

GENERAL INFORMATION

A1. PPI AND PRE HERBICIDES

Incorporation of herbicides

Good weed control with PPI and PRE herbicides depends on many factors, including rainfall after application, soil moisture, soil temperature, soil type and weed species. For these reasons, PRE herbicides applied to the soil surface sometimes fail to control weeds. Herbicides that are incorporated into the soil surface usually require less rainfall after application for effective weed control than unincorporated herbicides. Small weeds just emerging through a PRE herbicide may be controlled by a rotary hoe or harrow, which may also help activate the herbicide under dry conditions.

Many factors influence the activity and performance of soil-applied herbicides. Factors that should be considered are: rate too low for soil type, high weed pressure, weeds not listed on label, poor control in wheel tracks, cloddy soil, wet soil, amount of previous crop residue, dry weather, poor incorporation, improper setting of incorporation implement, herbicide resistant weeds, incorporation too shallow or deep, incorporation speed too slow, worn sweeps on cultivator, single pass instead of two pass incorporation, and second incorporation deeper than first. Consider these possibilities before poor weed control is attributed only to the herbicide.

Buckle, Eptam, Far-Go, Ro-Neet, Sonalan, and Treflan* require incorporation. Eptam, Far-Go, and Ro-Neet must be incorporated immediately (within minutes) after application. Treflan incorporation may be delayed up to 24 hours if applied to a cool, dry soil and if wind velocity is less than 10 mph. Sonalan incorporation may be delayed up to 48 hours. Prowl* is labeled only PPI in soybean, dry beans, and pulse crops and labeled PRE, not PPI, on corn. Dual*, Harness/Surpass*, IntRRo*, and Outlook* may be used PRE but shallow PPI improves weed control, particularly on fine textured soils. Incorporation of Dual*, Intro*, and Nortron* may be delayed several days. Incorporation of Eradicane and Eptam can be delayed up to 4 hours when applied with liquid fertilizer and the same day when impregnated on dry bulk fertilizer. Ro-Neet can be incorporated up to 4 hours after application and up to 8 hours when impregnated on dry fertilizer.

Perform a second tillage at right angles to the initial incorporation if a disk or field cultivator is used. The second incorporation will incorporate any herbicide remaining on the soil surface and provide more uniform distribution in the soil, thereby improving weed control and reducing crop injury.

A2. SOIL ORGANIC MATTER TEST

Soil-applied herbicides are adsorbed and inactivated by soil constituents in the following order: organic matter>clay>silt>sand. Adjust herbicide rates for soil type and organic matter content. - Most soil-applied herbicides require higher rates to be effective in high organic matter soils, but crop safety may be marginal on low organic matter soils. Linuron activity requires low organic matter. Far-Go, Treflan* and most POST herbicides are affected only slightly by organic matter levels. Organic matter levels should be determined on each field where organic-matter-sensitive herbicides are to be used. Organic matter levels change very slowly, and testing once every 5 years should be adequate.

*Or generic equivalent.

A3. POST APPLIED HERBICIDES

Weed control from POST herbicides is influenced by rate, weed species, weed size, and climatic conditions. Labeled rates will be effective under favorable conditions and when weeds are small and actively growing. Use the highest labeled rates under adverse conditions and for well established weeds.

Sunlight inactivates some herbicides by the ultraviolet (UV) spectrum of light. Treflan* and Eptam degradation is minimal when incorporated soon after application. "Dim" herbicides (Achieve, Select*, and Poast) are highly susceptible to UV light and will degrade rapidly if left in nonmetal spray tanks for an extended period of time or if applied during mid-day. To avoid UV breakdown, apply soon after mixing and add an effective oil adjuvant which speeds absorption.

Ideal temperatures for applying most POST herbicides are between 65 and 85 F. Speed of kill may be slow when temperatures remain below 60 F. Some herbicides may injure crops if applied above 85 F or below 40 F. Avoid applying volatile herbicides under conditions where vapors and particle drift may injure susceptible crops, shelterbelt trees, or farmsteads.

Temperatures following herbicide application influence crop safety and weed control. Crops metabolize herbicides but metabolism slows during cool or cold conditions, which extends the amount of time required for plants to degrade herbicides. Rapid degradation under warm conditions allow plants to escape herbicide injury. Herbicides may be sprayed following cold night-time temperatures if day-time temperatures warm to at least 60 degrees.

Some "Fop" ACCase herbicides (fenoxaprop) are more effective during cold/cool temperatures and are much less effective when grass weeds are drought stressed. Other ACCase herbicides, such as Assure II*, Poast, and Select* control grasses best in warm weather when grasses are actively growing. ALS grass herbicides in wheat generally provide more consistent and greater grass control in warm, dry conditions compared with cool, wet conditions. Cool or cold conditions at or following application of ACCase herbicides may increase injury to wheat. Wild oat is a cool season grass but green and yellow foxtail are warm season grasses and may stop growing under cold conditions, resulting in poor control. Weeds are controlled most effectively when plants are actively growing.

Cold temperatures and freezing conditions following application of ALS herbicides, Buctril*, and metribuzin may increase crop injury with little effect on weed control. Delay applying fenoxaprop, ALS herbicides, and metribuzin until daytime temperatures exceed 60F and after active plant growth resumes.

Basagran*, Cobra, Flexstar, Liberty, Ignite, paraquat*, Reflex, and Ultra Blazer are less likely to cause crop injury when cold temperatures follow application but less weed control may result.

2,4-D, MCPA, Banvel*, Starane*, Stinger*, and glyphosate (resistant crops) have adequate crop safety and provide similar weed control across a wide range of temperatures, but weed death is slowed when cold temperatures follow application.

Dew may increase absorption and weed control by hydrating leaf cuticle but may reduce weed control if spray run-off occurs. Rainfall shortly after POST herbicide application reduces weed control because herbicide is washed off the leaves before absorption is complete (See the rainfast interval chart on the next page).

*Or generic equivalent.

Minimum Interval Between Application and Rain for Maximum POST Weed Control.

Herbicide	Time Intrvl.	Herbicide	Time Intrvl.
Acuron	4 hr	MCPA ester	1 hr
Aim	4 hr	Metribuzin	6-8 hr
Alluvex	6-8 hr	Milestone	4 hr
Ally*/Escort*	4 hr	Olympus	4 hr
Armezon/Impact	1 hr	Orion	4 hr
Assure II / Targa	1 hr	Osprey	4 hr
atrazine*	4 hr	Panoflex	4 hr
Axial Star	1 hr	paraquat*	0.5 hr
Axial XL	0.5 hr	Permit	4 hr
Banvel* / Clarity*	6-8 hr	Perspective	6-8 hr
Basagran/bentazon*	4-8 hr	Plateau	1 hr
Betamix*	6 hr	Poast	1 hr
Beyond	1 hr	PowerFlex	4 hr
Bronate*/Buctril*	1 hr	Pulsar	4 hr
Cadet	4 hr	Pursuit	1 hr
Callisto	1 hr	Raptor	1 hr
Callisto GT	6-8 hr	Raze	1 hr
Capreno	1 hr	Realm Q	4 hr
Cimarron X-tra*	4 hr	Redeem	2 hr
ClearMax	1 hr	Reflex	1 hr
Cobra	0.5 hr	Reglone	0.5 hr
Curtail* / M*	6-8 hr	Remedy	6-8 hr
Defol 750	24 hr	Require Q	4 hr
DiFlexx	6-8 hr	Resolve*/Q	4 hr
diquat*	0.5 hr	Resource	1 hr
Discover NG	0.5 hr	Rimfire Max	4 hr
Engenia	6-8 hr	Roundup*(Full adjuvant)	6-12 hr
Enlist Duo	1 hr	Roundup* (Partial adj.)	6-12 hr
Everest 2.0 / Sierra	1 hr	Roundup* (No adjuvant)	6-12 hr
Express*	4 hr	Select* / Max	1 hr
Extreme	1 hr	Sharpen	1 hr
Facet	6 hr	Solstice	4 hr
Fenoxaprop	1 hr	Spartan Charge	6-8 hr
FirstRate	2 hr	Starane* / Flex	4 hr
Flexstar	1 hr	Starane NXT*	1 hr
Flexstar GT 3.5	6-12 hr	Status	4 hr
Foxfire	1 hr	Stinger*	6-8 hr
Fusilade DX	1 hr	SU herbicides	4 hr
GoldSky	4 hr	Supremacy	2 hr
Halex GT	1 hr	Tordon 22K	6-8 hr
Harmony*	4 hr	Ultra Blazer	4 hr
Hornet / Stanza	2 hr	UpBeet	6 hr
Huskie / Complete	1 hr	Varisto	4 hr
Instigate	4 hr	Varro	4 hr
Laudis	4 hr	Weedmaster*	6-8 hr
Laudis Flexx	6-8 hr	WideMatch*	6 hr
Liberty	4 hr	Wolverine	1 hr
Lumax EZ	4 hr	2,4-D amine	4-8 hr
Marvel	1 hr	2,4-D ester	1 hr
MCPA amine	4-6 hr		

*Or generic equivalent