6 lbs.	sandy loam: 1.0-1.33 pts. silt loam: 1.33-1.5 pts. silty clay loam: 1.33-1.67 pts.	Recommended on overflow areas or fields where variable soil textures prevent preemergence application of atrazine. Will control most annual grasses and some broadleaf weeds. Use only with Concep or Screen safened seed. Use postemergence herbicides for broadleaf weed control.
Guardsman Max (u) (Outlook plus Atrazine)	sandy loam: do not use silt loam: 1.9-2.5 lbs. silty clay loam: 1.9-2.5 lbs.	sandy loam: do not use silt loam: 1.5-2 qts. silty clay loam: 1.5-2 qts.	Do not use on soils containing less than 1% organic matter. Controls most annual grasses and many broadleaf weeds. Do not use unless your seed has been treated with Concep or Screen seed safener.
Lasso EC (u) or Micro-Tech (u) (Alachlor)	sandy loam: 1.5-2.5 lbs. silt loam: 2-2.75 lbs. silty clay loam: 2-3 lbs.	sandy loam: 1.5-2.5 qts. silt loam: 2-2.75 qts. silty clay loam: 2-3 qts.	Recommended on overflow areas or fields where variable soil textures prevent preemergence application of atrazine. Will control most annual grasses and some broadleaves. Use only with seed properly treated with Screen seed protectant or a safener containing the active ingredient flurazole. Use the higher rate for each soil texture in conservation or minimum tillage systems. See label. Use postemergence herbicides for broadleaf control.

*NOTE: Postemergence treatments may be required to control cocklebur, sicklepod or other hard-to-control broadleaf weeds.

(u) **Restricted Use Pesticide**--Refer to label for precautions to be taken during handling and application.

POSTEMERGENCE HERBICIDES FOR GRAIN SORGHUM

Herbicide	Rate/Acre Broadcast		Remarks
	Active Ingredient	Formulation	
Aim (carfentrazone-ethyl)	0.008 lbs.	0.5 ozs.	Apply overtop grain sorghum up to the 6 leaf growth stage to control velvetleaf, black nightshade, common lambsquarters and small ivyleaf and pitted morningglory. Excellent on large velvetleaf. Temporary leaf burn may occur. Always add nonionic surfactant at 1 qt./100 gal. of spray mix. May be tank mixed with atrazine, Banvel, Clarity or other herbicides to expand weed spectrum. See label. Do not tank mix with EC formulation pesticides, as excessive crop injury may occur. Do not apply more than a total of 0.9 oz./A per season. Any crop may be replanted 30 days following application except small grains crops that do not have an established crop tolerance.
Atrazine (u)*	2.0 lbs.	2.0 qts. 4L 2.2 lbs. Nine-0	Apply overtop before weeds exceed 1.5 inches in height. Grain sorghum should be fully emerged. Refer to the label for directions on applying in combination with emulsifiable oil. Do not apply during cloudy weather. Postemergence applications must be made before crop exceeds 12 in tall.
Basagran (Bentazon)	0.75-1.0 lb.	1.5-2 pts.	Apply overtop grain sorghum to control most broadleaf weeds less than 4 inches tall. Refer to label for specific weed sizes.
Banvel or Clarity (Dicamba)	0.125-0.25 lb.	0.25-0.5 pt.	Apply overtop grain sorghum from emergence to 8" tall. Use drop nozzles to apply to row middles and prevent spraying into the crop whorl when sorghum is 8" to 15" tall. Do not apply by air. Use caution to prevent drift and injury to sensitive crops.
Buctril 4E (Bromoxynil)	0.25-0.38 lb.	0.5-0.75 pt.	Apply overtop grain sorghum from the 3-leaf state to 12" height to control most broadleaf weeds in the 2-4 leaf stage of growth. Less drift potential than Banvel or 2,4-D. Use 10 or more gallons of water per acre.
Peak 75WG (Prosulfuron)	0.023-0.035 lb.	0.5-0.75 ozs.	Soybeans must be of STS variety the following year.
Permit 75WSG (Halosulfuron)	0.32-0.047 lb.	0.67-1.0 oz.	Good option for broadleaf weed control where adjacent sensitive crops such as cotton or soybeans prevent application of 2,4-D or Banvel. Apply overtop from the 2-leaf through layby stage of growth. Use 0.67 oz. to control cocklebur, small pigweed, common ragweed and velvetleaf. Use 1 oz. to control yellow nutsedge. Add nonionic surfactant at 1-2 qt./100 gal. of spray mix. Temporary stunting may occur when Permit is applied to grain sorghum under stress. Make only one application per season. Do not harvest for forage or silage until 30 days following application.
2,4-D	0.25-0.5 lb.	0.5-1 pt.	Apply overtop grain sorghum that is 6" to 10" tall to control most broadleaf weeds. Use drop nozzles if sorghum is more than 10" in height. Do not apply the ester formulation if sensitive crops are nearby. Use caution to prevent drift and injury to sensitive crops.

Herbicide	Rate/Acre Broadcast		Remarks
	Active Ingredient	Formulation	
Prowl or Pendimax 3.3 (Pendimethalin) (culti-spray)	0.5-0.74 lb. ^a 0.74-1.0 lb. ^b 0.74-1.5 lb. ^c	1.2-1.8 pts. ^a 1.8-2.4 pts. ^b 1.8-3.6 pts. ^c	For extended control of seedling johnsongrass, signalgrass or late-season grasses cultivate to throw soil around stems and protect brace roots when sorghum is a minimum of 4" in height and immediately spray with Prowl. Use drop nozzles to apply if grain sorghum foliage will prevent uniform coverage of the soil surface. If rainfall (0.5") is not received within 7 days after application, incorporate with a sweep-type or rolling cultivator.

^a sandy loam

^b silt loam

^c silty clay loam

(u) **Restricted Use Pesticide**--Refer to label for precautions to be taken during handling and application.

*When using postemergence herbicides which contain Atrazine, be sure the total amount of Atrazine does not exceed 2.5 lbs. a.i. per acre per year.

GRAIN SORGHUM HARVEST AIDS

Harvest aid chemicals are sometimes needed to desiccate weeds in order to improve timeliness of harvest. This is most frequently encountered with early maturing varieties which may be ready for harvest prior to a killing frost. Harvest aid chemicals do not speed-up maturity of the grain sorghum plant; they merely reduce moisture in weeds and may improve harvest efficiency, in addition to timeliness. Producers are encouraged to make harvest aid decisions by comparing cost with anticipated benefits. Also, care must be taken to minimize chances of drift to adjacent crops. Be sure to read labels thoroughly and follow required preharvest intervals (PHI).

Harvest Aid	Rate/Acre Broadcast		Remarks
	Active Ingredient	Formulation	
Aim 2EC	0.016 lb	1.0 ozs.	3 days PHI. Excellent on morningglory spp.
Touchdown/others* (Glyphosate 3ae)	0.75-1.5 lbs. (a.e.)	32-64 ozs.	Apply at 30% grain moisture or less. Allow a minimum of 7 days between application and harvest. Use a spray volume of 10 to 20 gallons of water per acre for ground applications, or 3 -10 gallons of water for aerial applications. Do not apply to grain sorghum grown for seed as a reduction in germination or vigor may occur. Avoid spraying during conditions which favor drift. See labels for additional directions.
Roundup PowerMax* (Glyphosate 4.5ae)		22-43 ozs.	
Sodium Chlorate, Defol 6, other trade names (Sodium Chlorate)	4.5-6.0 lbs.	1.5-2 gals. of a 3 lb./gal. formulation or 0.75-1 gal. of a 6 lb./gal. formulation	Make application 7 to 10 days before anticipated harvesting date. Use the lower rates when grain moisture is low and the weather is clear and dry. Use the higher rates when conditions for desiccation are poor. Apply in a spray volume of 10- 20 gallons per acre by ground or 5-10 gallons per acre by air. Do not apply under conditions which favor drift. Sodium Chlorate has not proven beneficial in Tennessee research for reducing the moisture content of the grain itself.

* NOTE: Several brands of glyphosate have become available in recent years. Products differ in terms of concentration, rates, addition of surfactant and registration on Roundup Ready crops. Always read the label before application.

EXPECTED HERBICIDE RESPONSE OF COMMON WEEDS IN GRAIN SORGHUM

	PREEMERGENCE		POST OVERTOP					
	Bicep II Magnum(u) or Cinch ATZ (u)	Lariat (u) or Bullet (u)	Aim	Atrazine (u)	2,4-D	Banvel	Basagran	Buctril
Bermudagrass	0	0	0	1	0	0	0	0
Black Nightshade	8	8	-	7	8	9	3	8
Broadleaf Signalgrass	8	8	0	6	0	0	0	0
Cocklebur	7	6	6	7	9	9	9	9
Common Ragweed	9	9	-	8	8	9	5	7
Fall Panicum	9	8	0	6	0	0	0	0
Foxtail	9	9	0	7	0	0	0	0
Giant Ragweed	6	5	2	6	9	9	5	7
Goosegrass	9	9	0	7	0	0	0	0
Groundcherries	8	8	-	7	8	9	3	8
Lambsquarters	9	9	8	9	8	9	6	8
Large Crabgrass	9	9	0	6	0	0	0	0
Morningglories	8	8	8	7	9	9	4	7
Pigweed	9	9	8	9	8	9	0	6
Prickly Sida	7	7	4	8	7	8	8	6
Rhizome Johnsongrass	0	0	0	0	0	0	0	0
Seedling Johnsongrass	8	8	0	0	0	0	0	0
Sicklepod	7	7	1	6	8	8	0	5
Smartweed	9	9	7	8	6	8	7	7
Smooth Crabgrass	9	9	0	4	0	0	0	0
Velvetleaf	6	5	9	7	8	8	8	7
Yellow Nutsedge	7	6	0	5	0	0	8	0
Sorghum Tolerance	2*	2*	3	3	3	2	0	1

*Rating refers to herbicide safened seed.

(u) **Restricted Use Pesticide**--Refer to label for precautions to be taken during handling and application.

KEY TO SYMBOLS: 0=No control or crop injury; 10=100% control or severe, yield reducing crop injury.

Ratings are based on labeled rates of each herbicide, applied at the optimum timing for each weed.