WEED RESPONSE RATINGS FOR COTTON HERBICIDES

(See explanation of rating tables on page 3.)

HERBICIDES	WSSA GROUP #	GRASSES									BROADLEAVES																SEDGES		
		Barnyardgrass	Bermudagrass	Broadleaf Signalgrass	Crabgrass	Fall Panicum	Foxtail	Goosegrass	Rhizome Johnsongrass	Seedling Johnsongrass	Bigroot Morningglory	Cocklebur	Common Ragweed	Entireleaf Morningglory	Hophornbeam Copperleaf	Lambsquarters	Palmer Amaranth[4]	Pitted Morningglory	Prickly Sida (Teaweed)	Purslane	Redvine	Sicklepod	Smartweed	Spotted Spurge	Spurred Anoda	Velvetleaf (Wild Cotton)	Flatsedges	Yellow Nutsedge	Crop Tolerance G – Good F – Fair
Preplant																													
Reflex	14	6	0	6	6	6	6	6	4	6	0	-	-	6	-	-	10	6	-	-	0	0	-	-	-	-	-	7	G
Treflan + Cotoran/Meturon	3, 5	9	0	9	9	9	9	9	3	9	0	7	9	7	9	9	9	7	7	9	0	6	7	3	6	5	9	0	G
Treflan or Prowl	3	9	0	9	9	9	9	6	3	9	0	0	3	2	0	8	6	2	0	9	0	0	2	2	0	2	3	0	G
Preemergence																													
Cotoran + Brake	5, 12	8	0	9	7	9	8	7	2	9	-	8	9	8	9	9	9	9	9	9	0	6	7	6	7	6	9	3	G
Cotoran	5	8	0	8	9	9	8	8	0	7	0	8	9	8	9	9	8	8	8	9	0	6	7	6	7	6	9	0	G
Direx	5	9	0	9	9	9	9	9	0	7	0	7	8	8	9	9	8	8	7	9	0	5	7	6	6	5	9	0	G
Engenia/Xtendimax[1]	4	2	2	2	2	2	2	2	0	2	-	-	-	7	-	-	8	7	2	-	2	7	-	0	6	6	0	0	G
Staple LX + Cotoran	2, 5	7	0	8	9	8	8	8	0	7	0	8	9	8	9	9	8	8	9	9	0	6	7	9	8	8	9	5	G
Postemergence (over-the-top)																													
Assure II / Targa	1	8	8	9	9	9	9	9	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G
Dual Magnum[5]	15	9	0	8	9	9	9	9	0	5	0	0	-	5	5	7	8	2	3	-	0	0	4	3	3	3	8	6	F/G
Engenia/Xtendimax	4	0	0	0	0	0	0	0	0	0	-	8	9	9	-	-	9	9	6	-	8	8	-	0	-	-	0	0	G
Enlist Duo	4, 9	9	6	10	10	10	10	10	10	10	7	10	10	10	9	10	9	10	9	10	6	9	7	9	9	9	8	5	G
Enlist One	4	0	0	0	0	0	0	0	0	0	3	9	9	9	8	9	9	9	8	9	-	8	5	8	8	8	0	0	G
Enlist One + Glufosinate	4, 10	8	4	8	8	-	-	6	8	9	-	10	9	10	-	9	10	10	8	10	6	8	8	9	9	10	2	3	G
Envoke	2	7	0	5	5	-	-	6	1	5	-	-	-	9	-	-	3	9	2	-	-	9	-	-	5	9	9	9	F/G
Glufosinate[3]	10	8	4	8	8	-	-	6	8	9	-	9	-	10	-	7	9	10	7	-	5	7	8	-	-	10	2	3	G
Glyphosate[2]	9	9	6	10	10	10	10	10	10	10	7	10	9	8	8	9	3	8	8	10	6	8	7	8	7	8	8	5	G
Envoke + Glyphosate	2, 9	9	6	10	9	10	10	10	10	10	8	9	9	9	8	9	4	9	8	10	5	9	8	8	9	9	9	8	G
Glyphosate + Glufosinate	9, 10	9	6	10	10	10	10	10	10	10	7	10	9	10	9	9	9	10	8	9	6	9	8	8	9	10	7	7	F
Staple + Glyphosate	2, 9	9	6	10	10	10	10	10	10	10	8	9	9	9	8	9	4	9	9	10	6	8	8	8	9	9	9	7	G
Outlook[5]	15	9	0	7	9	9	9	9	0	5	0	0	4	0	0	5	8	0	3	0	0	0	4	3	3	2	9	7	F/G
Poast	1	8	7	9	9	9	8	9	8	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G
Select	1	8	8	9	9	9	9	9	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G
Staple LX	2	2	0	2	2	2	2	2	2	6	-	8	4	9	0	0	3	8	7	-	-	6	8	6	9	9	7	6	G
Warrant[5]	15	6	0	6	6	6	6	6	0	2	0	0	2	0	-	-	8	0	2	-	0	0	-	3	2	2	7	4	F
Postemergence (directed)																													
Aim	14	0	0	0	0	0	0	0	0	0	2	7	7	10	-	-	7	10	7	9	0	4	8	-	-	9	0	2	G
Anthem Flex/Zidua	15	8	0	8	9	8	9	7	0	5	0	-	-	4	-	5	9	6	7	-	0	-	-	-	5	5	9	7	G
Envoke + Caparol	2, 5	9	0	8	8	-	-	7	-	8	-	10	8	9	-	-	8	10	9	-	-	9	8	9	-	9	10	9	G
Caparol + MSMA	5, 0	9	0	9	9	9	9	9	6	9	2	9	8	8	9	9	9	8	8	8	0	7	7	5	7	6	8	6	G
Cotoran + MSMA	5, 0	8	0	8	9	9	8	8	6	8	2	9	8	8	9	9	9	8	7	6	0	7	8	5	7	6	8	6	G
DSMA or MSMA	0	8	0	8	8	8	8	5	6	8	1	9	5	3	3	5	5	3	2	3	0	3	2	0	1	1	6	6	G
Fierce + MSMA (layby)	14, 15, 0	9	0	8	9	8	9	9	6	4	3	10	9	10	9	9	9	10	9	10	2	8	9	9	9	9	9	7	G
Karmex + MSMA	5, 0	9	0	9	9	9	9	9	6	9	2	9	8	8	9	9	9	8	8	8	0	7	7	5	6	6	8	6	G
Linex	5	7	0	7	8	7	7	7	0	7	2	7	8	8	9	9	7	8	8	9	0	7	7	7	7	7	7	2	G
Valor (layby) + MSMA	14	9	0	8	8	8	8	5	6	8	3	10	9	10	9	9	9	10	9	10	2	-	9	9	9	9	-	4	G

Rating scale – 0 = No Control 10 = 100% Control. Dash means insufficient data.

[1]Engenia/Xtendimax provide residual control under dry conditions, once rainfall occurs control is rapidly reduced.
[2]Glyphosate-resistant populations of Palmer amaranth, horseweed and johnsongrass have been found in Arkansas.
[3]Glufosinate in-crop rating on glyphosate-resistant horseweed is an 8.
[4]Populations of Palmer amaranth have been found resistant to herbicide modes of action 2, 3, 4, 9, 10, 14, 15 and 27.
[5]Residual control only

CROP REPLANT AND ROTATION GUIDE FOR COTTON HERBICIDES*

Herbicide	Replant/ Crop Rotation	Time Interval	Precautions
Aim 2 EC	C,CT,S,R,GS All	I 30 days	
Anthem Flex	S,C R SG W CT,P,SF	I 10 months 11 months I 4 months	
Assure II	CT,S All	I 4 months	
Brake 16 oz or less	CT S R,P,W,B C,GS All	I 2 months 8 months 10 months 18 months	No restrictions.
Caparol/others	CT SG,GS, as cover crops. All	I I† FY	† Must be plowed and not used for food or feed.
Cotoran	CT All	I 6 months	
Direx	CT† All	I FY	† Do not retreat with second application in same year.
Dual Magnum	S,C,CT,GS† SG Rice All	I 4.5 months Next spring 18 months	† Use Concep-treated grain sorghum seed.
Envoke	C,GS,S,R CT W All	7 months 30 days 3 months 18 months	Cotton rotation increases with higher rates.
Fierce	CT C GS R S W	45 days 30 days 12 months 10 months I 1 month	
Fusilade/Fusion	CT,S All	I 2 months	
Glufosinate	CT,C,S,R W GS	I 70 days 180 days	
Glyphosate	All	I	
Linex	C,GS,S All	I 4 months	Thoroughly rework soil before replanting. Do not retreat with second application. Plant corn at least 1.75 inches deep and grain sorghum at least 1-inch deep.
MSMA, DSMA	All	I	Research has shown arsenical herbicides (MSMA/DSMA) can cause straighthead in rice. Precautions for straight-head should be taken when rice is grown following cotton.
Paraquat			No restrictions.
Poast			No restrictions.
Prowl, Pendimax	CT,S W,B All	I 4 months FY	Do not rework soil deeper than treated zone.
Prowl, Pendimax (2X rate)	CT,S All	I FY	Do not rework soil deeper than treated zone.
Reflex//Flexstar/ Cheetah Max/Sinister	S,CT W,SG C,R,GS SF	I 4 months 10 months 18 months	
Select Max, Tapout	C	30 days	
Staple LX	CT S R GS C	I 10 months 9 months Do not rotate the following season. IMI-resistant corn – 9 months. Any other variety – 10 months if not more than 3.8 oz Staple XL was applied.	
Suprend	W CT,C,GS,R,S	3 months 7 months	
Treflan/others	CT,S W,B All	I Fall FY	
Treflan/others (2X rate)	CT,S Rice All	I FY 2 years	
Valor	C,CT,R,GS, W,SF S All others	 30 days I 12 months	Must receive 1-inch of rain.
Zidua (3.25 oz/A)	C,S CT, P R W GS others	I 2 months 12 months 70 days 6 months FY	

*This table applies to the major field and forage crops. Refer to the herbicide labels for the latest recrop and rotation information for horticultural crops. These are written as best we could interpret the labels. We regret any omissions or errors. Always refer to product labels before using a pesticide or replanting into treated fields.

KEY

Crop

C = Corn
CT = Cotton
B = Barley
GS = Grain Sorghum
R = Rice
S = Soybean
SF = Sunflower
SG = Small Grains
W = Wheat

Timing

All = All crops not specified
I = Immediately
FY = Following year (usually spring)

COTTON POSTEMERGENCE HERBICIDE
PREHARVEST APPLICATION INTERVALS (PHI)

Herbicide	PHI
Aim	7 days
Anthem Flex	7 days
Assure II	80 days
Brake	60 days
Caparol/Cotton Pro	No restrictions
Cotoran	60 days
Direx	No restrictions
DSMA	1st bloom
Dual Magnum	80 days after directed 100 days after POST
Enlist Duo	30 days
Enlist One	30 days
Envoke	60 days
Fusilade DX	90 days
Glufosinate	70 days
Glyphosate	7 days
Linex	No restrictions
MSMA	1st bloom
Poast	40 days
Reflex	70 days
Select	60 days
Staple	60 days
Valor LX	60 days

These intervals are the number of days that must be allowed between herbicide application and harvest. Applications made after these interval restrictions could cause illegal herbicide residues to be present in the harvested seed or fiber.

LABELED SOIL-APPLIED HERBICIDE RATES FOR COTTON
SOIL TEXTURE

Herbicide	Coarse (light)	Medium	Fine (heavy)
Preplant Herbicides			
Cotoran 4L	1.6 pt	2 pt	2 pt
Prowl or Pendimax 3.3 EC	1.2-1.8 pt	1.8-2.4 pt	2.4-3.6 pt
Prowl H_2O	2 pt	2-2.2 pt	3 pt
Treflan 4E	1 pt	1.5 pt	2 pt
Treflan + Cotoran 4L	1 pt + 1.6 pt	1.5 pt or 2-3.2 pt	2 pt or 3.2-4 pt
Preemergence Herbicides			
Brake	16-32 oz	16-32 oz	Not recommended
Caparol 4L	1.0-1.5 pt	1.5-2.0 pt	2.0-2.5 pt
Cotoran 4L or 80DF	1.6 pt	2.0 pt	2.0 pt
Direx 80DF or 4L	0.63 lb or 1 pt	1.25 lb or 2 pt	2 lb or 3 pt
Staple LX	1.3-2.1 oz/A	1.3-2.1 oz/A	1.3-2.1 oz/A

All rates are **broadcast rates.** Reduce rate for appropriate band width. See Example 2 on page 6.

COTTON HERBICIDE
COMPATIBILITY WITH FERTILIZERS AS APPLICATION CARRIERS

	Fertilizer	
	Fluid	Dry
Aim	N	N
Anthem Flex	Y	Y
Assure II	N	N
Caparol 4L	N	N
Cotoran 4L, 80W (preemergence only)	Y	N
Direx	N	N
DSMA	N	N
Dual Magnum	Y	Y
Fusilade DX	N	N
Glufosinate	Y	N
Glyphosate	Y	N
Linex 50DF	N	N
MSMA	N	N
Poast	N	N
Prowl 3.3EC	Y	Y
Select	N	N
Treflan 4EC	Y	Y
Zidua	Y	Y

Y = Yes, N = No

There are many specific fertilizer incompatibilities and restrictions with most herbicides. Be sure to read the herbicide label for specific mixing or impregnation instructions. Compatibility agents are required for many mixes. A typical compatibility test procedure for mixing herbicides in fluid fertilizers is given on page 4. NOTE: Compatibility with dry fertilizer is listed here from a labeling standpoint. The University of Arkansas only recommends herbicide application on dry fertilizer as a third alternative to spraying in water or in liquid fertilizer.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
COTTON **Preplant Incorporated**				
pendimethalin @ 0.5 to 1.4 lb/A	Annual grasses, seedling johnsongrass, pigweed and suppression of morninglories.	**Prowl** 1.2 to 3.6 pt/A. or **Prowl H_2O 3.8 CS** 1.0 to 3 pt/A.	Immediately prior to planting.	**All preplant herbicides on cotton are recommended to be applied during final seedbed preparation, after bed knockdown, and incorporated immediately. The rolling cultivator or a similar implement does an excellent job of incorporating the herbicide in the top 2 inches and leaves the soil intact on the bed. A Do-All tends to drag treated soil from the bed but can be used with care.**
trifluralin @ 0.5 to 1 lb/A	Same as above.	**Treflan 4 EC** 1 to 2 pt/A.	Same as above.	NOTE: Where rhizome johnsongrass is a severe problem, the herbicide should be disked in prior to bedding to get the herbicide deeper.
Preplant				
fomesafen @ 0.25 lb/A	Pigweed and morningglory.	**Reflex 2L** 1 pt/A.	Do not plant until 0.5-inch rainfall occurs.	Do not disturb beds after application. Follow up with a preemergence herbicide.
fomesafen + glyphosate @ 0.25 lb/A + 1 lb/A	Same as above with additional control of grasses and other broadleaves.	**Flexstar GT** 3.5 pt/A.	Do not plant until 0.5-inch rainfall occurs.	Do not disturb beds after application. Follow up with a preemergence herbicide.
Preemergence – All preemerge herbicides should include 2 pt/A paraquat unless tillage is done immediately prior to planting.				
diuron @ 0.5 to 1 lb/A	Most annual grasses and small-seeded broadleaf weeds. Good option for pigweed.	**Direx 4L** 1 to 2 pt/A. Be sure to check label for formulation.	At planting.	Use the lowest rate on low organic sandy loam and silt loam soils. Can cause more injury than fluometuron. **Crop injury may occur with diuron or fluometuron when organophosphate insecticides are used.**
prometryn @ 0.75 to 1.25 lb/A	Most annual grasses and small-seeded broadleaf weeds. Good option for pigweed.	**Caparol 4L** 1.5 to 2.5 pt/A.	At planting.	Use rate based on soil type. More injury can be expected on lighter soils following heavy rainfall.
fluometuron @ 0.8 to 1 lb/A	Same as above but more effective on hard-to-kill weeds such as prickly sida (teaweed), cocklebur and morningglory.	**Cotoran 4L** 1.6 to 2 pt/A 4L.	At planting.	**Crop injury may occur with diuron or fluometuron when organophosphate insecticides are used.**
fluridone @ 0.15 to 0.3 lb/A	Most annual grasses and small-seeded broadleaf weeds. Good tank mix partner for pigweed.	**Brake** 16 to 32 oz/A.	At planting.	Requires increased moisture for activation. Loss of moisture will result in decreased activity. Activity will be reduced on clay soils. Must be tank mixed with fomesafen, Cotoran, Caparol or diuron for best results. Do not apply to the same field more than two years in a row.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
pyrithiobac @ 0.032 to 0.070 lb/A	Morningglory, prickly sida, spurge, spurred anoda and velvetleaf.	**Staple 3.2 LX** 1.3 to 2.1 oz/A.	At planting.	Temporary leaf yellowing or stunting may occur following preemergence treatments – especially in wet, cool conditions. Some pigweed species are known to be resistant to ALS herbicides.
pyrithiobac + fluometuron or diuron 0.032 lb/A + 0.5 to 0.75 lb/A	Most annual grasses and small-seeded broadleaf weeds with improved control of spurge, prickly sida and pigweed over Cotoran alone.	**Staple 3.2 LX + Cotoran 4L or Direx** Add 1.3 oz/A broadcast rate of Staple LX to labeled rate of Cotoran or Direx, 1.0 to1.5 pt/A.	At planting.	Addition of Staple LX may not improve control of morningglory and cocklebur over Cotoran alone.
REPLANTING–It is recommended that an additional preemergence surface herbicide not be applied at time of planting. However, if only an incorporated material has been used, a surface-applied herbicide can be used if weeds remain uncontrolled.				
COTTON **Postemergence – Over the top – XtendFlex Cotton Only**				
At the time of publication there was no labeled dicamba formulation for in-season use with XtendFlex technology.				
COTTON **Postemergence – Over the Top** **Glytol + LibertyLink or XtendFlex or Enlist Varieties**				
Cotton varieties containing the "Widestrike" insecticide gene have shown some tolerance to glufosinate. The level of tolerance is lower and less consistent than in the LibertyLink varieties, especially with higher rates of Liberty (glufosinate). In addition, XtendFlex cotton varieties appear to be more sensitive to glufosinate than LibertyLink varieties especially with tank mixtures.				
glyphosate @ 1 lb/A	Emerged annual grasses, johnsongrass, cocklebur, sicklepod, morningglories, prickly sida, velvetleaf, eclipta, spurge, hemp sesbania, northern jointvetch and smartweed. See table for other species.	**Glyphosate** (4 lb/gal formulations) 2 pt/A per application. Sequential applications are needed for difficult-to-control weeds.	Application timing is important. Apply to actively growing weeds. Application should be made before morningglories produce runners. Maximum of 175 ounces of 4 lb/gal or equivalent glyphosate per season. Maximum of 60 ounces of 4 lb/gal or equivalent glyphosate between layby and 60% open bolls.	**For use on Roundup Flex varieties only.** **Check labels of glyphosate products to insure that they are approved for use on Roundup Flex cotton.** **Properly used residual herbicides will help control and prevent development and spread of glyphosate-resistant weeds.**
glyphosate + acetochlor @ 1 lb/A + 0.94 to 1.5 lb/A	Same as above but expect less control of grass and broadleaf weeds. See table for weed ratings.	**Glyphosate** (4 lb/gal formulations) **+ Warrant 3ME** 2 pt/A + 1.25 to 2 qt/A.	May be slower to activate, especially in cooler temperatures. Weed control may be inconsistent.	Some leaf injury may occur. Sequential applications are needed for optimum pigweed control and should be spaced 14-21 days apart.
glyphosate + pendimethalin 1lb/A + 0.95 lb/A	Annual grasses and broadleaf weeds residual control of Texas panicum.	**Glyphosate** (4 lb/gal formulations) **+ Prowl H2O** 2 pt/A + 2 pt/A	Rainfall or irrigation needs to occur 1-2 days following application for best residual control.	Only POST option for residual control of Texas panicum. Some cotton leaf yellowing may occur.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
glyphosate + *S*-metolachlor @ 1 lb/A + 0.95 to 1.25 lb/A	Emerged annual grasses, johnsongrass, cocklebur, sicklepod, morningglories, prickly sida, velvetleaf, eclipta, spurge, hemp sesbania, northern jointvetch and smartweed plus residual on pigweed and grass. See table for other species.	**Glyphosate** (4 lb/gal formulations) **+ Dual Magnum 7.62 EC or metolachlor 8 EC** 1.0 to 1.3 pt/A. **or** **Sequence 5.25 L** 1-4 leaf cotton 2.5 pt/A. 5-10 leaf cotton 2.5-3.0 pt/A.		University data suggests that 1.3X metolachlor product rate is needed to provide equal weed control to the S-isomer Dual Magnum (*S*-metolachlor) product in Sequence.
glyphosate + dimethenamide @ 1lb/A + 0.56 lb/A to 0.75 lb/A	Emerged annual grasses, johnsongrass, cocklebur, sicklepod, morningglories, prickly sida, velvetleaf, eclipta, spurge, hemp sesbania, northern jointvetch and smartweed plus residual on pigweed and grass. See table for other species.	**Glyphosate** (4 lb/gal formulations) **+ Outlook** 2pt/A + 12-16oz/A	Early POST until 2 weeks after bloom.	Some leaf injury will occur. Additional tank mixes can increase injury.
glufosinate @ 0.78 lb/A	Emerged annual grasses, seedling johnsongrass, annual broadleaf weeds.	**Glufosinate** (280 SL formulations) (2.34 lb ai/gal) 43 oz/A.	May be used for salvage situations.	Slight cotton stunting may occur when higher rates are used. Research indicates that two applications of 29 ounces ten days apart are superior to single 43-ounce rate. Cotton injury is likely under prolonged cloudy conditions.
L-glufosinate @ 0.24 to 0.36 lb/A	Emerged annual grasses, seedling Johnsongrass, broadleaf weeds.	**Liberty Ultra** 19 to 29 oz/A Can add AMS, no additional surfactant needed	Can make up to 3 in-crop applications, minimum 10 days apart, from emergence to early bloom.	19 oz rate is equivalent to 29oz rate of standard glufosinate. Maximum allowable rate per year is 58 oz/A. Read label for additional restrictions.
pyrithiobac + glufosinate @ 0.032 to 0.067 lb/A + 0.93 lb/A	Same as above with increased control of morningglory and yellow nutsedge.	**Staple LX + glufosinate** 1.3 to 2.7 oz + 32 oz/A.	Small actively growing weeds.	Same as above. The addition of Staple may cause brief injury and stunting.
pyrithiobac + glyphosate @ 0.032 to 0.095 + 1 lb/A	Emerged annual grasses, johnsongrass, cocklebur, sicklepod, morningglories, prickly sida, velvetleaf, eclipta, spurge, hemp sesbania, northern jointvetch and smartweed. Better control of yellow nutsedge, morningglory. Adds residual control of some weeds. See table for other species.	**Staple LX 3.2 + Glyphosate** (4 lb/gal formulations) 1.3 to 3.8 oz/A + 2 pt/A.		Staple LX may cause temporary yellowing and stunting. Do not tank mix with Dual for postemergence applications.
glufosinate @ 0.58 lb/A	Emerged annual grasses, seedling johnsongrass, annual broadleaf weeds.	**Glufosinate** (280 SL formulations) (2.34 lb ai/gal) 32 oz/A.	Apply over the top to small, actively growing weeds. From cotton emergence to early bloom stage. Apply between hours of 9 a.m. to 6 p.m.	Complete coverage of weeds is crucial. Air induction spray tips and low water volumes may reduce effectiveness. See label for restrictions. **Significant injury can occur to XtendFlex varieties especially prior to 4-leaf. Injury increases with additional tankmixtures and cloudy weather. Do not apply more than 87 ounces per season. For best results, apply in warm, humid conditions, adequate soil moisture and 2 hours after sunrise or prior to sunset.**

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
glufosinate + *S*-metolachlor @ 0.53 + 0.95 or 1.25 lb/A	Improved residual on pigweeds and grasses.	**Glufosinate** (280 SL formulations) **+ Dual Magnum 7.62 EC** 32 oz/A + 1 pt or 1.3 pt.	Apply over the top prior to 12-leaf cotton.	Some leaf burn may occur, but it normally is only temporary.
glufosinate + dimethenamid @ 0.53 lb/A + 0.56 lb/A to 0.75 lb/A	Post control of most grasses and broadleaf weeds. Improved residual control of group 15 resistant pigweed.	**Glufosinate** (280 SL formulations) **+ Outlook** 32 oz/A + 12 to 16 oz/A	Small actively growing weeds from first true leaf until 2 weeks after bloom.	Some leaf burn will occur. Additional tank-mixes can increase this injury.
glufosinate + pendimethalin @ 0.53lb/A + 0.95 lb/A	Same as above with added residual control of Texas panicum.	**Glufosinate** (280 SL formulations) **+ Prowl H2O** 32oz/A + 32oz/A	Rainfall or irrigation needs to occur 1-2 days following application for best results.	Only POST option for residual control of Texas Panicum. Some leaf injury will occur.
Glufosinate + quizalofop-P-ethyl @ 0.573 to 0.769 plus 0.058 to 0.077 lb/A	Annual grass and broadleaf weeds	**Zalo** 32-43 oz/A	From emergence up to 14 days pre-bloom	Tank mixing with certain broadleaf herbicides may result in reduced grass control. Apply 1 day before or 7 days after broadleaf herbicide.
glyphosate + glufosinate @ 1 lb + 0.53 lb/A	Broad-spectrum control of grasses and broadleaf weeds.	**Glyphosate** (4 lb/gal formulations) **+ Glufosinate** (280 SL formulations) 2 pt/A + 32 oz/A.	Apply to small, actively growing weeds. From cotton emergence to early bloom stage.	Complete coverage of weeds is crucial. Cotton injury is likely under prolonged cloudy conditions.
glyphosate + glufosinate + *S*-metolachlor @ 1 + 0.53 + 0.95 lb/A	Broad-spectrum control of grasses and broadleaf weeds, with added residual for grasses and glyphosate-resistant pigweed.	**Glyphosate** (4 lb/gal formulations) **+ Glufosinate** (280 SL formulations) **+ Dual Magnum 7.62 EC** 2 pt/A + 32 oz/A + 1 pt/A.	Apply over the top prior to 12-leaf cotton.	Complete coverage of weeds is crucial. Cotton injury is likely under prolonged cloudy conditions. Increased injury/leaf burn is possible with addition of metolachlor products.
Roundup Flex, LibertyLink, XtendFlex, Enlist and Conventional Varieties				
pyrithiobac @ 0.065 to 0.095 lb/A	Morninglories, cocklebur, velvetleaf, smartweed and suppression of prickly sida and spurge.	**Staple 3.2 LX** 2.6 to 3.8 oz/A. Add 0.25% nonionic surfactant.	Apply to small, actively growing weeds. Cotyledon or larger cotton.	Rainfall after application aids in prickly sida and spurge control. Avoid drift to corn or grain sorghum. Some pigweed species are known to be resistant to ALS herbicides.
trifloxysulfuron @ 0.0047 to 0.007 lb/A	Sicklepod, nutsedge, good on morningglory.	**Envoke 75 DG** 0.10 to 0.15 oz/A. Use 0.25% v/v nonionic surfactant.	After 5-leaf stage. Post direct on large cotton to improve coverage and soil contact.	Crop response in the form of temporary chlorosis and stunting may be observed. Do not apply within 24 hours of a malathion application. Some pigweed species are known to be resistant to ALS herbicides (Group 2). Do not apply within 60 days of harvest.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
sethoxydim @ 0.188 to 0.375 lb/A	Annual grasses, johnsongrass.	**Poast 1.5 EC** 1 to 2 pt/A. Add 1 qt/A crop oil concentrate. Use 1 pt rate only on small annual grasses. Bermudagrass may require repeat treatment of 1 pt/A following initial 1.5 pt treatment. For spot treatment, use 1% solution of Poast + 1% crop oil concentrate. Spray to wet but not to runoff.	Before annual grasses exceed 14 days after emergence. Timing very critical. Johnsongrass–15" to 20".	[Most effective grass herbicide on large annual grasses.] Apply only under conditions of active growth. Thorough coverage required. Do not cultivate 7 days before or after treatment. However, cultivation soon after 7 days will be helpful. Repeat treatments may be required if regrowth occurs. If a herbicide is needed for broadleaf weed control, apply Poast first and follow with broadleaf herbicide at least 1 day later. If broadleaf weeds form canopy over small grass, apply broadleaf herbicide, and wait 7 days before applying Poast.
fluazifop @ 0.188 lb/A	Bermudagrass, johnsongrass, annual grasses.	**Fusilade DX 2 EC** 0.75 pt/A. Add 1% crop oil concentrate or 0.25% nonionic surfactant. For spot treatment use 2 qt Fusilade/100 gal. Add 1% oil or 1% nonionic surfactant.	Before annual grasses exceed 14 days after emergence. Timing very critical. Johnsongrass–12" to 18". Bermudagrass–3" ht or 6" to 12" runner length maximum.	Apply only under conditions of active growth. Somewhat less effective than Poast on annual grasses, more effective on bermudagrass. Repeat if necessary. Thorough coverage required. Do not tank mix. Do not cultivate 7 days before or after treatment. However, cultivation soon after 7 days will be helpful. See label for details.
fluazifop @ 0.094 to 0.188 lb/A + fenoxaprop @ 0.026 to 0.053 lb/A	Bermudagrass, johnsongrass, annual grasses.	**Fusion 2.56 EC** 6 to 12 oz/A most annual grasses. 10 oz/A weedy rice. 12 oz/A bermudagrass and johnsongrass and repeat with 8 oz/A for regrowth. Add 1% crop oil concentrate or 0.25% nonionic surfactant. For spot treatment use 2 qt Fusion per 100 gal. Add 1% crop oil concentrate or 1% nonionic surfactant.	Apply to most annual grasses at 2" to 4". Johnsongrass–8" to 18". Bermudagrass–4" to 8" runner.	Apply only under conditions of active growth. Somewhat less effective than Poast on annual grasses, more effective on bermudagrass. Repeat if necessary. Thorough coverage required. Do not tank mix. Do not cultivate 7 days before or after treatment. However, cultivation soon after 7 days will be helpful. See label for details.
quizalofop p-ethyl @ 0.031 to 0.063 lb/A	Annual grasses, bermudagrass, johnsongrass, weedy rice.	**Assure II 0.88 EC** 5 oz/A volunteer corn and milo, 8 oz/A most annual grasses, 9 oz/A weedy rice. Repeat if needed. 10 oz/A rhizome johnsongrass and bermudagrass. Add crop oil concentrate at 1% ground application or 0.5% for aerial application or nonionic surfactant at 0.25%.	Before annual grasses exceed 14 days after emergence. Timing very critical. Johnsongrass – 10" to 24". Weedy rice – 1st 14 days after emergence or 1 to 4 leaf. Timing for annual grass and weedy rice is very critical.	See above comments for Poast and Fusilade on cultivation and tank mixing. Performance comparable to Poast on annual grasses and Fusilade on rhizome johnsongrass. Better than either on small weedy rice.
clethodim @ 0.094 to 0.25 lb/A	Annual grasses, bermudagrass, johnsongrass.	**Select Max** 12 to 16 oz/A most annual grasses. 16 to 20 oz/A rhizome johnsongrass. Repeat application with 12 to 16 oz/A for regrowth. 16 to 32 oz/A bermudagrass. Repeat application with 12 to 16 oz/A for regrowth. Add 1% crop oil concentrate.	Before annual grasses exceed 14 days after emergence. Johnsongrass–2" to 24" Bermudagrass–3" height or 6" runner length maximum	See above comments for Poast and Fusilade on cultivation and tank mixing. Performance comparable to Assure II for annual grasses and johnsongrass.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
Cotton Postemergence Enlist Cotton Only				
2,4-D choline @ 0.71 to 0.95 lb/A	Annual broadleaf weeds.	**Enlist One** 1.5 to 2.0 pt/A. Check website, EnlistTankmix.com, for approved adjuvants/tank mixtures.	Emergence to first bloom.	Apply **only** to Enlist cotton. – Non-Enlist **cotton** is very sensitive to 2,4-D. Read the label and follow all directions regarding nozzles, buffers, wind speed and direction. – At the time of application, the wind cannot be blowing toward adjacent tomatoes, other fruiting vegetables, cucurbits, grapes and **cotton**. – Physical drift has been found to be the primary cause of off-target movement. Using a hooded sprayer can reduce physical drift. – Applicators must take required training.
glyphosate + 2,4-D choline @ 0.74 to 1.0 + 0.7 to 0.95 lb/A	Annual grasses and broadleaf weeds.	**Enlist Duo** 3.5 to 4.75 pt/A. Check website, EnlistTankmix.com, for approved adjuvants/tank mixtures.	Emergence to first bloom.	Apply **only** to Enlist cotton. – Non-Enlist **cotton** is very sensitive to 2,4-D. Read the label and follow all directions regarding nozzles, buffers, wind speed and direction. – At the time of application, the wind cannot be blowing toward adjacent tomatoes, other fruiting vegetables, cucurbits, grapes and **cotton**. – Physical drift has been found to be the primary cause of off-target movement. Using a hooded sprayer can reduce physical drift. – Applicators must take required training.
2,4-D choline + glufosinate @ 0.71 to 0.95 + 0.53 lb/A	Most annual grasses and broadleaves. Best treatment for emerged pigweed.	**Enlist One** 1.5 to 2.0 pt/A + **Glufosinate (280)** 32 oz/A.. – Other glufosinate products may be labeled for mixing. – Check EnlistTankmix.com for all approved tank mix products.	Apply over the top from emergence through early bloom.	Apply **only** to Enlist cotton. – Non-Enlist **cotton** is very sensitive to 2,4-D. Read the label and follow all directions regarding nozzles, buffers, wind speed and direction. – At the time of application, the wind cannot be blowing toward adjacent tomatoes, other fruiting vegetables, cucurbits, grapes and **cotton**. – Physical drift has been found to be the primary cause of off-target movement. Using a hooded sprayer can reduce physical drift.
Postemergence Fertilizer Impregnation or Coating				
pyroxasulfone @ 0.08 to 0.11 lb/A	Residual control of pigweed and other small seed grasses / broadleaves	**Zidua 4.17 SC** 2.5 to 3.5 oz/A impregnated on 200-700 lbs/A of dry fertilizer	Postemergence 5 leaf to bloom	See label for impregnation instructions. Do not apply more than 3.5 oz of Zidua in single application Do not apply Zidua impregnated onto ammonium or potassium nitrate
Postemergence – Directed, Any Technology				
carfentrazone @ 0.025 lb/A	Morningglory, hemp sesbania and prickly sida.	**Aim 2 EC** 1.6 oz/A. Add crop oil concentrate at 1 pt/A.	After cotton plants are 8 inches or more. Extreme care must be taken to avoid contact with foliage.	Must be mixed with another product for residual control. Do not mix with MSMA. Direct to base of cotton. Avoid fine spray droplets.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
glyphosate @ 0.75 to 1 lb/A + prometryn @ 0.5 to 0.8 lb/A	Emerged annual grasses, johnsongrass, cocklebur, sicklepod, morningglories, prickly sida, velvetleaf, eclipta, spurge, hemp sesbania, northern jointvetch and smartweed. See table for other species. Improved morningglory control and improved pigweed control.	**Glyphosate** (4 lb/gal formulations) 2 pt/A plus **Caparol 4L** or **Cotton Pro 4L** 1 to 1.6 pt/A.	After cotton is 6 inches or more high.	Avoid contacting foliage with spray.
glyphosate @ 0.75 to 1 lb/A + fluometuron @ 0.8 lb/A	Same as glyphosate with improved residual control of morningglory and pigweed.	Same as glyphosate above + **Cotoran 4L** 1.6 pt/A.	After cotton is 6 inches or more high.	Avoid contacting foliage with spray.
pyroxasulfone @ 0.065 to 0.13 lb/A	Residual control of grasses and pigweed.	**Zidua 4.17 SC** 2 to 4 oz/A	Post directed to cotton between 5th leaf stage and bloom.	Provides residual control only; for control of emerged weeds, all MSMA, glyphosate or glufosinate.
pyroxasulfone + carfentrazone @ 0.065 to 0.13 lb/A + 0.0042 to 0.0094 lb/A	Residual control of grasses and pigweed.	**Anthem Flex 4SE** 2 to 3.8 oz/A.	Post directed to cotton that is at least 6 inches tall.	Provides mostly residual control; for increased control, spike with 0.5 to 0.75 oz/A Aim or add MSMA or glyphosate.
flumioxazin + pyroxasulfone @ 0.06 + 0.08 lb/A	Annual grasses and small-seeded broadleaves.	**Fierce 76 WDG** 3 oz/A.	Under row-hoods or layby after cotton has reached 16 inches in height.	For increased control of emerged weeds, add MSMA, glyphosate or glufosinate.
MSMA @ 2 lb/A	Small grasses and seedling cocklebur. Suppression of nutsedge and small johnsongrass.	**MSMA** Many formulations exist. Refer to label on specific material to be used.	After cotton is 3 inches tall and before first bloom.	Use as a directed spray. Combination with other herbicides more effective if a broad-spectrum of weeds is present.
fluometuron + MSMA @ 0.8 lb/A + 1.5 to 2 lb/A	Most small-seeded annual and perennial weeds in the seedling stage of growth.	**Cotoran 4L + MSMA** Tank mix at 1 lb/A Cotoran + 1 qt of 6.6 lb/gal MSMA or equivalent.	After cotton plants are 6 or more inches.	Direct in manner to obtain maximum coverage of weeds with minimum contact to cotton foliage.
prometryn + MSMA @ 0.5 + 2 lb/A	Same weed spectrum as Cotoran but more active.	**Caparol 4L or Cotton Pro 4L + MSMA** 1 pt/A Caparol or Cotton Pro + MSMA at rates shown above.	After cotton plants are 6 or more inches.	Same as above.
trifloxysulfuron @ 0.0047 to 0.007 lb/A	Sicklepod, nutsedge, good on morningglory.	**Envoke 75 DG** 0.10 to 0.15 oz/A (0.0047-0.007 lb ai/A) + NIS, 0.25% v/v.	After 5-leaf stage. Post direct on large cotton to improve coverage and soil contact.	Crop response in the form of temporary chlorosis and stunting may be observed. Do not apply within 24 hours of a malathion application. Some pigweed species are known to be resistant to ALS herbicides (Group 2). Do not apply within 60 days of harvest.

NOTE: The herbicide combinations with MSMA should not need an additional surfactant if the MSMA used contains one. If the MSMA does not contain a surfactant, add it according to herbicide label directions. All MSMA rates listed are average rates. Refer to specific label on product to be used for exact rate. NOTE: Research has shown arsenical herbicides can cause straighthead in rice. Precautions for straighthead should be taken when rice is grown following cotton.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
COTTON				
Postemergence – Directed, Any Technology [cont.]				
trifloxysulfuron + prometryn @ 0.007 to 0.015 lb/A + 0.79 to 1.19 lb/A	Morningglories, sicklepod, yellow nutsedge.	**Suprend 80 WG** 1 to 1.5 lb/A. Add 0.25% v/v nonionic surfactant.	After cotton plants are 6 or more inches.	Avoid contact with foliage.
diuron + MSMA @ 0.75 lb/A + 1.5 to 2 lb/A	Same as above.	**Direx 4L + MSMA** 1.5 pt/A + MSMA at rates shown previously.	After cotton plants are 6 or more inches.	Direct spray to lower ⅓ of cotton stem.
prometryn @ 1.2 to 1.6 lb/A	Cocklebur, prickly sida and spurge, but more effective on morning-glory, grasses and cocklebur.	**Caparol or Cotton Pro 4L** Coarse Soil 2.4 pt/A Medium Soil 2.8 pt/A Fine Soil 3.2 pt/A Add a surfactant.	After cotton is 15 inches tall.	Do not plant rotational crops other than cereal cover crops until the following year.
diuron @ 0.4 to 1.2 lb/A	Most small-seeded annual grasses and broadleaf weeds.	**Direx 4L** Coarse Soil (light) - 0.8 pt/A Medium Soil - 1.6 pt/A Fine Soil (heavy) - 2.4 pt/A Add a surfactant if emerged weeds present.	After cotton is 15 inches tall.	Provide longest residual and greatest potential for carryover to sensitive crops. Less burn on emerged weeds.
linuron @ 0.5 to 1.5 lb/A	Most small-seeded annual grasses and broadleaf weeds.	**Linex 4L** Coarse Soil - 1 pt/A Medium Soil - 2 pt/A Fine Soil - 3 pt/A Add a surfactant if emerged weeds present.	After cotton is 15 inches tall.	Intermediate residual period. Fall-seeded cereal crops may be planted.
flumioxazin @ 0.063 lb/A	Most annual broadleaves and small grasses.	**Valor 51 WDG** 2 oz/A. Add 0.25% NIS.	After cotton has 4 inches of bark. Good residual control of pigweed and morningglory.	Minimize contact with foliage. Adding glyphosate, glufosinate or MSMA will improve control of larger grasses. If emerged pigweed is present, use diuron (Direx) for PPO resistance management and increased pigweed control.
fomesafen @ 0.25 to 0.375 lb/A	Most annual broadleaves and small grasses.	**Reflex 2L** 1 to 1.5 pt/A. Add 0.25% NIS.	After cotton has 4 inches of bark. Good residual control of pigweed and morningglory.	Minimize contact with foliage. Adding glyphosate, glufosinate or MSMA will improve control of larger grasses. Do not apply more than 0.375 lb fomesafen per acre per year. If emerged pigweed is present, use diuron (Direx) for PPO resistance management and increased pigweed control.
S-metolachlor + fomesafen @ 1.09 to 1.26 + 0.24 to 0.28 lb/A	Pigweed and residual control of grass and small-seeded broadleaf weeds.	**Prefix** 2 to 2.33 pt/A.	6-inch cotton through layby. Avoid contact with foliage.	Minimize contact with foliage. Adding glyphosate, glufosinate or MSMA will improve control of larger grasses. Do not apply more than 0.375 lb fomesafen per acre per year. 80-day PHI. If emerged pigweed is present, use diuron (Direx) for PPO resistance management and increased pigweed control.
fomesafen plus acetochlor @ 0.24 to 0.32 lb/A plus 1.06 to 1.43 lb/A	Control of grass and broadleaf weeds	**Warrant Ultra** 48 - 65 oz/A.	Hooded application to cotton 6-12 inches tall. Post-directed spray to base of cotton plant with minimum 4 inches bark.	Do not exceed 3lbs ai/A acetochlor per season.
glyphosate + fomesafen @ 1.0 + 0.25 lb/A	Pigweed, grasses and other broadleaf weeds.	**Flexstar GT 3.5** 3.5 pt/A.	6-inch cotton through layby. Avoid contact with foliage.	Minimize contact with foliage. Adding glyphosate, glufosinate or MSMA will improve control of larger grasses. Do not apply more than 0.375 lb fomesafen per acre per year. 70-day PHI. If emerged pigweed is present, use diuron (Direx) for PPO resistance management and increased pigweed control.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
Spot Treatment Also see Poast and Fusilade above.				
glyphosate	Johnsongrass, bermudagrass, purple nutsedge, trumpetcreeper and most other annual and perennial grasses.	**Glyphosate** (4 lb/gal formulations) 2% solution. Add 1% surfactant.	Anytime before boll opening.	Treatment most effective on large, actively growing weeds. Cotton in area will be severely injured or killed. Avoid windy conditions and high pressure. Follow label directions.
Postemergence – Speciality Treatments Conventional Cotton				
glyphosate wipe-on	Johnsongrass emerged above canopy.	**Glyphosate** (4 lb/gal formulations) 33% solution in Ropewick or other wipe-on applicator.	Anytime before boll opening. Ropewick applicator.	Cotton will not tolerate accidental crop contact. Even though vegetative effects are not obvious, yield reduction may occur.
paraquat + diuron @ 0.5 + 0.5 lb/A	**Pigweed** and small grasses.	**Paraquat** (2 or 3 lb/gal formulations) **+ Direx 4L** 32 or 21 oz/A + 1 pt.	Apply in middles with **hooded sprayer**. Do not allow any spray particles to escape from under the hood.	May be used in salvage situations to remove pigweed from middles and reduce hand chopping labor. Apply under hoods only!
Between Cropping Application				
dicamba @ 2 lb/A	Redvine.	**Banvel SGF 2 SL** 1 gal/A + 0.25% nonionic surfactant. **Clarity 4 SL** 2 qt/A + 0.25% nonionic surfactant.	After harvest and at least 1 week prior to killing frost.	Apply when redvine has recovered from defoliants/desiccants and is actively growing.
glyphosate @ 1 to 2 lb/A	Trumpetcreeper, johnsongrass.	**Glyphosate** (4 lb/gal formulations) 2 to 4 pt/A.	Can be applied with defoliant at 60% open bolls or after harvest but at least 1 week prior to killing frost.	Good coverage is essential; for trumpetcreeper control, good coverage will usually be achieved after harvest.