

Weed Control in Field Crops

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Chemical

Herbicides are useful tools in most weed management programs. They should be used to supplement and not supplant other methods or tools available. These other tools include good cultural practices, such as proper fertilization and liming to give the crop a head start, and crop rotation and proper cultivation, which are essential for a total weed management program.

The following are definitions of terms you will find in this and similar publications on herbicides:

Preplowing. The herbicide is applied to a growing weed before the land is plowed.

Early Preplant (EPP). The herbicide is applied to the soil before planting. Generally used in no-till to control existing vegetation and provide early residual control.

Preplant incorporated (PPI). The herbicide is applied to the soil after plowing but before planting, and mixed with the top few inches of soil with different incorporation implements.

Preemergence (PRE). The herbicide is applied after the crop is planted but before it emerges from the ground. Soil moisture, light rainfall, or shallow cultivation may be necessary to obtain good weed control with many preemergence herbicides.

Postemergence (POST). The herbicide is applied to the foliage of weeds after the crop has emerged.

Surfactant. This is a surface-active agent that reduces the surface tension, thus permitting a more uniform application, and spreads the herbicide solution evenly on the plant foliage or ground.

Many terms designate particular surface activities such as adjuvant, detergent, emulsifier, spreader, sticker, and wetting agent.

Most of the herbicides recommended in this publication are selective. That is, at the recommended rate of application, they will selectively control or injure weeds but will not seriously damage the crop in which these weeds are growing. In using most selective herbicides, you should carefully follow the recommended rate of application because higher rates may severely injure or kill the crop. You, the user, must accept the responsibility if you use a herbicide other than as directed on the label. Read the label on the container and follow the directions carefully.

The precision required for the application of herbicides is greater than for many other farm tasks. Three factors governing the rate of application are pressure, nozzle size, and ground speed. Contact your local Extension office for related publications.

Use Rate

The recommended use rates of herbicides generally vary with soil texture and organic matter content. The herbicide rates given in this section refer only to three soil texture groups: coarse, medium, and fine. The following is a listing of soil textures included of these three soil texture groups:

Soil texture group	Soil texture
Coarse	Sand, loamy sand, sandy loam
Medium	Loam, silt loam, silt, sandy clay loam
Fine	Silty clay loam, clay loam, sandy clay, silty clay, clay

Please refer to the chart above to determine the soil texture group for the soil you want to treat. Low rates of herbicides generally are used on coarse soils low in organic matter while high rates generally are used on fine soils high in organic matter. Consult the label for the proper herbicide rate for your soils.

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Table 5.1 - Guide to Prepackaged Mixes

Product Name	Prepackaged Mix Ingredients	Formulation Ratio	Manufacturer
Authority Assist 4L	Authority + Pursuit	3.33 + 0.67 lb/gal	FMC
Authority MTZ 45 DF	Authority + metribuzin	1:1.5 ratio	FMC
Axiom 68 DF	Define + metribuzin	4:1 ratio	Bayer
Basis 75 DF	Harmony SG + Matrix	1:2 ratio	DuPont
Bicep Lite II Magnum 6L	Dual II Magnum + atrazine	3.33 + 2.67 lb/gal	Syngenta
Bicep II Magnum 5.5L	Dual II Magnum + atrazine	2.4 + 3.1 lb/gal	Syngenta
Boundary 6.5L	Dual II Magnum + metribuzin	5.25 + 1.25 lb/gal	Syngenta
Buctril + Atrazine 3L	Buctril + atrazine	1.0 + 2.0 lb/gal	Bayer
Bullet 4L	Lasso MT + atrazine	2.5 + 1.5 lb/gal	Monsanto
Camix 3.67L	Dual II Magnum + Callisto	3.34 + 0.33 lb/gal	Syngenta
Canopy 75 DF	Lexone + Classic	6:1 ratio	DuPont
Canopy EX 75 DF	Classic + Express	3.33:1 ratio	DuPont
Celebrity Plus 70DF	Distinct + Accent	5.6:1 ratio	BASF
Cimarron Plus	mtesulfuron methyl + Glean	3.2:1 ratio	DuPont
Crossbow 3.0L	Remedy + 2,4-D	1.0 + 2.0 lb/gal	Dow AgroSciences
Curtail 2.4L	Stinger + 2,4-D amine	0.4 + 2.0 lb/gal	Dow AgroSciences
Degree Xtra 4EC	Harness + atrazine	2.7 + 1.34 lb/gal	Monsanto
Distinct 70 DF	Banvel/Clarity + diflufenzopyr	2.5:1 ratio	BASF
Equip 32 WG	Option + iodosulfuron	15:1 ratio	Bayer
Exceed 57 WG	Peak + Beacon	1:1 ratio	Syngenta
Expert 4.88 EC	Dual II Magnum + Roundup + atrazine	1.74 + 1.0 + 2.14 lb/gal	Syngenta
Extreme 2.17 EC	Pursuit + glyphosate	0.17 + 2.0 lb/gal	BASF
Fieldmaster 4.25 SE	Roundup + Harness + atrazine	0.75 + 2.0 + 1.5 lb/gal	Monsanto
Finesse 75 DF	Glean + Ally	5:1 ratio	DuPont
Forefront 3 EC	Milestone + 2,4-D	0.33 + 2.66 lb/gal	Dow AgroSciences
Fultime 4 EC	Topnotch + atrazine	2.4 + 1.6 lb/gal	Dow AgroSciences
Fusion 2.56 EC	Fusilade 2000 + Whip	2.0 + 0.56 lb/gal	Syngenta
Gangster (copack)	Valor + FirstRate	1:1.65 ratio	Valent
Grazon P + D 2.54L	2,4-D + Tordon	2.0 + 0.54 lb/gal	Dow AgroSciences
Guardsman Max 5L	atrazine + Outlook	3.3 + 1.7 lb/gal	BASF
Guardsman Max Lite 5L	Outlook + atrazine	2.25 + 2.75 lb/gal	BASF
Halex GT 4.38EC	Dual II Magnum + glyphosate + Callisto	2.1 + 2.1 + .21 lb/gal	Syngenta
Harness Extra 5.6L	Harness + atrazine	3.1 + 2.5 lb/gal	BASF
Harmony Extra SG 50 SG	Harmony SG + Express	2:1 ratio	DuPont
Hornet 78.5 WP	Broadstrike + Stinger	1:3.25 ratio	Syngenta + Dow AgroSciences
Keystone 5.25L	atrazine + acetochlor	2.25 + 3.0 lb/gal	Dow AgroSciences
Keystone LA 5.5L	atrazine + acetochlor	1.5 + 4.0 lb/gal	Dow AgroSciences
Laddock S12 5L	Basagran + atrazine	2.5 + 1.5 lb/gal	MicroFlo
Landmaster 3.1 SL	glyphosate + 2,4-D amine	1.2 + 1.9 lb /gal	Monsanto
Lariat 4L	Lasso EC + atrazine	2.5 + 1.5 lb/gal	Monsanto

¹Products not targeted for major distribution in Delaware, Maryland, and Virginia.

Table 5.1 - Guide to Prepackaged Mixes (cont.)

Product Name	Prepackaged Mix Ingredients	Formulation Ratio	Manufacturer
Lexar 3.7 SC	atrazine + Dual II Magnum + Callisto	1.74 + 1.74 + 0.22 lb/gal	Syngenta
Liberty ATZ 4.3L	Liberty + atrazine	3.3 + 1.0 lb/gal	Bayer
Lighting 70 DG	Pursuit + Arsenal	2:1 ratio	BASF
Lumax 3.95 SC	atrazine + Dual II Magnum + Callisto	1.0 + 2.68 + 0.268 lb/gal	Syngenta
Marksman3.2 L	Banvel/Clarity	1.1 + 2.1 lb/gal + atrazine	BASF
Northstar 47.4 DG	Beacon + Banvel/Clarity	1:5.9 ratio	Syngenta
PastureGard 2.5L	Remedy + Vista	1.5 + 0.5 lb/gal	Dow AgroSciences
Prefix 5.29 EC	Dual II Magnum + Reflex	4.34 + 0.95lb/gal	Syngenta
Radius 4L	Define + Balance	3.57 + 0.43 lb/gal	Bayer
Ready Master ATZ 4L	glyphosate + atrazine	2.0 + 2.0 lb/gal	Monsanto
Redeem 3EC	Stinger + Clopyralid	2.25 + 0.75 lb/gal	Dow AgroSciences
Require Q	Banvel/Clarity + Matrix	8.5:1 ratio	DuPont
Resolve Q 22.4 DF	Matrix + Harmony SG	4.6:1 ratio	DuPont
Sequence 5.25 SC	glyphosate + Dual II Magnum	2.25 + 3.0 lb/gal	Syngenta
Sonic/Authority First 70 DF	Authority + FirstRate	7.75:1 ratio	Dow AgroSciences
Spirit 57 WDG	Beacon + Peak	3:1 ratio	Syngenta
Status 56 WG	Banvel/Clarity + diflufenzopyr	2.5:1 ratio	BASF
Steadfast 75 DF	Accent + Matrix	2:1 ratio	DuPont
Steadfast ATZ 89 WDG	Accent + Matrix + atrazine	2.1:1:65.6 ratio	DuPont
Stellar 3.1 EC	Resource + Cobra	0.7 + 2.4 lb/gal	Valent
Storm 4S	Basagran + Blazer	2.67 + 1.33 lb/gal	UPA
Stout 72.5 DF	Accent + Harmony SG	1.35:1 ratio	DuPont
Surestart 4.25 EC	acetochlor + Stinger + Python	3.75 + 0.38 + 0.12 lb/gal	Dow AgroSciences
Surmount 1.34 SL	Vista + Tordon	0.67 + 0.67 lb/gal	Dow AgroSciences
Synchrony XP 28.4 DF	Classic + Harmony SG	3.1:1 ratio	DuPont
TNT Broadleaf 75 DF	Harmony SG + Express	2:1 ratio	DuPont
Valor XLT 40 WDG	Valor + Classic	2.9:1 ratio	Valent
Yukon 67.5 WDG	Permit + Banvel	1:4.4 ratio	Monsanto

¹Products not targeted for major distribution in Delaware, Maryland, and Virginia.

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Table 5.2 - Guide to Single Active Ingredient Herbicides¹

Trade Name	Ingredients	Mode of Action	Manufacturer
Accent	nicosulfuron	ALS inhibitor	DuPont
Aim	carfentrazone-ethyl	PPO inhibitor	FMC
Ally	metsulfuron	ALS inhibitor	DuPont
Arsenal	imazapyr	ALS inhibitor	BASF
Assure II	quizalofop	lipid synthesis inhibitor	DuPont
Atrazine	atrazine	mobile photosynthesis inhibitor	Various
Authority	sulfentrazone	PPO inhibitor	FMC
Axial XL	penoxaden	lipid synthesis inhibitor	Syngenta
Balan	benefin	seedling root inhibitor	UAP
Balance Flex	isoxaflutole	pigment inhibitor	Bayer
Banvel	dicamba	growth regulator	MicroFlo
Basagran	bentazon	non-mobile photosynthesis inhibitor	MicroFlo
Beacon	primisulfuron	ALS inhibitor	Syngenta
Buctril	bromoxynil	non-mobile photosynthesis inhibitor	Bayer
Callisto	mesotrione	pigment inhibitor	Syngenta
Classic	chlorimuron	ALS inhibitor	DuPont
Clarity	dicamba	growth regulator	BASF
Cobra	lactofen	cell membrane disrupter	Valent
Command	clomazone	pigment inhibitor	FMC
2,4-D	2,4-D	growth regulator	Various
2,4-DB	2,4-DB	growth regulator	Various
Define	FOE-5043	seedling shoot inhibitor	Bayer
Degree	acetochlor	seedling shoot inhibitor	Monsanto
Devrinol	napropamide	seedling shoot inhibitor	UPI
Distinct/Overdrive	dicamba	growth regulator	BASF
Dual II Magnum/Cinch	s-metolachlor	seedling shoot inhibitor	Syngenta/DuPont
Eptam	EPTC	seedling shoot inhibitor	Syngenta
Eradicane	EPTC	seedling shoot inhibitor	Syngenta
Evik	ametryn	mobile photosynthesis inhibitor	Syngenta
Express ²	tribenuron	ALS inhibitor	DuPont
FirstRate	cloransulam	ALS inhibitor	Dow AgroSciences
Flexstar	fomesafen	cell membrane disrupter	Syngenta
Fusilade DX	fluzifop-P	lipid synthesis inhibitor	Syngenta
Glean ²	chlorsulfuron	ALS inhibitor	DuPont
Gramoxone Inteon	paraquat	cell membrane disrupter	Syngenta
Harmony SG	thifensulfuron	ALS inhibitor	DuPont
Harness	acetochlor	seedling shoot inhibitor	Monsanto
Hoelon	diclofop	lipid synthesis inhibitor	Bayer
Ignite 280	glufosinate	EPSP inhibitor	Bayer
Impact	topramezone	HPPD inhibitor	AMVAC
Kerb	pronamide	seedling shoot inhibitor	Dow AgroSciences

¹This update compiled September 2006.

²Products not targeted for major distribution in Delaware, Maryland, or Virginia.

Table 5.2 - Guide to Single Active Ingredient Herbicides¹ (cont.)

Trade Name	Ingredients	Mode of Action	Manufacturer
Lasso/Micro-Tech	Alachlor	seedling shoot inhibitor	Monsanto
Linex/Lorox	linuron	mobile photosynthesis inhibitor	Griffin
Laudis	tembotriione	MPPD inhibitor	Bayer
Matrix	rimsulfuron	ALS inhibitor	DuPont
MCPA	MCPA	growth regulator	Various
Milestone	aminopyralid	growth regulator	Dow AgroSciences
Option	foramsulfuron	ALS inhibitor	Bayer
Outlook	dimethenamid-P	seedling shoot inhibitor	BASF
Paramount	quinclorac	growth regulator	BASF
Peak	prosulfuron	ALS inhibitor	Syngenta
Pendimax	pendimethalin	seedling shoot inhibitor	Dow AgroSciences
Permit	halosulfuron	ALS inhibitor	Gowan
Poast (1.5 lb/gal)	sethoxydim	lipid synthesis inhibitor	MicroFlo
Poast Plus (1.00 lb/gal)	sethoxydim (with surfactant)	lipid synthesis inhibitor	MicroFlo
Princep	simazine	mobile photosynthesis inhibitor	Syngenta
Prowl, Pendimax	pendimethalin	seedling root inhibitor	BASF
Pursuit	imazethapyr	ALS inhibitor	BASF
Python	flumetsulam	ALS inhibitor	Dow AgroSciences
Raptor	imazamox	ALS inhibitor	BASF
Reflex	fomesafen	cell membrane disrupter	Syngenta
Remedy	triclopyr	growth regulator	Dow AgroSciences
Resolve	rimsulfuron	ALS inhibitor	DuPont
Resource	flumiclorac	PPO inhibitor	Valent
Roundup or other formulations	glyphosate	EPSP inhibitor	Various
Scepter	imazaquin	ALS inhibitor	BASF
Select	clethodim	lipid synthesis inhibitor	Valent
Sencor	metribuzin	mobile photosynthesis inhibitor	Bayer
Sinbar	terbacil	mobile photosynthesis inhibitor	DuPont
Sonalan	ethalfluralin	seedling root inhibitor	Dow AgroSciences
Spartan	sulfentrazone	PPO inhibitor	FMC
Spike	tebuthiuron	mobile photosynthesis inhibitor	Dow AgroSciences
Stinger	clopyralid	growth regulator	Dow AgroSciences
Strongarm	diclosulam	ALS inhibitor	Dow AgroSciences
Tillam	pebulate	seedling shoot inhibitor	Monterey Chemical
Topnotch	acetochlor	seedling shoot inhibitor	Dow AgroSciences
Touchdown	glyphosate	EPSP inhibitor	Syngenta
Treflan	trifluralin	seedling root inhibitor	Dow AgroSciences
Ultra Blazer	acifluorfen	cell membrane disrupter	UPI
Valor	flumioxazin	PPO inhibitor	Valent
Velpar	hexazinone	mobile photosynthetic inhibitor	DuPont

¹This update compiled September 2006.²Products not targeted for major distribution in Delaware, Maryland, or Virginia.

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Table 5.3 - Selected Glyphosate Products and Premixes for Agronomic Use

(courtesy Penn State University)

Currently, numerous products contain glyphosate. Most of them are labeled for "burndown"/preemergence and/or spot applications. The majority, but not necessarily all, of the products below are labeled for over-the-top application in Roundup Ready crops (namely, RR corn and RR soybean). Refer to the product label for additional information on crop use, formulation, application rates, and other use restrictions.

Product and Amount of glyphosate/gallon ¹	Company	Product rate (fl oz) equivalent to:				Formulation	
		0.375 lb ae	0.56 lb ae	0.75 lb ae	1.13 lb ae	Salt ²	Adjuvant load ³
5 lb ae							
Touchdown HiTech	Syngenta	10	14	19	29	Potassium	minimal
4.5 lb ae/5.5 lb ai							
Roundup WeatherMax	Monsanto	11	16	22	32	Potassium	fully loaded (TranSorb II)
Roundup Original Max	Monsanto	11	16	22	32	Potassium	partial
4 lb ae/5 lb ai							
Debit TMF	Nufarm	12	18	24	36	IPA	minimal
Glyphomax XRT/ Durango (5.4 ai)	Dow AgroSciences	12	18	24	36	IPA	fully loaded
Gly Star 5	Albaugh/AgriStar	12	18	24	36	IPA	minimal
Roundup Custom	Monsanto	12	18	24	36	IPA	minimal
Touchdown Total	Syngenta	12	18	24	36	Potassium	fully loaded (IQ System)
3.7 ae/5 lb ai							
Roundup Ultra Max	Monsanto	13	20	26	40	IPA	fully loaded (TranSorb)
3 lb ae/4 lb ai							
Buccaneer	Tenkoz	16	24	32	48	IPA	partial
Buccaneer Plus	Tenkoz	16	24	32	48	IPA	fully loaded
ClearOut 41	CPT	16	24	32	48	IPA	partial
ClearOut 41 Plus	CPT	16	24	32	48	IPA	fully loaded
Cornerstone	Agrilience	16	24	32	48	IPA	partial
Credit	Nufarm	16	24	32	48	IPA	partial
Credit Extra	Nufarm	16	24	32	48	IPA	fully loaded

¹Glyphosate products can be formulated to have different concentrations of glyphosate acid per gallon of product. To improve handling, performance, and concentration, the glyphosate acid is formulated as a salt compound. *Acid equivalent (ae)* is only the weight of the glyphosate acid, which is herbicidally active. *Active ingredient (ai)* is the weight of the glyphosate acid plus the salt. It is best to refer to ae when comparing glyphosate products and rates.

²Glyphosate can be formulated as different salts: isopropylamine (IPA), monoammonium, diammonium, or potassium.

³Some glyphosate products contain all the necessary adjuvants (i.e., fully loaded). Others contain only a limited amount and additional surfactants must be added to the tank before application. All brands of glyphosate recommend adding ammonium sulfate (AMS) if using hard water as a carrier or under other challenging conditions. If using AMS, always add to the spray solution before glyphosate. Refer to product label for more information.

Table 5.3 - Selected Glyphosate Products and Premixes for Agronomic Use (cont.)

(courtesy Penn State University)

Product and Amount of glyphosate/gallon ¹	Company	Product rate (fl oz) equivalent to:				Formulation	
		0.375 lb ae	0.56 lb ae	0.75 lb ae	1.13 lb ae	Salt ²	Adjuvant load ³
Credit Duo Extra	Nufarm	16	24	32	48	IPA + mono-ammonium	fully loaded
Gly-4	UPCA	16	24	32	48	IPA	partial
Gly-4 Plus	UPCA	16	24	32	48	IPA	fully loaded
Glyfos	Cheminova	16	24	32	48	IPA	partial
Glyfox Xtra	Cheminova	16	24	32	43	IPA	fully loaded
Gly Star Original	Albaugh/AgriStar	16	24	32	48	IPA	partial
Gly Star Plus	Albaugh/AgriStar	16	24	32	48	IPA	fully loaded
Glyphomax	Dow AgroSciences	16	24	32	48	IPA	partial
Glyphomax Plus	Dow AgroSciences	16	24	32	48	IPA	fully loaded
Glyphosate 4	FarmSaver.com	16	24	32	48	IPA	partial
Glyphosate 41%	Helm Agro	16	24	32	48	IPA	partial
Glyphosate Herbicide	DuPont	16	24	32	48	IPA	partial
Glyphosate Original	Griffin	16	24	32	48	IPA	partial
Honcho	Monsanto	16	24	32	48	IPA	minimal
Honcho Plus	Monsanto	16	24	32	48	IPA	fully loaded
Mirage	UAP	16	24	32	48	IPA	partial
Mirage Plus	UAP	16	24	32	48	IPA	fully loaded
Rascal	Agriliance	16	24	32	48	IPA	minimal
Rattler	Helena	16	24	32	48	IPA	partial
Rattler Plus	Helena	16	24	32	48	IPA	fully loaded
Roundup Original	Monsanto	16	24	32	48	IPA	partial
3 lb ae/3.7 lb ai							
Touchdown IQ	Syngenta	16	24	32	48	diammonium	fully loaded (IQ system)

¹Glyphosate products can be formulated to have different concentrations of glyphosate acid per gallon of product. To improve handling, performance, and concentration, the glyphosate acid is formulated as a salt compound. *Acid equivalent (ae)* is only the weight of the glyphosate acid, which is herbicidally active. *Active ingredient (ai)* is the weight of the glyphosate acid plus the salt. It is best to refer to ae when comparing glyphosate products and rates.

²Glyphosate can be formulated as different salts: isopropylamine (IPA), monoammonium, diammonium, or potassium.

³Some glyphosate products contain all the necessary adjuvants (i.e., fully loaded). Others contain only a limited amount and additional surfactants must be added to the tank before application. All brands of glyphosate recommend adding ammonium sulfate (AMS) if using hard water as a carrier or under other challenging conditions. If using AMS, always add to the spray solution before glyphosate. Refer to product label for more information.

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Table 5.4. - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Affalfa	Barley, winter	Bean, lima	Bean, snap	Cabbage	Corn, field	Corn, sweet	Cucumber	Muskmeloon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Sorghum, grain	Squash	Tomato	Watermelon	Wheat, winter
Accent	12	4	1 ²	10 ²	10 ²	NR	10	10 ⁵	10	10 ⁵	10	10 ²	10 ²	10 ²	4	0.5	10	10	10 ²	10	4
Aim	1	12	1	1	1	NR	1	1	1	1	1	1	12	1	1	1	1	1	1	1	1
Alanap	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Assure II/Targa	4	4	4	NR	4	4	4	4	4	NR	4	4	4	NR	4	4	4	4	4	4	4
Atrazine	SY	SY	SY	SY	NR	NR	SY	SY	SY	SY	SY	SY	SY	SY	12	SY	NR	SY	SY	SY	SY
Authority MTZ	12	4	18	18	10	18	18	18	18	18	18	18	12	18	18	4	18	18	18	18	4
Axial	4	0	4	4	1	4	4	4	1	4	4	4	4	4	4	4	4	4	4	4	0
Axiom	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	1	NY	NY	NY	NY	NY	NY	NY	NY
Balance	10	6	18	18	18	NR	6	18	18	18	18	6	18	18	6	6	18	18	18	18	4
Banvel	AH	1 ³	AH	AH	AH	NR	AH	AH	AH	AH	AH	AH	AH	AH	13	14	NR	AH	AH	AH	1 ³
Basagran	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Basis	10	8	18	8	18	NR	10	18	18	8	18	4	18	18	0.5	18	10	18	18	18	4
Beacon	8	3	18	8	18	0.5d	8	18	18	8	18	18	3	8	8	8	18	18	18	18	3
Boundary	4.5	4.5	12	12	8	12	12	12	18	12	8	12	12	8	12	12	NR	12	12	12	4.5
Breakfree	NY	NY	NI	NI	NI	0	0	NI	NI	NI	NI	NI	NY	NY	NY	NY	NI	NI	NI	4	

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.

⁶Transplanted

⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

Table 5.4. - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹ (cont.)

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Afalfa	Barley, winter	Bean, lima	Bean, snap	Cabbage	Corn, field	Corn, sweet	Cucumber	Muskmeloon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Squash	Sorghum, grain	Tomato	Wheat, winter	Watermelon
Buctril	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Callisto	NY	4	NY	NY	NY	NR	NY	NY	NY	NY	NY	NY	4	NY	NY	NY	NY	NY	NY	4	
Canopy	10	4	30	12	18	10	18	30	30	12	30	30	18	4	NR	12	30	10	18	4	
Canopy EX	12	4	12	12	18	10	18	30	18	12	30	18	18	4	NR	12	30	10	18	4	
Celebrity Plus	12	4	10 ⁵	10	10 ⁵	NR	10 ⁵	10 ⁵	10 ⁵	10	10 ⁵	10 ⁵	4	1	10 ⁵	4					
Chateau	12	4	12	4	12	1	4	12	12	4	12	12	4	NR	1	12	12	12	12	2	
Cimarron Plus	B	10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	1	
Clarity	3	AH	AH	AH	AH	NR	AH	AH	AH	AH	AH	AH	13	14	NR	AH	AH	AH	AH	AH	
Classic ⁶	12	3	30	9	18	9	18	30	30	9	30	30	18	3	NR	9	30	9	18	3	
Cobra	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Command ⁵	16	12	16	9	12	9	9	9	9	16	NR	NR	9	NR	12	NR	9	NR	96	9	12
Curbit	NR	NR	AH	NR	NR	NR	NR	NR	NR	AH	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Dacthal	8	8	8	AH	NR	8	8	8	NR	8	8	8	8	8	12	NR	12	12	12	12	
Define	12	12	12	12	4	NR	12	12	18	12	4	18	12	12	NR	12	12	12	12	12	
Degree	SY	SY	SY	SY	SY	NR	NY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	AH	

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.

⁶Transplanted

⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

5-10 Weeds: Weed Control in Field Crops

Table 5.4 - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹ (cont.)

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Afalfa	Barley, winter	Bean, lima	Bean, snap	Cabbage	Corn, field	Corn, sweet	Cucumber	Muskmeloon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Sorghum, grain	Squash	Tomato	Watermelon	Wheat, winter	
Devrinol	12	12	12	12	NR	12	12	12	12	12	12	12	12	12	12	12	12	NR	12	12	12	
Distinct	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Dual Magnum	4	4.5	NR	NR	NY	NR	NR	12	12	12	NR	12	NR	12	4.5	NR	NR	12	6	12	4.5	
Eptam	0	AH	AH	NR	AH	AH	AH	AH	AH	AH	NR	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	
Equip	8	2	18	18	18	0.5	18	0.5	18	18	18	18	18	2	9	9	18	18	18	18	2	
Eradicane	AH	AH	AH	AH	NR	NR	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	
Evik	NY	AH	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	
Extreme	4	9.5	NR	40	8.5	18	40	40	40	40	40	40	40	26	40	4	NR	18	40	40	40	4
Finesse Grass & Broadleaf	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	4	
First Rate	9	30B	30B	30B	9	9	30B	30B	30B	30B	30B	30B	30B	30B	NR	9	30B	30B	30B	30B	3	
Flexstar	18	4	10	10	18	10	10	18	18	10	18	18	18	18	4	10	18	18	18	18	4	
Fusilade DX/Fusion	2	2	NR	NR	2	2	NR	NR	NR	NR	NR	NR	NR	NR	2	NR	2	NR	NR	NR	2	
Galigan	2	10	2	2	10	10	2	2	2	2	2	2	2	2	10	NR	10	2	2	2	10	
									(NR)													

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.
⁶Transplanted

⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

Table 5.4 - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹ (cont.)

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Affalfa	Alfalfa, lima	Cabbage	Bean, snap	Barley, winter	Bean, field	Corn, sweet	Corn, field	Cucumber	Muskmealon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Sorghum, grain	Squash	Tomato	Watermelon	Wheat, winter
glyphosate products	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Goal	2	10	2	2	10	10	2	2	2	2	2	2	2	10	NR	10	2	2	2	2	10	
Gramoxone products	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Harmony Extra SG	2	NR	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	NR
Harmony GT	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Harness	SY	SY	SY	SY	SY	NR	NY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY
Ignite 280	4	2.5	4	4	4	NR	4	4	4	4	4	4	4	4	4	4	2.5	NR	2.5	4	4	2.5
Impact	9	3	18	18	18	0	0	18	18	18	9	18	9	18	3	9	9	18	18	18	18	3
Intro	NY	NY	NI	NI	NI	NY	NY	NI	NI	NI	NI	NI	NI	NI	NY	NY	NI	NI	NI	NI	NY	
Karmex	24	24	24	24	NY	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	12
Kerb ⁶	0	12	5	5	7	5	7	7	7	7	12	12	12	7	12	5	5	7	7	7	7	12
Laudis	10	4	18	10	18	0	0	18	18	18	10	18	10	18	4	8	10	18	10	18	4	
Lightning	9.5	9.5	40B	9.5	40B	8.5 ⁷	18	40B	40B	9.5	40B	26	40B	4	9	18	40B	40B	40B	40B	4	

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.
⁶Transplanted
⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

5-12 Weeds: Weed Control in Field Crops

Table 5.4 - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹ (cont.)

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Aflafra	Barley, winter	Bean, lima	Bean, snap	Cabbage	Corn, field	Corn, sweet	Cucumber	Muskmeloon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Sorghum, grain	Squash	Tomato	Watermelon	Wheat, winter
Lorox	4	4	4	4	NR	4	4	4	4	4	4	4	NR	4	4	4	4	4	4	4	
Matrix	12	12	10	10	12	NR	10	12	12	12	12	12	NR	12	10	12	12	1	12	4	
Micro-Tech/Partner	AH	AH	NR	NY	NY	NR	NY	NY	NY	NY	NY	NY	AH	NR	NR	NY	NY	NY	NY	AH	
Milestone	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	12B	
Option	2	2	2	2	0.25	0.25	2	2	2	2	2	2	2	0.5	2	2	2	2	2	2	
Outlook/Frontier	NY	4	NY	NY	NY	NR	NY	NY	NY	NY	NY	NY	NY	4	NR	NY	NY	NY	NY	4	
Paramount	24B	10	24B	24B	10	10	24B	24B	24B	24B	24B	24B	10	24B	0	24B	24B	24B	24B	0	
Paraquat products	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Peak	22	0	22	10	22	1	10	22	22	10	22	22	0	10	1	22	22	22	22	0	
Permit	9	2	9	9	15	1	3	9	9	18	9	10	9	9	2	9	2	9	8	9	
Poast	NR	NR	NR	NR	NR	AH	NR	NR	NR	NR	NR	NR	NR	NR	NR	AH	NR	NR	NR	NR	
Poast Plus	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Prefar	4	4	4	4	NR	4	4	NR	NR	NR	4	NR	4	4	4	4	4	4	4	4	
Princep	SY	SY	SY	SY	SY	NR	NR	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	SY	
Prowl	NY	4	NR	NR	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	4	

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.

⁶Transplanted

⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

Table 5.4 - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹ (cont.)

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Afalfa	Barley, winter	Bean, lima	Bean, snap	Cabbage	Corn, field	Corn, sweet	Cucumber	Muskmeloon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Sorghum, grain	Squash	Tomato	Wheat, winter	Watermelon
Pursuit ⁶	4	9.5	NR	4	40B	8.5 ⁷	18	40B	40B	4	40B	26	40B	4	NR	18	40B	40B	40B	4	
Python	4	4	26B	26B	NR	18	26B	26B	4	26B	12	26B	4	NR	12	26B	26B	26B	4		
Raptor	9	4	9	9	9	9	9	9	9	9	9	9	4	9	9	9	9	9	9	3	
Reflex	18	4	10	10	18	10	18	18	18	10	18	18	4	10	18	18	18	18	18	4	
Resolve	18	9	18	10	18	NR	10	10	18	18	18	18	18	10	18	18	18	1	18	3	
Resource	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Ro-Neet	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	
Sandea	9	2	NR	NR	15	1	3	NR	NR	18	9	10	9	NR	2	9	2	NR	NR	2	
Scepter ⁶	18	11	11	18	9.5 ⁷	18	18	18	18	18	18	18	18	18	NR	11	18	18	18	3	
Select/Select Max	NR	1	1	1	1	1	1	1	NR	1	1	1	1	1	1	1	1	NR	1	1	
Sencor	4	4	12	12	4	12	12	12	18	8	12	4	12	12	NR	12	12	4	12	4	
Sinbar	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
Solicam	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Sonalan	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH		
Sonic/Authority First	12	12	30B	30B	30B	10	18	30B	30B	12	30B	18	30B	12	NR	12	30B	30B	4		

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.
⁶Transplanted
⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

5-14 Weeds: Weed Control in Field Crops

Table 5.4 - Crop Rotation Planting Restrictions – Months after Herbicide Application until Planting New Crop¹ (cont.)

Summary of crop rotation restrictions after certain herbicide applications have been made. Example: If Devrinol was applied to tomatoes this year, you must delay planting sweet corn in the field for 12 months after the application of Devrinol. Consult the label for a different time interval if two or more of these materials are applied in the same season. This table is not a substitute for the label!

Herbicide	Affalfa	Barley, winter	Bean, lima	Bean, snap	Cabbage	Corn, field	Corn, sweet	Cucumber	Muskmeloon	Onion	Pea	Pepper	Potato, white	Pumpkin	Rye, winter	Soybean	Sorghum, grain	Squash	Tomato	Watermelon	Wheat, winter
Spin-aid	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Spirit	18	3	18	10	10	17	8	18	18	10	18	10	18	3	10	10	18	10	18	3	3
Starane	4	NR	4	4	NR	NR	4	4	4	4	4	4	4	NR	4	NR	4	4	4	NR	
Status	1	1	4	4	4	0.25	0.25	4	4	4	4	4	4	1	1	1	1	4	4	4	1
Steadfast	12	4	10	10	18	NR	10	18	18	18	18	18	18	4	0.5	18	18	18	18	18	4
Stinger	10.5	NR	18	18	NR	NR	18	18	10.5	18	18	18	18	NR	10.5	10.5	18	18	18	NR	
Synchrony XP ⁶	12	3	9	9	18	9	18	30	30	9	30	30	18	3	NR	9	30	9	18	3	
Tillam	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	
Touchdown products	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Treflan	NR	NR	NR	NR	NR	5	5	NR	5	5	NR	NR	5	NR	5	5	NR	5	5	NR	5
Ultra Blazer	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	AH	18	AH	AH	AH	AH	AH	AH	AH	AH
Valor	12	4	12	12	2	4	12	12	12	12	12	12	12	4	NR	2	12	12	12	2	
2,4-D	3	3	3	3	3	NR	3	3	3	3	3	3	3	3	.25 ⁸	3	3	3	3	3	

¹AH = After Harvest, B = Bioassay of Soil Recommended before Planting, d = Days, NI = No Information, NR = No Restrictions, NY = Next Year, SY = Second Year following Application

²18 months with a soil pH ≥ 6.5

³20 days per pint

⁴30 days per pint

⁵Read the label for additional restrictions due to special state restrictions, varieties, rate, rainfall, soil, pH, application rate, etc.

⁶Transplanted

⁷Corn hybrids, which are classified as tolerant (IT) or resistant (IR) to Scepter and/or other imidazoline herbicides (example Pursuit), may be planted in the spring of the following year following Scepter or Pursuit application.

⁸See current 2,4-D label.

Table 5.5 - Rain-free Periods for Postemergence Herbicides

Herbicide	Hours	Herbicide	Hours
Accent	4	Impact	1
Aim	1	Liberty	4
Assure II	1	Liberty ATZ	4
Atrazine	1-2	Lightning	1
Axial XL	30 minutes	Marksman	6
Banvel/Clarity	4	Milestone	Not specified
Basagran	8	Northstar	4
Basis	4	Option	2
Basis Gold	4	Paramount	6
Beacon	4	PastureGard	Not specified
Buctril	1	Peak	4
Callisto	1	Permit	4
Celebrity Plus	4	Poast Plus/Poast	1
Cimarron Plus	4	Pursuit	1
Clarity	4	Raptor	1
Classic	1	Ready Master ATZ ¹	4-6
Cobra	30 minutes	Redeem	Not specified
Contour	1	Reflex	1
Crossbow	Not specified	Remedy	Not specified
2,4-D Amine	6-8	Require Q	4
2,4-D Ester	1-2	Resolve	Not specified
2,4-DB	6	Resolve Q	Not specified
Distinct	4	Resource	1
Equip	2	Roundup Weather Max	30 minutes
Exceed	4	Scepter	1
Expert	2	Scorpion III	6
Extreme	1	Select	1
Fieldmaster	2	Sequence	Not specified
Finesse	6	Steadfast	4
Firstrate	2	Stellar	1
Flexstar	1	Stinger	6-8
ForeFront	Not specified	Storm	8
Fusilade	1	Stout	4
Fusion	1	Surmount	Not specified
Gramoxone Inteon	30 minutes	Synchrony	1
Grazon P+D	Not specified	Touchdown	1-2
Harmony Extra SG	3	Typhoon	1
Harmony SG	Not specified	Ultra Blazer	6
Hoelon	4-6	Yukon	4
Hornet	4		

¹Heavy rainfall soon after application may reduce control.

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