

Weed Management and Control

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Weed Control in Canola

A uniform stand of a competitive canola variety is the best weed control tool. Canola is not very competitive early but becomes more competitive as it approaches the late-rosette and bolting stage. The competitive ability of many canola varieties may allow a grower to reduce costs by spraying only once or, in some cases, not at all. Photographs of various weeds can be found in the back of this field guide.

- Some weeds are more competitive with canola than others. Canada thistle and wild oat are very competitive early in the growing season. High densities may require a split herbicide application. Research has shown a 400 lb/a yield advantage when wild oat was removed early (three-leaf canola) by PPI and/or POST herbicides, compared with late applications (six-leaf canola).
- NDSU studies have shown that a rotation of wheat followed by canola will reduce Canada thistle densities significantly. Suppress Canada thistle

with pre- or postharvest glyphosate in the fall prior to seeding canola. Glyphosate (in Roundup Ready canola) and Stinger provide excellent Canada thistle control in canola. Consider a split application if Canada thistle densities are high (greater than one per foot²) or emerge before or about the same time as canola.

- Most postemergence herbicides used in canola can be tank-mixed with labeled pyrethroid insecticides. Be sure to consult the labels of all pesticides before mixing them.

Weed Control Options for Canola

The following information provides general details regarding herbicide cost (2011), rate, weeds controlled, when to apply, etc. This information does not supersede the herbicide label. Always read and follow instructions in the most current label. Herbicide costs listed below do not take into account program incentives that retailers or manufacturers offer. The herbicides listed were registered for use as of the 2011 growing season. Illegal herbicide use may result in condemnation of the crop and possible fines.

Sonalan (ethalfluralin)

\$/a: 7 to 12

Rate: 5.5 to 9.5 lb 10G; 1.5 to 2.5 pt (pints) HFP (0.55 to 0.95 lb ai [active ingredient])

Weeds: Controls foxtail, barnyardgrass, several annual broadleaf weeds

Apply: Preplant incorporated

Remarks: Select herbicide rate based on soil type. Sonalan may be applied in the fall or spring. More effective on kochia than Trifluralin. Higher than labeled rates may result in crop injury, especially in prolonged wet or cold soils.

Broadcast application rates:

Soil texture	Sonalan 10 G (lb/a)	Sonalan HFP (pt/a)
Coarse	5.5	1.5
Medium	7.5	2
Fine	9.5	2.5

Treflan (generic trifluralin)

\$/a: 3.25 to 9.50

Rate: 5 to 10 lb 10 G; 1 to 2 pt (0.5 to 1 lb ai)

Weeds: Controls foxtail, barnyardgrass, several annual broadleaf weeds

Apply: Preplant incorporated

Remarks: Select herbicide rate based on soil type. Trifluralin may be applied in the fall or spring. See label for incorporation instructions.

Broadcast application rates:

Soil texture	Trifluralin 10G (lb/a)	Trifluralin 4EC (pt/a)
Coarse	5	1
Medium	7.5	1.5
Fine	10	2

Stinger (generic clopyralid)

\$/a: 15 to 30

Rate: 0.25 to 0.5 pt (0.094 to 0.187 lb ai)

Weeds: Canada thistle, perennial sowthistle, dandelion, curly dock, wild buckwheat, cocklebur, marshelder, prickly lettuce, ragweed, false chamomile, nightshade species and biennial wormwood

Apply: Two- to six-leaf canola stage

Remarks: Stinger may be tank-mixed with other canola herbicides. For best control of Canada thistle, apply Stinger after the majority of basal leaves have emerged but prior to bud stage. Do not apply within 50 days of harvest.

Ignite (glufosinate) – Liberty Link canola

\$/a: 13.35 to 16.20

Rate: 22 fl oz (fluid ounces) (0.4 lb ai)

Weeds: Controls most annual broadleaf weeds, small annual grasses

Apply: Cotyledon up to early bolting

Remarks: Apply postemergence to Liberty Link canola varieties only. Apply with AMS (ammonium sulfate) fertilizer at 3 lb/a. Ignite is a nonresidual, contact herbicide. Must apply to small grasses because Ignite only will suppress large grasses. May tank-mix with a half rate of Assure II, Poast or Select to control annual grasses. The AMS rate may be reduced to 1.5 lb/a when tank-mixing Ignite with a grass herbicide. Ignite will not control perennial weeds. See label for optimum application timing to control broadleaves and grasses based on weed size.

Beyond (imazamox) – Clearfield canola

\$/a: 19

Rate: 4 fl oz (0.031 lb ai)

Weeds: Controls many annual broadleaf and grass weeds

Apply: Prior to bloom

Remarks: Apply postemergence on Clearfield varieties only. Apply Beyond with crop oil concentrate (1 to 2 gal [gallons]/100 gal) or nonionic surfactant (1 qt [quart]/100 gal) and nitrogen fertilizer (2.5 gal/100 gal). Beyond is weak on wild buckwheat and lambs-quarters. Beyond will not control ALS (acetolactate synthase)-resistant kochia. Beyond will work well in tandem with Treflan or Sonalan to control many annual weeds. Beyond will not control perennial weeds. See label for maximum weed sizes.

Glyphosate – Roundup Ready canola

\$/a: 3 (does not include technology fee)

Rate: 0.375 to 0.56 lb ae [acid equivalent] (total of 0.75 lb ae can be applied from emergence to six-leaf stage)

Weeds: Most broadleaf and grass weeds

Apply: Emergence to bolting

Remarks: Apply postemergence on Roundup Ready varieties only. Apply with AMS fertilizer. Controls most annual and perennial weeds. A sequential application may be more effective on wild buckwheat and Canada thistle. For sequential applications, apply glyphosate to one- to three-leaf canola followed by the second application at a minimum of 10 days but no later than the six-leaf stage. Allow an eight-week preharvest interval (PHI).

Assure II (quizalofop)

\$/a: 8.15 to 11.35

Rate: 7 to 10 fl oz (0.77 to 1.1 oz ai)

Weeds: Annual grasses and quackgrass

Apply: Allow a 60-day PHI

Remarks: Controls grasses only. Use higher rates for yellow foxtail and quackgrass. Apply with crop oil concentrate at 1 percent v/v (volume to volume). Label indicates that yellow foxtail control may not be adequate when Assure II is tank-mixed with a broadleaf herbicide. For best results, apply Assure II either 24 hours before or seven days after the broadleaf herbicide.

Rates required for different grass species are:

Barnyardgrass	2-6 inches	8-10 fl oz
Green foxtail	2-4 inches	7-8 fl oz
Yellow foxtail	2-4 inches	7-8 fl oz
Wild oat	2-6 inches	7-8 fl oz
Volunteer cereals	2-6 inches	7-8 fl oz
Quackgrass	6-10 inches	10-12 fl oz

Poast (sethoxydim)

\$/a: 10 to 15.50

Rate: 1 to 1.5 pt (0.2 to 0.3 lb ai)

Weeds: Annual grasses

Apply: Allow a 60-day PHI

Remarks: Poast rate may be lowered to 0.75 pt/a for foxtails and barnyardgrass if grasses are less than 4 inches. Apply with oil adjuvant at 1.25 to 2 pt/a. Add nitrogen to improve wild oat and volunteer cereal control (2.5 lb/a AMS or 4 pt/a UAN [urea-ammonium nitrate] solution). Poast is rain-fast one hour after application.

Rates required for different grass species are:

Barnyardgrass	8 inches (max. height)	1 pt
Green foxtail	8 inches	1 p
Yellow foxtail	8 inches	1 pt
Wild oat	4 inches	1 pt
Volunteer cereals	4 inches	1.5 pt

Select (generic clethodim)/

Select Max (clethodim plus adjuvants)

\$/a: 4 to 5/10 to 17.50

Rate: 4 to 5 fl oz (1 to 1.25 oz ai) / 9 to 16 fl oz (1.125 to 2 oz ai)

Weeds: Annual grasses

Apply: Prior to bolting. Allow a 70-day PHI

Remarks: Do not apply after crop has begun bolting because crop injury may occur. Apply with oil adjuvant at 1.25 to 2 pt/a.

Rates required for different grass species are:

Barnyardgrass	1 to 4 inches	4/6 fl oz
Green foxtail	1 to 4 inches	4/9 fl oz
Yellow foxtail	1 to 4 inches	4/9 fl oz
Wild oat	1 to 4 inches	5/9 fl oz
Volunteer cereals	1 to 4 inches	5/9 fl oz

Preharvest herbicides for canola.

Reglone (diquat)*	1.5 to 2 pt 2SL (0.37 to 0.5 lb)	Desiccant	POST. Allow a 7-day PHI. Harvest no later than 10 days after application.	Add NIS at 0.25 percent v/v. Nonresidual, contact herbicide requiring thorough coverage. Most active in hot and sunny conditions. Maximum of 1 application per season. Apply when 60 to 70 percent of canola seed turns green to brown stage.
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* Generic equivalent may have different label.

Relative Herbicide Effectiveness on Weeds and Persistence in Soil

A general rating for herbicide effectiveness on weeds and herbicide persistence in soil is provided in the table. Under favorable weather conditions, control may be better than indicated. Under unfavorable conditions, some herbicides rated as good may give erratic and unacceptable results. Also, dry and/or cool weather increases herbicide persistence while wet and/or warm weather reduces herbicide persistence.

Weed control ratings in this section are based on the following scale:

- E: Excellent = 90 to 99 percent control
- G: Good = 80 to 90 percent control
- F: Fair = 65 to 80 percent control
- P: Poor = 40 to 65 percent control
- N: None = No control.

Herbicide persistence ratings are for residues present 12 months after application:

- O = Often S = Seldom N = None.

Mode of Action	Barnyardgrass	Brome, Downy	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Cereals	Wild Oat	Buckwheat, Wild	Cocklebur, Common	Horseweed (Marestail)	Kochia	Lanceleaf Sage	Mallow, Common	Marshelder	Mustard, Wild	Mustard, W. Annual	Nightshade, E/Black	Nightshade, Hairy	Pigweed, Redroot	Pigweed/Waterhemp	Prickly Lettuce	Ragweed, Common	Smartweed, Annual	Sunflower	Thistle, Russian	Wormwood, Biennial	Thistle, Canada	Herb. Persistence			
Sonalan (PPI)	E	F-G	E1	E	N	P	P	P	P	N	P-F	E	-	N	N	P	P	P	E	G-E	P	N	P	N	N	N	S				
Treflan* (PPI)	E	F-G	E1	E	N	N	P-F	P	N	N	P	G-E	-	N	N	P	N	N	E	G-E	N	P	P	N	G	N	S				
Stinger	N	N	N	N	N	N	N	F-G	E	G-E	N	P-F	F	F-G	E	N	E	E	P	P	E	G-E	G-E	G-E	P-F	E	S				
Assure II/Targa	E	PE	E	F-G	E	E	G-E ¹	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
Poast	E	P-G	E	E	F	G-E	G-E ¹	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
Select ³	E	PE	E	E	E	E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
Select Max	E	PE	E	E	E	G-E	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
Herbicide-resistant Canola																															
Beyond	2	E	G-E	E	G-E	F	G-E	E ¹	P	G-E	P ¹	E ¹	F	E	P	G-E	E	E	E	E	PG ¹	E ¹	P	G-E	E	G-E	P	NP	S		
Ignite 280	10	E	-	E	G	P	F-G	G-E	E	F	F	F-G	E	G	E	G-E	G-E	G-E	E	E	F-G	G-E	G-E	E	E	G-E	E	P	N	N	
Roundup ¹																															
Glyphosate ²	9	E	G-E	E	E	E	G-E	P-G	E	G-E ¹	F-E ¹	P-E ¹	E	P-G	G-E	G-E	P-G	P-G	E	PG ¹	P-G	G-E ¹	P-E	G-E	G	F-E	G-E	N	N		

PPI = Preplant Incorporated.

¹Or generic equivalent.

²Herbicides will not control resistant biotypes or provide minimal control in tank-mix/premixes with alternative modes of action.

³Weed control from Roundup[®] is dependent on rate, size of weeds, environmental conditions and number of applications.

Rotation restrictions for planting canola.

Herbicide	Months after application	Herbicide	Months after application
Accent* (<0.68 oz DF/a)	18	Milestone	24b
Ally*	34cd	Nortron	12
Ally Extra* (0.2 oz)	22e	Olympus	22k
Amber	B	Paramount	10
Assert	12/15f	Permit/Sandea	15
Atrazine* (0.38 lb ai)	NCS	Plateau	48b
Atrazine* (0.38-0.5 lb ai)	2CS	PowerFlex	9
Atrazine* (0.5-1 lb ai)	2CS	PrePare	9
Authority Assist	40b	Prequel	18
Authority First/Sonic	24	Prowl EC/H2O	NCS
Authority MTZ	24	Pulsar	9
Axial TBC	9	Pursuit	40b
Balance Flexx	18j	Pursuit Plus	40b
Banvel* (<1.5 pt)	4h	Python	26b
Beyond	18	Raptor/Beyond	18
Boundary	12	Raze	9
Callisto	NCS	Reflex	18
Callisto Xtra	NCS	Require Q	10j
Camix	18	Resolve*(<1.1 oz DF/a)	10j
ClearMax	18	Resolve Q	10j
Curtail*/M*	5	Rimfire Max	10
Everest 2.0	9	Sencor*	12u
Extreme	40b	Sharpen (1 fl oz)	4v
Far-Go	NCS	Sharpen (2 fl oz)	5v
Fierce	18	Sharpen (3 fl oz)	6v
FirstRate	30b	Sonalan	0
Flexstar/GT	18	Spartan	24
Gangster	B	Spartan Advance	24
Glean*	B	Spartan Charge	24
Goldsky	9	Starane Flex	9
Halex GT	10	Status	4h
Harness*	NCS	Steadfast (<0.76 oz/a)	18
Hornet	26b	Stinger*	0
Huskie	9	SureStart/TripleFlex	26b
Ignite 280	0	Surpass*	NCS
Impact	9	Tordon (1.5 oz)	2CS
Laudis	10	Treflan*	0
Lightning	40b	Valor/Chateau	-
Lumax (<3 pt/a)	18	WideMatch*	4
Matrix*	18	Wolverine	9
Maverick	B		

continued

* Or generic equivalent.

NCS = Next cropping season after herbicide application.

2CS = Second cropping season after herbicide application.

b = Bioassay. Do not plant until field bioassay indicates it is safe.

c = Do not use on soil with pH greater than 7.9.

d = Requires soil pH of 7.9 or less and a 34-month minimum rotation interval and 28 inches of cumulative precipitation.

e = Requires soil pH of 7.9 or less, 22 months and 22 inches of precipitation west of North Dakota Highway 1 or 34 months and 34 inches of precipitation east of Highway 1. These restrictions also apply to Ally Extra* at rates greater than 0.2 oz dry fowable (DF)/a.

f = Clearfield (imidazolinone resistant) canola varieties may be planted the season after application. Conventional canola varieties may be planted the following season after application at 1 pt/a in North Dakota counties of Cavalier, Pembina, Ramsey, Rolette, Towner and Walsh and Minnesota counties of Kittson, Marshall, Pennington, Red Lake and Roseau.

h = Any rotational crop may be planted 120 days following application of Banvel* at 1.5 pt/a or less, excluding days when ground is frozen. For all crops and rates greater than 1.5 pt/a, allow 45 days per 1 pt/a of Banvel* using excluding days when ground is frozen.

j = Requires 15 inches of cumulative precipitation during the growing season following application. An 18-month restriction applies to Accent*, Resolve*, Prequel and Steadfast applied above rates indicated or if drought follows application. Refer to label for crop rotation restrictions if rates greater than those indicated are used.

k = Requires 24 inches of accumulated precipitation.

u = Must add two months if soil is frozen.

v = Do not include time when soil is frozen. For Verdict: All crops can be planted the spring following application.

Minimum interval between application and rain for maximum postemergence weed control in canola.

Herbicide	Time Interval
Assure II	1 hour
Beyond	1 hour
Glyphosate (Full adj.)	6-12 hours
Glyphosate (Part. adj.)	6-12 hours
Glyphosate (No adj.)	6-12 hours
Ignite	4 hours
Poast	1 hours
Select/SelectMax	1 hour
Stinger	6-8 hours

Adj. is abbreviation for adjuvant.

Controlling Volunteer Canola in Succeeding Crops

Canola can volunteer for several years following a canola crop. These volunteers will compete with the succeeding crop and may affect yield, depending on the volunteer density. Take steps during harvest operations to minimize canola seed losses. Following the canola harvest, seeds that remain on or near the soil surface may germinate in the fall and be killed by frost. Avoid deep tillage that will deposit canola seeds several inches deep into the soil, where they are less likely to germinate and secondary dormancy is more likely to be induced. If practical, allow time in the spring for canola volunteers to germinate before a tillage operation and then till and seed the new crop as soon as possible.

For no-till small grains, consider adding a labeled herbicide to the glyphosate burn-down application

to control emerged glyphosate-resistant canola volunteers. Canola volunteers that emerge before or with the crop may be very large by the time the postemergence herbicide application is made. Canola volunteers become much more difficult to control with herbicides once they reach the six-leaf to bolting stage. Some herbicides provide excellent control of small volunteers but provide poor control of bolting canola. Canola volunteers will be controlled best when herbicide is applied by the five-leaf stage.

The following tables provide a general rating for herbicide effectiveness on volunteer canola. All postemergence herbicides were applied with recommended adjuvants. Volunteer canola control will improve where densities are lower and canola is smaller.

Volunteer canola control ratings in this section are based on the following scale:

- E: Excellent = 90 to 99 percent control
- G: Good = 80 to 90 percent control
- F: Fair = 65 to 80 percent control
- P: Poor = 40 to 65 percent control
- VP: Very poor = Less than 40 percent control
- N: None = No control.

Herbicide costs are approximate retail prices for small quantities (2011). The prices do not include adjuvants or application costs. Prices will vary, depending on location, wholesaler, bulk discounts, seasonal changes and company incentive programs. Prices are averages based on a statewide dealer survey for small quantities. Producers should consult local agricultural suppliers for exact prices in their area.

Volunteer canola control

Herbicide	Rate	Pre-Cost	3-leaf emergence	6-leaf canola	Bolting canola	Flowering canola	canola	Control rating	
								product/a	\$/a
IN CORN									
Accent	0.5 oz	16.90	—	E	E	—	—	—	—
Atrazine	0.75 pt	1.80	G	G	P	—	—	—	—
Balance Flexx	3 fl oz	13.50	E	—	—	—	—	—	—
Callisto	3 fl oz	15.00	E	E	G-E	—	—	—	—
Laudis	3 fl oz	15.00	—	E	G-E	—	—	—	—
Option	1.5 oz	15.00	—	E	E	—	—	—	—
Starane	0.5 pt	5.30	—	VP	VP	—	—	—	—
Status	4 oz	11.00	—	G	F	—	—	—	—
Steadfast	0.75 oz	20.00	—	E	E	—	—	—	—
2,4-D Amine	0.5 pt	1.00	—	G	P	—	—	—	—
IN SOYBEAN									
Basagran	0.5 pt	6.25	—	G-E	F	—	—	—	—
Cobra	6 fl oz	8.00	—	G-E	VP	—	—	—	—
Extreme	1.5 pt	9.40	E	E	G-E	P	P	P	P
FirstRate	0.3 oz	10.00	E	E	F-E	P-F	P-F	F	F
Flexstar	0.75 pt	11.50	E	E	E	E	E	E	E
Harmony	0.083 oz	1.50	—	P-F	P	—	—	—	—

Pursuit	2 fl oz.	12.00	G-E	E	G-E	P	P
Python	1 oz	12.00	F-G	—	—	—	—
Raptor	4 fl oz	19.50	—	E	E	G	F
Sencor	0.25 lb	4.00	E	G-E	F	—	—
Spartan	4 fl oz	17.00	P-F	—	—	—	—
Ultra Blazer	0.75 pt	6.75	—	F-G	P	—	—
Valor	2.5 oz	12.00	G-E	—	—	—	—

IN DRY PEA

Basagran	0.5 pt	6.25	—	G-E	F	—	—
Pursuit	2 fl oz	12.00	G-E	E	G-E	P	P
Raptor	4 fl oz	19.50	—	E	E	G	F
Metribuzin	0.25 lb	4.00	E	G-E	F	—	—
Spartan	4 fl oz	17.00	P-F	—	—	—	—

IN SUNFLOWER

Assert	0.8 pt	7.50	—	E	G	—	—
Spartan	4 fl oz	17.00	P-F	—	—	—	—

IN FLAX

Bronate Adv	0.8 pt	6.20	—	E	F-G	—	—
MCPA ester	0.5 pt	1.50	P	G-E	P	—	—
Spartan	4 fl oz	17.00	P-F	—	—	—	—

continued

Volunteer canola control

Herbicide	Rate	Pre-Cost	3-leaf emergence	6-leaf canola	Bolting canola	Flowering canola	canola	Control rating	
								product/a	\$/a
IN WHEAT									
Aim	0.5 oz	3.50	—	VP	N	N	N		
Bronate Adv	0.8 pt	6.20	—	E	F-G	—	—		
Curtail	0.5 pt	3.25	—	G-E	F-G	—	—		
2,4-D ester	0.5 pt	1.25	—	G	P	—	—		
Dicamba	2 fl oz	1.00	—	P	N	N	N		
Express	0.167 oz	2.90	—	E	G-E	—	—		
Harmony	0.3 oz	2.40	—	E	G-E	—	—		
Huskie	11 fl oz	7.75	—	E	G-E	—	—		
MCPA ester	0.5 pt	1.50	P	G-E	P	—	—		
Sharpen	1 fl oz	4.70	E	E	E	F	G		
Starane	0.5 pt	3.75	—	VP	VP	—	—		
WideMatch	0.25 pt	3.00	—	P	P	N	N		
Wolverine	1.7 pt	20.00	—	E	G-E	—	—		