

Wild Oat Control In Small Grains - 2006

Beverly R. Durgan
Weed Scientist - University of Minnesota

Good wild oat control with any herbicide requires proper timing of applications. Postemergence wild oat herbicides require application to wild oats and crops at precise leaf stages. Leaf number on wild oats is determined by counting the leaves on the main stem and disregarding the tillers. The youngest leaf is counted as a full leaf only when another leaf becomes visible. Lower leaves, which may have died from various stresses, such as frost or wind damage, should also be counted in the total leaf number. An accurate leaf count is important for optimum wild oat control.

There are a number of tradeoffs for the advantages any one wild oat herbicide might offer. Early wild oat control can result in better yields because the weed has less time to compete with the crop. However, when an herbicide treatment is applied early, odds are greater that a late flush of wild oats will require a second herbicide application, or that some wild oats might escape treatment. Uncontrolled wild oats can reduce yields, and will produce seed that contribute to next year's wild oat problem. In general, under heavy wild oat pressure (over 15 plants/square foot) research has shown that an herbicide treatment should be applied as soon as possible to prevent high yield losses.

Below is a summary of the wild oat herbicides currently labeled in Minnesota.

Preemergence Wild Oat Control:

Far-Go (triallate):

Far-Go available as a 10% ai granule and is labeled for preplant or preemergence incorporated application in the spring and fall for wild oat control in spring wheat, durum and barley. Apply Far-Go at 12.5 to 15 lbs. of product/A to spring wheat, durum and barley in the fall. Far-Go can be applied in the spring at 10 to 12.5 lbs. of product/A for spring and durum wheat and 12.5 to 15 lbs. of product/A for barley. Far-Go may be applied preplant incorporated or preemergence incorporated in the spring. Fall applications generally give more consistent wild oat control in Minnesota. Far-Go is volatile and must be incorporated after application, except when applying the granule formulation in the fall. The granule formation will give greatest wild oat control in the fall.

Far-Go may be applied in combination with trifluralin (Treflan) at 0.5 to 0.75 lb/A for wild oat and foxtail control in spring wheat, durum, and barley in the spring after seeding. A combination of Far-Go and trifluralin is available as a package mix called Buckle. Buckle can be applied in the fall to land that will be planted to spring wheat, barley or durum at 12.5 to 15 lbs. of product/A. Buckle can be applied in the spring at 10 to 12.5 lbs. of product/A for spring and durum wheat and 12.5 to 15 lbs. of product/A for barley.

Far-Go has a different mode of action than the postemergence wild oat herbicides labeled in Minnesota. Therefore, the use of Far-Go should be considered as part of an herbicide resistance weed management program.

Postemergence Wild Oat Control:

Achieve (tralkoxydim):

Achieve is labeled for control of wild oats and other annual grass weeds in barley. **Due to crop injury potential, Achieve is NO LONGER labeled for use in spring wheat and durum in Minnesota.**

Apply Achieve to barley in the 2 to 6-leaf stage. Apply Achieve to 1 to 6-leaf wild oat. Achieve is available as Achieve SC (3.33 lbs ai/gal). Achieve use rate is 0.18 to 0.25 lbs ai/A. Use rate of product is 6.9 to 9.2 oz/A. Use the high rate when soil is dry and weeds are large. Apply Achieve in at least 10 gpa by ground or 5 gpa by

air. Always add Supercharge adjuvant to the spray solution at 4 pts/100 gals of water (0.5% v/v). Ammonium sulfate at 15 lbs/100 gals of water can also be added. Numerous broadleaf herbicides can be tank-mixed with Achieve. Achieve can be tank-mixed with MCPA ester, Bronate Advanced, Buctil, Curtail M, and Stinger. Achieve can be tank mixed with 2, 4-D ester when ammonium surfactant is added. DO NOT tank mix with amine formulations of labeled herbicides. DO NOT tank mix with sulfonylurea herbicides. Achieve can cause barley injury under cool, wet conditions. DO NOT apply Achieve to barley that has heavy dew.

Assert (imazethabenz):

Assert is labeled for wild oat control in spring wheat, durum, and barley. Assert will also control of plants in the mustard family, including wild mustard. Spring wheat, durum and barley have good tolerance to Assert.

The use rate of Assert is 1.0 to 1.2 pts/A. For best control, apply Assert when wild oats are in the 1 to 4-leaf stage. Good wild oat control has been obtained when the 1.0 pt/A rates have been applied to 1 to 3-leaf wild oats; however, for larger wild oats, the 1.2 pt/A rate should be used. **Assert must always be applied with a non-ionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution.** For control under adverse conditions, such as dry conditions or heavy wild oat pressure, Assert should be applied with a **crop oil concentrate at 2 pt/A in addition to the surfactant.** Do Not apply crop oil concentrate with 2,4-D ester because of the potential for crop injury. Assert will also available as a 67% SG formulation. The use rate for the Assert SG is 7.5 to 11.2 oz/A. The 7.5 oz/A rates are equivalent to the 1 pt/A rate of the liquid and 9 oz/A is equivalent to the 1.2 pt/A of the liquid formulation. One container of Assert SG contains enough material for 24 acres at the 1 pt/A rate of the liquid formulation, or 20 acres at the 1.2 pt/A.

Adjuvant selection is very important when using Assert SG. Failure to use the proper adjuvant can result in unacceptable wild oat control (less than 50%). Assert SG should **ALWAYS** be applied with a good quality non-ionic surfactant with at least 80% active ingredient at a rate of 2 pints per 100 gallons of spray solution. For control under adverse conditions, such as dry conditions or heavy wild oat pressure, Assert should be applied with a **crop oil concentrate at 2 pt/A in addition to the surfactant.** Assert and Assert SG can be tank mixed with 2,4-D ester, MCPA ester, Bronate Advanced, Harmony Extra (tribenuron + thifensulfuron) and Harmony GT. Do not tank mix with Banvel (dicamba), MCPA amine, or 2,4-D amine as reduced wild oat control will result.

Assert and Assert SG have soil activity, and may persist for more than one year in the soil; therefore, do not plant any crop other than barley, wheat, corn, sunflowers, soybeans or edible beans for at least 15 months after an Assert application. Do not plant sugarbeets for at least 20 months following an Assert application. Do Not plant oats, canola, or alfalfa for 15 months after an Assert application.

Axial (pinoxaden):

Axial is labeled for control of wild oats, green and yellow foxtails, millets, and barnyardgrass in spring wheat, durum, and barley. Apply Axial to spring wheat and barley from the 2-leaf stage up to the pre-boot stage. Apply Axial to 1 – 5 lf foxtail at a rate of 8.2 oz/A plus Adigor adjuvant at a rate of 9.6 oz/A. Adigor adjuvant is sold with Axial and one box will treat 40 acres. Apply Axial in 5-10 gpa by ground or 5 gpa by air. Axial can be tank mixed with most labeled broadleaf herbicides. Do not tank mix with dicamba containing herbicides such as Clarity. Tank mixing Axial with Curtail or Starane may decrease yellow foxtail control. Check label for rates and other restrictions. Do Not apply Axial to corn, tame oats, or rye. University of Minnesota research has shown that spring wheat, durum and barley tolerance to Axial is excellent. Research has also shown that grass weed control with Axial is excellent.

DO NOT graze livestock or feed forage or hay from treated areas for a minimum of 50 days following an Axial application. **DO NOT** apply Axial within 60 days of harvest.

Discover (clodinafop):

Discover is labeled for postemergence control of wild oat and other annual grass weed control in spring wheat and durum. Discover is **NOT** labeled for use in barley and winter wheat. Apply Discover from the 2 leaf-stage until the emergence of the 4th tiller of spring wheat and durum. Apply when wild oats are in the 1 to 6-leaf stage.

Discover is sold in two different formulations – Discover and Discover NG. The Discover NG formulation has an adjuvant in the formulation. **Do Not** add an additional adjuvant. Use rate of Discover NG is 12.8 to 16 oz/A. Discover is also sold in a case that contains the herbicide and DSV adjuvant packaged in separate containers and treats 40 to 50 acres depending on the use rate. Discover must always be applied with the DSV adjuvant. **DO NOT** add any additional adjuvants. Apply Discover at 3.2 fl oz/A plus DSV adjuvant at 10.2 fl oz/A (treats 50 acres) for wild oat control.

Discover/Discover NG can be tank-mixed with most broadleaf herbicides. However, always follow the label of the tank-mix broadleaf herbicide. For wild oat control, Discover can be tank-mixed with most broadleaf herbicides including: Starane, Starane+Sword, Bronate Advanced, Buctril, Curtail, Curtail M, Harmony Extra, Harmony GT, Harmony GT + MCPA, 2,4-D amine, MCPA amine and ester, Stinger, Banvel, and Clarity. Apply Discover in a minimum spray volume of 5 gpa by ground and 3 gpa by air. Check label for additional broadleaf herbicide tank-mix options.

Wheat injury can occur when air temperatures are below 40 F during the period 48 hours before and after a Discover/Discover NG application. Do not graze livestock or feed forage or hay from treated areas for a minimum of 30 days following a Discover application. Do not apply Discover/Discover NG within 60 days of harvest.

University of Minnesota research has shown that spring wheat and durum tolerance to Discover/Discover NG is good to excellent. Discover/Discover NG has provided good to excellent wild oat control in research plots.

Everest (flucarbazone):

Everest is labeled for wild oat and foxtail suppression in spring wheat and durum. Everest is **NOT** labeled for use in barley. Apply Everest 70 WDG from the 1- 4 leaf plus 2 tiller stage of wheat, but prior to jointing. Apply to 1- 6 leaf foxtails and wild oats. The use rate for Everest WDG is 0.41 oz/A (0.018a.i. oz/A) for green foxtail and 0.67 oz/A (0.027 a.i. oz/A) for yellow foxtail and wild oats. Everest can be tank mixed with 2,4-D, Ally, Buctril, Bronate Advanced, MCPA, Curtail, Curtail M, Harmony Extra, Express, and Starane. Spring wheat and durum tolerance is fair to good. For optimum wild oat control and crop safety, Everest must be tank-mixed with a surfactant and a broadleaf herbicide listed on the label. Apply a non-ionic surfactant at 1 qt/100 gallon or 0.25% v/v. See label for rates and tank-mixing instructions. Do NOT tank-mix Everest with any broadleaf herbicide not list on the label.

Everest has soil activity and recropping restrictions. Sugarbeets, barley, canola, and potatoes should not be planted until 9 months after application. Field peas can be planted 11 months after application. See label for additional recropping restrictions.

University of Minnesota research has shown that Everest will provide good wild oat control. Everest can cause wheat injury under adverse weather conditions.

Puma (fenoxaprop + safener):

Puma is labeled for control of wild oats and other annual grasses in spring wheat, durum, and barley. Crop tolerance to Puma is good to excellent, with spring wheat having greater tolerance than durum or barley.

Apply Puma to wheat from emergence to 6-leaf stage. Apply Puma to barley from emergence to the 4-leaf stage. For greatest crop safety – do not apply to wheat after jointing. Puma will control susceptible grass weeds in the 2-leaf to 2-tiller stage. Puma use rate is 0.67 pt/A for wild oat control. Apply Puma in at least 10 gpa by

ground and 5 gpa by air. Puma can be tank-mixed with numerous broadleaf herbicides, but it is important to follow label restrictions to avoid a reduction in grass control.

For control of wild oat, Puma at 0.67 pt/A can be tank mixed with Buctril, Bronate Advanced, Curtail M, Stinger, Starane, MCPA ester, Harmony Extra, Harmony GT, Peak, and Tordon. DO NOT apply Puma to corn, tame oats, or rye. Do NOT apply Puma within 60 days of wheat harvest or 57 days of barley harvest.

Research at the University of Minnesota has shown that Puma will good to excellent control of wild oats with good crop safety.

Rimfire (mesosulfuron methyl + propoxycarbazone-sodium + mefenpyr):

Rimfire is labeled for and control of wild oat (including ACC'ase resistant wild oat) suppression of foxtails, barnyardgrass in spring wheat and durum wheat. Rimfire will also control some broadleaf weeds such as, mustards, chickweed, redroot pigweed and volunteer canola. **Do Not** apply to barley. Apply Rimfire from emergence up to flag leaf emergence of wheat. Rimfire controls susceptible grasses from the 1-leaf to the 2-tiller stage. Rimfire can be applied at 1.75 to 2.25 oz/A. Apply in 10 gpa by ground and 5 gpa by air. Always apply with an adjuvant. Apply with a MSO at 1.5 pts/A, or NIS at 0.25 – 0.5 % v/v + UAN (1-2 qt/A) or Basic Blend at 1% v/v. Several broadleaf herbicides can be mixed with Silverado but it is always important to follow label restrictions. **Do Not** apply Rimfire within 71 days of grain harvest. See label for recropping restrictions.

Herbicide Resistant Wild Oat

Wild oats have developed resistance to several wild oat herbicides used in Minnesota. Herbicide resistance develops through the selections of naturally occurring weed biotypes that have an inherent ability to tolerate the herbicide. The term “biotype” refers to plants within a species that have a slightly different genetic makeup from the general population.

Selection for change in weed populations begins when a small number of plants (a biotype) within a weed species have a genetic makeup that enables them to survive a particular herbicide application. Where this difference in genetic makeup originated is not clear. However, herbicides are not known to directly cause the genetic change (i.e. mutation) that allows resistance. The resistant biotype, therefore, is present in low numbers in natural populations and when an herbicide is applied, most of the susceptible weeds die but the few resistant weeds survive, mature, and produce seed. If the same herbicide continues to be applied and, the resistant weeds reproduce, the percentage of the weed population that is resistant will increase.

It is difficult to predict exactly which weed species will have biotypes resistant to a given herbicide. However, we have learned from previous pesticide resistance problems that the occurrence of herbicide resistant weeds is linked directly to the herbicide program used, the weed species present, and the crop management practices employed.

Regardless of how weed resistance develops, it is important to know the herbicide mode of action to plan weed control programs that prevent the development and spread of resistant weeds. Table 1 list the commonly used wild oat herbicide, their herbicide families and mode of action.

Strategies for preventing and managing herbicide resistant weeds:

- Scout fields to identify weed species present
- Use herbicides only when necessary.
- Practice herbicide rotation using herbicides with different modes of actions and herbicides from different families.
- Control weed escapes and sanitize equipment to prevent the spread of resistant weeds.
- Integrate mechanical, cultural, and chemical weed control methods.