DIVISION OF AGRICULTURE
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CHAPTER 8

Weed Control in Corn

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Weeds compete with corn to reduce yields, cause harvesting losses and produce seed that increase the soil seedbank. Even a light infestation of weeds can reduce yields by 10% to 15%. Heavy infestations may reduce yields as much as 50% if left unchecked during the season. Ideally, weeds should be controlled throughout the season, including post-harvest. However, the most critical weed-free period to maintain maximum yields is the first 6 weeks after planting.

The potential size of the ear is determined over a 3-week period starting about 6 weeks after emergence. It is critical to have the corn growing well without stress from competing weeds at this time. Research has shown that one morningglory or pigweed plant per 4 feet of row that is allowed to remain uncontrolled for 4 weeks after emergence will reduce yields by 4%.

Late-season weed infestations have less effect on produced yields but may interfere with harvesting and reduce harvestable yields. Late-season weeds are also very efficient at producing seed to replenish the soil seedbank. If fields contain glyphosate-resistant pigweed, every effort should be made to prevent these plants from producing seed. Effective and economical weed control in corn requires an integrated program that includes good cultural practices such as crop rotation, water management, judicious mechanical practices, proper herbicide selection and proper weed identification.

Several herbicides and control methods are mentioned in this chapter, but producers should also refer to the Extension publication MP44, *Recommended Chemicals for Weed and Brush Control*, for the most up-to-date recommendations. MP44 is updated annually to reflect the most current information on herbicide label changes and revised recommendations based on research data. It is available online at www.uaex.uada.edu and from county Extension offices throughout the state. The color photographs at the end of this chapter depict some of the more common weed seedlings found in corn in Arkansas.

Farmers have known for many years that **cultivation often prunes corn roots and can reduce yields**. Better available herbicide technology has allowed more reliance on chemical weed control and less on cultivation. It is estimated that near 100% of the corn grown in Arkansas receives at least one herbicide application. The introduction of Roundup Ready and other traits providing tolerance to over-the-top applications of non-selective herbicide have reduced cultivation almost 100% once corn emerges. However, cultivation is still a viable means to control weeds as long as weeds are small. The drawbacks to in-crop cultivation include root pruning, loss of moisture and loss of residual herbicides applied prior to cultivation.

The ten most troublesome weeds in Arkansas corn are morningglory, Palmer amaranth (pigweed), johnsongrass, broadleaf signalgrass, barnyardgrass, nutsedge, sicklepod, velvetleaf, prickly sida and crabgrass. Recommended control measures for these weeds are usually quite effective. Adverse weather conditions can cause control failures. The grassy weeds and pigweed usually compete most heavily with corn during the early season, while morningglory species are often most troublesome by germinating after layby and causing harvesting problems.

Possibly no other crop has as many weed control options as corn. There are currently over 130 different herbicide brand names labeled for weed control in this crop of 85 million U.S. acres. However, many of these brand names are simply various mixtures of a much smaller number of active ingredients. There are approximately 30 brand names listed in Arkansas' MP44, *Recommended Chemicals for Weed and Brush Control*.

Atrazine is the basis of most chemical weed control programs in Arkansas corn, with over 80% of the acres treated receiving at least one application. Atrazine may be applied alone or in combination with other herbicides either preemergence or postemergence. Other herbicides are often mixed with atrazine to broaden the weed spectrum or to offer more residual weed control. Residual weed control with atrazine can vary based on the number of years it has been applied on a given field. Rapid microbial breakdown of atrazine can increase and reduce residual activity after a couple years of application without rotation. The occurrence of weeds with resistance to atrazine has not be documented in Arkansas.

Metolachlor (Dual II Magnum), acetochlor (Degree, Harness) and dimethenamid (Outlook) are acid amide – sometimes called chloroacetamide – herbicides. Although atrazine has some activity on grassy weeds, it is considered a broadleaf product. The acid amide herbicides have much more activity on grassy weeds than on broadleaf weeds. Pyroxasulfone (Zidua) has been added to the MP44 publication recently as another chemistry and option with a low use rate. Mixtures of atrazine and one of the acid amides offer broad-spectrum weed control with good residual properties. (See Table 8-1.)

Due to concerns about atrazine moving into underground aquifers, there are some label restrictions governing mixing, loading and application in proximity to water wells and reservoirs. The EPA is considering additional restrictions that, if implemented, could make atrazine use in Arkansas impractical. University and industry scientists have worked diligently over the past few years to identify a herbicide with similar weed control attributes to atrazine but without the regulatory restrictions. Bleaching herbicides (HPPD) such as Callisto (mesotrione) and Capreno (thiencarbazone + tembotrione) have been added to MP44 as an alternative in atrazine-sensitive areas.

Herbicide-tolerant corn hybrids are available that will allow use of glyphosate (Roundup Ready® hybrids) or Liberty (Herculex® and SmartStax® hybrids) (see Table 8-2). There are several formulations of glyphosate available and labeled for use on Roundup Ready® corn. Rates and use patterns vary by formulations, and labels should be checked prior to using any herbicide. Sequential applications of glyphosate in combination with atrazine, or HPPD herbicides such as Callisto and Capreno, are very effective for control of a broad spectrum of both grass and broadleaf weeds. Due to the development and spread of glyphosate-resistant Palmer amaranth and other weed species, multiple herbicide modes of action should be incorporated into the herbicide application.

Herbicide-resistant weeds are becoming more of a problem in all crops. Pigweed (Palmer amaranth) with resistance to glyphosate has become a major issue in Arkansas. Although there are many herbicides available for pigweed control in corn including atrazine, Dual II Magnum, Clarity, etc., it is important to rotate and use multiple herbicide modes of action to prevent further resistance in pigweed populations. Since most corn in Arkansas is rotated with other crops, there have been fewer weeds identified as being resistant to corn herbicides. This does not diminish the importance of resistance management and maintaining a close watch for suspected resistance. Glyphosate-resistant johnsongrass and Italian ryegrass are increasing in magnitude across Arkansas. If weeds are not controlled by a particular herbicide application and resistance is suspected, they should be treated with an alternative herbicide and the local county agent should be contacted. The University of Arkansas will collect weed specimens and test for resistance. Weeds that are suspected to be herbicide resistant should not be allowed to produce seed in the field.

Preemergence (PRE) herbicides are applied after the corn has been planted and prior to emergence. Some herbicides such as Dual II Magnum are taken into the weedy plants through the emerging coleoptile and have little or no activity on emerged weeds. These herbicides must be applied before targeted weeds germinate. Dual, Outlook and Zidua primarily control grasses such as crabgrass, barnyardgrass and broadleaf signalgrass but also suppress yellow nutsedge and offer control of pigweeds and other small-seeded broadleaves.

Figure 8-1. Many options for excellent weed control are available in corn. However, best results have been achieved with two applications starting with a residual herbicide PRE, followed with a POST application including atrazine by V4.

Combinations of these products with atrazine as tank mixes or premixes applied preemergence will control most seedling grasses and broadleaf weeds for 3 to 4 weeks. Rainfall or irrigation is required to incorporate the herbicides with the soil for activity. This is often referred to as "activation" of the herbicide. However, large rains immediately after application may move some of the herbicide into contact with the germinating corn seedling and may actually be taken into the germinating seed as it imbibes water. This usually results in delayed emergence and some crop injury. Typical injury symptoms include buggy whipping and slowed growth. Under good growing conditions, the symptoms are usually only cosmetic and the corn resumes normal growth 7 to 10 days after emergence. (See Table 8-3, Preemergence.)

Postemergence (POST) herbicides are applied after the corn has emerged and most often after the weeds have emerged. Postemergence herbicides are used to control emerged weeds that have escaped through the preemergence herbicides or to extend the residual weed control beyond what

Figure 8-2. Buggy whipping or leaf wrapping is caused when the leaves fail to unfurl. New leaves are trapped in the leaf below, resulting in abnormal growth as shown. Factors other than herbicides can also cause this symptom. Buggy whipping is usually a temporary condition, and plants will likely recover except under the most extreme conditions.

can be achieved with preemergence herbicides alone. For general control recommendations, see Table 8-3, Postemergence.

Atrazine, 2,4-D, Clarity (dicamba), Callisto, Capreno and many others control broadleaf weeds when applied postemergence. Atrazine may be applied until corn reaches 12 inches tall, Clarity and 2,4-D over the top to 5-leaf corn and Callisto may be applied on corn up to 30 inches tall or up to V8 growth stage. Callisto and atrazine have some activity postemergence on grassy weeds but may provide unacceptable control if used alone on grasses over 1 inch tall. Glyphosate on tolerant hybrids and Accent Q (nicosulfuron) on conventional hybrids are very effective when applied to most grassy weeds less than 4 inches tall. Always check the herbicide label for crop stage or height cutoff for POST herbicide applications. If the height restriction has past, drop nozzles or row hoods should be used to keep herbicide out of the whorl.

Nutsedge and rhizome johnsongrass are particularly troublesome perennial weeds. Permit herbicide applied at 1.33 ounces per acre when nutsedge is 4 to 12 inches tall is the most effective treatment in conventional corn. However, if nutsedge is allowed to reach 4 to 12 inches tall, severe crop competition has already occurred. Heavy infestations of nutsedge may require sequential applications. An earlier treatment may be required to prevent nutsedge from competing

with the crop. No more than 2.66 ounces of Permit may be applied in one growing season. Repeat applications of glyphosate, Accent Q or Steadfast Q may be required for acceptable rhizome johnsongrass control. Accent Q and Steadfast Q may be applied over the top of corn until 20 inches tall or 5 leaf-collars, whichever is most restrictive.

Glyphosate-resistant pigweed populations can be greatly reduced in corn and grain sorghum rotations because atrazine, dicamba and other effective herbicide modes of action can be used. However, growers should remain diligent and control late-season pigweed escapes quickly following harvest and either apply herbicides or use tillage to prevent post-harvest populations of pigweed from producing seed. Late-emerging pigweed can produce enough seed to build up the soil seedbank and cause major problems the following season. Applications of Sharpen plus 2,4-D, Gramoxone + Valor, or Gramoxone + Dual can provide both postemergence and residual control of pigweed following harvest. (See Table 8-3, Post Harvest.)

Figure 8-3. Glyphosate-resistant Palmer amaranth (pigweed) will grow and produce seed following corn harvest. Every effort to remove Palmer amaranth populations prior to seedhead formation should be taken. These may include tillage, herbicide application, hand removal or all three.

Glyphosate-resistant Italian ryegrass germinates in early fall and depending on temperatures through the winter and early spring. Populations are becoming an issue, especially south of the I-40 corridor. Currently the best control for glyphosate-resistant ryegrass is to apply a fall residual herbicide such as Dual Magnum or Zidua sometime between October 20 and November 1. These herbicides will prevent ryegrass from emerging through the winter but will not control ryegrass that has already emerged. For emerged ryegrass, Gramoxone should be added to the fall residual application. Fall applications of Leadoff (rimsulfuron + thifensulfuron) will also control ryegrass as long as the populations are not ALS resistant. If fields have been in wheat and ALS chemistry has been used for ryegrass control, most likely the ryegrass population is glyphosate and ALS resistant. It is very important to remove any ryegrass prior to planting corn. Populations that survive through the winter are very difficult to kill in the spring, and in most cases, two applications of Gramoxone will be required for control. If corn is planted into glyphosate-resistant ryegrass, not many options are available. Steadfast Q is the best option for control as long as populations are not also ALS resistant. If ALS resistant, there are no current available options for control of glyphosate-resistant ryegrass in corn.

Figure 8-4. Glyphosate-resistant Italian ryegrass is very difficult to kill in the spring. Corn should not be planted in fields prior to removal of Italian ryegrass. There are limited options for control of this weed once corn emerges. Best management of glyphosate-resistant Italian ryegrass is achieved with residual herbicides applied in the fall.

General weed control recommendations – Many producers have transitioned into a "one application and done" method for weed control in corn. An example would be to wait until the V3 to V4 growth stage and apply a tank mixture of atrazine + metolachlor + mesotrione + glyphosate (Halex GT + AAtrex). Although in some situations this program has resulted in adequate weed control, latest data show some yield (10-15 bu/A) is often lost due to early competition with weeds. To avoid yield loss due to early-season weed competition, growers should plant into a clean seedbed and plan on a two-application system beginning with a preemerge (PRE) herbicide such as Dual II Magnum, Zidua or Outlook, etc. POST applications with tank mixture of glyphosate and products containing mesotrione (Callisto), atrazine, metolachlor or pyroxasulfone (Zidua, Anthem) can be applied once weeds break or prior to 12-inch corn. Atrazine cannot be applied once corn grows above 12 inches tall. Halex GT and Callisto can be applied to corn that is 30 inches tall or V8 stage, whichever is most restrictive. Soil residual herbicides like Callisto should be applied as late as possible to prevent late-season morningglories and pigweed from germinating and causing harvesting problems. If a stand of corn is lost, soybeans can be planted behind Dual II Magnum, Outlook, Zidua and other chloroacetamides without injury. (See recommendations in Tables 8-1 and 8-3.)

Herbicides from previous crops can carry over to corn and potentially cause stand problems or yield loss. Carryover intervals for common herbicides can be found in Table 8-4 and Extension publication MP519, *Row Crop Plant-Back Intervals for Common Herbicides* (available at www.uaex.uada.edu). Soybean herbicides including fomesafen (Reflex, Flexstar, etc.) seem to be the most problematic, especially in late-season soybeans or situations where fomesafen was applied multiple times. Corn should not be planted within 10 months following fomesafen application. Preemerge soybean herbicides containing Classic (chlorimuron) also have potential to carry over to corn. Rice herbicides Newpath and Clearpath have 8.5-month and 10-month rotational intervals to corn, while League has a 12-month rotational interval.

Killing a skippy stand for replant – If corn fields fail to reach a desired plant population due to poor environmental conditions or other factors, producers should kill the existing partial stand prior to replanting the field. No producer wants to replant a field, especially with seed costs as high as they are. So, first, producers should determine the cause of the stand failure or reduction to minimize the loss from the second planting. Also, producers should determine whether the corn seedlings may just be delayed in emergence. Several factors including planting depth, moisture, preemerge herbicide and insects could potentially reduce corn stands or create stand failures. In many cases, corn seedlings may still be trying to push up out of the soil. Therefore, before deciding to kill the current stand, make sure that all plants are emerged that are trying to emerge. If the factors above are considered and a replant is **imminent**, there are several ways to kill an existing stand of corn. Corn seedlings are much easier to kill at the 1-leaf stage than the spike stage, mainly due to spray coverage. Table 8-3 (Removing Partial Corn Stands for Replant) provides herbicide recommendation that will effectively remove corn seedlings. When making these applications, always check with the herbicide label to confirm the plant-back period for corn. According to our data, spraying a pre-mixture of paraquat (Gramoxone) plus metribuzin (Sencor 3 oz), or atrazine (AAtrex 1 pt), will effectively kill the existing stand, and the field can be replanted immediately.

Table 8-1. Weed Response Ratings for Corn Herbicides

HERBICIDES	MODE OF ACTION	GRASSES											BROADLEAVES												SEDGES
		Barnyardgrass	Broadleaf Signalgrass	Crabgrass	Fall Panicum	Foxtail	Goosegrass	Red Rice	Rhizome Johnsongrass	Ryegrass	Seedling Johnsongrass	Shattercane	Bigroot Morningglory	Cocklebur	Common Ragweed	Honeyvine Milkweed	Horsenettle	Lambsquarters	Morningglory	Pigweed sp.	Prickly Sida	Purslane	Sicklepod	Smartweed	Velvetleaf	Yellow Nutsedge
Preemergence																									
Surestart II	2, 4, 15	9	7	9	9	9	9	8	0	8	6	7	-	-	8	-	-	9	9	8	9	9	8	7	7	6
Prowl + Atrazine	3, 5	9	6	9	9	9	9	8	0	-	7	7	3	8	9	5	2	9	8	9	9	9	7	9	6	4
Atrazine	5	6	4	7	3	6	6	8	0	-	2	0	4	9	9	6	5	9	8	9	9	9	8	9	8	0
Anthem ATZ	5, 15	9	8	9	8	9	9	8	0	9	4	-	8	8	8	-	-	5	8	9	8	-	8	-	7	7
Verdict	14, 15	8	7	8	7	8	8	7	0	-	-	-	5	-	-	-	-	7	8	9	7	-	5	-	-	-
Anthem	15	9	8	9	8	9	9	8	0	9	4	-	-	-	-	-	-	5	6	9	7	-	-	-	5	7
Zidua	15	9	8	9	8	9	9	8	0	9	4	-	-	-	-	-	-	5	6	9	7	-	-	-	5	7
Dual II Magnum + Atrazine	15, 5	8	8	9	9	9	9	9	0	9	4	7	4	8	9	6	3	9	8	9	9	9	8	4	7	7
Degree + Atrazine	15, 5	9	7	9	9	9	9	8	0	8	6	7	4	8	9	6	3	9	8	9	9	9	8	4	7	7
Micro-Tech + Atrazine	15, 5	8	7	9	8	9	9	9	0	8	3	7	3	8	9	5	3	9	8	9	9	9	8	8	6	6
Outlook + Atrazine	15, 5	9	8	9	9	9	9	8	0	8	6	7	4	8	9	6	3	9	8	9	9	9	8	6	6	7
Lexar	15, 5, 27	9.5	9.5	9.5	8	8	7	8	0	9	3	5	4	9	9	7	3	9	9	10	9.5	9	9	9	10	7
Callisto	27	7	7	9	-	7	-	7	0	-	0	0	-	8	7	8	7	9	9	9	9	-	5	9	9	2
Postemergence																										
Accent Q	2	8	8	5	7	8	-	-	8	6	9	9	7	5	6	2	2	3	6	0	-	-	7	7	6	3
Permit	2	0	3	3	3	0	3	0	3	-	3	0	-	-	5	-	-	5	5	0	7	7	4	6	6	9
Steadfast Q	2	8	9	8	8	9	8	6	8	7	9	9	8	6	7	3	3	8	8	7	6	-	7	8	9	6
Permit Plus	2	0	3	3	3	0	3	0	3	-	3	0	-	-	5	-	-	6	6	0	8	8	5	7	7	10
Resolve Q	2	8	9	8	8	8	8	-	7	5	9	9	-	6	7	-	5	8	8	7	7	8	7	7	8	7
Capreno + Atrazine	2, 5, 27	9	8	9	8	-	9	9	5	6	10	-	5	9	8	6	8	9	9	9	9	9	8	9	9	5
Corvus + Atrazine	2, 5, 27	9	8	9	8	-	9	9	5	8	5	-	5	9	8	6	8	9	9	9	9	9	8	9	9	5
Capreno	2, 27	9	8	9	-	-	9	-	5	6	-	-	-	8	7	-	7	9	8	9	9	-	5	-	9	5
Corvus	2, 27	9	8	9	-	-	9	-	7	7	-	-	-	8	7	-	7	8	7	7	8	-	-	-	8	2
Realm Q	2, 27	8	7	8	8	8	8	-	7	6	9	9	-	9	9	-	7	8	8	8	9	8	7	9	9	7
2,4-D	4	0	0	0	0	0	0	0	0	0	0	0	3	9	9	9	4	8	9	8	8	9	8	5	8	0
Banvel or Clarity	4	0	0	0	0	0	0	0	0	0	0	0	8	8	9	9	6	9	9	9	-	-	8	9	8	0
Atrazine + oil	5	6	6	6	5	7	6	9	0	5	3	0	4	9	8	6	4	8	8	9	8	9	8	9	7	5
Basagran	6	0	0	0	0	0	0	0	0	0	0	0	3	9	8	5	0	5	4	0	7	7	0	9	8	7
Buctril	6	0	0	0	0	0	0	0	0	0	0	0	7	9	7	7	4	8	7	5	-	-	3	9	7	0
Glyphosate (4 lb/gal) (1 qt/A once)	9	9	9	9	9	9	9	8	9	6	10	8	-	9.5	9	7	6	9	7	9	8	9	9	7	7	4
Halex GT	9, 15, 27	9	9	9	9	9	9	9	9	5	10	8	9	9	9	-	7	9	8	9	9	9	9	9	9	5
Liberty 1 application	10	8	9	8	9	-	5	9	8	6	9	-	-	9	9	-	7	-	8	8	8	-	9	9	5	6
Paraquat directed or Hood	22	9	9	9	8	8	9	9	0	7	8	0	-	4	8	-	7	9	4	9	3	8	9	5	7	3
Callisto	27	7	7	9	7	7	7	7	0	5	0	0	-	8	7	8	-	9	8	8	9	-	5	9	9	2
Laudis	27	7	8	8	-	-	7	-	5	4	-	-	-	8	-	-	-	9	8	9	7	-	7	-	-	-

*Rating will be 0 on ALS inhibitor-resistant weeds (Group 2).
**Repeat application may be needed to achieve these ratings.

Rating scale – 0 = No Control 10 = 100% Control.

Table 8-2. Bt Corn Traits in the Southeastern U.S.

Product Trade Name (Abbreviation)	Bt Protein(s)	Level of Insect Control[1]						Herbicide Tolerance[5]	Required Refuge in the South[6]	Event(s)
		Corn Earworm (ear)	Fall Armyworm (whorl)	Corn Borers[2] (stalk)	Black Cutworm (seedling)	LCB[3] (seedling)	Corn rootworm[4] (roots)			
		Aboveground					In soil			
Agrisure Products										
Agrisure 3011	Cry1Ab mCry3A	F	F-G	E	P	G	F-G	GT LL	50%	Bt11, MIR604, GA21
Agrisure Viptera 3110	Vip3Aa20 Cry1Ab	E	E	E	G	G	---	GT LL	20%	MIR162, Bt11, GA21
Agrisure Viptera 3111	Vip3Aa20 Cry1Ab mCry3A	E	E	E	G	G	F-G	GT LL	20%	MIR162, Bt11, MIR604, GA21
Agrisure Viptera 3220	Vip3Aa20 Cry1Ab Cry1F	E	E	E	VG	VG	---	GT LL	20%	MIR162, Bt11, TC 1507, GA21
Herculex and Optimum Products										
Herculex I (HX1or HR)	Cry1F	P	G-VG[7]	E	G	G	---	LL	50%	TC 1507
Optimum Intrasect (YHR)	Cry1F Cry1Ab	F-G	VG	E	VG	VG	---	LL RR2	20%	TC 1507, MON810
Optimum Intrasect XTRA (YXR)	Cry1F Cry1Ab Cry34Ab1/Cry35Ab1	F-G	VG	E	VG	VG	E	LL RR2	20%	TC 1507, MON810, DAS-59122-7
Optimum Leptra (VYHR)	Cry1F Cry1Ab Vip3Aa20	E	E	E	VG	VG	---	LL RR2	20%	TC 1507, MON810, MIR162
YieldGard Products										
YieldGard Corn Borer (YGCB)	Cry1Ab	F	F-G	E	P	G	---	---	50%	MON810
YieldGard VT Triple (VT3)	Cry1Ab Cry3Bb1	F	F-G	E	P	G	VG	RR2	50%	MON810, MON88017
Genuity/SmartStax/POWERCORE Products										
Genuity VT Double PRO (GENVT2P)	Cry1A.105 Cry2Ab2	G-VG	E	E	P	VG	---	RR2	20%	MON89034, NK603
Genuity VT Triple PRO (GENVT3P)	Cry1A.105 Cry2Ab2 Cry3Bb1	G-VG	E	E	P	VG	VG	RR2	20%	MON89034, MON88017
POWERCORE	Cry1A.105 Cry2Ab2 Cry1F	VG	E	E	G	VG	---	LL RR2	20%	MON89034, TC 1507, NK603
SmartStax (SSX, Dow) or Genuity SmartStax (GENSS, Monsanto)	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34Ab1/Cry35Ab1	VG	E	E	G	VG	E	LL RR2	20%	MON89034, TC 1507, MON88017, DAS-59122-7

[1]E = excellent, VG = very good, G = good, F = fair, P = poor. Excellent usually means better than 95% control. Poor means less than about 30% control. [2]Southwestern corn borer, European corn borer, sugarcane borer and others. [3]Lepidopteran Bt traits do not specifically list lesser cornstalk borer (LCB) as a target pest. [4]Bt rootworm traits target western corn rootworm larvae (CRW), which occurs primarily in the Midwest. These traits are not effective against the southern corn rootworm found in Arkansas. [5]GT = Glyphosate tolerant; LL = Liberty Link (glufosinate tolerant); RR2 = Roundup Ready 2 (glyphosate tolerant). [6]See product Insect Resistance Management (IRM) documentation from the seed companies for more details. [7]Resistance to Cry1F has been reported in some areas of the Southeast.

Adapted from D. Buntin and K. Flanders, 2014, Bt Corn Products for the Southeastern United States. Based on input from the Southern Corn Insect Working Group and the Southern Row Crop Insects Group.

Table 8-3. Recommended Herbicides for Weed Control in Field Corn

ATRAZINE AND WATER QUALITY

Atrazine label restrictions regarding mixing, loading and application are discussed below. These restrictions are part of the overall ground and surface water contamination risk reduction measures. Atrazine users are strongly encouraged to follow these guidelines to comply with the label, and to share in the responsibility of preserving the future of this extremely valuable corn herbicide. **These restrictions, and the Restricted Use Pesticide designation, apply to all formulations of atrazine, and all package mix products which contain atrazine.**

Mixing, Loading and Application – Atrazine may not be mixed/loaded or used within 50 feet of all wells, including abandoned wells, drainage wells and sink holes. Atrazine may not be mixed or loaded within 50 feet of intermittent streams and rivers, natural or impounded lakes and reservoirs. Atrazine may not be applied aerially or by ground within 66 feet of the points where field surface runoff enters perennial or intermittent streams and rivers or within 200 feet around natural or impounded lakes and reservoirs. If atrazine is applied to highly erodible land, the 66-foot buffer or setback from runoff entry points must be planted to corn, seeded with grass, or another suitable crop.

Application rates – All soil applications prior to crop emergence –

***Highly Erodible Soils** (as defined by NRCS) – If conservation tillage is practiced (at least 30 percent of residue coverage at planting), apply a maximum of 2 lb a.i./acre. If residue coverage is less than 30 percent, apply a maximum of 1.6 lb a.i./acre.

***Soils Not Highly Erodible** – Apply a maximum of 2 lb a.i./acre.

Postemergence Applications – If no atrazine was applied prior to corn emergence, apply a maximum of 2 lb a.i./acre. If a postemergence treatment is required following an earlier herbicide application, the total atrazine applied may not exceed 2.5 lb a.i./acre/calendar year. Postemergence application to corn must be made before corn exceeds 12 inches in height.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
FIELD CORN				
REMOVING PARTIAL CORN STANDS FOR REPLANT				
clethodim @ 0.045 lb/A	Corn, including Roundup Ready and Liberty Link.	**Select Max** 0.97 lb/gal, 6 oz/A.	Up to 12-inch corn.	Do not plant corn for 7 days after application.
glufosinate @ 0.6 lb/A	Corn, including Roundup Ready but not Liberty Link.	**Liberty 280** 32 oz/A.	Good coverage is essential. Adding AMS may enhance control.	Note that corn with the Herculex insecticide trait is tolerant to glufosinate and will not be controlled. Corn may be replanted immediately.
paraquat + metribuzin @ 0.625 + 0.14 lb/A	Corn, including Roundup Ready and Liberty Link.	**Paraquat (2 or 3 lb/gal formulations) + Metribuzin 75DF** 40 or 26 oz/A + 3 oz/A.	Good coverage is essential.	Corn may be replanted immediately.
paraquat + diuron @ 0.625 + 0.5 lb/A	Corn, including Roundup Ready and Liberty Link.	**Paraquat (2 or 3 lb/gal formulations) + Direx 4L** 40 or 26 oz/A + 1 pt/A.	Good coverage is essential.	Corn may be replanted immediately.
paraquat + atrazine @ 0.625 + 0.5 lb/A	Corn, including Roundup Ready and Liberty Link.	**Paraquat (2 or 3 lb/gal formulations) + Atrazine 4L** 40 or 26 oz/A + 1 pt/A.	Good coverage is essential.	Corn may be replanted immediately.
PREEMERGENCE				
Many herbicide "pre-mixes" exist for field corn – too many to list here. Check the active ingredients and rates for all pre-mixes. Most individual components of these mixes are listed below and in Table 8-1.				
S-metolachlor @ 0.75 to 1.3 lb/A	Annual grasses and pigweed.	**Dual II Magnum 7.64 EC** 0.8 to 1.4 pt/A.	Preplant to preemerge.	
atrazine @ 2 lb/A	Most small-seeded annuals, annual morningglory, cocklebur, velvetleaf, smartweed and sicklepod.	**AAtrex, Atrazine** 2.5 lb/A 80W or 2 qt/A 4L or 2.2 lb/A Nine-0.	At planting.	Do not plant fall cover crops. Do not plant crops other than corn or grain sorghum in treated fields during the same season. Do not apply more than 2.5 lb/A active atrazine per season.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
alachlor + atrazine @ 1.5 to 2.25 lb/A + 1 to 1.6 lb/A	Annual grasses, pigweed, annual morningglory, common cocklebur, velvetleaf, smartweed and sicklepod.	**Micro-Tech 4L + AAtrex, Atrazine** 1.5 to 2.25 qt/A Lasso + 1.25 to 2 lb/A 80W or 1 to 1.6 qt/A 4L or 1.1 to 1.75 lb/A Nine-0. or **Lariat/Bullet 4F** 2.5 to 3.75 qt/A.	Preemergence or preplant. **Note** – This treatment can be applied to emerged corn before it exceeds 5" tall. However, weed control will be reduced if weeds exceed 2" tall.	Add additional atrazine for improved control of cocklebur and morningglory. Rainfall in 5 to 7 days is necessary for best results. With preplants, shallow incorporate 2 to 3 inches within 7 days of planting.
S-metolachlor + atrazine @ 0.75 to 1.3 lb/A + 1 to 1.6 lb/A	Annual grasses, pigweed, annual morningglory, common cocklebur, velvetleaf, smartweed and sicklepod.	**Cinch or Dual II Magnum 7.64 EC + AAtrex, Atrazine** See label for specific formulations in question. 0.8 to 1.4 pt/A + 1.25 lb/A 80W or 2 pt/A 4L to 2.0 lb 80W or 3.2 pt/A 4L. or **Bicep II Magnum 5.5 L or Cinch ATZ** 1.3 to 2 qt/A.	Preemergence or preplant.	Add additional atrazine for improved control of cocklebur and morningglory. Rainfall in 5 to 7 days is necessary for best results. With preplants, shallow incorporate 2 to 3 inches within 7 days of planting. If concerned about achieving a stand, leave atrazine out as pre and follow with atrazine early post.
dimethenamid + atrazine @ 0.56 to 0.75 lb/A + 0.75 to 2 lb/A	Annual grasses, pigweed, annual morningglory, common cocklebur, velvetleaf and smartweed.	**Outlook 6E + AAtrex, Atrazine** 12 to 16 + 0.75 to 2 qt/A 4L or **Guardsman Max 5L** 3 to 4.6 pt/A.	From 45 days preplant to preemergence up to 8" tall corn.	Same as above. Rates depend on percent organic matter. See label.
dimethenamid + saflufenacil @ 0.31 to 0.62 + 0.044 to 0.088 lb/A	Annual grasses, pigweed, velvetleaf, morningglory and horseweed.	**Verdict** 10 to 12 oz/A.	Burndown up to preemergence. **Do not** apply Verdict over the top of emerged corn.	Rainfall or overhead irrigation is required for activation. Verdict can be used as a burndown that leaves behind residual control. For best burndown activity, tank mix with glyphosate and use MSO 1 pt/A + AMS. On medium to fine soils, the rotation interval to soybeans is 30 days if you were to lose the corn crop. See label for restrictions.
acetochlor @ 1.09 to 1.97 lb/A	Annual grasses and pigweed.	**Surpass NXT** 1.25 to 2.25 pt/A.	Preplant or preemergence.	
acetochlor + atrazine @ 1.7 lb/A + 0.8 lb/A	Annual grasses, pigweed, morningglory, cocklebur, velvetleaf, smartweed and sicklepod.	**Degree 3.8 SL + Atrazine** 3.5 pt + 0.8 qt/A Atrazine 4L. or **Degree Xtra** 5 pt/A.	Preplant or preemergence.	Add additional atrazine for improved control of cocklebur and morningglory. Rainfall in 5 to 7 days is necessary for best results. With preplants, shallow incorporate 2 to 3 inches within 7 days of planting.

Table 8-3. Recommended Herbicides for Weed Control in Field Corn (cont.)

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
FIELD CORN				
PREEMERGENCE [cont.]				
acetochlor + atrazine @ 0.85 to 2 lb/A + 0.88 to 1.6 lb/A	Annual grasses, pigweed, morningglory, common cocklebur, velvetleaf, smartweed and sicklepod.	**Keystone NXT** 1.4 to 2.6 qt/A.	Preplant or preemergence.	Add additional atrazine for improved control of morningglory.
acetochlor + clopyralid + flumetsulam @ 0.7 to 1.4 + 0.07 to 0.14 + 0.023 to 0.045 lb/A	Annual grasses and broadleaves, thistles.	**Surestart II** 1.5 to 2.5 pt/A.	Preplant or preemergence.	Optimal weed control will be obtained when applications are as close as possible to planting but before weeds emerge. Applications may be made from 30 days prior to planting till 11 inch tall corn.
mesotrione @ 0.188 to 0.24 lb/A	Annual broadleaf weeds.	**Callisto 4L** 6 to 7.7 oz/A.	Preemergence.	**Do not plant crops other than corn in treated fields during the same season.**
metolachlor + mesotrione + atrazine @ 1.3 + 0.168 + 1.3 lb/A	Annual grasses and broadleaf weeds.	**Lexar EZ 3.75 SE** 3 qt/A.	Preemergence.	**Do not plant crops other than corn in treated fields during the same season. Do not exceed 3.5 qt/A per year.**
thiencarbazone + isoxaflutole @ 0.019 to 0.03 + 0.05 to 0.08 lb/A	Annual grasses and broadleaf weeds.	**Corvus 2.63 SC** 3.3 to 5.6 oz/A. See label for soil type restrictions.	Preemergence.	Do not apply to corn treated with Counter, Lorsban or other OP or carbamate insecticides – see label for precautions. Do not plant crops other than corn in treated fields during the same season.
pyroxasulfone @ 0.08 to 0.16 lb/A	Annual grasses, pigweed, glyphosate-resistant ryegrass.	**Zidua** 1.5 to 3 oz/A.	Preemergence.	Add atrazine for improved control of cocklebur and morningglory. Rates vary based on soil type. Do not apply more than one application to corn in the spring.
pyroxasulfone + fluthiacet-methyl @ 0.11 to 0.16 lb/A + 0.003 to 0.005 lb/A	Annual grasses, pigweed, glyphosate-resistant ryegrass.	**Anthem** 7-10 oz/A.	Preemergence.	Add atrazine for improved control of cocklebur and morningglory. Rates vary based on soil type. Do not apply more than one application to corn in the spring.
pyroxasulfone + fluthiacet-methyl + atrazine @ 0.1 to 0.15 lb/A + 0.003 to 0.005 lb/A + 0.88 to 1.25 lb/A	Annual grasses, pigweed, glyphosate-resistant ryegrass, with improved control of pigweed, morningglory, cocklebur, velvetleaf, smartweed and sicklepod.	**Anthem ATZ** 1.75-2.5 pt/A.	Preemergence.	Add atrazine for improved control of cocklebur and morningglory. Rates vary based on soil type. Do not apply more than one application to corn in the spring.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
POSTEMERGENCE				
atrazine @ 2 lb/A	Most small-seeded annuals. More effective on broadleaf weeds, red rice and sicklepod.	**AAtrex, Atrazine** 2.5 lb/A 80W or 2 qt/A of 4L or 2.2 lb/A Nine-0. Select rate according to soil texture. No surfactant recommended on label. Dual, Lasso or Outlook may be added if no soil-applied grass herbicide was used. **AAtrex, Atrazine + oil** 2.5 lb/A 80W or 2 qt/A 4L or 2.2 lb/A Nine-0 + 1 qt/A oil concentrate.	After corn emergence, before grass weeds reach ½ inch or broadleaf 1½ inches.	Do not apply if corn is taller than 12 inches. Do not plant crops other than corn or grain sorghum in treated field until following season. After June 10, do not plant any crop other than corn or grain sorghum the following year. Do not apply more than 2.5 lb/A active atrazine per season.
metolachlor @ 0.95 to 1.9 lb/A	Annual grass and some small-seeded broadleaf weeds.	**Dual II Magnum 7.62 EC or Cinch** 1 to 2 pt/A.	Apply before weeds emerge or tank mix with a postemergence herbicide like glyphosate or Liberty.	Do not apply more than 3.9 pints of Dual Magnum per acre per year.
2,4-D amine @ 0.5 lb/A	Morningglory, cocklebur and most other young broadleaf weeds.	**2,4-D amine** 1 pt/A of 4 lb/gal 2,4-D + 0.25% NIS.	Apply when weeds are small and corn is under 12 inches; however, effective results can be obtained with later application.	After corn is more than 12 inches, apply spray directly on weeds with a drop-type nozzle between the corn row and not on the terminal growth of corn. **AVOID DRIFT to cotton and soybeans. Follow all State Plant Board regulations.**
dicamba @ 0.25 lb/A	Same as above.	**Banvel or Clarity 4 SL** 0.5 pt/A + 0.25% NIS.	From corn emergence up to 15 inches tall.	Ground application only. **Drift is extremely toxic to soybeans.** Do not apply after soybeans begin to emerge in general area. Less toxic than 2,4-D to cotton. **Follow all State Plant Board regulations.**
dicamba + diflufenzopyr	Pigweed, morningglory and most other annual broadleaf weeds.	**Status** 5 to 10 oz/A + 0.25% NIS.	Apply on 4-inch to 36-inch-tall corn.	Status requires an NIS at 0.25% v/v. Do not tank mix with 2,4-D or clopyralid-containing products. Ground application only. **Drift is extremely toxic to soybeans. Do not apply after soybeans begin to emerge in general area. Less toxic to cotton than 2,4-D.** Follow all State Plant Board regulations.
bentazon @ 0.75 to 1 lb/A	Cocklebur, ragweed, jimsonweed, smartweed, prickly sida, velvetleaf and yellow nutsedge.	**Basagran 4 SL** 0.75 to 1 qt/A. **Can be tank mixed with 0.5 to 0.75 lb/A active atrazine.**	Postemergence. See label for specific timing for weed desired. Corn tolerant at all stages.	May be tank mixed with atrazine. See label. Best treatment for smartweed.

Table 8-3. Recommended Herbicides for Weed Control in Field Corn (cont.)

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
FIELD CORN **POSTEMERGENCE [cont.]**				
nicosulfuron @ 0.031 lb/A	Johnsongrass, broadleaf signalgrass, foxtail and shattercane.	**Accent Q 54.5 DF** Accent Q + nonionic surfactant (80%) or crop oil concentrate and 28% or 32% UAN liquid fertilizer (optional). 0.5 oz/A + 2 pt/100 gal or 1 gal/100 gal and 4 gal/100 gal. Tank mix with atrazine for broadleaf weeds.	Apply to 4- to 10-inch seedling and 8- to 12-inch rhizome johnsongrass. If regrowth occurs, apply a second application when johnsongrass is 8 to 10 inches tall. 1- to 2-leaf broadleaf signalgrass. May be applied to 2- to 6-leaf stage of corn.	Repeat application may be required to control regrowth. **Do not apply to corn treated with Counter or Counter 20CR insecticide unless IT (Clearfield) corn is planted. See label for restrictions with other organo-phosphate insecticides and postemergence herbicides.** **Do not apply during cool, cloudy weather.**
halosulfuron @ 0.032 to 0.063 lb/A or halosulfuron + thifensulfuron @ 0.031 + 0.004	Nutsedge, cocklebur. See label for tank mixes to broaden weed spectrum.	**Halomax, Permit 75 WG, or Permit Plus** 1 to 1.33 oz/A for nutsedge. Add a nonionic surfactant or crop oil concentrate. May use two applications not to exceed 2.67 oz/A total rate. Use 0.75 oz Permit Plus.	Postemergence from corn spike through layby. 4- to 12-inch nutsedge 1- to 9-inch cocklebur	Ground application only. See label for mixtures and other precautions. Clean tank with ammonia.
halosulfuron + dicamba @ 0.075 + 0.2 lb/A	Ragweed, horseweed, nutsedge and broadleaf weeds.	**Yukon 67.5 DG** 6 oz/A.	From corn emergence to 15 inches.	Ground application only. **Drift is extremely toxic to soybeans.** Do not apply after soybeans begin to emerge in general area. Less toxic than 2,4-D to cotton. **Follow all State Plant Board regulations.**
rimsulfuron + thifensulfuron @ 0.014 + 0.003 lb/A	Some grass and broadleaf weeds.	**Resolve Q 22.4 DG** 1.25 oz/A.	Early postemergence to corn V5 stage of growth or earlier.	**Some hybrids are sensitive to rimsulfuron. Consult with seed supplier for sensitivity prior to applying.**
nicosulfuron + rimsulfuron @ 0.023 + 0.012 lb/A	Annual grass and broadleaf weeds.	**Steadfast Q 37.7 DG** 1.5 oz/A. Add a crop oil concentrate.	Apply to small weeds. Early post to corn.	**Some hybrids are sensitive to rimsulfuron. Consult with seed supplier for sensitivity rating prior to applying.** Do not apply to corn treated with Counter or Counter 20 CR insecticides. See label for other precautions.
mesotrione @ 0.094 lb/A	Annual broadleaf weeds.	**Callisto 4L** 3 oz/A. Add surfactant.	May be applied up to 30 inches or 8-leaf stage of corn for extended morninglory control.	Do not apply to corn treated with Counter or Lorsban insecticides. See label.
thiencarbazone + tembotrione @ 0.013 + 0.068 lb/A	Annual grass and broadleaf weeds.	**Capreno 3.45L** 3 oz/A. Add surfactant.	Apply when corn has between 1 and 5 collars.	**Some hybrids are sensitive to ALS-inhibiting herbicides. Consult with seed supplier for sensitivity rating prior to use.** Do not apply to corn treated with Counter or Lorsban insecticides.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
S-metolachlor + mesotrione + atrazine @ 1.3 + 0.168 + 1.3 lb/A	Annual grasses and broadleaf weeds.	**Lexar EZ 3.75 SE** 3 qt/A.	Early postemergence.	**Do not plant crops other than corn in treated fields during the same season. Do not exceed 3.5 qt/A per year.**
thiencarbazone + isoxaflutole @ 0.019 to 0.03 + 0.05 to 0.08 lb/A	Annual grasses and broadleaf weeds.	**Corvus 2.63 SC** 3.3 to 5.6 oz/A. See label for soil type restrictions.	Early postemergence.	Do not apply to corn treated with Counter, Lorsban or other OP or carbamate insecticides – see label for precautions. Do not plant crops other than corn in treated fields during the same season. The addition of atrazine improves control of pigweed and morningglory.
pyroxasulfone @ 0.08 to 0.16 lb/A	Annual grasses, pigweed, glyphosate-resistant ryegrass.	**Zidua** 1.5 to 3 oz/A.	Apply before weeds emerge or tank mix with a postemergence herbicide like glyphosate or Liberty. Emergence to V4.	Do not apply more than one application to corn in the spring. See label for maximum use rates.
pyroxasulfone + fluthiacet-methyl @ 0.11 to 0.16 lb/A + 0.003 to 0.005 lb/A	Annual grasses, pigweed, glyphosate-resistant ryegrass.	**Anthem** 7 to 10 oz/A.	Apply before weeds emerge or tank mix with a postemergence herbicide like glyphosate or Liberty. Emergence to V4.	Do not exceed a maximum of 16.4 oz per season.
pyroxasulfone + fluthiacet-methyl + atrazine @ 0.1 to 0.15 lb/A + 0.003 to 0.005 lb/A + 0.88 to 1.25 lb/A	Annual grasses, pigweed, glyphosate-resistant ryegrass, with improved control of pigweed, morningglory, cocklebur, velvetleaf, smartweed and sicklepod.	**Anthem ATZ** 1.75 to 2.5 pt/A.	Emergence to V4.	Maximum of 4.3 pt per season.
mesotrione + rimsulfuron @ 0.078 + 0.019 lb/A	Annual grass and broadleaf weeds.	**Realm Q 38.75 DG** 4 oz/A. Add surfactant.	Up to 20-inch corn.	**Some hybrids are extremely sensitive to rimsulfuron. Consult with seed supplier for sensitivity rating prior to applying.** Do not apply to corn treated with Counter or Counter 20 CR insecticides. See label for other precautions.
topramezone + atrazine @ 0.0164 lb/A + 1 lb/A	Pigweed, horseweed, velvetleaf, morningglory, barnyardgrass, fall panicum and broadleaf signalgrass.	**Armezon or Impact + Atrazine** 0.75 oz/A + 1 qt/A. COC or MSO at 1% v/v.	Postemergence up to 45 days from harvest.	Apply to corn when weeds are small and actively growing. Use an MSO at 1% v/v and tank mix with atrazine for larger weeds and best results.
HERBICIDE-TOLERANT CULTIVARS – Check suitability of available hybrids with county agent.				
glyphosate @ 0.75 to 1 lb/A	Most annual grass and broadleaf weeds and Johnsongrass.	**Glyphosate (4 lb/gal formulations)** 2 pt/A.	May be applied up to 30 inches or 8-leaf stage of corn.	Apply only to Roundup Ready corn. Single in-crop applications not to exceed 1 lb/A and multiple in-crop applications not to exceed 2 lb/A total. See label for tank mixes.
glyphosate + atrazine @ 0.75 to 1 lb/A + 1 lb/A	Same as above plus residual control of broadleaf weeds. Improved morningglory control.	**Glyphosate (4 lb/gal formulations) + AAtrex** 2 pt/A + 1 qt/A.	Prior to 12-inch corn.	Apply only to Roundup Ready corn. Single in-crop applications not to exceed 1 lb/A and multiple in-crop applications not to exceed 2 lb/A total. See label for tank mixes.

Table 8-3. Recommended Herbicides for Weed Control in Field Corn (cont.)

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
FIELD CORN				
HERBICIDE-TOLERANT CULTIVARS [cont.] – Check suitability of available hybrids with county agent.				
glyphosate + atrazine + thifensulfuron/rimsulfuron @ 0.75 to 1 lb/A + 1 lb/A + 0.014 lb/A	Most annual grass and broadleaf weeds. Improved residual control of annual grass.	**Glyphosate (4 lb/gal formulations) + AAtrex + Resolve Q** 2 pt/A + 2 pt/A + 1 oz/A.	Prior to 12-inch corn or 5 collar, whichever comes first.	Apply only to Roundup Ready corn. Single in-crop applications not to exceed 1 lb/A and multiple in-crop applications not to exceed 2 lb/A total. See label for tank mixes. **Some hybrids are sensitive to rimsulfuron. Consult with seed supplier for sensitivity rating prior to applying.**
glyphosate + mesotrione @ 0.75 to 1 lb/A + 0.094 lb/A	Annual grass and broadleaf weeds with residual activity.	**Glyphosate (4 lb/gal formulations) + Callisto 4L** 2 pt/A + 3 oz/A.	May be applied up to 30 inches or 8-leaf stage of corn.	Apply only to Roundup Ready corn. Single in-crop applications not to exceed 1 lb/A and multiple in-crop applications not to exceed 2 lb/A total. See label for tank mixes. Do not apply to corn treated with Counter or Lorsban insecticides.
glufosinate @ 0.4 lb/A	Most annual grass and broadleaf weeds.	**Liberty 280 SL** 22 oz/A.	May be applied to corn through the V7 growth stage. May be tank mixed with other corn herbicides for residual control.	**Apply only to Liberty Link corn varieties or those containing Herculex or SmartStax traits.** Do not apply more than 44 ounces of Liberty per season.
glyphosate + *S*-metolachlor + mesotrione @ 0.94 + 0.94 + 0.094 lb/A	Most annual grass and broadleaf weeds.	**Glyphosate (4 lb/gal formulations) + Dual Magnum II 7.64 EC or Cinch 7.64 EC + Callisto 4L** 30 oz + 16 oz + 3 oz/A. or **Halex GT** 3.6 pt/A.	From corn emergence to 30" or 8-leaf corn.	Tank mix with atrazine will improve residual morningglory control. Sequence at 2.5 to 3.5 pt/A contains glyphosate and metolachlor. The Halex GT rate is 3.6 to 4 pt/A.
PREHARVEST				
carfentrazone @ 0.0312 lb/A	Morningglory desiccation.	**Aim 2 EC** 2.0 oz/A. Add 1% crop oil concentrate.	7 days prior to harvest.	Good coverage is critical to Aim activity. 10 gpa is recommended.
sodium chlorate @ 4.5 to 6 lb/A	Desiccation of green vegetation.	**Sodium Chlorate** Several brands and trade names available. 2 gal of 3 lb/gal or 1 gal of 6 lb/gal.	7 to 10 days prior to harvest.	Use a labeled brand and follow label directions.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
POST HARVEST				
paraquat + flumioxazin @ 0.625 + 0.063 lb/A	Pigweed.	**Paraquat (2 or 3 lb/gal formulations) + Valor 51 WDG** 40 or 27 oz/A + 2.0 oz/A. Add 1% COC.	Apply to small pigweed after harvest.	Apply 30 days prior to planting wheat.
paraquat + *S*-metolachlor @ 0.625 + 0.95 lb/A	Pigweed and annual grass.	**Paraquat (2 or 3 lb/gal formulations) + Dual Magnum 7.62 EC** 40 or 27 oz/A + 1 pt/A. Add 1% COC.	Apply to small pigweed after harvest.	Apply to acres that **will not be** planted to small grains (wheat). Follow Dual label on total use rates.
paraquat + metribuzin @ 0.625 + 0.141 lb/A	Volunteer corn, pigweed and other weeds.	**Paraquat (2 or 3 lb/gal formulations) + metribuzin 75 DF** 40 or 27 oz/A + 3 oz/A. Add 1% COC.	Apply to 6-inch volunteer corn.	If planting wheat, use a metribuzin-tolerant variety.
2,4-D amine @ 0.75 lb/A	Pigweed and other broadleaf weeds.	**2,4-D amine** 1.5 pt/A of 4 lb/gal 2,4-D.	Apply to 4- to 6-inch pigweed.	Avoid drift to cotton and soybeans. Be aware of state regulations on 2,4-D. 7-day plant-back to wheat. Due to potential off-target movement to maturing soybeans, dicamba is not recommended for use post-harvest in corn.
saflufenacil @ 0.022 lb/A	Pigweed and other broadleaf weeds.	**Sharpen 2.85 SC** 1.0 oz/A + 1% v/v MSO.	Apply to 4- to 6-inch pigweed.	Avoid off-target drift to soybeans.

Table 8-4. Crop Replant and Rotation Guide for Corn and Grain Sorghum Herbicides*

Herbicide	Replant/Crop Rotation	Time Interval	Precautions
2,4-D	All	90 days	90 days or until sufficiently dissipated.
Accent Q	C W S CT	I 4 months 15 days 10 months	Sweet corn and popcorn - 10 months. All crops not specified - 10 months if pH < 6.5 or 18 months if pH > 6.5. Grain sorghum - 10 months if pH < 7.5 or 18 months if pH > 7.5.
Anthem	S, C R SG W CT, P, SF	I 10 months 11 months 4 months 4 months	
Atrazine	C, GS All	I FY	If applied after June 10, only corn and grain sorghum can be planted the following year.
Basagran	All	I	
Bicep II Magnum Cinch ATZ	C, GS† S, CT SG All	I FY 15 months 18 months	† Use Concep-treated seed. If applied after June 10, only corn and grain sorghum can be planted the following year.
Buctril	C, GS SG All	I Fall FY	
Buctril + atrazine	C, GS S CT, FG, FL, R SG All others	I FY Do not plant the year following application.	If applied after June 15, plant only corn or grain sorghum the next year.
Callisto	C, GS SG All	I 4 month 10 months	Do not apply post if soil was treated with Counter or Lorsban.
Clarity	C, G, W All	I 45 days/pt† Following normal harvest of C, G, W, GS	† Wheat planting must be delayed 45 days after application per pint of Banvel used.
Dual II Magnum Cinch	C, S, GS† SG Rice All	I 4.5 months Next spring 18 months	† Use Concep-treated seed.
Glyphosate			No restrictions.
Guardsman Max	GS, S, CT All	FY Do not plant the year following application.	
Halex GT	C, GS† SG CT, S	I 4 months 10 months	† Use Concep-treated grain sorghum seed.
Huskie	CT SF, C GS R S W	FY 9 months 4 months FY 4 months 1 month	
Keystone NXT	C GS, S A, B, O, RY, SF, W	I Following spring 15 months	
Lexar EZ	C, GS CT, SG, S, P All	I Next spring 18 months	Use Concep-treated grain sorghum seed.
Liberty 280	CT, C, R, S SG, W All other	I 70 days 180 days	
Outlook	C, S SG All	I 4 months Next spring	
Paraquat			No restrictions.
Peak	IR Corn, SG C, GS R, FG, S, CT, P A, SF	I 1 month 10 months 22 months	Do not replant any broadleaf crop if less than 10 inches of rainfall or irrigation has occurred since the application of Peak.
Permit	W S	3 months 10 months	
Prowl	CT, S W, B All	I 120 days† FY	† 90 days after post-incorporated application, cannot plant using no-tillage practices.
Realm Q	C SG W CT, GS, S	I 9 months 4 months 10 months	
Resolve Q	C W A, R, GS, S, SF All other CT	I 3 months 10 months 18 months 1 month	If at least 15 inches of rainfall has not occurred since application, CT, GS, SF, A rotations are extended to 18 months. Do not replant rice on soils with greater than pH 6.5.
Surestart II	C W A, B, S GS SF CA, CT	I 4 months Following spring 12 months 18 months 26 months	
Zidua	C, S CT, P, SF, W R All	I 4 months 10-18 months 18 months	Depending on rate used.

*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

All = All crops not specified
A = Alfalfa
B = Barley
C = Corn
CA = Canola
CT = Cotton
FG = Forage Grasses
FL = Forage Legumes
GS = Grain Sorghum
P = Peanuts
R = Rice
S = Soybeans
SF = Sunflowers
SG = Small Grains
W = Wheat

Timing

I = Immediately
FY = Following year (usually spring)

Figure 8-5. Common Weed Seedlings in Corn

smooth pigweed, redroot pigweed

Palmer amaranth

tall waterhemp

common lambsquarters

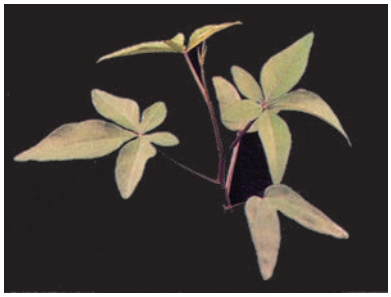
common cocklebur

ivyleaf morningglory

Figure 8-5. Common Weed Seedlings in Corn (cont.)

pitted morningglory

palmleaf morningglory



entireleaf morningglory

purple moonflower

smallflower morningglory

bigroot morningglory

spotted spurge

prickly sida

Pennsylvania smartweed

nutsedge

large or southern crabgrass

goosegrass

Figure 8-5. Common Weed Seedlings in Corn (cont.)

broadleaf signalgrass

fall panicum

red rice

barnyardgrass

johnsongrass