Grain Sorghum Herbicide Management Strategies

Preemergence herbicide programs have been the mainstay of weed management in grain sorghum, due in large part to the low cost of atrazine, its broad spectrum of control, and lack of postemergence herbicides for grass control. Acetamide herbicides (Dual, Outlook, Lasso) are commonly used with atrazine in grain sorghum either as tankmixes or premixes (Bicep II Magnum, Guardsman Max, Bullet/Lariat). If acetamide herbicides are used, grain sorghum seed must be pre-treated with a safener that protects it from injury caused by the acetamide herbicides. Common seed safeners include Screen and Concep. Always check with your seed company representative to determine if the seed has been treated with these safeners

Common weed management issues

If shattercane or johnsongrass present, it is advisable to plant something other than sorghum because there are no selective herbicides to control these weeds in sorghum. In addition, because there are not highly effective postemergence grass herbicides for sorghum, fields with heavy grass pressure should be avoided for similar reasons.

Table 10. Weed response to herbicides in grain sorghum.

Herbicide	Mode of action	Barnyardgrass	Crabgrass	Fall panicum	Foxtail	Goosegrass	Seedling johnsongrass	Rhizome johsongrass	Shattercane	Yellow nutsedge	Eastern black nightshade	Cocklebur	Jimsonweed	Common lambsquarters	Entire/Ivyleaf morningglory	Pitted morningglory	Redroot and smooth pigweed	Prickly sida	Common ragweed	Giant ragweed	Annual smartweed	Sunflower	Velvetleaf	Common / tall waterhemp	Crop response
Atrazine	P	7	5	3	7	6	2	0	0	7	9	8	9	9	9	9	9	9	9	8	9	7	8	9	1
Bicep II Magnum[1]	S/P	8	9	9	9	9	2	0	5	8	9	8	9	9	9	9	9	9	9	8	9	8	8	9	1
Dual II Magnum[1]	S	8	9	9	9	9	6	0	5	8	9	0	4	6	2	2	9	3	5	3	5	0	2	9	1
Outlook[1]	S	8	9	8	8	9	6	0	4	7	8	2	4	7	2	2	9	0	5	2	4	0	2	9	1
Guardsman Max[1]	S/P	8	9	9	9	9	2	0	5	8	9	8	9	9	9	9	9	9	9	8	9	8	8	9	1
Lariat/Bullet[1]	S/P	8	9	9	9	9	2	0	5	8	9	8	9	9	9	9	9	9	9	8	9	8	8	9	1
Lasso/Microtech[1]	S	8	9	9	9	9	6	0	5	7	9	0	4	6	2	2	9	4	5	3	5	0	2	9	1
Postplant incorporated																									
Prowl/pendimethalin	R	9	9	8	9	9	7	0	7	0	0	0	0	7	0	0	8	-	0	0	3	0	0	7	1
Treflan	R	8	8	7	8	8	7	0	7	0	0	0	0	8	0	0	8	-	0	0	3	0	0	7	1
Postemergence																									
2,4-D	G	0	0	0	0	0	0	0	0	0	7	9	8	9	9	10	9	8	9	8	7	9	8	8	2
Aim	D	2	2	3	3	-	2	1	1	-	10	6	9	9	7	7	9	7	7	6	9	7	9	8	1
Atrazine	P	8	7	5	7	6	3	0	2	6	9	9	9	9	9	9	9	9	9	8	9	9	9	9	1
Basagran	P	0	0	0	0	0	0	0	0	7	2	9	9	6	5	7	4	8	8	8	9	8	8	3	0
Bromoxynil	P	0	0	0	0	0	0	0	0	0	9	9	10	9	8	8	7	4	9	9	9	8	8	6	1
Bromoxynil+atrazine	P	8	7	5	7	6	3	0	2	6	9	9	9	10	9	9	9	9	9	8	9	9	9	9	1
Dicamba	G	0	0	0	0	0	0	0	0	0	9	9	9	9	9	10	9	8	10	9	9	9	9	8	1
Dicamba+atrazine	G/P	8	7	5	7	6	3	0	2	6	9	9	9	9	9	9	9	9	9	8	9	9	8	9	1
Laddok	P	8	7	5	7	6	3	0	2	8	9	9	9	9	9	9	9	9	9	8	9	9	9	8	1
Peak	A	0	0	0	0	0	0	0	0	0	-	8	8	7	8	8	9	8	7	8	8	9	8	5	1
Permit	A	0	0	0	0	0	0	0	0	9	6	9	8	6	6	6	9	7	8	8	7	9	9	5	0
Shotgun	G/P	8	7	5	7	6	3		2	6	9	9	8	9	9	10	9	9	9	8	9	9	8	9	1
Post directed or hooded																									
Glyphosate	E	9	9	8	10	8	10	9	10	8	9	10	9	8	8	8	9	9	9	8	8	10	8	9	3
Gramoxone Max	D	9	9	8	8	8	8	0	6	3	-	4	7	9	5	4	9	4	8	-	5	-	6	-	1
Linex	P	7	8	8	8	-	7	0	-	-	-	8	-	9	8	8	9	9	8	-	8	-	9	-	1

[1]Use chloroacetamide safened (examples are Screen or Concep) seed to avoid crop injury from these herbicides.

Mode of action: A= ALS inhibitor; C= ACCase inhibitor; D= cell membrane disruptor; M = pigment inhibitor; P= photosysnthesis inhibitor; S= shoot meristem inhibitor; R= root meristem inhibitor; E = EPSP-synthase inhibitor.

Grain Sorghum: Soil Applied Herbicides – Preplant or Preemergence

Herbicide	Formulation	Product Rate
Aatrex/Atrazine	4L	Highly erodible soils with less than 30% resi due cover – 3.2 pts/A Highly erodible soils with greater than 30% residue cover – 4 pts/A Soils not highly erodible – 4 pts/A
	90DF	Highly erodible soils with less than 30% resi due cover – 1.8 lbs/A Highly erodible soils with greater than 30% residue cover – 2.2 lbs/A Soils not highly erodible – 2.2 lbs/A

Tank mix with: Dual, Outlook, Lasso

- Mode of action: photosynthesis inhibitor.
- Apply up to 45 days before planting.
- Do not use on light, sandy soils.
- Do not use on loam or clay soils with less than 1% organic matter.

Herbicide	Formulation	Product Rate
Dual II Magnum	7.64 E	
Parallel	7.8E	

Soil texture	Dual II/Dual II + atrazine	Parallel/Parallel + atrazine
Coarse	1.33/1 to 1.33 pt/A	1 to 1.33 pt/A/Do not use
Medium	1.5/1.33 to 1.5 pt/A	1.33 to 1.5/1.0 pt/A
Fine	1.67/1.5 to 1.67 pt/A	1.5 to 1.67/1.0 to 1.33 pt/A

Tank mix with: atrazine, Bicep II Magnum

- Mode of action: shoot meristem inhibitor.
- Apply only to sorghum with safened seed.
- May be applied up to 30 days before planting as a single application preplant incorporated or preemergence.
- Do not use on coarse soils with less than 1.5% organic matter.
- Incorporation to a depth of 2 inches will improve yellow nutsedge control and reduce dependence on rainfall for activation.

Herbicide	Formulation	Product Rate
Outlook	6EC	

Soil texture	Less than 3% organic matter	Greater than 3% organic matter
Coarse	12 to14 oz/A	14 to18 oz/A
Medium or fine	14 to18 oz/A	18 to21 oz/A

Tank mix with: atrazine,

- Mode of action: shoot meristem inhibitor
- Apply only to sorghum with safened seed.
- May be applied up to 30 days before planting as a single application and postemergence on grain sorghum up to 12 inches tall.
- Incorporation to a depth of 2 inches will improve yellow nutsedge control and reduce dependence on rainfall for activation.

Grain Sorghum: Soil Applied Herbicides – Preplant or Preemergence

Herbicide	Formulation	Product Rate
Lasso	4EC	
Microtech	4L	

Soil texture	Preplant incorporated alone	Preemergence surface application alone
Coarse	2 to 2.5 qts/A	1.5 to 2 qts/A
Medium	2.5 to 2.75 qts/A	2 to 2.25 qts/A
Fine	2.5 to 3 qts/A	2 to 2.5 qts/A

Mixtures with atrazine – preplant incorporated

Soil texture	Less than 1.5% organic matter		Greater than 1.5% organic matter	
	Lasso/Microtech	Atrazine 4L	Lasso/Microtech	Atrazine 4L
Coarse	--	--	--	--
Medium	1.5 to 2 qts/A	1 to 1.25 qts/A	1.75 to 2 qts/A	1 to 1.5 qts/A
Fine	1.75 to 2 qts/A	1.25 to 1.5 qts/A	2 to 2.5 qts/A	1.25 to 1.75 qts/A

Mixtures with atrazine – preemergence surface application

Soil texture	Less than 1.5% organic matter		Greater than 1.5% organic matter	
	Lasso/Microtech	Atrazine 4L	Lasso/Microtech	Atrazine 4l
Coarse (except sand)	1.5 qts/A	0.75 to 1 qts/A	1.5 to 1.75 qts/A	0.75 to 1 qts/A
Medium	1.5 to 1.75 qts/A	1 to 1.25 qts/A	1.5 to 2 qts/A	1 to 1.5 qts/A
Fine	1.5 to 2 qts/A	1 to 1.5 qts/A	1.75 to 2.25 qts/A	1.25 to 1.75 qts/A

Tank mix with: atrazine, Lariat

- Mode of action: shoot meristem inhibitor.
- Apply only to sorghum with safened seed.
- May be applied up to 7 days before planting as a single application.

Grain Sorghum: Soil Applied Herbicides – Preplant or Preemergence

Herbicide	Formulation	Product Rate
Bicep II Magnum	5.5L	

Soil texture	Organic matter content	
Coarse (sand, loamy sand, sandy loam)	Any level	Do not use
Medium (loam, silt loam, silt)	Less than 1%	Do not use
	More than 1% and less than 30% residue cover	2.1 qts/A
	More than 1% and more than 30% residue cover	2.1 to 2.33 qts/A
Fine (sandy clay loam, silty clay loam, clay loam, sandy clay, silty clay, clay)	More than 1% and less than 30% residue cover	2.1 qts/A
	1 to 1.5 % and more than 30% residue cover	2.1 to 2.33 qts/A
	More than 1.5% and more than 30% residue cover	2.33 to 2.6 qts/A

Tank mix with: Dual, atrazine

- Mode of action: shoot meristem inhibitor (Dual) + photosynthesis inhibitor (atrazine).
- Do not use on light, sandy soils.
- Do not use on loam or clay soils with less than 1% organic matter.
- Apply only to sorghum with safened seed.
- May be applied up to 30 days before planting as a single application.
- Incorporation to a depth of 2 inches will improve yellow nutsedge control and reduce dependence on rainfall for activation.

Herbicide	Formulation	Product Rate
Bicep Lite II Magnum	6L	

Soil texture	Organic matter content	
Coarse (sand, loamy sand, sandy loam)	Any level	Do not use
Medium (loam, silt loam, silt)	Less than 1%	Do not use
	More than 1%	1.5 to 1.7 qts/A
Fine (sandy clay loam, silty clay loam, clay loam, sandy clay, silty clay, clay)	Less than 1.5%	1.5 to 1.7 qts/A
	More than 1.5%	1.7 to 1.9 qts/A

Tank mix with: Dual, atrazine

- Mode of action: shoot meristem inhibitor (Dual) + photosynthesis inhibitor (atrazine).
- Formulation of Bicep loaded with lower rates of atrazine.
- Do not use on light, sandy soils.
- Do not use on loam or clay soils with less than 1% organic matter.
- Apply only to sorghum with safened seed.
- May be applied up to 30 days before planting as a single application.
- Incorporation to a depth of 2 inches will improve yellow nutsedge control and reduce dependence on rainfall for activation.

Grain Sorghum: Soil Applied Herbicides – Preplant or Preemergence

Herbicide	Formulation	Product Rate
Guardsman Max	5L	

Soil texture	Less than 3% organic matter	More than 3% organic matter
Coarse	2.5 to 3 pts/A	3 to 4 pts/A
Medium or fine	3 to 4 pts/A	4 to 4.6 pts/A

Tank mix with: Outlook, atrazine

- Mode of action: shoot meristem inhibitor (Outlook) + photosynthesis inhibitor (atrazine).
- Do not use on light, sandy soils.
- Do not use on loam or clay soils with less than 1% organic matter.
- Apply only to sorghum with safened seed.
- May be applied up to 30 days before planting as a single application.
- Incorporation to a depth of 2 inches will improve yellow nutsedge control and reduce dependence on rainfall for activation.

Herbicide	Formulation	Product Rate
Lariat	4F	

Soil texture	Less than 1.5% organic matter	More than 1.5 % organic matter
Coarse	2.5 qts/A	2.75 qts/A
Medium	2.75 qts/A	2.75 to 3.75 qts/A
Fine	3 qts/A	3 to 4 qts/A

Tank mix with: Lasso/Microtech, atrazine

- Mode of action: shoot meristem inhibitor (Lasso) + photosynthesis inhibitor (atrazine).
- Do not use on light, sandy soils.
- Do not use on loam or clay soils with less than 1% organic matter.
- Apply only to sorghum with safened seed.
- May be applied up to 7 days before planting as a single application.
- Incorporation to a depth of 2 inches will improve yellow nutsedge control and reduce dependence on rainfall for activation.

Grain Sorghum: Postemergence Incorporated (Preemergence to Weeds) and Layby

Herbicide	Formulation	Product Rate
Prowl/Pendimax	3.3 EC	1.5 to 3.6 pt/A

Tank mix with: atrazine

- Mode of action: root meristem inhibitor.
- Apply to cultivated or otherwise weed-free soil after grain sorghum is 4 inches tall and up to the last cultivation. If tankmixed with atrazine, do not apply after grain sorghum is 12 inches tall.
- Use drop nozzles if foliage prevents coverage of soil.
- Incorporate 1 inch deep with a cultivator or rain/irrigation within 7 days after application.
- Do not use on sand or loamy sand soils.
- Do not allow grazing or feed forage to livestock until 21 days after application.

Herbicide	Formulation	Product Rate
Treflan/others	4EC	0.6 to 1.6 pt/A

Tank mix with: atrazine

- Mode of action: root meristem inhibitor.
- Apply to cultivated or otherwise wee-free soil after grain sorghum is 8 inches tall and up to the last cultivation. If tankmixed with atrazine, do not apply after grain sorghum is 12 inches tall.
- Use drop nozzles if foliage prevents coverage of soil.
- Incorporate 1 inch deep with a cultivator or rain/irrigation immediately after application.
- Do not use on sand or loamy sand soils.
- Do not allow grazing or feed forage to livestock until 21 days after application.

Grain Sorghum: Postemergence

Herbicide	Formulation	Product Rate
2,4-D amine	4 lb/gal	1 pt/A

Tank mix with: atrazine, dicamba, bromoxynil, Peak, Permit.

- Mode of action: growth regulator.
- Numerous formulations are available. Application rates, spray volumes, and timings vary with company and formulation.
- Apply when grain sorghum is at least 6 inches tall and before it is 15 inches tall. If it is over 8 inches tall use drop nozzles to direct spray between rows.
- Most hybrids are injured by 2,4-D. Injury symptoms include rolled leaves, and brittle, spreading stems and tillers. High humidity and temperatures increase potential for injury.

Herbicide	Formulation	Product Rate
2,4-D ester	4 lb/gal	0.5 pt/A

Tank mix with: atrazine, dicamba, bromoxynil, Peak, Permit.

- Mode of action: growth regulator.
- Numerous formulations are available. Application rates, spray volumes, and timings vary with company and formulation.
- Apply when grain sorghum is at least 6 inches tall and before it is 15 inches tall. If it is over 8 inches tall use drop nozzles to direct spray between rows.
- Most hybrids are injured by 2,4-D. Injury symptoms include rolled leaves, and brittle, spreading stems and tillers. High humidity and temperatures increase potential for injury.

Herbicide	Formulation	Product Rate
Aim	40DF	0.33 oz/A

Tank mix with: atrazine, dicamba, Laddok, Peak, Permit

- Mode of action: cell membrane disruptor.
- Aim is a contact herbicide that controls black nightshade, velvetleaf, pigweeds, small morningglories, and lambsquarters. Aim is often tankmixed with other herbicides to improve control of these weeds.
- Add nonionic surfactant at 1 qt/100 gallons or 0.25% v/v. Do not use crop oil concentrate or methylated seed oils or EC formulations of tankmix partners because of crop injury. UAN (2 to 4 gallons/100 gallons) or ammonium sulfate (2to4 lbs/A) can be added if recommended for use with other herbicides.
- Leaf speckling is likely. Severity of injury varies with environmental conditions, adjuvants, and tankmix partner. To reduce injury, 1) do not apply within 6to8 hrs of rain, and 2) make sure spray nozzles are positioned 18 inches above crop and avoid applications directly into crop whorls.
- Apply in a spray volume of 10 to 20 gpa with a pressure of 20 to 40 psi. Flat fan nozzles are recommended for adequate coverage.
- Add Aim to the tank before adding other herbicides.

Herbicide	Formulation	Product Rate
Atrazine	4L	1 qt/A
	90DF	1.1 lb/A

Tank mix with: most other postemergence products

- Mode of action: photosynthesis inhibitor.
- Atrazine can injure grain sorghum on high pH soils.
- Do not use on sandy/sandy loam soils.
- Add crop oil concentrate at 1 qt/A or nonionic surfactant at 1 qt/A or 0.25% v/v.
- Apply after sorghum reaches 3-leaf stage but before 12 inches tall.
- Apply before weeds exceed 1.5 inches in height.

Herbicide	Formulation	Product Rate

Grain Sorghum: Postemergence

Basagran	4L	1 to 2 pt/A

- Mode of action: photosynthesis inhibitor.
- Broadcast applications can be made to sorghum until heading.
- Add crop oil concentrate at 1 to 2 pt/A. Add a nitrogen source if velvetleaf is present.
- Apply no more than 2 pints per growing season.

Herbicide	Formulation	Product Rate
Bromoxynil	2E	1 to 1.5 pt/A

Tank mix with: atrazine, 2,4-D, dicamba.

- Bromoxynil is sold under the trade names Buctril, Moxy, and Broclean.
- Mode of action: photosynthesis inhibitor.
- This is a contact herbicide and thorough coverage is required.
- Safer to sorghum than 2,4-D or dicamba, but somewhat weaker on pigweed species.
- Broadcast applications can be made to sorghum from the 3- to 4-leaf stage until the pre-boot stage.
- Do not graze or cut forage for feed within 30 days after application.

Herbicide	Formulation	Product Rate
Buctril/Atrazine Moxy/Atrazine	3F	1.5 to3 pt/A

Tank mix with: atrazine, bromoxynil, dicamba, 2,4-D

- Mode of action: photosynthesis inhibitor.
- Apply from the 2 to 4 leaf stage up to 10 inches tall. See label for more detail on rates and growth stages.
- Can be tankmixed with dicamba to improve control of pigweeds and bindweed.
- Do not graze or cut forage for feed within 30 days after application.

Herbicide	Formulation	Product Rate
Dicamba	4L	0.5 pt/A

Tank mix with: atrazine, 2,4-D, bromoxynil, Permit, Peak, Shotgun.

- Dicamba is sold under a variety of trade names, including Banvel, Sterling, Oracle, and Banvel-K.
- Mode of action: growth regulator.
- Broadcast applications can be made to sorghum up to 8 inches tall. Directed applications can be made to sorghum 8 to 15 inches tall to keep product out of whorls. Failure to follow these height restrictions can result in damage seed heads.
- Do not apply to sorghum grown for seed.
- Do not allow grazing or feed treated forage before mature grain stage.
- Do not apply when temperature on day of application is expected to exceed 85 F.
- Expect some crop response in the form of rolled up leaves.

Herbicide	Formulation	Product Rate
Dicamba+atrazine	3.2L	1.5 to 2 pt/A

- Dicamba plus atrazine is sold under various trade names, including Marksman, Sterling Plus, Banvel-K+atrazine, and Stratos.
- Mode of action: growth regulator (dicamba) + photosynthesis inhibitor (atrazine).
- Apply from 2 to 5 leaf stage of grain sorghum and weeds less than 6 inches tall.
- The 1.5 pt rate is only for pigweed control.

Herbicide	Formulation	Product Rate

Grain Sorghum: Postemergence

Laddok S-12	5L	2 to 3.5 pt/A

- Mode of action: photosysnthesis inhibitor (Basagran and atrazine)
- Apply from emergence up to 12 inches tall
- Add crop oil concentrate or Dash at 1 qt/A or UAN at 2to4 qt/A or ammonium sulfate at 2to4 lb/A. Add UAN or ammonium sulfate if velvetleaf is a target.
- Do not graze or cut forage for feed within 21 days after application.

Herbicide	Formulation	Product Rate
Peak	57DG	0.5 to 1 oz/A

Tank mix with: atrazine, dicamba, bromoxynil, dicamba+atrazine, 2,4-D

- Mode of action: ALS inhibitor.
- Apply to grain sorghum from 5 to 30 inches tall.
- If applied alone or tankmixed with atrazine, add crop oil concentrate at 1 qt/A. Add UAN at 2to4 qt/A if velvetleaf is targeted.
- If tankmixed with 2,4-D, dicamba or bromoxynil, use nonionic surfactant rather than crop oil concentrate.
- No restrictions on rotation to wheat.
- Soybean is very sensitive to Peak residues and rotational intervals will vary by region, rate used, and soil pH.

Herbicide	Formulation	Product Rate
Permit	75DF	0.67 oz/A

Tank mix with: atrazine, 2,4-D, dicamba

- Mode of action: ALS inhibitor.
- Apply to grain sorghum in the 2-leaf stage to layby (before head emergence).
- Add dicamba or 2,4-D to improve control of pigweeds and morningglories.
- Always apply with nonionic surfactant at 1 to 2 qt/100 gallons (0.25 to 0.5% v/v). Add UAN at 4 gal/100 gal for control of velvetleaf.
- Do not apply to sorghum treated with an organophosphate insecticide.

Herbicide	Formulation	Product Rate
Shotgun	3.25L	2 pt/A

Tank mix with: atrazine, dicamba, bromoxynil

- Mode of action: growth regulator (2,4-D) + photosynthesis inhibitor (atrazine).
- Apply from spike to 8 inches tall or 4 leaf stage as a broadcast spray. Directed applications can be used on 8 to 12 inch tall grain sorghum.
- Do not use with liquid fertilizer.
- Addition of adjuvants is not recommended because of crop injury concerns.

Grain Sorghum: Postemergence Directed or Hooded Sprayer

Herbicide	Formulation	Product Rate
Glyphosate	3 lb ae/gal	1 to 2 pt/A

Tank mix with:
- Mode of action: EPSPS inhibitor.
- Hooded application only.
- Glyphosate will cause severe injury to grain sorghum, so avoid drift and use hoods that are shielded on all four sides.
- Weeds in the row (outside of the hood) will not be controlled.

Herbicide	Formulation	Product Rate
Gramoxone Max	3SL	1.5 to 2.5 pt/A

Tank mix with:
- Mode of action: cell membrane disruptor.
- Apply after grain sorghum is over 12 inches tall, but before weeds are 3 inches tall.
- Directed application - keep spray off all but lower 3 inches of sorghum.
- Use nonionic surfactant at 0.5 pt/100 gallons (0.125% v/v).

Herbicide	Formulation	Product Rate
Linex	4L	1 to 2 pt/A

Tank mix with:
- Mode of action: photosynthesis inhibitor.
- Directed application - Keep spray off all but lower 3 inches of sorghum.
- Use a nonionic surfactant at 1 qt/100 gallon.

Grain Sorghum: Special Problems Postemergence – Johnsongrass and Shattercane

Herbicide	Formulation	Product Rate
Glyphosate	3 lb ae/gal	2.5 oz/gallon (2% solution)

Tank mix with:
- Mode of action: EPSPS inhibitor.
- Spot application – sorghum plants will be injured or killed if treated.
- Add nonionic surfactant (see label).
- Add ammonium sulfate at 8.5 to 17 lbs/100 gallons.

Herbicide	Formulation	Product Rate
Glyphosate	3 lb ae/gal	10% solution (roller) 33% solution (rope wick or wper)

Tank mix with:
- Mode of action: EPSPS inhibitor.
- Spot application – sorghum plants will be injured or killed if treated.
- Add nonionic surfactant (see label).
- Add ammonium sulfate at 8.5 to 17 lbs/100 gallons.

Grain Sorghum: Special Problems Postemergence – Annual and Perennial Vines

Herbicide	Formulation	Product Rate

2,4-D amine	4 lb/gal	1.5 to 2 pt/A
2,4-D ester	4 lb/gal	0.75 to 1 pt/A

Tank mix with: dicamba

- Mode of action: growth regulator.
- Apply after grain sorghum is over 6 inches but before it is 15 inches tall. If sorghum is more than 8 inches tall use drop nozzles to keep spray off leaves.
- For control of annual morningglories, honeyvine milkweed, field bindweed, trumpetcreeper.

Herbicide	Formulation	Product Rate
Dicamba	4 lb/gal	2 to 4 pt/A

Tank mix with: 2,4-D, glyphosate

- Mode of action: growth regulator.
- Fall treatment only, Apply after crop harvest, but before a killing frost. Avoid disturbing area for at least 7 days after application.
- Delay planting wheat 45 days for each pint of Banvel/Clarity applied.
- For control of annual morningglories, honeyvine milkweed, field bindweed, trumpetcreeper.

Herbicide	Formulation	Product Rate
Glyphosate	3 lb ae/gal	2 to 4 pt/A

Tank mix with:

- Mode of action: EPSPS inhibitor.
- Fall treatment only, Apply after crop harvest, but before a killing frost. Avoid disturbing area for at least 7 days after application.
- Delay planting wheat 45 days for each pint of Banvel/Clarity applied.
- For control of annual morningglories, honeyvine milkweed, field bindweed, trumpetcreeper.

Grain Sorghum: Special Problems Postemergence – Harvest Aid

Herbicide	Formulation	Product Rate

Glyphosate	3 lb ae/gal	2 to 4 pt/A

Tank mix with:

- Mode of action: EPSPS inhibitor.
- Apply at least 7 days before harvest, make applications at 30% grain moisture or less. A 14 day delay is recommended to give the product time to kill the weeds and weed growth to dessicate.
- Do not apply to grain sorghum grown for seed.

Herbicide	Formulation	Product Rate
Reglone	2 lb/gal	1.5 to 2 pt/A

Tank mix with:

- Mode of action: cell membrane disruptor.
- Apply 1 to 2 weeks before harvest make applications at 30% grain moisture or less.
- Do not use seed from treated plants for food, feed or oil purposes.

Herbicide	Formulation	Product Rate
Sodium chlorate	Many	4 to 6 lb/A

Tank mix with:

- Mode of action:
- Apply 7 to 10 days before harvest.
- Use spray adjuvants as recommended by the label.
- Can be applied in 28% UAN solutions to enhance foliar activity.
- Do not graze treated fields or feed treated fodder, forage, or seed within 14 days of application.

Table 11. Grazing and forage (silage, hay, etc.) intervals for herbicide-treated grain sorghum.

This table is a guide for grazing and feeding herbicide-treated grain sorghum, and shows the time that should occur between herbicide application and grazing or harvest for silage. For premixes or combinations not listed below, the minimum time interval equals the longer of the two intervals for each individual product in the mix. Always consult herbicide labels for specific limitations.

Herbicide	Grazing	Forage (silage, etc)
2,4-D	7 days	7 days
Aim	No information on label	No information on label
Atrazine	21 days	21 days
Basagran	21 days	none
Bicep II Magnum	30 days	30 days
Bromoxynil	45 days	45 days
Bromoxynil+atrazine	45 days	45 days
Dicamba	Past milk stage	Past milk stage
Dicamba+atrazine	21 days	37 days
Dual II Magnum/Parallel	30 days	30 days
Outlook	60 days	60 days
Glyphosate	Do not graze	Do not feed
Gramoxone Max at planting	None	None
Gramoxone Max directed	Do not graze	Do not feed
Guardsman Max	40 days	40 days
Laddok	21 days	21 days
Lariat/Bullet	21 days	21 days
Lasso/Microtech	None	None
Lorox/Linex	Do not graze	Do not feed
Peak	30 days	40 days
Permit	30 days	30 dys
Prowl/pendimethalin	21 days	21 days
Shotgun	21 days	21 days
Treflan/trifluralin	No restrictions found on label	No restrictions found on label

Table 12. Rainfast intervals, spray additives, and maximum crop sizes for postemergence grain sorghum herbicides.

This table shows the required time interval between herbicide application and rainfall and summarizes label recommendations for spray additives and maximum crop stage. Check herbicide labels for additive rates. Information in this table applies to field corn only. Use the following key for spray additives:
SURF = nonionic surfactant
COC = crop oil concentrate
DASH = BASF spray adjuvant
UAN = 28% nitrogen solution
AMS – ammonium sulfate
MSO = methylated seed oil

Herbicide	Rainfast interval (hours)	Spray additives/Maximum crop size
2,4-D amine	6-8	No additives. Broadcast on 6- to 8-inch tall sorghum. Use drop nozzles on 8- to 15-inch tall sorghum.
2,4-D ester	2-3	No additives. Broadcast on 6- to 8-inch tall sorghum. Use drop nozzles on 8- to 15-inch tall sorghum.
Aim	1	SURF. UAN or AMS can be added if recommended with tank mix partners.Broadcast up to 6 leaf growth stage.
Atrazine	1-2	COC or NIS. Broadcast from 3-leaf stage up to 12 inches tall.
Basagran	8	COC. Add UAN or AMS if velvetleaf is present. Broadcast up to just before heading.
Bromoxynil	2 1	No additives. Broadcast applications until pre-boot stage. No additives. Broadcast applications from 2 to 4 lf stage until 10 inches tall.
Dicamba	6-8	No additives. Broadcast on 6- to 8-inch tall sorghum. Use drop nozzles on 8- to 15-inch tall sorghum.
Dicamba+ atrazine	6-8	SURF only if crop injury can be tolerated. Apply from 2 to 5 leaf stage.
Glyphosate	1-2 see label of specific product	AMS. See label of specific product regarding NIS.
Gramoxone Max	0.5	SURF. Directed or hooded application - apply after grain sorghum is 12 inches tall.
Laddok	8	COC or DASH or UAN. Add UAN or AMS if velvetleaf is present. Broadcast from emergence to 12 inches tall.
Lorox/Linex	No information on label	SURF. Directed or hooded applications – apply after grain sorghum is 12 inches tall.
Peak	4	SURF or COC; Add UAN if velvetleaf is targeted. Broadcast from 5 to 30 inches tall.
Permit	4	SURF; add UAN if velvetleaf is targeted. Broadcast from 2 leaf until layby (before head emergence).
Shotgun	6	No additives recommended because of crop injury concerns. Apply from spike to 8 inches tall or 4 leaf stage as a broadcast spray. Directed applications can be used on 8 to 12 inch tall grain sorghum.