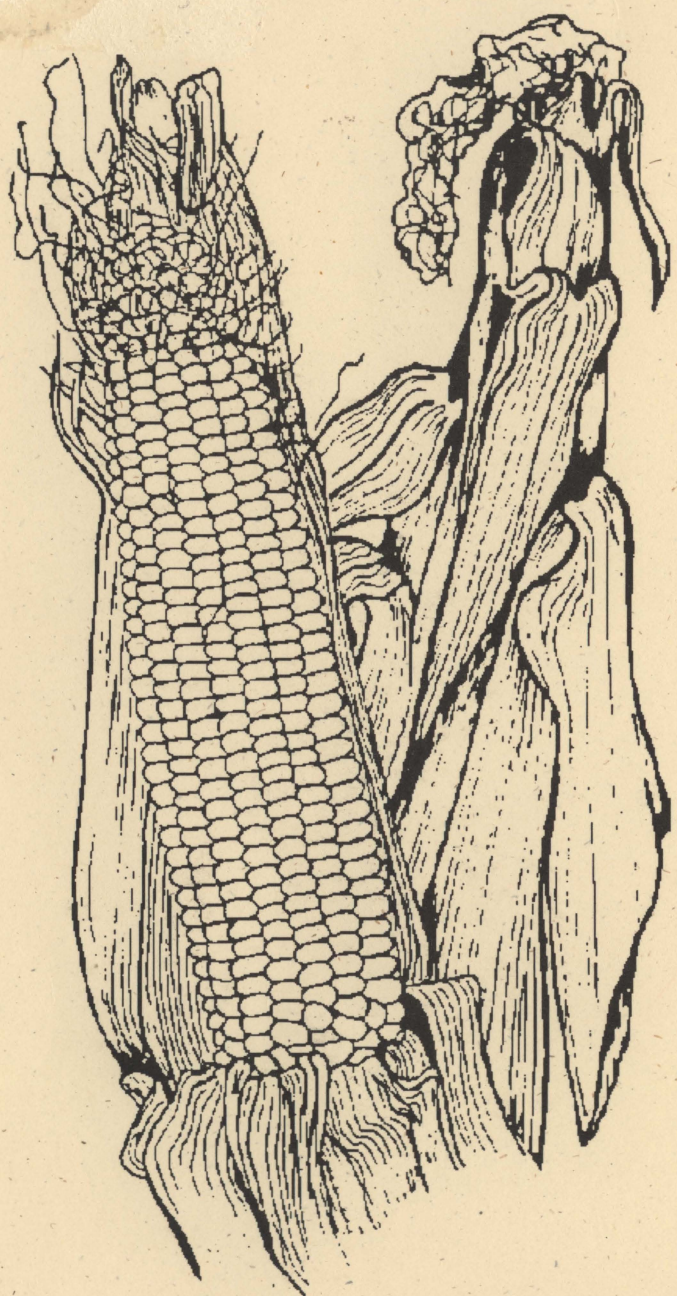


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Texas Agricultural Extension Service  
The Texas A&M University System



# SUGGESTIONS FOR WEED CONTROL IN CORN

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# Suggestions for Weed Control in Corn

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The suggestions contained herein are based primarily on herbicide labels, research by the Texas Agricultural Experiment Station and demonstrations by the Texas Agricultural Extension Service. The use of product names is not intended as an endorsement of the product or of a specific manufacturer, nor is there any implication that other formulations containing the same active chemical are not equally as effective. Product names are included solely to aid readers in locating and identifying the herbicides suggested.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

**This publication is no substitute for the herbicide product labels! It is intended to serve only as a guide for controlling weeds in corn. Labeled rates and restrictions change constantly, therefore, consult a current product label before use.**

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Weeds can be controlled in cropland through cultural, mechanical and chemical means. Judiciously using these methods individually or in combination can effectively manage weeds without causing economic loss or environmental harm. Deciding which practice to employ will depend largely on the weed(s) being controlled and the infestation level. Also, the crop being planted will play a major role in determining the timing of mechanical measures.

Considerations for cultural and mechanical weed control include:

1. Remove light or spotty infestations of weeds by hand hoeing or spot cultivation to prevent spreading weed seed, rhizomes or roots. Exercise caution when plowing perennial weeds, being careful to prevent the transport and spread of plant parts to other areas of the field.
2. Use weed-free planting seed to protect against weed infestations in the row and the introduction of new weed species.
3. Thoroughly clean harvesting equipment before moving from one field to the next, or require it of custom harvesters before they enter your fields.
4. Use mechanical tillage to remove initial weed flushes before planting, thereby eliminating or at least reducing the potential for continued infestation.
5. Consider the economics of using mechanical cultivation alone for weed control in the crop, especially where only light infestations of annual weeds are present.
6. Rotate crops that physically out-compete certain weeds, resulting in their gradual decline.

**Table 1. Winter Weed Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Annual broadleaf weeds such as thistles, henbit and seedling dock  (Refer to label for specific weeds controlled.)	<b>AAtrex 4L</b> ® <b>atrazine 4L</b> <b>AAtrex Nine-O</b> ® (atrazine) Novartis and others	0.8 to 1.0 qt.  0.9 to 1.1 lbs.	Postemergence to small weeds in November or December on fall bedded land.	For use in the Texas Gulf Coast and Blacklands only. Plant only corn, grain or forage sorghum in the spring. Normal weed control programs will be necessary at crop planting time.
Numerous annual broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Harmony Extra 75DF</b> ® (thifensulfuron-methyl (50%) plus tribenuron-methyl (25%)) DuPont	0.5 to 0.6 oz.	Apply postemergence at least 45 days before planting, to weeds less than 4 inches tall or wide.	Add nonionic surfactant or crop oil concentrate to spray mixture. Tank mixes with Roundup Ultra ® hasten burndown.

**Table 2. Preplant Herbicides for Postemergence Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Emerged annual broadleaf weeds and grasses  (Refer to label for specific weeds controlled.)	<b>Gramoxone Extra</b> ® (paraquat dichloride) Zeneca	1.5 to 3.0 pts. plus nonionic surfactant	Prior to, during or after planting but before crop emergence, when weeds are 1 to 6 inches tall.	Avoid drift to emerged crops. Beds should be preformed to permit maximum weed and grass emergence. This herbicide is useful in minimum tillage systems. Add nonionic surfactant to spray solution at 8 to 32 ozs. per 100 gals. of water  <b>Note: Gramoxone Extra</b> ® (1.5 to 2.5 pts./A) may be combined with <b>atrazine or Bladex</b> ® for residual control
Annual grasses and broadleaf weeds and suppression of perennials  (Refer to label for specific weeds controlled.)	<b>Roundup Ultra</b> ® (glyphosate) Monsanto	0.5 to 1.5 qts.	Apply before planting or after harvesting corn.	For henbit, use 1 pt./A on weeds < 3 inches tall, 1 qt./A on 3- to 6-inch weeds. Apply when weeds are growing vigorously and are 6 inches or less tall. Consult label for specific rates for weeds. Do not apply when winds are gusty or cause product to drift. Allow at least 7 days before tillage. Tank mixtures with 2,4-D or dicamba must be made at least 7 days before planting corn.

(continued)



**Table 2 (continued). Preplant Herbicides for Postemergence Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Bermudagrass	<b>Roundup Ultra®</b> (glyphosate) Monsanto	5.0 qts. (control) 3.0 qts. (partial control)	Before planting or after harvest.	Apply when bermudagrass is actively growing and seedheads are present. Retreatment may be necessary to maintain control. Allow at least 7 days before tillage.
Field bindweed	<b>Roundup Ultra®</b> (glyphosate) Monsanto <b>Roundup Ultra® + Banvel®</b> (dicamba) BASF <b>Roundup Ultra® + 2,4-D</b> Monsanto	4.0 to 5.0 qts. (control)  2 qts. + 1 pt. (0.5 lb. active ingredient)  2 qts. + 1 qt. (1.0 lb. active ingredient)	Before planting or after harvest.	Apply when bindweed is actively growing and at or beyond full bloom. For best results, apply in late summer or fall. Wait at least 7 days to till. Apply with ground equipment only. Refer to Banvel® or 2,4-D label for crop rotation restrictions and cautionary statements. (See Roundup Ultra® label for this use.)
Johnsongrass	<b>Roundup Ultra®</b> (glyphosate) Monsanto	1.0 to 3.0 qts.	Before planting or after harvest.	Apply when actively growing and in boot stage for best results. Do not apply after johnsongrass turns brown in fall. Allow 7 days before tillage. Do not tank mix with residual herbicide when using the 1 qt./A rate. Fall applications must be made before frost.
Johnsongrass (burndown control only)	<b>Roundup Ultra®</b> (glyphosate) Monsanto	0.5 qt.	Before planting or after harvest.	Apply before johnsongrass reaches 12 inches tall. Allow 7 days before tillage.  <i>Note: In annual cropping systems a rate of 1.0 qt./A of Roundup Ultra® may be applied. Use a spray volume of 3 to 10 gals. per acre. For spot treatment in corn, use a 1.0 percent solution and spray before silking. Apply to johnsongrass 12 to 18 inches tall, but treat no more than 10 percent of the total field.</i>

(continued)

**Table 2 (continued). Preplant Herbicides for Postemergence Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Nutsedge (yellow, purple)	<b>Roundup Ultra</b> ® (glyphosate) Monsanto	3 qts. (control)	Before planting or after harvest.	Treat when plants are flowering or have new nutlets at rhizome tips. Repeat applications are required for long-term control. Wait 7 days after treatment to till. Nutlets not germinated will not be controlled and may germinate after treatment.
	<b>Roundup Ultra</b> ® (glyphosate) Monsanto	0.5 to 2 qts. (partial control)		Treat when plants have 3 to 5 leaves (6 inches tall). Repeat applications are required for long-term control. Wait 7 days after treatment to till.
Silverleaf nightshade	<b>Roundup Ultra</b> ® (glyphosate) Monsanto	2 qts.	Before planting or after harvest.	Treat when at least 60 percent of the plants have berries. Fall treatments must be made before a killing frost. Plants must be actively growing. Allow 7 or more days after treatment before tillage.
Annual and perennial weeds (Refer to label for specific weeds controlled.)	<b>Touchdown</b> ® (sulfosate) Zeneca	0.5 to 5.3 pts.	Apply before, during or after planting, but before crop emergence.	Can be tank-mixed with other herbicides to provide preemergence control or suppression of annual weeds. Consult label for mixing rates.

**Table 3. Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)	<b>Dual 8E</b> ® or <b>Dual II</b> ® (metolachlor) or (metolachlor + safener) Novartis	1.5 to 2.5 pts.	Preplant incorporated up to 14 days before planting or preemergence after planting.	Dual® or Dual II® may be tank-mixed with other products to expand broadleaf weed control such as atrazine and Bladex®.
Annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)	<b>Dual II Magnum</b> ® (s-metolachlor) Novartis	1 to 2 qts.	Preplant incorporated, preplant surface applied or preemergence.	Same as Dual®.

(continued)



**Table 3 (continued). Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
<p>Annual grasses and broad-leaf weeds. Partial control of seedling johnsongrass, shattercane and volunteer sorghum.</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>Bicep 6L ® or Bicep II ®</b> (metolachlor + atrazine) or (metolachlor + safener + atrazine) <b>Bicep II Magnum ®</b> (atrazine + s-metolachlor) <b>Bicep Lite II ®</b> (atrazine + metolachlor + safener) Novartis</p>	<p>1.8 to 2.2 qts.  2.1 to 2.6 qts.  2.4 to 3.5 qts.</p>	<p>Preplant surface applied 30 to 45 days before planting.</p>	<p>For use on medium- and fine-textured soils after final seedbed preparation in the Blacklands and Gulf Coast areas of Texas. Grass suppression for 2 to 3 weeks after planting can be expected as a result of this application. Do not incorporate or disturb the soil before planting and avoid moving the soil during the planting operation. A follow-up application of Dual ® herbicide may be needed in fields with heavy grass pressure. Apply Dual ® after planting but before corn and weeds emerge.</p>
	<p><b>Bicep 6L ® or Bicep II ®</b> (metolachlor + atrazine) or (metolachlor + safener + atrazine) <b>Bicep II Magnum ®</b> (atrazine + s-metolachlor) <b>Bicep Lite II ®</b> (atrazine + metolachlor + safener) Novartis</p>	<p>1.5 to 2.4 qts.  1.3 to 2.1 qts.  1.5 to 3.5 pts.</p>	<p>Preplant surface applied, preplant incorporated or preemergence.</p>	<p>If crop is lost, corn can be replanted, but don't retreat. Do not plant rotational crops for 18 months. May cause some temporary stunting in wet, sandy soils. This combination may be applied preplant and incorporated into the top 2 inches of soil with a disk, harrow or rolling cultivator if furrow irrigation is used or if a period of dry weather is expected after application. Bicep ® or the tank mixture can be mixed with Gramoxone Extra ® or Roundup Ultra ® for use in minimum tillage systems.</p>
<p>Annual grasses and broadleaf weeds</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>Harness ®</b> (acetochlor + safener) Monsanto</p>	<p>1.25 to 2.25 pts.</p>	<p>Preplant incorporated (shallowly) within 14 days of planting or preemergence after planting.</p>	<p>This product may be tank-mixed with other products for expanded broadleaf weed control. Consult labels, and refer to rotational crop restrictions.</p> <p>Performance improves when moisture is received within 7 days after application and before weed emergence.</p>
<p>Annual grasses and broadleaf weeds</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>Harness Xtra ®</b> (acetochlor + safener + atrazine) Monsanto</p>	<p>1.8 to 2.3 qts.</p>	<p>Preplant incorporated (shallowly) within 14 days of planting or preemergence after planting.</p>	<p>This product provides expanded broadleaf weed control over Harness ®. Refer to label for additional rotational crop restrictions.</p>

(continued)

**Table 3 (continued). Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Surpass EC®</b> (acetochlor + safener) Zeneca	1.5 to 2.75 pts.	Preplant incorporated (into top 1 to 2 inches of soil) up to 14 days before planting or preemergence.	If rainfall or irrigation does not take place within 7 days after preemergence application, a shallow incorporation will improve herbicide performance. Surpass® may be applied up to 30 days before planting when used in combination with other selected products. Consult label.
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Topnotch®</b> (acetochlor + safener) Zeneca	2 to 3 qts.  2 to 3 qts.  2 to 3 qts.  2.5 to 3.75 qts.	After planting and/or emergence.  Less than 10 days before planting.  10 to 30 days before planting.  30 to 40 days before planting.	Topnotch® is a microencapsulated formulation of acetochlor.  Incorporate herbicide into soil <b>not</b> more than 10 days before planting or more than 2 inches deep.  Preemergence application needs rain or irrigation 7 days after application.  Planting should be alone or as soon as possible after the application.  Application can be made 40 days before planting, but highest control is when applications are made as close to planting as possible.
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Surpass 100®</b> (acetochlor + safener + atrazine) Zeneca	1.6 to 2.6 qts.	Same as above.	If rainfall or irrigation does not take place within 7 days after preemergence application, a shallow incorporation will improve herbicide performance. Surpass® may be applied up to 30 days before planting when used in combination with other selected products. Consult label.  This product controls broadleaf weeds better than when Surpass® is used alone. Consult label for crop rotation restrictions.

(continued)



**Table 3 (continued). Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Broadleaf and grass weeds  (Refer to label for specific weeds controlled.)	<b>Fultime</b> ® (acetochlor + atrazine) Zeneca	2.5 to 3.5 qts./A	Early preplant 40 days before planting; preplant incorporated in top 2 inches anytime within 10 days before planting.	Wheat may be planted 15 months after treatment. Rotational crops include corn, soybeans and grain sorghum. Provides expanded broadleaf control over Topnotch®.
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Frontier 7.5 EC</b> ® (dimethenamid) BASF	13 to 25 oz.  Use rate determined by C.E.C. (cation exchange capacity) or soil texture and organic matter content, consult label.	Preemergence, preplant incorporated (into top 1 to 2 inches of soil) or surface applied within 2 weeks of planting. Early postemergence before corn is 8 inches tall, but before weeds emerge.	Several other products may be used with Frontier® for additional weed control. Consult the product label. Rotational crop restrictions will vary for use of these combinations with other products. If Frontier® is used alone, cereal crops such as wheat or oats may be planted 4 months after application. Other crops may follow in the spring after the previous year's application of Frontier®.
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Guardsman</b> ® (dimethenamid + atrazine) BASF	2.5 to 4.5 pts.  Use rate determined by C.E.C. (cation exchange capacity) or soil texture and organic matter content. Consult label.	Same as above.	This combination product provides expanded broadleaf weed control over Frontier® used alone. Refer to label for rotational crop restrictions.
Annual broadleaf and grass weeds  Partial control of yellow nutsedge	<b>Axiom DF</b> ® (fluthiamide + metribuzin) Bayer	13 - 22 oz.	Preemergence, or early preplant 45 days before planting; preplant incorporated (into top 1 to 2 inches of soil) or surface applied within 2 weeks of planting.	May be tank mixed with atrazine, Banvel®, Bladex®, Clarity®, Marksman®, and Sencor®. Rates vary by soil texture and organic matter. Rotational crops - 2 years. Do not apply by chemigation or air.

(continued)

**Table 3 (continued). Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Annual broadleaf and grasses	<b>Balance</b> ® (isoxaflutole) Rhone-Poulenc	1.4 - 3 oz. 1.0 - 2.5 oz.	Preplant surface- applied or preplant incorporated. Apply 0 - 14 days before planting. Preemergence apply during or after planting but before emergence of weeds or crops.	May be tank-mixed with Aatrex®, atrazine, Dual®, Dual II®, Frontier®, Harness®, MicroTech®, and Surpass®. Rates vary by soil texture and tillage. Do not forage grain or feed fodder to livestock. Do not plant rotational crops until the following year. No rotational crops may be planted within 6 months following a Balance® application.
Annual grasses broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Aatrex 4L</b> ® or <b>atrazine 4L</b> <b>AAatrex Nine-O</b> ® <b>AAatrex Accu-Pak</b> ® Novartis and other companies	3.2 to 4.0 pts. 1.8 to 2.2 lbs. 1.8 to 2.2 lbs.	Preplant incorporated at least 2 weeks before planting. Preemergence apply during or shortly after planting, but before crop and weeds emerge.	Consult label for appropriate rates for soil classification. Products can be mixed with other compounds to control small-seeded grass better. Apply no more than 2.5 lbs. active ingredient per acre per calendar year (i.e. 2.5 qts./A of atrazine 4L; 2.7 lbs./A of AAatrex Nine-O®, 2.8 lbs./A of AAatrex Accu-Pak ®). May be tank-mixed with several other products to strengthen grass control.
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Cypro 4L</b> ® <b>Bladex 4L</b> ® (cyanazine) Griffin, DuPont  <b>Bladex 90DF</b> ® DuPont	1.3 to 3 qts.  1.3 to 3.3 lbs.	Preemergence at or shortly after planting before crop has emerged. Early postemergence on small weeds.	No more than 1 qt. of Bladex® or Cypro 4L® or 1.1 lbs. of Bladex 90DF® may be applied during 1999. Refer to current labels for following years. May be tank-mixed with other products to strengthen grass control.
Annual grasses and broadleaf weeds  Partial control or control of light to moderate infestations of selected weeds  (Refer to label for specific weeds controlled.)	<b>Broadstrike SF + Dual</b> ® (flumetsulam + metolachlor) Dow Agrosciences	1.75 to 2.5 pts.	Preplant incorporated into top 1 to 2 inches of soil within 14 days before planting.  Preemergence before crop and weeds emerge.	If applied preplant incorporated, incorporate with equipment designed to provide a uniform distribution of herbicide. If crop is planted on beds, apply and incorporate Broadstrike SF + Dual® after bed formation.  Do not plant wheat or oats for 4½ months, grain sorghum for 18 months, or cotton for 22 months after applying this herbicide combination. Other herbicides may be used with this combination to broaden weed control spectrum. Consult label for additional restrictions and recommendations.

(continued)



**Table 3 (continued). Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)	<b>Lasso</b> ® (alachlor) Monsanto	2 to 3 qts.	Preplant incorporated (into top 1 to 2 inches of soil), preemergence or postemergence. Postemergence applications should be made before corn reaches 5 inches tall.	Most effective if 1/3 to 3/4 inch rainfall or irrigation occurs within 7 days after preemergence application. If weeds emerge after treatment because of insufficient rainfall, use a rotary hoe or shallow cultivation to improve performance.
Annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)	<b>Lasso II</b> ® (granular) (alachlor) Monsanto	13 to 18 lbs.	Preemergence after planting before crop or weeds emerge.	Most effective if 1/3 to 3/4 inch rainfall or irrigation occurs within 7 days after preemergence application. If weeds emerge after treatment because of insufficient rainfall, use a rotary hoe or shallow cultivation to improve performance.
Annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)  Some suppression of cocklebur, morningglory, seedling johnsongrass, shattercane, teaweed, Texas panicum and velvetleaf	<b>Lariat 3.75</b> ® (alachlor + atrazine) <b>Bullet</b> ® (alachlor + atrazine) Monsanto	2.5 to 3.75 qts.  2.5 to 4.0 qts.	Preplant incorporated (into top 1 to 2 inches of soil), preemergence or postemergence until grasses and weeds reach the 2-leaf stage and crop is no more than 5 inches tall.	Bullet® contains a micro-encapsulated formulation of alachlor. Most effective if 1/3 to 3/4 inch rainfall or irrigation occurs within 7 days after preemergence application. If weeds emerge after treatment because of insufficient rainfall, use a rotary hoe or shallow cultivation to improve performance.  These products offer expanded broadleaf weed control over Lasso®, and MicroTech®.  Refer to label for rotational crop restrictions.
Annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)	<b>MicroTech 4 ME</b> ® (alachlor) Monsanto	2 to 3 qts.	Preplant incorporated or preemergence; post-emergence applications can be made before corn reaches 5 inches tall.	MicroTech® is a micro-encapsulated formulation of alachlor. Most effective if 1/3 to 3/4 inch rainfall or irrigation occurs within 7 days after preemergence application. If weeds emerge after treatment because of insufficient rainfall, use a rotary hoe or shallow cultivation to improve performance.  Refer to label for additional approved tank-mix combinations.
Selected annual grasses and broadleaf weeds (Refer to label for specific weeds controlled.)	<b>Ramrod</b> ® 4F (propachlor) Monsanto	4 to 5.5 qts.	Preemergence.	Most effective if 1/3 to 3/4 inch of rainfall occurs within 10 days after application. Weed control spectrum from Ramrod® is less extensive than other preemergence herbicides. However, it can be tank-mixed with atrazine for additional weed control. These herbicides are available in the product Ramrod® and atrazine by Monsanto.

**Table 3 (continued). Preplant Incorporated, Preplant Surface Applied, and Preemergence Herbicides for Residual Control**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Prowl 3.3 EC</b> ® (pendimethalin) American Cyanamid	1.8 to 4.8 pts.  (rates depend on soil texture and organic matter content)	Preemergence.	Most effective if rainfall or overhead irrigation is received within 7 days of application. Plant corn at least 1½ inches deep to ensure good seed coverage and help avoid injury. Prowl 3.3 EC® can be used in combination with other products such as atrazine and Bladex® for expanded weed control. Consult product label for rates and rotational restrictions.
Annual broadleaf weeds and a few annual grasses	<b>Pursuit 2AS</b> ® (imazethapyr) American Cyanamid	4 oz.	Preplant, preplant incorporated, preemergence or early postemergence.	<b>Use only on imidazolinone resistant or tolerant (IR or IT) corn varieties. Consult your seed dealer.</b> Refer to the label for specific weed treatment stages of growth for postemergence applications. Pursuit® may be mixed with several other herbicides for broader spectrum grass and broadleaf weed control. Do not rotate to wheat for 4 months, field corn for 8½ months and cotton or sorghum for 18 months after applying Pursuit®. Refer to the label for other crop rotation restrictions. Postemergence application should include the use of a surfactant or crop oil concentrate <b>plus</b> liquid fertilizer solution. Refer to label.
Numerous annual broadleaf weeds and some annual grasses. Some activity on yellow and purple nutsedge.  (Refer to label for specific weeds controlled.)	<b>Contour 3.38L</b> ® (imazethapyr plus atrazine) American Cyanamid	1.3 pts.	Preplant incorporated, preemergence and postemergence.	<b>Apply Contour® only on corn varieties (IR/IT) warranted to possess resistance/tolerance to Pursuit® (imazethapyr) herbicide.</b> Postemergence applications should include a surfactant or crop oil concentrate <b>and</b> a liquid fertilizer solution. Refer to label. This product offers expanded weed control over Pursuit® used alone. Refer to label for additional recommendations and precautions for rotational crops.
Crabgrass, junglerice, pigweed (carelessweed), purslane  Weeds usually not controlled include <i>Brachiaria</i> spp. (signalgrass), browntop panicum, johnsongrass and Texas panicum (Coloradograss)	<b>Princep 4L</b> ® <b>Princep Caliber 90</b> ® (simazine) Novartis	2.0 to 3.0 qts. 2.2 to 3.3 lbs.	Preemergence.	Use in eastern Texas on medium textured soils. Plant only corn within 12 months after application. If soil remains dry, incorporation by shallow cultivation may improve control. Do not graze treated areas during the year of treatment.

**Table 4. Postemergence and Post-directed Herbicides**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Many annual grasses, rhizome johnsongrass and selected broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Accent®</b> (nicosulfuron) DuPont	0.67 oz.	Postemergence when grasses are 1 to 12 inches tall. See label for optimum weed height. Apply after corn reaches the 2-leaf stage through the 10-leaf stage.	Do not use where organophosphate materials have been or will be applied except as specifically allowed on the product label. Always add surfactant or crop oil concentrate. Do not apply to stressed corn. See label for specific rotational crop restrictions. Do not cultivate for at least 7 days after application. Do not exceed 1½ oz./A per year. Avoid spray drift to non-target crops, especially sorghum. Take special care to clean spray equipment properly after use, as per label.  <b>Note: May be tank-mixed with atrazine, Buctril®, Banvel® or Marksman® for increased broadleaf activity.</b>
Annual grasses and broadleaf weeds  (Refer to label to specific weeds controlled.)	<b>Basis Gold®</b> (nicosulfuron + rimsulfuron + atrazine) DuPont	14 oz.	Postemergence when corn is up to 12" tall. Do not apply to corn taller than 12" or exhibiting 6 collars.	Apply when weeds are small, generally 2-4 inches tall. Refer to label for specific recommendations. This combination product offers limited residual activity, especially if rainfall is received within 5 to 7 days after application.
Some annual grasses, rhizome johnsongrass and many annual broadleaf weeds  (Refer to label for specific weeds controlled.)  Suppresses morningglory	<b>Beacon®</b> (primisulfuron) Novartis	0.76 oz. 0.38 + 0.38 oz. or 0.50 + 0.25 oz. split application for johnsongrass	Postemergence. When corn is 4 to 20 inches tall. Optimum weed height ranges from less than 1½ to 9 inches. See label for specific weed species.	Do not use with organophosphate insecticides unless specifically allowed on label. Do not apply if corn is stressed. Add spray adjuvant or crop oil concentrate as per label instructions. Do not apply through irrigation equipment. Do not cultivate for at least 7 days after treatment. Follow equipment cleaning instructions completely.  <b>Note: May be tank-mixed with 2,4-D, Banvel® and Buctril® for increased broadleaf activity.</b>
Numerous broadleaf weeds and a few grasses. Refer to label for specific weeds and optimum treatment height.	<b>Exceed 65 WDG®</b> [prosulfuron (32.3%) plus primisulfuron (32.3%)] Novartis	1.0 oz.  (1 water-soluble packet per 4 acres)	Postemergence to corn 4 to 48 inches tall. Use directed sprays if corn exceeds 24 inches tall.	Individual weeds vary greatly in susceptibility to this combination product. Consult label for specific weed problems. Add nonionic surfactant or crop oil concentrate to spray mixture. Refer to label for additional precautions regarding application and rotational crop restrictions.

(continued)



**Table 4. Postemergence and Post-Directed Herbicides**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
<p>Small annual grasses and broadleaf weeds</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>AAtrex 4L ® or atrazine 4L</b> <b>AAtrex Nine-O ®</b> (atrazine) Novartis and others</p>	<p>up to 2.0 qts.  up to 2.2 lbs.</p>	<p>Postemergence topical spray before weeds exceed 1½ inches and corn is less than 10 inches tall. Layby applications may be made when corn is 20 to 30 inches high and weeds are not more than 1½ inches high.</p>	<p>Do not plant treated areas to any crop except corn and sorghum until the following year. If applied after June 10 or on the High Plains under arid conditions, a crop of untreated corn or sorghum should be planted preceding the next rotational crop. The total atrazine applied per acre per calendar year may not exceed 2.5 lbs. active ingredient (i.e., 2.7 lbs. of AAtrex Nine-O ® , or 2.5 qts. of atrazine 4L).</p>
<p>Cocklebur, morningglory, pigweed, sunflower, and other broadleaves</p>	<p><b>2,4-D amine or oil soluble amine</b> (2,4-D) Several manufacturers</p>	<p>0.25 to 1.0 pt. ( 4 lbs./gal. product)</p>	<p>Postemergence.</p>	<p>Use as directed spray after corn exceeds 10 inches and before tasseling. Do not use near susceptible crops. High rates may injure corn. Corn hybrids vary in tolerance to 2,4-D. Use surfactant or crop oil concentrate in mixture to improve performance.</p>
<p>Cocklebur, morningglory, pigweed, sunflower, and other broadleaves</p>	<p><b>Banvel ®</b> (dicamba) Sandoz</p>	<p>0.5 to 1 pt. (4 lbs./gal. formulation)</p>	<p>Postemergence. Spike to 36 inch tall corn.</p>	<p>Apply 1 pt. rate from emergence to 8 inch tall corn or 5-leaf stage, whichever comes first. Reduce the rate to ½ pt. on coarse-textured soils, and on corn 8 to 36 inches tall. Use directed sprays if needed for adequate weed coverage. Do not use near susceptible crops.</p>
<p>Cocklebur, morningglory, pigweed, sunflower, and other broadleaves</p>	<p><b>Clarity ®</b> (diglycolamine salt of dicamba) BASF</p>	<p>0.5 to 1.0 pt.</p>	<p>Postemergence from spike to 8" tall corn.</p>	<p>Do not apply preemergence to corn grown on soils with less than 2% organic matter. Can be tank-mixed with other herbicides for expanded weed control. When tank-mixed with Accent or Beacon, corn may be up to 12" tall. Consult label.</p>
<p>Several annual broadleaf weeds</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>Marksman ®</b> (dicamba + atrazine) BASF</p>	<p>2.0 to 3.5 pts.</p>	<p>Early postemergence from corn emergence through 5th true leaf stage.</p>	<p>Do not apply through any type of irrigation system. Do not use aerial application equipment if sensitive broadleaf crops are growing near the area to be treated. Corn hybrids vary in tolerance.</p>

(continued)

**Table 4. Postemergence and Post-directed Herbicides**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Numerous annual broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Scorpion III®</b> ([flumetsulam 9.3%] plus clopyralid (25%) plus 2,4-D (50%)) Dow Agrosciences	0.25 lb.  (1 water-soluble packet per 2 acres)	Postemergence to corn up to 8 inches tall, and weeds in 2 to 4 true-leaf stage.	Add nonionic surfactant to spray mixture. Applications to corn taller than 8 inches should be directed to the weeds but away from the corn to reduce the potential for brace root injury. Refer to label for precautions when following Broadstrike® plus Dual®, and other application and crop rotation information. Can be tank-mixed with other products for expanded weed control. Refer to Scorpion III® label.
Broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Hornet®</b> (clopyralid + flumetsulam) Dow Agrosciences	1.6 to 4 oz. postemergence  3.2 to 4.8 oz. preemergence	Postemergence from spike stage to 24" tall corn. Can also be applied preemergence, however, higher use rates are required.	Test corn lines for crop tolerance. Rate varies by soil type and weed species and size. May be tank-mixed with other herbicides such as Dual®, Dual II®, Frontier®, Harness®, MicroTech®, or Surpass®.
Numerous annual broadleaf weeds, and yellow and purple nutsedge  (Refer to label for specific weeds controlled.)	<b>Permit 75 WDG®</b> (halosulfuron) Monsanto	.67 to 1.33 oz. (rate depends on weed species and size)	Postemergence from spike to layby stage of corn. Use drop nozzles to ensure good weed coverage if necessary.	Always use a nonionic surfactant or crop oil concentrate with Permit®. Make no more than 2 applications per season or a total of 2% oz./A per season. Permit® may be used with several other postemergence broadleaf and grass herbicides for expanded weed control. Refer to the individual product labels for application precautions and rotational crop restrictions.
Numerous annual broadleaf weeds and some annual grasses. Some activity on yellow and purple nutsedge.  (Refer to label for specific weeds controlled.)	<b>Resolve SG®</b> (imazethapyr plus dicamba) American Cyanamid	5.3 oz. (1 packet per 2.5 acres)	Postemergence before weeds are 3 inches tall and corn is 12 inches tall.	This product offers expanded broadleaf control over Pursuit® used alone. Apply Resolve® only on corn varieties warranted to possess resistance/tolerance to direct applications of Resolve® (IMI-Corn). A nonionic surfactant and liquid fertilizer solution must be added for optimum weed control. Resolve® can be tank-mixed with other products for expanded weed control. Refer to label for additional recommendations, precautions and rotational crop restrictions.
Selected broadleaf weeds and grasses  (Refer to label for specific weeds controlled.)	<b>Lightning®</b> (imazethapyr + imazapyr) American Cyanamid	1.28 oz.	Postemergence before weeds are 4" tall and corn is 12" tall.	Use only on IMI-corn hybrids with resistance/tolerance to imidazolinone herbicides (IR/IT). Add both surfactant and liquid fertilizer. Apply only once per growing season.

(continued)

**Table 4. Postemergence and Post-directed Herbicides**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
Broadleaf weeds and grasses  (Refer to label for specific weeds controlled.)	<b>Liberty</b> ® (glufosinate) AgrEvo	1 to 1.75 pts.	Postemergence until corn is 24" tall or in the V-7 stage of growth. Apply between dawn and 2 hrs. before sunset.	Use only on corn resistant to glufosinate-ammonium (Liberty Link). Do not apply if crop is stressed and make no more than two applications of Liberty®. Rainfall after 4 hrs.
Numerous annual broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Basagran</b> ® (bentazon) BASF	1.5 to 2.0 pts.	Postemergence when weeds are small and actively growing. Growth stage of weed determines rate (see label).	Corn is tolerant at all growth stages. Slight speckling may occur but corn generally outgrows this condition.  <b>Note: Basagran® may be mixed with atrazine 4L, or with AAtrex Nine-O® plus crop oil concentrate to control a broader spectrum of weeds. See label for cocklebur, morningglory and yellow nutsedge application instructions. Repeat treatment may be needed.</b>
Numerous annual broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Buctril</b> ® (bromoxynil) Rhone Poulenc	1.0 to 1.5 pts.	Postemergence before weeds are 4 to 6 inches tall and when corn is in the 2- to 8- leaf stage.	Application when weeds are small is important. Do not add surfactant or mix with liquid fertilizers. Temporary leaf scorch to corn may occur under cool, cloudy conditions but will soon disappear. Do not plant rotational crops until the following season. Useful for broadleaf weed control near crops where volatile herbicides might cause injury. Refer to label for specific weed susceptibility. May be applied in tank mixture with atrazine to broaden the spectrum of weed control.
Small annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Extrazine II 4L</b> ® <b>Extrazine II DF</b> ® (cyanazine + atrazine) DuPont	1.3 to 2.0 qts. 1.3 to 2.2 lbs.	Postemergence up to 1½ inch weed height, and 8 inches (5th leaf) corn.	Do not use on sand or loamy sand soils. Rates may vary, depending if Bladex® or atrazine was used preemergence.
Annual broadleaf weeds and some grasses  (Refer to label for specific weeds controlled.)	<b>Evik 80W</b> ® (ametryne) Novartis	0.75 to 2.5 lbs.	Postemergence directed after smallest corn is 12 inches tall and weeds are less than 2 inches tall.	Do not apply over top of corn. Gauge wheels or leaf lifters are recommended to prevent spray contact with corn leaves. Allow 30 days after application before harvesting, grazing or feeding forage to livestock. Do not apply within 3 weeks of tasseling. Wheat, oats and rye may be planted the fall after application.

(continued)



**Table 4 (continued). Postemergence and Post-directed Herbicides**

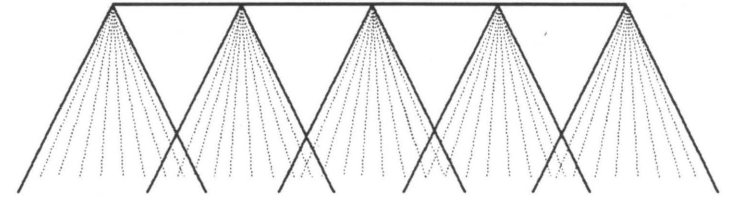
Weeds controlled	Product Herbicide common name Company	Application rate per acre	Time to apply	Remarks
Small annual broadleaf weeds and grasses  (Refer to label for specific weeds controlled.)	<b>Gramoxone Extra</b> ® (paraquat dichloride) Zeneca	13 to 24 oz.	Post-directed sprays only.	Always use a nonionic surfactant or crop oil concentrate with Gramoxone Extra®. Apply when corn is at least 10 inches tall with nozzles arranged to spray no higher than the lower 3 inches of corn stalks. Use shielded sprayer designed to maintain uniform spray height and keep spray off plants. Corn foliage sprayed will be injured but the crop should recover and develop normally.
Selected annual grasses and broadleaf weeds  (Refer to label for specific weeds controlled.)	<b>Karmex 85DF</b> ® (diuron) DuPont	.75 to 1 lb.	Postdirected when corn < 20 inches and weeds < 3 inches.	Apply in combination with non-pressurized nitrogen solution. If nitrogen solution is not used, apply 1 lb./A with surfactant.
Seedling annual broadleaf weeds and grasses  (Refer to label for specific weeds controlled.)	<b>Lorox DF</b> ® (linuron) DuPont	1.25 to 3.0 lbs.	Postemergence directed spray. Use on 15-inch or taller corn and weeds not more than 5 inches high.	Do not apply within 60 days of harvest. Do not plant crops other than corn within 4 months after treatment. Keep herbicide solution from contacting corn plant.
Annual broadleaf weeds and grasses  (Refer to label for specific weeds controlled.)	<b>Roundup Ultra</b> ® (glyphosate) Monsanto	1.0 qt. maximum (refer to label for specific rates)	Postemergence through hooded sprayer when corn is at least 12" tall.	This application is approved only with hooded sprayers approved for use by Monsanto. A hooded sprayer is a type of shielded applicator, where the spray pattern is enclosed on the top and all four sides by a "hood," thereby shielding the crop from the spray solution. Consult the supplemental label for more information.
Sunflower, cocklebur, pigweed and other selected broadleaf weeds.  Nutsedge spp.	<b>Tough</b> ® (pyridate) Novartis	1 to 2 pts.	Postemergence when weeds are in 2 to 4 true-leaf stage.	Tough® burns back topgrowth of nutsedge; regrowth may occur. Verify selectivity with seed corn company before applying to inbred line or variety of seed corn. Can be tank-mixed with Accent®, Banvel®, Bladex® or atrazine.

(continued)

**Table 4 (continued). Postemergence and Post-directed Herbicides**

Weeds controlled	Product (Herbicide common name) Company	Application rate per acre	Time to apply	Remarks
<p>Annual grasses and broadleaf weeds</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>Treflan 5 (5EC) ®</b> <b>Treflan EC ® (4EC)</b> (trifluralin) Dow Agrosciences</p>	<p>0.6 to 1.6 pts. 0.75 to 2.0 pts.</p>	<p>Postemergence and incorporated when corn is 8 inches or taller. Use drop nozzles if corn foliage will prevent uniform coverage of the soil surface.</p>	<p>Emerged weeds will not be controlled. Cultivate before application to cover the base of the corn brace roots and remove established weeds. May be incorporated with a properly adjusted sweep type or rolling cultivator. Incorporate with sweep type cultivator at 6 to 8 mph to move treated soil into the crop row. Do not apply to corn grown for seed. Do not apply as a preplant or preemergence treatment.</p>
<p>Annual grasses and broadleaf weeds</p> <p>(Refer to label for specific weeds controlled.)</p>	<p><b>Prowl ®</b> (pendimethalin) American Cyanamid</p>	<p>1.8 to 3.6 pts.</p>	<p>Postemergence and incorporated, when corn is 6 to 8 inches tall or as late as the time of last cultivation. Use drop nozzles if corn foliage will prevent uniform coverage of the soil surface.</p>	<p>Field must be cultivated and all emerged weeds destroyed before application. Rolling cultivator should be operated at a speed to throw at least 1 inch of soil over the base of the corn plants. This covers small weeds and prevents herbicide from directly contacting the zone of brace root formation. Uniformly incorporate herbicide into soil to a depth of 1 to 2 inches with rolling cultivators. Move treated soil over bases of corn plants in the row. Do not apply Prowl ® before use as a postemergence incorporated treatment. Rotational crops may be planted the following year. May be used in combination with atrazine for expanded broadleaf weed control.</p>

# Boom Sprayer Calibration



1. Determine nozzle spacing.
2. Refer to the table below for length of calibration course.
3. Mark off the calibration course on the actual area to be sprayed.
4. Record the time required to drive the calibration course at the desired field gear and rpm to be used while spraying.
5. Park the tractor, maintain the rpm used to drive course, turn on the sprayer and set it at the proper pressure for desired nozzle tips.
6. Catch water from one nozzle for the time equal to that required to drive calibration course.
7. Ounces of water caught = gallons per acre.
8. Divide gallons per acre into the number of gallons in spray tank to determine how many acres will be sprayed. Add the appropriate amount of herbicide for the number of acres to be sprayed.

**Chart for Nozzle Spacing and Length of Calibration Course**

<b>Nozzle Spacing (inches)</b>	18	20	30	40
<b>Length of Calibration Course* (linear feet)</b>	227	204	136	102

*\*To determine the calibration course for a nozzle spacing not listed, divide the spacing expressed in feet into 340 (340 sq. ft. = 1/128 of an acre).*

**Example:** Calibration distance for 19-inch nozzle spacing =  $340 \div 19/12 = 215$  feet).



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