

GRAIN SORGHUM: GRAIN SORGHUM INSECT CONTROL

David Buntin, Research/Extension Entomologist

PEST	INSECTICIDE	MOA	AMOUNT OF FORMULATION PER ACRE	LB ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
DO NOT USE methomyl (Lannate Annihilate) or chlorpyrifos (Lorsban and similar products) on sweet sorghum varieties. See the section for temporary summer grazing insect control.						
Soil Insects: White grubs, wireworms, seed maggots, rootworms, fire ants	SEED TREATMENTS					Apply Counter granules in a 7" band over the row at planting and lightly incorporate. DO NOT APPLY COUNTER GRANULES IN DIRECT CONTACT WITH THE SEED. Control of white grubs may be variable. Commercial seed treatment. Generally effective against wireworms, seed maggots and fire ants. Seed treatments may not provide effective control of white grubs. NOTE: Chlorpyrifos (Lorsban, others) 15G as listed for cutworms and lesser cornstalk borer is also available.
	<i>imidacloprid</i> Gaucho 600, Attendant 600, Axxess, Senator, other brands	4C	6.4 fl oz/100 lb of seed	0.25/100 lb	12 H/ 45 D Grazing	
	<i>thiamethoxam</i> Cruiser 5FS	4C	5.1-7.6 oz/100 lb seed	0.2/100 lb	12 H/ 45 D	
	<i>clothianidin</i> Poncho 600, NipsIt Inside 5	4C	5.1-6.4 fl oz/100 lb seed	0.2-0.25/100 lb	12 H/ –	
	AT-PLANTING TREATMENT					
<i>terbufos</i> Counter Lock n' Load 20 G	1B	5.2 oz/ 1000 ft row	varies with row width	48 H/ 100 D		
Cutworms, Lesser cornstalk borer	AT-PLANTING TREATMENT					Lorsban 15G for cutworms and lesser cornstalk borer: Apply Lorsban 15G at-planting in a T-band and cover lightly with soil. DO NOT APPLY LORSBAN 15G OR SIMILAR PRODUCTS IN-FURROW WITH THE SEED. CUTWORMS: Lorsban 4E, Asana. Adjourn, Baythroid, Delta Gold, and cyhalothrin products also can be applied broadcast at or immediately before planting or applied in a narrow band over the row at planting. Use full rate for broadcast applications or concentrate lower labeled dosage rate in the treated band. LESSER CORNSTALK BORER: Apply liquid formulations in a band over the row at planting and lightly incorporate. Broadcast application is not effective. Seed treatments as listed for soil insects may provide suppression of lesser cornstalk borer. NOTE: DO NOT USE Lorsban/Nufos/Chlorpyrifos on sweet sorghum varieties
	<i>alpha-cypermethrin</i> Fastac, other brands 0.83 (Cutworm only)	3A	2.6-3.6 oz	0.017-0.023	12 H/ 14 D	
	<i>beta-cyfluthrin</i> Baythroid XL 1EC (Cutworm only)	3A	1.3 fl oz	0.01	12 H/ 0 D	
	<i>chlorpyrifos</i> Lorsban 15G	1B	6.6 lb/A OR 8 oz/1000 ft row	0.97	24 H/ – Not listed	
	<i>deltamethrin</i> Delta Gold 1.5EC	3A	1.8 fl oz	0.025	12 H/ 7 D	
	<i>esfenvalerate</i> Asana XL, Adjourn 0.6 6EC	3A	5.8-9.6 fl oz	0.03-0.05	12 H/ 21 D	
	<i>gamma cyhalothrin</i> Declare 1.25 Proaxis 0.5	3A	1.02-1.54 fl oz 2.56-3.84 fl oz	0.01-0.015 0.01-0.015	24 H/ 7 D	
	<i>lambda cyhalothrin</i> Warrior II Zeon 2.08 Silencer, Lambda, others 1	3A	1.28-1.92 fl oz 2.56-3.84 fl oz	0.02-0.03 0.02-0.03	12 H/ 7 D	
	POST-EMERGENCE TREATMENTS					
<i>chlorpyrifos</i> Lorsban, Nufos, Chlorpyrifos 4E		2pt	1	24 H/ 30 D		

GRAIN SORGHUM INSECT CONTROL

PEST	INSECTICIDE	MOA	AMOUNT OF FORMULATION PER ACRE	LB ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Aphids (Sugarcane Aphid, Greenbug and Corn Leaf Aphid)	SEED TREATMENTS					
	<i>imidacloprid</i> Gaucho 600, Attendant 600, Axxess, Senator, other brands	4C	6.4 fl oz/ 100 lb of seed	0.25-100 lb	12 H/ 45 D Grazing	Greenbug and corn leaf aphid seldom require control on sorghum in Georgia. Sugarcane aphid is new to Georgia and can cause devastating losses to sorghum if not controlled. Seed Treatments: Products listed with provide 25-40 day control of aphids. For sugarcane aphid use thiamethoxam or clothianidin products at the highest rate listed. Imidacloprid products are not specifically listed for sugarcane aphid control. NOTE: DO NOT USE Lorsban/Nufos/Chlorpyrifos on sweet sorghum varieties.
	<i>thiamethoxam</i> Cruiser 5FS	4C	5.1-7.6 fl oz/ 100 lb seed	0.062-0.093 mg/seed	12 H/ 45 D	
	<i>clothianidin</i> Poncho 600, NipsIt Inside 5	4C	5.1-6.4 fl oz/ 100 lb seed	0.2-0.25/100 lb	12 H/ –	
	POST-EMERGENCE TREATMENTS					
	<i>chlorpyrifos</i> Lorsban, Nufos, others 4E Chlorpyrifos 4EC Lorsban 75WG	1B	1-2 pt 0.67 lb	0.5-1 0.5	24 H/ 30 D at 1 pt 60 D at 2 pt	Post-emergence application: Greenbug: Treat when greenbugs are present and killing 3 leaves/plant before boot stage. Corn leaf aphid: Treat when a large population occurs and leaves are dying. Sugarcane aphid: Consult with local county extension office for the latest recommendations. In general treat when infestations reach 50 aphids/leaf OR when pre-boot stage 25% of plants are infested and large numbers are present. Good spray coverage is critical, minimum of 10 gpa by ground and 5 gpa by air. Chlorpyrifos products may not provide more than 7 days control. Malathion may give partial control of sugarcane aphid on the head at the end of the season.
	<i>malathion</i> Malathion, 57%, other brands	1B	1.5 pt	0.93	12 H/ 7 D	
	<i>flupyradifurone</i> Sivanto Prime	4D	4-10 fl oz	0.052-0.13	4 H/ 21 D	
	SEED TREATMENTS					
	Chinch bug and False chinch bug (on seedlings), Billbugs, Sugarcane beetles	<i>imidacloprid</i> Gaucho 600, Attendant 600, Axxess, Senator, other brands	4C	6.4 fl oz/ 100 lb of seed	0.25-100 lb	12 H/ 45 D grazing
<i>thiamethoxam</i> Cruiser 5FS		4C	5.1-7.6 fl oz/ 100 lb seed	0.25-100 lb	12 H/ 45 D	
<i>clothianidin</i> Poncho 600, NipsIt Inside 5		4C	5.1-6.4 fl oz/ 100 lb seed	0.2-0.25/100 lb	12 H/ –	
POST-EMERGENCY TREATMENTS						
<i>alpha-cypermethrin</i> Fastac, other brands 0.83		3A	2.6-3.6 oz	0.017-0.023	12 H/ 14 D	NOTE: DO NOT USE Lorsban/Nufos/Chlorpyrifos on sweet sorghum varieties. Apply chlorpyrifos products post-emergence at base of seedling plants in 8-12” band with adequate water. Concentrate full rate in the treated band.
<i>beta-cyfluthrin</i> Baythroid XL 1EC		3A	2.8 fl oz	0.022	12 H/ 14 D	
<i>chlorpyrifos</i> Lorsban, Nufos, others 4E Chlorpyrifos 4EC Lorsban 75WG		3A	1.5 pt 2 pt 1.33 lb	0.75 1 1	24 H/ 30 D at 1 pt 60 D at 2 pt	
<i>cyfluthrin</i> Tombstone 2		3A	2.8 fl oz	0.044	12 H/ 21 D	
<i>deltamethrin</i> Delta Gold 1.5EC		3A	1.9 fl oz	0.022	12 H/ 14 day	

GRAIN SORGHUM INSECT CONTROL

PEST	INSECTICIDE	MOA	AMOUNT OF FORMULATION PER ACRE	LB ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Chinch bug and False chinch bug (on seedlings), Billbugs, Sugarcane beetles (continued)	POST-EMERGENCY TREATMENTS					
	<i>gamma cyhalothrin</i> Declare 1.25 Proaxis 0.5	3A	1.54 fl oz 3.84 fl oz	0.015 0.015	24 H/ 30 D	
	<i>lambda cyhalothrin</i> Warrior II Zeon 2.08 Silencer, Lambda, others 1	3A	1.92 fl oz 3.84 fl oz	0.03 0.03	24 H/ 30 D	
<i>zeta-cypermethrin</i> Mustang Maxx, other brands	3A	4 fl oz	0.025	12 H/ 14 D		
European corn borer	Materials labeled for "foliage feeding larvae" will give helpful control.					Treat if numerous egg masses are found in the field (treat just before eggs hatch), or if shot-hole type leaf feeding by newly hatched larvae appears in 25% of the plants in a field. Insecticides are not effective once larvae bore in to the plant stem. Use products are listed for foliage-feeding larvae.
Foliage-feeding Larvae: armyworms, fall armyworm, corn earworm Headworms (larvae feeding on grain heads): fall armyworm, corn earworm, sorghum webworm	<i>alpha-cypermethrin</i> Fastac 0.83 (Cutworm only)	3A	1.8-3.8 fl oz	0.12-0.025	12 H/ 14 D	ARMYWORM, FALL ARMYWORM, CORN EARWORM IN WHORL:
	<i>beta-cyfluthrin</i> Baythroid XL 1EC	3A	2.8 fl oz	0.022	12 H/ 14 D	Seedling plants , treat when stand loss reaches 10%, OR 30% or more plants are infested.
	<i>carbaryl</i> Sevin, other brands 4	1A	1-2 qt	1-2	12 H/ Grain = 21 D Grazing = 14 D	Whorl stage plants , do not initiate controls unless 40% or more of the plants in a field are infested. Economic losses probably do not occur unless population levels exceed 1 larvae per plant. Apply spray by ground directing spray into whorls using cone nozzles with large droplet size and at least 15 gal/A of spray. For large infestation use tank mix of OP insecticide (Lannate or Lorsban) plus pyrethroid (Asana/Adjourn, Baythroid, Delta Gold, lambda/gamma cyhalothrin, Mustang, Tombstone). Pyrethroid insecticides alone are usually not effective for fall armyworm.
	<i>chlorantraniliprole</i> Prevathon 0.43	28	14-20 fl oz	0.047-0.067	4 H/ 14 D	FALL ARMYWORM, CORN EARWORM, SORGHUM WEBWORM, FEEDING ON GRAIN HEADS: Treat when an average of 1 or more (1/2" or larger) of any of these insects are found per grain head. For sorghum webworm, treat when an average of 5 or more small (1/4") larvae are found per grain head. Higher dosages within the rate range may be needed to effectively control corn earworm or fall armyworms. Pyrethroid insecticides may not be effective for sorghum webworm. NOTE: Tracer is most effective against smaller larvae. NOTE: DO NOT USE Lorsban/Nufos/Chlorpyrifos or Lannate on sweet sorghum varieties.
	<i>chlorpyrifos</i> Lorsban, Nufos, others 4E Chlorpyrifos 4EC Lorsban 75WG	1B	1-2 pt 2 pt 1.33 lb	0.5-1 1 1	24 H/ 30 D at 1 pt 60 D at 2 pt	
	<i>deltamethrin</i> Delta Gold 1.5EC	3A	1.8 fl oz	0.025	12 H/ 14 D	
	<i>esfenvalerate</i> Asana XL, Adjourn 0.6 6EC (Earworms on heads only)	3A	9.6 fl oz	0.05	12 H/ 21 D	
	<i>gamma cyhalothrin</i> Declare 1.25	3A	1.54 fl oz 3.84 fl oz	0.015 0.015	24 H/ 30 D	
	<i>lambda cyhalothrin</i> Warrior II Zeon 2.08 Silencer, Lambda, others 1	3A	1.92 fl oz 3.84 fl oz	0.03 0.03	24 H/ 30 D	

GRAIN SORGHUM INSECT CONTROL

PEST	INSECTICIDE	MOA	AMOUNT OF FORMULATION PER ACRE	LB ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Foliage-feeding Larvae: armyworms, fall armyworm, corn earworm Headworms (larvae feeding on grain heads): fall armyworm, corn earworm, sorghum webworm	<i>methomyl</i> Lannate, Annihilate 2.4 LV	1A	0.75-1.5 pt	0.225-0.45	48 H/ 14 D	
	<i>spinosad</i> Blackhawk 36%	5	1.7-3.3 oz	0.038-0.075	4 H/ 21 D	
	<i>zeta-cypermethrin</i> Mustang Maxx, other brands	3A	4 fl oz	0.025	12 H/ 14 D	
Mites	<i>propargite</i> Comite II 6	12C	1.5-2.25 pt	1.125-1.6875	7 D/ 30 D	Mites seldom require control on grain sorghum in Georgia. Treat if infestations become widespread and leaf discoloration is evident. Control after the boot stage rarely is effective. Comite II: Use minimum of 20 gal/A by ground application and 5 gal/A for aerial application. Only apply to dry foliage. Do not tank mix with other products. Do not use an oil-based surfactant. Due to large number of sorghum varieties, treating a small test plot is recommended to check for phytotoxicity before treating a large area.
	<i>dimethoate</i> Dimethoate 4EC, 400 Dimethoate 2.67EC	1B	1 pt 1.5 pt	0.5 0.5	48 H/ 28 D	
Sorghum midge	<i>alpha-cypermethrin</i> Fastac, other brands 0.83	3A	1.3-3.8 fl oz	0.008-0.025	12 H/ 14 D	Treat when an average of 1 adult/head is observed after 25-30% of the heads are blooming. Treat again 5-10 days later if there are still many heads blooming and at least 1 midge/head is found. The susceptible period for midge damage is the bloom period; treatment for midge after this time is too late. Remember that insecticidal controls are directed at the adult midge. The eggs or larvae of the pest cannot be killed inside the glumes with insecticide applications. If a "borderline" economic infestation of sorghum midge exists and there is good yield potential, spray. When an economic infestation exists, spray immediately. A delay of a few days may result in considerable damage. NOTE: DO NOT USE Lorsban/Nufos/Chlorpyrifos or Lannate on sweet sorghum varieties. NOTE: Some brands of dimethoate do not allow application after heading. Pyrethroid insecticides are not effective against sugarcane aphid and may flare infestations. If sugarcane aphid is present tank mix the pyrethroid (3A) product for midge control with Sivanto Prime as listed in the aphid section.
	<i>beta-cyfluthrin</i> Baythroid XL 1EC	3A	1-1.3 fl oz	0.008-0.01	12 H/ 14 D	
	<i>chlorpyrifos</i> Lorsban, Nufos, others 4E Chlorpyrifos 4EC Lorsban 75WG	1B	0.5 pt 0.5 pt 0.33 lb	0.25 0.25 0.25	24 H/ 30 D at 1 pt	
	<i>cyfluthrin</i> Tombstone 2	3A	1-1.3 fl oz	0.016-0.020	12 H/ 14 D	
	<i>deltamethrin</i> Delta Gold 1.5 EC	3A	1.3-1.9 fl oz	0.015-0.025	12 H/ 14 D	
	<i>dimethoate</i> Dimethoate, Cygon 4 EC, 400 Dimethoate 2.67 EC		0.25-0.5 pt 0.75 pt	0.125-0.25 0.25	48 H/ 28 D	
	<i>esfenvalerate</i> Asana XL, Adjourn 0.6 6 EC	3A	2.9-5.8 fl oz	0.015-0.03	12 H/ 21 D	
	<i>gamma cyhalothrin</i> Declare 1.25 Proaxis 0.5	3A	0.77-1.02 fl oz 1.90-2.56 fl oz	0.0075-0.01 0.0075-0.01	24 H/ 30 D	
	<i>lambda cyhalothrin</i> Warrior II Zeon 2.08 Silencer, Lambda, others 1	3A	0.96-1.28 fl oz 1.9-2.56 fl oz	0.015-0.02 0.015-0.02	24 H/ 30 D	

GRAIN SORGHUM INSECT CONTROL

PEST	INSECTICIDE	MOA	AMOUNT OF FORMULATION PER ACRE	LB ACTIVE INGREDIENT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
Sorghum midge (continued)	<i>methomyl</i> Lannate, Annihilate 2.4 LV	1A	0.75-1.5 pt	0.225-0.45	48 H/ 14 D	
	<i>zeta-cypermethrin</i> Mustang Maxx	3A	1.76-3.2 fl oz	0.011-0.02	12 H/ 14 D	
Stink bugs, Leaffooted bugs, False chinch bugs on grain heads	<i>alpha-cypermethrin</i> Fastac, other brands 0.83	3A	3.8 fl oz	0.025	12 H/ 14 D	<p>STINK BUGS, LEAFFOOTED BUGS: Treat if combined numbers of adults and large nymphs exceed 3 bugs per head at milk stage or 6 bugs per head at soft dough stage. Damage not important during hard dough stage.</p> <p>FALSE CHINCH BUG: For grain head infestations, treat if populations exceed 100 bugs per grain head at milk stage. Damage not important during medium to hard dough stages.</p> <p>Pyrethroid insecticides are not effective against sugarcane aphid and may flare infestations. If sugarcane aphid is present tank mix the pyrethroid (3A) product with Sivanto Prime as listed in the aphid section.</p>
	<i>beta-cyfluthrin</i> Baythroid XL 1EC	3A	1.3-2.8 fl oz	0.01-0.022	12 H/ 14 D	
	<i>cyfluthrin</i> Tombstone 2	3A	1-1.3 fl oz	0.016-0.020	12 H/ 14 D	
	<i>deltamethrin</i> Delta Gold 1.5EC	3A	1.5-1.8 fl oz	0.018-0.025	12 H/ 14 D	
	<i>gamma cyhalothrin</i> Declare 1.25 Proaxis 0.5	3A	1.28-1.54 fl oz 3.20-3.84 fl oz	0.0125-0.015 0.0125-0.015	24 H/ 30 D	
	<i>lambda cyhalothrin</i> Warrior II Zeon 2.08 Silencer, Lambda, others 1	3A	1.6-1.92 fl oz 3.2-3.84 fl oz	0.25-0.03 0.25-0.03	24 H/ 30 D	
	<i>zeta-cypermethrin</i> Mustang Maxx, other brands	3A	1.76-3.2 fl oz	0.011-0.02	12 H/ 14 D	

Premixed or Co-Packed Insecticides: Products listed are available as premixes or co-packages of two insecticide active ingredients. User should check mixture labels for active ingredient, specific use rates, target pests, and precautions.

BRAND NAME (ACTIVE INGREDIENTS)	RANGE OF FORMULATION RATES
Besiege (<i>lambda cyhalothrin, chlorantraniliprole</i>)	5-10 fl oz/A
Hero (<i>zeta-cypermethrin, bifenthrin</i>)	2.6-5.5 fl oz/A
Steed (<i>zeta-cypermethrin, bifenthrin</i>)	2.5-4.7 fl oz/A
Consero (<i>lambda cyhalothrin, spinosad</i>)	2-3 fl oz/A

GRAIN SORGHUM WEED CONTROL

Eric P. Prostko, Extension Agronomist – Weed Science

HERBICIDE	MOA	BROADCAST RATE/ACRE		REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
		AMOUNT OF FORMULATION	POUNDS ACTIVE INGREDIENT		
BURNDOWN (Reduced Tillage)					
<i>paraquat</i> Gramoxone Inteon/Gramoxone SL 2 lb/gal Firestorm/Parazone/Helmquat 3 lb/gal	22	1.88-3.76 pt 1.25-2.5 pt	0.47-0.94	24 H/ Grain 48 D Forage 20 D	Apply before, at, or immediately after planting but before crop emergence. Use low rate of paraquat if emerged annual weeds are less than 4" tall and high rate if emerged annual weeds are 4-6" tall. Add non-ionic surfactant at 0.25% v/v. Paraquat usually will not suppress bermudagrass, johnsongrass or other perennial weeds well enough to permit high yields. Tank-mix with Dual or Warrant (Concep treated seed only).
<i>glyphosate</i> numerous trade names 3 lb ae/gal 3.73 lb ae/gal 4 lb ae/gal 4.17 lb ae/gal 4.50 lb ae/gal 5 lb ae/gal	9	32-64 oz 26-52 oz 24-48 oz 23-46 oz 21-42 oz 19-38 oz	0.75-1.50 ae	4 H/ 7 D	Apply before, at, or immediately after planting but before crop emergence. Use low rate of glyphosate to control emerged annual grass and broadleaf weeds; high rate for control of emerged johnsongrass and bermudagrass. Tank-mix with Dual or Warrant (Concep treated seed only).
<i>dicamba</i> Banvel, Clarity, Sterling, Vision 4 lb/gal	4	8 oz	0.25	24 H/ 30 D	Tank-mix with glyphosate or paraquat to improve burndown control of broadleaf weeds in reduced tillage system, especially where marestail/horseweed is a problem. Must be applied at least 15 days before planting sorghum. Rain-free period is 4 hours.
PREEMERGENCE¹					
<i>metolachlor</i> Stalwart, Parallel PCS, Me-Too-Lachlor	15	1-1.33 pt	1-1.33	24 H/ 75 D	Use only with sorghum seed that has been treated by the seed company with Concep. If sorghum seed are not properly treated, metolachlor will severely injure sorghum. Apply after planting before weeds and sorghum emerge. Metolachlor can be applied with fluid fertilizer. Can also be applied POST for residual weed control. The generic formulations of metolachlor (Parallel, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.
<i>S-metolachlor</i> Dual Magnum 7.62EC Cinch 7.64EC		1-1.33 pt	0.96-1.27		
<i>acetochlor</i> Warrant 3ME	15	1.5-2.25 qt	1.13-1.69	12 H/ Forage 60 D	Use only with sorghum seed that has been treated by the seed company with Concep. Can be applied preemergence up to 11" tall sorghum. Will provide residual control of many annual grass weeds and certain annual broadleaf weeds, especially crabgrass, Florida pusley, and Palmer amaranth. Weed control will be similar to Dual Magnum, or Intro. Can be tank-mixed with glyphosate or paraquat for use as a burndown in minimum tillage systems. Warrant does not control emerged weeds. For the following soil types, do not apply Warrant within 50 feet of any well where the depth to groundwater is 30 feet or less : sands <3% OM; loamy sands < 2% OM; sandy loams <1% OM. These restrictions do not apply for areas more than 50 feet from a well or if groundwater is more than 30 feet below land surface.

¹ Nitrogen solutions or complete fluid fertilizers may replace all or part of the water as a carrier for some preemergence herbicides. Proper agitation is necessary. Follow label instructions concerning tests for potential compatibility problems. Do not use fluid fertilizers with postemergence herbicides since possible crop injury may occur from the use of the fluid fertilizer.

GRAIN SORGHUM WEED CONTROL

HERBICIDE	MOA	BROADCAST RATE/ACRE		REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
		AMOUNT OF FORMULATION	POUNDS ACTIVE INGREDIENT		
CENTER PIVOT IRRIGATION APPLICATION					
<i>metolachlor</i> Stalwart, Parallel PCS Me-To-Lachlor	15	1-1.33 pt	1-1.33		May be applied by injection through center pivot irrigation systems. Apply in maximum of 1/2" water/A on coarse textured soils. Apply after planting but before sorghum and weeds emerge. Equipment must have appropriate check valves or other suitable devices in the system to ensure that the herbicide solution cannot siphon back into water supply. Use Dual only with Concep treated sorghum seed. The generic formulations of metolachlor (Parallel, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.
<i>S-metolachlor</i> Dual Magnum 7.62EC Cinch 7.64EC	15	1-1.33 pt	0.96-1.27		
POSTEMERGENCE					
<i>atrazine</i> numerous trade names 80W 90DG 4L	5	24 oz 21 oz 38 oz	1.2	12 H/ Forage 45 D	Generally, sorghum is less tolerant of atrazine than corn. Apply with crop oil concentrate (1% V/V) after sorghum reaches the three-leaf stage but before it reaches 12" tall . Controls broadleaf weeds 2-3" tall and newly emerged (1-leaf) annual grasses. DO NOT use on sands or loamy sands. DO NOT apply with fluid fertilizers or crop injury may occur. DO NOT apply when sorghum is under stress from cold wet weather, poor fertility, or other factors, or when crop is wet and tender from recent rainfall. Follow label directions for crop rotation. Rain-free period is 2 hours.
<i>2,4-D amine</i> numerous trade names 3.8 lb/gal	4	1 pt	0.48	48 H/ 30 D	Sorghum is not as tolerant to 2,4-D as corn. Apply over-the-top for control of annual broadleaf weeds when sorghum is 6-8" tall. Arrange nozzles to keep spray out of crop whorl. If sorghum is 8-15" tall, apply as directed spray-see recommendation under POST-EMERGENCE (Directed Spray). Sorghum is most subject to 2,4-D injury from over-the-top treatments, use of high rates or applications made during high soil moisture and high air temperatures. DO NOT (a) apply during boot, bloom, or early dough stages, or (b) apply in fluid fertilizers. Use only the amine formulation to help prevent drift to susceptible crops. DO NOT use with adjuvants.
<i>bentazon</i> Basagran/Broadloom 4 lb/gal	6	1.5-2 pt	0.75-1	48 H/ Forage 12 D	Apply over-the-top when sorghum has 1-5 leaves. Grain sorghum is tolerant at all stages of growth up to, and including the early boot stage. Can be tank-mixed with atrazine if necessary. DO NOT apply to grain sorghum that is heading or blooming. Add oil concentrate (1% v/v) according to label directions for the weed species present. DO NOT apply more than 2 pt of bentazon per season. DO NOT apply with fluid fertilizers. Rain-fall period is 4 hours.
<i>bromoxynil</i> Buctril 2E	6	1-1.5 pt	0.25-0.38	24 H/ Forage 45 D	Apply over-the-top when sorghum has 3 leaves (up to pre-boot stage). Controls cocklebur, bristly starbur, smartweed and certain other broadleaf weeds less than 3" tall. DO NOT add spray additives or mix with fluid fertilizers. Spray when sorghum foliage is dry to decrease risk of sorghum leaf burn. Temporary sorghum leaf burn may occur.

GRAIN SORGHUM WEED CONTROL

HERBICIDE	MOA	BROADCAST RATE/ACRE		REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
		AMOUNT OF FORMULATION	POUNDS ACTIVE INGREDIENT		
POSTEMERGENCE (continued)					
<i>pyrasulfotole + bromoxynil</i> Huskie 2.06EC	6 + 27	12.8-16 oz	0.03-0.04 + 0.18-0.22	24 H/ Grain 60 D Forage 7 D	For broadleaf weed control including annual morningglory and Palmer amaranth. Apply from 3 leaf stage up to 30" tall and/or prior to flag leaf emergence, whichever comes first. Huskie will cause temporary crop stunting, leaf burn, and chlorosis (bleaching/whitening). Tank-mix with atrazine to improve broadleaf control (up to 12" tall sorghum) and reduce initial crop injury. Include a NIS at 0.25% v/v. Do not tank-mix with Lorsban. Crop rotation restrictions: wheat, barley, oats, annual ryegrass-1 month; soybean, grain sorghum-4 months; canola, corn,-9 months; cotton, peanut-field bioassay. Rain-free period is 1 hour.
<i>halosulfuron</i> Profine, Sandea 75 DF	2	0.67 oz	0.032	12 H/ Forage 30 D	Controls many annual broadleaf weeds and suppression of nutsedge. Can be applied over-the-top from the 2 leaf stage through layby stage of grain sorghum (before grain head emergence). Can be tank-mixed with Banvel, 2,4-D, Buctril or atrazine. The use of a non-ionic surfactant or crop oil is recommended. Rotational restrictions include the following: barley, oats, rye, wheat-2 months; cotton-4 months; peanuts-6 months; soybeans-9 months; onions-18 months. Refer to product label for additional crop rotation information. Rain-free period is 4 hours.
<i>dicamba</i> Banvel, Clarity, Sterling, Vision 4 lb/gal	4	8 oz	0.25	24 H/ 30 D	Apply over-the-top when sorghum is in the 3 leaf stage to 8" tall. If sorghum is 8-15" tall, apply only as a directed spray—see recommendation under POSTEMERGENCE (Directed Spray). DO NOT apply to sorghum grown for seed production. Make only one POST application per season. Prevent drift to susceptible crops. Do not graze or feed treated sorghum forage or silage prior to mature grain stage. Do not use adjuvants. If dicamba is applied during periods of rapid growth, temporary leaf rolling and plant leaning may occur. Rain-free period is 4 hours.
<i>nicosulfuron</i> Zest 75WDG	2	0.67-1.33 oz	0.031-0.062	4 H/ Forage/Grazing: soft dough stage 7 Grain/Stover: mature grain stage 9	ONLY FOR USE ON DUPONT™ INZEN™ GRAIN SORGHUM VARIETIES. Can be applied up to 20" tall grain sorghum. Tank-mix with atrazine. If tank-mixed with atrazine, can only be applied up to 12" tall grain sorghum. Use in combination with a COC (1% v/v) and liquid UAN (2 qt/A). Zest works best when following a PRE application of Dual, Warrant, or Cinch (Concep-treated seed). If tank-mixed with 2,4-D or dicamba use a NIS (0.25% v/v). In UGA research, Zest has caused temporary crop injury (stunting, chlorosis). Crop rotation restrictions: corn = 0 months; soybean = 15 days; wheat/barley/oats = 4 months; cotton/peanut = 10 months; sorghum = 18 months. Rain-free period is 4 hours. **Limited INZEN™ grain sorghum variety performance data for the SE is available.
POSTEMERGENCE (Directed Spray)					
<i>2,4-D amine</i> numerous trade names 3.8 lb/gal	4	0.5-1 pt	0.24-0.48	48 H/ 30 D	Apply as a directed spray to sorghum 8-15" tall. Use low rate if applications are made under conditions of high soil moisture and high air temperatures. DO NOT (a) apply during boot, bloom, or early dough stages, or (b) apply in fluid fertilizers. Use only the amine formulation and prevent drift to susceptible crops.
<i>dicamba</i> Banvel, Clarity, Sterling, Vision 4 lb/gal	4	8 oz	0.25	24 H/ 30 D	Apply as a directed spray to sorghum 8-15" tall. DO NOT apply to sorghum grown for seed production. Make only one application per season. Prevent drift to susceptible crops. Do not graze or feed treated sorghum or silage prior to mature grain stage. If dicamba is applied during periods of rapid growth, temporary leaf rolling and plant leaning may occur.

GRAIN SORGHUM WEED CONTROL

HERBICIDE	MOA	BROADCAST RATE/ACRE		REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
		AMOUNT OF FORMULATION	POUNDS ACTIVE INGREDIENT		
POSTEMERGENCE (Directed Spray)					
<i>linuron</i> 4L 50DF numerous trade names	7	1-2 pt 1-2 lb	0.5-1	24 H/ 75 D	Apply as a directed spray after sorghum is 12" tall. Use low rate when sorghum is 12-15" tall, and a sprayer equipped with skirts, shoes or shields. Use the high rate when sorghum is 15" tall and weeds are up to 4" in height. Make only one application per season. Add nonionic surfactant (0.5 % v/v)).
<i>paraquat</i> Gramoxone Inteon/ Gramoxone SL 2 lb/gal Firestorm/Parazone/Helmquat 3 lb/gal	22	1-2 pt 0.7-1.3 pt	0.25-0.50	24 H/ Grain 48 D Forage 20 D	Apply with a nonionic surfactant (1 qt/100 gals. spray solution) when sorghum is at least 12" tall. Use low rate for weeds less than 2" tall; high rate for weeds 2-3" tall. DO NOT apply with (a) drop nozzles mounted on a boom or (b) fluid fertilizers. Use 20-40 gals of water/A and do not exceed 30 psi pressure. Do not spray higher than 3" on the sorghum stalks. <u>Can also be used with hooded-sprayer.</u>
<i>carfentrazone</i> Aim 2EC	14	0.5-1 oz	0.08-0.016	12 H/ Leaf Collars 6 D	Use Aim for the post-directed control of annual morningglory (except smallflower), pigweed, and tropical spiderwort. Add NIS at 0.25% v/v (1 qt/100 gals). Use drop nozzles or other spray methods to minimize the amount of Aim deposited on sorghum leaves or in whorl. Aim provides no residual control. Rain-free period for Aim is 6-8 hours.
POSTEMERGENCE - INCORPORATED (Culti-Spray)					
<i>pendimethalin</i> Prowl/Pendimax 3.3EC Prowl H20 3.8 ACS	3	1.2-1.8 pt 1.5 pt	0.50-0.75 0.71		<p>These treatments will provide residual control of annual grasses, including Texas panicum. They will not control existing grasses. They should be used to augment other weed control tactics. When using either of the treatments, the following steps must be followed:</p> <ol style="list-style-type: none"> 1. The herbicides must be applied to weed free soil. 2. Sorghum brace roots must be protected by soil thrown to the base of the stalk with a sweep or rolling cultivator prior to application. 3. The herbicides can be applied over-the-top or with drop nozzles, depending on sorghum size. Pendimethalin can be applied from the 4" growth stage up until layby. Trifluralin can be applied when the sorghum is 8-24" tall. 4. A shallow follow-up cultivation is required after application to minimize herbicide loss. Rainfall or irrigation amounts of 0.5-1" can be used instead of mechanical cultivation.
<i>trifluralin</i> numerous trade names 4 lb/gal	3	1 pt	0.50		
HARVEST AID					
<i>carfentrazone</i> Aim 2EC	14	1 oz	0.016	12 H/ 3 D	For the pre-harvest desiccation of pigweed and morningglories. Can be applied by ground or air. Use with a crop oil concentrate at 1% v/v (1 gal/100 gal). Can be tank-mixed with glyphosate to improve the spectrum of control.
glyphosate numerous trade names 3 lb ae/gal 3.73 lb ae/gal 4 lb ae/gal 4.17 lb ae/gal 4.50 lb ae/gal 5 lb ae/gal	9	32-64 oz 26-52 oz 24-48 oz 23-46 oz 21-42 oz 19-38 oz	0.75-1.50 ae	4 H/ 7 D	Apply when grain moisture is 30% or less. Do not use on sorghum grown for seed because a reduction in seed germination or vigor may occur. Not all formulations of glyphosate may be labeled for this use. Refer to specific product label.

HERBICIDE PROGRAMS FOR MANAGING HERBICIDE-RESISTANT PALMER AMARANTH IN GRAIN SORGHUM

PREEMERGENCE ¹	POSTEMERGENCE ² (OVER THE TOP)	POSTEMERGENCE ³ (DIRECTED SPRAY)	HOODED SPRAYER
Dual Magnum or Warrant	Atrazine or Huskie + Atrazine	2,4-D or Clarity	Gramoxone Inteon or Gramoxone SL or Firestorm or Parazone or Helmquat

¹ Must use Concep-treated seed. ² 3-leaf sorghum up until 12" in height. ³ 8-15" tall sorghum.

GRAIN SORGHUM WEED RESPONSE TO HERBICIDES

Eric P. Prostko, Extension Agronomist – Weed Science

	Intrro* Micro-Tech	Dual Magnum* ¹	Outlook Propel*	Warrant*	Atrazine	LinexLorox	Paraquat**	2,4-D	Banvel	Zest	Buctril	Huskie	Sandea/ Profine	Basagran
	PRE	PRE	PRE	PRE	POST	PDS	PDS	POST/ PDS	POST/ PDS	POST	POST	POST	POST	POST
PERENNIAL WEEDS														
johnsongrass, rhizome	P	P	P	P	P	P	P	P	P	G-E	P	P	P	P
nutsedge, purple	P	P	P	P	P	P-F	P	P	P	P-F	P	P	F-G	P
nutsedge, yellow	F-G	F-G	F-G	F	P	P-F	P	P	P		P	P	F-G	F-G
ANNUAL GRASSES														
crabgrass	E	E	E	E	P-F	G	G	P	P	P	P	P	P	P
crowfootgrass	E	E	E	E	P	E	G	P	P	G-E	P	P	P	P
goosegrass	E	E	E	E	P	E	G	P	P	G-E	P	P	P	P
fall panicum	G	G	G	G	P	E	G	P	P	G-E	P	P	P	P
johnsongrass (seedling)	P	P	P	P	P	G	G	P	P	G-E	P	P	P	P
sandbur	F-G	F-G	F-G	F-G	F	E	G	P	P	G-E	P	P	P	P
signalgrass, broadleaf	F-G	F-G	F-G	F-G	P	G	G	P	P	G	P	P	P	P
Texas panicum	P-F	P-F	P-F	P-F	P	G	E	P	P	G-E	P	P	P	P
BROADLEAF WEEDS														
bristly starbur	P	P	P	P	E	G	G	G	E		G	G	G	E
citronmelon	P	P	P	P	G	E	F	E	E				P-F	P
cocklebur	P	P	P	P	E	E	G	E	E	P-F	E	G-E	G	E
cowpea	P	P	P	P	G	G	G	E	E					P
crotalaria	P	P	P	P	G	E	G	G	G					P

GRAIN SORGHUM WEED RESPONSE TO HERBICIDES

	Intrro* Micro-Tech	Dual Magnum* ¹	Outlook Propel*	Warrant*	Atrazine	Linex Lorox	Paraquat**	2,4-D	Banvel	Zest	Buctril	Huskie	Sandea/ Profine	Basagran Broadloom
	PRE	PRE	PRE	PRE	POST	PDS	PDS	POST/ PDS	POST/ PDS	POST	POST	POST	POST	POST
BROADLEAF WEEDS (continued)														
croton, tropic	P	P	P	P	G	G	G	G	G					P
Florida beggarweed	F	F	F	F	G	E	G	P	G	G	G	G	P	P
Florida pusley	G-E	G-E	G-E	G-E	G	G	F-G	G	G	P-F	G-E	G-E		P
jimsonweed	P	P	P	P	E	E	G	E	E	F-G		G		E
lambsquarters	F	F	F-G	F-G	E	E	F-G	E	E	F-G	G	G	F	P
morningglories	P	P	P	P	E	G	G	G	E	F-G	G	G-F	P	F
Pigweed	G	G	G	G	E	E	G	G-E	G-E	G-E	G	G	F-G	P
ALS-resistant	G	G	G	G	E	E	G	G-E	G-E	P	G	G	P	P
Atrazine-resistant	G	G	G	G	P	E	G	G-E	G-E	G-E	G	G	F-G	P
prickly sida	F	F	F		E	G	F-G	E	E	P	G	G	F	F-G
purslane	G	G	G		E	G	G	G	E					P
ragweed, common	F	F	F	F	E	E	G	E	E	P-F	G	G	G	F
sesbania, hemp	P	P	P		F-G	G	P-F	G	E	P-F	G	G	F-G	P
sicklepod	P	P	P	P	G	E	G	E	E	P-F	P	P	P	P

Key to response symbols:

E – Excellent control, weed kill 90% or above

G – Good control, weed kill 80% or above

F – Fair control, weed kill 70% or above

P – Poor control, less than 70% control

If no symbol is given, weed response is unknown.

Ratings are based on average to good soil and weather conditions for herbicide performance.

¹ The generic formulations of metolachlor (**Parallel, Stalwart, Me-Too Lachlor**) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.

* Use only where Concep-treated grain sorghum seed is planted.

** Commercially available as Gramoxone Inteon, Gramoxone SL, Parazone, or Firestorm.

PRE = Preemergence

POST = Postemergence over-the-top

PDS = Postemergence directed spray.