Corn

Uncontrolled weeds continue to be a major limiting factor in Delmarva corn production. To be successful in controlling weeds in corn, the weed control program must be both well planned and well executed. Consideration should be given to cultural, mechanical, and chemical methods of weed control with reference to specific weed infestations. The major elements of a successful weed control program in corn are summarized below.

Weed Control Program

Weed identification. The first step in an effective weed control program is proper weed identification. Only by knowing the exact identities and relative infestations of weeds on a field-by-field basis can the proper weed control strategy be developed. Continued use of the same program, or use of reduced tillage practices, can result in changes in weed infestations. Keep an accurate field record of the weeds in each field on a yearly basis and use this record to plan your weed control program.

Cultural control. Several aspects of cultural weed control should be considered in planning a corn weed control program. These include weed-free seed, cover crops, and crop rotation. Crop rotation is a valuable tool in our corn/soybean rotations because perennial broadleaf weeds that cannot be controlled in soybeans can be effectively controlled in corn. Take advantage of this opportunity to control these tough weeds with mechanical methods and herbicides.

Mechanical control. Mechanical weed control is still one of our most useful weed control tools. Both primary tillage and cultivation should be considered for specific weed problems. Perennial broadleaf weeds are an increasing problem in no-till corn production. In some cases, these weeds cannot be controlled without tillage to disrupt underground perennial parts. The use of the moldboard plow when these weeds become a problem is an effective method of control, and for some weeds represents the only practical method of control.

Herbicidal control. Many options are available in terms of herbicidal control of weeds in corn. Both preplant-incorporated and preemergence combinations are available that offer broad-spectrum weed control. Preplant incorporated treatments ensure activation of the herbicide and minimize the risk of crop injury. Preemergence treatments require rainfall for activation, but offer good weed control when rainfall occurs within the first 2 weeks after application. Consider postemergence and directed postemergence applications. These are some of our strongest options in corn weed control. Identify the weed and select the herbicide program that best fits your specific weed infestation.

The repeated use of herbicides with similar modes of action may result in herbicide-resistant weed populations. (See Table on Guide to single active ingredient herbicides.) Crop rotation, herbicide rotation, or tank-mixing herbicides with different modes of action will help reduce the buildup of herbicide-resistant weeds.

The following tables give general ratings of relative herbicidal activity. Activity varies with weather conditions, soil type, and application method. Under nonoptimal conditions, activity may be less than indicated.

Table 5.17 - Corn Herbicides and their Restrictions

Trade name	Common name	Manufacturer	Restricted-use pesticide[1]	Water quality advisory[2]	Worker re-entry (hours)[3]
2,4-D amine 4S	2,4-D amine	several	—	—	48
2,4-D LVE 4E	2,4-D LVE	several	—	—	12
AAtrex, Atrazine 4L/90DF	atrazine	Syngenta, others	yes	yes	12
Accent 75DF/SP	nicosulfuron	DuPont	—	—	4
Aim 2EC	carfentrazone-ethyl	FMC	—	—	12
Axiom 68DF	flufenacet + metribuzin	Bayer	—	yes	12
Balance Flex	Isoxaflutole	Bayer	yes	yes	12
Banvel 4S	dicamba	MicroFlo	—	yes	24
Basagran 4S	bentazon	MicroFlo	—	yes	48
Basis 75DF	rimsulfuron + thifensulfuron	DuPont	—	—	4
Beacon 75DF	primisulfuron	Syngenta	—	—	12
Bicep II Magnum 5.5L	s-metolachlor + atrazine + safener	Syngenta	yes	yes	24
Bicep Lite II Magnum 6L	s-metolachlor + atrazine + safener	Syngenta	yes	yes	24
Buctril 4E	bromoxynil	Bayer	—	—	12
Buctril + atrazine 3L	bromoxynil + atrazine	Bayer	yes	yes	24
Bullet 4ME	alachlor + atrazine	Monsanto	yes	yes	12
Callisto 4L	mesotrione	Syngenta	no	yes	12
Camix 3.67L	mesotrione + metolachlor	Syngenta	no	yes	24
Celebrity Plus 70DF	nicosulfuron + dicamba + diflufenzopyr	BASF	—	yes	12
Cinch 7.64E	metolachlor	DuPont	no	yes	24
Cinch ATZ 5.5L	metolachlor + atrazine	Dupont	yes	yes	12
Clarity 4S	dicamba	BASF	—	yes	24
Define 60DF	flufenacet	Bayer	no	yes	12
Degree 3.8ME	acetochlor	Monsanto	yes	yes	12
Degree Xtra 4.04ME	acetochlor + atrazine	Monsanto	yes	yes	12
Distinct 70DF	dicamba + diflufenzopyr	BASF	no	yes	12
Dual II Magnum 7.64E	s-metolachlor + safener	Syngenta	no	yes	24
Equip	foramsulfuron+iodosulfuron	Bayer	no	yes	12

[1] Only licensed applicators may purchase and apply restricted-use pesticides. To become licensed, contact the Virginia Department of Agriculture.

[2] These herbicides have properties that may result in ground- or surface-water contamination. Do not apply them in areas where soils are permeable or coarse and groundwater is near the surface. Practice should be followed to minimize the potential for dissolved runoff and/or runoff erosion. See the herbicide label for specific restrictions.

[3] If soil-applied products are injected or incorporated at application time, under certain circumstances the Worker Protection Standard allows workers to enter the treated area if they will have no contact with anything that has been treated. Personal protective equipment is required for early entry to treated areas if contact with treated soil, plants, or water is involved.

[4] For use only on IMI (IR/IT) or Clearfield (CL) corn hybrids.

[5] For use only on glufosinate-resistant corn hybrids.

Table 5.17 - Corn Herbicides and their Restrictions (cont.)

Trade name	Common name	Manufacturer	Restricted-use pesticide[1]	Water quality advisory[2]	Worker re-entry (hours)[3]
Evik 80W	ametryn	Syngenta	—	—	12
Expert	metolachlor + glyphosate + atrazine	Syngenta	yes	yes	24
Field Master 4.25SE	glyphosate + acetochlor + atrazine	Monsanto	yes	yes	12
FulTime 4CS/EC	acetochlor + atrazine + safener	Dow AgroSciences	yes	yes	12
Gramoxone Inteon (Harvest Aid)	paraquat	Syngenta	yes	—	24
Gramoxone Inteon (Preemergence)	paraquat	Syngenta	yes	—	12
Guardsman Max 5L	atrazine + dimethanimid	BASF	yes	yes	12
Halex GT	metolachlor + glyphosate + mesotrione	Syngenta	no	yes	24
Harmony Extra SG	thifensulfuron + tribenuron	DuPont	—	—	12
Harmony SG	thifensulfuron	DuPont	no	no	4
Harness 7E	acetochlor + safener	Monsanto	yes	yes	12
Harness Xtra 5.6/6L	acetochlor + atrazine	Monsanto	yes	yes	12
Hornet 78.5 WG	flumetsulam + clopyralid	Dow AgroSciences	—	yes	48
Impact 2.8L	topramezone	AMVAC	no	no	12
Keystone 5L	atrazine + acetochlor	Dow AgroSciences	yes	yes	12
Keystone LA 5.5L	atrazine + acetochlor	Dow AgroSciences	yes	yes	12
Lariat 4E	alachlor + atrazine	Monsanto	yes	yes	12
Lasso 4E	alachlor	Monsanto	yes	yes	12
Laudis	tembotrione	Bayer	no	yes	12
Lexar 3.7SC	atrazine + metolachlor + mesotrione	Syngenta	yes	yes	24
Lightning 70DG[4]	imazethapyr + imazapyr	BASF	—	yes	12
Linex 50DF, 4L	linuron	Griffin	—	—	24
Lumax 4L	atazine + mesotrione + s-metolachlor	Syngenta	yes	yes	24
Marksman 3.2L	dicamba + atrazine	BASF	yes	yes	24
Micro-Tech 4ME	alachlor	Monsanto	yes	yes	12

[1] Only licensed applicators may purchase and apply restricted-use pesticides. To become licensed, contact the Virginia Department of Agriculture.

[2] These herbicides have properties that may result in ground- or surface-water contamination. Do not apply them in areas where soils are permeable or coarse and groundwater is near the surface. Practice should be followed to minimize the potential for dissolved runoff and/or runoff erosion. See the herbicide label for specific restrictions.

[3] If soil-applied products are injected or incorporated at application time, under certain circumstances the Worker Protection Standard allows workers to enter the treated area if they will have no contact with anything that has been treated. Personal protective equipment is required for early entry to treated areas if contact with treated soil, plants, or water is involved.

[4] For use only on IMI (IR/IT) or Clearfield (CL) corn hybrids.

[5] For use only on glufosinate-resistant corn hybrids.

Table 5.17 - Corn Herbicides and their Restrictions (cont.)

Trade name	Common name	Manufacturer	Restricted-use pesticide[1]	Water quality advisory[2]	Worker re-entry (hours)[3]
NorthStar 51.4WG	primisulfuron + dicamba	Syngenta	—	—	12
Option 35WDG	foramsulfuron	Bayer	no	yes	12
Outlook	dimethenamid-P	BASF	—	yes	12
Permit/Sandea 75WG	halosulfuron	Gowan	—	—	12
Princep, Simazine, 4L/90DF	simazine	Syngenta, others	—	yes	12
Prowl 3.3E	pendimethalin	BASF	—	—	24
Prowl H_2O	pendimethalin	BASF	—	—	24
Pursuit 2S	imazethapyr	BASF	—	—	4
Python 80WDG	flumetsulam	Dow AgroSciences	—	yes	12
Radius 4L	isoxaflutole + flufenacet	Bayer	yes	yes	12
Ready Master ATZ 4L	glyphosate + atrazine	Monsanto	yes	yes	12
Require Q	rimsulfuron + dicamba	DuPont	no	yes	24
Resolve	rimsulfuron	DuPont	no	no	4
Resolve Q	rimsulfuron + thifensulfuron	DuPont	no	no	4
Resource 0.86E	flumiclorac	Valent	—	—	12
Roundup Weather Max	glyphosate	Monsanto	—	—	4-12
Sencor 75DF/4L	metribuzin	Bayer	—	yes	12
Spirit 57WG	primisulfuron + prosulfuron	Syngenta	—	—	12
Status 56WG	dicamba + diflufenzopyr	BASF	no	yes	24
Steadfast 75DF	nicosulfuron + rimsulfuron	DuPont	no	no	4
Stinger 3S	clopyralid	Dow AgroSciences	—	yes	12
Stout 72.5DF	nicosulfuron + thifensulfuron	DuPont	no	no	4
SureStart	acetochlor + flumetsulam + clopyralid	Dow AgroSciences	yes	yes	12
TopNotch 3.2CS	acetochlor + safener	Dow AgroSciences	yes	yes	12
Touchdown Total + Hi-Tech	glyphosate	Syngenta	—	—	12
Valor	fluxioxazin	Valent	no	yes	12
Yukon 67.5WDG	halosulfuron + dicamba	Monsanto	no	yes	12

[1] Only licensed applicators may purchase and apply restricted-use pesticides. To become licensed, contact the Virginia Department of Agriculture.

[2] These herbicides have properties that may result in ground- or surface-water contamination. Do not apply them in areas where soils are permeable or coarse and groundwater is near the surface. Practice should be followed to minimize the potential for dissolved runoff and/or runoff erosion. See the herbicide label for specific restrictions.

[3] If soil-applied products are injected or incorporated at application time, under certain circumstances the Worker Protection Standard allows workers to enter the treated area if they will have no contact with anything that has been treated. Personal protective equipment is required for early entry to treated areas if contact with treated soil, plants, or water is involved.

[4] For use only on IMI (IR/IT) or Clearfield (CL) corn hybrids.

[5] For use only on glufosinate-resistant corn hybrids.

Table 5.18 - Relative Effectiveness of "Burndown" for No-till Corn Establishment[1,2,3]

	Grasses and broad-leaf weeds in crop stubble (0-3 in)	Grasses and broad-leaf weeds in crop stubble (>3 in)	Annual ryegrass and weeds	Rye cover and annual weeds	Volunteer orchard-grass sod and annual weeds	Small grains and annual weeds
Gramoxone Inteon	G	F-G	P	G	P-F	F
Gramoxone Inteon (and then Gramoxone Inteon 10-14 days later)	G	G	P-F	G	G	G
Gramoxone Inteon + 2,4-D	G	G	P	G	P-F	F
Gramoxone Inteon + Banvel/Clarity	G	G	P	G	P-F	F
2,4-D (and then Gramoxone Inteon 10-14 days later)	G	G	P	G	P-F	F
Banvel/Clarity (and Gramoxone Inteon 10-14 days later)	F	G	G	P	G	P-F
4.0 lb ai/gallon glyphosate or equivalent[4] (1.0 qt) or others	G	F-G	F-G	F-G	P	F
4.0 lb ai/gallon glyphosate or equivalent[4] (2.0-3.0 qt) or others	G	G	G	G	F-G	G
4.0 lb ai/gallon glyphosate or equivalent[4] (1.0 qt) or others + 2,4-D	G	G	F-G	F-G	P	F
4.0 lb ai/gallon glyphosate or equivalent[4] (1.0 qt) or others + Banvel/Clarity	G	G	F-G	F-G	P	F
Atrazine (1.0-2.0 lb) + Gramozone Inteon	G	F-G	F	G	F	G

[1]G = 80 to 100 percent control, F = 60 to 80, P = 20 to 60, N = less than 20, NR = not recommended.

[2]These treatments are rated only for control of vegetation existing at the time of no-till corn establishment. Add residual herbicides as required for the specific infestation.

[3]Use Banvel only on soil types for which the preemergence use of this product is permitted by label.

[4]See Table 5.3 - Selected Glyphosate Products and Premixes for Agronomic Use: *Weed Control in Field Crops* section.

Table 5.19 - Relative Effectiveness of "Burndown" for No-till Corn Establishment[1,2,3]

	Fescue sod and annual weeds	Clover and annual weeds	Alfalfa and annual weeds	Horseweed and other annual weeds	Perennial broadleaf weeds aand annuals
Gramoxone Inteon	F	F	P-F	F	P-F
Gramoxone Inteon (and then Gramoxone Inteon 10-14 days later)	G	F-G	F	F-G	F
Gramoxone Inteon + 2,4-D	P-F	F-G	F	F-G	F
Gramoxone Inteon + Banvel/Clarity	P-F	F-G	F-G	F-G	F
2,4-D (and then Gramoxone Inteon 10-14 days later)	P-F	G	F	G	F-G
Banvel/Clarity (and then Gramoxone Inteon 10-14 days later)	P-F	G	G	G	F-G
4.0 lb ai/gallon glyphosate or equivalent[4] (1.0 qt) or others	P	F	P-F	F-G	F
4.0 lb ai/gallon glyphosate or equivalent[4] (2.0-3.0 qt) or others	G	G	G	G	F-G
4.0 lb ai/gallon glyphosate or equivalent[4] (1.0 qt) or others + 2,4-D	P	G	F	G	F-G
4.0 lb ai/gallon glyphosate or equivalent [4] (1.0 qt) or others + Banvel/Clarity	P	G	G	G	F-G
Atrazine (1.0-2.0 lb) + Gramoxone Inteon	F	F	P	F	P-F

[1]G = 80 to 100 percent control, F = 60 to 80, P = 20 to 60, N = less than 20, NR = not recommended.

[2]These treatments are rated only for control of vegetation existing at the time of no-till corn establishment. Add residual herbicides as required for the specific infestation.

[3]Use Banvel only on soil types for which the preemergence use of this product is permitted by label.

[4]See Table 5.3 - Selected Glyphosate Products and Premixes for Agronomic Use: *Weed Control in Field Crops* section.

Table 5.20 - Corn Group 1 - Preplant Incorporated

Relative effectiveness of residual herbicides for corn[1]

	Barnyardgrass	Bermudagrass	Broadleaf signalgrass	Crabgrass	Fall panicum	Foxtails	Goosegrass	Johnsongrass (seedlings)	Johnsongrass (rhizome)	Quackgrass	Sandbur	Shattercane	Texas panicum	Yellow nutsedge
Atrazine	F	N	P	F-G	N	F	F	N	N	P-F	P	N	N	N
Dual II Magnum/Cinch	G-E	N	F-G	G-E	G-E	E	E	P	N	N	F	P	P	F-G
Dual II Magnum/Cinch + Atrazine	G-E	N	F-G	G-E	G-E	E	E	P	N	P-F	F	P	P	F-G
Dual II Magnum/Cinch + Atrazine + Princep	G-E	N	F-G	G-E	G-E	E	E	P	N	P-F	F	P	P	F-G
Outlook	G-E	N	F-G	G-E	G-E	E	E	P	N	N	F	P	P	F-G
Outlook + Atrazine	G-E	N	F-G	G-E	G-E	E	E	P	N	P-F	F	P	P	F-G
Outlook + Atrazine + Princep	G-E	N	F-G	G-E	G-E	E	E	P	N	P-F	F	P	P	F-G
Princep	G	N	P	F-G	F	F-G	F-G	P	N	P	-	P	P	P
SureStart	G-E	N	F-G	G-E	E	E	E	P	N	N	F	P	P	F

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.21 - Corn Group 1 - Preemergence

Relative effectiveness of residual herbicides for corn[1]

	Barnyardgrass	Bermudagrass	Broadleaf signalgrass	Crabgrass	Fall panicum	Foxtails	Goosegrass	Johnsongrass (seedlings)	Johnsongrass (rhizome)	Quackgrass	Sandbur	Shattercane	Texas panicum	Yellow nutsedge
Atrazine	F	N	P	P-F	P	F	F	N	N	P-F	P	P	P	P
Atrazine + Princep	F-G	N	P	F-G	F	F-G	F-G	P	N	P-F	P	P	-	P
Axiom	G	N	F-G	G	G	G	G	P	N	N	P	P	P	P
Basis	G	N	N	P	G	G	P	N	N	N	P	N	-	N
Callisto	N	N	P	F	N	P	N	N	N	N	-	N	N	P
Degree/Harness/Topnotch	G-E	N	F-G	G-E	E	E	E	P	N	P-F	F	P	P	F
Degree/Harness/Topnotch + Atrazine	G-E	N	F-G	G-E	E	E	E	P	N	P-F	F	P	P	F
Degree/Harness/Topnotch +Atrazine+Princep	G-E	N	F-G	G-E	E	E	E	P	N	P-F	F	P	P	F
Dual II Magnum/Cinch	G-E	N	F-G	G-E	G-E	E	E	P	N	N	F	P	P	F
Dual II Magnum/Cinch + Atrazine	G-E	N	F-G	G-E	G-E	E	E	P	N	P-F	F	P	P	F
Dual II Magnum/Cinch + Atrazine + Princep	G-E	N	F-G	G-E	G-E	E	E	P	N	P-F	F	P	P	F
Hornet	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Lumax (atrazine + Dual II Magnum + Callisto)	G-E	N	G	G-E	G-E	E	E	F	N	N	F	F	P-F	F
Micro-Tech	G-E	N	F-G	F-G	E	E	E	P	N	N	F	P	P	P
Micro-Tech + Atrazine	G-E	N	F-G	F-G	E	E	E	P	N	P-F	F	P	P	P
Micro-Tech + Atrazine + Princep	G-E	N	F-G	F-G	E	E	E	P	N	P-F	F	P	P	P
Outlook	G-E	N	F-G	G	G	G	G	P	N	N	P-F	P	P	F
Outlook + Atrazine	G-E	N	F-G	G	G	G	G	P	N	P-F	P-F	P	P	F
Outlook + Atrazine + Princep	G-E	N	F-G	G	G	G	G	P	N	P-F	P-F	P	P	F
Princep	F-G	N	P	F-G	G	G	F-G	P	N	F	-	P	P	P
Prowl	G-E	N	F-G	F	F-G	G	F	F	N	N	F	F	P-F	N
Python	N	N	N	N	N	N	N	N	N	N	N	N	N	N
SureStart	G-E	N	F-G	G-E	E	E	E	P	N	N	F	P	P	F

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.22 - Corn Group 1 - Postemergence

Relative effectiveness of residual herbicides for corn[1]

	Barnyardgrass	Bermudagrass	Broadleaf signalgrass	Crabgrass	Fall panicum	Foxtails	Goosegrass	Johnsongrass (seedlings)	Johnsongrass (rhizome)	Quackgrass	Sandbur	Shattercane	Texas panicum	Yellow nutsedge
Accent	G-E	N	G-E	P-F	G	G	P	E	G-E	G-E	G	E	G	P
Aim	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Atrazine + Oil	F	N	F	P-F	P	F	G	P	N	F-G	-	P	P	P-F
Banvel/Clarity	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Basagran	N	N	N	N	N	N	N	N	N	N	N	N	N	F
Basis	F-G	N	F-G	P-F	G	G	P	F-G	F	-	F	F-G	F	P-F
Beacon	P	N	P	P	F	F-G	P	E	G	G	-	E	P	P
Brominal or Buctril	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Callisto	-	N	F	F	P	P	P	P	N	-	-	P	P	F
Celebrity Plus	G-E	N	G-E	P-F	G	G	P	E	G-E	G-E	G	E	G	P
2,4-D	N	N	N	N	N	N	N	N	N	N	N	N	N	N
2,4-D + Banvel	N	N	N	N	N	N	N	N	P	N	N	N	N	N
Distinct	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Equip	F	N	F-G	F	F	F	F	F-G	F-G	G	F	G	F	-
Evik	G	N	G	F-G	F-G	F-G	G	P-F	N	-	-	F	G	P
Exceed	P	N	N	P	P	P-F	N	P-F	N	P-F	-	P-F	N	P
FieldMaster	E	G	E	E	G-E	E	E	E	G	G-E	E	G	G	P-F
Glyphosate	E	G	E	E	G-E	E	E	E	G	G-E	E	G	G	P-F
Gramoxone Inteon	G	N	F	G	G	G	G	G	N	P	G	G	F	F
Hornet	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Impact	-	N	F	F-G	F	G	F	P	N	-	-	P	-	-
Laudis	G	N	P-F	F-G	P	G	F	G	N	N	-	G	G	-
Liberty	F-G	N	F	F	F-G	F-G	P	F-G	N	F	F-G	F-G	F-G	P
Liberty ATZ	G	N	F-G	F-G	F-G	G	P-F	F-G	N	F	F-G	F-G	F-G	P-F
Lightning	G	N	F-G	P-F	P-F	G	P	G	F	F-G	-	G	P-F	F-G
Linex/Lorox	F	N	F-G	F	F	F	F	P-F	N	N	-	P-F	F	P
Marksman	N	N	P	P	N	P	F	N	N	F	-	N	-	P
NorthStar	P	N	P	P	F	F-G	P	E	G	G	-	E	P	P
Option	F-G	N	G	P-F	G	G	G	G	G	G	G	G	G	F
Permit	N	N	N	N	N	N	N	N	N	N	N	N	N	E
Poast Plus/Poast	E	F-G	G	G-E	E	E	G-E	E	G	G	G-E	G	G	N
Prowl + Atrazine	F-G	N	F	F-G	P	F	G	P-F	N	F	-	P	P	F
Require Q	G	N	F-G	P-F	G	G	P	P-F	N	-	F	F-G	F	P-F

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.22 - Corn Group 1 - Postemergence (cont.)

Relative effectiveness of residual herbicides for corn[1]

	Barnyardgrass	Bermudagrass	Broadleaf signalgrass	Crabgrass	Fall panicum	Foxtails	Goosegrass	Johnsongrass (seedlings)	Johnsongrass (rhizome)	Quackgrass	Sandbur	Shattercane	Texas panicum	Yellow nutsedge
Resolve	G	N	F-G	P-F	G	G	P	P-F	N	-	F	F-G	F	P-F
Resolve Q	G	N	F-G	P-F	G	G	P	P-F	N	-	F	F-G	F	P-F
Resource	N	N	N	N	N	N	N	N	N	N	N	N	N	N
“Sencor + 2,4-D or Banvel”	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Spirit	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Status	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Steadfast	G-E	N	G-E	P-F	G	G-E	P	E	G-E	G-E	G	E	G	P

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.23 - Corn Group 2 - Preplant Incorporated

Relative effectiveness of residual herbicides for corn[1]

	Eastern black nightshade	Burcucumber	Cocklebur	Jimson weed	Lambsquarters	TR-Lambsquarters	Morningglory (annual spp.)	Pigweed	TR-Pigweed	Giant ragweed	Common ragweed	Sicklepod	Smartweed	Spurred anoda	Prickly sida or teaweed	Tropic Croton	Velvetleaf
Atrazine	E	F	G	G	G	N	G	G	N	G	G	G	G	G	G	G	G
Dual II Magnum/ Cinch	F	N	N	N	P-F	P-F	N	G	G	N	P	N	P	N	P	N	N
Dual II Magnum/ Cinch + Atrazine	E	F	G	G	G	P-F	G	G	G	G	G	G	G	G	G	G	G
Dual II Magnum/ Cinch + Atrazine + Princep	E	F	G	G	G	P-F	G	G	G	G	G	G	G	G	G	G	G
Outlook	F	N	N	N	P-F	P-F	N	G	G	N	P	N	P	N	P	N	N
Outlook + Atrazine	E	F	G	G	G	P-F	G	G	G	G	G	G	G	G	G	G	G
Outlook + Atrazine + Princep	E	F	G	G	G	P-F	G	G	G	G	G	G	G	G	G	G	G
Princep	G-E	F	G	G	G	N	G	G	N	F	G	G	G	F-G	F-G	F-G	F-G
SureStart	P-F	N	G	F	G	G	F	G	G	G	G	-	-	-	P	-	G

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.24 - Corn Group 2 - Preemergence

Relative effectiveness of residual herbicides for corn[1]

	Eastern black nightshade	Burcucumber	Cocklebur	Jimsonweed	Lambsquarters	TR-Lambsquarters	Morningglory (annual spp.)	Pigweed	TR-Pigweed	Giant ragweed	Common ragweed	Sicklepod	Smartweed	Spurred anoda	Prickly sida or teaweed	Tropic Croton	Velvetleaf
Atrazine	E	P-F	G	E	E	N	F-G	E	N	F-G	G-E	G	G	F-G	G	G	F-G
Atrazine + Princep	E	F	G	E	E	N	G	E	N	G	E	G	G	F-G	G	G	G
Axiom	P	N	N	N	P-F	P-F	N	P-F	P-F	N	P	N	N	N	N	N	N
Basis	N	N	P	P	F-G	F-G	N	G	G	N	N	-	P	P	-	-	P
Callisto	P	-	P-F	F	G	G	F	F-G	F-G	-	P	-	-	N	N	N	-
Degree/Harness/ Topnotch	F	N	N	N	F	F	N	F-G	F-G	N	P	N	P	-	P	N	N
Degree/Harness/ Topnotch + Atrazine	E	F	G	E	E	F	G	E	F-G	G	E	G	G	G	G	G	G
Degree/Harness/ Topnotch + Atrazine + Princep	E	F	G	E	E	F	G	E	F-G	G	E	G	G	G	G	G	G
Dual II Magnum/ Cinch	F	N	N	N	P	P	N	G	G	N	P	N	P	N	P	N	N
Dual II Magnum/ Cinch + Atrazine	E	F	G	E	E	P	G	E	G	G	E	G	G	G	G	G	G
Dual II Magnum/ Cinch + Atrazine + Princep	E	F	G	E	E	P	G	E	G	G	E	G	G	G	G	G	G
Gramoxone Inteon	G	G	G	G	G	G	F-G	G	G	F-G	G	G	F-G	G	G	G	G
Hornet	P-F	P	F-G	F-G	F-G	G	P	E	E	P	P	F-G	E	F	F-G	-	G
Lumax (atrazine + Dual II Magnum + Callisto)	G-E	P-F	F	G-E	G-E	G-E	F-G	G	G	F	F-G	P-F	F-G	P-F	F-G	-	F
Micro-Tech	F-G	N	N	N	P	P	N	G	G	N	P	N	P	N	P	N	N
Micro-Tech + Atrazine	E	F	G	E	E	P	G	E	G	G	E	G	G	G	G	G	G
Micro-Tech + Atrazine + Princep	E	F	G	E	E	P	G	E	G	G	E	G	G	G	G	G	G
Outlook	F	N	N	N	P	P	N	G	G	N	P	N	P	N	P	N	N
Outlook + Atrazine	E	F	G	E	E	P	G	E	G	G	E	G	G	G	G	G	G
Outlook + Bladex	F-G	P	F	G	G	P	F-G	G	G	F	G	-	G	-	G	-	P-F
Outlook + Atrazine + Princep	E	F	G	E	E	P	G	E	G	G	E	G	G	G	G	G	G
Princep	G-E	F	G	G-E	E	N	G	E	N	F	E	G-E	E	F-G	F-G	F-G	F-G
Prowl	N	N	N	N	F-G	F-G	P	F-G	F-G	N	P	N	P	N	P	P	F
Python	P-F	P	F-G	F-G	G	G	P	G	G	P	P	F-G	E	F	F-G	-	G
SureStart	P-F	N	G	F	G	G	F	G	G	G	G	-	-	-	P	-	G

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.25 - Corn Group 2 - Postemergence

Relative effectiveness of residual herbicides for corn[1]

	Eastern black nightshade	Burcucumber	Cocklebur	Jimsonweed	Lambsquarters	TR-Lambsquarters	Morningglory (annual spp.)	Pigweed	TR-Pigweed	Giant ragweed	Common ragweed	Sicklepod	Smartweed	Spurred anoda	Prickly sida or teaweed	Tropic Croton	Velvetleaf
Accent	N	F-G	P	F	P	P	F	G-E	G-E	P	P	F	F-G	-	P	-	P
Aim	G	N	N	N	F-G	F-G	F	G	G	N	P	-	-	-	-	-	E
Atrazine + Oil	G-E	F-G	G-E	E	E	N	G-E	E	N	G	G-E	G	E	-	G	F-G	F-G
Banvel/Clarity	E	F	E	E	E	E	E	E	E	G-E	G-E	G-E	E	-	G	G	G
Basagran	P	P	G-E	E	P-F	P-F	P	P	P	P-F	F-G	P	G-E	F	F-G	F	F-G
Basis	N	N	F	P-F	G	G	P	G-E	G-E	N	P	P	G	-	N	-	G
Beacon	P-F	G	F-G	F-G	F-G	F-G	F	G-E	G-E	G	G-E	F	F-G	-	F	-	F-G
Buctril	G-E	F-G	F-G	F-G	G	G	F	P	P	F-G	F-G	N	F-G	-	P	G	F-G
Callisto	G	-	F-G	G	E	E	F-G	G-E	G-E	-	F	-	-	F-G	P	-	G-E
Celebrity Plus	E	F-G	E	E	E	E	E	E	E	G-E	G-E	G-E	E	-	G	G	F-G
2,4-D	F	P	G-E	E	E	E	E	E	E	E	E	F-G	F-G	-	G	G	F-G
Distinct	E	F-G	E	E	E	E	E	E	E	G-E	G-E	G-E	E	-	G	G	G
Equip	F	F-G	F	F	F	F	P	E	E	F-G	F-G	P-F	F	-	-	-	P
Evik	G	F	E	E	E	E	F-G	G	G	F-G	G-E	F-G	F-G	-	G	F-G	F-G
Exceed	G	G	G	G	P-F	P-F	P-F	G-E	G-E	G-E	G-E	G	G-E	-	P	-	F-G
FieldMaster	F-G	E	E	E	F-G	F-G	G	E	E	G	F-G	F-G	F-G	F	F-G	G	F-G
Glyphosate	F-G	E	E	E	F-G	F-G	G	E	E	G	F-G	F-G	F-G	F-G	F	F-G	G
Gramoxone Inteon	G	G	G	G	G	G	F-G	G	G	F-G	G	G	F-G	G	G	G	G
Harmony SG	P	P-F	F	P	E	E	P	E	E	P	N-P	P	G	P	P	P	F-G
Hornet	P	N	G	G	P-F	P-F	F	F	F	F-G	G	-	F-G	-	N	-	G
Impact	G	-	F-G	G	E	E	F	G-E	G-E	G	G	-	-	F-G	P	-	G-E
Laudis	G	-	F-G	G	E	E	F	G-E	G-E	G	G	-	G	-	N	-	G-E
Liberty	G	G	G-E	G-E	F-G	F-G	G-E	G	G	G	G-E	G-E	F	-	F-G	-	G
Liberty ATZ	G-E	G	G-E	G-E	G-E	F-G	G-E	G-E	G	G	G-E	G-E	E	-	G	F-G	G
Lightning	G-E	P	G-E	G-E	P-F	P-F	P-F	E	E	P	P-F	F	G	-	G	-	F
Linex/Lorox	P-F	F	G	G	G	G	F-G	G	G	G	G	G	F-G	G	G	-	F-G
Marksman	E	G	E	E	E	E	G-E	E	E	G-E	G-E	G-E	E	-	G	G	G
NorthStar	E	F-G	E	E	E	E	E	E	E	G-E	G-E	G	E	-	G	G	G
Option	F	F-G	F	F	P-F	P-F	P	E	E	P-F	G	-	-	-	-	-	P
Permit	P	P	G-E	G	P	P	F	G-E	G-E	F-G	G-E	P-F	F-G	-	N	-	G

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Table 5.25 - Corn Group 2 - Postemergence (cont.)

Relative effectiveness of residual herbicides for corn[1]

	Eastern black nightshade	Burcucumber	Cocklebur	Jimsonweed	Lambsquarters	TR-Lambsquarters	Morningglory (annual spp.)	Pigweed	TR-Pigweed	Giant ragweed	Common ragweed	Sicklepod	Smartweed	Spurred anoda	Prickly sida or teaweed	Tropic Croton	Velvetleaf
Poast Plus/Poast	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Prowl + Atrazine	G-E	F-G	G-E	E	E	N	G-E	E	N	G	G-E	G	E	-	G	F-G	G
Require Q	P-F	-	P-F	F	P-F	P-F	P-F	G	G	F	P	-	P	-	-	-	P
Resolve	P	-	P	-	P	P	P-F	F-G	F-G	-	P	-	P	-	-	-	P
Resolve Q	P	-	P-F	-	P-F	P-F	P-F	G	G	-	P	-	P	-	-	-	P
Resource	F-G	F-G	P	P	P	P	P	F	F	P	P	N	P	-	N	-	E
Scorpion III	P-F	P	G-E	G	F	F	G	G	G	G	G-E	-	F-G	-	F	G	E
Sencor + 2,4-D or Banvel	F	P	G	G-E	G	G	G-E	G-E	G	G	G	G	F-G	-	G	G	G
Status	E	F-G	E	E	E	E	E	E	E	G-E	G-E	G-E	E	-	G	G	G
Steadfast	N	F-G	P	P-F	P	P	P	G-E	G-E	P	P	P	F-G	-	P	-	P
Stinger	F	N	G-E	G	P	P	N	P	P	G-E	E	-	F	-	-	-	P
Spirit	F	F-G	F-G	F-G	P-F	P-F	P-F	G-E	G-E	G	G-E	F	F-G	-	P	-	F-G

[1]Legend - based on adequate moisture, good growing conditions, and proper herbicide application.

E = Excellent (>90% control), G-E = Good to Excellent, G = Good (80-90% control), F-G = Fair to Good, F = Fair (60-80% control), P-F = Poor to Fair, P = Poor (20-60% control), N = None (<20% control)

Atrazine Use Recommendations and Precautions

Preemergence* - Soil applications prior to crop emergence:

1. On highly erodible soil (as defined by SCS):

   - Fields where more than 30% of the soil is covered with plant residue at planting - apply a maximum of 2.0 pounds of active ingredient of atrazine per acre as a broadcast spray.

   - Fields where less than 30% of the soil is covered with plant residue at planting - apply a maximum of 1.6 pounds of active ingredient of atrazine per acre as a broadcast spray.

2. On soils not highly erodible

   - Apply a maximum or 2.0 pounds of active ingredient of atrazine per acre as a broadcast spray.

Postemergence* - for all applications after crop has emerged:

1. If no atrazine was applied prior to crop emergence, use a maximum postemergence rate of 2.0 pounds of active ingredient of atrazine per acre.

2. If a preemergence application was made in the same calendar year, the combined pre- and postemergence applications may not exceed 2.5 pounds of active ingredient of atrazine per acre.

***Remember** - the total amount of atrazine applied (pre- and postemergence combined) may not exceed 2.5 pounds of active ingredient of atrazine per acre per calendar year.

Do not mix, load or apply atrazine within 50 feet of:

- Drinking water wells
- Livestock water wells
- Agricultural drainage wells
- Irrigation wells
- Abandoned wells
- Sinkholes

Do not mix or load atrazine within 50 feet of:

- Intermittent streams
- Perennial streams
- Rivers
- Lakes
- Reservoirs

Do not apply atrazine within 200 feet of:

- Lakes
- Reservoirs

Do not apply atrazine within a 66 foot arc measured from points where surface water runoff enters:

- Intermittent streams
- Perennial streams
- Rivers

Corn Herbicide Use

Table 5.26 - Grazing and Foraging Restrictions for Corn Herbicides

The following corn herbicide labels restrict grazing and/or foraging (silage) intervals for treated corn.

	Days after treatment	
Corn Herbicide	**Graze**	**Silage/Grain**
24-D	7	7
Accent	30	30
Aim	No restrictions	No restrictions
Atrazine	21	21
Axiom	Do not graze	—
Banvel/Clarity or Marksman	> milk stage	> milk stage
Basagran	12	12
Basis	30	30
Basis Gold	30	30
Beacon	30	45/80
Buctril	30	30
Callisto	not specified	not specified
CelebrityPlus	Do not graze	32/72
Define	5 months	5 months
Degree	Do not graze	0
Distinct	Do not graze	32/72
Dual II Magnum/Cinch	30	30
Equip	45	45/70
Evik	30	30
Exceed	30	40/80
Expert	30	30
Gramoxone Inteon	Do not graze	Do not feed
Halex GT	45	45
Harmony SG	30	30
Harness	21	21
Hornet	Do not graze	85
Ignite 280	Do not graze	60/70
Impact	45	45
Laudis	45	45
Liberty	Do not graze	60/70
Liberty ATZ	Do not graze	60/70
Lightning	45	45
Lumax	Do not graze	Do not feed
Micro Tech/Partner	21	21
Northstar	<30	45/60
Option	<45	<45/70

[1]Do not graze or use for silage if sequential in-crop applications are made.

[2]Do not graze, harvest, or feed corn forage or silage following a sequential in-crop application of this product followed by Roundup Ultra herbicide on Roundup Ready corn.

Table 5.26 - Grazing and Foraging Restrictions for Corn Herbicides (cont.)

The following corn herbicide labels restrict grazing and/or foraging (silage) intervals for treated corn.

	Days after treatment	
Corn Herbicide	**Graze**	**Silage/Grain**
Outlook	40	40
Permit	30	30
Poast Plus/Poast	60	45/60
Princep	Do not graze	—
Prowl	75	75
Pursuit	45	45
Python	Do not graze	85
Ready Master ATZ[2]	—	50/—
Require Q	30	30
Resolve	30	30
Resolve Q	30	30
Resource	28	28
Roundup Weather Max	0[1]	50/7[1]
Roundup Weather Max (spot treatment)	14	14
Sequence	30	30/50
Spirit	<30	<40/60
Status	—	32/72
Steadfast	30	30
Stinger	40	40
Stout	30	30
SureStart	not specified	not specified
Touchdown	56	56
Yukon	30	30

[1]Do not graze or use for silage if sequential in-crop applications are made.

[2]Do not graze, harvest, or feed corn forage or silage following a sequential in-crop application of this product followed by Roundup Ultra herbicide on Roundup Ready corn.

IR/IT Corn Statement

Lightning, Pursuit, and Scepter are imidazolinone herbicides or imidazolinone-containing package mixes. These herbicides can be used only on IR (imidazolinone resistant) or IT (imidazoline tolerant) corn varieties such as Clearfield or severe injury may result. IR and IT corn varieties are recommended when a risk of Pursuit or Scepter carryover makes the planting of standard varieties impractical. Continuous or exclusive use of a herbicide or herbicides with a single site of action encourages the development of resistant weeds. The use of these products in corn is not recommended due to the increased risk of weed resistance development.

Table 5.27 - Maximum Corn and Weed Size for Delayed Preemergence Herbicides

Herbicides	Maximum Corn Size	Maximum Weed Size
Atrazine	12 inches	1.5 inches
Banvel or Marksman + Dual or Lasso EC	3 inches	2-leaf grass
Banvel or Marksman + Outlook	8 inches	1-inch grass
Bicep II Magnum/Cinch ATZ	5 inches	2-leaf
Bullet or Micro-Tech + atrazine	5 inches	2-leaf
Callisto	30 inches or 8-leaf	5 inch
Define	before emergence	before emergence
Degree[5]	11 inches or by tank-mix partner	before emergence or by tank-mix partner
Dual II Magnum/Cinch	<40 inches	2-leaf
Dual II Magnum + Banvel	5 inches	3-inch pigweed
Dual II Magnum/Cinch + Marksman	3 inches	2-leaf
Guardsman Max/Leadoff	12 inches	1.5 inches
Harness or Harness Xtra[3]	11 inches or by tank-mix partner	2-inch grass or by tank-mix partner
Marksman + Prowl	2-leaf	1-inch grass
Outlook	8 inches	before emergence or by tank-mix partner
Outlook + Accent[1]	12 inches	3 inches
Outlook + Beacon	12 inches	depends on weed (see Beacon label)
Princep	before emergence	before emergence
Prowl + Accent[2]	6-leaf	depends on weed (see Accent label)
Prowl + Atrazine or Prowl + Bladex 90DF	4-leaf	1 inch
Prowl + Beacon[2]	6-leaf	depends on weed (see Beacon label)
Python WDG	2 inches (spike)	before emergence
SureStart	11 inches	1-2 inch
TopNotch[4], Fultime	11 inches or by tank-mix partner	before emergence or by tank-mix partner

[1] May use a reduced rate of Outlook and Accent under certain conditions.

[2] Accent rate of 1/3-2/3 oz/A and Beacon rate or 3/8-3/4 oz/A.

[3] May be tank mixed with Accent, Atrazine (Harness), Banvel, or Clarity, Marksman, Permit, or Pursuit (IMI-corn)

[4] May be tank mixed with a number of different products including Accent, Banvel, or Clarity, Prowl, Pursuit (IMI-corn), etc. See an herbicide label for specific information.

[5] May be tank mixed with Accent, Atrazine, Banvel or Clarity, Marksman, Permit, Princep, Prowl, or Pursuit (IMI corn).

Table 5.28 - Perennial Sod: Bluegrass, Fescue, Orchardgrass, Timothy, and Ryegrass

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
CORN (no-till)			
For control of fescue and orchardgrass sods and control of annual weeds listed above	paraquat 0.50 lb + surfactant + paraquat 0.50 lb + surfactant 10-14 days later + residual herbicide treatment as required for specific infestations	Gramoxone Inteon 1.0 pt + surfactant as labeled + Gramoxone Inteon 1.0 pt + surfactant as labeled 10- to 14-days later + residual herbicide	Use double paraquat application for vigorous orchardgrass stands where single applications have not been effective. Observe paraquat use instructions and precautions as above. Tankmix with residual herbicides as listed below for the specific weed infestation. High triazine rates are not required for orchardgrass control where the double paraquat application is used.
Alternative method: For control of tall fescue and orchardgrass sods	glyphosate 1.0-3.0 lb + residual herbicide treatment as required for specific infestation	4.0 lb ai/gal glyphosate or equivalent 1.0-3.0 qt + residual herbicides	For fescue control apply 3.0 lb rates of Roundup Ultra or Touchdown when most plants have reached the boot stage. For orchardgrass control, apply the 2.0 lb rate of Roundup Ultra or Touchdown when most plants have reached the boot stage. 1.0-1.5 lb of Roundup Ultra can be used in 3.0-10.0 gal of water for orchardgrass control when orchardgrass is a minimum of 12 inches tall. Use of atrazine with these treatments is recommended for optimum sod control.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble

Acetochlor use restrictions:

-Read label concerning personal protective equipment.

-This product is toxic to fish. Avoid application/runoff to areas containing aquatic life.

-This chemical demonstrates the properties and characteristics associated with chemicals detected in ground water. Avoid permeable soils and minimize runoff.

-Do not apply to coarse soils classified as sands with less than 3% OM, loamy sands less than 2% OM, or sandy loams less than 1% OM, where depth to groundwater is 30' or less.

-Observe restrictions on label concerning mixing, loading, rinsing, and washing.

-Do not apply through irrigation equipment.

-Do not apply using aerial application equipment.

-Do not use acetochlor on any crop other than corn.

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Control of annual weeds and annual cover crops	paraquat 0.25-0.50 lb + surfactant	Gramoxone Inteon 0.5-1.0 pt	Apply in 20.0 to 60.0 gal/A of water 10- to 14-days before planting. A nonionic surfactant is needed. Paraquat may not control weeds taller than 6 inches. Increase gallonage as density of stubble, crop residue, or weeds increases. Paraquat will not provide residual weed control. Residual herbicides can be tankmixed with paraquat.
Control of annual weeds and annual cover crops and suppression or control of perennial weeds or covers	glyphosate 0.5-3.0 lb	4.0 lb ai/gal glyphosate or equivalent 0.5-3.0 qts	Glyphosate is effective in heavy annual weed infestations and with large weeds where through coverage with paraquat is not possible. Higher rates will control perennial species, but those species often are not present or susceptible at the time of planting. Use 0.5 qt for annual weeds up to 6 inches tall and 1.5 qt for weeds taller than 6 inches. Applications with fan-type nozzles generally have been more effective than with flood nozzles. A surfactant is required for some glyphosate formulations. Residual herbicides can be tankmixed with glyphosate. Glyphosate is also available in a prepack with Dual II Magnum called Sequence.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Contact kill of rye, wheat, and barley cover crops from use of Gramoxone Inteon or glyphosate and residual control of annuals including barnyardgrass, crabgrass, fall panicum, foxtails, goosegrass, lambsquarters, morning-glory (annual), mustard, nightshade, redroot pigweed, purslane, ragweed, smartweed, spanish needles, velvetleaf and witchgrass	nonselective herbicide + atrazine 1.0-2.0 lb + simazine 1.0-2.0 lb	(discussed above) + atrazine 4L 1-2 qt, or 90DF 1.1-2.2 lb + Princep 4L 1.0-2.0 qt or 90DF 1.1-2.2 lb	Apply 10-14 days before planting in 35-45 gal/A. Use paraquat 0.5 lb active ingredient on barley. Use 1:2 atrazine to simazine ratio on heavily infested fall panicum fields. Do not plant to any crop, except those specifed on the label, the following year. Do not allow animals to graze treated forage. See precaution above on use of paraquat. Follow label for proper mixing procedures and adjust rate to soil texture, organic matter content of soil, and weed problem. Low-volume broadcast applications (3-10 gal/A) are recommended with some formulations for best results.
Contact kill of rye, wheat and barley cover crops from use of Gramoxone Inteon or glyphosate and residual control of annuals including barnyardgrass, carpetweed, cocklebur,crabgrass, fall panicum, Florida pusley, foxtails, goosegrass, jimsonweed, lambsquarters, nightshade (black), pigweed spp.,purslane, ragweed (common), signalgrass, smartweed, velvetleaf and witchgrass	nonselective herbicide + alachlor 2.5-3.0 lb + atrazine 1.0-2.0 lb	(discussed above) + Micro-Tech 2.5-3.0 qt + atrazine 4L 1.0-2.0 qt or 90DF 1.1-2.2 lb	Apply 10-14 days before and up to day of planting. Use paraquat at 0.47 lb active ingredient on barley. See precaution above on use of paraquat. Follow label for proper mixing procedures and adjust rate to soil texture, organic matter content of soil, and weed problem. This combination may be weak on crabgrass species and may not provide season-long control of other annual grasses. Alachlor plus atrazine may also be applied as prepackage mix called Bullet. Low-volume broadcast applications (3-10 gal/A) are recommended with some formulations.
Contact kill of rye, wheat, and barley cover crops from use of Gramoxone Inteon or glyphosate and residual control of annuals including barnyardgrass, crabgrass, fall panicum, foxtails, goosegrass, signalgrass yellow nutsedge, carpetweed cocklebur, common purslane, pusley, lambsquarters, morning-glory, pigweed spp., ragweed, smartweed, and velvetleaf	nonselective herbicide + s-metolachlor 0.95-1.6 lb + atrazine 1.2-2.0 lb	(discussed above) + Dual II Magnum 7.64 L 1.0-1.67 pt + atrazine 4L 1.2-2.0 qt or 90DF 1.3-2.2 lb or Bicep II Magnum 5.5 1.6-2.6 qt	Apply before, during, or after planting, but before the corn emerges. Adjust rates to soil texture and organic matter. Use lower rate of glyphosate for annual weeds and higher rate for perennial weeds. Do not graze or feed forage to livestock or use for silage. Small grains may be seeded 4.5 months after metolachlor use. Do not graze or feed forage or fodder from small grains to livestock. Metolachlor and the Metolachlor plus Atrazine prepackage mix are also available as Cinch and Cinch ATZ. Atrazine plus s-metolachlor is also available with glyphosate as the prepackage mix Expert.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Contact kill of rye, wheat, and barley cover crops from use of Gramoxone Inteon or glyphosate and residual be control of annual grasses including barnyardgrass, crabgrass spp., fall panicum, foxtail spp., goosegrass and witchgrass and annual broadleaf weeds including jimsonweed, lambsquarters (including triazine-resistant species), nightshade, common pigweed (including triazine- resistant species), smartweed, and velvetleaf	nonselective herbicide + atrazine 0.625-0.75 lb + mesotrione 0.168-0.20 lb + s-metolachlor 1.68-2.0 lb	(discussed above) + Lumax 4.0L 2.5-3.0 qt	Use the 2.5 qt rate on soils of less 3.0% organic matter content, and the 3.0 qt rate on soils of greater than 3.0% organic matter. Unsatisfactory weed control may observed if activation rainfall is not received within 7 days of appliccation. Lumax contains a relatively low rate of atrazine. Broadleaf weed control can be significantly improved through use of additional atrazine. The addition of Princep will also provide improved broadleaf and annual grass control. Lumax provides control of triazine- resistant pigweed and ragweed, lambsquarters species. Do not rotate to crops other than corn (all types), cotton, soybeans, sorghum, or peanuts in the spring following application. Lumax can also be applied as an early postemergence treatment on corn up to 5 inches in height. Early postemergence applications will not provide consistent control of emerged annual grasses.
Contact kill of rye, wheat, and barley cover crops from use of Gramoxone Inteon or glyphosate and residual control of annuals including barnyardgrass, crabgrass, fall panicum, foxtails, goosegrass, signalgrass, yellow nutsedge, carpetweed, cocklebur, common purslane, Florida pusley, lambsquarters, morning-glory, pigweed spp., ragweed, smartweed, and velvetleaf	pendimethalin .75-1.5 lb	Prowl 3.33EC 0.91-1.8 qt	Addition of prowl will aid in the control or triazine-resistant lambsquarters and velvetleaf. Use of this treatment on coarse textured soils of less than 1.5% organic matter content is not recommended due to the potential for crop injury. Pendimethalin is also available as Prowl H_2O.
Contact kill of rye, wheat, and barley cover crops from use of Gramoxone Inteon or glyphosate and residual control of annuals including barnyardgrass, crabgrass, fall panicum, foxtail millet, giant foxtail, goosegrass, green foxtail, signalgrass, southwestern cupgrass, witchgrass, yellow foxtail, yellow nutsedge, carpetweed, cocklebur, common purslane, Florida pusley, lambsquarters, morning-glory, pigweed spp., ragweed, smartweed, velvetleaf, and sandbur	nonselective herbicide + s-metolachlor 0.95-1.6 lb + atrazine 0.6-1.0 lb + simazine 0.6-1.0 lb	(discussed above) + Dual II Magnum 7.64L 1.0-1.67 pt + atrazine 4L 0.6-1.0 qt or 90DF 0.66-1.1 lb + Princep 4L 0.6-1.0 qt or 90DF 0.66-1.1 lb	Apply in 10-40 gal of water or fluid fertilizer with ground equipment in minimum tillage or no-tillage systems where corn is planted directly into a cover crop, stale seedbed, established sod, or previous crop residues. Use lower rate of glyphosate for annual weeds and higher rate for perennial weeds. Adjust rates of metolachlor, atrazine, and simazine to soil texture, organic matter content of soil, and weed problem. Check labels for restrictions regarding planting of rotational cover crops. Note: metolachlor plus atrazine plus simazine may also be applied as Bicep II Magnum plus Princep. Consult label for specific rates. Metolachlor and the metolachlor plus atrazine prepackage mix are also available as Cinch and Cinch ATZ.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Contact kill of barley, rye and wheat cover crops from use of Gramoxone Inteon, or glyphosate and residual control of annuals, including barnyardgrass, carpetweed, cocklebur, crabgrass, foxtail; (giant, green and yellow), goosegrass, lambsquarters, morning-glory spp., nutsedge (yellow), panicum (fall), pigweed supp., purslane, pusley (Florida), ragweed, signalgrass, smartweed and velvetleaf	nonselective herbicide + the approved tankmix dimethenamid-P 0.66-0.98 lb + atrazine 1.2-2.0 lb	(discussed above) + Outlook 6EC 14.0-21.0 oz + atrazine 4L 1.2-2.0 qt or 90W 1.3-2.2 lb	Apply before, during or after planting, but apply before the corn emerges. Adjust rates to soil texture and organic matter content of soil. Do not graze or feed forage to livestock or use for silage. Small grains may be seeded 4 months after dimethenamid use. Do not graze or feed forage or fodder from small grains to livestock. Dimethenamid plus atrazine may also be applied as the prepackage mix Guardsman Max.
Contact kill of barley, wheat, or rye cover crops from use of Gramoxone Inteon or glyphosate and residual control of annuals, including barnyardgrass, carpetweed, cocklebur, crabgrass, southwestern cupgrass, foxtail; (giant, green and yellow), goosegrass, lambsquarters, foxtail millet, morning-glory spp., yellow nutsedge, fall panicum, pigweed supp., purslane, Florida pusley, ragweed, signalgrass, smartweed, velvetleaf and witchgrass.	nonselective herbicide + dimethenamid-P 0.66-0.98 lb + atrazine 0.5-1.0 lb + simazine 0.5-1.0 lb	(discussed above) + Outlook 14.0-21.0 oz + atrazine 4L 0.5-1.0 qt or 90W 0.55-1.1 lb + Princep 4L 0.5-1.0 qt or 90W 0.55-1.1 lb	Apply in 10 to 40 gal of water or fluid fertilizer with ground equipment in minimum tillage or no-tillage systems where corn is planted directly into a cover crop, stale seedbed, established sod or previous crop residues. Adjust rates of atrazine, dimethenamid and simazine to soil texture, organic matter content of soil and weed problem. Check labels for restrictions regarding planting of rotational cover crops. Consult label for specific rates. Dimethenamid plus atrazine may also be applied as the prepackage mix Guardsman Max. Late season grass control may diminish in no-till conditions.
Contact kill of barley, wheat, or rye cover crops from use of Gramoxone Extra or glyphosate and residual control of carpetweed, chickweed, cocklebur, henbit, horseweed, jimsonweed, lambsquarters, morning-glory, nightshade, pigweeds, ragweed purslane, red clover, (common), sicklepod, sida (prickly), smartweed, spurred anoda, velvetleaf	nonselective herbicide + flumetsulam/clopyralid 0.171-0.257 lb or flumetsulan 0.04-0.07 lb	(discussed above) + Hornet 78.5D 4.0-6.0 oz or Python 80D 0.8-1.33 oz	Adequate soil moisture is required for optimum herbicidal activity. If using in liquid fertilizer solution, water-soluble packets containing Hornet or Python should be premixed with water and added to the spray tank through a 20-35 mesh screen. Soil insecticides should be applied in a band to avoid potential injury. Plant corn at least 1.5 inches deep with soil organic matter > 1.5% and soil temperature above 50° F. If these three criteria are not met, injury may occur. To avoid crop injury, plant “IR” or “IMR” corn hybrids. Observe rotational restrictions on label. Hornet and Python are approved for use with most residual grass herbicides.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Contact kill of barley, wheat, or rye cover crops from use of Gramoxone Inteon or glyphosate and residual control of annual grasses such as barnyard grass, broadleaf signalgrass, browntop and fall panicum, crabgrass, crowfootgrass, field sandbur, foxtail millet, foxtails (giant, green, yellow), goosegrass, prairie cupgrass, red sprangletop, robust foxtail (purple, white), seedling johnsongrass, shattercane, Texas panicum, wild proso millet, witchgrass, yellow nutsedge and broadleaf weeds such as carpetweed, cocklebur, Florida beggarweed, galinsoga, ground cherry, jimsonweed, lambsquarters, nightshade (black and hairy), pigweed, prickly sida, purslane, ragweed (common and giant), smartweed sp., and velvetleaf.	nonselective herbicide + acetochlor 1.53-2.4 lb + atrazine 1.25-2.0 lb	(discussed above) + Harness 7EC 1.75-2.75 pt + atrazine 4L 1.25-2.0 qt or 90 DF 1.4-2.2 lb	See acetochlor comments below. Use of the highest labeled rates should result in more consistent late-season annual grass control. Harness is also available as a package mix with atrazine called Harness Extra.
Contact kill of barley, wheat, or rye cover crops from use of Gramoxone Inteon or glyphosate and residual control of annual grasses such as barnyard grass, broadleaf signalgrass, browntop and fall panicum, crabgrass, crowfootgrass, field sandbur, foxtail millet, foxtails (giant, green, yellow), goosegrass, prairie cupgrass, red sprangletop, robust foxtail (purple, white), seedling johnsongrass, shattercane, Texas panicum, wild proso millet, witchgrass, yellow nutsedge and broadleaf weeds such as carpetweed, cocklebur, Florida beggarweed, galinsoga, ground cherry, jimsonweed, lambsquarters, nightshade (black and hairy), pigweed, prickly sida, purslane, ragweed (common and giant), smartweed sp., and velvetleaf.)	nonselective herbicide + acetochlor 1.6-2.4 lb + atrazine 1.0-2.0 lb or acetochlor 1.6-2.4 lb + atrazine 0.5-1.0 lb + simazine 0.5-1.0 lb	Topnotch 3.2L 4.0-6.0 pt + atrazine 1.0-2.0 qt or Topnotch 3.2L 4.0-6.0 pt + atrazine 1.0-2.0 pt + simazine 1.0-2.0 pt	See acetochlor comments below. Use of the highest labeled rates should result in more consistent late-season annual grass control. Topnotch plus atrazine is also available as a prepackage mix with atrazine called FulTime. Acetochlor plus atrazine is also available in other prepackage mixes including Keystone and Keystone LA.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Contact kill of barley, rye, and wheat cover crops from use of Gramoxone Inteon or glyphosate and residual control of annual grasses such as barnyard grass, broadleaf signalgrass, browntop + fall panicum, crabgrass, crowfootgrass, field sandbur, foxtail millet, foxtails (giant, green, yellow), goosegrass, prairie cupgrass, red rice, red sprangletop, robust foxtail (purple, white), seedling johnsongrass, shattercane, Texas panicum, wild proso millet, witchgrass, yellow nutsedge, and broadleaf weeds such as carpetweed,cocklebur, Florida beggarweed, galinsoga, ground cherry, jimsonweed, lambsquarters, nightshade (black and hairy), pigweed, prickly sida, purslane ragweed (common and giant), smartweed sp., and velvetleaf	nonselective herbicide + the approved tank-mix: acetochlor 1.54-2.4 lb + atrazine 1.25-2.0 lb or acetochlor 1.54-2.4 lb + atrazine 1.25-2.0 lb or 90W 1.39-2.2 lb + simazine 1.0-1.5 lb	nonselective herbicide + the approved tank-mix: Degree 3.8EC 3.25-5.0 pt + Atrazine 4L 1.25-2.0 qt or 90W 1.39-2.2 lb or Degree 3.8EC 3.25-5.0 pt + Atrazine 4L 1.25-2.0 qt + Princep 4L 1.0-1.5 qt or 90W 1.1-1.6 lb	See acetochlor restrictions above. Use of the highest labeled rates should result in more consistent late-season annual grass control. Degree is available in a package mix called Degree Xtra. Rates of Degree Xtra range from 2.9 to 3.7 qt/A.
Pigweed, carpetweed, chickweed, crabgrass, jimsonweed, lambsquarters, nightshade, ragweed (common), smartweed, and velvetleaf	nonselective herbicide + mesotrione 0.188-0.24 lb or mesotrione 0.188-0.24 lb + residual grass herbicide or mesotrione 0.156-0.188 lb + residual grass herbicide + atrazine 1.2-2.0 lb	nonselective herbicide + Callisto 4FL 6.0-7.7 oz or Callisto 4FL 6.0-7.7 oz + residual grass herbicide or Callisto 4FL 5.0-6.0 oz + residual grass herbicide + Atrazine 4L 1.2-2.0 qt or 90W 1.3-2.2 lb	Callisto is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn. Callisto is not effective for the control of most grass weeds. Many preemergence grass herbicides or a postemergence grass herbicide can be tank- mixed with Callisto to provide a broader spectrum of weed control. To broaden its broadleaf weed control ability, tank-mix atrazine with Callisto. Do not apply more than a total of 10.7 oz/A of Callisto/A/season.
Barnyardgrass, carpetweed, crabgrass (large, smooth), foxtail (giant, green, yellow), goosegrass, johnsongrass (seedling), fall panicum, common purslane, and signalgrass	nonselective herbicide + flufenacet 0.6-0.79 lb or flufenacet 0.6-0.79 lb + atrazine 1.0-2.0 lb	nonselective herbicide + Define 60DF 16.0-21.0 oz or Define 60 DF 16.0-21.0 oz + Atrazine 4L 1.0-2.0 qt or 90W 1.1-2.2 lb	Apply after planting and before corn emerges. In the event of a crop failure, corn or soybeans may be planted immediately after a Define application. Small grains may be seeded 12 months after a Define application. Adjust rate to soil texture and organic matter.

Table 5.29 - Annual Cover Crops: Rye, Wheat, Barley, or Crop Stubble (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Contact kill of barley, rye, and wheat cover crops and residual control of annual grasses, including barnyardgrass, crabgrass spp., fall panicum, foxtail spp., goosegrass, and witchgrass and annual broadleaf weeds, including jimsonweed, lambsquarters (including triazine-resistant species), morningglory spp. (suppression), nightshade, common ragweed, pigweed (including triazine-resistant), smartweed, velvetleaf, and yellow nutsedge	nonselective Herbicide + approved tank-mix: Atrazine 1.3-1.5 lb + mesotrione 0.168-0.196 lb + s-metolachlor 1.3-1.5 lb	nonselective herbicide + approved tank-mix: Lexar 3.7FL 3.0-3.5 qt	Use 3 qt/acre on soil with organic matter content less than 3% and 3.5 qt/acre on soil organic matter content 3% or greater. Do not apply more than 14 days prior to planting or to field corn taller than 12 inches. Do not graze or feed forage from treated areas for 45 days following last application. Do not harvest forage, grain, or stover within 60 days after last application. Do not apply other mesotrione containing products (Callisto, Camix, or Lumax) to ground that has been treated the same season. The addition of Princep will improve preemergence broadleaf and annual grass control. Do not apply Lexar postemergence to corn that has received an at-plant application of Counter. Do not make a postemergence application of Lexar in a tank-mix with any organophosphate or carbamate insecticide. Do not make a postemergence application of any organophosphate or carbamate insecticide within 7 days before or 7 days after a Lexar application. If significant rainfall does not occur within 7 days after application, weed control may be decreased. Do not rotate to crops other than corn, cotton, small grains, sorghum or peanuts the spring following application of Lexar herbicide. If applied after June 1, do not rotate with crops other than corn or sorghum the next season.
Early preplant control of annual grasses.	Simazine 1.0-1.5 lb	Princep 4L 1.0-1.5 qt or 90DF 1.1-1.7 lb	Apply 2-4 weeks prior to corn planting. Rainfall is necessary for satisfactory control. Apply additional burndown and residual herbicides at planting as required.
Supplement to paraquat or glyphosate early preplant, burndown treatments. For added control of hard to control annual broadleaf weeds present at no-till corn establishment, suppression of some perennial broadleaf species, and control of alfalfa and clovers.	2,4-D 0.25-0.5 or Dicamba 0.25-0.375 lb	2,4-D 0.5-1.0 pt or Banvel 0.5-0.75 pt	Add 2,4-D or dicamba to paraquat or glyphosate for added burndown of hard to control broadleaf weeds. Use the lower rate of 2,4-D on light sandy soils and the higher rate only on heavy soils. Do not apply dicamba on light, sandy, coastal plain soils as a preemergence treatment. Adjust dicamba rate to soil texture and organic matter content as labeled. Use 2,4-D for added control or suppression of mustard spp., plantains, horseweed, dandelion, and 2,4-D susceptible annual broadleaf weeds. Use dicamba for control or suppression of dock, clovers, alfalfa, and dicamba-susceptible annual broadleaf weeds.

Triazine-resistant Weeds in No-till Corn

For pigweed control, use a nonselective herbicide plus atrazine in combination with chloroacetamide herbicide (alachlor, s-metolachlor, acetochlor, or dimethenamid-p). Simazine may also be included where required for late-season annual-grass control. The chloroacetamide herbicide will suppress or control initial triazine-resistant pigweed flushes, but in most years an early postemergence application of dicamba will be required for season-long control. For control of triazine-resistant pigweed, common lambsquarters, and velvetleaf, use a nonselective herbicide in combination with flumetsulam (Python) or rimsulfuron plus thifensulfuron-methyl (Basis). With timely activation rainfall, these treatments can provide season-long control of these species without supplemental postemergence herbicide applications. Atrazine should generally be applied in combinations with flumetsulam for broad-spectrum weed control. A residual grass herbicide should be tank mixed with Python or Basis for season-long grass control. Lumax, a blend of s-metolachlor + atrazine + mesotrione (Callisto) also provides excellent season-long control of triazine-resistant lambsquarters and pigweed species.

Corn (Conventional Tillage) Herbicide Use

Table 5.30 - Preplant Incorporated

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Barnyardgrass, carpetweed, crabgrass (large, smooth), foxtail (giant, green, yellow), goosegrass, johnsongrass (seedling), fall panicum, common purslane, and signalgrass	flufenacet 0.525-0.75 lb or flufenacet 0.525-0.75 lb + atrazine 1.0-2.0 lb	Define 60DF 14.0-20.0 oz or Define 60DF 14.0-20.0 oz + Atrazine 4L 1.0-2.0 qt or 90W 1.1-2.2 lb	Apply to the soil and incorporate into top 2 inches of soil before planting using a field cultivator, disk harrow, or similar implement. Read the label and adjust rate to soil texture and organic matter content of soil. In the event of a crop failure, corn or soybeans may be planted immediately after a Define application. Small grains may be seeded 12 months after a Define application.
Barnyardgrass, crabgrass, fall panicum, foxtails, goosegrass, signalgrass, witchgrass, yellow nutsedge, carpetweed, Florida pusley, and pigweed.	s-metolachlor 0.95-1.6 lb	Dual II Magnum 7.64L 1.0-1.67 pt	Apply to the soil and incorporate into the top 2 inches within 14 days before planting using a disk, harrow, rolling cultivator, or similar implement. Small grains may be planted 4.5 months following treatment. Do not graze or feed forage or fodder from small grains to livestock. S-metolachlor is also available as Cinch.
Above weeds and cocklebur, common purslane, lambsquarters, pigweed spp., morning glory, ragweed, smartweed, and velvetleaf	s-metolachlor 0.76-1.6 lb + atrazine 1.0-2.0 lb	Dual II Magnum 7.64L 0.8-1.67 pt + atrazine 4L 1.0-2.0 qt or 90DF 1.1-2.2 lb or Bicep II Magnum 5.5L 1.3-2.6 qt	Apply tankmixture to the soil and incorporate into the top 2 inches before planting using a disk, harrow, rolling cultivator, or similar implement. Read the label and adjust rate to soil texture and organic matter content. See metolachlor restrictions above. S-metolachlor plus atrazine is also available in the prepackage mix Cinch ATZ.

Table 5.30 - Preplant Incorporated (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Barnyardgrass, crabgrass, fall panicum, foxtail millet, giant foxtail, goosegrass, green foxtail, signalgrass, southwestern cupgrass, witchgrass, yellow foxtail, yellow nutsedge, carpetweed, cocklebur, common purslane, Florida pusley, lambsquarters, morning-glory, pigweed spp., ragweed, smartweed, velvetleaf, sandbur, seedling johnsongrass, and volunteer sorghum	s-metolachlor 0.76-1.6 lb + atrazine 0.5-1.0 lb + simazine 0.5-1.0 lb	Dual II Magnum 7.64L 0.8-1.67 pt + Atrazine 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb + Princep 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb	Apply the tankmixture to the soil and incorporate into the top 2 inches of soil within 14 days before planting using a finishing disk, harrow, rolling cultivator, or similar implement capable of providing uniform 2 inches incorporation. If corn is to be planted on beds, apply and incorporate the tankmixture after bed formation. Read the label and adjust rate to soil texture and organic matter content. Note: Metolachlor plus atrazine plus simazine may also be applied as Bicep II Magnum or Cinch ATZ plus Princep (simazine).Consult label for specific ratios.
Barnyardgrass, crabgrass spp., foxtail spp., goosegrass, seedling johnsongrass, yellow Nutsedge, panicum spp., shattercane, broadleaf signa lgrass, witchgrass, pigweed spp., ca rpetweed, common chickweed, cocklebur, galinsoga, henbit, horseweed, jimsonweed, lambsquarters spp., Venice mallow, morningglory spp., purselane, ragweed spp., sicklepod, prickly sida, smartweed, spurge spp., velvetleaf, and others	acetochlor 0.70 - 0.94 lb + clopyralid 0.071 - 0.095 lb + flumetsulam 0.023 - 0.030 lb	SureStart 4.25 E 1.5 - 2.0 pt	SureStart contains acetochlor. Follow acetochlor use restrictions. If incorporated, uniformly incorporate into the top 2 to 3 inches of soil. Adequate soil moisture is required for preemergence surface activity. If adequate soil moisture is not received within 7 to10 days following a surface-applied treatment, a shallow cultivation is recommended. Injury to corn has been observed when cool, wet soil conditions follow application. Refer to label restrictions regarding insecticide interactions. Do not use as a soil-applied treatment in fields with less than 1.5% organic matter content unless risk of crop injury is acceptable. SureStart may also be applied as a postemergence treatment to corn up to 11 inches in height and weeds up to 1 to 2 inches in height.
Barnyardgrass, carpetweed, crabgrass, foxtail (giant, green and yellow), goosegrass, nutsedge (yellow), panicum (fall), pigweed spp., pusley (Florida), signalgrass and witchgrass	Dimethenamid-P 0.66-0.98 lb	Outlook 6EC 14.0-21.0 oz	Apply to the soil and uniformly incorporate into the top 2 inches within 14 days before planting using a field cultivator, disk harrow, or similar implement. Small grains may be planted 4 months following treatment.
Above weeds and johnsonweed, cocklebur, lambsquarters, morning- glory spp., pigweed spp., purslane, ragweed, smartweed, velvetleaf and nightshade (black)	Dimethenamid-P 0.66-0.98 lb + atrazine 1.0-2.0 lb	Outlook 6EC 14.0-21.0 oz + atrazine 4L 1.0-2.0 qt or 90W 1.1-2.2 lb	Apply tankmixture to the soil and incorporate into the top 2 inches of soil before planting using a field cultivator, disk harrow, or similar implement. Read the label and adjust rate to soil texture and organic matter content of soil. See dimethenamid restrictions above. Dimethenamid plus atrazine may also be applied as the prepackage mix Guardsman Max.

Table 5.30 - Preplant Incorporated (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Barnyardgrass, carpetweed, crabgrass, cupgrass (southwestern), foxtaiil (giant, green and yellow), goosegrass, johnsongrass seedling, lambsquarters, millet (foxtail), morning glory spp., nutsedge (yellow), panicum (fall), pigweed spp., purslane, pusley (Florida), ragweed, sandbur, signalgrass, smartweed, velvetleaf, volunteer sorghum and witchgrass	Dimethenamid-P 0.66-0.98 lb + atrazine 0.5-1.0 lb + simazine 0.5-1.0 lb	Outlook 6EC 14.0-21.0 oz + atrazine 4L 0.5-1.0 qt or 90W 0.5-1.1 lb + Princep 4L 0.5-1.0 qt or 90W 0.5-1.1 lb adjust rate to soil texture and	Apply the tankmixture to the soil and incorporate into the top 2 inches of soil within 14 days before planting using a finishing disk, harrow, field cultivator or similar implement capable of providing uniform 2 inch incorporation. If corn is to be planted on beds, apply and incorporate the tankmixture and organic matter content of soil. Dimethenamid plus atrazine may also be applied as the prepackage mix Guardsman Max.

Table 5.31 - Preemergence

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Acetochlor use restrictions: -Read label concerning personal protective equipment. -This product is toxic to fish. Avoid application/runoff to areas containing aquatic life. -This chemical demonstrates the properties and characteristics associated with chemicals detected in ground water. Avoid permeable soils and minimize runoff. -Do not apply to coarse soils classified as sands with less than 3% OM, loamy sands less than 2% OM, or sandy loams less than 1% OM, where depth to groundwater is 30' or less. -Observe restrictions on label concerning mixing, loading, rinsing, and washing. -Do not apply through irrigation equipment. -Do not apply using aerial application equipment. -Do not use acetochlor on any crop other than corn.			
Barnyardgrass, carpetweed, crabgrass, fall panicum, Florida pusley, foxtails (giant, green, and yellow), goosegrass, purslane (common), signalgrass, witchgrass, and pigweed spp.	Alachlor 2.0-3.25 lb	Micro-Tech 2.0-3.25 qt or other alachlor formulations	Apply after planting and before crop or weeds emerge. Read label and adjust rate to soil texture and organic matter content. Most effective on grasses; higher rate improves control of many broadleaf weeds.
Above weeds and black nightshade, jimsonweed, lambsquarters, morningglory, mustards, pigweed spp., ragweed, smartweed, and velvetleaf	Alachlor 1.5-3.0 lb + atrazine 1.0-1.6 lb	Micro-Tech 1.5-3.0 qt or other alachlor formulations + atrazine 4L 1.0-1.6 qt, or 90DF 1.1-1.8 lb or Bullet (prepackage mix) 2.5-4.5 qt	Read label and adjust rate to soil texture and organic matter content. See other remarks and precautions to the use of alachlor and atrazine separately. Alachlor and atrazine may be applied as a tankmix and incorporated into the top 2 inches of soil within 7 days before planting. Certain alachlor formulations may also be applied as an early postemergence treatment up to the time when weeds reach the 2 leaf stage and corn is not more than 5 inches high. Do not apply as an early postemergence treatment in fluid fertilizer.

Table 5.31 - Preemergence (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Many annuals: Florida pusley, lambsquarters, morningglory, nightshade, mustards, redroot pigweed, velvetleaf, and witchgrass. Broadleaf weeds listed above for atrazine plus barnyardgrass, Brachiaria sp., crabgrass, foxtails, fall panicum, Florida pusley, goosegrass, lambsquarters, morning-glory, mustards, nightshade, redroot pigweed, ragweed, smartweed, spanish needles, and witchgrass	Atrazine 1.5-2.0 lb or atrazine 1.0-1.5 lb + simazine 1.0-1.5 lb	Atrazine 4L 1.5-2.0 qt or 90 DF 1.66-2.21lb or atrazine 4L 1.0-1.5 qt or 90DF 1.1-1.6 lb + Princep 4L 1.0-1.5 qt or 90DF 1.1-1.6 lb	Spray immediately after planting. Use lower rate on light soils. Shallow cultivation usually will improve weed control. Do not plant any crop the following year except those specified on the label the following year. Do not apply more than 4 lb of atrazine or simazine in any one year. Use 1:2 ratio of atrazine to simazine on more severe annual grass problem areas.
Barnyardgrass, crabgrass, fall panicum, foxtails, pigweed spp., signalgrass, witchgrass, yellow nutsedge, goosegrass, carpetweed, and Florida pusley	s-metolachlor 0.95-1.6 lb	Dual II Magnum 7.64L 1.0-1.67 pt	Apply after planting and before corn emerges. Small grains may be seeded 4.5 months after treatment. Do not graze or feed forage or fodder from small grains to livestock. Adjust rate to soil texture. S-metolachlor is also available as Cinch.
Above weeds and cocklebur, lambsquarters, ragweed, smartweed, and velvetleaf	s-metolachlor 0.67-1.6 lb + atrazine 1.0-2.0 lb	Dual II Magnum 7.64L 0.8-1.67 pt + atrazine 4L 1.0-2.0 qt or 90DF 1.1-2.2 lb or use Bicep II Magnum 5.5L 1.3-2.6 qt	See above for respective herbicides. Metolachlor plus atrazine (Bicep) also may be applied as an early postemergence treatment up to the time when weeds reach the 2 leaf stage and corn is no more than 5 inches high. Do not apply as an early postemergence treatment in fluid fertilizer. Atrazine plus s-metolachlor is also available as the prepackage mix Cinch ATZ.
Barnyardgrass, crabgrass, fall panicum, foxtail millet, giant foxtail, signalgrass, southwestern cupgrass, witchgrass, yellow nutsedge, carpetweed, cocklebur, common purslane, Florida pusley, lambsquarters, morning-glory, pigweed spp., ragweed, smartweed, velvetleaf, sandbur, seedling johnsongrass, and volunteer sorghum	s-metolachlor 0.67-1.4 lb + atrazine 0.5-1.0 lb + simazine 0.5-1.0 lb	Dual II Magnum 7.64 L 0.8-1.67 pt + atrazine 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb + Princep 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb	Apply the tankmixture during planting (behind the planter) or after planting but before weeds or corn emerge. Read the label and adjust rates to soil texture and organic matter content. Check labels for instructions regarding planting of rotational crops. Note: Metolachlor plus atrazine plus simazine may also be applied as Bicep or Cinch ATZ plus Princep (simazine). Consult labels for specific ratios.

Table 5.31 - Preemergence (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Annual grasses including barnyardgrass, crabgrass spp., fall panicum, foxtail spp., goosegrass and witchgrass and annual broadleaf weeds including jimsonweed, lambsquarters (including triazine-resistant species), nightshade, common ragweed, pigweed (including triazine-resistant species), smartweed, and velvetleaf	atrazine 0.625-0.75 lb + mesotrione 0.168-0.2 lb + s-metolachlor 1.68-2.0 lb	Lumax 4.0L 2.5-3.0 qt	Use the 2.5 qt rate on soils of less 3.0% organic matter content, and the 3.0 qt rate on soils of greater than 3.0% organic matter. Unsatisfactory weed control may be observed if activation rainfall is not received within 7 days of applic- ation. Lumax contains a relatively low rate of atrazine. Broadleaf weed control can be significantly improved through use of additional atrazine. The addition of Princep will also improve broadleaf and annual grass control. Lumax provides control of triazine- resistant pigweed and lambsquarters species. Do not rotate to crops other than corn (all types), cotton, soybeans, sorghum, or peanuts in the spring following application. Lumax can also be applied as an early postemergence treatment on corn up to 5 inches in height. Early postemergence applications will not provide consistent control of emergent annual grasses.
Barnyardgrass, carpetweed, crabgrass, foxtail (giant, green and yellow), goosegrass, nutsedge (yellow), panicum (fall), pigweed spp., pusley (Florida), signalgrass and witchgrass	Dimethenamid-P 0.66-0.98 lb	Outlook 6EC 14.0-21.0 oz	Apply after planting and before corn emerges. Small grains may be seeded 4 months after treatment. Adjust rate to soil texture.
Above weeds and cocklebur, lambsquarters, ragweed, smartweed and velvetleaf	Dimethenamid-P 0.66-0.98 lb + atrazine 1.0-2.0 lb or atrazine 0.15-1.0 lb + simazine 0.5-1.0 lb	Outlook 6EC 14.0-21.0 oz + atrazine 4L 1.0-2.0 qt or 90DF 1.1-2.2 lb atrazine 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb Princep 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb	See above for respective herbicides. Frontier plus atrazine also may be applied as an early postemergence treatment up to the time when weeds reach the two-leaf stage and corn is no more than 8 inches high. Do not apply as an early postemergence treatment in fluid fertilizer. Dimethenamid plus atrazine may also be applied as the prepackage mix Guardsman Max or Leadoff.

Table 5.31 - Preemergence (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Carpetweed, chickweed, cocklebur, henbit, horseweed, jimsonweed, lambsquarters, morning- glory, nightshade, pigweeds, purslane, red clover, ragweed (common) sicklepod, sida (prickly), smartweed, spurred anoda, velvetleaf.	Flumetuslam + clopyralid 0.171-0.257 lb or Flumetsulan 0.04-0.07 lb	Hornet 78.5D 4.0-6.0 oz or Python 80D 0.80-1.33 oz	If incorporating, uniformly incorporate the herbicide treatment into the top 2-3 inches of the final seedbed. Adequate soil moisture is required for optimum herbicidal activity. If adequate soil moisture is not received within 7-10 days after a surface applied treatment, a shallow cultivation is recommended. If using in liquid fertilizer solution, water soluble packets containing Hornet or Python should be pre-mixed with water and added to the spray tank through a 20-35 mesh screen. Soil insecticides should be applied in a band to avoid potential injury. Plant corn at least 1.5 inches deep with soil organic matter > 1.5% and soil temperature above 50° F. If these three criteria are not met, injury may occur. To avoid crop injury, plant Clearfield corn hybrids. Observe rotational restrictions on label. Hornet and Python are approved for use with most residual grass herbicides.
Annual grasses such as barnyard grass, bristly foxtail, broadleaf signal grass, browntop + fall panicum, crabgrass, crowfootgrass, field sandbur, foxtail millet, foxtails (giant, green, yellow), goosegrass, prairie cupgrass, red rice, red sparangletop, robust foxtail (purple, white), seedling johnsongrass, shattercane, Texas panicum, wild proso millet, witchgrass, yellow nutsedge and broadleaf weeds such as carpetweed, cocklebur, Florida beggarweed, galinsoga, ground cherry, jimsonweed, lambsquarters, nightshade (black and hairy), pigweed, prickly sida, purslane, ragweed (common and giant), smartweed sp. and velvetleaf.	Acetochlor 1.53-2.4 lb + atrazine 1.25-2.0 lb	Harness 7EC 1.75-2.75 pt + atrazine 4L 1.25-2.0 qt or 90 DF 1.4-2.2 lb	See acetochlor restrictions below. Acetochlor plus atrazine is also available in a prepackage mix called Harness Extra.

Table 5.31 - Preemergence (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Residual control of annual grasses such as barnyard- grass, broadleaf signal- grass, browntop + fall panicum, crabgrass, crowfoot- grass, field sandbur, foxtail millet, foxtails (giant, green, yellow), goosegrass, prairie cupgrass, red rice, red sprangletop, robust foxtail (purple, white), seedling john- songrass, shattercane, Texas panicum, wild proso millet, witchgrass, yellow nutsedge, and broadleaf weeds such as carpetweed, cocklebur, Florida beggarweed, galinsoga, ground cherry, jimsonweed, lambsquarters, nightshade (black and hairy), pigweed, prickly sida, purslane ragweed (common and giant), smart- weed sp., and velvetleaf.	acetochlor 1.54-2.4 lb + atrazine 1.25-2.0 lb or acetochlor 1.54-2.4 lb + atrazine 1.25-2.0 lb + simazine 1.0-1.5 lb	Degree 3.8EC 3.25-5.0 pt + Atrazine 4L 1.25-2.0 qt or 90W 1.39-2.2 lb or Degree 3.8EC 3.25-5.0 pt + Atrazine 4L 1.25-2.0 qt or 90W 1.39-2.2 lb + Princep 4L 1.0-1.5 qt or 90W 1.1-1.6 lb	See acetochlor restrictions below. Use of the highest labeled rates should result in more consistent late-season annual grass control. Degree plus atrazine is available in a package-mix called Degree Xtra. Rates ofDegree Xtra range from 2.9 to 3.7 quarts per acre.
Annual grasses such as barnyard grass, bristly foxtail, broadleaf signal grass, browntop + fall panicum, crabgrass, crowfootgrass, field sandbur, foxtail millet, foxtails (giant, green, yellow), goosegrass, prairie cupgrass, red rice, red sparangletop, robust foxtail (purple, white), seedling johnsongrass, shattercane, Texas panicum, wild proso millet, witchgrass, yellow nutsedge and broadleaf weeds such as carpetweed, cocklebur, Florida beggarweed, galinsoga, ground cherry, jimsonweed, lambsquarters, nightshade (black and hairy), pigweed, prickly sida, purslane, ragweed (common and giant), smartweed sp. and velvetleaf.	Acetochlor 0.8-2.4 lb + atrazine 1.0-2.0 lb or Acetochlor 0.8-2.4 lb + atrazine 0.5-1.0 lb + simazine 0.5-1.0 lb	Topnotch 3.2L 2.0-6.0 pt + atrazine 4L 1.0-2.0 qt or 90 DF 1.1-2.2 lb or Topnotch 3.2L 2.0-6.0 pt + atrazine 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb + Princep 4L 0.5-1.0 qt or 90DF 0.6-1.1 lb	See acetochlor restrictions below. Topnotch plus atrazine is also available in the prepackage mix FulTime. Acetochlor plus atrazine is also available in the prepackage mixes including Keystone and Keystone LA.

Table 5.31 - Preemergence (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Pigweed, carpetweed, chickweed, crabgrass, jimsonweed, lambsquarters, nightshade, ragweed (common), smartweed, and velvetleaf.	mesotrione 0.188-0.24 lb or mesotrione 0.188-0.24 lb + residual grass herbicide or mesotrione 0.156-0.188 lb + residual grass herbicide + atrazine 1.2-2.0 lb	Callisto 4FL 6.0-7.7 oz or Callisto 4FL 6.0-7.7 oz + residual grass herbicide or Callisto 4FL 5.0-6.0 oz + residual grass herbicide + Atrazine 4L 1.2-2.0 qt or 90W 1.3-2.2 lb	Callisto is a systemic preemer- gence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn. Callisto is not effective for the control of most grass weeds. Most preemergence grass herbicides or a postemergence grass herbicide can be tank mixed with Callisto to provide a broader spectrum of weed control. To broaden its broadleaf weed control ability, tank-mix atrazine with Callisto. Do not apply more than a total of 10.7 oz/A of Callisto/A/season.
Residual control of annual grasses, including barnyardgrass, crabgrass , spp. fall panicum, foxtail spp., goosegrass, and witchgrass and annual broadleaf weeds, including jimsonweed, lambsquarters (including triazine-resistant species), morning-glory spp. (suppression), nightshade, common ragweed, pigweed (including triazine-resistant), smartweed, velvetleaf, and yellow nutsedge	atrazine 1.3-1.5 lb + mesotrione 0.168-0.196 lb + s-metolachlor 1.3-1.5 lb	Lexar 3.7FL 3.0-3.5 qt	Use 3 qt/A on soil with organic matter content less than 3% and 3.5 qt/A on soil organic-matter content 3% or greater. Do not apply more than 14 days prior to planting or to field corn taller than 12 inches. Do not graze or feed forage from treated areas for 45 days following last application. Do not harvest forage, grain, or stover within 60 days after last application. Do not apply other mesotrione-containing products (Callisto, Camix, or Lumax) to ground that has been treated the same season. The addition of Princep will improve broadleaf and annual grass control. Do not apply Lexar postemergence to corn that has received an at-plant application of Counter. Do not make a postemergence application of Lexar in a tank-mix with any organophosphate or carbamate insecticide. Do not make a postemergence application of any organophosphate or carbamate insecticide within 7 days before or 7 days after a Lexar application. If significant rainfall does not occur within 7 days after application, weed control may be decreased. Do not rotate to crops other than corn, cotton, small grains, sorghum, or peanuts the spring following application of Lexar herbicide. If applied after June 1, do not rotate with crops other than corn or sorghum the next season.

Table 5.31 - Preemergence (cont.)

Weed Problem	Chemical Rate per acre	Product per acre	Remarks
Barnyardgrass, large crabgrass, smooth crab- grass, foxtail (green, giant, yellow) goosegrass, seedling johnsongrass, fall panicum, broadleaf signalgrass, witchgrass, Florida beggarweed, carpetweed, galinsoga, common lambsquarter, pigweed, common purslane, Florida pusley, spotted spurge	flufenacet 0.44-0.78 lb + metribuzin 0.11-0.2 lb + atrazine 1.0-2.0 lb	Axiom 13-23 oz atrazine 4L 1.0-2.0 qt or 90D 1.1-2.2 lb	Plant corn 1.0 to 1.5 inches deep. Axiom is not labeled for applica- tion to emerged corn plants.
Barnyardgrass, carpetweed, crabgrass (large, smooth), foxtail (giant, green, yellow), goosegrass, johnsongrass (seedling), fall panicum, common purslane, and signalgrass	flufenacet 0.525-0.75 lb + atrazine 1.0-2.0 lb	Define 60 DF 14.0-20.0 oz + Atrazine 4L 1.0-2.0 qt or 90W 1.1-2.2 lb	Apply after planting and before corn emerges. Define may also be applied early postemergence through the 5th leaf of corn, but will not control emerged weeds and grasses. In the event of a crop failure, corn or soybeans may be planted immediately after a Define application. Small grains may be seeded 12 months after a Define application. Adjust rate to soil texture and organic matter.
Barnyardgrass, crabgrass spp., foxtail spp., goosegrass, seedling johnsongrass, yellow Nutsedge, panicum spp., shattercane, broadleaf signalgrass, witchgrass, pigweed spp., carpetweed, common chickweed, cocklebur, galinsoga, henbit, horseweed, jimsonweed, lambsquarters spp., Venice mallow, morningglory spp., purslane, ragweed spp., sicklepod, prickly sida, smartweed, spurge spp., velvetleaf, and others	acetochlor 0.7-0.94 lb + clopyralid 0.071-0.095 lb + flumetsulam 0.023-0.03 lb	SureStart 4.25E 1.5-2.0 pt	SureStart contains acetochlor. Follow acetochior use restrictions. If incorporated, uniformly incorporate into the top 2 to 3 inches of soil. Adequate soil moisture is required for preemergence surface activity. If adequate soil moisture is not received within 7 to 10 days following a surface-applied treatment, a shallow cultivation is recommended. Injury to corn has been observed when cool, wet soil conditions follow application. Refer to label restrictions regarding insecticide interactions. Do not use as a soil-applied treatment in fields with less than 1.5% organic matter content unless risk of crop injury is acceptable. SureStart may also be applied as a postemergence treatment to corn up to 11 inches in height and weeds up to 1 to 2 inches in height.

Table 5.32 - Post-herbicide Application Restrictions for Corn

Herbicide	Over-the-top application	Use of drop nozzles	Comment
2,4-D	<8" tall	0.5 pt—8" to 36" tall	
Accent	20" or 6-collar	20" to 36" or 10-collar	
Aim	Up to 8-leaf collar stage	up to 14-leaf collar stage	
Atrazine	12" tall		
Banvel or Clarity	1.0 pt—8" tall or 5 leaves; 0.5 pt—8" to 36" tall or 15 days before tassel emergence		Do not apply Banvel or Clarity near soybeans if corn is >24" tall or if soybeans are >10" tall or have begun to bloom
Basis	Spike to 4 leave (or 2 collars) or 0.5" to 6" tall		Do not apply to corn >6" tall or having 3 collars
Beacon	4" to 20" tall (freestanding)	For splits, 20" tall to before tassel emergence	
Buctril	1.0 pt—emergence to tassel; 1.5 pt—4 leaves to tassel		Postemergence application before 3-leaf stage may result in corn leaf burn
Callisto	Up to 30" tall (or 8-leaf stage of corn)		
Celebrity Plus	4" to 24" tall (freestanding) or <6 collars (V6 stage)	When necessary	
Distinct	4" to 24" tall		
Equip	0" to 12" or V4	V4-V8, 12" to 36"	Use the more restrictive of growth stage or height recommendations
Expert	Up to 12" tall	N/A	Apply to Roundup Ready hybrids only
Halex GT	30" or 8-leaf		
Harmony SG	2 to 6 leaves up to 12" tall (1 to 4 collars)		Do not apply to corn >12" tall or having 4 collars
Hornet	Emergence up to 20" tall		
Ignite 280	Up to 5-collar		Apply to Liberty Link or GR corn hybrids only
Impact	Up to 45 days before harvest	When necessary	
Laudis	Up to V8		
Lightning	Up to 20" tall	When necessary	Apply to Clearfield or IMI corn hybrids only
Marksman	Emergence to 5-leaf stage (or up to 8" tall)		
NorthStar	4" to 20" (or 6 collars)	>20" to 30" tall	
Option	0" to 16" or V6	V6-V8, 16" to 36"	Use the more restrictive of growth stage or height recommendations.
Permit/Sandea	Spike to 48" tall	When necessary	If tank mixed with 2,4-D, apply to corn up to 8" tall; with Banvel or Clarity up to 36" tall corn
Require Q	4" to 20" or V2-V6		
Resolve	Up to 12" tall or 6 leaf collars		
Resolve Q	20" or 7-collar		
Resource	2-leaf to 10-leaf stage (collars must be visible)	When necessary to direct below corn leaves	

Table 5.32 - Post-herbicide Application Restrictions for Corn (cont.)

Herbicide	Over-the-top application	Use of drop nozzles	Comment
Roundup	Up to 30" tall (V8 stage)		Apply to Roundup-Ready hybrids Weather Max only
Sequence	Up to 30"		Only postermergence in glyphosate-resistant corn
Spirit	4" to 20" or 6-collar	20" to 24"	
Status	4" to 35" or V2-V10		
Stout	Up to 16" or 5 leaf collars		Target applications to corn that is less than 12" tall for best overall performance
SureStart	Up to 11"		
Touchdown IQ	Emergence through V8 stage		Apply to Roundup-Ready hybrids only
Yukon	Spike through 36" tall	When necessary	

Table 5.33 - Postemergence

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Cocklebur, nightshade (black), morning glory, jimsonweed, mustards, ragweed, velvetleaf, barnyardgrass, crabgrass, fall panicum, foxtails, goosegrass, johnsongrass from seed, lambsquarters pigweed spp., and signalgrass	Pendimethalin 0.75-1.5 lb + atrazine 1.0-1.6 lb	Prowl 3.33 EC 0.9-1.8 qt + atrazine 4L 1.0-1.6 qt or 90DF 1.1-1.8 lb	Refer to label for rate of application for different soil types and organic matter content and for mixing procedures. Some injury can occur if seed is not well covered with soil. Apply as early postemergence treatments in water only up until corn reaches the 2 leaf stage and weeds are no more than 1 inch high. These combinations are particularly effective as early postemergence treatments for velvetleaf control.
Barnyardgrass, crabgrass, foxtails, lambsquarters, morning glory, nightshade, pigweed, purslane, ragweed, cocklebur, mustards and smartweed	Atrazine 2.0-2.5 lb + crop oil concentrate	Atrazine 4L 2.0-2.5 qt or 90DF 2.2-2.7 lb + crop oil concentrate 1.0 qt	Use in single broadcast spray before weeds exceed 1.5 inch in height. Use oil/atrazine in 20 gal/A. Do not include oil in atrazine sprays when corn is under stress from prolonged cold, wet weather, poor fertility, or other factors, or when corn is wet and succulent from recent rainfall because crop injury may occur. Do not use oil in sprays when treating inbred lines or other breeding stock. Adding other pesticides, fertilizers, or other material to the oil/water emulsions may cause compatibility problems or crop injury. Follow instructions on the container for proper mixing and maintaining the emulsion in the spray tank.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, carpetweed, crabgrass, fall panicum, Florida pusley, foxtails (giant, green, yellow), galinsoga, goosegrass, lambsquarters, pigweed spp., morning-glory, purslane (common), ragweed (common), smartweed, prickly sida, cocklebur, sicklepod, sesbania, and velvetleaf	Linuron 0.63-1.5 lb + surfactant	Lorox DF 1.25-3.0 lb or Linex 4L 1.25-3.0 pt + surfactant as labeled	Apply as a single directed spray in 25 gal of water after corn is at least 15 inches high and weeds are up to 5 inches high. Thoroughly cover weed foliage without contacting upper leaves or whorl of corn because such contact causes crop injury. Use wetting agent suggested by manufacturer. Do not plant to other crops not on the label within 4 months after treatment. Gauge wheels and/or leaf-lifter equipment should be used to prevent corn leaf contact with spray. Provide continuous agitation in tank.
Above weeds and nutsedge, shattercane and signalgrass	Ametryn 1.6-2.0 lb + surfactant	Evik 80W 2.0-2.5 lb + surfactant as labeled	Same as above. Apply in a minimum of 20 gal of water or nonpressure nitrogen solution. Do not harvest, graze, or feed forage to livestock until 30 days after application. Do not apply if temperatures are low. Do not plant any rotational crop other than small grains until the following year. Do not apply within 3 weeks of tasseling.
Canada thistle, beggarticks, cocklebur, dayflower, jimsonweed, prickly sida, ragweed, smartweed, spurred anoda, velvetleaf, wild mustard, wild sunflower, and yellow nutsedge	Bentazon 0.75-1.0 lb + crop oil concentrate	Basagran 0.75-1.0 qt + crop oil concentrate 1.0 qt	Refer to label because the rate of application is dependent on leaf stage and height of weeds to be controlled. For Canada thistle and yellow nutsedge, follow with a second application if needed in 7 -10 days. Cultivation within 10-14 days after application will improve control. For some species (jimsonweed and cocklebur), the addition of a crop oil concentrate is not required for adequate control.
Beggarticks, bindweed, burdock, cocklebur, coffeeweed, carpetweed, Florida pusley, galinsoga, horseweed, jimsonweed, lambsquarters, morning- glory (annual), mustards, nightshade (black), purslane (common), ragweed (common), smartweed, spanish needles, sunflower, velvetleaf, pigweed spp., and sicklepod	2,4-D 0.25-0.5 lb	2,4-D amine or LVE 0.5-1.0 pt of a 4.0 lb/gal formulation or equivalent.	Use from time corn emerges until layby. Do not cultivate for 10 days, or corn may break off. Small weeds are easier to kill; use higher rate for larger weeds. Grasses are not controlled. After corn is more than 10 inches high direct the spray below top of corn plant (use drop nozzles). Many current formulations contain greater than 4.0 lb ai/gal.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Clovers, cocklebur, jimsonweed, lambsquarters, morning-glory, mustards, black nightshade, pepperweed, pigweed spp., prickly sida (teaweed), purslane, ragweed, smartweed, prostrate spurge, velvetleaf, and Canada thistle supression	Dicamba 0.25-0.5 lb dicamba 0.26-0.47 lb + atrazine 0.52-0.94 lb	Banvel/Clarity 0.50-1.0 pt Marksman 2.0-3.5 pt	Use the early postemergence rate as labeled for the specific soil type for corn up to the fifth leaf. For corn past the 5 leaf stage, use only Banvel at the 0.25 lb (0.50 pt) rate. Apply Banvel in this manner after weeds have emerged but before corn is burcucumber, giant ragweed, tassel emergence. Best perfor mance occurs when weeds are small. Drop-nozzles may be used to increase coverage where corn leaves cover weeds. Do not graze or harvest for dairy or beef feed before ensilage (milk) stage. Observe precautions to avoid drift to adjacent crops. Also may be applied as a dicamba plus atrazine prepackage mix as Marksman.
Burcucumber, carpetweed, cocklebur, jimsonweed, lambs- quarters, marestail, morning- glory spp., nightshade (black) pigweed spp., ragweed (common & giant), sicklepod sida (prickly), smartweed velvetleaf, suppression of perennial broadleaf weeds such as alfalfa, bindweed, clover, dandelion, dock dogbane, horsenettle, milk- weed spp., pokeweed, and thistles.	Sodium salt of dicamba 0.175-0.263 lb + diflufenzopyr	Distinct 70DF 4.0-6.0 oz	Apply Distinct up to 6 oz/A from 4 to 10-inch corn. Apply 4 oz/A from 10 to 24-inch tall corn. Do not exceed a total of 10 oz/A per season. Adjuvants must be used. Use a non- ionic surfactant at 0.25% v/v plus 5 qt/A of UAN (28-34% nitrogen) per 100 gallons of water. Distinct contains dicamba, the same active ingredient as Banvel or Clarity.
Nightshade spp., cocklebur, lambsquarters, common ragweed, giant ragweed, morning-glory spp., jimsonweed, smartweed spp., velvetleaf, wild buckwheat.	Bromoxynil 0.25-0.375 lb	Buctril 2E 1.0-1.5 pt	Apply as an early postemergence treatment to small weeds in corn from the 4-8 leaf stage. Adjust rate to weed size as specified by label. This treatment is nonvolatile and is appropriate to situations where the proximity of susceptible crops prohibits the use of 2,4-D or dicamba.
Contact kill of emerged annual weeds in corn	Paraquat 0.25 lb + surfactant	Gramoxone Inteon 0.5 pt + surfactant as labeled	Apply as a directed spray when corn plants are at least 10 inches high. Do not allow spray to contact more than the lower 3 inches of the corn plant. Paraquat is toxic. Follow label for proper mixing procedures.
Weeds listed above for respective chemicals plus suppression of alfalfa, jerusalem artichoke, bindweeds, curly dock, hemp dogbane, horsenettle, or milkweed (common and honeyvine), broadleaf plantain, red sorrel, and Canada thistle	2,4-D amine 0.125 lb + dicamba 0.25 lb	2,4-D 0.25 pt of a 4.0 lb/gal formulation + Banvel 0.5 pt	Observe all precautions listed for respective chemicals. When corn is greater than 8 inches, direct spray beneath corn leaves and onto weeds.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, foxtail (giant, green, and yellow), johnsongrass (seedling and rhizome), panicum (fall), pigweed, quackgrass, shattercane, and smartweed	Nicosulfuron 0.031 lb	Accent 75SP 0.66 oz or approved tankmixes: atrazine 0.75-1.5 qt or other formulations Buctril 1.0-1.5 qt or Buctril-Atrazine as labeled Banvel/Clarity 0.5-1.0 pt Marksman 2.0-3.5 pt	Prior to using Accent, consideration should be given to crop rotational plans. Consult label. Apply to corn prior to 11- leaf stage. Consult label prior to application to corn that is under stress, treated with Counter insecticide, treated preemergence or postemergence with another organophosphate insecticide or Basagran herbicide 7 days before Accent application, or a hybrid that is susceptible to MDMV or MCDV if johnsongrass is present. Always add a nonionic surfactant or crop oil concentrate when used alone. Tank-mixing with broadleaf herbicides other than atrazine may result in a reduction in annual grass control and may result in an increase in crop injury. Consult Accent label for adjuvant recommendations for tankmix combinations. A higher degree of johnsongrass control may be achieved with split applications, but do not exceed 1.33 oz/A in 1 year. Do not graze or feed forage or grain from treated areas to livestock within 30 days after application.
Barnyardgrass, foxtails (giant, green, and yellow), seedling johnsongrass, panicum (fall and Texas), ryegrass (annual), sandbur (field),signalgrass (broadleaf), shattercane, jimsonweed, chickweed, cocklebur, quackgrass, burcucumber, carpetweed, lambsquarters, marestail, morningglory spp., black nightshade, pigweed spp., ragweed (common and giant), sicklepod, sida (prickly), smartweed, velvetleaf.	Nicosulfuron 0.031 lb + sodium salt of dicamba 0.0178 lb	Celebrity Plus 70DF 4.8 oz	Do not use where Counter was applied in furrow. Temporary injury may also result when applied over top of corn that had Dyfonate, Lorsban, or Thimet applied. Apply to corn from 4-24 inches tall. Use in a minimum of 10 gal/A Applications must include a nonionic surfactant (0.25 - 0.5% v/v) and an ammonium nitrogen fertil- izer (ex. 1 - 2 qts of 28 - 0 - 0). Do not apply more than 9.4 oz /A per season.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, foxtail spp., fall panicum, smartweed spp., common lambsquarters, pigweed spp., velvetleaf, and wild mustard	Rimsulfuron 0.01 lb + thifensulfuron methyl 0.005 lb	Basis 75 WDG 0.33 oz Approved tankmixes: Banvel/Clarity .25-.50 pt or Atrazine .75-1.5 pt or Marksman 2.0-3.5 pt	Apply to 1-2 inch grasses and 1-3 inch broadleaf weeds when corn is in the spike to 4 leaf stage. Applications of Basis must include a nonionic surfactant and an ammonium nitrogen fertilizer. Do not apply Basis to conventional corn hybrids previously treated with Counter 15G. Applications of Basis to conventional or corn hybrids previously treated with other insecticides may also result in crop damage. No restrictions with regard to insecticide apply when a Clearfield corn hybrid is planted. Do not tankmix Basis with Basagran, Laddok, 2,4-D, Marksman, atrazine, Beacon, or other ALS inhibiting herbicides, or with foliarly applied organophosphate or pyrethroid insecticides to avoid antagonism or crop injury. Rimsulfuron is available as a single active ingredient under the trade name Resolve.
Anoda (spurred), bindweed, burcucumber, cocklebur, jimsonweed, johnsongrass (seedling), lambsquarters, morning-glory, nightshade, pigweed, quackgrass, ragweed (common, giant), shattercane, sicklepod, sida (prickly) smartweed, thistle (Canada), velvetleaf	Prosulfuron/primisulfuron 0.036 lb + COC or NIS	Spirit 57WG 1.0 oz + approved tankmixes: Accent 0.33-0.5 oz or atrazine 0.5-1.5 qt or Banvel or Clarity 0.125-0.5 pt or Buctril 0.5-1.0 pt or Marksman 1.0-2.0 pt or 2,4-D 0.25-0.5 pt or Beacon 0.19-.38 oz or Tough 1.0-2.0 pt	Do not apply to corn under severe environmental stress. Do not apply to corn treated with Counter 15G (any application) or Counter 20CR applied in-furrow. If an IR corn hybrid is planted, the above restrictions do not apply. Apply Spirit postemergence to corn between 4 and 30 inches in height. Applications made after the corn is 24 inches tall should be post-directed. Do not apply aerially. The use of a crop oil concentrate or nonionic surfactant is recommended - consult label. Consult label for rotational restrictions.
Cocklebur, nutsedge (yellow, purple), pigweed, pokeweed, ragweed (common, giant), sunflower, velvetleaf	Halosulfuron 0.032-0.063 lb + COC or NIS	Permit/Sandea 75WG 0.6-1.3 oz + approved tankmixes: Accent 0.66 oz or atrazine 0.75-1.5 qt or Banvel or Clarity 0.25-0.5 pt or Beacon 0.76 oz or Buctril 0.5-1.0 pt or 2,4-D 0.25-0.5 pt	Do not apply to corn under severe environmental stress. Do not apply aerially. Permit, alone, can be applied over-the- top or with drop nozzles from the spike through layby stage of field corn. The use of a crop oil concentrate or nonionic surfactant is recommended - consult label. Consult label for rotational restrictions. When used exclusively with Pioneer IR field corn hybrids, Permit may be soil applied at the rate of 1.3-2.0 oz/A.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
velvetleaf	Flumiclorac 0.027-0.04 lb + Crop oil concentrate	Resource 4.0-6.0 oz + crop oil concentrate 1.0 pt	Apply as a broadcast over-the- top postemergence spray to 5-6 leaf velvetleaf and to corn that is in the 2- to 10-leaf stage. As a directed spray using drop nozzles, Resource may be applied at 8.0 oz/A. Resource has activity against several other weeds when they are in the 2- to 3-leaf stage including lambsquarters, common ragweed, and smooth pigweed. Labeled combinations include Accent, atrazine, Banvel, Basis, Basis Gold, Beacon, Buctril, Clarity, Exceed, Hornet, Laddok, Liberty (for use on corn varieties designated as **Liberty Link** or **Gr [Glufosinate Resis- Tant]**), Lightning, Marksman, Northstar, Permit, Poast and Poast Plus (for use on corn var- ieties designated as **IMI-Corn**), Roundup Ultra (for use on corn varieties designated as **Roundup Ready**), and Stinger.
Cocklebur, foxtail (giant, green and yellow), johnsongrass (rhizome and seedling), jimsonweed, lambsquarters, panicum (fall), pigweed, quackgrass, ragweed, shattercane, smartweed and velvetleaf	Primisulfuron 0.018-0.036 lb	Beacon 75 SP 0.38-0.76 oz approved tankmixes: atrazine 2.0-3.0 pts or other formulations Banvel/Clarity 0.25-1.0 pt Buctril 0.5-1.0 pt 2,4-D 0.5-1.0 pt Clarity 0.5-1.0 pt Accent 0.33 oz Marksman 1.0-2.0 pts	Consult county Extension office or seed corn dealer for listing of corn hybrids susceptible to Beacon applications. Apply when free- standing corn height is between 4-20 inches tall or using post directed equipment until corn tassels. Do not apply to corn that is under stress, treated with Counter insecticide, treated with an organophosphate insecticide 10 days before Beacon applica tion, or in tankmixes with other pesticides unless recommended on the label. Wait at least 20 days after planting to apply Beacon if insecticides other than counter are applied at time of corn seeding. Do not apply an organophosphate insecticide within 10 days of Beacon application. Do not apply to hybrids susceptible to MDMV or MCDV if johnsongrass is present in field. Always add a nonionic surfactant or crop oil concentrate when sprayed alone. Tankmixing with other broadleaf herbicides may result in a reduction of grass control and may result in an increase in crop injury. Use only nonionic surfactant at 1.0 qt/100 gal when tankmixing. A higher degree of johnsongrass control may be achieved with split (0.38 oz + 0.38 oz) applications, but do not exceed 0.76 oz/A in 1 year. Do not graze or feed forage from Beacon-treated corn to livestock within 30 days after application. Consult label for rotational restrictions.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Chickweed, cocklebur, jimsonweed, lambsquarters, morning-glory, nighshade, pigweeds, purslane, ragweeds, sicklepod, sida (prickly), spurred anoda, sunflower and velvetleaf	Flumetsulam/clopyralid/ 2,4-D 0.21 lb	Scorpion III 84.3WG 0.25 lb	Apply overtop of corn up to 8 inches tall. May be applied in Tankmix combination with other herbicides registered for postemergence application in field corn. All applications must include a nonionic surfactant at 0.25% v/v. Consult label for rotational restrictions.
Alfalfa, bindweed, burcucumber cocklebur, dandelion, dog- bane,horsenettle, horseweed, jimsonweed, lambsquarters, morningglory spp., night- shade (black) pigweed spp., ragweed (common, giant) sicklepod,sida (prickly), thistles (suppression), velvetleaf, johnsongrass (seedling), quackgrass, ryegrass (annual), and shattercane.	Primisulfuron 0.075 lb + sodium salt of dicamba 0.4 lb	NorthStar 47.4 WDG 5 oz	NorthStar can be broadcast from 4- to 20-inch corn. From a 20- to 36-inch tall corn, apply as a directed spray. Do not apply if Counter was used. Do not make a foliar post or soil application of any OP insecticide within 10 days before or 7 days after a NorthStar application.
Canada Thistle	Clopyralid 0.09-0.25 lb	Stinger 0.25-0.66 pt	Apply after corn emergence until corn reaches 24 inches to Canada thistle at least 6-8 inches in height. The addition of an adjuvant is not required.
Cocklebur, jimsonweed, lambsquarters, nightshades, pigweed, ragweed, velvetleaf	Pyridate 0.5-1.0 lb	Tough 5L 0.8-1.6 pt Approved tank mixes: Accent 0.66 oz Atrazine 0.75-1.5 pt Banvel/Clarity 0.5-1.0 pt	Tough is mostly effective on small, actively growing broadleaf weeds in the 1- to 4-leaf stage. The addition of atrazine or an approved adjuvant will provide broader spectrum control.
Anoda (spurred), cocklebur, jimsonweed, morning-glory (suppression), nightshade (suppression), purslane ragweed (common), sicklepod, sida (prickly), smartweed, thistle (Canada) (suppression), and velvetleaf	Flumetsulam 0.023 lb + clopyralid 0.063 lb	Hornet 78.5D 2.0 oz	Applications may be applied broadcast over the top of field corn up to 24 inches tall. Apply when broadleaf weeds are at the 2 to 8 inches in height. Do not apply if rainfall is expected within 6 hours. Do not apply within 85 days of harvest. Include a non- ionic surfactant at 0.25% v/v. Reduced weed control may result if applied to weeds under severe stress. If cultivating, delay for 10 days after application. Follow rotational restrictions with subsequent crops.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, large crabgrass, foxtail (giant, green, yellow), seedling johnsongrass, panicum (fall, Texas), quackgrass, ryegrass (Italian), field sandbur, shattercane, broadleaf signalgrass, jimsonweed, mustard sp., pigweed, smartweed.	Nicosulfuron 0.023 lb and rimsulfuron 0.012 lb	Steadfast 75DF 0.75 oz + approved tank-mixes: Atrazine 90DF 0.25-1.0 lb or Clarity 4L 4.0-8.0 oz or Marksman 3.2FL 1.0 pt or Hornet 78.5D 2.0 oz or Callisto 4FL 3.0 oz or Tough 5EC 1.0 pt or Stinger 3SL 2-4 oz or Distinct 70DF 1.0-2.0 oz	Apply Steadfast to corn that is up to 12 inches tall. Do not apply to corn taller than 12 inches or exhibiting 6 collars, whichever is the more restrictive. Applications of Steadfast must include either a crop oil concentrate at 1% v/v or a nonionic surfactant at 0.25 to 0.5% v/v. In addition, an ammonium nitrogen fertilizer is required. Use a high quality liquid nitrogen fertilizer such as 28-0-0 at a rate of 2.0 qt/A, or a spray grade ammonium sulfate may be used at a rate of 2.0 lb/A. Do not apply Steadfast with Basagran, Laddok, 2,4-D, or foliar applied organophosphates such as Lorsban. To avoid crop injury or antagonism, apply these products at least 7 days before or 3 days after the application of Steadfast. Do not tank-mix Steadfast with other ALS inhibiting herbicides such as Exceed, Permit, or Northstar unless the micture is specifically recommended on Steadfast labels.
Anoda (spurred), Jerusalem artichoke, wild buckwheat, carpetweed, common cocklebur, field bindweed (suppression), jimsonweed, knotweed, lambsquarters, honeyvine milkweed, morningglory (enireleaf, ivyleaf, pitted, tall, smallflower), mustard spp., nightshade (eastern black, black), nutsedge (suppression), pigweed (palmer, prostrate, redroot, smooth, spiney), common ragweed suppression, giant ragweed, sicklepod, prickley sida, smartweed, spurge, (prostrate, spotted) sunflower, velvetleaf, Canada thistle suppression), barnyard- grass, crabgrass (large, smooth), foxtail (giant, green, yellow) goosegrass, johnsongrass (seedling, rhizome), fall panicum, quackgrass, field sandbur, shattercane, witchgrass.	Imazethapyr 0.042 lb + imazapyr 0.014 lb	Lightning 70DG 1.28 oz + approved tank mixes: 2,4-D 0.5-1.0 pt or Banvel/Clarity 0.5-1.0 pt or Buctril 0.5-1.0 pt or Outlook 20.0-32.0 oz or Prowl 0.9-1.8 qt	Apply to Clearfield corn only. Lightning should be applied to small weeds, usually no larger than 3 inches tall. Lightning requires the addition of a nonionic surfactant. Addition of liquid fertilizer may enhance weed control. There are no soil insecticide restrictions. Lightning can carry over and cause injury to some rotational crops. Be sure to check rotational restrictions.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Control of many annual broadleaf weeds and control or suppression of some annual grasses in conventional and no-till corn production systems and suppression of many perennial weeds	Glufosinate 0.4 lb	Ignite 280SL 22.0 fl oz/A	**For use only on corn varieties designated as Liberty Link or GR (glufosinate resistant)**. Ignite 280 may be applied from emergence until corn has 5 developed collars. A repeat application of Ignite 280 or applications with appropriate residual herbicides will be needed to control weeds that have not emerged at the time of application. Do not apply more than 44.0 fl oz/A on corn per growing season. Good coverage is required for acceptable control. Ignite 280 is a postemergence herbicide with no residual soil activity and may be applied as the only herbicide in the program, alone following preemergence herbicides, or mixed with other postemergence herbicides listed on label. Ammonium sulfate has improved broadleaf weed control by Ignite 280.
Velvetleaf, pigweed spp., lambsquarters, annual smartweeds, wild mustard.	Thifensulfuron 0.004 lb	Harmony SG 50SG 0.128 oz	Apply to corn 2 to 6 leaf (1-3 collars) or up to approximately 12 inches tall. Do not apply Harmony SG to standard IT corn hybrids if previously treated with Counter 15 G or 20 CR. Applications of Harmony SG to or IT corn hybrids treated with other insecticides may also result in crop damage. There are no restrictions with regard to insecticides applied if an IR corn hybrid is planted. Use a nonionic surfactant (0.25% v/v) or crop oil concentrate 1%. Nitrogen fertilizer is also required (UAN or spray grade ammonium sulfate).
Lambsquarters (common), morningglory (ivyleaf and pitted), nightshade (black), pigweed, velvetleaf	carfentrazone 0.008 - 0.016 lb	Aim 2EW 0.5-1.0 oz + approved tank mixes: Atrazine 4L 16.0 oz or DF 9.0 oz or Banvel/Clarity 4.0-8.0 oz	Apply to corn up to 14-leaf collar stage and when weeds are generally 1-4 inches tall. Include a nonionic surfactant at 0.25% v/v. Tank mixing with other herbicides increases weed control spectrum. Do not tank mix with EC formulated products or COC as excessive injury may occur. Injury may vary with corn hybrid and environmental conditions. When tank-mixing, make sure that the Aim is mixed in the spray tank water first. Apply to corn up to the 14-leaf collar stage at a rate of 2 oz/A with drop nozzles or sprayers capable of directing spray to target weeds and away from the corn whorl.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Control of many annual broadleafs and grasses; species and suppression or control of certain perennial species.	Glyphosate 0.75 to 1.0 lb	4.0 lb ai/gal glyphosate containing product 0.75-1.0 qt or equivalent	Apply approved glyphosate products to corn hybrids designated as Roundup Ready. **Apply from emergence to V-8 (8 leaf collar visibles) or 30 inches tall, whichever occurs first.** A full rate preemergence herbicide program followed by one application of glyphosate may provide better weed control under heavy weed pressure than one timely application of glyphosate. Tank-mix combinations with other residual or post herbicides are allowed by respective labels. Single in-crop applications are not to exceed 1 qt/A. Sequential in- crop applications must not exceed 2 qt/A. This product can be applied preharvest, up to 1 qt/A, after maximun kernal fill is complete (black layer formation) until 7 days before harvest. Combined total per year for all applications may not exceed 8 qt/ A. Allow a minimum of 50 days for application to corn harvest for forage and 7 days to corn harvest for grain. Do not graze, harvest, or feed corn forage or silage following sequential in-crop applications. Some Roundup Ready corn hybrids may not have acceptable disease tolerance.
Pigweed, carpetweed, chickweed, crabgrass, jimsonweed, lambsquarters, nightshade, giant ragweed, smartweed, velvetleaf, cocklebur, and yellow nutsedge.	mesotrione 0.094 lb or mesotrione 0.094 lb + atrazine 0.25 lb	Callisto 4FL 3.0 oz or Callisto 4FL 3.0 oz + Atrazine 4L 0.25 qt or 90W 0.28 lb	Callisto is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn. Callisto is not effective for the control of most grass weeds. Postemergence grass herbicide can be tank mixed with Callisto to provide a broader spectrum of weed control. To broaden its broadleaf weed control ability, tank-mix atrazine with Callisto. Always add crop oil concentrate at a rate of 1% v/v. Always add spray guide UAN (28-0-0) at 2.5% v/v or ammonium sulfate at 8.5 lb/ 100 gallons spray solution. Do not apply postemergence if the corn was treated with Counter or Lorsban. Do not tank-mix and apply with any organophosphat or carbamate insecticide. Do not apply an organophosphat or carbamate insecticide within 7 days before or 7 days after a Callisto application. Do not apply Callisto in a tank-mix with emulsifiable concentrate grass herbicides. Do not use methylated seed oil. Do not apply more than a total of 10.7 oz/A of Callisto/A/season.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, foxtail spp., goosegrass, johnsongrass, fescue, orchardgrass, fall panicum, quackgrass, Italian ryegrass, shattercane, witchgrass, volunteer cereals, burcucumber, Canada thistle, jimsonweed, lambsquarters, marestail, morningglory spp., pigweed spp., ragweed (common, giant), smartweed, and velvetleaf	Foramsulfuron .028 lb + Iodosulfuron-methyl .002 lb	Equip 1.5 oz	Apply to young, actively growing weeds when corn is 0”-12” tall or from emergence to the V4 growth stage. Drop nozzles can be used for corn from 12”-36” or V4-V8 growth stages. Apply in combination with methylated or ethylated seed oil with a minimum of 10% emulsifier and with nitrogen fertilizer. Use 1.5 pt/A seed oil and 1.5-2.0 qt/A UAN or 1.5-3.0 lb/acre AMS. May be tank mixed with many residual or postemergence herbicides for increased spectrum of weed control. Consult label.
Barnyardgrass, burcucumber, cocklebur, foxtail (giant, green, yellow), goosegrass, jimsonweed, johnsongrass (rhizome, seedling), nightshade, panicum (fall, Texas), pigweed, quackrass, ragweed (common), shattercane, velvetleaf, and volunteer cereals	Foramsulfuron 0.03-0.04 lb	Option 35WDG 1.5-1.75 oz	Apply when corn is 0”-16” tall. Use drop nozzles when corn is 16”-36” tall. Methylated or ethylated seed oil with 10% emulsifier or greater in combination with nitrogen fertilizer is the recommended adjuvant system at 1.5 pt/A + 1.5-2.0 qt/A. Do not apply by air. Do not apply more than twice per season. Do not use if Counter, Dyfonate, or Thimet was applied. Do not apply foliar applications of the OP insecticide within 7 days of an Option application.
Cocklebur, jimsonweed, lambsquarters, morningglory, nightshade, nutsedge, pigweed, pokeweed, ragweed, smartweed, velvetleaf, and suppression of horsenettle, milkweed, and Canada thistle	Halosulfuron-methyl 0.02-0.04 lb + Sodium salt of dicamba 0.09-0.18 lb	Yukon 67.5WDG 4.0-8.0 oz	A nonionic surfactant or crop oil concentrate should be used. Use 0.25-0.5% nonionic surfactant or 1% v/v crop oil concentrate. When used alone, Yukon can be applied over the top or with crop nozzles from the spike through 36”-tall corn. Yukon can be applied 2 times a season with total application not to exceed 8.0 oz/A. Allow at least 2 weeks between applications.
Amaranth (palmer), carpetweed, cocklebur (common). galinsoga, jimsonweed, lambsquarters (common), morningglory (suppression), mustard, nightshade (eastern black), pigweed species, ragweed (common, giant), smartweed, sunflower, velvetleaf; barnyardgrass, crabgrass (large), yellow and giant foxtail, goosegrass, signalgrass, broadleaf, Texas panicum; suppression of smooth crabgrass and green foxtail	Tembotrione 0.082 lb ai	Laudis 3.5SC 3.0 oz	Methylated seed oil (MSO) or crop-oil concentrate (COC) adjuvants are recommended by manufacturer. In addition, nitrogen fertilizer is required (liquid or AMS). Tank mix with 0.25 to 1.0 lb ai/A of atrazine for improved control and to broaden the spectrum of control. Local university data supports at least 0.5 lb ai/A of atrazine. Do not apply the tank mixture of Laudis and atrazine to corn greater than 12 inches tall. Laudis will control/suppress crabgrass and some other grass species, but will not control fall panicum.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Amaranth (palmer), carpetweed, cocklebur (common), jimsonweed, lambsquarters (common), morningglory (suppression), mustard, nightshade (eastern black), pigweed species, ragweed (common, giant), sunflower, velvetleaf; suppression of smartweed and prickly sida, barnyardgrass, crabgrass (large and smooth), giant foxtail, goosegrass, suppression of yellow foxtail, green foxtail, seedling johnsongrass, fall panicium, and broadleaf signalgrass	Topramezone 0.164 lbs ai/A	Impact 2.8L 0.75 oz/A	Methylated seed oil (MSO) or crop oil concentrate (COC) adjuvants are recommended by manufacturer. In addition, nitrogen fertilizer is required (liquid or AMS). Tank mix with 0.25 to 1 lb ai/A of atrazine for improved control and to broaden the spectrum of control. Local university data supports at least 0.5 lb ai/A of atrazine. Do not apply the tank mixture of Impact and atrazine to corn greater than 12 inches tall. Do not use postemergence if Lumax or Lexar was used preemergence. Do not tank mix with Callisto. Impact will control/suppress crabgrass and other grass species, but is not effective for fall panicum control. Tank mixes include 2,4-D, Accent, atrazine, Basagran, Buctril, Clarity, Distinct, glyphosate, Hornet, Laddok, Liberty, Lightning, Marksman, Option, Permit, Steadfast, and Stinger.
Shattercan (up to 4 inches); less than 2 inches: volunteer barley and wheat, barnyardgrass, annual bluegrass, foxtail species, and fall panicum, large crabgrass less than 1/2 inch tall. Broadleaf weeds less than 3 inches tall: common chickweed, dandelion, henbit, pigweed species, shepherd's-purse, and wild radish	Rimsulfuron 0.016 lb ai/A	Resolve 25D 1 oz/A	Resolve alone will control small seedling weeds, grass less than 2 inches and broadleaves less than 3 inches. Resolve will control crabgrass less than 1/2 inch tall. Resolve can be tank mixed with glyphosate to provide residual control of broadleaf and grass weed species emerging after the application. Do not apply Resolve to corn under stress due to crop injury. Refer to the Resolve label for all restrictions concerning increased injury when tank mixed with organo-phosphate insecticides (Counter, Lorsban, or Thimet). Do not tank mix with Basagran or Laddok due to crop injury concern. Apply Resolve to corn up to 12 inches tall or before the appearance of 6 or more collars, whichever is more restrictive. Resolve must be applied with a nonionic surfactant (NIS) and nitrogen fertilizer. Crop-oil concentrate (COC) may be used in place of nonionic surfactant. When applying Resolve in tank mixture with a glyphosate product that contains a "built-in" adjuvant system, the Resolve label does not recommend the use of extra adjuvants. Resolve can be tank mixed with other registered herbicides for use in corn (except Basagran and Laddok).

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, broadleaf signalgrass, foxtails, johnsongrass (seedling and rhizome), panicum (fall and Texas), quackgrass, ryegrass (Italian and perennial), sandbur, shattercan, timothy, volunteer grains, and wirestern muhly, burcucumber, jimsonweed, common lambsquarters, morningglory, pigweed, smartweed, and velvetleaf. Local experience has shown good control of dock. Suppression of hemp dogbane, pokeweed, and Canada thistle.	Nicosulfuron + thifensulfuron 0.023-0.034 lb	Stout 0.5 to 0.75 oz/A	Stout can be applied to corn up to 16 inches tall or with less than 6 collars, whichever is more restrictive. Stout will not contol crabgrass species. Applications of Stout must include either a crop-oil concentrate (COC) or a nonionic surfactant (NIS). In addition, a nitrogen fertilizer must be used. Do not tank mix Stout with Basagran or Laddok due to crop safety concerns. Do not tank mix with 2,4-D due to reduction in grass control. Refer to Stout label for restrictions regarding organophosphate insecticides such as Counter, Lorsban, malathion, parathion, and Thimet. Do not tank mix with other ALS-inhibiting herbicides (Group 2) unless specifically mentioned on herbicide label.
Barnyardgrass, annual bluegrass, foxtail spp., fall panicum, volunteer barley, volunteer wheat, chickweed, henbit, mustard spp., pigweed spp., Russian thistle, shepherd's-purse, wild radish, wild sunflower, velvetleaf, and others	Rimsulfuron 0.016 lb + dicamba 0.132 lb	Require Q 59DF 4.0 oz	Apply after corn has reached 4 inches in height. Do not apply to corn taller than 20 inches in height. Applications made after weed emergence will provide contact control of labeled weeds and limited residual control of later emergence. For control of emerged weeds, include a nonionic surfactant and an ammonium-nitrogen fertilizer. If applied in combination with a glyphosate or glufosinate herbicide that contains a built-in adjuvant system, no additional surfactant needs to be added. Require Q may be tank mixed with glyphosate or glufosinate herbicides if applications are made to corn hybrids containing appropriate herbicide tolerance genes, and can be tank mixed with full or reduced rates of other products registered for use in corn. Crop-oil concentrate can be used in place of nonionic surfactant for burndown applications of Require Q. Require Q may be tank mixed with full or reduced rates of preemergence grass and broadleaf herbicides to provide added residual activity.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Barnyardgrass, annual bluegrass, foxtail spp., fall panicum, volunteer barley, volunteer wheat, chickweed, henbit, mustard spp., pigweed spp., shepherd's-purse, wild radish, velvetleaf, and others	Rimsulfuron 0.14 lb + thifensulfurom-methyl 0.003 lb	Resolve Q 22.4DF 1.25 oz	Apply postemergence to corn up to 20 inches tall. Applications made after weed emergence will provide contact control of labeled weeds and limited residual control of later emergence. For control of emerged weeds, include a nonionic surfactant and an ammonium-nitrogen fertilizer. If applied in combination with a glyphosate or glufosinate herbicide that contains a built-in adjuvant system, no additional surfactant needs to be added. Resolve Q may be tank mixed with glyphosate or glufosinate herbicides if applications are made to corn hybrids containing appropriate herbicide tolerance genes and can be tank mixed with full or reduced rates of other products registered for use in corn. Do not tank mix Resolve Q with Basagran or Laddock. Resolve Q may be tank mixed with full or reduced rates of preemergence grass and broadleaf herbicides to provide added residual activity.
Johnsongrass and other annual and perennial weeds.	Glyphosate	4.0 lb ai/gal glyphosate containing product or equivalent as labeled	In annual cropping systems, apply 1.0 to 1.75 qt/A. Apply 1.0 qt of this product in 3.0 to 10.0 gal/ water/A Use 1.75 qt of this product when applying 10.0 to 30.0 gal/water/A. In noncrop, or areas where annual tillage (no-till) is not practiced, apply 1.75 to 2.5 qt of this product in 10.0 to 30.0 gal/water/A. For best results, apply when plants have reached the boot-to-head stage of growth or in the fall prior to frost. Allow 7 or more days after application before tillage. Do not tank-mix with residual herbicides when using the 1.0 qt/A rate. In corn, for spot treatments, apply prior to silking. Do not treat more than 10% of the total field area to be harvested.

Table 5.33 - Postemergence (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Control of many annual grasses and broadleaf weeds and suppression of many perennial weeds as well	Glyphosate 0.75-1.0 lb + atrazine 0.75-1.0 lb	Ready Master ATZ 1.5-2.0 qt	Apply this product postemergence to Roundup Ready corn from seedling emergence until the corn reaches 12 inches in height. A sin- gle in-crop application must not exceed 2.0 qt/A. The addition of adjuvants, micronutrients, or liquid fertilizers is not recommended. Ready Master ATZ can be tank- mixed with Harness, MicroTech, Partner, or atrazine. Tank mixtures of Ready Master ATZ with Har- ness must be applied before the corn is 11 inches tall, while tank mixtures with MicroTech or Partner must be applied before the corn exceeds 5 inches in height. If adding atrazine, a max- imum of 2.0 lb of active ingredient may be applied postemergence if no atrazine was applied before corn emergence.
Control of Roundup Ready Corn: volunteer corn or replanting	There are times when corn has to be removed from a field with the intention of replanting a corn crop. Tillage is one effective method, but it is not appropriate in no-tillage situations. The use of glyphosate is highly effective for non-Roundup Ready corn. The challenge is in removing Roundup Ready hybrids. There are limited herbicides that consistently kill small corn plants. Gramoxone Inteon, Ignite, and Select are three products that have shown the most activity. Research conducted in this region with Gramoxone and Select demonstrated that Select was the most effective for corn 2 to 3 inches tall. For taller corn (4 to 6 inches tall), Gramoxone in combination with a photosystem II inhibiting herbicide (Sencor, Lorox, or atrazine) was the most effective. Ignite is a tlird option, but will not control Liberty Link hybrids. Individual recommendations are as follows: Select Max: Apply up to 6.0 oz of Select Max with a nonionic surfactant at 0.25% v/v plus AMS at 2.5 to 4.0 lbs/A. Do not use a COC or MSO. Wait a minimum of 6 days from time of application until corn planting due to risk of crop injury. Gramoxone Inteon: Apply 2.0 to 3.0 pt/A in combination with Sencor (4.0 to 6.0 oz/A), Lorox (1.0 pt/A) or atrazine (1.0 lb/A). These photosystem II inhibitors are not added to control the corn, but are used to reduce the speed of Gramoxone Inteon activity, which helps provide more consistent control. Ignite 280: 22.0 to 29.0 oz of Ignite. Ignite has not been as consistent for control of corn as Gramoxone.		

Table 5.34 - Harvest Aid

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Morningglory and other broadleaf weeds	2,4-D 0.5-1.0 lb	2,4-D amine 0.5-1.0 lb ai of a formulation labeled for harvest aid use.	Apply after hard dough or denting stage. Do not forage or feed corn fodder for 7 days following application.
	Glyphosate up to 3.0 lb	4.0 lb ai/gal glyphosate containing product or equivalent as labeled Up to 3.0 qt by ground, 1.0 qt by air.	Apply at 35% grain moisture or less. Ensure that maximum kernel fill is complete and the corn is mature (black layer formed). Allow at least 7 days between application and harvest. Apply with extreme caution because spray drift can be very damaging to trees, shrubs, and lawns at this time of year. For Roundup-Ready corn, the maximum amount of this product that can be applied after maxi- mum kernel fill is complete and the crop is physiologically mature (black layer formation) until 7 days before harvest is 32.0 oz/A.
	Paraquat 0.3-0.5 lb	Gramoxone Inteon 3L 1.2-2.0 pt	Make one application at least 7 days prior to harvest after corn is mature and the black layer has formed. Apply in a minimum of 5.0 gal/A by air and 20 gal/A by ground. Use a nonionic surfactant containing at least 75% surface active agent at 0.25% v/v. 2.0 pt/A should be used on mature broadleaf weeds and grasses and those that are taller than 18”.

Table 5.35 - Fall Weed Control (Postharvest)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
Improved spectrum of control for perennial broadleaf weeds	Glyphosate 1.0-5.0 lb + dicamba 0.5-2.0 lb or glyphosate 1.0-5.0 lb + 2,4-D ester 0.5-3.0 lb	4.0 lb ai/gal glyphosate or equivalent. 1.0-5.0 qt + Banvel 1.0-4.0 pt or 4.0 lb ai/gal glyphosate or equivalent. 1.0-5.0 qt + 2,4-D ester 1.0-6.0 pt	See the remarks for glyphosate. Fall seeded small grains can follow dicamba applications (20 days/pint of dicamba applied). Small grains are restricted to the following year for 2,4-D applications.
Alfalfa, artichoke (Jerusalem), bindweeds dock (curly), dogbane (hemp), horsenettle, milkweed (common and honeyvine), plantains, pokeweed, sorrel (red), and thistle (Canada)	Dicamba 1.0-2.0 lb + surfactant or crop oil concentrate	Banvel/Clarity 2.0-4.0 pt + surfactant 1.0 qt/100.0 gal) or crop oil concentrate 1.0 gal/100.0 gal	Apply after corn harvest and prior to frost to actively growing weeds. Results are best when weeds are at or beyond the full bloom stage. Allow 10 or more days after applications before tillage or mowing. Fall seeded small grains are restricted to 20 days after application/pint of dicamba applied.

Table 5.35 - Fall Weed Control (Postharvest) (cont.)

Weed Problem	Chemical Rate per Acre	Product per Acre	Remarks
	Glyphosate up to 3.0 lb	4.0 lb ai/gal glyphosate or equivalent as labeled. Up to 3.0 qt by ground, 1.0 qt by air	Apply at 35% grain moisture or less. Ensure that maximum kernel fill is complete and the corn is mature (black layer formed). Allow at least 7 days between application and harvest. Apply with extreme caution because spray drift can be very damaging to trees, shrubs, and lawns at this time of year.
Alfalfa, artichoke (Jerusalem), bindweeds dock (curly), dogbane (hemp), horsenettle, milkweed (common and honeyvine), plantains, pokeweed, sorrel (red), and thistle (Canada), garlic (wild)	Dicamba 0.5-2.0 lb + 2,4-D ester 0.5-3.0 lb + surfactant or crop oil concentrate	Banvel/Clarity 1.0-4.0 pt + 2,4-D ester 1.0-6.0 pt + surfactant 1.0 qt/100.0 gal or crop oil concentrate 1.0 gal/100.0 gal	See the remarks for dicamba above. Fall seeded small grains are restricted to the following year for 2,4-D applications.
Alfalfa, artichoke (Jerusalem), Bermudagrass, bindweeds dock (curly), dogbane (hemp), horsenettle, johnsongrass, milkweed (common), muhly (wirestem), thistle (Canada), and ryegrass (perennial)	Glyphosate 1.0-5.0 lb	4.0 lb ai/gal glyphosate or equivalent. 1.0-5.0 qt	Apply after corn harvest and prior to frost to actively growing weeds. Results are best when weeds are at or beyond the full bloom stage. Allow 7 or more days after application before tillage or mowing.
Docks spp., garlic (wild)	Thifensulfuron & tribenuron 0.014-0.028 lb + crop oil concentrate or surfactant	Harmony Extra SG 0.45-0.9 oz + crop oil concentrate 1.0 gal/100.0 gal or surfactant 0.5-4.0 pt/100.0 gal.	Best results are obtained when applications are made to young actively growing weeds. Always premix Harmony Extra SG with water before adding to the spray tank Sequential treatments may be applied provided the total amount of Harmony Extra SG applied during one fallow cropland season does not exceed 1.5 ounce/A. Harmony Extra SG must be applied at least 45 days prior to planting corn, rice, grain sorghum, or soybeans and 14 days prior to planting cotton. For small grains, all other crops require a 60-day planting restriction.
	approved combinations: tankmix with 2,4-D or dicamba		Use to improve spectrum of perennial weed control.