

WEED CONTROL IN SMALL GRAINS

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General

SG1. Effective weed control in field crops can usually be accomplished with a combination of cultural, mechanical, and chemical practices. In row crops, tillage can be an integral part of weed control. However, in close-sown small grain crops, tillage is not feasible, except that early germinating weeds may be destroyed by tillage during seedbed preparation. Therefore, more dependence on cultural and chemical weed control practices is needed.

Cultural Practices

SG2. Sowing clean seed at an adequate seeding rate will help to reduce weed populations in small grains. Also, small grains must be seeded early so the cool season small grain crop can compete effectively with weeds. Early spring seeding reduces warm season annual grass weed problems, such as foxtail (pigeongrass), that are increased by late seeding. However, early spring seeding does not help to reduce wild oats or most annual or perennial broadleaf weed problems.

Perennial Weed Control

SG3. Most herbicides available for use in small grains will control many annual weeds at safe usage rates for small grain, but will not adequately control established perennials. Perennial weeds, such as quackgrass should be controlled prior to (preferably the year before) seeding small grains. Glyphosate (Roundup, Touchdown, others*) may be used to control most perennials prior to seeding small grain. See the glyphosate label for more details. See perennial weed control section for additional information.

SPRING WHEAT, DURUM, BARLEY AND OATS

Herbicides – Preplant or Pre-emergence

- SG4.** **Far-Go (triallate)** applied at 1 to 1.25 lb ai/A to spring wheat and durum and at 1.25 to 1.5 lb ai/A to barley in the fall or spring will control wild oats. Far-Go may be applied preplant incorporated or preemergence incorporated in the spring. Far-Go is volatile and must be incorporated after application, except when applying the granule formulation in the fall. Far-Go at 1 lb/A may be applied in combination with trifluralin (Treflan*) at 0.5 to 0.75 lb ai/A for wild oat and foxtail control in spring wheat, durum, and barley in the spring after seeding (PEI).
- SG5.** **trifluralin (Treflan*)** at 0.5 to 0.75 lb ai/A may be applied in the fall preplant incorporated or preemergence incorporated in the spring for foxtail control in spring wheat, durum and barley. Trifluralin can also be applied preplant incorporated in the spring to barley only. **Do Not** use on oats. Trifluralin in the spring should be applied preemergence and shallowly incorporated twice at right angles with a harrow. The small grain should be seeded 2 to 2.5 inches deep to permit incorporation above the seed.

Herbicides - Postemergence

- SG6.** Combinations of certain postemergence herbicides may give greater weed control than an individual herbicide used alone. For example, a tank mix of bromoxynil (Buctril*) and MCPA gives greater wild mustard control than with either of these herbicides alone. However, loss of weed control or increased crop injury may also result from the use of certain herbicide combinations.
- SG7.** When planning your weed control program, consider herbicide effectiveness, crop tolerance and herbicide cost. Accurately identify the weed problem and then select the most effective herbicide.
- SG8.** **Achieve (tralkoxydim)** is labeled for control of green and yellow foxtail, wild oats, and annual ryegrass in durum wheat and barley. Achieve is not labeled for use in spring wheat or oats. Apply Achieve at 6.9 fl oz/A to durum or barley from emergence to the flag leaf stage and 1 to 6-leaf wild oat and/or 1 to 5-leaf foxtails (total leaves including tillers). Apply at 10 to 15 gpa by ground or 3 to 5 gpa by air. Always add Supercharge adjuvant to the spray solution at 4 pints/100 gals of water (0.5% v/v). Ammonium sulfate at 7 to 15 lbs/100 gals of water should also be added when water carrier contains more than 400 ppm bicarbonate ions. Numerous broadleaf herbicides are labeled for tank mixes with Achieve including; 2,4-D ester (do not use amine formulations), Bronate Advanced*, Buctril*, Curtail M, MCPA ester (do not use amine formulations), Starane (including Starane package mixes), and Stinger*. Tank mixes with Harmony SG* are also listed on the label for control of wild oat and broadleaf weeds, however these tank mixes may result in reduced wild oat control and will not control foxtail species. Applications to tillered small grains within 48 hours of freezing temperatures or to non-tillered small grains within 48 hours of temperatures less than 40°, may result in crop injury.
- SG9.** **Affinity BroadSpec (tribenuron (25%) + thifensulfuron (25%))** controls many annual broadleaf weeds and will suppress Canada thistle. Affinity BroadSpec is labeled for use in spring wheat, durum, and barley at 0.4 to 1 oz/A (0.0125 to 0.032 lb ai/A). When applying 0.4 to 0.6 oz/A, Affinity BroadSpec must be used in a tank mix combination with another registered herbicide. Affinity BroadSpec is also labeled for use in oats at 0.4 oz/A and must be used in a tank mix combination with another registered herbicide. Do not apply on the

* or generic equivalent.

oat varieties Ogle, Porter, or Premier. Apply Affinity BroadSpec after spring wheat, durum, or barley is in the 2-leaf stage but before the flag leaf is visible. Apply to oats after the 3-leaf stage but before jointing. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted in the tank mix section on the label, Affinity BroadSpec should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v (0.5 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v (1 to 2 gal/100 gal). In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. Affinity BroadSpec may be tank mixed with one or more herbicides including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Cleanwave, Widematch*, Axial, Everest, Rimfire, and Assert. Make sure tank mix partners are labeled for the respective small grain crop. Do not tank mix with Achieve herbicide. Affinity BroadSpec can be applied with labeled fungicides, insecticides (do not mix with Malathion), or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Affinity BroadSpec may also be used for preplant/preemergence burndown applications.

- SG10. Affinity Tankmix (tribenuron (10%) + thifensulfuron (40%))** must be applied in combination with other suitable registered products. Affinity Tankmix is labeled for use in spring wheat, durum, and barley at 0.6 to 1 oz/A (0.019 to 0.032 lb ai/A). Affinity Tankmix is also labeled for use in oats at 0.6 to 0.75 oz/A (0.019 to 0.023 lb ai/A). Do not apply on the oat varieties Ogle, Porter, or Premier. Apply Affinity Tankmix after spring wheat, durum, or barley is in the 2-leaf stage but before the flag leaf is visible. Apply to oats after the 3-leaf stage but before jointing. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Affinity Tankmix should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity Tankmix is applied to young actively growing weeds that are less than 4 inches tall or across. Affinity Tankmix should be tank mixed with one or more herbicides including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Cleanwave, Widematch*, Aim, Curtail, Curtail M, Stinger*, Assert, Axial, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Do not tank mix with Achieve herbicide. Affinity Tankmix can be applied with labeled fungicides, insecticides (do not mix with Malathion and do not apply within 60 days of crop emergence when an organophosphate insecticide has been applied in-furrow), or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Affinity Tankmix may also be used for preplant/preemergence burndown applications.
- SG11. Aim (carfentrazone-ethyl)** is labeled for broadleaf weed control in spring wheat, durum, barley, and oats. Apply Aim up until the jointing stage of the crop. Aim must be applied to small weeds, 2 to 4 inches tall, for best control. Aim will give control of eastern black nightshade, kochia, lambsquarters, pigweed, and wild buckwheat. Apply a minimum of 10 gpa by ground or a minimum of 3 gpa by air. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v (2 pt/100 gal). In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v (2 to 4 gal/100 gal) or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. Aim can be mixed with other labeled herbicides for increased weed control. Refer to the other product label for specific instructions and restrictions. Crop tolerance is fair to good. Aim may also be used for preplant/preemergence burndown applications.
- SG12. Assert (imazamethabenz)** is labeled for wild oats and wild mustard control in spring wheat, durum and barley. **Do not apply to oats.** Assert provides good control of wild oats and wild mustard. Assert will provide partial control of wild buckwheat. Assert will also provide excellent control of other mustards; including field pennycress and flixweed. Crop tolerance to Assert is excellent. Apply Assert at 1.0 to 1.5 pt/A after the crop is in the 2-leaf stage, but before jointing. Apply to wild oats in the 1 to 4-leaf stage, and before the mustards are blooming. The 1.0 pt/A rate can be used when wild oats are in the 1 to 2-leaf stage; however, the higher rate should be used on larger wild oats or when populations are in excess of 25 plants/sq ft. Apply a minimum of 10 gpa by ground or a minimum of 5 gpa by air. For wild oats populations in excess of 25 plants/sq ft or under cool conditions, use a minimum spray volume of 15 gpa by ground. Do not apply when freezing temperatures have occurred within two days prior or are forecast within two days. Always apply Assert with a nonionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution. Assert may be tank mixed with the following herbicides for additional broadleaf weed control; 2,4-D (ester formulations only), Bronate Advanced*, Curtail M, Express, Harmony SG*, Harmony Extra, MCPA (ester formulations only), Starane, Starane + Salvo, or Starane + Sword. Do not tank mix with 2,4-D ester unless crop is fully tillered. Do not Tank mix with Banvel* or any product containing dicamba.
- SG13: Axial, Axial XL (pinoxaden)** is labeled for control of green and yellow foxtails, millets, wild oats, and barnyardgrass in spring wheat and barley. Do not use on durum wheat or oats. Apply Axial/Axial XL to spring wheat and barley from the 2-leaf stage up to the pre-boot stage. Axial/Axial XL will control susceptible grass weeds in the 1 to 6-leaf stage. Axial use rate is 8.2 fl oz/A plus Adigor adjuvant at a rate

* or generic equivalent.

of 9.6 fl oz/A. Adigor adjuvant is sold with Axial and one box will treat 40 acres. The Axial XL formulation has an adjuvant in the formulation. **Do not** add additional Adigor adjuvant to Axial XL. Use rate for Axial XL is 16.4 oz/A. Apply Axial/Axial XL in 5-10 gpa by ground or 5 gpa by air. Axial and Axial XL are labeled for two- and three-way tank mix combinations with several broadleaf herbicides including; Affinity Tankmix, Bronate Advanced*, Buctril*, Curtail M, Express, Harmony Extra, Harmony SG*, MCPA Ester, Starane, Starane + Sword, and Widematch*. Refer to the label (including supplemental labels) for all two- and three-way tank mix recommendations, rates, and restrictions. Do not apply both Discover and Axial products to the same crop in the same season. Axial/Axial XL may also be tank mixed with Tilt and Quilt fungicides, Warrior insecticide (not for barley), and spray solutions with up to 50% liquid nitrogen solution.

- SG14. Banvel*/Clarity* (dicamba)** controls many broadleaf weeds, including wild buckwheat and smartweed in spring wheat, durum, barley and oats. However, dicamba is weak on wild mustard. Oats are more tolerant to dicamba than wheat or barley. Barley has only marginal tolerance to dicamba, therefore dicamba should not be applied to barley unless some injury is acceptable. Apply to barley at 0.06 to 0.09 lb ai/A in the 2 to 4-leaf stage. Dicamba should be applied to wheat and oats at 0.06 to 0.125 lb ai/A when these crops are in the 2 to 5-leaf stage. Dicamba can be applied alone, but is usually applied in tank mixes with 2,4-D, Buctril*, or MCPA. Other labeled tank mix combinations include Bronate Advanced*, Curtail, Express, Harmony Extra and Stinger*. Refer to the specific product label for details on tank mix recommendations, rates, and restrictions. Dicamba may be applied preplant or at planting for burndown applications.
- SG15. Buctril* (bromoxynil)** can be applied at 1 to 2 pts/A (0.25 to 0.5 lb ai/A) to all varieties of spring wheat, durum, barley, and oats from the emergence of the crop until boot stage. Bromoxynil controls many annual broadleaf weeds, including wild buckwheat and smartweeds. However, bromoxynil is weak on wild mustard and pigweed. Bromoxynil should be applied before the four-leaf stage of the weeds. Bromoxynil should be applied through flat fan nozzles, in a minimum of 10 gallons per acre and no less than 30 pounds pressure. Good coverage is essential for good weed control. Labeled tank mixes include; 2,4-D, Banvel*/Clarity*, Curtail, Curtail M ,Express, Harmony Extra, and MCPA,.
- SG16. Bronate Advanced* (bromoxynil + MCPA ester)** can be applied from the 3-leaf to boot stage to all varieties of spring wheat, durum, barley and oats. Bronate Advanced* controls many broadleaf weeds, including wild buckwheat, kochia, wild mustard, redroot pigweed, and common lambsquarters. Bronate Advanced* should be applied before the four-leaf stage of broadleaf weeds. Bronate Advanced* should be applied through flat fan nozzles, in a minimum of 10 GPA and no less than 30 PSI. Good coverage is essential for good weed control. Bronate Advanced* can be tank mixed with several broadleaf or grass herbicides including; 2,4-D, Banvel*/Clarity**, Curtail, Curtail M ,Express, Harmony SG*, Harmony Extra, MCPA, Starane, Achieve, Assert, Discover NG, Everest, and Puma.
- SG17. Curtail (clopyralid + 2,4-D amine)** is a package mix for weed control in spring wheat and barley. Research has shown that Curtail provides excellent shoot suppression of Canada thistle. However, repeated applications over several years are needed for complete Canada thistle control. Curtail will control most annual broadleaf weeds, including wild buckwheat. Curtail is weak on kochia and smartweed. Curtail will not control grass weeds. Curtail can be applied from tillering to before boot stage of the small grain. The recommended rate of Curtail is 2.0 pt/A. Rates up to 2.67 pts/A are labeled if condition of the weeds prevent optimal control (less sensitive species, perennials, stressed conditions, dense stands, larger weeds), however the higher rate may increase risk of crop injury. A reduced rate of 1.5 pt/A has supplemental labeling for use in Minnesota for control of annual broadleaf weeds only, as listed under 'Broadleaf Weeds Controlled' on the label. For best control, apply before annual weeds exceed three inches and apply to Canada thistle after the basal leaves have emerged, but before the bud stage. Apply in a minimum 10 gpa for ground and a minimum 2 gpa for aerial applications. Curtail can be tank mixed labeled rates of other products registered for wheat and barley provided that timing and method of application do not conflict and tank mixing is not prohibited on the tank mix partner label. Tank mixes with Buctril* or Banvel*/Clarity* may increase the annual weed control spectrum but may reduce control of perennials. Do not tank mix with 2,4-D or Banvel*/Clarity* unless the risk of crop injury is acceptable. **Note recropping restrictions.**
- SG18. Curtail M (clopyralid + MCPA ester)** is a package mix for weed control in spring wheat, durum, barley and oats. Research has shown that Curtail M provides excellent shoot suppression of Canada thistle. However, repeated applications over several years are needed for complete Canada thistle control. Curtail M will not control grass weeds. Curtail M can be applied from the 3 leaf stage to before boot stage of the small grain. The recommended rate of Curtail M is 1.75 to 2.33 pt/A. Use the higher rate if condition of the weeds prevent optimal control (less sensitive species, perennials, stressed conditions, dense stands, larger weeds), however the higher rate may increase risk of crop injury. For best control, apply before annual weeds exceed three inches and apply to Canada thistle after the basal leaves have emerged, but before the bud stage. Apply in a minimum 10 gpa for ground and a minimum 2 gpa for aerial applications. Curtail M can be tank mixed labeled rates of other products registered for wheat, barley, and oats provided that timing and method of application do not conflict and tank mixing is not prohibited on the tank mix partner label. Tank mixes with Banvel*/Clarity* may increase the annual weed control spectrum but may reduce control of perennials. Do not tank mix with 2,4-D or Banvel*/Clarity* unless the risk of crop injury is acceptable. **Note recropping restrictions.**
- SG19. Discover NG (clodinafop)** can be applied to all hard red spring and durum wheat varieties. **Do not** apply to barley or oats. Apply when wheat is in the 2 leaf stage but before the boot stage. Use rate of Discover NG is 12.8 to 16 fl oz/A. Discover NG at 12.8 oz/A will control wild oat, volunteer (tame) oat, and canarygrass

* or generic equivalent.

when applied between the 1 and 6 true leaf stage, and barnyardgrass, green and yellow foxtail, and volunteer corn when applied between the 1 and 5 true leaf stage (before tillering begins for optimum control). Discover NG at 16 fl oz/A controls giant foxtail and annual ryegrass when applied between the 1 and 5 true leaf stage (before emergence of the 3rd tiller for optimum control). Apply Discover NG in a minimum spray volume of 5 gpa by ground (minimum of 10 gpa under dry conditions) and 3 gpa by air (minimum of 5 gpa under dry conditions). A methylated seed oil (MSO) may be used at 0.25% v/v (2 pts/100 gallons spray volume) to enhance weed control under low moisture or high temperatures or if spray volume exceeds 10 gpa. Discover NG may be tank mixed with several broadleaf herbicides or broadleaf herbicide combinations including; 2,4-D (amine only), Affinity Tankmix + MCPA ester, Affinity Tankmix + Starane, Banvel*/Clarity* (including three-way mix with MCPA ester), Bronate Advanced*, Buctril* (including three-way mix with MCPA ester), Curtail (including three-way mix Harmony SG), Curtail M, Double Up B+D, Express, Harmony Extra (including three-way mixes with Bronate Advanced*, Buctril*, or MCPA), Harmony SG* (including three-way mix with Bronate Advanced*, Buctril* or MCPA), MCPA (amine or ester), Starane (including three-way mixes with Bronate Advanced*, Curtail, Curtail M, Harmony Extra, or Harmony SG), Starane + Sword (including three-way mix Harmony SG), Stinger, Widematch (including three-way mixes with Harmony SG* or MCPA ester). Refer to the Discover NG label for a list of grasses controlled by each tank mix, required additives, and recommended product rates. Discover NG may also be tank mixed with Tilt and Quilt fungicides, Warrior insecticide, and spray solutions with up to 50% liquid nitrogen solution. Wheat is more susceptible to injury when exposed to temperatures below 40 F during the period 48 hours before and after Discover NG application.

- SG20. Everest (flucarbazone)** can be applied to spring wheat and durum wheat. **Do Not** apply to barley or oats. Everest is labeled for postemergence control of wild oats, foxtails, mustards, and pigweed. Apply Everest from the 1 to 4-leaf plus 2 tiller stage of wheat, but prior to jointing. Apply to 1 to 6-leaf foxtails and wild oats. Apply at a rate of 0.3 oz/A (0.013 lb ai/A) for green foxtail control, 0.4 oz/A (0.018 lb ai/A) for low to moderate infestations of wild oats, and 0.6 oz/A (0.026 lb ai/A) for yellow foxtail suppression and control of high infestations of wild oats or when tank mixed with dicamba. Refer to the label for other grass and broadleaf weeds controlled at each rate level. Apply in 5 to 10 gpa for ground applications and a minimum of 3 gpa (minimum 5 gpa under dry conditions or heavy weed infestations) for aerial applications. Adjuvants may be used with Everest. When applied alone or with amine or water soluble herbicides, use 0.25% v/v (1 qt/100 gallons) nonionic surfactant OR for improved control use a basic blend at 0.5% v/v (2 qts/100 gallons) OR methylated seed oil (MSO) at 1.5 pt/A plus ammonium sulfate (AMS) at 1.5 lb/A. Do not add adjuvants when tank mixing with ester or EC based herbicides. When tank mixing with sulfonylurea herbicides (plus 2,4-D amine or dicamba) add 0.125% v/v (1 pt/100 gallons) nonionic surfactant. Everest can be tank mixed with 2,4-D, Aim, Banvel*/Clarity*, Bronate Advanced*, Buctril*, Curtail, Curtail M, Double-Up B+D, MCPA, Starane, Stinger*, and Widematch. Everest can also be tank mixed with sulfonylurea herbicides including; Affinity BroadSpec, Affinity Tankmix, Express, Harmony Extra, and Harmony SG. Always apply 2, 4-D or Banvel*/Clarity* when tank mixing with sulfonylurea herbicides for increased crop safety. Tank mixes with Banvel*/Clarity* may result in decreased wild oat control. Do not apply tank mixes with MCPA within 72 hours of frost. Refer to the label for tank mix rates and further recommendations. Everest may be applied at 0.4 oz/A in preplant or preemergence applications on spring wheat only for control of wild oats and green foxtail. Do not apply preplant or preemergence if in-furrow applications of organophosphate insecticides have been made. Refer to the label for more information.
- SG21. Express (tribenuron)** is labeled for broadleaf weed control in spring wheat, durum and barley. Crop tolerance is fair to good. **Do not apply to oats.** Express will control of many annual broadleaf weeds, however it is weak on pigweed, smartweed and wild buckwheat. Research has shown that Express provides excellent shoot suppression of Canada thistle, however repeated applications over several years are needed for complete Canada thistle control. Apply Express at 0.25 to 0.5 oz/A (0.008 to 0.016 lb ai/A) after the crop is in the 2 leaf stage but before the flag leaf is visible. Use the lower rate for light weed infestations. For best Canada thistle control use the 0.5 oz/A rate. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Express should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v (0.5 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v (1 to 2 gal/100 gal). In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Express can be tank mixed with 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Aim, Curtail, Curtail M, Stinger*, Assert, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Express can be applied with labeled fungicides, insecticides (do not mix with Malathion and refer to label for potential for injury with organophosphate insecticides), or liquid nitrogen fertilizer solution as a spray carrier. May be used in preplant or post harvest burndown applications.
- SG22. Harmony SG* (thifensulfuron)** is labeled for broadleaf weed control in spring wheat, durum, barley, and oats. Apply Harmony SG* to wheat and barley at 0.45 to 0.9 oz/A (0.014-0.028 lb ai/A) after the crop is in the 2-leaf stage but before the flag leaf is visible in spring. Apply Harmony SG* to spring oats at 0.45 to 0.6 oz/A (0.014-0.0187 lb ai/A) after the crop is in the 3 leaf stage but prior to jointing. Do not apply on the oat varieties Ogle, Porter, or Premier. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground

* or generic equivalent.

or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Harmony SG* should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Harmony SG* is applied to young actively growing weeds that are less than 4 inches tall or across. Harmony SG* can be tank mixed with other herbicides in wheat and barley including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Aim, Curtail, Curtail M, Express, Stinger*, Achieve, Assert, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Harmony SG* can be applied with labeled fungicides, insecticides (do not mix with Malathion and refer to label for potential for injury with organophosphate insecticides, or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Harmony SG* may also be use for preplant/preemergence burndown applications.

- SG23. Harmony Extra (tribenuron (17%) + thifensulfuron (33%))** provides excellent control of many annual broadleaf weeds and suppression of Canada thistle. Harmony Extra is labeled for use in spring wheat, durum, barley and oats. Apply Harmony Extra to wheat and barley at 0.45 to 0.9 oz/A (0.014-0.028 lb ai/A) after the crop is in the 2-leaf stage but before the flag leaf is visible in spring. Research has shown the 0.75 oz/A rate is the maximum rate needed for annual broadleaf control in Minnesota. Apply Harmony Extra to spring oats at 0.45 to 0.6 oz/A (0.014-0.0187 lb ai/A) after the crop is in the 3 leaf stage but prior to jointing. **Do Not** apply to Ogle, Porter or Premier oat varieties. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Harmony Extra should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v (0.5 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Harmony Extra is applied to young actively growing weeds that are less than 4 inches tall or across. Harmony Extra can be tank mixed with other herbicides in wheat and barley including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Aim, Curtail, Curtail M, Express, Stinger*, Assert, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Harmony Extra can be applied with labeled fungicides, insecticides (do not mix with Malathion and refer to label for potential for injury with organophosphate insecticides), or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Harmony Extra may also be use for preplant/preemergence burndown applications.
- SG24. Huskie (pyrasulfotole + bromoxynil)** is labeled for use in spring wheat, durum, and barley. Apply 11 to 15 fl oz/A (0.18 to 0.24 lb ai/A) after the first true leaf has fully expanded up to flag leaf emergence. Apply in a minimum 5 gpa for both ground and aerial applications. Spray additives are recommended with Huskie, especially under adverse conditions. Ammonium sulfate fertilizer (AMS) at 0.5 to 1 lb/A is the preferred additive. Urea ammonium nitrogen (28-32% UAN) at 1 to 2 qt/A may also be used. Huskie may be tank mixed with other herbicides including; Achieve, Assert, Axial, Discover NG, Puma, Rimfire, Silverado, 2,4-D, Affinity BroadSpec, Affinity Tankmix, Aim, Bronate Advanced*, Banvel*/Clarity*, Buctril*, Curtail, Curtail M, Express, Harmony Extra, Harmony SG*, MCPA, Starane, Starane NXT, Stinger, and Widematch. If the tank mix partner requires the use of a non-ionic surfactant, use the recommended rate on the tank mix partner label. Huskie may also be tank mixed with fungicides and insecticides when timing of application is similar.
- SG25. MCPA (amine or ester)** will control many broadleaf weeds in spring wheat, durum, barley and oats. MCPA is weak on wild buckwheat and smartweeds. Small grains generally have a better tolerance to MCPA than to 2,4-D. Apply from the 3- to 4-leaf to early boot stage of the crop.
- SG26. Orion (florasulam + MCPA ester)** is labeled for broadleaf weed control in spring wheat, durum, barley and oats. Controls common lambsquarters, mustards, pigweed, ragweed, smartweed, and wild buckwheat. Apply from the 3-leaf stage to the jointing stage. Apply in a minimum 8 gpa by ground and a minimum 3 gpa by air. Orion may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Extreme growing conditions such as drought or near freezing temperatures prior to, at, or following time of application may reduce weed control and increase risk of crop injury. Take precautions to avoid drift to sensitive crops, refer to the label.
- SG27. Prowl H2O (pendimethalin)** is labeled for use as a layby application in spring wheat. Prowl H2O must be applied to wheat from the 1 leaf stage until before the flag leaf is visible and prior to weed emergence. Emerged weeds will not be controlled. Apply 1.5 pts/A on coarse textured soils, 1.5 to 2.5 on medium textured soils, and 2.0 to 3.0 pts//A on fine textured soils. For control of established weeds, Prowl H2O can be tank mixed with any postemergence herbicide registered for spring wheat unless prohibited on the tank mix partner label. If crop fails, do not replant wheat.
- SG28. Puma (fenoxaprop + safener)** is labeled for control of green and yellow foxtails, millets, wild oats, and barnyardgrass in spring wheat, durum, and barley. Do not apply to oats. Apply Puma to wheat from

* or generic equivalent.

emergence up to 60 days prior to harvest. Apply to barley from emergence up to the 4 leaf stage. Do not apply to barley in the 5 leaf stage or after jointing begins. Do not apply Puma within 57 days of barley harvest. Puma will control susceptible grass weeds in the 1-leaf to 2-tiller stage. Puma use rate is 0.33 to 0.67 pt/A. Apply at 0.33 pt/A to control green foxtail, foxtail millets, and volunteer corn; apply 0.4 pt/A to control yellow foxtail and proso millet; Apply 0.67 pt/A to control wild oat and barnyardgrass. Apply Puma in 5-10 gpa by ground or 5 gpa by air. Numerous broadleaf herbicides or herbicide combinations can be tank mixed with Puma including; Banvel*/Clarity* (including three-way mix with MCPA ester), Bronate Advanced* (including three-way mixes with Starane), Buctril* (including three-way mix with MCPA ester), Curtail M (including three-way mix with Clarity* or Starane), Express (including three-way mix with MCPA ester), Harmony Extra (including three-way mixes with MCPA ester or Starane), Harmony SG* (including three-way mix with MCPA ester or Starane), MCPA ester, Starane (including three-way mix with MCPA ester), and Stinger (including three-way mix with MCPA ester). Do not apply tank mixes with Banvel*/Clarity* to barley. Do not apply tank mixes with Bronate Advanced* or Buctril* to 2-row barley. Refer to the Puma label for specific rates and grass species controlled by each tank mix prior to use.

- SG29. Rage D-Tech (carfentrazone-ethyl + 2,4-D)** is labeled for broadleaf weed control in spring wheat, durum, barley and oats. Apply 8 to 16 fl oz/A (0.25 to 0.5 lb ai/A) along with a non-ionic surfactant (NIS) at 0.25% v/v from the 3 tiller stage until jointing. A sprayable liquid nitrogen fertilizer at 2 to 4% v/v or ammonium sulfate at 2 to 4 lbs/A may be used in addition to the NIS. Rage D-Tech may be tank mixed with other registered herbicides. Tank mixes with products containing bromoxynil are not recommended. Use of adjuvants other than NIS is not recommended. Temporary crop response such as speckling or necrosis may occur. Tank mixes with products formulated as EC or Ester may increase this response.
- SG30. Rimfire (mesosulfuron methyl + propoxycarbazone-sodium + mefenpyr (safener))** is labeled for wild oat (including ACC'ase resistant wild oat) and 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 or oats. Apply Rimfire from crop emergence up to flag leaf emergence. 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 methylated seed oil (MSO) at 1.3 to 1.5 pts/A, OR a nonionic surfactant (NIS) at 0.5% v/v (2 qts/100 gallons spray solution) plus an ammonium nitrogen fertilizer (28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A) OR a basic blend adjuvant at 1 to 1.25% v/v. Several broadleaf herbicides can be mixed with Rimfire including; Affinity Tankmix, Affinity BroadSpec, Bronate Advanced*, Buctril*, Express, Harmony Extra, Harmony SG*, Huskie, MCPA ester, Silverado, Starane, Starane NXT, Sitnger, and Widematch. Rimfire may also be tank mixed with several fungicides and insecticides (do not tank mix with malathion, mancozeb, phosphorodithioate, or methyl parathion as unacceptable crop injury may occur). Refer to both the Rimfire and tank mix partner labels for recommended adjuvants, rates, and restrictions when tank mixing.
- SG31. Silverado (mesosulfuron methyl + safener)** is labeled for control of wild oat (including ACC'ase resistant wild oat) and suppression of foxtails in spring wheat and durum wheat. Silverado will also control wild mustard. **Do not** apply to barley or oats. Apply Silverado to crop from emergence up to the jointing stage. Silverado controls susceptible grasses from the 1-leaf to the 2-tiller stage. Silverado can be applied at 1.75 to 2.25 oz/A. Apply in 10 to 20 gpa by ground and a minimum 5 gpa by air. Always apply with a methylated seed oil (MSO) or a basic blend adjuvant. MSO rate should be 1.5 pts/A (addition of 28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A may improve weed control but leaf burn may occur). A basic blend adjuvant should contain a nonionic surfactant, MSO, and a nitrogen source and should be added at a rate of 1% v/v or 0.8 to 1.6 pt/A depending on spray volume. Several broadleaf herbicides can be mixed with Silverado including; Bronate Advanced*, Buctril*, Curtail M, Express, Harmony Extra, Harmony SG*, MCPA ester, Starane, and Sitnger. Silverado may also be tank mixed with several fungicides and insecticides (do not tank mix with malathion, mancozeb, or methyl parathion as unacceptable crop injury may occur). Refer to both the Silverado and tank mix partner labels for recommended adjuvants, rates, and restrictions when tank mixing.
- SG32. Starane, Starane Ultra (fluroxypyr)** can be applied to all varieties of spring wheat, durum, barley, and oats from the 2-leaf stage up to and including the flag leaf stage. Starane contains 1.5 lb a.e./gallon. Starane Ultra is a new formulation containing 2.8 lb a.e./gallon and will replace Starane. Starane/Starane Ultra gives good control of kochia, cocklebur, common ragweed, sunflower and venice mallow. Apply Starane Ultra at 0.3 pt/A (0.5 pt/A for Starane) to susceptible broadleaf species less than 4 inches tall, apply Starane Ultra at 0.4 pt/A (0.66 pt/A for Starane) to susceptible broadleaf species less than 8 inches tall or vining. Apply 0.7 pt/A (1.33 pt/A for Starane) to control volunteer potatoes. Apply in a minimum 8 gpa by ground and a minimum 3 gpa by air. Starane/Starane Ultra may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Fluroxypyr is also available in several premixes with 2, 4-D (Starane + Salvo; Starane + Saber) and MCPA (Starane + Sword).
- SG33. Starane NXT, Starane NXTcp (fluroxypyr + bromoxynil)** can be applied to spring wheat, durum, barley and oats. Apply from the 3 leaf stage up to flag leaf emergence. Starane NXT is a premix with a use rate of 14 to 27.4 oz/A. Starane NXTcp is a co-pack product with separate containers of Starane (fluroxypyr) and NXTcp (bromoxynil). Starane NXTcp rate is 20 to 40 acres per case. Refer to the respective labels for rates based on weed species and weed stage of growth. Apply in 10 to 20 gpa by ground and a minimum 5 gpa by air. Starane NXT and Starane NXTcp may be tank mixed with other registered herbicides provided the

* or generic equivalent.

tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Starane NXT tank mixes listed on supplemental labels include Affinity BroadSpec, Affinity Tankmix, Harmony SG*, Axial, and Discover NG. The foliar fungicide propiconazole and the insecticides chlorpyrifos, dimethoate, gamma cyhalothrin, and malathion are compatible for tank mixes with Starane NXT and Starane NXTcp.

- SG34. Stinger* (clopyralid)** can be applied to all varieties of spring wheat, durum, barley and oats. Research has shown that clopyralid provides excellent shoot suppression of Canada thistle. However, repeated applications over several years is needed for complete Canada thistle control. Clopyralid will also give good control of wild buckwheat, sunflower, cocklebur and ragweeds; however, clopyralid is weak on most other annual broadleaf weeds. Therefore, clopyralid should be tank mixed with other broadleaf herbicides for broad spectrum weed control. Apply to spring wheat, durum, barley or oats from the 3-leaf stage to the early boot stage. The higher rate should be used for dense infestations or under poor growing conditions. For best control of perennial weeds such as Canada thistle, apply after the basal leaves have emerged, but before the bud stage. Apply in a minimum 10 gpa by ground and a minimum 2 gpa by air. Stinger* may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product.
- SG35. 2,4-D* (amine and ester)** will control many broadleaf weeds in spring wheat, durum, barley and oats. **Oat tolerance to 2,4-D is marginal and should only be applied if crop injury is acceptable.** 2,4-D is weak on wild buckwheat and smartweeds. Apply 2,4-D after the small grain has tillered and before the boot stage. Small grains may be sprayed with 2,4-D at 0.5 to 1 lb ae/A when the grains are in the dough stage to control large weeds that may interfere with harvest.
- SG36. WideMatch* (clopyralid + fluroxypyr)** will control many broadleaf weeds in spring wheat, durum, barley and oats. Apply from the 3 leaf stage up to and including flag leaf emergence. Apply WideMatch* at 1.0 pt/A to susceptible broadleaf species less than 4 inches tall. Apply WideMatch* at 1.33 pt/A to susceptible broadleaf species less than 8 inches tall or vining and to dicamba tolerant kochia types. To obtain season-long control of perennial weeds such as Canada thistle, apply when the majority of the basal leaves have emerged from the soil up to the bud stage. WideMatch* will provide only fair control of mustard species, smartweeds, and common lambsquarters. Apply in a minimum 10 gpa by ground and a minimum 3 gpa by air. WideMatch* may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. WideMatch* tank mixes listed on supplemental labels include Affinity BroadSpec, Affinity Tankmix, and Harmony SG*.
- SG37. WideMatch M (fluroxypyr + clopyralid + MCPA ester)** will control many annual and perennial broadleaf weeds in spring wheat, durum, barley and oats. Apply from the 3 leaf stage up to and including flag leaf emergence. WideMatch M is a co-pack of 1.4 gallons of WideMatch S (fluroxypyr) and WideMatch CM (clopyralid + MCPA ester). The entire contents will treat 22 acres. Apply in a minimum 10 gpa by ground and a minimum 3 gpa by air. WideMatch M may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. For improved control of dicamba-tolerant kochia, additional fluroxypyr may be added at a rate of 2 pts Starane Ultra (3.75 pts Starane) per 22 acres.

Preharvest

- SG38. Glyphosate (Roundup*)** can be applied preharvest to spring wheat and feed barley. Apply at 1 lb/A ai (26 fl oz) to spring wheat and 1.24 lb/A ai (32 fl oz) to feed barley. This application will provide control/suppression of many perennial weeds. Applications should be made after the hard dough stage and at least 7 days prior to harvest. **Do Not** apply to wheat or barley grown for seed as a reduction in germination or vigor may occur. **Touchdown** can be applied preharvest to spring wheat only. Apply at 1 qt/A (0.75 lb ae/A) at least 7 days prior to harvest.

WINTER WHEAT AND RYE

Cultural Practices

- SG39.** Winter annuals and/or perennials are usually the major weed problems in fall sown cereal grains. Perennial weeds should be controlled by tillage or herbicides before or during seedbed preparation. Seeding of winter wheat should be completed by September 20 and rye should be seeded by October 1 so the crops are well established before winter and able to compete well with weeds.

Winter Wheat

- SG40.** Many of the same herbicides used in spring sown small grains can also be used in winter wheat. However, the timing of these herbicides may be different.
- SG41. Achieve (tralkoxydim)** is labeled for control of green and yellow foxtail, wild oats, and annual ryegrass. Apply Achieve at 6.9 fl oz/A to winter wheat up to the flag leaf stage and 1 to 6-leaf wild oat and/or 1 to 5-leaf foxtails (total leaves including tillers). Apply at 10 to 15 gpa by ground or 3 to 5 gpa by air. Always add

* or generic equivalent.

Supercharge adjuvant to the spray solution at 4 pints/100 gals of water (0.5% v/v). Ammonium sulfate at 7 to 15 lbs/100 gals of water should also be added when water carrier contains more than 400 ppm bicarbonate ions. Numerous broadleaf herbicides are labeled for tank mixes with Achieve including; 2,4-D ester (do not use amine formulations), Bronate Advanced*, Buctril*, Curtail M, MCPA ester (do not use amine formulations), Starane (including Starane package mixes), and Stinger*. Tank mixes with Harmony are also listed on the label for control of wild oat and broadleaf weeds, however these tank mixes may result in reduced wild oat control and will not control foxtail species. Applications to tillered winter wheat within 48 hours of freezing temperatures or to non-tillered winter wheat within 48 hours of temperatures less than 40°, may result in crop injury.

- SG42. Affinity BroadSpec (tribenuron (25%) + thifensulfuron (25%))** controls many annual broadleaf weeds and will suppress Canada thistle. Apply Affinity BroadSpec at 0.4 to 1 oz/A (0.0125 to 0.032 lb ai/A) after the crop is in the 2-leaf stage but before the flag leaf is visible. When applying 0.4 to 0.6 oz/A, Affinity BroadSpec must be used in a tank mix combination with another registered herbicide. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted in the tank mix section on the label, Affinity BroadSpec should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v (0.5 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v (1 to 2 gal/100 gal). In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. Affinity BroadSpec may be tank mixed with one or more herbicides labeled for use on winter wheat including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Cleanwave, Widematch*, Axial, Everest, Rimfire, and Assert. Affinity BroadSpec can be applied with labeled fungicides, insecticides (do not mix with Malathion), or liquid nitrogen fertilizer solution as a spray carrier. Affinity BroadSpec may also be used for preplant/preemergence burndown applications.
- SG43. Affinity Tankmix (tribenuron (10%) + thifensulfuron (40%))** must be applied in combination with other suitable registered products. Affinity Tankmix is labeled for use on winter wheat at 0.6 to 1 oz/A (0.019 to 0.032 lb ai/A). Apply from the 2-leaf stage but before the flag leaf is visible. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Affinity Tankmix should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity Tankmix is applied to young actively growing weeds that are less than 4 inches tall or across. Affinity Tankmix should be tank mixed with one or more herbicides including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Cleanwave, Widematch*, Aim, Curtail, Curtail M, Stinger*, Assert, Axial, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Do not tank mix with Achieve herbicide. Affinity Tankmix can be applied with labeled fungicides, insecticides (do not mix with Malathion), or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Affinity Tankmix may also be used for preplant/preemergence burndown applications.
- SG44. Aim (carfentrazone-ethyl)** is labeled for broadleaf weed control in winter wheat. Apply Aim up until the jointing stage of the crop. Aim must be applied to small weeds, 2 to 4 inches tall, for best control. Aim will give control of eastern black nightshade, kochia, lambsquarters, pigweed, and wild buckwheat. Apply a minimum of 10 gpa by ground or a minimum of 3 gpa by air. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v (2 pt/100 gal). In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v (2 to 4 gal/100 gal) or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. Aim can be mixed with other labeled herbicides for increased weed control. Refer to the other product label for specific instructions and restrictions. Crop tolerance is fair to good. Aim may also be used for preplant/preemergence burndown applications.
- SG45. Assert (imazamethabenz)** is labeled for wild oats and wild mustard control in winter wheat. Assert will provide partial control of wild buckwheat. Assert will also provide excellent control of other mustards; including field pennycress and flixweed. Crop tolerance to Assert is excellent. Apply Assert at 1.0 to 1.5 pt/A after the crop is in the 2-leaf stage, but before jointing. Apply to wild oats in the 1 to 4-leaf stage, and before the mustards are blooming. The 1.0 pt/A rate can be used when wild oats are in the 1 to 2-leaf stage; however, the higher rate should be used on larger wild oats or when populations are in excess of 25 plants/sq ft. Apply a minimum of 10 gpa by ground or a minimum of 5 gpa by air. For wild oats populations in excess of 25 plants/sq ft or under cool conditions, use a minimum spray volume of 15 gpa by ground. Do not apply when freezing temperatures have occurred within two days prior or are forecast within two days. Always apply Assert with a nonionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution. Assert may be tank mixed with the following herbicides for additional broadleaf weed control; 2,4-D (ester formulations only), Bronate Advanced*, Curtail M, Express, Harmony SG*, Harmony Extra, MCPA (ester formulations only), Starane, Starane + Salvo, or Starane + Sword. Do not tank mix with 2,4-D ester

* or generic equivalent.

- unless crop is fully tillered. Do not Tank mix with Banvel* or any product containing dicamba.
- SG46. Axial, Axial XL (pinoxaden)** is labeled for control of green and yellow foxtails, millets, wild oats, and barnyardgrass in winter wheat. Apply Axial/Axial XL from the 2-leaf stage up to the pre-boot stage. Axial/Axial XL will control susceptible grass weeds in the 1 to 6-leaf stage. Axial use rate is 8.2 fl oz/A plus Adigor adjuvant at a rate of 9.6 fl oz/A. Adigor adjuvant is sold with Axial and one box will treat 40 acres. The Axial XL formulation has an adjuvant in the formulation. **Do Not** add additional Adigor adjuvant to Axial XL. Use rate for Axial XL is 16.4 oz/A. Apply Axial/Axial XL in 5-10 gpa by ground or 5 gpa by air. Axial and Axial XL are labeled for two- and three-way tank mix combinations with several broadleaf herbicides including; Affinity Tankmix, Bronate Advanced*, Buctril*, Curtail M, Express, Harmony Extra, Harmony SG*, MCPA Ester, Starane, Starane + Sword, and Widematch*. Refer to the respective labels (including supplemental labels) for all two- and three-way tank mix recommendations, rates, and restrictions. Do not apply both Discover and Axial products to the same crop in the same season. Axial/Axial XL may also be tank mixed with Tilt and Quilt fungicides, Warrior insecticide, and spray solutions with up to 50% liquid nitrogen solution.
- SG47. Banvel*Clarity* (dicamba)** controls many broadleaf weeds, including wild buckwheat and smartweed but is weak on wild mustard. Apply prior to the jointing stage of winter wheat. Apply in the spring for less injury. Dicamba can be applied alone, but is usually applied in tank mixes with 2,4-D, Buctril*, or MCPA. Other labeled tank mix combinations include Bronate Advanced*, Curtail, Express, Harmony Extra and Stinger*. Refer to the specific product label for details on tank mix recommendations, rates, and restrictions. Dicamba may be applied preplant or at planting for burndown applications.
- SG48. Buctril* (bromoxynil)** can be applied fall or spring from wheat emergence until boot stage. Apply at 1 to 1.5 pts/A (0.25 to 0.375 lb ai/A). Bromoxynil controls many annual broadleaf weeds, including wild buckwheat and smartweeds. However, bromoxynil is weak on wild mustard and pigweed. Bromoxynil should be applied before the four-leaf stage of the weeds. Bromoxynil should be applied through flat fan nozzles, in a minimum of 10 gallons per acre and no less than 30 pounds pressure. Good coverage is essential for good weed control. Labeled tank mixes include; 2,4-D, MCPA, Banvel*, Curtail, Curtail M ,Express, and, Harmony Extra.
- SG49. Bronate Advanced* (bromoxynil + MCPA ester)** can be applied from the 3-leaf to boot stage to all varieties winter wheat. Bronate Advanced* controls many broadleaf weeds, including wild buckwheat, kochia, wild mustard, redroot pigweed, and common lambsquarters. Bronate Advanced* should be applied before the four-leaf stage of broadleaf weeds. Bronate Advanced* should be applied through flat fan nozzles, in a minimum of 10 GPA and no less than 30 PSI. Good coverage is essential for good weed control. Bronate Advanced* can be tank mixed with several broadleaf or grass herbicides including; 2,4-D, Banvel*/Clarity*, Curtail, Curtail M ,Express, Harmony SG*, Harmony Extra, MCPA, Starane, Achieve, Assert, Discover NG, Everest, and Puma.
- SG50. Curtail (clopyralid + 2,4-D amine)** is labeled for application to winter wheat from the tillering up to early boot stage. **Do Not** apply in the fall. Research has shown that Curtail provides excellent shoot suppression of Canada thistle. However, repeated applications over several years are needed for complete Canada thistle control. Curtail will control most annual broadleaf weeds, including wild buckwheat. Curtail is weak on kochia and smartweed. Curtail will not control grass weeds. Curtail can be applied from tillering to before boot stage of the small grain. The recommended rate of Curtail is 2.0 pt/A. Rates up to 2.67 pts/A are labeled if condition of the weeds prevent optimal control (less sensitive species, perennials, stressed conditions, dense stands, larger weeds), however the higher rate may increase risk of crop injury. A reduced rate of 1.5 pt/A has supplemental labeling for use in Minnesota for control of annual broadleaf weeds only, as listed under 'Broadleaf Weeds Controlled' on the label. For best control, apply before annual weeds exceed three inches and apply to Canada thistle after the basal leaves have emerged, but before the bud stage. Apply in a minimum 10 gpa for ground and a minimum 2 gpa for aerial applications. Curtail can be tank mixed labeled rates of other products registered for winter wheat provided that timing and method of application do not conflict and tank mixing is not prohibited on the tank mix partner label. Tank mixes with Buctril* or Banvel*/Clarity* may increase the annual weed control spectrum but may reduce control of perennials. Do not tank mix with 2,4-D or Banvel*/Clarity* unless the risk of crop injury is acceptable. **Note recropping restrictions.**
- SG51. Curtail M (clopyralid + MCPA ester)** is a package mix for weed control in winter wheat. **Do Not** apply in the fall. Research has shown that Curtail M provides excellent shoot suppression of Canada thistle. However, repeated applications over several years are needed for complete Canada thistle control. Curtail M will control most annual broadleaf weeds, however, Curtail M is weak on kochia and smartweed. Curtail M will not control grass weeds. Curtail M can be applied from the 3 leaf stage to before boot stage of the small grain. The recommended rate of Curtail M is 1.75 to 2.33 pt/A. Use the higher rate if condition of the weeds prevent optimal control (less sensitive species, perennials, stressed conditions, dense stands, larger weeds), however the higher rate may increase risk of crop injury. For best control, apply before annual weeds exceed three inches and apply to Canada thistle after the basal leaves have emerged, but before the bud stage. Apply in a minimum 10 gpa for ground and a minimum 2 gpa for aerial applications. Curtail M can be tank mixed labeled rates of other products registered for winter wheat provided that timing and method of application do not conflict and tank mixing is not prohibited on the tank mix partner label. Tank mixes with Banvel*/Clarity* may increase the annual weed control spectrum but may reduce control of perennials. Do not tank mix with 2,4-D or Banvel*/Clarity* unless the risk of crop injury is acceptable. **Note recropping**

* or generic equivalent.

restrictions.

- SG52. Discover NG (clodinafop)** can be applied to all winter wheat varieties. Do not apply in the fall. Apply when wheat is in the 2 leaf stage but before the boot stage. Use rate of Discover NG is 12.8 to 16 fl oz/A. Discover NG at 12.8 oz/A will control wild oat, volunteer (tame) oat, and canarygrass when applied between the 1 and 6 true leaf stage, and barnyardgrass, green and yellow foxtail, and volunteer corn when applied between the 1 and 5 true leaf stage (before tillering begins for optimum control). Discover NG at 16 fl oz/A controls giant foxtail and annual ryegrass when applied between the 1 and 5 true leaf stage (before emergence of the 3rd tiller for optimum control). Apply Discover NG in a minimum spray volume of 5 gpa by ground (minimum of 10 gpa under dry conditions) and 3 gpa by air (minimum of 5 gpa under dry conditions). A methylated seed oil (MSO) may be used at 0.25% v/v (2 pts/100 gallons spray volume) to enhance weed control under low moisture or high temperatures or if spray volume exceeds 10 gpa. Discover NG may be tank mixed with several broadleaf herbicides or broadleaf herbicide combinations including; 2,4-D (amine only), Affinity Tankmix + MCPA ester, Affinity Tankmix + Starane, Banvel*/Clarity* (including three-way mix with MCPA ester), Bronate Advanced*, Buctril* (including three-way mix with MCPA ester), Curtail (including three-way mix Harmony SG), Curtail M, Double Up B+D, Express, Harmony Extra (including three-way mixes with Bronate Advanced*, Buctril*, or MCPA), MCPA (amine or ester), Starane (including three-way mixes with Bronate Advanced*, Curtail, Curtail M, Harmony Extra, or Harmony SG), Starane + Sword (including three-way mix Harmony SG), Stinger, Widematch (including three-way mixes with Harmony SG* or MCPA ester). Refer to the Discover NG label for a list of grasses controlled by each tank mix, required additives, and recommended product rates. Discover NG may also be tank mixed with Tilt and Quilt fungicides, Warrior insecticide, and spray solutions with up to 50% liquid nitrogen solution. Wheat is more susceptible to injury when exposed to temperatures below 40 F during the period 48 hours before and after Discover NG application.
- SG53. Everest (flucarbazone)** is labeled for postemergence control of wild oats, foxtails, mustards, and pigweed. Apply Everest from the 1 to 4-leaf plus 2 tiller stage of wheat, but prior to jointing. Everest may be applied in the fall or spring. Apply to 1 to 6-leaf foxtails and wild oats. Apply at a rate of 0.3 oz/A (0.013 lb ai/A) for green foxtail control, 0.4 oz/A (0.018 lb ai/A) for low to moderate infestations of wild oats, and 0.6 oz/A (0.026 lb ai/A) for yellow foxtail suppression and control of high infestations of wild oats or when tank mixed with dicamba. Refer to the label for other grass and broadleaf weeds controlled at each rate level. Apply in 5 to 10 gpa for ground applications and a minimum of 3 gpa (minimum 5 gpa under dry conditions or heavy weed infestations) for aerial applications. Follow one of the two adjuvant recommendations when applying Everest alone or with any tank mix combination on winter wheat. 1). Use 0.125 to 0.25 %v/v (0.5 to 1 qt/100 gallons) nonionic surfactant (NIS). For improved performance on susceptible weeds, add (in addition to NIS) liquid nitrogen fertilizer at 2 qt/A (up to 50% of spray solution may be used if making application in the spring) or ammonium sulfate fertilizer (AMS) at 1.5 lb/A. 2). Add a basic blend at 0.5% v/v (2 qts/100 gallons) OR methylated seed oil (MSO) at 1.5 pt/A plus ammonium sulfate (AMS) at 1.5 lb/A. Everest can be tank mixed with 2,4-D, Affinity BroadSpec, Affinity Tankmix, Aim, Banvel*/Clarity*, Buctril*, Bronate Advanced*, Curtail, Curtail M, Double-Up B+D, Express, Harmony Extra, Harmony SG*, MCPA, Starane, Stinger*, and Widematch. Tank mixes with Banvel*/Clarity* may result in decreased wild oat control. Do not apply tank mixes with MCPA within 72 hours of frost. Refer to the label for tank mix rates and further recommendations. Everest may be applied at 0.4 oz/A in preplant or preemergence applications on winter wheat for control of wild oats and green foxtail. Do not apply preplant or preemergence if in-furrow applications of organophosphate insecticides have been made. Refer to the label for more information.
- SG54. Express (tribenuron)** is labeled for broadleaf weed control in winter wheat. Express can be applied in the fall or spring. Express will control many annual broadleaf weeds, however it is weak on pigweed, smartweed and wild buckwheat. Research has shown that Express provides excellent shoot suppression of Canada thistle, however repeated applications over several years are needed for complete Canada thistle control. Apply Express at 0.25 to 0.5 oz/A (0.008 to 0.016 lb ai/A) after the crop is in the 2 leaf stage but before the flag leaf is visible. Use the lower rate for light weed infestations. For best Canada thistle control use the 0.5 oz/A rate. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Express should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v (0.5 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v (1 to 2 gal/100 gal). In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Express can be tank mixed with 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Aim, Curtail, Curtail M, Stinger*, Assert, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Affinity Tankmix can be applied with labeled fungicides, insecticides (do not mix with Malathion and refer to label for potential for injury with organophosphate insecticides), or liquid nitrogen fertilizer solution as a spray carrier. May be used in preplant or post harvest burndown applications.
- SG55. Harmony SG* (thifensulfuron)** is labeled for broadleaf weed control in winter wheat. Apply Harmony SG* to winter wheat at 0.45 to 0.9 oz/A (0.014-0.028 lb ai/A) after the crop is in the 2-leaf stage but before the flag leaf is visible in spring. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Harmony SG* should be applied with a nonionic

* or generic equivalent.

surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Harmony SG* is applied to young actively growing weeds that are less than 4 inches tall or across. Harmony SG* can be tank mixed with other herbicides in wheat and barley including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Aim, Curtail, Curtail M, Express, Stinger*, Achieve, Assert, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. Harmony SG* can be applied with labeled fungicides, insecticides (do not mix with Malathion and do not apply within 60 days of crop emergence when an organophosphate insecticide has been applied in-furrow), or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Harmony SG* may also be use for preplant/preemergence burndown applications.

- SG56. Harmony Extra (tribenuron (17%) + thifensulfuron (33%))** provides excellent control of many annual broadleaf weeds and suppression of Canada thistle. Harmony extra can be applied in the fall. Apply Harmony Extra at 0.45 to 0.9 oz/A (0.014-0.028 lb ai/A) after the crop is in the 2-leaf stage, but before the first node is detectable. Research has shown the 0.75 oz/A rate is the maximum rate needed for annual broadleaf control in Minnesota. Apply at 5 to 20 gpa (dependent on nozzle type and spacing) by ground or 2 to 5 gpa by air. Unless otherwise noted for a specific tank mix, Harmony Extra should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v (0.5 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Harmony Extra is applied to young actively growing weeds that are less than 4 inches tall or across. Harmony Extra can be tank mixed with other herbicides in wheat and barley including; 2,4-D (ester formulations preferred), MCPA (ester formulations preferred), Banvel*/Clarity*, Bronate Advanced*, Buctril*, Starane (including Starane package mixes), Aim, Curtail, Curtail M, Express, Stinger*, Assert, Discover, Everest, and Puma. Make sure tank mix partners are labeled for the respective small grain crop. Refer to the label for additional tank mix requirements, specific rates, adjuvant recommendations, and other three-way tank mix options. The addition of 2,4-D or MCPA will increase crop safety. 2,4-D is the preferred tank mix. Do not apply tank mixes in the fall. Harmony Extra can be applied with labeled fungicides, insecticides (do not mix with Malathion and refer to label for potential for injury with organophosphate insecticides), or liquid nitrogen fertilizer solution as a spray carrier for use on wheat and barley. Harmony Extra may also be use for preplant/preemergence burndown applications.
- SG57. Huskie (pyrasulfotole + bromoxynil)** is labeled for use in winter wheat. Apply 11 to 15 fl oz/A (0.18 to 0.24 lb ai/A) after the first true leaf has fully expanded up to flag leaf emergence. Apply in a minimum 5 gpa for both ground and aerial applications. Spray additives are recommended with Huskie, especially under adverse conditions. Ammonium sulfate fertilizer (AMS) at 0.5 to 1 lb/A is the preferred additive. Urea ammonium nitrogen (28-32% UAN) at 1 to 2 qt/A may also be used. Huskie may be tank mixed with other herbicides including; Achieve, Assert, Axial, Discover NG, Puma, Rimfire, Silverado, 2,4-D, Affinity BroadSpec, Affinity Tankmix, Aim, Bronate Advanced*, Banvel*/Clarity*, Buctril*, Curtail, Curtail M, Express, Harmony Extra, Harmony SG*, MCPA, Starane, Starane NXT, Stinger, and Widematch. If the tank mix partner requires the use of a non-ionic surfactant, use the recommended rate on the tank mix partner label. Huskie may also be tank mixed with fungicides and insecticides when timing of application is similar. Huskie can be applied in fluid fertilizer (maximum 50% v/v or 30 lb nitrogen/A when applied in the fall) on winter wheat. Refer to the label.
- SG58. MCPA and 2,4-D*** should be applied in the spring for broadleaf weed control. Apply MCPA from the 4-leaf stage until prior to boot stage. Apply 2,4-D after the wheat has tillered, but prior to boot stage.
- SG59. Orion (florasulam + MCPA ester)** controls common lambsquarters, mustards, pigweed, ragweed, smartweed, and wild buckwheat. Apply from the 3-leaf stage to the jointing stage. Apply in a minimum 8 gpa by ground and a minimum 3 gpa by air. Orion may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Extreme growing conditions such as drought or near freezing temperatures prior to, at, or following time of application may reduce weed control and increase risk of crop injury. Take precautions to avoid drift to sensitive crops, refer to the label.
- SG60. Prowl H20 (pendimethalin)** is labeled for use as a layby application in winter wheat. Prowl H2O must be applied to winter wheat from the 1 leaf stage until before the flag leaf is visible and prior to weed emergence. Emerged weeds will not be controlled. Apply 1.5 pts/A on coarse textured soils, 1.5 to 2.5 on medium textured soils, and 2.0 to 3.0 pts//A on fine textured soils. For control of established weeds, Prowl H2O can be tank mixed with any postemergence herbicide registered for winter wheat. If crop fails, do not replant wheat.
- SG61. Puma (fenoxaprop + safener)** is labeled for control of green and yellow foxtail, millets, wild oats, and barnyardgrass in winter wheat. Apply Puma to crop from emergence to 60 days prior to harvest. Puma use rate is 0.33 to 0.67 pt/A. Apply at 0.33 pt/A to control green foxtail, foxtail millets, and volunteer corn; apply 0.4 pt/A to control yellow foxtail and proso millet; Apply 0.67 pt/A to control wild oat and barnyardgrass.

* or generic equivalent.

Apply Puma in 5-10 gpa by ground or 5 gpa by air. Numerous broadleaf herbicides or herbicide combinations can be tank mixed with Puma including; Banvel*/Clarity* (including three-way mix with MCPA ester), Bronate Advanced* (including three-way mixes with Starane), Buctril* (including three-way mix with MCPA ester), Curtail M (including three-way mix with Clarity* or Starane), Express (including three-way mix with MCPA ester), Harmony Extra (including three-way mixes with MCPA ester or Starane), Harmony SG* (including three-way mix with MCPA ester or Starane), MCPA ester, Starane (including three-way mix with MCPA ester), and Stinger (including three-way mix with MCPA ester). Refer to the Puma label for specific rates and grass species controlled by each tank mix prior to use.

- SG62. Rage D-Tech (carfentrazone-ethyl + 2,4-D)** is labeled for broadleaf weed control in winter wheat. Apply 8 to 16 fl oz/A (0.25 to 0.5 lb ai/A along with a non-ionic surfactant (NIS) at 0.25% v/v from the 3 tiller stage until jointing. A sprayable liquid nitrogen fertilizer at 2 to 4% v/v or ammonium sulfate at 2 to 4 lbs/A may also be used in addition to the NIS. Rage D-Tech may be tank mixed with other registered herbicides. Tank mixes with products containing bromoxynil are not recommended. Use of adjuvants other than NIS are not recommended. Temporary crop response such as speckling or necrosis may occur. Tank mixes with products formulated as EC or Ester may increase this response.
- SG63. Rimfire (mesosulfuron methyl + propoxycarbazone-sodium + mefenpyr (safener))** is labeled for wild oat (including ACCase resistant wild oat) and suppression of foxtails, barnyardgrass in winter wheat. Rimfire will also control some broadleaf weeds such as, mustards, chickweed, redroot pigweed and volunteer canola. Apply Rimfire from crop emergence up to flag leaf emergence. 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 methylated seed oil (MSO) at 1.3 to 1.5 pts/A, OR a nonionic surfactant (NIS) at 0.5% v/v (2 qts/100 gallons spray solution) plus an ammonium nitrogen fertilizer (28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A) OR a basic blend adjuvant at 1 to 1.25% v/v. Several broadleaf herbicides can be mixed with Rimfire including Affinity Tankmix, Affinity BroadSpec, Bronate Advanced*, Buctril*, Express, Harmony Extra, Harmony SG*, Huskie, MCPA ester, Silverado, Starane, Starane NXT, Stinger, and Widematch. Rimfire may also be tank mixed with several fungicides and insecticides (do not tank mix with malathion, mancozeb, phosphorodithioate, or methyl parathion as unacceptable crop injury may occur). Refer to both the Rimfire and tank mix partner labels for recommended adjuvants, rates, and restrictions when tank mixing.
- SG64. Silverado (mesosulfuron methyl + safener)** is labeled for control of wild oat (including ACCase resistant wild oat) and suppression of foxtails in winter wheat. Silverado will also control wild mustard. Apply Silverado to crop from emergence up to before the jointing stage. Silverado controls susceptible grasses from the 1-leaf to the 2-tiller stage. Silverado can be applied at 1.75 to 2.25 oz/A. Apply in 10 to 20 gpa by ground and a minimum 5 gpa by air. Always apply with a methylated seed oil (MSO) or a basic blend adjuvant. MSO rate should be 1.5 pts/A (addition of 28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A may improve weed control but leaf burn may occur). A basic blend adjuvant should contain a nonionic surfactant, MSO, and a nitrogen source and should be added at a rate of 1% v/v or 0.8 to 1.6 pt/A depending on spray volume. Several broadleaf herbicides can be tank mixed with Silverado including; Bronate Advanced*, Buctril*, Curtail M, Express, Harmony Extra, Harmony SG*, MCPA ester, Starane, and Stinger*. Silverado may also be tank mixed with several fungicides and insecticides (do not tank mix with malathion, mancozeb, or methyl parathion as unacceptable crop injury may occur). Refer to both the Silverado and tank mix partner labels for recommended adjuvants, rates, and restrictions when tank mixing.
- SG65. Starane (fluroxypyr)** can be applied to winter wheat from the 2-leaf stage up to and including the flag leaf stage. Starane contains 1.5 lb a.e./gallon. Starane Ultra is a new formulation containing 2.8 lb a.e./gallon and will replace Starane. Starane/Starane Ultra gives good control of kochia, cocklebur, common ragweed, sunflower and venice mallow. Apply Starane Ultra at 0.3 pt/A (0.5 pt/A for Starane) to susceptible broadleaf species less than 4 inches tall, apply Starane Ultra at 0.4 pt/A (0.66 pt/A for Starane) to susceptible broadleaf species less than 8 inches tall or vining. Apply 0.7 pt/A (1.33 pt/A for Starane) to control volunteer potatoes. Apply in a minimum 8 gpa by ground and a minimum 3 gpa by air. Starane/Starane Ultra may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Fluroxypyr is also available in several premixes with 2, 4-D (Starane + Salvo; Starane + Saber) and MCPA (Starane + Sword).
- SG66. Starane NXT, Starane NXTcp (fluroxypyr + bromoxynil)** can be applied to winter wheat from the 3 leaf stage up to flag leaf emergence. Starane NXT is a premix with a use rate of 14 to 27.4 oz/A. Starane NXTcp is a multi-pack product with separate containers of Starane (fluroxypyr) and NXTcp (bromoxynil). Starane NXTcp rate is 20 to 40 acres per case. Refer to the respective labels for rates based on weed species and weed stage of growth. Apply in 10 to 20 gpa by ground and a minimum 5 gpa by air. Starane NXT and Starane NXTcp may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Starane NXT tank mixes listed on supplemental labels include Affinity BroadSpec, Affinity Tankmix, Harmony SG, Axial, and Discover NG. The foliar fungicide propiconazol and the insecticides chlorpyrifos, dimethoate, gamma cyhalothrin, and malathion are compatible for tank mixes with Starane NXT and Starane NXTcp.
- SG67. Stinger* (clopyralid)** can be applied to winter wheat from the 3-leaf stage up to early boot stage. Can be applied in the fall. Research has shown that clopyralid provides excellent shoot suppression of Canada

* or generic equivalent.

thistle. However, repeated applications over several years is needed for complete Canada thistle control. Clopyralid will also give good control of wild buckwheat, sunflower, cocklebur and ragweeds; however, clopyralid is weak on most other annual broadleaf weeds. Therefore, clopyralid should be tank mixed with other broadleaf herbicides for broad spectrum weed control. The higher rate should be used for dense infestations or under poor growing conditions. For best control of perennial weeds such as Canada thistle, apply after the basal leaves have emerged, but before the bud stage. Apply in a minimum 10 gpa by ground and a minimum 2 gpa by air. Stinger* may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product.

- SG68. WideMatch* (clopyralid + fluroxypyr)** will control many broadleaf weeds in winter wheat. Apply from the 3 leaf stage up to and including flag leaf emergence. Apply WideMatch* at 1.0 pt/A to susceptible broadleaf species less than 4 inches tall. Apply WideMatch* at 1.33 pt/A to susceptible broadleaf species less than 8 inches tall or vining and to dicamba tolerant kochia types. To obtain season-long control of perennial weeds such as Canada thistle, apply when the majority of the basal leaves have emerged from the soil up to the bud stage. WideMatch* will provide only fair control of mustard species, smartweeds, and common lambsquarters. Apply in a minimum 10 gpa by ground and a minimum 3 gpa by air. WideMatch* may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. WideMatch* tank mixes listed on supplemental labels include Affinity BroadSpec, Affinity Tankmix, and Harmony SG.
- SG69. WideMatch M (fluroxypyr + clopyralid + MCPA ester)** will control many annual and perennial broadleaf weeds in winter wheat. Apply from the 3 leaf stage up to and including flag leaf emergence. WideMatch M is a co-pack of 1.4 gallons of WideMatch S (fluroxypyr) and WideMatch CM (clopyralid + MCPA ester). The entire contents will treat 22 acres. Apply in a minimum 10 gpa by ground and a minimum 3 gpa by air. WideMatch M may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. For improved control of dicamba-tolerant kochia, additional fluroxypyr may be added at a rate of 2 pts Starane Ultra (3.75 pts Starane) per 22 acres.

Rye

- SG70. Aim (carfentrazone-ethyl)** is labeled for broadleaf weed control in rye. Apply Aim up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim will give control of eastern black nightshade, kochia, lambsquarters, pigweed, and wild buckwheat. Apply a minimum of 10 gpa by ground or a minimum of 3 gpa by air. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v (2 pt/100 gal). In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v (2 to 4 gal/100 gal) or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. Aim may also be used for preplant/preemergence burndown applications.
- SG71. Buctril* (bromoxynil), MCPA and 2,4-D** are for weed control in rye. Apply all three herbicides in the spring. Apply bromoxynil (Buctril*) from emergence until early boot stage. Apply MCPA and 2,4-D in the spring until prior to boot stage. MCPA and 2,4-D are weak on wild buckwheat and smartweed. Since there are no herbicides available for grass weed control in rye, rye should not be seeded on fields that have a severe infestation of annual grass weeds.
- SG72. Bronate Advanced* (bromoxynil + MCPA ester)** can be applied from the 3-leaf to boot stage to all varieties rye. Bronate Advanced* controls many broadleaf weeds, including wild buckwheat, kochia, wild mustard, redroot pigweed, and common lambsquarters. Bronate Advanced* should be applied before the four-leaf stage of broadleaf weeds. Bronate Advanced* should be applied through flat fan nozzles, in a minimum of 10 GPA and no less than 30 PSI. Good coverage is essential for good weed control.
- SG73. Orion (florasulam + MCPA ester)** controls common lambsquarters, mustards, pigweed, ragweed, smartweed, and wild buckwheat. Apply from the 3-leaf stage to the jointing stage. Apply in a minimum 8 gpa by ground and a minimum 3 gpa by air. Orion may be tank mixed with other registered herbicides provided the tank mix product is labeled for the timing and method of application and that tank mixing is not prohibited by the label of the tank mix product. Extreme growing conditions such as drought or near freezing temperatures prior to, at, or following time of application may reduce weed control and increase risk of crop injury. Take precautions to avoid drift to sensitive crops, refer to the label.
- SG74. Rage D-Tech (carfentrazone-ethyl + 2,4-D)** is labeled for broadleaf weed control in rye. Apply 8 to 16 fl oz/A (0.25 to 0.5 lb ai/A) along with a non-ionic surfactant (NIS) at 0.25% v/v from the 3 tiller stage until jointing. A sprayable liquid nitrogen fertilizer at 2 to 4% v/v or ammonium sulfate at 2 to 4 lbs/A may also be used in addition to the NIS. Rage D-Tech may be tank mixed with other 2,4-D or MCPA. Tank mixes with products containing bromoxynil are not recommended. Use of adjuvants other than NIS are not recommended. Temporary crop response such as speckling or necrosis may occur. Tank mixes with products formulated as EC or Ester may increase this response.

* or generic equivalent.

CLEARFIELD WHEAT

- SG75. Beyond (imazamox)** is registered for postemergence control of broadleaf and grass weeds in Clearfield wheat. **Do not** apply to non-Clearfield varieties of wheat. Apply Beyond to Clearfield spring wheat at a rate of 4 fl oz/acre (0.031 lb ai/A) from the 4-leaf stage up until prior to the jointing stage. Refer to the label for more specific rates depending on weed species present and weed size. A nonionic surfactant at 0.25% v/v and a nitrogen fertilizer (UAN at 2.5% v/v or AMS at 12 to 15 lbs /100 gal of spray solution) should be added.
- SG76. Clearmax (imazamox + MCPA)** is registered for postemergence control of broadleaf and grass weeds in Clearfield wheat. **Do not** apply to non-Clearfield varieties of wheat. Clearmax comes in a molded jug pack that treats 16 acres (equivalent to 12 fl oz/A). Clearmax requires the addition of a nonionic surfactant at 0.25% v/v and a nitrogen fertilizer (UAN at 2.5% v/v or AMS at 12 to 15 lbs /100 gal of spray solution). Apply to Clearfield spring wheat from the 4-leaf stage up until prior to the jointing stage. Refer to the label for more specific rates depending on weed species present and weed size. Applications should be made before broadleaf weeds exceed 3 inches and grasses exceed 4-5 leaves. Butril* or Starane may be tank mixed with Clearmax.

* or generic equivalent.

Table SG1. Package mixtures labeled for use in Small Grains

Trade Name	Formulation	Common Name	Active Ingredient	Crop
Affinity BroadSpec	50 SG	thifensulfuron & tribenuron	25% & 25%	spring, winter, durum wheat, barley, & oats
Affinity TankMix	50 SG	thifensulfuron & tribenuron	40% & 10%	spring, winter, durum wheat, barley, & oats
Bison	4 E	bromoxynil & MCPA	2 lb/gal & 2 lb/gal	all
Bison Advanced	5 E	bromoxynil & MCPA	2.5 lb/gal & 2.5 lb/gal	all
Brash	3.87 L	dicamba & 2,4-D	1 lb/gal & 2.87 lb/gal	spring, winter, & durum wheat
Bromac	4 E	bromoxynil & MCPA	2 lb/gal & 2 lb/gal	all
Bromac Advanced	5 E	bromoxynil & MCPA	2.5 lb/gal & 2.5 lb/gal	all
Bronate Advanced	5 E	bromoxynil & MCPA	2.5 lb/gal & 2.5 lb/gal	all
Colt AS	1.5 E	clopyralid & fluroxypyr	0.75 lb/gal & 0.75 lb/gal	spring, winter, durum wheat, barley, & oats
Curtail	2.38 L	clopyralid & 2,4-D	0.38 lb/gal & 2 lb/gal	spring, winter, durum wheat, & barley
Curtail M	2.77 E	clopyralid & MCPA	0.42 lb/gal & 2.35 lb/gal	spring, winter, durum wheat, barley, & oats
Double Up B+D	3.9 E	bromoxynil & 2,4-D	2 lb/gal & 1.9 lb/gal	all
Harmony Extra	50 SG	thifensulfuron & tribenuron	33% & 17%	spring, winter, durum wheat, barley, & oats
Huskie	2.08 EC	pyrasulfotole & bromoxynil		spring, winter, durum wheat, & barley
Orion	2.373 L	florasulam & MCPA	0.033 lb/gal & 2.34 lb/gal	all
Rage D-Tech	4.06 EC	carfentrazone-ethyl & 2,4-D	0.13 lb/gal & 3.93 lb/gal	all
Rifle-D	3.87 L	dicamba & 2,4-D	1 lb/gal & 2.87 lb/gal	spring, winter, durum wheat, barley, & oats
Rimfire	10.17 DF	mesosulfuron & propoxycarbazone	2.03% & 8.14%	spring, winter, & durum wheat
Starane + Saber	2.5 E	fluroxypyr & 2,4-D	0.5 lb/gal & 2 lb/gal	spring, winter, durum wheat, barley, & oats
Starane + Salvo	3.75 E	fluroxypyr & 2,4-D	0.75 lb/gal & 3 lb/gal	spring, winter, durum wheat, barley, & oats
Starane + Sword	3.55 E	fluroxypyr & MCPA	0.71 lb/gal & 2.84 lb/gal	spring, winter, durum wheat, barley, & oats
Starane NXT	2.91 E	fluroxypyr & bromoxynil	0.58 lb/gal & 2.33 lb/gal	spring, winter, durum wheat, barley, & oats
Starane NXTcp	1.5 + 2 E	fluroxypyr & bromoxynil	1.5 lb/gal + 2 lb/gal	spring, winter, durum wheat, barley, & oats
Weedmaster	3.87 L	dicamba & 2,4-D	1 lb/gal & 2.87 lb/gal	spring, winter, & durum wheat
WideMatch	1.5 E	clopyralid & fluroxypyr	0.75 lb/gal & 0.75 lb/gal	spring, winter, durum wheat, barley, & oats
WideMatch M	1.5 + 2.77 E	fluroxypyr + clopyralid & MCPA	1.5 lb/gal + 0.42 lb/gal & 2.35 lb/gal	spring, winter, durum wheat, barley, & oats

Table SG2. Crop Stage and Harvest Restrictions for Spring Wheat

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
2,4-D, generic (2,4-D)	after fully tillered	prior to jointing	none
Affinity BroadSpec (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Affinity TankMix (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Aim (carfentrazone-ethyl)	none	jointing	none
Assert (imazamethabenz)	2-leaf	prior to jointing	none
Axial (pinoxaden)	2 leaf	prior to boot stage	60
Banvel (dicamba)	2 leaf	5 leaf	none
Bison (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bison Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Brash (dicamba & 2,4-D)	none	none	none
Broclean (bromoxynil)	emergence	boot	none
Bromac (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bromac Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Bronate Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Buctril (bromoxynil)	emergence	boot	none
Clarity (dicamba)	2 leaf	5 leaf	none
Clopyr AG (clopyralid)	3 leaf	early boot	none
Colt AS (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
Curtail (clopyralid & 2,4-D)	4 leaf and tillering	up to jointing	none
Curtail M (clopyralid & MCPA)	3 leaf	up to jointing	none
Discover NG (clodinafop-propargyl)	2 leaf	pre-boot	60
Double Up B+D (bromoxynil & 2,4-D)	tillering	before jointing	none
Everest (flucarbazone-sodium)	1 leaf	4 leaf	60
Express (tribenuron)	2 leaf	prior to emergence of flag leaf	45
Fargo (trallate)	n.a.	n.a.	none
Harmony (thifensulfuron)	2 leaf	prior to emergence of flag leaf	45
Harmony Extra (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Huskie (pyrasulfotole & bromoxynil)	1 leaf	flag leaf emergence	60
MCPA, generic (MCPA)	4 leaf and prior to jointing	prior to boot	none
Moxy (bromoxynil)	emergence	prior to boot	none
Orion (florasulam & MCPA)	3 leaf	up tp jointing	60
Prowl H20 (pendimethalin)	1 leaf	prior to flag leaf emergence or 12 inches	60
Puma (fenoxaprop)	emergence	60 days prior to harvest	60
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	3 tillers	jointing	3
Rifle (dicamba)	none	5 leaf	none
Rifle-D (dicamba & 2,4-D)	none	none	none
Rimfire (mesosulfuron & propocarbazon)	emergence	flag leaf emergence	71

Table SG2. Crop Stage and Harvest Restrictions for Spring Wheat

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
Saber (2,4-D)	3 leaf and tillering	before boot	none
Salvo (2,4-D)	3 leaf and tillering	before boot	none
Savage (2,4-D)	3 leaf and tillering	before boot	none
Silverado (mesosulfuron)	emergence	up to jointing stage	55
Starane (fluroxypyr)	2 leaf	flag leaf	40
Starane + Saber (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Salvo (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Sword (fluroxypyr & MCPA)	3 leaf	flag leaf emergence	40
Starane NXT (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane NXTcp (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane Ultra (fluroxypyr)	2 leaf	flag leaf	40
Sterling (dicamba)	none	5 leaf	none
Sterling Blue (dicamba)	2 leaf	5 leaf	none
Stinger (clopyralid)	3 leaf	early boot	none
Sword (MCPA)	fully tillered	before boot	none
Targa (quizalofop)	n.a.	n.a.	none
trifluralin, generic (trifluralin)	n.a.	n.a.	none
Unity WDG (thifensulfuron)	2 leaf	before flag leaf is visible	none
Weedmaster (dicamba & 2,4-D)	none	none	none
WideMatch (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
WideMatch M (fluroxypyr + clopyralid & MCPA)	3 leaf	flag leaf emergence	40

Table SG3. Crop Stage and Harvest Restrictions for Durum Wheat

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
2,4-D, generic (2,4-D)	after fully tillered	prior to jointing	none
Achieve (tralkoxydim)	none	flag leaf	60
Affinity BroadSpec (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Affinity TankMix (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Aim (carfentrazone-ethyl)	none	jointing	none
Assert (imazamethabenz)	2-leaf	prior to jointing	none
Banvel (dicamba)	1 leaf	5 leaf	none
Bison (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bison Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Brash (dicamba & 2,4-D)	none	none	none
Broclean (bromoxynil)	emergence	boot	none
Bromac (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bromac Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Bronate Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Buctril (bromoxynil)	emergence	boot	none
Clarity (dicamba)	1 leaf	5 leaf	none
Clopyr AG (clopyralid)	3 leaf	early boot	none
Colt AS (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
Curtail (clopyralid & 2,4-D)	4 leaf and tillering	up to jointing	none
Curtail M (clopyralid & MCPA)	3 leaf	up to jointing	none
Discover NG (clodinafop-propargyl)	2 leaf	pre-boot	60
Double Up B+D (bromoxynil & 2,4-D)	tillering	before jointing	none
Everest (flucarbazone-sodium)	1 leaf	4 leaf	60
Express (tribenuron)	2 leaf	prior to emergence of flag leaf	45
Fargo (trilalate)	n.a.	n.a.	none
Harmony (thifensulfuron)	2 leaf	prior to emergence of flag leaf	45
Harmony Extra (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Huskie (pyrasulfotole & bromoxynil)	1 leaf	flag leaf emergence	60
MCPA, generic (MCPA)	4 leaf	prior to boot	none
Moxy (bromoxynil)	emergence	prior to boot	none
Orion (florasulam & MCPA)	3 leaf	up tp jointing	60
Prowl H20 (pendimethalin)	1 leaf	prior to flag leaf emergence or 12 inches	60
Puma (fenoxaprop)	emergence	60 days prior to harvest	60
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	3 tillers	jointing	3
Rifle (dicamba)	1 leaf	5 leaf	none
Rifle-D (dicamba & 2,4-D)	none	none	none
Rimfire (mesosulfuron & propocarbazone)	emergence	flag leaf emergence	71

Table SG3. Crop Stage and Harvest Restrictions for Durum Wheat

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
Saber (2,4-D)	3 leaf and tillering	before boot	none
Salvo (2,4-D)	3 leaf and tillering	before boot	none
Savage (2,4-D)	3 leaf and tillering	before boot	none
Silverado (mesosulfuron)	emergence	up to jointing stage	55
Starane (fluroxypyr)	2 leaf	flag leaf	40
Starane + Saber (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Salvo (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Sword (fluroxypyr & MCPA)	3 leaf	flag leaf emergence	40
Starane NXT (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane NXTcp (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane Ultra (fluroxypyr)	2 leaf	flag leaf	40
Sterling (dicamba)	1 leaf	5 leaf	none
Sterling Blue (dicamba)	1 leaf	5 leaf	none
Stinger (clopyralid)	3 leaf	early boot	none
Sword (MCPA)	fully tillered	before boot	none
Targa (quizalofop)	n.a.	n.a.	none
trifluralin, generic (trifluralin)	n.a.	n.a.	none
Unity WDG (thifensulfuron)	2 leaf	before flag leaf is visible	none
Weedmaster (dicamba & 2,4-D)	none	none	none
WideMatch (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
WideMatch M (fluroxypyr + clopyralid & MCPA)	3 leaf	flag leaf emergence	40

Table SG4. Crop Stage and Harvest Restrictions for Barley

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
2,4-D, generic (2,4-D)	after fully tillered	prior to jointing	none
Achieve (tralkoxydim)	none	flag leaf	60
Affinity BroadSpec (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Affinity TankMix (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Aim (carfentrazone-ethyl)	none	jointing	none
Assert (imazamethabenz)	2-leaf	prior to jointing	none
Axial (pinoxaden)	2 leaf	prior to boot stage	60
Banvel (dicamba)	2 leaf	4 leaf	none
Bison (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bison Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Broclean (bromoxynil)	emergence	boot	none
Bromac (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bromac Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Bronate Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Buctril (bromoxynil)	emergence	boot	none
Clarity (dicamba)	2 leaf	4 leaf	none
Clopyr AG (clopyralid)	3 leaf	early boot	none
Colt AS (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
Curtail (clopyralid & 2,4-D)	4 leaf and tillering	up to jointing	none
Curtail M (clopyralid & MCPA)	3 leaf and tillering	up to jointing	none
Double Up B+D (bromoxynil & 2,4-D)	tillering	before jointing	none
Express (tribenuron)	2 leaf	prior to emergence of flag leaf	45
Fargo (triallate)	n.a.	n.a.	none
Harmony (thifensulfuron)	2 leaf	prior to emergence of flag leaf	45
Harmony Extra (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Huskie (pyrasulfotole & bromoxynil)	1 leaf	flag leaf emergence	60
MCPA, generic (MCPA)	4 leaf	prior to boot	none
Moxy (bromoxynil)	emergence	prior to boot	none
Orion (florasulam & MCPA)	3 leaf	up to jointing	60
Puma (fenoxaprop)	emergence	before 5 leaf and prior to jointing	57
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	3 tillers	jointing	3
Rifle (dicamba)	none	4 leaf	none
Saber (2,4-D)	3 leaf and tillering	before boot	none
Salvo (2,4-D)	3 leaf and tillering	before boot	none
Savage (2,4-D)	3 leaf and tillering	before boot	none
Starane (fluroxypyr)	2 leaf	flag leaf	40
Starane + Saber (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Salvo (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14

Table SG4. Crop Stage and Harvest Restrictions for Barley

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
Starane + Sword (fluroxypyr & MCPA)	3 leaf	flag leaf emergence	40
Starane NXT (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane NXTcp (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane Ultra (fluroxypyr)	2 leaf	flag leaf	40
Sterling (dicamba)	none	4 leaf	none
Sterling Blue (dicamba)	2 leaf	4 leaf	none
Stinger (clopyralid)	3 leaf	early boot	none
Sword (MCPA)	fully tillered	before boot	none
Targa (quizalofop)	n.a.	n.a.	none
trifluralin, generic (trifluralin)	n.a.	n.a.	none
Unity WDG (thifensulfuron)	2 leaf	before flag leaf is visible	none
WideMatch (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
WideMatch M (fluroxypyr + clopyralid & MCPA)	3 leaf	flag leaf emergence	40

Table SG5. Crop Stage and Harvest Restrictions for Oats

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
2,4-D, generic (2,4-D)	after fully tillered	prior to jointing	none
Affinity BroadSpec (thifensulfuron & tribenuron)	3 leaf	prior to jointing	45
Affinity TankMix (thifensulfuron & tribenuron)	3 leaf	prior to jointing	45
Aim (carfentrazone-ethyl)	none	jointing	none
Banvel (dicamba)	1 leaf	5 leaf	none
Bison (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bison Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Broclean (bromoxynil)	emergence	boot	none
Bromac (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bromac Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Bronate Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Buctril (bromoxynil)	emergence	boot	none
Clarity (dicamba)	1 leaf	5 leaf	none
Clopyr AG (clopyralid)	3 leaf	early boot	none
Colt AS (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
Curtail M (clopyralid & MCPA)	3 leaf	up to jointing	none
Double Up B+D (bromoxynil & 2,4-D)	tillering	before jointing	none
Harmony (thifensulfuron)	3 leaf	prior to jointing	45
Harmony Extra (thifensulfuron & tribenuron)	3 leaf	prior to jointing	45
MCPA, generic (MCPA)	4 leaf	prior to boot	none
Moxy (bromoxynil)	emergence	prior to boot	none
Orion (florasulam & MCPA)	3 leaf	up to jointing	60
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	3 tillers	jointing	3
Rifle (dicamba)	1 leaf	5 leaf	none
Saber (2,4-D)	fully tillered	before boot	none
Salvo (2,4-D)	fully tillered	before boot	none
Savage (2,4-D)	fully tillered	before boot	none
Starane (fluroxypyr)	2 leaf	flag leaf	40
Starane + Saber (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Salvo (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Sword (fluroxypyr & MCPA)	3 leaf	flag leaf emergence	40
Starane NXT (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane NXTcp (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane Ultra (fluroxypyr)	2 leaf	flag leaf	40
Sterling (dicamba)	1 leaf	5 leaf	none
Sterling Blue (dicamba)	1 leaf	5 leaf	none
Stinger (clopyralid)	3 leaf	early boot	none
Sword (MCPA)	fully tillered	before boot	none

Table SG5. Crop Stage and Harvest Restrictions for Oats

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
Unity WDG (thifensulfuron)	2 leaf	before jointing	none
WideMatch (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
WideMatch M (fluroxypyr + clopyralid & MCPA)	3 leaf	flag leaf emergence	40

Table SG6. Crop Stage and Harvest Restrictions for Winter Wheat

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
2,4-D, generic (2,4-D)	after fully tillered	prior to jointing	none
Achieve (tralkoxydim)	none	flag leaf	60
Affinity BroadSpec (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Affinity TankMix (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Aim (carfentrazone-ethyl)	none	jointing	none
Assert (imazamethabenz)	2-leaf	prior to jointing	none
Axial (pinoxaden)	2 leaf	prior to boot stage	60
Banvel (dicamba)	spring application only	prior to jointing	none
Bison (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bison Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Brash (dicamba & 2,4-D)	none	none	none
Broclean (bromoxynil)	emergence	boot	none
Bromac (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bromac Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Bronate Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Buctril (bromoxynil)	emergence	boot	none
Clarity (dicamba)	spring application only	prior to jointing	none
Clopyr AG (clopyralid)	3 leaf	early boot	none
Colt AS (clopyralid & fluroxypyr)	3 leaf	flag leaf emergence	40
Curtail (clopyralid & 2,4-D)	4 leaf and tillering	up to jointing	none
Curtail M (clopyralid & MCPA)	3 leaf	up to jointing	none
Discover NG (clodinafop-propargyl)	2 leaf	pre-boot	60
Double Up B+D (bromoxynil & 2,4-D)	tillering	before jointing	none
Everest (flucarbazone-sodium)	1 leaf	4 leaf	60
Express (tribenuron)	2 leaf	prior to emergence of flag leaf	45
Fargo (triallate)	n.a.	n.a.	none
Harmony (thifensulfuron)	2 leaf	prior to emergence of flag leaf	45
Harmony Extra (thifensulfuron & tribenuron)	2 leaf	prior to emergence of flag leaf	45
Huskie (pyrasulfotole & bromoxynil)	1 leaf	flag leaf emergence	60
MCPA, generic (MCPA)	4 leaf	prior to boot	none
Moxy (bromoxynil)	emergence	prior to boot	none
Orion (florasulam & MCPA)	3 leaf	up to jointing	60
Prowl H20 (pendimethalin)	1 leaf	prior to flag leaf emergence or 12 inches	60
Puma (fenoxaprop)	emergence	60 days prior to harvest	60
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	3 tillers	jointing	3
Rifle (dicamba)	spring application only	prior to jointing	none
Rifle-D (dicamba & 2,4-D)	none	none	none

Table SG6. Crop Stage and Harvest Restrictions for Winter Wheat

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
Rimfire (mesosulfuron & propocarbazone)	emergence	flag leaf emergence	71
Saber (2,4-D)	3 leaf and tillering	before boot	none
Salvo (2,4-D)	3 leaf and tillering	before boot	none
Savage (2,4-D)	3 leaf and tillering	before boot	none
Silverado (mesosulfuron)	emergence	up to jointing stage	55
Starane (fluroxypyr)	2 leaf	flag leaf	40
Starane + Saber (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Salvo (fluroxypyr & 2,4-D)	4 leaf	flag leaf emergence	14
Starane + Sword (fluroxypyr & MCPA)	3 leaf	flag leaf emergence	40
Starane NXT (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane NXTcp (fluroxypyr & bromoxynil)	3 leaf	flag leaf emergence	45
Starane Ultra (fluroxypyr)	2 leaf	flag leaf	40
Sterling (dicamba)	spring application only	prior to jointing	none
Sterling Blue (dicamba)	spring application only	prior to jointing	none
Stinger (cloprralid)	3 leaf	early boot	none
Sword (MCPA)	fully tillered	before boot	none
Targa (quizalofop)	n.a.	n.a.	none
Weedmaster (dicamba & 2,4-D)	none	none	none
WideMatch (cloprralid & fluroxypyr)	3 leaf	flag leaf emergence	40
WideMatch M (fluroxypyr + cloprralid & MCPA)	3 leaf	flag leaf emergence	40

Table SG7. Crop Stage and Harvest Restrictions for Rye

Herbicide Name	Minimum Crop Stage	Maximum Crop Stage	Grain Harvest Restriction (days)
2,4-D, generic (2,4-D)	after fully tillered	prior to jointing	none
Aim (carfentrazone-ethyl)	none	jointing	none
Bison (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bison Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Broclean (bromoxynil)	emergence	boot	none
Bromac (bromoxynil & MCPA)	3 leaf	up to but before boot stage	none
Bromac Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Bronate Advanced (bromoxynil & MCPA)	3 leaf	boot	none
Buctril (bromoxynil)	emergence	boot	none
Double Up B+D (bromoxynil & 2,4-D)	tillering	before jointing	none
MCPA, generic (MCPA)	4 leaf	prior to boot	none
Moxy (bromoxynil)	emergence	prior to boot	none
Orion (florasulam & MCPA)	3 leaf	up to jointing	60
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	3 tillers	jointing	3
Saber (2,4-D)	3 leaf and tillering	before boot	none
Savage (2,4-D)	3 leaf and tillering	before boot	none
Sword (MCPA)	fully tillered	before boot	none

Table SG8. Summary of herbicides for use in Spring Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Burndown			
glyphosate, others (glyphosate)	varies by product (0.39 to 1 lb ai/A)	-	Many formulations available including Cornerstone, Duramax, Durango, Makaze, Roundup, RT3, and Touchdown. Rates vary depending on formulation, target weed species, and weed size. Refer to the respective label. Apply prior to wheat emergence. Controls emerged annual grass and broadleaf weeds with no soil residual.
Gramoxone Inteon 2 S	2 to 4 pts	-	Apply prior to grain emergence but after weeds have emerged. No soil residual. Apply with a nonionic surfactant. Apply the low rate to weeds 1 to 3 inches tall and increase the rate as weed size increases. Restricted use herbicide.
Gramoxone Max 3 S (paraquat)	1.3 to 2.7 pts (0.5 to 1.0 lb ai/A)		
Targa 0.88 E (quizalofop)	5 to 10 fl oz (0.34 to 0.68 lb ai/A)	-	Applications must be made prior to emergence of the crop. Applications made within 7 days prior to planting may result in crop injury.
Preplant or Preemergence			
Fargo 10 G	10 to 12.5 lbs	G	Apply fall or spring for wild oat control. Must be incorporated, except when applying Far-Go granules in the fall.
Fargo 4 E (triallate)	2 to 2.5 pts (1 to 1.25 lb ai/A)		
trifluralin 10 G	5 to 7.5 lbs	F	Apply fall, granules preferred, or postplant spring, liquid formulation preferred. Must be incorporated. Apply after Sept. 1 for fall applications.
trifluralin 4 E (trifluralin)	1 to 1.5 pt (0.5 to 0.75 lb ai/A)		
Postemergence			
2,4-D Amine 4 S	0.5 to 1.33 pt	F	Controls many broadleaf weeds. Weak on wild buckwheat and smartweeds. Apply when wheat is at the 5-leaf stage until just prior to boot. Use the lower rate range (0.16 to 0.5 lb ai/A) for ester formulations and the higher range (0.25 to 0.66 lb ai/A) for amine formulations.
2,4-D Ester 4 E (2,4-D)	0.33 to 1 pt (0.16 to 0.66 lb ai/A)		
Affinity BroadSpec 50 SG (thifensulfuron & tribenuron)	0.4 to 1 oz (0.0125 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. When applying 0.4 to 0.6 oz/A, Affinity BroadSpec must be used in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity BroadSpec should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.
Affinity TankMix 50 SG (thifensulfuron & tribenuron)	0.6 to 1 oz (0.019 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Always apply in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity Tankmix should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.

Table SG8. Summary of herbicides for use in Spring Wheat

<u>Application Type</u>			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Aim 2 EC (carfentrazone-ethyl)	0.5 to 1 fl oz (0.008 to 0.016 lb ai/A)	F/G	Apply up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v. In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. May cause temporary yellowing and stunting.
Assert 2.5 E (imazamethabenz)	1 to 1.5 pts (0.31 to 0.38 lb ai/A)	G	Apply when wild oats are in the 1 to 4-leaf stage and wheat is from the 2-leaf stage until the development of the first internode. Use 1.0 pt when wild oats are in the 1 to 2 leaf stage. The higher rate should be used on larger wild oats or when populations are in excess of 25 plants/sq ft. Note crop rotation restrictions. Always apply Assert with a nonionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution. May be tank-mixed with several other broadleaf herbicides, refer to label.
Axial 0.83 E Axial XL 0.42 E (pinoxaden)	8.2 fl oz 16.4 oz (0.053 lb ai/A)	G	Controls green and yellow foxtails, millets, wild oats, and barnyardgrass. Apply Axial/Axial XL from the 2-leaf stage up to the pre-boot stage. Apply to grass weeds in the 1-leaf to 6-leaf stage. Add Adigor adjuvant at a rate of 9.6 oz/A with Axial. Adigo adjuvant is sold with Axial and one box will treat 40 acres. Axial XL does not require additional adjuvant. Several broadleaf herbicides can be tank mixed with Axial, Axial XL.
Banvel 4 S Banvel SGF 2 S (dicamba)	0.12 to 0.25 pt 0.25 to 0.5 pt (0.06 to 0.125 lb ai/A)	F	Apply before wheat is in the 6-leaf stage. Applying at the 2 to 4- leaf stage will increase safety. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.
Bison 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bison Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Broclean 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Bromac 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bromac Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bronate Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Buctril 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Clarity 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	F	Apply before wheat is in the 6-leaf stage. Applying at the 2 to 4-leaf stage will increase safety. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.

Table SG8. Summary of herbicides for use in Spring Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Clopyr AG 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Colt AS 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters.
Curtail 2.38 L (clopyralid & 2,4-D)	1.5 to 2.67 pts (0.45 to 0.79 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Recommended rate is 2 pts/A. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Use the reduced rate of 1.5 pt/A for control of annual broadleaf weeds only. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Curtail M 2.77 E (clopyralid & MCPA)	1.75 to 2.31 pts (0.61 to 0.81 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply from 3-leaf stage to jointing. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Discover NG 0.5 E (clodinafop-propargyl)	12.8 to 16 fl oz (0.5 to 0.6 lb ai/A)	G	Apply from 2 leaf but before the boot stage. The 12.8 oz/A rate will control wild oat, volunteer (tame) oat, and canarygrass when applied between the 1 and 6 true leaf stage, and barnyardgrass, green and yellow foxtail, and volunteer corn when applied between the 1 and 5 true leaf stage. The 16 fl oz/A rate controls giant foxtail and annual ryegrass when applied between the 1 and 5 true leaf stage. Discover NG may be tank mixed several broadleaf herbicides or broadleaf herbicide combinations. Refer to the label for a list of grasses controlled by each tank mix, required additives, and recommended product rates.
Double Up B+D 3.9 E (bromoxynil & 2,4-D)	0.75 to 2 pts (0.37 to 0.98 lb ai/A)	F	Controls most annual broadleaf weeds and suppresses perennial broadleaves. Apply from tillering stage but before jointing. Apply to weeds up to the 4-leaf stage or 2 inches in height, whichever comes first. Good coverage is essential.
Everest 70 WDG (flucarbazone-sodium)	0.3 to 0.6 oz (0.013 to 0.026 lb ai/A)	F/G	Controls wild oats, foxtails, mustards, and pigweed. Apply from 1-6 leaf stage of small grain. Apply from 1-6 leaf stage of foxtail and wild oat. Apply at a rate of 0.3 oz/A for green foxtail control, 0.4 oz/A for low to moderate infestations of wild oats, and 0.6 oz/A (0.026 lb ai/A) for yellow foxtail suppression and control of high infestations of wild oats or when tank mixed with dicamba. When applied alone or with amine or water soluble herbicides, use 0.25% v/v (1 qt/100 gallons) nonionic surfactant OR for improved control use a basic blend at 0.5% v/v (2 qts/100 gallons) OR methylated seed oil (MSO) at 1.5 pt/A plus ammonium sulfate (AMS) at 1.5 lb/A. Do not add adjuvants when tank mixing with ester or EC based herbicides. When tank mixing with sulfonyleurea herbicides (plus 2,4-D amine or dicamba) add 0.125% v/v (1 pt/100 gallons) nonionic surfactant. Refer to label for tank mix recommendations
Express 50 SG (tribenuron)	0.25 to 0.5 oz (0.008 to 0.016 lb ai/A)	F	For control of many annual broadleaf weeds and Canada thistle suppression. Apply from 2 leaf stage until flag leaf visible. Use lower for small weeds and light infestations. For best Canada thistle control use the 1/2 oz/A rate. Should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations.
Harmony SG 50 SG (thifensulfuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	For control of annual broadleaf weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Unless otherwise noted for a specific tank mix, add a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations

Table SG8. Summary of herbicides for use in Spring Wheat

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Harmony Extra 50 SG (thifensulfuron & tribenuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Apply after the 2-leaf stage but before the flag leaf is visible. Research has shown the 0.75 oz/A rate is the maximum rate needed for annual broadleaf control in Minnesota. Apply with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Apply to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.
Huskie 2.08 EC (pyrasulfotole & bromoxynil)	11 to 15 oz (0.18 to 0.24 lb ai/A)	G	Apply to wheat after the first true leaf has expanded up until flag leaf emergence. Spray additives are recommended with Huskie, especially under adverse conditions. Ammonium sulfate fertilizer (AMS) at 0.5 to 1 lb/A is the preferred additive. Urea ammonium nitrogen (28-32% UAN) at 1 to 2 qt/A may also be used. Can be tank mixed with most small grain herbicides, refer to the label.
MCPA Amine 4 S MCPA Ester 4 E (MCPA)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	G	Controls many broadleaf weeds, but weak on wild buckwheat and smartweeds. Apply from 3- to 4-leaf stage to early boot stage of wheat. Use the lower rate range (0.16 to 0.5 lb ai/A) for ester formulations and the higher range (0.25 to 0.66 lb ai/A) for amine formulations.
Moxy 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Orion 2.373 L (florasulam & MCPA)	17 fl oz (0.315 lb ai/A)	G	Apply from 3-leaf stage up to the jointing stage. Can be tank mixed with other labeled herbicides.
Puma 1 E (fenoxaprop)	0.33 to 0.67 pt (0.41 to 0.84 lb ai/A)	G	Apply from emergence to 60 days before harvest. Apply to annual grass weeds in the 1-leaf to 2-tiller stage. Apply at 0.33 pt/A to control green foxtail, foxtail millets, and volunteer corn; apply 0.4 pt/A to control yellow foxtail and proso millet; Apply 0.67 pt/A to control wild oat and barnyardgrass. See label for tank mixing restrictions.
Rage D-Tech 4.06 EC (carfentrazone-ethyl & 2,4-D)	8 to 16 oz (0.25 to 0.50 lb ai/A)	F/G	Apply to wheat from the 3 tiller stage until jointing. Always add a nonionic surfactant at 0.25% v/v. A sprayable liquid nitrogen fertilizer at 2 to 4 % v/v or ammonium sulfate at 2 to 4 lbs/A may also be added.
Rimfire 10.17 DF (mesosulfuron & propocarbazone)	1.75 to 2.25 oz (0.011 to 0.014 lb ai/A)	G	Apply Rimfire from emergence up to flag leaf emergence. Apply to susceptible grasses from the 1-leaf to the 2-tiller stage. Always apply with an adjuvant. Apply with a methylated seed oil (MSO) at 1.3 to 1.5 pts/A, OR a nonionic surfactant (NIS) at 0.5% v/v (2 qts/100 gallons spray solution) plus an ammonium nitrogen fertilizer (28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A) OR a basic blend adjuvant at 1 to 1.25% v/v. See label for tank mixes.
Silverado 2 WDG (mesosulfuron)	1.75 to 2.25 oz (0.0022 to 0.0028 lb ai/A)	G/F	Apply when wild oats are in the 1-leaf to 2-tiller stage. Always applied with an approved adjuvant. Apply to wheat from emergence but prior to jointing. Always apply with a methylated seed oil (MSO) or a basic blend adjuvant. MSO rate should be 1.5 pts/A (addition of 28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A may improve weed control but leaf burn may occur). The basic blend adjuvant should be added at a rate of 1% v/v or 0.8 to 1.6 pt/A depending on spray volume.
Starane 1.5 EC (fluroxypyr)	0.5 to 0.66 pt (0.09 to 0.12 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 1.33 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Starane + Saber 2.5 E (fluroxypyr & 2,4-D)	1.5 to 2 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.

Table SG8. Summary of herbicides for use in Spring Wheat

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Starane + Salvo 3.75 E (fluroxypyr & 2,4-D)	1 to 1.33 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Sword 3.55 E (fluroxypyr & MCPA)	1.125 to 1.5 pts (0.5 to 0.66 lb ai/A)	G	Apply at the 2 leaf to flag leaf stage. Weak on smartweeds. See label for recropping restrictions.
Starane NXT 2.91 E (fluroxypyr & bromoxynil)	14 to 27.4 oz (0.32 to 0.62 lb ai/A)	G	Apply at the 3-leaf to flag leaf emergence of wheat. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane NXTcp 1.5 + 2 E (fluroxypyr & bromoxynil)	0.33 pt + 1 pt to 0.67 pt + 2 pts (0.32 to 0.62 lb ai/A)	G	Starane NXTcp is a co-pack product. Each co-pack contains 1.6 gal of Starane 1.5E (fluroxypyr) and 5 gal of NXTcp 2E (bromoxynil) in separate containers and will treat between 20 to 40 acres. Apply at the 3-leaf to flag leaf emergence of wheat. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane Ultra 2.8 EC (fluroxypyr)	0.3 to 0.4 pt (0.10 to 0.14 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 0.7 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Sterling Blue 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	F	Apply before wheat is in the 6-leaf stage. Applying at the 2 to 4-leaf stage will increase safety. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.
Stinger 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. Can be used on spring wheat and durum. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Unity WDG 75 WDG (thifensulfuron)	0.3 to 0.6 oz (0.014 to 0.028 lb ai/A)	G	For control of annual weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Good crop safety.
WideMatch 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.
Layby			
Prowl H2O 3.8 CS (pendimethalin)	1.5 to 3 pts (0.62 to 1.24 lb ai/A)	F/G	Apply prior to weed emergence but after the crop has emerged. For control of established weeds, tank mix with a registered postemergence herbicide.

Table SG9. Summary of herbicides for use in Durum Wheat

Application Type		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
<u>Burndown</u>			
glyphosate, others (glyphosate)	varies by product (0.39 to 1 lb ai/A)	-	Many formulations available including Cornerstone, Duramax, Durango, Makaze, Roundup, RT3, and Touchdown. Rates vary depending on formulation, target weed species, and weed size. Refer to the respective label. Apply prior to wheat emergence. Controls emerged annual grass and broadleaf weeds with no soil residual.
Gramoxone Inteon 2 S Gramoxone Max 3 S (paraquat)	2 to 4 pts 1.3 to 2.7 pts (0.5 to 1.0 lb ai/A)	-	Apply prior to grain emergence but after weeds have emerged. No soil residual. Apply with a nonionic surfactant. Apply the low rate to weeds 1 to 3 inches tall and increase the rate as weed size increases. Restricted use herbicide.
Targa 0.88 E (quizalofop)	5 to 10 fl oz (0.34 to 0.68 lb ai/A)	-	Applications must be made prior to emergence of the crop. Applications made within 7 days prior to planting may result in crop injury.
<u>Preplant or Preemergence</u>			
Fargo 10 G Fargo 4 E (triallate)	10 to 12.5 lbs 2 to 2.5 pts (1 to 1.25 lb ai/A)	G	Apply fall or spring for wild oat control. Must be incorporated, except when applying Far-Go granules in the fall.
trifluralin 10 G trifluralin 4 E (trifluralin)	5 to 7.5 lbs 1 to 1.5 pt (0.5 to 0.75 lb ai/A)	F	Apply fall, granules preferred, or postplant spring, liquid formulation preferred. Must be incorporated. Apply after Sept. 1 for fall applications.
<u>Postemergence</u>			
2,4-D Amine 4 S 2,4-D Ester 4 E (2,4-D)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	F	Controls many broadleaf weeds. Weak on wild buckwheat and smartweeds. Apply when wheat is at the 5-leaf stage until just prior to boot. Use the lower rate range (0.16 to 0.5 lb ai/A) for ester formulations and the higher range (0.25 to 0.66 lb ai/A) for amine formulations.
Achieve 3.3 SC (tralkoxydim)	6.9 fl oz (0.18 lb ai/A)	G/F	Apply up to the flag leaf stage. Apply to 1 to 6-leaf wild oat and/or 1 to 5-leaf foxtails (total leaves including tillers) See label for tank mixing restrictions. Always add Supercharge adjuvant to the spray solution at 4 pints/100 gals of water (0.5% v/v). Ammonium sulfate at 7 to 15 lbs/100 gals of water should also be added when water carrier contains more than 400 ppm bicarbonate ions. Applications to tillered durum wheat within 48 hours of freezing temperatures or to non-tillered durum wheat within 48 hours of temperatures less than 40°, may result in crop injury. See label for tank mix recommendations.
Affinity BroadSpec 50 SG (thifensulfuron & tribenuron)	0.4 to 1 oz (0.0125 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. When applying 0.4 to 0.6 oz/A, Affinity BroadSpec must be used in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity BroadSpec should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.

Table SG9. Summary of herbicides for use in Durum Wheat

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Affinity TankMix 50 SG (thifensulfuron & tribenuron)	0.6 to 1 oz (0.019 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Always apply in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity Tankmix should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal). In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.
Aim 2 EC (carfentrazone-ethyl)	0.5 to 1 fl oz (0.008 to 0.016 lb ai/A)	F/G	Apply up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v. In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. May cause temporary yellowing and stunting.
Assert 2.5 E (imazamethabenz)	1 to 1.5 pts (0.31 to 0.38 lb ai/A)	G	Apply when wild oats are in the 1 to 4-leaf stage and wheat is from the 2-leaf stage until the development of the first internode. Use 1.0 pt when wild oats are in the 1 to 2 leaf stage. The higher rate should be used on larger wild oats or when populations are in excess of 25 plants/sq ft. Note crop rotation restrictions. Always apply Assert with a nonionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution. May be tank-mixed with several other broadleaf herbicides, refer to label.
Banvel 4 S Banvel SGF 2 S (dicamba)	0.12 to 0.25 pt 0.25 to 0.5 pt (0.06 to 0.125 lb ai/A)	F	Apply before wheat is in the 6-leaf stage. Applying at the 2 to 4- leaf stage will increase safety. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.
Bison 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bison Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Broclean 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Bromac 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bromac Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bronate Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Buctril 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Clarity 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	F	Apply before wheat is in the 6-leaf stage. Applying at the 2 to 4-leaf stage will increase safety. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.

Table SG9. Summary of herbicides for use in Durum Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Clopyr AG 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Colt AS 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters.
Curtail 2.38 L (clopyralid & 2,4-D)	1.5 to 2.67 pts (0.45 to 0.79 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Recommended rate is 2 pts/A. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Use the reduced rate of 1.5 pt/A for control of annual broadleaf weeds only. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Curtail M 2.77 E (clopyralid & MCPA)	1.75 to 2.31 pts (0.61 to 0.81 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply from 3-leaf stage to jointing. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Discover NG 0.5 E (clodinafop-propargyl)	12.8 to 16 fl oz (0.05 to 0.06 lb ai/A)	G	Apply from 2 leaf but before the boot stage. The 12.8 oz/A rate will control wild oat, volunteer (tame) oat, and canarygrass when applied between the 1 and 6 true leaf stage, and barnyardgrass, green and yellow foxtail, and volunteer corn when applied between the 1 and 5 true leaf stage. The 16 fl oz/A rate controls giant foxtail and annual ryegrass when applied between the 1 and 5 true leaf stage. Discover NG may be tank mixed several broadleaf herbicides or broadleaf herbicide combinations. Refer to the label for a list of grasses controlled by each tank mix, required additives, and recommended product rates.
Double Up B+D 3.9 E (bromoxynil & 2,4-D)	0.75 to 2 pts (0.37 to 0.98 lb ai/A)	F	Controls most annual broadleaf weeds and suppresses perennial broadleaves. Apply from tillering stage but before jointing. Apply to weeds up to the 4-leaf stage or 2 inches in height, whichever comes first. Good coverage is essential.
Everest 70 WDG (flucarbazone-sodium)	0.3 to 0.6 oz (0.013 to 0.026 lb ai/A)	F/G	Controls wild oats, foxtails, mustards, and pigweed. Apply from 1-6 leaf stage of small grain. Apply from 1-6 leaf stage of foxtail and wild oat. Apply at a rate of 0.3 oz/A for green foxtail control, 0.4 oz/A for low to moderate infestations of wild oats, and 0.6 oz/A (0.026 lb ai/A) for yellow foxtail suppression and control of high infestations of wild oats or when tank mixed with dicamba. When applied alone or with amine or water soluble herbicides, use 0.25% v/v (1 qt/100 gallons) nonionic surfactant OR for improved control use a basic blend at 0.5% v/v (2 qts/100 gallons) OR methylated seed oil (MSO) at 1.5 pt/A plus ammonium sulfate (AMS) at 1.5 lb/A. Do not add adjuvants when tank mixing with ester or EC based herbicides. When tank mixing with sulfonyleurea herbicides (plus 2,4-D amine or dicamba) add 0.125% v/v (1 pt/100 gallons) nonionic surfactant. Refer to label for tank mix recommendations
Express 50 SG (tribenuron)	0.25 to 0.5 oz (0.008 to 0.016 lb ai/A)	F	For control of many annual broadleaf weeds and Canada thistle suppression. Apply from 2 leaf stage until flag leaf visible. Use lower for small weeds and light infestations. For best Canada thistle control use the 1/2 oz/A rate. Should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations.
Harmony SG 50 SG (thifensulfuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	For control of annual broadleaf weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Unless otherwise noted for a specific tank mix, add a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations

Table SG9. Summary of herbicides for use in Durum Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Harmony Extra 50 SG (thifensulfuron & tribenuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Apply after the 2-leaf stage but before the flag leaf is visible. Research has shown the 0.75 oz/A rate is the maximum rate needed for annual broadleaf control in Minnesota. Apply with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Apply to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.
Huskie 2.08 EC (pyrasulfotole & bromoxynil)	11 to 15 oz (0.18 to 0.24 lb ai/A)	G	Apply to wheat after the first true leaf has expanded up until flag leaf emergence. Spray additives are recommended with Huskie, especially under adverse conditions. Ammonium sulfate fertilizer (AMS) at 0.5 to 1 lb/A is the preferred additive. Urea ammonium nitrogen (28-32% UAN) at 1 to 2 qt/A may also be used. Can be tank mixed with most small grain herbicides, refer to the label.
MCPA Amine 4 S MCPA Ester 4 E (MCPA)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	G	Controls many broadleaf weeds, but weak on wild buckwheat and smartweeds. Apply from 3- to 4-leaf to early boot stage of wheat. Use the lower rate range (0.16 to 0.5 lb ai/A) for ester formulations and the higher range (0.25 to 0.66 lb ai/A) for amine formulations.
Moxy 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Orion 2.373 L (florasulam & MCPA)	17 fl oz (0.315 lb ai/A)	G	Apply from 3-leaf stage up to the jointing stage. Can be tank mixed with other labeled herbicides.
Puma 1 E (fenoxaprop)	0.33 to 0.67 pt (0.41 to 0.84 lb ai/A)	G	Apply from emergence to 60 days before harvest. Apply to annual grass weeds in the 1-leaf to 2-tiller stage. Apply at 0.33 pt/A to control green foxtail, foxtail millets, and volunteer corn; apply 0.4 pt/A to control yellow foxtail and proso millet; Apply 0.67 pt/A to control wild oat and barnyardgrass. See label for tank mixing restrictions.
Rage D-Tech 4.06 EC (carfentrazone-ethyl & 2,4-D)	8 to 16 oz (0.25 to 0.50 lb ai/A)	F/G	Apply to wheat from the 3 tiller stage until jointing. Always add a nonionic surfactant at 0.25% v/v. A sprayable liquid nitrogen fertilizer at 2 to 4 % v/v or ammonium sulfate at 2 to 4 lbs/A may also be added.
Rimfire 10.17 DF (mesosulfuron & propocarbazone)	1.75 to 2.25 oz (0.011 to 0.014 lb ai/A)	G	Apply Rimfire from emergence up to flag leaf emergence. Apply to susceptible grasses from the 1-leaf to the 2-tiller stage. Always apply with an adjuvant. Apply with a methylated seed oil (MSO) at 1.3 to 1.5 pts/A, OR a nonionic surfactant (NIS) at 0.5% v/v (2 qts/100 gallons spray solution) plus an ammonium nitrogen fertilizer (28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A) OR a basic blend adjuvant at 1 to 1.25% v/v. See label for tank mixes.
Silverado 2 WDG (mesosulfuron)	1.75 to 2.25 oz (0.0022 to 0.0028 lb ai/A)	G/F	Apply when wild oats are in the 1-leaf to 2-tiller stage. Always applied with an approved adjuvant. Apply to wheat from emergence but prior to jointing. Always apply with a methylated seed oil (MSO) or a basic blend adjuvant. MSO rate should be 1.5 pts/A (addition of 28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A may improve weed control but leaf burn may occur). The basic blend adjuvant should be added at a rate of 1% v/v or 0.8 to 1.6 pt/A depending on spray volume.
Starane 1.5 EC (fluroxypyr)	0.5 to 0.66 pt (0.09 to 0.12 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 1.33 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Starane + Saber 2.5 E (fluroxypyr & 2,4-D)	1.5 to 2 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.

Table SG9. Summary of herbicides for use in Durum Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Starane + Salvo 3.75 E (fluroxypyr & 2,4-D)	1 to 1.33 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Sword 3.55 E (fluroxypyr & MCPA)	1.125 to 1.5 pts (0.5 to 0.66 lb ai/A)	G	Apply at the 2 leaf to flag leaf stage. Weak on smartweeds. See label for recropping restrictions.
Starane NXT 2.91 E (fluroxypyr & bromoxynil)	14 to 27.4 oz (0.32 to 0.62 lb ai/A)	G	Apply at the 3-leaf to flag leaf emergence of wheat. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane NXTcp 1.5 + 2 E (fluroxypyr & bromoxynil)	0.33 pt + 1 pt to 0.67 pt + 2 pts (0.32 to 0.62 lb ai/A)	G	Starane NXTcp is a co-pack product. Each co-pack contains 1.6 gal of Starane 1.5E (fluroxypyr) and 5 gal of NXTcp 2E (bromoxynil) in separate containers and will treat between 20 to 40 acres. Apply at the 3-leaf to flag leaf emergence of wheat. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane Ultra 2.8 EC (fluroxypyr)	0.3 to 0.4 pt (0.10 to 0.14 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 0.7 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Sterling Blue 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	F	Apply before wheat is in the 6-leaf stage. Applying at the 2 to 4-leaf stage will increase safety. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.
Stinger 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. Can be used on spring wheat and durum. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Unity WDG 75 WDG (thifensulfuron)	0.3 to 0.6 oz (0.014 to 0.028 lb ai/A)	G	For control of annual weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Good crop safety.
WideMatch 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.
Layby			
Prowl H20 3.8 CS (pendimethalin)	1.5 to 3 pts (0.62 to 1.24 lb ai/A)	F/G	Apply prior to weed emergence but after the crop has emerged. For control of established weeds, tank mix with a registered postemergence herbicide.

Table SG10. Summary of herbicides for use in Barley

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Burndown			
glyphosate, others (glyphosate)	varies by product (0.39 to 1 lb ai/A)	-	Many formulations available including Cornerstone, Duramax, Durango, Makaze, Roundup, RT3, and Touchdown. Rates vary depending on formulation, target weed species, and weed size. Refer to the respective label. Apply prior to barley emergence. Controls emerged annual grassy and broadleaf weeds with no soil residual.
Gramoxone Inteon 2 S Gramoxone Max 3 S (paraquat)	2 to 4 pts 1.3 to 2.7 pts (0.5 to 1.0 lb ai/A)	-	Apply prior to grain emergence for control of emerged weeds. No soil residual. Apply with a nonionic surfactant. Restricted Use Herbicide.
Targa 0.88 E (quizalofop)	5 to 10 fl oz (0.34 to 0.68 lb ai/A)	-	Applications must be made prior to emergence of the crop. Applications made within 7 days prior to planting may result in crop injury.
Preplant or Preemergence			
Fargo 10 G Fargo 4 E (triallate)	10 to 12.5 lbs 2 to 2.5 pts (1 to 1.25 lb ai/A)	G	Apply fall or spring for wild oat control. Must be incorporated, except when applying Far-Go granules in the fall.
trifluralin 10 G trifluralin 4 E (trifluralin)	5 to 7.5 lbs 1 to 1.5 pt (0.5 to 0.75 lb ai/A)	F	If applied in fall, granules preferred. Must be incorporated. In spring, apply preplanted incorporated or preemergence incorporated. Liquid formulated preferred in spring.
Postemergence			
2,4-D Amine 4 S 2,4-D Ester 4 E (2,4-D)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	G	Controls many broadleaf weeds. Weak on wild buckwheat and smartweed. Apply when barley is at the 5-leaf stage until just prior to boot.
Achieve 3.3 SC (tralkoxydim)	6.9 fl oz (0.18 lb ai/A)	G/F	Apply to barley from emergence to the flag leaf stage. Apply to 1 to 6-leaf wild oat and/or 1 to 5-leaf foxtails (total leaves including tillers) See label for tank mixing restrictions. Always add Supercharge adjuvant to the spray solution at 4 pints/100 gals of water (0.5% v/v). Ammonium sulfate at 7 to 15 lbs/100 gals of water should also be added when water carrier contains more than 400 ppm bicarbonate ions. Applications to tillered barley within 48 hours of freezing temperatures or to non-tillered barley within 48 hours of temperatures less than 40°, may result in crop injury. See label for tank mix recommendations.
Affinity BroadSpec 50 SG (thifensulfuron & tribenuron)	0.4 to 1 oz (0.0125 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. When applying 0.4 to 0.6 oz/A, Affinity BroadSpec must be used in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity BroadSpec should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.

Table SG10. Summary of herbicides for use in Barley

Application Type		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Affinity TankMix 50 SG (thifensulfuron & tribenuron)	0.6 to 1 oz (0.019 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Always apply in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity Tankmix should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.
Aim 2 EC (carfentrazone-ethyl)	0.5 to 1 fl oz (0.008 to 0.016 lb ai/A)	F/G	Apply up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v. In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. May cause temporary yellowing and stunting.
Assert 2.5 E (imazamethabenz)	1 to 1.5 pts (0.31 to 0.38 lb ai/A)	G	Apply when wild oats are in the 1 to 4-leaf stage and barley is from the 2-leaf stage until the development of the first internode. Use 1.0 pt when wild oats are in the 1 to 2 leaf stage. The higher rate should be used on larger wild oats or when populations are in excess of 25 plants/sq ft. Note crop rotation restrictions. Always apply Assert with a nonionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution. May be tank-mixed with several other broadleaf herbicides, refer to label.
Axial 0.83 E Axial XL 0.42 E (pinoxaden)	8.2 fl oz 16.4 oz (0.053 lb ai/A)	G	Controls green and yellow foxtails, millets, wild oats, and barnyardgrass. Apply Axial/Axial XL from the 2-leaf stage up to the pre-boot stage. Apply to grass weeds in the 1-leaf to 6-leaf stage. Add Adigor adjuvant at a rate of 9.6 oz/A with Axial. Adigo adjuvant is sold with Axial and one box will treat 40 acres. Axial XL does not require additional adjuvant. Several broadleaf herbicides can be tank mixed with Axial, Axial XL.
Banvel 4 S Banvel SGF 2 S (dicamba)	2 to 3 fl oz 4 to 6 fl oz (0.06 to 0.09 lb ai/A)	P/F	Apply before barley is in the 4-leaf stage. Potential for barley injury as barley tolerance is only fair. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes. Use lower rate in tank mixes.
Bison 4 E (bromoxynil & MCPA)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Bison Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Broclean 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Bromac 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bromac Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bronate Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.

Table SG10. Summary of herbicides for use in Barley

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Buctril 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Clarity 4 S (dicamba)	2 to 3 fl oz (0.06 to 0.09 lb ai/A)	P/F	Apply before barley is in the 3-leaf stage. Potential for barley injury as barley tolerance is only fair. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes. Use lower rate in tank mixes.
Clopyr AG 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Colt AS 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.
Curtail 2.38 L (clopyralid & 2,4-D)	1.5 to 2.67 pts (0.45 to 0.79 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Recommended rate is 2 pts/A. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Use the reduced rate of 1.5 pt/A for control of annual broadleaf weeds only. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Curtail M 2.77 E (clopyralid & MCPA)	1.75 to 2.31 pts (0.61 to 0.81 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply from 3-leaf stage to jointing. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Double Up B+D 3.9 E (bromoxynil & 2,4-D)	0.75 to 2 pts (0.37 to 0.98 lb ai/A)	G	Controls most annual broadleaf weeds and suppresses perennial broadleaves. Apply from tillering stage but before jointing. Apply to weeds up to the 4-leaf stage or 2 inches in height, whichever comes first. Good coverage is essential.
Express 50 SG (tribenuron)	0.25 to 0.5 oz (0.008 to 0.016 lb ai/A)	F/G	For control of many annual broadleaf weeds and Canada thistle suppression. Apply from 2 leaf stage until flag leaf visible. Use lower for small weeds and light infestations. For best Canada thistle control use the 1/2 oz/A rate. Should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations.
Harmony SG 50 SG (thifensulfuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	For control of annual broadleaf weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Unless otherwise noted for a specific tank mix, add a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations
Harmony Extra 50 SG (thifensulfuron & tribenuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Apply after the 2-leaf stage but before the flag leaf is visible. Research has shown the 0.75 oz/A rate is the maximum rate needed for annual broadleaf control in Minnesota. Apply with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Apply to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.. Addition of 2,4-D will increase crop safety.

Table SG10. Summary of herbicides for use in Barley

<u>Application Type</u>			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Huskie 2.08 EC (pyrasulfotole & bromoxynil)	11 to 15 oz (0.18 to 0.24 lb ai/A)	G	Apply to barley after the first true leaf has expanded up until flag leaf emergence. Spray additives are recommended with Huskie, especially under adverse conditions. Ammonium sulfate fertilizer (AMS) at 0.5 to 1 lb/A is the preferred additive. Urea ammonium nitrogen (28-32% UAN) at 1 to 2 qt/A may also be used. Can be tank mixed with most small grain herbicides, refer to the label.
MCPA Amine 4 S MCPA Ester 4 E (MCPA)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	G	Controls many broadleaf weeds, but weak on wild buckwheat and smartweed. Apply from 3- to 4-leaf to early boot stage of barley.
Moxy 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Apply from crop emergence until boot stage. Postemergence control of most small broadleaf annual weeds. Weak on wild mustard and pigweed.
Orion 2.373 L (florasulam & MCPA)	17 fl oz (0.315 lb ai/A)	G	Apply from 3-leaf stage up to the jointing stage. Can be tank mixed with other labeled herbicides.
Puma 1 E (fenoxaprop)	0.33 to 0.67 pt (0.41 to 0.84 lb ai/A)	G	Apply to barley from emergence up to the 4-leaf stage. Apply to grass annual weeds in the 1-leaf to 2-tiller stage. Apply at 0.33 pt/A to control green foxtail, foxtail millets, and volunteer corn; apply 0.4 pt/A to control yellow foxtail and proso millet; Apply 0.67 pt/A to control wild oat and barnyardgrass. See label for tank mix recommendations.
Rage D-Tech 4.06 EC (carfentrazone-ethyl & 2,4-D)	8 to 16 oz (0.25 to 0.50 lb ai/A)	F	Apply to barley from the 3 tiller stage until jointing. Always add a nonionic surfactant at 0.25% v/v. A sprayable liquid nitrogen fertilizer at 2 to 4 % v/v or ammonium sulfate at 2 to 4 lbs/A may also be added.
Starane 1.5 EC (fluroxypyr)	0.5 to 0.66 pt (0.09 to 0.12 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 1.33 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Starane + Saber 2.5 E (fluroxypyr & 2,4-D)	1.5 to 2 pts (0.047 to 0.62 lb ai/A)	G	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Salvo 3.75 E (fluroxypyr & 2,4-D)	1 to 1.33 pts (0.047 to 0.62 lb ai/A)	G	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Sword 3.55 E (fluroxypyr & MCPA)	1.125 to 1.5 pts (0.5 to 0.66 lb ai/A)	G	Apply at the 2 leaf to flag leaf stage. Weak on smartweeds. See label for recropping restrictions.
Starane NXT 2.91 E (fluroxypyr & bromoxynil)	14 to 27.4 oz (0.32 to 0.62 lb ai/A)	G	Apply from the 3 leaf stage up to flag leaf emergence. Can be tank mixed with other labeled herbicides.
Starane NXTcp 1.5 + 2 E (fluroxypyr & bromoxynil)	0.33 pt + 1 pt to 0.67 pt + 2 pts (0.32 to 0.62 lb ai/A)	G	Starane NXTcp is a co-pack product. Each co-pack contains 1.6 gal of Starane 1.5E (fluroxypyr) and 5 gal of NXTcp 2E (bromoxynil) in separate containers and will treat between 20 to 40 acres. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane Ultra 2.8 EC (fluroxypyr)	0.3 to 0.4 pt (0.10 to 0.14 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 0.7 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.

Table SG10. Summary of herbicides for use in Barley

<u>ApplicationType</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Sterling Blue 4 S (dicamba)	0.19 (0.09 lb ai/A)	P/F	Apply before barley is in the 3-leaf stage. Potential for barley injury as barley tolerance is only fair. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes. Use lower rate in tank mixes.
Stinger 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Unity WDG 75 WDG (thifensulfuron)	0.3 to 0.6 oz (0.014 to 0.028 lb ai/A)	G	For control of annual weeds. Apply from 2 leaf stage until prior to flag leaf emergence. Good crop safety.
WideMatch 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.

Table SG11. Summary of herbicides for use in Oats

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Burndown			
glyphosate, others (glyphosate)	varies by product (0.39 to 1 lb ai/A)	-	Many formulations available including Cornerstone, Duramax, Durango, Makaze, Roundup, RT3, and Touchdown. Rates vary depending on formulation, target weed species, and weed size. Refer to the respective label. Apply prior to oat emergence. Controls emerged annual grass and broadleaf weeds with no soil residual.
Postemergence			
2,4-D Amine 4 S	0.5 to 0.66 pt	P	Oat tolerance is marginal and only should be applied if crop injury is acceptable.
2,4-D Ester 4 E (2,4-D)	0.5 to 0.66 pt (0.25 to 0.38 lb ai/A)		
Affinity BroadSpec 50 SG (thifensulfuron & tribenuron)	0.4 oz (0.0125 lb ai/A)	F	Controls many annual broadleaf weeds and will suppress Canada thistle. Apply only in a tank-mix combination with another registered herbicide. Do not apply on the oat varieties Ogle, Porter, or Premier. See label for tank-mix and adjuvant recommendations.
Affinity TankMix 50 SG (thifensulfuron & tribenuron)	0.6 to 0.75 oz (0.019 to 0.023 lb ai/A)	F	Controls many annual broadleaf weeds. Apply to oats from the 3-leaf stage but before jointing and only in a tank-mix combinations with another registered herbicides. Do not apply on the oat varieties Ogle, Porter, or Premier. See label for tank-mix and adjuvant recommendations.
Aim 2 EC (carfentrazone-ethyl)	0.5 to 1 fl oz (0.008 to 0.016 lb ai/A)	F/G	Apply up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v. In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. May cause temporary yellowing and stunting.
Banvel 4 S Banvel SGF 2 S (dicamba)	0.12 to 0.25 pt 0.25 to 0.5 pt (0.06 to 0.125 lb ai/A)	G	Apply before 5-leaf stage of oats. Controls many broadleaf weeds, including wild buckwheat and smartweed.
Bison 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bison Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Broclean 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Controls most annual broadleaf weeds. Weak on wild mustard and pigweed. Apply from oat emergence until boot stage.
Bromac 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bromac Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bronate Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.

Table SG11. Summary of herbicides for use in Oats

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Buctril 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Controls most annual broadleaf weeds. Weak on wild mustard and pigweed. Apply from oat emergence until boot stage.
Clarity 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	G	Apply before 5-leaf stage of oats. Controls many broadleaf weeds, including wild buckwheat and smartweed.
Clopyr AG 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Colt AS 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.
Curtail M 2.77 E (clopyralid & MCPA)	1.75 to 2.31 pts (0.61 to 0.81 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply from 3-leaf stage to jointing. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Note recropping restrictions.
Double Up B+D 3.9 E (bromoxynil & 2,4-D)	0.75 to 2 pts (0.37 to 0.98 lb ai/A)	P	Controls most annual broadleaf weeds and suppresses perennial broadleaves. Apply from tillering stage but before jointing. Apply to weeds up to the 4-leaf stage or 2 inches in height, whichever comes first. Good coverage is essential.
Harmony SG 50 SG (thifensulfuron)	0.45 to 0.6 oz (0.014 to 0.019 lb ai/A)	G	For control of annual broadleaf weeds. Apply from 3-leaf stage until prior to jointing. Add a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions.
Harmony Extra 50 SG (thifensulfuron & tribenuron)	0.45 to 0.6 oz (0.014 to 0.019 lb ai/A)	F	For control of most annual broad leaf weeds and Canada thistle suppression. Apply from 3-leaf stage but prior to jointing. Do Not apply to the varieties of Ogle, Porter or Premier. Apply with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Apply to young actively growing weeds that are less than 4 inches tall or across.
MCPA Amine 4 S MCPA Ester 4 E (MCPA)	0.5 to 0.66 pt 0.5 to 0.66 pt (0.25 to 0.375 lb ai/A)	G	Controls most broadleaf weeds. Weak on wild buckwheat and smartweeds. Apply to oats from 3- to 4-leaf stage to boot stage. Oat injury is possible.
Moxy 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.5 lb ai/A)	G	Controls most annual broadleaf weeds. Weak on wild mustard and pigweed. Apply from oat emergence until boot stage.
Orion 2.373 L (florasulam & MCPA)	17 fl oz (0.315 lb ai/A)	G	Apply from 3-leaf stage up to the jointing stage. Can be tank mixed with other labeled herbicides.
Rage D-Tech 4.06 EC (carfentrazone-ethyl & 2,4-D)	8 to 16 oz (0.25 to 0.50 lb ai/A)	P	Apply to oats from the 3 tiller stage until jointing. Always add a nonionic surfactant at 0.25% v/v. A sprayable liquid nitrogen fertilizer at 2 to 4 % v/v or ammonium sulfate at 2 to 4 lbs/A may also be added.
Starane 1.5 EC (fluroxypyr)	0.5 to 0.66 pt (0.09 to 0.12 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 1.33 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.

Table SG11. Summary of herbicides for use in Oats

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Starane + Saber 2.5 E (fluroxypyr & 2,4-D)	1.5 to 2 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Salvo 3.75 E (fluroxypyr & 2,4-D)	1 to 1.33 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Sword 3.55 E (fluroxypyr & MCPA)	1.125 to 1.5 pts (0.5 to 0.66 lb ai/A)	G	Apply at the 2 leaf to flag leaf stage. Weak on smartweeds. See label for recropping restrictions.
Starane NXT 2.91 E (fluroxypyr & bromoxynil)	14 to 27.4 oz (0.32 to 0.62 lb ai/A)	G	Apply at the 3-leaf to flag leaf emergence of oats. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane NXTcp 1.5 + 2 E (fluroxypyr & bromoxynil)	0.33 pt + 1 pt to 0.67 pt + 2 pts (0.32 to 0.62 lb ai/A)	G	Starane NXTcp is a co-pack product. Each co-pack contains 1.6 gal of Starane 1.5E (fluroxypyr) and 5 gal of NXTcp 2E (bromoxynil) in separate containers and will treat between 20 to 40 acres. Apply at the 3-leaf to flag leaf emergence of oats. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane Ultra 2.8 EC (fluroxypyr)	0.3 to 0.4 pt (0.10 to 0.14 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 0.7 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Sterling Blue 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	G	Apply before 5-leaf stage of oats. Controls many broadleaf weeds, including wild buckwheat and smartweed.
Stinger 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Unity WDG 75 WDG (thifensulfuron)	0.03 to 0.4 oz (0.014 to 0.019 lb ai/A)	G	For control of annual weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Good crop safety. See label for variety restrictions.
WideMatch 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.

Table SG12. Summary of herbicides for use in Winter Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
<u>Burndown</u>			
glyphosate, others (glyphosate)	varies by product (0.39 to 1 lb ai/A)	-	Many formulations available including Cornerstone, Duramax, Durango, Makaze, Roundup, RT3, and Touchdown. Rates vary depending on formulation, target weed species, and weed size. Refer to the respective label. Apply prior to wheat emergence. Controls emerged annual grass and broadleaf weeds with no soil residual.
Gramoxone Inteon 2 S Gramoxone Max 3 S (paraquat)	2 to 4 pts 1.3 to 2.7 pts (0.5 to 1.0 lb ai/A)	-	Apply prior to grain emergence but after weeds have emerged. No soil residual. Apply with a nonionic surfactant. Apply the low rate to weeds 1 to 3 inches tall and increase the rate as weed size increases. Restricted Use Herbicide.
Targa 0.88 E (quizalofop)	5 to 10 fl oz (0.34 to 0.68 lb ai/A)	-	Applications must be made prior to emergence of the crop. Applications made within 7 days prior to planting may result in crop injury.
<u>Preplant or Preemergence</u>			
Fargo 10 G Fargo 4 E (triallate)	12.5 lbs 2.5 pts (1.25 lb ai/A)	G	Apply fall or spring for wild oat control. Must be incorporated, except when applying Far-Go granules in the fall.
<u>Postemergence</u>			
2,4-D Amine 4 S 2,4-D Ester 4 E (2,4-D)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	F	Controls many broadleaf weeds. Weak on wild buckwheat and smartweeds. Do Not apply in fall. Apply after wheat has tillered, but before boot stage.
Achieve 3.3 SC (tralkoxydim)	6.9 fl oz (0.18 lb ai/A)	G/F	Apply up to the flag leaf stage. Apply to 1 to 6-leaf wild oat and/or 1 to 5-leaf foxtails (total leaves including tillers) See label for tank mixing restrictions. Always add Supercharge adjuvant to the spray solution at 4 pints/100 gals of water (0.5% v/v). Ammonium sulfate at 7 to 15 lbs/100 gals of water should also be added when water carrier contains more than 400 ppm bicarbonate ions. Applications to tillered winter wheat within 48 hours of freezing temperatures or to non-tillered winter wheat within 48 hours of temperatures less than 40°, may result in crop injury. See label for tank mix recommendations.
Affinity BroadSpec 50 SG (thifensulfuron & tribenuron)	0.4 to 1 oz (0.0125 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. When applying 0.4 to 0.6 oz/A, Affinity BroadSpec must be used in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity BroadSpec should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.
Affinity TankMix 50 SG (thifensulfuron & tribenuron)	0.6 to 1 oz (0.019 to 0.032 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Always apply in a tank-mix combination with another registered herbicide. Apply after the 2-leaf stage but before the flag leaf is visible. Unless otherwise noted in the tank-mix section on the label, Affinity Tankmix should be applied with a nonionic surfactant (NIS) at 0.25% to 0.5% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. Best control results are obtained when Affinity BroadSpec is applied to young actively growing weeds that are less than 4 inches tall or across. See label for tank-mix recommendations.

Table SG12. Summary of herbicides for use in Winter Wheat

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
<u>Postemergence</u>			
Aim 2 EC (carfentrazone-ethyl)	0.5 to 1 fl oz (0.008 to 0.016 lb ai/A)		Apply up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v. In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control. May cause temporary yellowing and stunting.
Assert 2.5 E (imazamethabenz)	1 to 1.5 pts (0.31 to 0.38 lb ai/A)	G	Apply when wild oats are in the 1 to 4-leaf stage and wheat is from the 2-leaf stage until the development of the first internode. Use 1.0 pt when wild oats are in the 1 to 2 leaf stage. The higher rate should be used on larger wild oats or when populations are in excess of 25 plants/sq ft. Note crop rotation restrictions. Always apply Assert with a nonionic surfactant at a rate of 2 pts of surfactant per 100 gallons of spray solution. May be tank-mixed with several other broadleaf herbicides, refer to label.
Axial 0.83 E Axial XL 0.42 E (pinoxaden)	8.2 fl oz 16.4 oz (0.053 lb ai/A)	G	Controls green and yellow foxtails, millets, wild oats, and barnyardgrass. Apply Axial/Axial XL from the 2-leaf stage up to the pre-boot stage. Apply to grass weeds in the 1-leaf to 6-leaf stage. Add Adigor adjuvant at a rate of 9.6 oz/A with Axial. Adigo adjuvant is sold with Axial and one box will treat 40 acres. Axial XL does not require additional adjuvant. Several broadleaf herbicides can be tank mixed with Axial, Axial XL.
Banvel 4 S Banvel SGF 2 S (dicamba)	0.12 to 0.25 pt 0.25 to 0.5 pt (0.06 to 0.125 lb ai/A)	F	Apply prior to jointing stage. Apply in spring for less injury. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.
Bison 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bison Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Broclean 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.38 lb ai/A)	G	Apply from wheat emergence until boot stage. Can be applied in the fall. Postemergence control of most small broadleaf weeds. Weak on wild mustard and pigweed.
Bromac 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bromac Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bronate Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Buctril 2 E (bromoxynil)	1 to 1.5 pts (0.25 to 0.38 lb ai/A)	G	Apply from wheat emergence until boot stage. Can be applied in the fall. Postemergence control of most small broadleaf weeds. Weak on wild mustard and pigweed.
Clarity 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	F	Apply prior to jointing stage. Apply in spring for less injury. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.

Table SG12. Summary of herbicides for use in Winter Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Clopyr AG 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
Colt AS 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters.
Curtail 2.38 L (clopyralid & 2,4-D)	1.5 to 2.67 pts (0.45 to 0.79 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Recommended rate is 2 pts/A. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Use the reduced rate of 1.5 pt/A for control of annual broadleaf weeds only. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Curtail M 2.77 E (clopyralid & MCPA)	1.75 to 2.31 pts (0.61 to 0.81 lb ai/A)	G	For control of most annual broadleaf weeds and Canada thistle suppression. Apply from 3-leaf stage to jointing. The higher rate may be used if condition of the weeds and/or crop prevent optimal control, however the higher rate may increase risk of crop injury. Can be tank mixed with most other labeled herbicides, refer to the respective labels. Note recropping restrictions.
Discover NG 0.5 E (clodinafop-propargyl)	12.8 to 16 fl oz (0.05 to 0.06 lb ai/A)	G	Apply from 2 leaf but before the boot stage. The 12.8 oz/A rate will control wild oat, volunteer (tame) oat, and canarygrass when applied between the 1 and 6 true leaf stage, and barnyardgrass, green and yellow foxtail, and volunteer corn when applied between the 1 and 5 true leaf stage. The 16 fl oz/A rate controls giant foxtail and annual ryegrass when applied between the 1 and 5 true leaf stage. Discover NG may be tank mixed several broadleaf herbicides or broadleaf herbicide combinations. Refer to the label for a list of grasses controlled by each tank mix, required additives, and recommended product rates.
Double Up B+D 3.9 E (bromoxynil & 2,4-D)	0.75 to 2 pts (0.37 to 0.98 lb ai/A)	F	Controls most annual broadleaf weeds and suppresses perennial broadleaves. Apply from tillering stage but before jointing. Apply to weeds up to the 4-leaf stage or 2 inches in height, whichever comes first. Good coverage is essential.
Everest 70 WDG (flucarbazone-sodium)	0.3 to 0.6 oz (0.013 to 0.026 lb ai/A)	F/G	Controls wild oats, foxtails, mustards, and pigweed. Everest may be applied in the fall or spring. Apply from 1-6 leaf stage of small grain. Apply from 1-6 leaf stage of foxtail and wild oat. Apply at a rate of 0.3 oz/A for green foxtail control, 0.4 oz/A for low to moderate infestations of wild oats, and 0.6 oz/A for yellow foxtail suppression and control of high infestations of wild oats or when tank mixed with dicamba. Follow one of the two adjuvant recommendations when applying Everest alone or with any tank mix combination on winter wheat. 1) Use 0.125 to 0.25 %v/v (0.5 to 1 qt/100 gallons) nonionic surfactant (NIS). For improved performance on susceptible weeds, add (in addition to NIS) liquid nitrogen fertilizer at 2 qt/A (up to 50% of spray solution may be used if making application in the spring) or ammonium sulfate fertilizer (AMS) at 1.5 lb/A. 2) Add a basic blend at 0.5% v/v (2 qts/100 gallons) OR methylated seed oil (MSO) at 1.5 pt/A plus ammonium sulfate (AMS) at 1.5 lb/A. See label for tank mix recommendations
Express 50 SG (tribenuron)	0.25 to 0.5 oz (0.008 to 0.016 lb ai/A)	G	For control of many annual broadleaf weeds and Canada thistle suppression. Apply from 2 leaf stage until flag leaf visible. Use lower for small weeds and light infestations. For best Canada thistle control use the 1/2 oz/A rate. Should be applied with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations.
Harmony SG 50 SG (thifensulfuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	For control of annual broadleaf weeds. Apply from 2-leaf stage until prior to flag leaf emergence. Unless otherwise noted for a specific tank mix, add a nonionic surfactant (NIS) at 0.25% to 0.5% v/v (2 to 4 pt/100 gal) or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1 to 2% v/v (1 to 2 gal/100 gal). The use of NIS is recommended over COC or MSO. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank mix recommendations

Table SG12. Summary of herbicides for use in Winter Wheat

<u>Application Type</u>		Crop	
Herbicide / Formulation	Rate Range	Tolerance	Remarks
Postemergence			
Harmony Extra 50 SG (thifensulfuron & tribenuron)	0.45 to 0.9 oz (0.014 to 0.028 lb ai/A)	G	Controls many annual broadleaf weeds and will suppress Canada thistle. Research has shown the 0.75 oz/A rate is the maximum rate needed for annual broadleaf control in Minnesota. Apply after the 2-leaf stage but before the flag leaf is visible. Apply with a nonionic surfactant (NIS) at 0.06% to 0.5% v/v or either a crop oil concentrate (COC) or methylated seed oil (MSO) at 1% to 2% v/v. In addition, ammonium nitrate (28%-32% UAN) or ammonium sulfate (AMS) at 2 to 4 qt/A may be used. Use the higher additive rates under arid conditions. See label for tank-mix recommendations. Can be applied in the fall.
Huskie 2.08 EC (pyrasulfotole & bromoxynil)	11 to 15 oz (0.18 to 0.24 lb ai/A)	G	Apply to wheat after the first true leaf has expanded up until flag leaf emergence. Spray additives are recommended with Huskie, especially under adverse conditions. Ammonium sulfate fertilizer (AMS) at 0.5 to 1 lb/A is the preferred additive. Urea ammonium nitrogen (28-32% UAN) at 1 to 2 qt/A may also be used. Can be tank mixed with most small grain herbicides, refer to the label. Can be applied in the fall.
MCPA Amine 4 S MCPA Ester 4 E (MCPA)	0.5 to 1.33 pt 0.33 to 1 pt (0.16 to 0.66 lb ai/A)	G	Controls many broadleaf weeds, but weak on wild buckwheat and smartweeds. Apply from the 4-leaf stage but before the jointing stage of wheat. Spring application decreases injury.
Moxy 2 E (bromoxynil)	1 to 1.5 pts (0.25 to 0.38 lb ai/A)	G	Apply from wheat emergence until boot stage. Can be applied in the fall. Postemergence control of most small broadleaf weeds. Weak on wild mustard and pigweed.
Orion 2.373 L (florasulam & MCPA)	17 fl oz (0.315 lb ai/A)	G	Apply from 3-leaf stage up to the jointing stage. Can be tank mixed with other labeled herbicides.
Puma 1 E (fenoxaprop)	0.33 to 0.67 pt (0.41 to 0.84 lb ai/A)	G	Apply from emergence to 60 days before harvest. Apply to annual grass weeds in the 1-leaf to 2-tiller stage. Apply at 0.33 pt/A to control green foxtail, foxtail millets, and volunteer corn; apply 0.4 pt/A to control yellow foxtail and proso millet; Apply 0.67 pt/A to control wild oat and barnyardgrass. See label for tank mixing restrictions.
Rage D-Tech 4.06 EC (carfentrazone-ethyl & 2,4-D)	8 to 16 oz (0.25 to 0.50 lb ai/A)	F/G	Apply to wheat from the 3 tiller stage until jointing. Always add a nonionic surfactant at 0.25% v/v. A sprayable liquid nitrogen fertilizer at 2 to 4 % v/v or ammonium sulfate at 2 to 4 lbs/A may also be added.
Rimfire 10.17 DF (mesosulfuron & propocarbazono)	1.75 to 2.25 oz (0.011 to 0.014 lb ai/A)	G	Apply Rimfire from emergence up to flag leaf emergence. Apply to susceptible grasses from the 1-leaf to the 2-tiller stage. Always apply with an adjuvant. Apply with a methylated seed oil (MSO) at 1.3 to 1.5 pts/A, OR a nonionic surfactant (NIS) at 0.5% v/v (2 qts/100 gallons spray solution) plus an ammonium nitrogen fertilizer (28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A) OR a basic blend adjuvant at 1 to 1.25% v/v. See label for tank mixes.
Silverado 2 WDG (mesosulfuron)	1.75 to 2.25 oz (0.0022 to 0.0028 lb ai/A)	G/F	Apply when wild oats are in the 1-leaf to 2-tiller stage. Always applied with an approved adjuvant. Apply to wheat from emergence but prior to jointing. Always apply with a methylated seed oil (MSO) or a basic blend adjuvant. MSO rate should be 1.5 pts/A (addition of 28-32% UAN at 1 to 2 qt/A or AMS at 1.5 to 3 lbs/A may improve weed control but leaf burn may occur). The basic blend adjuvant should be added at a rate of 1% v/v or 0.8 to 1.6 pt/A depending on spray volume.
Starane 1.5 EC (fluroxypyr)	0.5 to 0.66 pt (0.09 to 0.12 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 1.33 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Starane + Saber 2.5 E (fluroxypyr & 2,4-D)	1.5 to 2 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.
Starane + Salvo 3.75 E (fluroxypyr & 2,4-D)	1 to 1.33 pts (0.047 to 0.62 lb ai/A)	F	For control of most broadleaf weeds. Apply after tillering and before boot stage. Weak on smartweeds. See label for recropping restrictions.

Table SG12. Summary of herbicides for use in Winter Wheat

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Postemergence			
Starane + Sword 3.55 E (fluroxypyr & MCPA)	1.125 to 1.5 pts (0.5 to 0.66 lb ai/A)	G	Apply at the 2 leaf to flag leaf stage. Weak on smartweeds. See label for recropping restrictions.
Starane NXT 2.91 E (fluroxypyr & bromoxynil)	14 to 27.4 oz (0.32 to 0.62 lb ai/A)	G	Apply at the 3-leaf to flag leaf emergence of wheat. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane NXTcp 1.5 + 2 E (fluroxypyr & bromoxynil)	0.5 pt + 1.5 pts to 0.67 pt + 2 pts (0.32 to 0.62 lb ai/A)	G	Starane NXTcp is a co-pack product. Each co-pack contains 1.6 gal of Starane 1.5E (fluroxypyr) and 5 gal of NXTcp 2E (bromoxynil) in separate containers and will treat between 20 to 26.5 acres. Apply at the 3-leaf to flag leaf emergence of wheat. Apply at the 3-leaf to flag leaf emergence of barley. Can be tank mixed with other labeled herbicides.
Starane Ultra 2.8 EC (fluroxypyr)	0.3 to 0.4 pt (0.10 to 0.14 lb ai/A)	G	Apply at the 2-leaf to flag leaf stage of barley. Apply before weeds are 8 inches. Can be applied at 0.7 pt/A for control of volunteer potatoes. Can be tank mixed with other labeled herbicides.
Sterling Blue 4 S (dicamba)	0.12 to 0.25 pt (0.06 to 0.125 lb ai/A)	F	Apply prior to jointing stage. Apply in spring for less injury. Controls many broadleaf weeds including wild buckwheat and smartweeds. Weak on wild mustard. Most commonly used in tank mixes.
Stinger 3 S (clopyralid)	0.25 to 0.33 pt (0.09 to 0.12 lb ai/A)	G	Controls Canada thistle top growth and suppresses regrowth. Apply from the 3-leaf stage of the crop to early boot. See reference section for additional application and crop rotation restrictions. Weak on several annual broadleaf weeds.
WideMatch 1.5 E (clopyralid & fluroxypyr)	1 to 1.33 pts (0.19 to 0.25 lb ai/A)	G	For control of most many broadleaf weeds and Canada thistle suppression. Apply after tillering and before the boot stage. Weak on mustards, smartweeds and common lambsquarters. See narrative for additional information and recropping restrictions.
Layby			
Prowl H20 3.8 CS (pendimethalin)	1.5 to 3 pts (0.62 to 1.24 lb ai/A)	F	Apply prior to weed emergence but after the crop has emerged. For control of established weeds, tank mix with a registered postemergence herbicide.

Table SG13. Summary of herbicides for use in Rye

Application Type			
Herbicide / Formulation	Rate Range	Crop Tolerance	Remarks
Burndown			
glyphosate, others (glyphosate)	varies by product (0.39 to 1 lb ai/A)	-	Many formulations available including Cornerstone, Duramax, Durango, Makaze, Roundup, RT3, and Touchdown. Rates vary depending on formulation, target weed species, and weed size. Refer to the respective label. Apply prior to rye emergence. Controls emerged annual grass and broadleaf weeds with no soil residual.
Postemergence			
2,4-D Amine 4 S 2,4-D Ester 4 E (2,4-D)	0.5 to 0.66 pt 0.5 to 0.66 pt (0.25 to 0.5 lb ai/A)	F	Controls most broadleaf weeds. Weak on wild buckwheat and smartweeds. Apply in spring prior to boot stage.
Aim 2 EC (carfentrazone-ethyl)	0.5 to 1 fl oz (0.008 to 0.016 lb ai/A)	F/G	Apply up until the jointing stage of the crop. Aim must be applied to small weeds 2 to 4 inches tall for best control. Aim should always be applied with a nonionic surfactant (NIS) at 0.25% v/v (2 pt/100 gal). In addition, ammonium nitrate (28%-32% UAN) at 2 to 4% v/v (2 to 4 gal/100 gal) or ammonium sulfate (AMS) at 2 to 4 lbs/A may be used. Tank mix with 2,4-D (amine or ester) or MCPA (amine or ester) for increased crop safety and additional broadleaf weed control.
Bison 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bison Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Broclean 2 E (bromoxynil)	1 to 1.5 pts (0.25 to 0.38 lb ai/A)	G	Controls most annual broadleaf weeds. Weak on wild mustard and pigweed. Apply in the spring prior to early boot stage.
Bromac 4 E (bromoxynil & MCPA)	1 to 2 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bromac Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Bronate Advanced 5 E (bromoxynil & MCPA)	0.8 to 1.6 pts (0.5 to 1 lb ai/A)	G	Apply from 3-leaf stage until prior to boot stage. Controls most annual broadleaf weeds. Crop tolerance is good. Can be can be tank mixed with most broadleaf herbicides and grass herbicides. Check label.
Buctril 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.38 lb ai/A)	G	Controls most annual broadleaf weeds. Weak on wild mustard and pigweed. Apply in the spring prior to early boot stage.
Double Up B+D 3.9 E (bromoxynil & 2,4-D)	0.75 to 2 pts (0.37 to 0.98 lb ai/A)	F	Controls most annual broadleaf weeds and suppresses perennial broadleaves. Apply from tillering stage but before jointing. Apply to weeds up to the 4-leaf stage or 2 inches in height, whichever comes first. Good coverage is essential.
MCPA Amine 4 S MCPA Ester 4 E (MCPA)	0.5 to 0.66 pt 0.5 to 0.66 pt (0.25 to 0.5 lb ai/A)	G	Controls most broadleaf weeds. Weak on wild buckwheat and smartweeds. Apply in spring prior form th 3- to 4-leaf stage to boot stage.
Moxy 2 E (bromoxynil)	1 to 2 pts (0.25 to 0.38 lb ai/A)	G	Controls most annual broadleaf weeds. Weak on wild mustard and pigweed. Apply in the spring prior to early boot stage.

Table SG13. Summary of herbicides for use in Rye

<u>ApplicationType</u>			
<u>Herbicide / Formulation</u>	<u>Rate Range</u>	<u>Crop Tolerance</u>	<u>Remarks</u>
<u>Postemergence</u>			
Orion 2.373 L (florasulam & MCPA)	17 fl oz (0.315 lb ai/A)	G	Apply from 3-leaf stage up to the jointing stage. Can be tank mixed with other labeled herbicides.
Rage D-Tech 4.06 EC (carfentrazone-ethyl & 2,4-D)	8 to 16 oz (0.25 to 0.50 lb ai/A)	F/G	Apply to wheat from the 3 tiller stage until jointing. Always add a nonionic surfactant at 0.25% v/v. A sprayable liquid nitrogen fertilizer at 2 to 4% v/v or ammonium sulfate at 2 to 4 lbs/A may also be added.

Table SG14. Effectiveness of herbicides on major weeds in Small Grains

Herbicides	Grasses				Broadleaves												Perennials*				
	Barryardgrass	Green Foxtail	Wild Oats	Yellow Foxtail	Cocklebur	Common Ragweed	Eastern Black Nightshade	Giant Ragweed	Kochia	Common Lambsquarters	Marshelder	Pigweed spp.	Russian Thistle	Smartweeds (annual)	Wild Sunflower	Wild Buckwheat	Wild Mustard	Canada Thistle	Field Bindweed	Perennial SowThistle	
Preplant or Preemergence																					
Fargo (trilalate)	N	N	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
trifluralin, generic (trifluralin)	G	G	P	G	N	N	N	N	F	F	F	F	N	N	N	N	N	N	N	N	
Postemergence																					
2,4-D, generic (2,4-D)	N	N	N	N	F	G	G	G	F	G	G	G	F	P	G	P	G	F	F	F	
Achieve (tralkoxydim)	G	G	G	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Affinity BroadSpec (thifensulfuron & tribenuron)	N	N	N	N	G	G	N	G	G	G	G	G	G	G	G	G	G	F	P	F	
Affinity TankMix (thifensulfuron & tribenuron)	N	N	N	N	G	G	N	G	G	G	G	G	G	G	G	G	G	F	P	F	
Aim (carfentrazone-ethyl)	N	N	N	N	P	P	G	P	G	G	F/G	N	G	F	F/G	F/G	P	N	N	F/G	
Assert (imazamethabenz)	N	N	G	N	N	N	N	N	F	N	N	N	N	P	N	F	G	N	N	N	
Axial (pinoxaden)	G	G	G	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Banvel (dicamba)	N	N	N	N	G	G	G	G	G	G	G	G	F	G	G	G	P	G	G	G	
Bison (bromoxynil & MCPA)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P	P	
Bison Advanced (bromoxynil & MCPA)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P	P	
Bronate Advanced (bromoxynil & MCPA)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P	P	
Buctril (bromoxynil)	N	N	N	N	G	G	G	G	G	G	G	F/G	G	G	G	G	F	N	P	N	
Clarity (dicamba)	N	N	N	N	G	G	G	G	G	G	G	G	F	G	G	G	P	G	G	G	
Clopyr AG (clopyralid)	N	N	N	N	G	G	F	G	P	N	G	N	P	F	G	G	N	G	P	F	
Curtail (clopyralid & 2,4-D)	N	N	N	N	G	G	G	G	F	G	G	G	F	F	G	G	G	G	F	F	
Curtail M (clopyralid & MCPA)	N	N	N	N	G	G	G	G	F	G	G	G	F	F	G	F	G	G	F	G	
Discover NG (clodinafop-propargyl)	G	G	G	F	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Double Up B+D (bromoxynil & 2,4-D)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	F	
Everest (flucarbazone-sodium)	G	G	G	F	N	N	G	N	N	N	N	G	N	G	F/P	F/P	G	N	N	N	
Express (tribenuron)	N	N	N	N	F	G	F	G	G	G	G	F	G	F	F/G	F	G	G	P	F	
Harmony (thifensulfuron)	N	N	N	N	G	G	N	G	G	G	G	G	G	G	G	G	G	F	N	N	
Harmony Extra (thifensulfuron & tribenuron)	N	N	N	N	G	G	N	G	G	G	G	G	G	G	G	G	G	G	N	F	
Huskie (pyrasulfotole & bromoxynil)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	F	
MCPA, generic (MCPA)	N	N	N	N	G	G	G	G	G	G	G	G	N	P	F	P	G	F	G	F	
Moxy (bromoxynil)	N	N	N	N	G	G	G	G	G	G	G	F/G	G	G	G	G	F	N	P	N	
Orion (florasulam & MCPA)	N	N	N	N	G	G	-	G	-	G	G	G	-	G	G	G	G	P	-	F	
Puma (fenoxaprop)	G	G	G	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
Rage D-Tech (carfentrazone-ethyl & 2,4-D)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	F	
Rimfire (mesosulfuron & propocarbazone)	F	F	G	F	N	N	N	N	N	N	N	G	N	N	N	N	G	N	N	N	
Silverado (mesosulfuron)	F	F	G	N	N	N	N	N	N	N	N	F	N	N	N	N	F	N	N	N	
Starane (fluroxypyr)	N	N	N	N	G	G	G	G	G	N	G	P	F	N	G	F	N	P	G	N	
Starane NXT (fluroxypyr & bromoxynil)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P	
Starane NXTcp (fluroxypyr & bromoxynil)	N	N	N	N	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P	
Stinger (clopyralid)	N	N	N	N	G	G	F	G	P	N	G	N	P	F	G	G	N	G	P	F	

NOTE: G = Good; F= Fair; P = Poor; N = No control. Effectiveness ratings apply if herbicide is used according to label recommendations as to rate, time of application, etc., and favorable temperature and moisture conditions prevail.

* Only control of top, no control of roots

Table SG14. Effectiveness of herbicides on major weeds in Small Grains

Herbicides	Grasses				Broadleaves												Perennials*			
	Barryardgrass	Green Foxtail	Wild Oats	Yellow Foxtail	Cocklebur	Common Ragweed	Eastern Black Nightshade	Giant Ragweed	Kochia	Common Lambsquarters	Marshelder	Pigweed spp.	Russian Thistle	Smartweeds (annual)	Wild Sunflower	Wild Buckwheat	Wild Mustard	Canada Thistle	Field Bindweed	Perennial Sow/Thistle
Unity WDG (thifensulfuron)	N	N	N	N	G	G	N	G	G	G	G	G	G	G	G	G	G	F	N	N
WideMatch (clopyralid & fluroxypyr)	N	N	N	N	G	G	G	G	G	N	G	P	F	F	G	G	N	G	G	F
Layby																				
Prowl H20 (pendimethalin)	G	G	P	G	N	N	N	N	F	F	N	F	N	N	N	N	N	N	N	N
Burndown																				
Targa (quizalofop)	G	G	G	GN	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

NOTE: G = Good; F= Fair; P = Poor; N = No control. Effectiveness ratings apply if herbicide is used according to label recommendations as to rate, time of application, etc., and favorable temperature and moisture conditions prevail.

* Only control of top, no control of roots

Table SG15. Crop tolerance and herbicide clearance.¹

Herbicide	Barley	Oats	Rye	Durum Wheat	Spring Wheat	Winter Wheat
Achieve (tralkoxydim)	G/F	NL	NL	G/F	NL	G/F
Affinity BroadSpec (thifensulfuron & tribenuron)	G	F	NL	G	G	G
Affinity Tankmix (thifensulfuron & tribenuron)	G	F	NL	G	G	G
Aim (carfentrazone)	F/G	F/G	F/G	F/G	F/G	F/G
Assert (imazamethabenz)	G	NL	NL	G	G	G
Axial/Axial XL (pinoxaden)	G	NL	NL	NL	G	G
Banvel*/Clarity* (dicamba)	P	G	NL	F	F	F
Buctril* (bromoxynil)	G	G	G	G	G	G
Bronate Advanced* (bromoxynil + MCPA ester)	G	G	G	G	G	G
Curtail (clopyralid + 2,4-D amine)	G	NL	NL	G	G	G
Curtail M (clopyralid + MCPA ester)	G	G	NL	G	G	G
Discover NG (clodinafop)	NG	NL	NL	G	G	G
Double Up B+D (bromoxynil & 2,4-D ester)	G	P	F	F	F	F
Everest (flucarbazone)	NL	NL	NL	G/F	G/F	G/F
Express (tribenuron) + 2,4-D (ester/amine)	F/G	NL	NL	F	F	G
Far-Go (triallate)	G	NL	NL	G	G	G
Harmony SG* (thifensulfuron)	G	G	NL	G	G	G
Harmony Extra (tribenuron & thifensulfuron)	G	G/F	NL	G	G	G
Huskie (pyrasulfotole & bromoxynil)	G	NL	NL	G	G	G
MCPA (amine or ester)	G	G	G	G	G	G
Orion (florasulam & MCPA ester)	G	G	G	G	G	G
Prowl H ₂ O (pendimethalin)	NL	NL	NL	F/G	F/G	F
Puma (fenoxaprop + safener)	G	NL	NL	G	G	G
Rage D-Tech (carfentrazone & 2,4-D ester)	F	P	F/G	F/G	F/G1	F/G
Rimfire (mesosulfuron & propocarbazone & safener)	NL	NL	NL	G	G	G
Silverado (mesosulfuron + safener)	NL	NL	NL	G/F	G/F	G/F
Starane/Starane Ultra (fluroxypyr)	G	G	NL	G	G	G
Starane NXT/ NXTcp (fluroxypyr & bromoxynil)	G	G	NL	G	G	G
Stinger* (clopyralid)	G	G	NL	G	G	G
Treflan* (trifluralin)	F	NL	NL	F	F	F
2,4-D (amine and ester)	G	P	G	G	G	G
WideMatch (clopyralid & fluroxypyr)	G	G	NL	G	G	G
WideMatch M (fluroxypyr + clopyralid & MCPA ester)	G	G	NL	G	G	G

¹ P = Poor; F = Fair; G = Good; NL = Not labeled for use

* or generic equivalent.