

Cotton

Preplant and Preemergence Weed Control

Good weed control is not an accident – it's planned. Successful weed control depends on preparing a smooth, firm seedbed, a vigorous-growing stand of cotton, proper rates and placement of fertilizer, disease control, and a well-limed soil. All of these cotton-production practices contribute to a rapid-growing stand of cotton and ease in weed control.

A planned weed-control program is based on knowledge of the weed problem. Most fields are infested with grass and broadleaf weeds. Herbicides generally do not control both equally well, so preplant, preemergence, and postemergence herbicides along with cultivation usually are needed.

Preplant Incorporated Herbicides

The herbicides Prowl and Treflan are similar in the weeds they control. Both provide excellent grass control, good control of many small-seeded broadleaf weeds, and poor-to-no control of sedges, large-seeded broadleaves, and most perennials.

Both of these herbicides are fairly volatile. On a warm, moist, windy day, losses from not incorporating for 24 hours average 15 percent for Prowl and 30 percent for Treflan. Poor incorporation is the greatest source of weed control failure. For best control, apply herbicide to a fairly dry, well-pulverized soil, and mix thoroughly. Application to soils that have not been tilled results in high herbicide losses and poor incorporation. Two passes with the equipment to incorporate 1 to 2 inches deep are generally preferred. Since these herbicides can prevent normal development of small cotton roots, incorporation on a preformed row reduces injury.

Cold, wet weather, excessive rates, low organic matter soils, seedling disease, banded fertilizers, and other herbicide applications may intensify cotton injury.

Incorporation

Tests of some commercial incorporators indicate that ground-driven band equipment gives incorporation approximately half the incorporation depth. With power-driven, rotary-tiller-type equipment, the chemical is incorporated to the depth the machine operates.

Rotary hoes, rolling cultivators, or gang disks are used on a broadcast basis. You will get better results by making two passes over the field with rotary hoes or rolling cultivators. If you use gang disks, they should run no deeper than 3 inches. The spray boom is usually mounted on the tractor and the chemical applied at the first disking. The second or cross disking is sometimes postponed until nearer planting time.

Maintain a speed of 3 mph or more with ground-driven incorporating equipment. Some of the equipment described may not be listed on company labels, so read labels carefully before incorporating herbicides.

Preemergence Weed Control

Preemergence herbicides are applied at planting, before weeds emerge, to provide control during cotton emergence and early growth.

Preemergence herbicides control most small-seeded, annual broadleaf weeds and grasses such as crabgrass, pigweed, barnyardgrass, and lambsquarter. Preemergence herbicides alone will not effectively control many of the larger-seeded annual broadleaf and perennial weeds, such as cocklebur, morningglory, trumpet creeper, and nutsedge.

Since preemergence herbicides normally are applied on the soil surface after planting, little or no weed control occurs until they are moved into soil by rainfall. If rainfall is delayed, a light rotary hoeing sometimes improves performance but must be done without damaging the cotton.

All preemergence herbicides can damage young cotton or reduce or destroy stands if high concentrations of the herbicides come in contact with the germinating seed or young seedling. Tolerance depends upon soil type, organic matter content, and amount and timeliness of rainfall the first two weeks after planting.

You can limit damage by planting high-vigor seed and firmly covering with $\frac{1}{2}$ to 1 inch soil. Set planters to shape the row so that rainfall will run to the row middles instead of funneling the water and herbicide toward the seed.

Preplant Plus Preemergence Herbicide

You can get better control of a variety of weeds, including grasses and broadleaf weeds, by using both a preplant incorporated herbicide and a surface preemergence herbicide. Apply separately and use according to label directions.

It is strongly recommended that you select and use a combination of preplant and preemergence herbicides that controls or suppresses the expected weed problems. Controlling escaped weeds using hoe labor or over-the-top herbicides can be very costly.

Crop, weed, or situation and active chemical per treated land acre	Formulation needed to treat 1 acre broadcast	Time of application	Weeds controlled	Special instructions and remarks
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Post-Harvest/Fallowbed/Preplant Foliar

Post-Harvest/Fallowbed or preplant foliar herbicide applications are designed to provide residual control of winter annuals or burndown of existing vegetation. **Applications can be made during or after fall tillage, up to various time intervals prior to planting, depending on which herbicide is used.** Fall application of residual herbicides can reduce the need for spring tillage or spring burndown herbicides. However, exceeding maximum use rates in any 1 year is possible with certain herbicides. Also, fall application of most herbicides eliminates the possibility of fall cover crops becoming properly established. See pages 8 and 9 for expected levels of control for various weeds.

norflurazon at 0.8 to 1.25 lb/A	Zorial Rapid 80 — 1.0 to 1.5 lb/A	Surface applied in fall after final disking or bed formation	Annual bluegrass, chickweed, bittercress. Poor control of henbit and Carolina geranium.	Do not exceed broadcast rates of 1.25 lb/A for light soils, 1.9 lb/A on medium soils, or 2.5 lb/A on heavy soils in any one year.
trifluralin at 1.0 to 1.25 lb/A	4 lb/gal formulation — 2 to 2.5 pt/A	Apply and incorporate any time between Oct. 15 and Dec. 31. May be left flat or bedded.	Annual bluegrass, chickweed, henbit, other winter annuals.	Do not apply to wet soils or soils subject to prolonged flooding.
pendimethalin at 0.75 to 1.0 to 1.5 lb/A	Prowl/Pendimax 3.3EC — 1.8 to 2.4 to 3.6 pt/A	After Oct. 15 up to 140 days prior to planting.	Most winter annuals and other small-seeded annuals.	Incorporate within 7 days of application if rainfall does not occur. Do not apply to wet soils or soils subject to prolonged flooding.
dicamba 0.188 to 0.25 lb/A	Clarity 4AS 6-8 fl oz	Preplant for vegetation knockdown.	Cutleaf eveningprimrose, buttercup species, clovers, Pennsylvania smartweed, & other winter annual weeds.	Consult label to determine rates for weeds and growth stages. Include nonionic surfactant at 0.25% v/v. If applied in the spring following a fall application the total amount applied cannot exceed 2.0 lb ai/A. Clarity applied as a preplant burndown treatment must be applied at least 21 days before planting . Consult label for added restrictions following a fall application.
oxyfluorfen at 0.25 to 0.5 lb/A	Goal 2XL — 1.0 to 2 pt/A in a minimum of 20 gal water by ground	Early fall up to 7 days prior to planting.	Residual control of most winter annuals, especially henbit. Postemergence control of henbit, common groundsel, and shepherdspurse up to 4-leaf stage with the addition of suitable surfactant. Fair control of chickweed.	Use lower rate for short residual (late winter, early spring) application. Use higher rate for long residual (fall, early winter) applications. Soil must be tilled to depth of 2 inches before planting unless treatment is 30 days or more prior to planting and unless at least three rain falls of ¼-inch or more have fallen since the application. For best preemergence activity, rainfall or irrigation should occur within 3 to 4 weeks after application and soil should be left undisturbed during the period of desired weed control.

Crop, weed, or situation and active chemical per treated land acre	Formulation needed to treat 1 acre broadcast	Time of application	Weeds controlled	Special instructions and remarks
prometryn at 0.75 to 1.0 lb/A	4 lb/gal formulation — 1.5 to 2 pt/A with crop oil concentrate at 1 pt/A	Nov. 1 up to 30 days prior to planting.	Residual control of most winter annuals and postemergence control of small (less than 2 inches) existing vegetation.	Use high rate for early applications, low rate for applications nearer to planting. Use crop oil concentrate if vegetation is present at time of application. If weeds are larger than 2 inches, addition of Gramoxone or Roundup may improve control. Do not make multiple applications to exceed seasonal maximum rate for cotton.
thifensulfuron + tribenuron at 0.225 to 0.45 oz/A	Harmony Extra — 0.3 to 0.6 oz/A with nonionic surfactant at 1 qt per 100 gal spray mix.	After weed emergence but 45 days prior to planting.	Postemergence control of broadleaf winter weeds such as curlydock, chickweed, henbit, and buttercup.	Apply to young actively growing weeds. Allow 1 to 3 weeks after application for full control. May be mixed with other preplant herbicides to broaden weed spectrum.
glyphosate at 0.5 to 1.0 lb/A	glyphosate 4/5 lb/gal — 0.5 to 1 qt/0.4 to 0.8 qt/A	After weed emergence up to 3 to 7 days before planting. Touchdown must be applied at least 35 days before planting.	See chart below. Consult label for complete list of weeds controlled.	Include 0.25% v/v nonionic surfactant with Touchdown. Use higher rate for larger weeds or heavy infestations. Use of flood-jet nozzles is not suggested. If tillage is intended after treatment, wait at least 3 days (7 days for rhizome johnsongrass). Cultivation before johnsongrass emergence will result in better control after glyphosate application. Rainfall within 6 hours after application may reduce control. Heavy rainfall within 2 hours after application may require repeat treatment to obtain control. Avoid drift to nearby crops or areas not intended to be treated. Do not use with galvanized (zinc coated) spray equipment. Apply a preplant or preemergence herbicide to control johnsongrass from seed.
		Max. weed height (inches) for 16 oz, (24 oz), or [32 oz]		
		Glyphosate		
		16 oz Roundup or 13 oz Touchdown = 0.5 lb ai/A		
		barnyardgrass 4, (6)		
		buttercup 12		
		cheat 6		
		crabgrass 12		
		cocklebur 12		
		foxtail 12		
		geranium [12]		
		goosegrass [12]		
		johnsongrass, seedling 12		
		morningglory 2		
		prickly sida [4]		
		ryegrass *		
		signalgrass (4)		
		*Perennial and annual ryegrass require 64 oz per acre for control.		
MSMA at 2.0 lb/A	MSMA — 2.7 pt of a 6 lb per gal formulation in 10 to 20 gal water. Add 1 qt nonionic surfactant to each 100 gal of spray mix unless formulation contains surfactant.	After weeds emerge but before planting cotton.	Most annual grasses and cocklebur. Weak on most other broad leaf weeds. Top kill of johnsongrass.	Useful where planting was delayed and weeds have emerged. Control decreases in cool weather. Cotton may be planted immediately after spraying.

Crop, weed, or situation and active chemical per treated land acre	Formulation needed to treat 1 acre broadcast	Time of application	Weeds controlled	Special instructions and remarks
paraquat at 0.625 to 0.94 lb/A	Gramoxone Max (3.0 lb/gal) — 1.7 to 2.5 pt in 20 gal water by ground equipment or 5 gal by air. Add 1 qt surfactant per 100 gal water.	For burndown of existing vegetation before planting, but before weeds reach 6-in. height.	Top kill of most annual and perennial weeds and grasses. Perennials will regrow.	Paraquat is nonselective so avoid spray drift onto desirable vegetation. Use low rate on weeds under 2 inches tall.

Preplant Incorporated

norflurazon at 1 to 1.5 to 2 lb/A	Zorial 80 DF — 1.25 to 1.9 to 2.5 lb in 10 to 20 gal water.	Within 30 days of planting.	Most annual grasses and small-seeded broadleaf weeds. Good to excellent control of prickly sida and good control of spurred anoda.	Incorporate no deeper than 2 to 3 inches after beds have been reduced for planting. Do not use where johnsongrass or morningglory is a major problem. Incorporation offers potential advantages over surface application: <ol style="list-style-type: none"> 1. better control under early season dry conditions 2. better suppression of deep germinating weeds such as cocklebur and morningglory 3. better suppression of perennials such as nutsedge and bermudagrass. The application also may be split with $\frac{1}{2}$ rate preplant incorporated and the other $\frac{1}{2}$ on the surface after planting.
pendimethalin at 0.5 to 0.75 to 1.5 lb/A	Prowl/Pendimax 3.3EC — 1.2 to 1.8 to 3.6 pt in 5 gal water by air or 10 gal water by ground equipment.	From 140 days to immediately before planting.	Most annual grasses and small-seeded broadleaf weeds such as pigweed and purslane.	Increase rate by 0.6 pt/A on coarse and medium textured soils where heavy weed populations are anticipated. Use 3.6 pt/A on heavy clay soils. Incorporate 1 to 2 inches deep immediately after application for best results. A 15% loss can occur if incorporation is delayed 24 hours. When making band applications, avoid removal of treated soil from the seedbed during incorporation and planting.
trifluralin at 0.5 to 0.75 to 1.0 lb/A	4 lb/gal formulation — 1 to 1.5 to 2 pt or 5 lb/gal formulation— 0.8 to 1.2 to 1.6 pt in 5 gal water by air or 10 gal water by ground equipment.	Anytime after January 1 to immediately before planting.	Most annual grasses and some small-seeded broadleaf weeds such as pigweed and purslane.	Incorporate 1 to 2 inches deep immediately after application for best results. A 30% loss can occur if incorporation is delayed 24 hours. When making band applications, avoid removal of treated soil from the seedbed during incorporation and planting.

Preemergence

Preemergence herbicide applications should be made after planting but before weed or crop emergence. Avoid planting cotton seed less than $\frac{1}{2}$ -inch deep to avoid excessive injury during periods of heavy rainfall. Substituted-urea herbicides such as fluometuron or diuron may interact when used in combination with organophosphate insecticides at planting resulting in cotton injury. **Use of an organophosphate insecticide, in-furrow, is mandatory when applying clomazone preemergence.**

clomazone at 0.5 to 1.0 lb/A	Command 3 ME at 1.33 to 2.67 pt/A	At planting.	Excellent control of annual grasses and many small-seeded broadleaf weeds except pigweed. Use low rate when only velvetleaf control is desired. Addition of fluometuron at recommended rates improves morningglory and cocklebur control.	Use an organophosphate insecticide, in-furrow, to prevent cotton injury! Failure to do so will result in severe cotton injury and stand loss. These insecticides may, however, cause injury when used with fluometuron or diuron. Clomazone has a high potential for off-site movement by drift and/or volatility. Do not apply within 1,200 feet of residential areas, unsafened cotton, horticultural crops, and other sensitive species. Do not apply during periods of high winds in excess of 10 mph and/or expected heavy rainfall. Apply to dry soil when potential for drift is low. Use low pressure and drift control agents where possible.
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Crop, weed, or situation and active chemical per treated land acre	Formulation needed to treat 1 acre broadcast	Time of application	Weeds controlled	Special instructions and remarks
diuron at 0.5 to 1.0 to 1.6 lb/A	80% dry formulation — 0.67 to 1.25 to 2.0 lb or 4 lb/gal liquid formulation — 1 to 2 to 3.2 pt in 10 to 20 gal water.	At planting.	Most annual grasses and small-seeded broadleaf weeds. Fair to good control of prickly sida and morningglory.	If stand failure occurs, cotton may be replanted through the treated band with minimum disturbance of the treated soil. In a single season, do not exceed 0.8 lb ai on loamy sand, 1.2 lb ai on sandy loam, 1.6 lb ai on clay loam, 2.2 lb ai on clay. Injury may occur if used with soil-applied organophosphate pesticides. Rebed only after thorough tillage.
fluometuron at 0.75 to 1.5 to 2.0 lb/A	4 lb/gal formulation — 0.75 to 1.5 to 2 qt	At planting.	Most annual grasses and small-seeded broadleaf weeds. Good to excellent control of prickly sida and morningglory.	If stand failure occurs, cotton may be replanted through the treated band with minimum disturbance of the treated soil. Injury may occur if used with soil-applied organophosphate pesticides. Rebed only after thorough tillage.
fluometuron at 1.0 to 1.5 to 2 lb/A + metolachlor at 1.5 to 2.0 lb/A	Cotoran 4L — 2 to 3 to 4 pt + Dual 8E — 1.5 to 2.0 pt in 10 to 20 gal water.	At planting.	Most annual grasses and small-seeded broadleaf weeds. Good to excellent control of prickly sida and morningglory. Addition of Dual improves control of annual grasses, spurge, and yellow nutsedge.	Plant seed at least 1 inch deep to reduce possibility of injury. Use the high rate of Dual on fine-textured soils containing appreciable clay. If stand failure occurs, cotton may be replanted through the treated band with minimum disturbance of the treated soil or the area may be reworked in several ways before replanting. Rebed only after thorough tillage.
norflurazon at 1 to 1.5 to 2 lb/A	Zorial 80DF — 1.25 to 1.9 to 2.5 lb in 10 to 20 gal water.	At planting.	Most annual grasses and small-seeded broadleaf weeds. Good to excellent control of prickly sida, and good control of spurred anoda. Inadequate control of morningglory.	If stand failure occurs, cotton, soybeans, or peanuts may be replanted through the treated band with minimum disturbance of the treated soil or the area may be reworked. Rebed only after thorough tillage. Norflurazon also may be applied preplant incorporated or as a split application with half preplant incorporated and the other half preemergence. See preplant incorporated section.
pendimethalin at 0.5 to 0.75 to 1.0 lb	Prowl/Pendimax 3.3EC at 1.2 to 1.8 to 2.4 pt	Within 2 days after planting	Most grasses from seed and some small-seeded broadleaf weeds such as pigweed and purslane.	Rainfall or overhead irrigation is needed within 7 days for activity. Seedling diseases, cold weather, excessive moisture, shallow or deep planting, low or high soil pH, high soil salt concentration or drought can weaken seedlings and increase the possibility of crop damage.
pyrithiobac at 0.51 to 0.68 oz/A	Staple SP — 0.6 to 0.8 oz in 10 to 20 gal water.	At planting.	Spurge, pigweeds, prickly sida.	Do not exceed 0.8 oz/A. Do not apply more than 2.4 oz/A per season.

Estimated Levels of Preplant Foliar Weed Control Normally Expected

	Annual Bluegrass	Bittercress	Buttercup	Carolina Geranium	Chickweed	Cheat	Eveningprimrose	Groundsel	Henbit	Prostrate Knotweed	Shepherdspurse	Wildlettuce	Virginia Pepperweed	Vetch	Little Barley/Car. Foxtail	Horseweed	Curly Dock (seedling)	Ryegrass	Barnyardgrass	Broadleaf signalgrass	Crabgrass	Goosegrass	Seedling Johnsongrass	Cocklebur	Entireleaf Morn.	Pitted Morn.	Smallflower Morn.	P. Smartweed	Hemp Sesbania	Prickly Sida	Spurred Anoda	Pigweed	Sicklepod	Cutleaf Groundcherry	Common Ragweed	Red Rice	Upright Spurge	Soil Activity
Caparol/Cotton Pro	-	9	9	7	10	-	7	-	8	6	8	9	7	6	6	7	8	-	-	-	-	-	7	7	9	9	7	8	7	7	9	-	-	-	-	-	yes	
Clarity	0	9	9	8	9	0	8	-	9	8	9	9	9	9	0	7	9	0	0	1	1	1	0	9	9	9	9	9	8	9	8	8	9	9	0	9	-	no
Goal	9	10	9	9	8	7	8	7	9	9	9	9	8	7	-	9	9	9	-	-	-	-	8	8	9	9	8	9	9	8	9	-	-	-	-	-	yes	
Gramoxone Extra	8	10	10	7	10	8	8	9	9	6	9	7	8	8	0	6	8	9	9	9	9	8	9	6	5	5	7	5	6	6	8	9	9	7	8	7	8	no
Harmony Extra	0	9	9	8	8	0	8	-	7	-	9	9	9	0	6	10	0	0	0	0	0	0	8	7	8	8	-	6	4	-	8	4	-	0	-	0	no	
Glyphosate	9	10	9	7	10	9	7	9	9	7	9	7	8	5	10	8	7	9	9	9	9	9	8	9	8	7	8	8	7	6	7	5	9	8	9	7	9	no

* Plus approved adjuvant according to label instructions.

Estimated Levels of Weed Control Normally Expected^a

Herbicides	Barnyardgrass	Broadleaf signalgrass	Crabgrass	Goosegrass	Fall panicum	Johnsongrass-seedling	Johnsongrass-rhizome	Bermudagrass	Nutsedge - purple	Nutsedge - yellow	Annual sedge	Cocklebur	Hemp Sesbania	Honeyvine milkweed	Annual morningglory	Pigweed	Prickly sida	Purslane	Smartweed	Nodding spurge	Spurred anoda	Velvetleaf	Sicklepod	Crop tolerance
Preplant																								
Prowl	9	9	9	9	9	9	5	0	0	0	0	0	0	0	3	9	0	9	2	1	0	0	1	G
Trifluralin	9	9	9	9	9	9	6	0	0	0	0	0	0	0	3	9	0	9	2	1	0	0	1	G
Zorial (PPI or Split)	9	8	9	8	8	8	3	3	5	5	9	4	3	0	6	9	9	9	6	7	8	7	5	G
Overlay (PPI + PRE) Treatment will control a broader spectrum of weeds but effectiveness on any given species will be no better than the highest rating for the best herbicide in the specific combination selected.																								
Preemergence																								
Command	9	9	9	9	8	9	3	-	-	-	-	6	4	-	5	7	9	9	8	8	9	10	0	F
Fluometuron	8	8	9	8	7	6	0	0	0	0	9	6	6	0	7	9	9	9	7	3	3	3	8	G
Cotoran + Dual	9	9	9	9	9	7	0	0	0	7	9	6	6	0	7	9	9	9	7	7	3	3	8	G
Diuron	7	8	8	8	7	6	0	0	0	0	9	4	4	0	7	9	6	9	7	6	2	7	5	G
Staple	-	-	-	-	-	-	-	-	-	-	-	4	4	-	5	9	9	-	-	9	-	-	6	G
Zorial	8	8	9	8	7	7	2	2	4	4	9	3	3	0	5	7	9	9	6	7	8	7	4	G

^aRating scale: 0-3, none to slight; 4-6, fair; 7-8, good; 9-10,excellent; Ratings assume the herbicides are applied in the manner suggested in the guidelines and according to the label under optimum growing conditions. Crop tolerance rating scale: E - excellent; G - good; F - fair.

Consult labels for approved adjuvants.

Weed resistance to recommended use rates of certain herbicides has been documented in Mississippi.

The information given here is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended against other products that also may be suitable.

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