



WEED CONTROL RECOMMENDATIONS IN WHEAT

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This publication is adapted from *Weed Control Recommendations in Wheat* by Neely et al., 2016.

The recommendations contained herein are based primarily on herbicide labels researched by the Texas A&M AgriLife Extension Service. Information given is for educational purposes only. The use of product names is not intended as an endorsement by the Texas A&M AgriLife Extension Service of the product or of a specific manufacturer, nor is there any implication that other formulations containing the same active ingredient are not equally effective. Product names are included solely to aid readers in locating and identifying the herbicides suggested.

This publication is not a substitute for herbicide product labels! It is only a guide for controlling weeds in wheat. Labeled rates and restrictions change constantly. Please consult a current product label before use. Remember, the label is the law.

Cultural and Mechanical Weed Control

Weeds may be controlled through cultural, mechanical, and chemical means. Judicious use of these methods individually or in combination can manage weeds effectively without causing economic losses or environmental harm. Choose the proper management strategy according to the target weed(s) and the infestation level. The type of crop will play a major role in determining the timing of mechanical measures.

- ▶ Use weed-free seed to protect against weed infestations.
- ▶ Thoroughly clean harvesting equipment before moving from one field to the next, and require custom harvesters to clean their equipment before entering the field.
- ▶ In conventional tillage systems, use mechanical tillage or preplant burndown herbicides to remove initial weed flushes before planting. This will reduce or eliminate the potential for continued infestation.
- ▶ Rotate crops that physically outcompete certain weeds, resulting in their gradual decline. Remove light or spotty infestations of weeds by hand-hoeing, or use spot cultivation to prevent weed seed production and the spread of rhizomes or roots. When plowing perennial weeds, take care to prevent the transport and spread of plant parts to other areas of the field. Crop rotation also allows for other herbicides with differing modes of action to be used for ryegrass management.

Managing Herbicide-resistant Weeds

- ▶ Use integrated weed management strategies. Apply herbicides only when necessary, and combine their use with mechanical, cultural, or biological methods.
- ▶ Rotate or mix herbicides (per label allowances) with different modes of action.
- ▶ If possible, rotate crops where herbicide rotations are feasible.
- ▶ Scout fields regularly for resistant weed populations. Control weed escapes: treat them as you would a newly established invasive species.
- ▶ Plant weed-free wheat seed.
- ▶ Clean tillage and harvest equipment to prevent the spread of resistant species.

If you suspect that you may have herbicide-resistant weeds, you can contact:

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Managing Herbicide-resistant Ryegrass

Italian ryegrass (*Lolium perenne* ssp. *multiflorum*) has long been one of the most troublesome weeds in Texas wheat. Biotypes resistant to ALS inhibitors, ACC-ase inhibitors, and EPSPS inhibitors (glyphosate) have been identified in Texas (Tucker et al., 2006; Ellis et al., 2008; Heap, 2019; Singh et al., 2020). Continued widespread use of these herbicides without mode of action rotations and/or crop rotations will continue to drive ryegrass populations toward resistance. Resistance to other herbicides used ahead of or in wheat crops have been identified within the United States, including photosystem I inhibitors (paraquat) and very-long-chain fatty acid inhibitors (pyroxasulfone) (Heap, 2019). Resistant plants are likely to produce heavier seeds that are better suited to successfully germinate from greater soil depths and later in the season. This further exposes them to post-emergence applied herbicides (Maity et al., 2021). To control this weed, growers must take a systems-approach using several tactics. One of the most effective methods for managing resistant ryegrass populations is crop rotation. Rotating to a summer crop allows the use of non-selective herbicides and winter tillage. Additional herbicides with varying modes of action can then be utilized to control any plants that survive winter control methods. Timely control of ryegrass infestations in winter fallow fields can greatly reduce ryegrass seed



Figure 1. Ryegrass in wheat.
Photo courtesy of David Drake, IPM Agent: Hunt County

in the soil. Recent data from Texas A&M AgriLife Extension trials (Drake, 2023) in northeast Texas show that early control of ryegrass is vital. Treatments including delayed preemergence applications of Zidua SC or Anthem Flex offer the greatest control. For fields in wheat production, plant certified seeds to avoid spreading ryegrass to uninfested fields. Also, thoroughly clean the tillage and harvesting equipment before moving from ryegrass-infested fields. Several herbicide products are available to control ryegrass resistant to ALS and ACC-ase inhibitors at different points in the season:

- **Before planting:** A burn-down application of Roundup (glyphosate) or Gramoxone (paraquat) can control emerged ryegrass.
- **At delayed preemergence or early post-emergence:** Zidua (pyroxasulfone) and Anthem Flex (pyroxasulfone + carfentrazone) provide residual control. Delayed preemergence is defined as when 80 percent of wheat seeds have a ½-inch radicle. Pyroxasulfone applications prior to that can cause severe crop damage. Note: The addition of metribuzin is needed if ryegrass has emerged at the time of application.

- **Between spiking and the two-leaf state:** Axiom DF (flufenacet + metribuzin) can be applied to wheat to provide residual control of ryegrass.
- **From the first leaf stage of wheat until the flag leaf is visible:** Apply Prowl H2O (pendimethalin) for residual control or suppression of ryegrass that has yet to germinate. This product will not control emerged plants.
- **Between two-leaf stage and pre-boot:** Control with Axial XL* (pinoxaden). Note: Axial XL will NOT control ryegrass biotypes resistant to ACC-ase herbicides.

Use of Clearfield and CoAXium Trait Systems

Weed control in wheat, especially grassy weeds, can be problematic in major wheat-growing regions with little crop rotation. To combat this issue, two herbicide trait systems have been developed to assist wheat growers in weed control. The Clearfield and CoAXium Wheat Production Systems

were developed using traditional, non-GMO methods, allowing for the application of Beyond (in the Clearfield system) and Aggressor AX (in the CoAXium system) herbicides without crop damage. Though largely absent in Texas, these systems surpass 30 percent of acreage in some regions such as the Pacific Northwest. Please note, ACC-ase herbicides are highly susceptible to herbicide antagonism. Be sure to check the label or contact a local representative for tank-mix options.

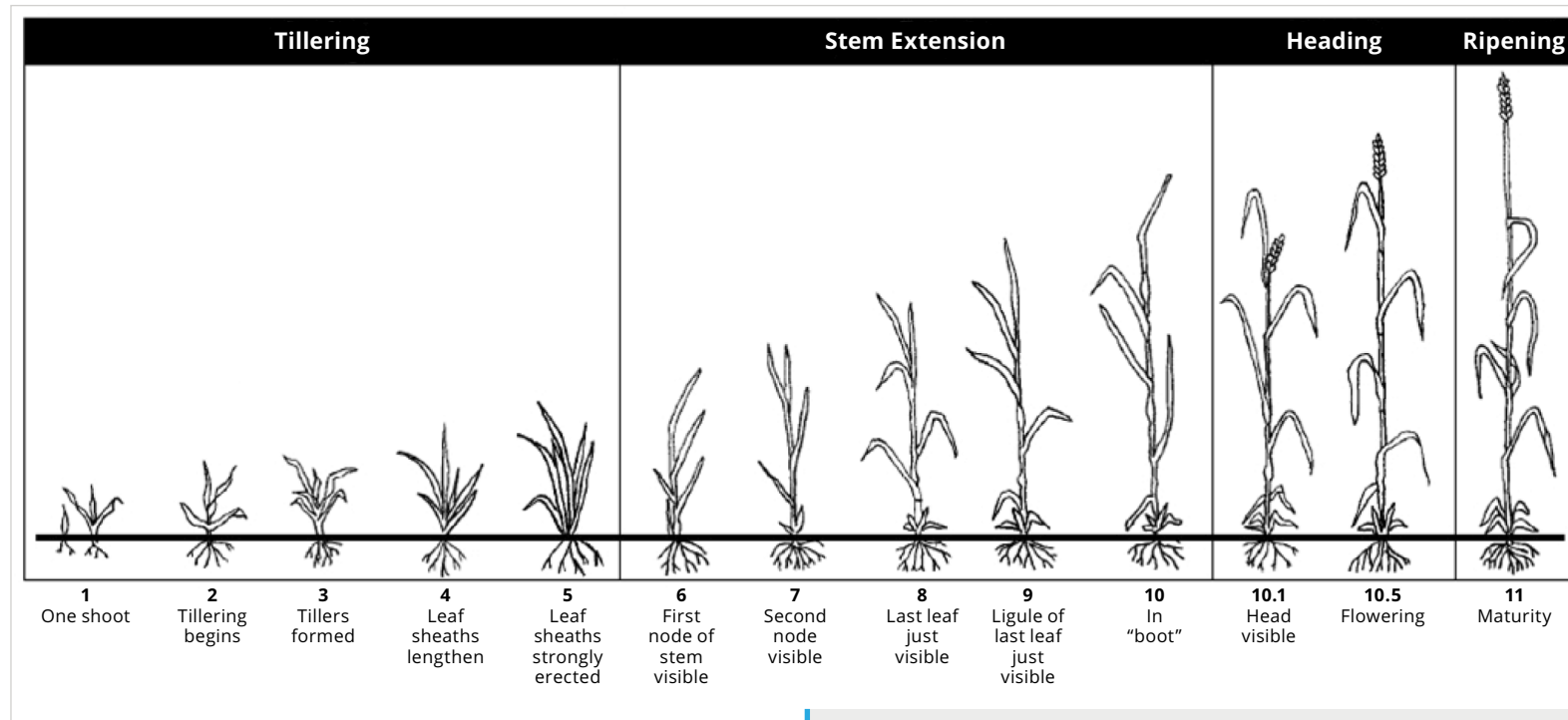


Figure 2. Feekes scale for the growth and development of cereals.

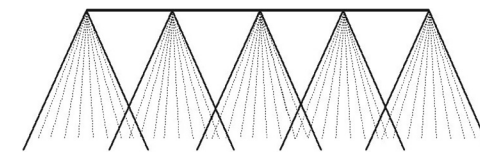
Clearfield System

The Clearfield wheat system was introduced into hard red winter wheat through TAM 110, and released by BASF Corporation in 2001. For safe application of imazamox, varieties must be labeled as Clearfield varieties. Denotations for varieties with the Clearfield trait may differ depending on how many tolerance genes it possesses. Varieties containing a single tolerance gene will be marked with "CL", while those with two genes may be denoted with a "CL+", "CL2", "CL Plus", or "CLP". Varieties with two genes provide significantly better tolerance to the herbicide compared to those with a single gene. Beyond and Beyond Xtra, the herbicides used in the Clearfield system, are ALS-inhibiting herbicides which provide both post-emergent and residual control of grass and broadleaf weeds. Due to the residual activity, plant-back restrictions must be considered when used in a crop rotation. Check the label for crop-specific rotation intervals which will depend on plowing, soil pH, and rainfall. These herbicides will not control weeds with resistance to ACC-ase-inhibiting herbicides.

CoAXium Wheat Production System

Development of the CoAXium Wheat Production System began in 2008 as part of an initiative to provide better grassy weed control in wheat. Three agricultural organizations were involved in the development of this system: the Colorado Wheat Research Foundation, which owns the patent of the AXigen trait; Limagrain, who provides donor lines to other wheat breeders; and Albaugh LLC, who is the exclusive provider of the Aggressor AX herbicide for the CoAXium Wheat Production System. Varieties in this system are denoted with an "AX" at the end of the variety name. Aggressor AX herbicide is the only quizalofop herbicide that is registered for use on CoAXium wheat. It is designated with "AX", which represents the Albaugh herbicide brand that is optimized for use on CoAXium wheat varieties to deliver weed control efficacy and crop safety. The use of other herbicides with similar active ingredients is a violation of the grower contract and may result in crop damage. Aggressor AX is an ACC-ase-inhibiting herbicide that will only control grassy weeds. It has been found to be particularly effective on brome species, jointed goat grass, feral rye, and wild oats. Unlike the Clearfield system, the CoAXium system provides little residual activity and will not control weeds that have not emerged at application. Aggressor AX will not control grassy weeds with resistance to ACC-ase-inhibiting herbicides.

Boom Sprayer Calibration



Method 1:

1. Determine the nozzle spacing.
2. See the table below for the length of the calibration course.
3. Mark off the calibration course on the actual area to be sprayed.
4. Record the amount of time required to drive the calibration course with the desired field gear and rpm to be used while spraying.
5. Park the tractor, maintain the rpm used to drive the course, turn on the sprayer, and set it at the proper pressure for the desired nozzle tips.
6. Catch water from one nozzle for the amount of time required to drive the calibration course.
7. Ounces of water caught = gallons per acre.
8. Divide gallons per acre into the number of gallons in the spray tank to determine how many acres will be sprayed. Add the appropriate amount of herbicide per label directions for the number of acres to be sprayed.

Nozzle spacing and length of calibration course				
Nozzle spacing (inches)	18	20	30	40
Length of calibration course (linear feet)	227	204	136	102

To determine the calibration course for a nozzle spacing not listed, divide the spacing expressed in feet into 340 (340 square feet = 1/128 acre).

Example: Calibration distance for 19-inch nozzle spacing = $340 \div (19/12) = 215$ feet

Source: Suggestions for Weed Control in Cotton (B-5039), the Texas A&M AgriLife Extension Service.

Method 2:

1. Use the formula: Ground Speed (mph) x Intended Gallons Per Acre x Nozzle Spacing (inches) \div 5940
2. The resulting number will be how much solution (in gallons) should be caught from each nozzle in 1 minute.
3. Adjust the sprayer pressure or nozzle tips to achieve the desired output.

Table 1. Preplant Herbicides

Product Name	Application Rate Per Acre	Weeds Controlled or Suppressed	Remarks	Other Labeled Small Grains
Aim EC Antik EC	1.0 ounce	Broadleaves: Bindweed, Carpetweed, Kochia, Pennycress, Prickly Lettuce, Sowthistle, Tansymustard.	Can be applied up to 1 day prior to seeding.	Barley, Oat, Rye, Triticale
Amber Custom-Pak	0.28 to 0.56 ounce	Broadleaves: Mustards, Pennycress, Vetch; Grass Suppression: Bromes, Cheat, Ryegrass.	Only for use with disk drills (no hoe/sweep drills). Requires rainfall to activate (enough to wet 2 to 3 inches deep).	None
Audit 1:1	0.4 to 1.0 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Sowthistle, Thistles.	Must be tank-mixed if using a rate less than 0.6 ounce. Do not exceed 1 ounce per season.	Barley, Oat, Triticale
Dicamba (various products)	Various	Broadleaves: Many broadleaves controlled/suppressed. Check individual labels.	Take extreme caution against off-target drift. Tank-mixing may offer the best control.	Barley, Oat, Rye, Triticale
Direx 4L Diuron 4L	0.8 to 1.6 quarts	Broadleaves: Chickweed, Lambsquarters, Mustards, Pennycress; Grasses: Crabgrass, Foxtail, Johnsongrass.	Do not use on sand or sandy loam soils. Do not treat wheat planted less than 1 inch deep.	None
Drill	1.0 to 2.0 pounds	Broadleaves: Chickweed, Kochia, Mustards, Pennycress, Sowthistle; Grasses: Crabgrass, Foxtail, Johnsongrass, Ryegrass.	Do not use on sand or sandy loam soils. Do not treat wheat planted less than 1 inch deep.	None
ET Herbicide ETX Herbicide	0.5 to 2.0 ounces	Broadleaves: Bindweed, Chickweed, Henbit, Kochia, Mustards, Sowthistle, Thistles.	A minimum of 30 days between applications. The addition of a crop oil concentrate adjuvant is recommended.	Barley, Oat, Rye, Triticale
Facet L	22 ounces	Broadleaves: Bindweed, Kochia, Lambsquarters, Sowthistle, Thistles; Grasses: Barnyardgrass, Foxtail.	Wheat must be planted at least 1 inch deep.	None
Finesse Cereal and Fallow	0.2 to 0.5 ounce	Broadleaves: Chickweed, Henbit, Kochia, Mustards, Thistles, Vetch; Grasses: Brome, Cheat, Ryegrass.	Do not apply to soils with a pH above 7.9 or in late-planted wheat which may have delayed emergence.	Barley, Triticale
FirstShot SG Burndown	0.5 to 0.8 ounce	Broadleaves: Chickweed, Chamomile, Henbit, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Smartweed.	Do not exceed 1 ounce per season. Allow for at least 30 days between applications.	Barley, Triticale
GCS Quinco 4	8 to 12 ounces	Broadleaves: Bindweed, Kochia, Prickly Lettuce, Sowthistle, Thistles; Grasses: Barnyardgrass, Foxtail, Signalgrass.	Only labeled for use in certain counties of north and west Texas. Check the label for county listings.	None
Glyphosate (Various Products)	Various	Many broadleaves and grasses are controlled/suppressed. Check individual labels.	Glyphosate-resistant weeds may be present. Tank-mixing may offer the best control.	Barley, Oat, Rye, Triticale
Gramoxone SL 3.0	1.7 to 2.7 pints	Broadleaves and Grasses: Many annual weeds are controlled. Only perennial broadleaves may be suppressed unless other tank mixes are utilized.	Minimum spray volume of 10 gallons per acre by ground or 5 by air.	Barley

Table 1. Preplant Herbicides continued

Product Name	Application Rate Per Acre	Weeds Controlled or Suppressed	Remarks	Other Labeled Small Grains
Harmony SG Harmony Extra SG Harmony GT XP	0.3 to 0.9 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Shepherd's-purse, Smartweeds, Sowthistle.	Can be applied preplant until emergence. Do not exceed two applications per year, and there must be at least 14 days between treatments.	Barley, Oat, Triticale
Karmex DF	1.0 to 2.0 pounds	Broadleaves: Chickweed, Pennycress, Sowthistle, Tansymustard; Grasses: Barnyardgrass, Crabgrass, Foxtail, Johnsongrass, Ryegrass.	Do not use on sand or sandy loam soils. Do not treat wheat planted less than 1 inch deep.	None
Longbow EC	1.0 ounce	Broadleaves: Bindweed, Flixweed, Kochia, Lambsquarters, Nightshade, Pennycress, Prickly Lettuce, Sowthistle.	Can be applied up to 1 day prior to seeding.	Barley, Oat, Rye, Triticale
Olympus 70% WDG	0.6 ounce	Broadleaves: Flixweed, Henbit, Mustards, Pennycress; Grasses: Bromes, Cheat, Jointed Goatgrass, Rescuegrass.	Should be tank-mixed with compatible herbicides for best results.	Triticale
Panoflex	0.3 to 0.6 ounce	Broadleaves: Chamomile, Henbit, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Thistles, Hairy Vetch.	Can be applied preplant up to emergence. Allow at least 14 days between treatments.	Barley, Oat, Triticale
Pre-Pare 70% WDG	0.2 to 0.3 ounce	Broadleaves: Flixweed, Henbit, Mustards, Pennycress; Grasses: Bromes, Cheat, Foxtail, Wild Oat, Ryegrass.	Residual activity may be reduced if activating rainfall is not received within 10 days of application.	None
Prize	0.5 pint	Broadleaves: Bindweed, Kochia, Prickly Lettuce, Sowthistle, Thistles; Grasses: Barnyardgrass, Foxtail, Signalgrass.	Only labeled for use in certain counties of north and west Texas. Check the label for county listings.	None
Quelex	0.55 to 0.75 ounce	Broadleaves: Bindweed, Chamomile, Flixweed, Henbit, Kochia, Mustards, Pennycress, Smartweeds, Sowthistles, Vetch.	Can be applied preplant until emergence.	Barley, Triticale
QuinStar 4L	0.5 pint	Broadleaves: Bindweed, Kochia, Prickly Lettuce, Sowthistle, Thistles; Grasses: Barnyardgrass, Crabgrass, Foxtail, Signalgrass.	Only labeled for use in certain counties of north and west Texas. Check the label for county listings.	None
Rapport BroadSpec	0.4 to 1.0 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Smartweeds, Thistles.	Must be tank-mixed if using a rate less than 0.6 ounce. Do not exceed 1 ounce per season.	Barley, Oat, Triticale
Reviton	1.0 to 3.0 ounces	Broadleaves: Chickweed, Henbit, Lambsquarters, Shepherd's-purse; Grasses: Barnyardgrass, Bluegrass, Crabgrass, Johnsongrass, Wild Oat.	Do not exceed 6 ounces per acre per year. Do not reapply within 14 days.	None
Se-Cure EC	2.5 to 5.0 ounces	Grasses: Downy Brome, Crabgrass, Foxtail, Jointed Goatgrass, Johnsongrass, Oat, Ryegrass, Signalgrass, Volunteer Wheat.	A crop rotation interval of 120 days is needed before planting wheat or barley.	Barley

Table 1. Preplant Herbicides continued

Product Name	Application Rate Per Acre	Weeds Controlled or Suppressed	Remarks	Other Labeled Small Grains
Sharpen	1.0 to 4.0 ounces	Broadleaves: Bindweed, Henbit, Kochia, Lambsquarters, Mallow, Morningglory species, Pigweeds, Sowthistles, Thistles.	Residual activity of broadleaf weeds is dependent on rainfall and soil texture.	Barley, Oat, Rye, Triticale
Thief	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mallow, Mustards, Pennycress, Smartweeds, Sowthistle.	Can be applied preplant up to emergence. Do not exceed 1 ounce per acre per season.	Barley, Oat, Triticale
Treaty Treaty Extra	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mustards, Smartweeds, Sowthistle, Thistles.	Can be applied preplant up to emergence. Do not exceed 1 ounce per acre per season.	Barley, Oat, Triticale
Treflan TR-10	5.0 to 7.5 pounds	Broadleaves: Chickweed, Henbit, Nettle; Grasses: Ryegrass, Downy Brome.	Wet or flooded soil may result in poor weed control.	Barley
T-Square	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Lambsquarters, Mustards, Pennycress, Smartweeds, Thistles, Vetch.	Do not exceed 1 ounce per acre per year. Do not reapply within 14 days.	Barley, Oat, Triticale
Valor SX	1.0 to 2.0 ounces	Broadleaves: Chickweed, Pennycress, Henbit, Lambsquarters, Prickly Lettuce, Sowthistle.	Requires 30 days and 1 inch of rainfall/irrigation prior to planting. Provides only residual control.	None
Volta Volta Extra	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mustards, Smartweeds, Sowthistle, Thistles.	Do not exceed 1 ounce per acre per year. Do not reapply within 14 days.	Barley, Oat, Triticale

Table 2. Preemergence Herbicides

Product Name	Application Rate Per Acre	Weeds Controlled or Suppressed	Remarks	Other Labeled Small Grains
Anthem Flex	2.0 to 4.55 ounces	Broadleaves: Carpetweed, Henbit, Kochia, Lambsquarters; Grasses: Bromes, Cheat, Panicum, Wild Oat, Ryegrass.	Apply delayed pre- or post-emergence. Recommended tank-mixing if some weeds have already germinated.	None
Audit 1:1	0.4 to 1.0 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Sowthistle, Thistle.	Must be tank-mixed if using a rate less than 0.6 ounce. Do not exceed 1 ounce per season.	Barley, Oat, Triticale
Axiom DF	4.0 to 10.0 ounces	Broadleaves: Chickweed, Henbit, Prickly Lettuce, Mustards; Grasses: Bromes, Fescues, Wild Oat, Ryegrass.	Apply delayed pre- or post-emergence until three-leaf stage. Do not exceed 10 ounces per season.	Triticale
Cryder	0.67 ounce	Broadleaves: Flixweed, Henbit, Mustards, Pennycress; Grasses: Bluegrass, Bromes, Cheat, Wild Oat, Ryegrass.	Applications must be made after drilling, but before wheat or weed emergence. Do not use in drought conditions.	None
Dicamba (Various Products)	Various	Broadleaves: Many broadleaves controlled/suppressed. Check individual labels.	Take extreme caution against off-target drift. Tank-mixing may offer the best control.	Barley, Oat, Rye, Triticale
Direx 4L Diuron 4L	0.8 to 1.6 quarts	Broadleaves: Chickweed, Lambsquarters, Mustards, Pennycress; Grasses: Crabgrass, Foxtail, Johnsongrass.	Do not use on sand or sandy loam soils. Do not treat wheat planted less than 1 inch deep.	None
Drill	1.0 to 2.0 pounds	Broadleaves: Chickweed, Kochia, Mustards, Pennycress, Sowthistle; Grasses: Crabgrass, Foxtail, Johnsongrass, Ryegrass.	Do not use on sand or sandy loam soils. Do not treat wheat planted less than 1 inch deep.	None
ET Herbicide ETX Herbicide	0.5 to 2.0 ounces	Broadleaves: Bindweed, Chickweed, Henbit, Kochia, Mustards, Sowthistle, Thistle.	A minimum of 30 days between applications. The addition of a crop oil concentrate adjuvant is recommended.	Barley, Oat, Rye, Triticale
Finesse Cereal and Fallow	0.2 to 0.5 ounce	Broadleaves: Chickweed, Henbit, Kochia, Mustards, Thistle, Vetch; Grasses: Brome, Cheat, Ryegrass.	Do not apply to soils with a pH above 7.9 or in late-planted wheat which may have delayed emergence.	Barley, Triticale
Glean XP	0.33 to 0.50 ounce	Broadleaves: Flixweed, Henbit, Kochia, Prickly Lettuce, Mustards; Grasses: Downy Brome, Ryegrass.	Take caution of tank-mix options. Do not apply preemergent in areas of dry or extreme winter weather.	Oat
Glyphosate (Various Products)	Various	Many broadleaves and grasses are controlled/suppressed. Check individual labels.	Glyphosate-resistant weeds may be present. Tank-mixing may offer the best control.	Barley, Oat, Rye, Triticale
Gramoxone SL 3.0	1.7 to 2.7 pints	Broadleaves and Grasses: Many annual weeds controlled. Only perennial broadleaves may be suppressed unless other tank mixes are utilized.	Minimum spray volume of 10 gallons per acre by ground or 5 by air.	Barley
Harmony GT XP Harmony SG	0.3 to 0.9 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Shepherd's-purse, Smartweeds, Sowthistle.	Can be applied preplant until emergence. Do not exceed two applications per year, and there must be at least 14 days between treatments.	Barley, Oat, Triticale

Table 2. Preemergence Herbicides continued

Product Name	Application Rate Per Acre	Weeds Controlled or Suppressed	Remarks	Other Labeled Small Grains
Karmex DF	1.0 to 2.0 pounds	Broadleaves: Chickweed, Pennycress, Sowthistle, Tansymustard; Grasses: Barnyardgrass, Crabgrass, Foxtail, Johnsongrass, Ryegrass.	Do not use on sand or sandy loam soils. Do not treat wheat planted less than 1 inch deep.	None
Olympus 70% WDG	0.6 ounce	Broadleaves: Flixweed, Henbit, Mustards, Pennycress; Grasses: Bromes, Cheat, Jointed Goatgrass, Rescuegrass.	Should be tank-mixed with compatible herbicides for best results.	Triticale
Outrider	0.67 ounce	Broadleaves: Bromes, Flixweed, Henbit, Mustards, Pennycress; Grasses: Bluegrass, Bromes, Cheat, Wild Oat, Ryegrass.	Applications must be made after drilling, but before wheat or weed emergence. Do not use in drought conditions.	None
Panoflex	0.3 to 0.6 ounce	Broadleaves: Chamomile, Henbit, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Thistles, Hairy Vetch.	Can be applied preplant up to emergence. Allow at least 14 days between treatments.	Barley, Oat, Triticale
Pin-Dee 3.3 EC	0.9 to 1.8 quarts	Broadleaves: Henbit, Kochia, Lambsquarters, Shepherd's-purse; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	Apply to seeds planted at least 1 inch deep. Rainfall within 7 days of application will result in best control.	None
Pre-Pare 70% WDG	0.2 to 0.3 ounce	Broadleaves: Flixweed, Henbit, Mustards, Pennycress; Grasses: Bromes, Cheat, Foxtail, Wild Oat, Ryegrass.	Residual activity may be reduced if activating rainfall is not received within 10 days of application.	None
Quelex	0.55 to 0.75 ounce	Broadleaves: Bindweed, Chamomile, Flixweed, Henbit, Kochia, Mustards, Pennycress, Smartweeds, Sowthistles, Vetch.	Can be applied preplant until emergence.	Barley, Triticale
Rapport BroadSpec	0.4 to 1.0 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Smartweeds, Thistles.	Must be tank-mixed if using a rate less than 0.6 ounce. Do not exceed 1 ounce per season.	Barley, Oat, Triticale
Reviton	1.0 to 3.0 ounces	Broadleaves: Chickweed, Henbit, Lambsquarters, Shepherd's-purse; Grasses: Barnyardgrass, Bluegrass, Crabgrass, Johnsongrass, Wild Oat.	Do not exceed 6 ounces per acre per year. Do not reapply within 14 days.	None
Satellite HydroCap	1.5 to 3.0 pints	Broadleaves: Henbit, Kochia, Lambsquarters, Shepherd's-purse; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	Apply to seeds planted at least 1 inch deep. Rainfall within 7 days of application will result in best control.	Triticale
Sharpen	1.0 to 4.0 ounces	Broadleaves: Bindweed, Henbit, Kochia, Lambsquarters, Mallow, Morningglory spp., Pigweeds, Sowthistles, Thistles.	Residual activity of broadleaf weeds is dependent on rainfall and soil texture.	Barley, Oat, Rye, Triticale

Table 2. Preemergence Herbicides continued

Product Name	Application Rate Per Acre	Weeds Controlled or Suppressed	Remarks	Other Labeled Small Grains
Stealth	1.8 to 3.6 pints	Broadleaves: Henbit, Kochia, Lambsquarters, Shepherd's-purse; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	Apply to seeds planted at least 1 inch deep. Rainfall within 7 days of application will result in best control.	None
Thief	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mallow, Mustards, Pennycress, Smartweeds, Sowthistle.	Can be applied preplant up to emergence. Do not exceed 1 ounce per acre per season.	Barley, Oat, Triticale
Treaty Treaty Extra	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mustards, Smartweeds, Sowthistle, Thistle.	Can be applied preplant up to emergence. Do not exceed 1 ounce per acre per season.	Barley, Oat, Triticale
T-Square	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Lambsquarters, Mustards, Pennycress, Smartweeds, Thistles, Vetch.	Do not exceed 1 ounce per acre per year. Do not reapply within 14 days.	Barley, Oat, Triticale
Volta Volta Extra	0.3 to 0.6 ounce	Broadleaves: Chamomile, Chickweed, Henbit, Kochia, Prickly Lettuce, Mustards, Smartweeds, Sowthistle, Thistle.	Do not exceed 1 ounce per acre per year. Do not reapply within 14 days.	Barley, Oat, Triticale
Zidua Zidua SC	0.7 to 3.25 ounces	Broadleaves: Flixweed, Henbit, Kochia, Wild Mustard; Grasses: Bromes, Cheat, Wild Oat, Ryegrass.	Apply delayed pre- or post-emergence. Recommended tank-mixing if some weeds have already germinated.	None

Table 3. Post-emergence Herbicides

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
2,4-D (Various Products)	See Labels	Post-tillering to Full Flag Leaf	Broadleaves: Bindweed, Kochia, Prickly Lettuce, Lambsquarters, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, oat, rye, triticale
Affinity BroadSpec	0.4 to 1.0 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Thistles.	Barley, oat, triticale
Aggressor Aggressor AX	8.0 to 16.0 ounces	2nd Leaf to Pre-jointing (COAX Only)	Grasses: Bromes, Crabgrass, Foxtails, Jointed Goatgrass, Johnsongrass, Wild Oat, Panicums, Ryegrass, Signalgrass.	None
Aim EC	0.5 to 1.0 ounce	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Kochia, Morning glories, Tansymustard, Nightshades, Pigweeds, Sowthistles, Russian Thistle.	Barley, oat, rye, triticale
Ally Extra SG	0.3 to 0.5 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Chickweeds, Henbit, Kochia, Lambsquarters, Mustards, Pigweeds, Thistles.	Barley, triticale
Ally XP	0.1 ounce	2nd Leaf to Full Flag Leaf	Broadleaves: Henbit, Kochia, Lambsquarters, Mustards, Shepherd's-purse, Thistles.	Barley, triticale
Amber	0.28 to 0.56 ounce	1st Leaf to Full Flag Leaf	Broadleaves: Henbit, Kochia, Morning glories, Mustards, Thistles; Grasses: Bromes, Cheat, Ryegrass.	Barley
Anthem Flex	2.0 to 4.55 ounces	1st Leaf to Full Tillering	Broadleaves: Henbit, Kochia, Nightshades, Pigweeds; Grasses: Bromes, Cheat, Wild Oat, Panicums, Ryegrass.	None
Antik EC	0.5 to 1.0 ounce	Tiller Initiation to Full Flag Leaf	Broadleaves: Bindweed, Morning glories, Tansymustard, Nightshades, Pigweeds, Sowthistles, Russian Thistle.	Barley, oat, rye, triticale
Audit 1:1	0.4 to 1.0 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Henbit, Kochia, Lambsquarters, Pennycress, Prickly Lettuce, Mustards, Pennycress, Thistles.	Barley, oat, triticale
Axial Bold	15.0 ounces	1st Leaf to Full Flag Leaf	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass, Windgrass.	Barley
Axial Star	16.4 ounces	2nd Leaf to Full Flag Leaf	Broadleaves: Catchweed Bedstraw, Kochia, Prickly Lettuce; Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass.	Barley
Axial XL	16.4 ounces	2nd Leaf to Full Flag Leaf	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass, Windgrass.	Barley
Axiom DF	4.0 to 10.0 ounces	1st Leaf to 2nd Leaf	Broadleaves: Chickweeds, Henbit, Prickly Lettuce, Pigweeds; Grasses: Bluegrasses, Bromes, Wild Oat, Ryegrass.	Triticale
Base Camp MCP Ester	0.5 to 1.67 pints	4th Leaf to Full Flag Leaf	Broadleaves: Buttercups, Kochia, Lambsquarters, Mustards, Pennycress, Shepherd's-purse, Sowthistles, Hairy Vetch.	Barley, oat, rye
Batalium Amped Batalium II	13.7 to 16.0 ounces	2nd Leaf to 2nd Node Visible	Broadleaves: Kochia, Morning glories, Nightshades, Russian Thistle; Grasses: Barnyardgrass, Bromes, Cheat, Foxtails, Wild Oat.	None
Beyond Beyond Xtra	4.0 to 5.0 ounces	Tiller Initiation to Pre-jointing (CL Only)	Broadleaves: Bindweeds, Kochia, Mustards, Thistles; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	None
Bison	1.0 to 2.0 pints	3rd Leaf to Full Flag Leaf	Broadleaves: Chamomiles, Henbit, Kochia, Mustards, Nightshades, Pennycress, Pigweeds, Smartweeds, Thistles.	Barley, oat, rye

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
Bite	0.25 to 0.33 pint	3rd Leaf to Full Flag Leaf	Broadleaves: Chamomile, Clovers, Prickly Lettuce, Nightshades, Sowthistles, Thistles, Hairy Vetch.	Barley, oat
Boomer	1.5 to 2.0 pints	3rd Leaf to Full Flag Leaf	Broadleaves: Bindweed, Kochia, Morning glories, Mustards, Nightshades, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, oat
Brash	0.5 to 1.33 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Shepherd's-purse, Sowthistles, Thistles, Hairy Vetch.	None
Broclean	1.0 to 2.0 pints	1st Leaf to Full Flag Leaf	Broadleaves: Chamomiles, Kochia, Morning glories, Mustards, Nightshades, Pepperweeds, Sowthistles, Thistles.	Barley, oat, rye, triticale
Brox 2EC	1.0 to 2.0 pints	1st Leaf to Full Flag Leaf	Broadleaves: Chamomile, Kochia, Lambsquarters, Morning glories, Mustards, Nightshades, Pigweeds, Russian Thistle.	Barley, oat, rye, triticale
BurnMaster	0.5 to 1.4 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	None
Carnivore	1.5 pints	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Henbit, Kochia, Lambsquarters, Morning glories, Mustards, Nightshades, Russian Thistle.	Barley, oat
Cimarron Plus	0.125 ounce	2nd Leaf to Full Flag Leaf	Broadleaves: Chamomiles, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Thistles.	Barley
Civility Extra	0.3 to 0.6 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Catchweed Bedstraw, Corn Gromwell, Mallows, Nightshades, Canada Thistle, Hairy Vetch.	Barley, oat, triticale
Clean Slate	0.25 to 0.33 pint	3rd Leaf to Full Flag Leaf	Broadleaves: Chamomiles, Prickly Lettuce, Nightshades, Sowthistles, Thistles, Hairy Vetch.	Barley, oat
Cleansweep M	1.0 to 1.5 pints	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Henbit, Kochia, Morning glories, Mustards, Pigweeds, Russian Thistle.	Barley, oat
Colt + Salvo	1.0 to 2.66 pints	4th Leaf to 2nd Node Visible	Broadleaves: Bindweed, Chickweeds, Henbit, Kochia, Morning glories, Mustards, Nightshades, Thistles.	Barley
Colt + Sword	1.125 to 2.0 pints	3rd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Henbit, Kochia, Morning glories, Mustards, Nightshades, Thistles.	Barley, oat
Colt AS	1.0 to 1.33 pints	3rd Leaf to Flag Leaf Emergence	Broadleaves: Chickweeds, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Sowthistles, Thistles.	Barley, oat
Comet	0.5 to 1.33 pints	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Hairy Vetch.	Barley, oat
Cryder	0.67 ounce	2nd Leaf to Pre-jointing	Broadleaves: Chickweed, Henbit, Tansymustard, Pennycress; Grasses: Bromes, Cheat, Wild Oat, Rescuegrass, Ryegrass.	None
Dagger	0.33 to 1.15 pints	Post-tillering to Full Flag Leaf	Broadleaves: Bindweed, Kochia, Lambsquarters, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, oat, rye

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
Derive 4L Derive 75 DF	1.0 to 16.0 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Russian Thistle; Grasses: Bromes, Cheat, Wild Oat, Windgrass.	Barley
Dicam De-Ester	0.5 to 1.0 pint	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	None
Dicamba (Various Products)	See Labels	1st Leaf to Pre-jointing	Broadleaves: Bindweed, Chickweeds, Henbit, Kochia, Mustards, Pennycress, Smartweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, oat, triticale
Dicamba + 2,4-D DMA	3.33 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles.	Barley, oat, rye
Dimetric DF 75% Dimetric EXT	1.0 to 10.67 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Pigweeds, Russian Thistle; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Rescuegrass.	Barley
Discover NG	12.8 to 16.0 ounces	2nd Leaf to Full Flag Leaf	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass, Volunteer Corn.	None
Diuron Products	See Labels	Emergence to Full Flag Leaf	Broadleaves: Kochia, Morning glories, Pigweeds, Tansymustard; Grasses: Barnyardgrass, Bluegrass, Foxtails, Johnsongrass.	None
Double Check	0.33 to 0.66 pint	1st Leaf to 2nd Node Visible	Grasses: Barnyardgrass, Foxtails, Wild Oat, Panicums, Windgrass.	Barley
ET Herbicide ETX Herbicide	0.3 to 1.0 ounce	1st Leaf to 2nd Node Visible	Broadleaves: Bindweed, Chickweeds, Henbit, Kochia, Morning glories, Tansymustard, Pigweeds, Thistles.	Barley, oat, rye, triticale
Everest 3.0 AG	1.0 to 1.3 ounces	1st Leaf to 2nd Node Visible	Broadleaves: Mustards, Pennycress, Shepherd's-purse, Smartweeds; Grasses: Barnyardgrass, Bromes, Cheat, Wild Oat, Ryegrass.	None
Express Express XP	0.33 to 0.5 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Henbit, Kochia, Lambsquarters, Mustards, Pennycress, Shepherd's-purse, Thistles, Hairy Vetch.	Barley, oat, triticale
Fancy	0.66 to 1.33 pints	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Russian Thistle.	Barley, oat
Far Reach	1.0 to 1.33 pints	3rd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chamomiles, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Sowthistles, Thistles.	Barley, oat
Finesse Cereal and Fallow	0.2 to 0.5 ounce	1st Leaf to Full Flag Leaf	Broadleaves: Henbit, Kochia, Mustards, Pigweeds, Thistles; Grasses: Bromes, Cheat, Foxtails, Ryegrass.	Barley, triticale
Flagstaff	0.3 to 0.7 pint	2nd Leaf to Flag Leaf Emergence	Broadleaves: Chickweeds, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Russian Thistle.	Barley, oat, triticale
GCS Clogy 360SL	0.25 to 0.33 pint	3rd Leaf to Full Flag Leaf	Broadleaves: Chamomiles, Clovers, Knapweeds, Prickly Lettuce, Nightshades, Thistles, Hairy Vetch.	Barley, oat
GCS Pinoxaden 0.8EC	8.0 ounces	2nd Leaf to Full Flag Leaf	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass, Windgrass.	Barley

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
Glean XP	0.33 ounce	2nd Leaf to Full Flag Leaf	Broadleaves: Henbit, Kochia, Mustards, Pigweeds, Thistles; Grasses: Downy Brome, Foxtails, Ryegrass.	Barley, oat, triticale
Glory Glory 4L	1.0 to 16.8 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Pigweeds; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Rescuegrass.	Barley
GR1	2.0 ounces	3rd Leaf to Pre-jointing	Broadleaves: Henbit, Mustards, Pennycress, Russian Thistle; Grasses: Bromes, Cheat, Wild Oat, Ryegrass, Windgrass.	Triticale
Harmony Extra SG Harmony GT XP Harmony SG	0.45 to 0.9 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Chickweeds, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mallows, Mustards, Nightshades, Pennycress, Pigweeds, Thistles, Hairy Vetch.	Barley, oat, triticale
Huskie	11.0 to 15.0 ounces	1st Leaf to 2nd Node Visible	Broadleaves: Bindweed, Henbit, Kochia, Prickly Lettuce, Mustards, Nightshades, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, rye, triticale
Huskie Complete	13.7 ounces	1st Leaf to 2nd Node Visible	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Thistles; Grasses: Barnyardgrass, Canarygrass, Wild Oat.	None
Huskie FX	13.5 to 18.0 ounces	2nd Leaf to 2nd Node Visible	Broadleaves: Bindweed, Henbit, Kochia, Prickly Lettuce, Mustards, Nightshades, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, rye, triticale
IronGate	1.75 ounces	3rd Leaf to Flag Leaf Emergence	Broadleaves: Henbit, Mustards, Russian Thistle, Hairy Vetch; Grasses: Barnyardgrass, Bromes, Cheat, Wild Oat, Ryegrass.	None
Kochiavore	1.0 to 1.5 pints	4th Leaf to 2nd Node Visible	Broadleaves: Bindweed, Chickweeds, Kochia, Lambsquarters, Morning glories, Mustards, Pennycress, Pigweeds, Russian Thistle.	Barley
Longbow EC	0.5 to 1.0 ounce	Tiller Initiation to Full Flag Leaf	Broadleaves: Bindweed, Kochia, Morning glories, Tansymustard, Nightshades, Pigweeds, Sowthistles, Russian Thistle.	Barley, oat, rye, triticale
Maestro 2EC Maestro 4EC	0.5 to 2.0 ounces	1st Leaf to Full Flag Leaf	Broadleaves: Chamomiles, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Sowthistles, Russian Thistle.	Barley, oat, rye, triticale
Malibu	7.0 ounces	3rd Leaf to Pre-jointing	Broadleaves: Buttercups, Clovers, Henbit, Knapweeds, Lambsquarters, Tansymustard, Sowthistles, Thistles, Vetches.	None
MCP Amine 4 MCP Ester 4	See Labels	4th Leaf to Full Flag Leaf	Broadleaves: Buttercups, Kochia, Lambsquarters, Mustards, Pennycress, Pigweeds, Sowthistles, Hairy Vetch.	Barley, oat, rye
MCPA L.V. 4 Ester	0.5 to 1.75 pints	Post-tillering to Full Flag Leaf	Broadleaves: Bindweed, Buttercups, Kochia, Lambsquarters, Prickly Lettuce, Pigweeds, Sowthistles, Hairy Vetch.	Barley, rye
MCPA-4 Amine	1.6 pints	Post-tillering to Full Flag Leaf	Broadleaves: Bindweed, Kochia, Lambsquarters, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, oat, rye, triticale
Metribuzin 4L	1.6 to 16.8 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Prickly Lettuce, Mustards, Pigweeds; Grasses: Bromes, Cheat, Foxtails, Wild Oat.	Barley
Metribuzin 75	1.0 to 10.6 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Prickly Lettuce, Mustards, Pigweeds; Grasses: Bromes, Cheat, Foxtails, Wild Oat.	Barley

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
Metricor 4F Metricor DF	1.5 to 16 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Pigweeds, Russian Thistle; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Rescuegrass.	Barley
Metrixx Metrixx 75DF	1.07 to 10.67 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Pigweeds, Russian Thistle; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Rescuegrass.	Barley
Me-Try-Buzin 4L Me-Try-Buzin 75DF	1.0 to 16.0 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Russian Thistle; Grasses: Bluegrasses, Bromes, Cheat, Wild Oat, Windgrass.	Barley
Moxy 2E	1.0 to 2.0 pints	1st Leaf to Full Flag Leaf	Broadleaves: Chamomile, Kochia, Morning glories, Mustards, Nightshades, Pennycress, Shepherd's-purse, Sowthistles, Thistles.	Barley, oat, rye, triticale
MSM 60	0.1 ounce	2nd Leaf to Full Flag Leaf	Broadleaves: Chamomile, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Thistles.	Barley
NextStep NG	12.8 to 16.0 ounces	2nd Leaf to Full Flag Leaf	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass, Volunteer Corn.	None
Olympus 70% WDG	0.6 to 0.9 ounce	Tiller Initiation to Pre-jointing	Broadleaves: Henbit, Mustards, Pennycress, Shepherd's-purse; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat.	Triticale
Orion	17.0 ounces	3rd Leaf to Pre-jointing	Broadleaves: Chamomiles, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Shepherd's-purse, Sowthistles.	Barley, oat, rye, triticale
Osprey Osprey Xtra	4.75 ounces	1st Leaf to Pre-jointing	Broadleaves: Henbit, Wild Mustard, Pennycress; Grasses: Bluegrasses, Bromes, Cheat, Wild Oat, Ryegrass.	Triticale
Outrider	0.67 ounce	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Mustards, Pennycress, Shepherd's-purse; Grasses: Bromes, Cheat, Wild Oat, Rescuegrass, Ryegrass.	None
Parity	0.33 to 0.66 pint	1st Leaf to 2nd Node Visible	Grasses: Barnyardgrass, Canarygrass, Crabgrass, Foxtails, Wild Oat, Panicums, Windgrass.	Barley
Patriot	0.1 ounce	2nd Leaf to Full Flag Leaf	Broadleaves: Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pigweeds, Sowthistles, Thistles.	Barley, triticale
Peak	0.38 to 0.5 ounce	1st Leaf to Jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Prickly Lettuce, Shepherd's-purse, Thistles.	Barley, oat, rye, triticale
Pina	16.4 ounces	2nd Leaf to Full Flag Leaf	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Ryegrass, Windgrass.	Barley
Pin-Dee 3.3 EC	0.9 to 1.8 quarts	1st Leaf to 2nd Node Visible	Broadleaves: Henbit, Kochia, Morning glories, Pigweeds; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	None
Pixxaro EC	6.0 ounces	2nd Leaf to 2nd Node Visible	Broadleaves: Bindweed, Henbit, Kochia, Prickly Lettuce, Morning glories, Nightshades, Pennycress, Thistles, Hairy Vetch.	Barley, triticale
Plotter Plotter Extra	0.1 to 0.4 ounce	Full Tillering to Full Flag Leaf	Broadleaves: Chamomile, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Thistles.	Barley, triticale

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
PowerFlex HL	2.0 ounces	3rd Leaf to Jointing	Broadleaves: Henbit, Mustards, Russian Thistle, Hairy Vetch; Grasses: Barnyardgrass, Bromes, Cheat, Wild Oat, Ryegrass.	Triticale
Prowl H2O	1.5 to 3.0 pints	1st Leaf to 2nd Node Visible	Broadleaves: Henbit, Kochia, Morning glories, Pigweeds; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	Triticale
Puma 1EC	0.33 to 0.66 pint	1st Leaf to 2nd Node Visible	Grasses: Barnyardgrass, Canarygrasses, Foxtails, Wild Oat, Windgrass.	Barley
Purestand	0.1 ounce	2nd Leaf to Full Flag Leaf	Broadleaves: Henbit, Kochia, Prickly Lettuce, Lambsquarters, Mustards, Pigweeds, Sowthistles, Thistles.	Barley, triticale
Quelex	0.75 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Bindweed, Chamomiles, Henbit, Kochia, Mustards, Pennycress, Smartweeds, Sowthistles, Hairy Vetch.	Barley, triticale
Rancor 4 F Rancor 75 DF	1.0 to 10.6 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Mustards, Pigweeds, Russian Thistle; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Rescuegrass.	Barley
Range Star	0.5 to 1.33 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles.	None
Rapport BroadSpec	0.4 to 1.0 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Henbit, Kochia, Lambsquarters, Mustards, Pennycress, Shepherd's-purse, Thistles.	Barley, oat, triticale
Rave	4.0 ounces	1st Leaf to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Morning glories, Mustards, Pennycress, Pigweeds, Thistles, Hairy Vetch.	Barley
Rezuvant	16.4 ounces	2nd Leaf to 2nd Node Visible	Broadleaves: Bindweed, Henbit, Kochia, Morning glories, Thistles; Grasses: Barnyardgrass, Foxtails, Wild Oat, Windgrass.	Barley
Rhomene MCPA Broadleaf	0.25 to 1.6 pints	4th Leaf to Full Flag Leaf	Broadleaves: Bindweed, Buttercups, Kochia, Lambsquarters, Mustards, Pigweeds, Sowthistles, Thistles.	Barley, oat, rye, triticale
Rhonox MCPA	0.5 to 1.5 pints	4th Leaf to Full Flag Leaf	Broadleaves: Lambsquarters, Mustards, Pennycress, Pigweeds, Plantains, Shepherd's-purse, Thistles.	Barley, oat, rye, triticale
Rifle-D	1.0 to 8.0 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Nightshades, Pennycress, Pigweeds, Thistles, Hairy Vetch.	Triticale
Saddle-Up	0.5 to 1.33 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	None
Satellite HydroCap	1.5 to 3.0 pints	1st Leaf to 2nd Node Visible	Broadleaves: Henbit, Kochia, Morning glories, Pigweeds; Grasses: Bromes, Cheat, Jointed Goatgrass, Ryegrass, Wild Oat.	Triticale
Scorch	0.5 to 1.3 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Shepherd's-purse, Thistles, Hairy Vetch.	Barley, oat, triticale
Solve MCPA Ester	0.5 to 1.67 pints	4th Leaf to Full Flag Leaf	Broadleaves: Buttercups, Kochia, Lambsquarters, Mustards, Pennycress, Sowthistles, Hairy Vetch.	Barley, rye

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
Spitfire	0.5 to 1.4 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Shepherd's-purse, Thistles, Hairy Vetch.	None
Spur	0.25 to 0.33 pint	3rd Leaf to Full Flag Leaf	Broadleaves: Chamomile, Prickly Lettuce, Nightshades, Sowthistles, Thistles, Hairy Vetch.	Barley, oat
Starane NXT	14.0 to 27.4 ounces	3rd Leaf to 2nd Node Visible	Broadleaves: Bindweed, Chickweeds, Kochia, Prickly Lettuce, Morning glories, Mustards, Nightshades, Russian Thistle.	Barley, oat, triticale
Starane Ultra	0.3 to 0.7 pint	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Prickly Lettuce, Morning glories, Mustards, Nightshades, Russian Thistle.	Barley, oat, triticale
StareDown	0.3 to 0.7 pint	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Prickly Lettuce, Morning glories, Mustards, Nightshades, Russian Thistle.	Barley, oat, triticale
Stark Ultra	0.3 to 0.7 pint	2nd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Prickly Lettuce, Morning glories, Mustards, Nightshades, Russian Thistle.	Barley, oat, triticale
Stealth	1.8 to 3.6 pints	1st Leaf to 2nd Node Visible	Broadleaves: Henbit, Kochia, Morning glories, Pigweeds; Grasses: Bromes, Cheat, Jointed Goatgrass, Wild Oat, Ryegrass.	None
Stigmata	0.25 to 0.33 pint	3rd Leaf to Full Flag Leaf	Broadleaves: Chamomile, Clovers, Prickly Lettuce, Nightshades, Sowthistles, Thistles, Hairy Vetch.	Barley, oat
Stinger	0.25 to 0.33 pint	3rd Leaf to Full Flag Leaf	Broadleaves: Clovers, Prickly Lettuce, Nightshades, Ragweeds, Smartweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, oat
Supremacy	5.0 ounces	2nd Leaf to 2nd Node Visible	Broadleaves: Bindweed, Henbit, Kochia, Lambsquarters, Morning glories, Mustards, Nightshades, Sowthistles, Thistles.	Barley, oat, triticale
Sword	0.33 to 0.75 pint	Post-tillering to Full Flag Leaf	Broadleaves: Bindweed, Kochia, Prickly Lettuce, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	Barley, rye
Tacoma 1EC	0.33 to 0.66 pint	1st Leaf to 2nd Node Visible	Grasses: Barnyardgrass, Canarygrass, Foxtails, Wild Oat, Windgrass, Volunteer Corn.	Barley
Talinor	13.7 to 18.2 ounces	2nd Leaf to 2nd Node Visible	Broadleaves: Chickweeds, Henbit, Kochia, Prickly Lettuce, Mustards, Nightshades, Pennycress, Pigweeds, Sowthistles, Thistles.	Barley
Taquet	0.17 to 0.33 ounce	2nd Leaf to Pre-flag Leaf	Broadleaves: Chamomile, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Sowthistles.	Barley, oat, triticale
Tarzec	1.0 ounce	3rd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Thistles, Hairy Vetch; Grasses: Bromes, Cheat, Wild Oat, Ryegrass, Windgrass.	Triticale
Thief	0.3 to 0.6 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Henbit, Kochia, Prickly Lettuce, Mustards, Pennycress, Sowthistles, Russian Thistle.	Barley, oat, triticale
Tide MSM 60 DF	0.1 ounce	Tiller Initiation to Full Flag Leaf	Broadleaves: Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pigweeds, Sowthistles, Thistles.	Barley, triticale

Table 3. Post-emergence Herbicides continued

Product Name	Application Rate Per Acre	Application Growth Stages	Weeds Controlled or Suppressed	Other Labeled Small Grains
Tolvera	11.0 to 14.7 ounces	1st Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Sowthistles, Thistles; Grasses: Barnyardgrass, Crabgrass, Foxtails.	Barley
Treaty Treaty Extra	0.3 to 0.6 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Henbit, Kochia, Prickly Lettuce, Lambsquarters, Mustards, Pennycress, Russian Thistle.	Barley, oat, triticales
TriCor 4F Tricor DF	1.0 to 16.0 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Prickly Lettuce, Mustards, Russian Thistle; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Rescuegrass.	Barley
T-Square	0.3 to 0.6 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Chickweeds, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Thistles, Hairy Vetch.	Barley, oat, triticales
Victory	0.167 to 0.33 ounce	2nd Leaf to 2nd Node Visible	Broadleaves: Chamomiles, Henbit, Kochia, Lambsquarters, Mustards, Pennycress, Shepherd's-purse, Thistles.	Barley, oat, triticales
Volta Volta Extra	0.3 to 0.6 ounce	2nd Leaf to Pre-flag Leaf	Broadleaves: Chamomiles, Henbit, Kochia, Lambsquarters, Prickly Lettuce, Mustards, Pennycress, Russian Thistle.	Barley, oat, triticales
WeedMaster	0.5 to 1.4 pints	Post-tillering to Pre-jointing	Broadleaves: Bindweed, Henbit, Kochia, Mustards, Pennycress, Pigweeds, Sowthistles, Thistles, Hairy Vetch.	None
Weld	1.0 to 2.0 pints	3rd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Lambsquarters, Morning glories, Mustards, Nightshades, Sowthistles, Thistles.	Barley, oat
WideMatch	1.0 to 1.33 pints	3rd Leaf to Flag Leaf Emergence	Broadleaves: Bindweed, Chickweeds, Kochia, Prickly Lettuce, Morning glories, Mustards, Nightshades, Thistles.	Barley, oat
Willowood Metribuzin 75DF	1.0 to 10.67 ounces	2nd Leaf to Pre-jointing	Broadleaves: Henbit, Kochia, Mustards, Russian Thistle; Grasses: Bluegrasses, Bromes, Cheat, Wild Oat, Windgrass.	Barley
Zidua Zidua SC	1.0 to 4.0 ounces	1st Leaf to Tiller Initiation	Broadleaves: Henbit, Kochia, Lambsquarters, Pigweeds; Grasses: Bromes, Cheat, Foxtails, Wild Oat, Ryegrass.	None

Table 4. Harvest Aids

Product Name	Application Rate Per Acre	Weeds Controlled	Preharvest Interval	Remarks
2,4-D (Various Products)	Various	Broadleaf weeds	Do not apply within 14 days of harvest.	Do not use treated straw for livestock.
Aim EC	2.0 ounces	Broadleaf weeds	Do not apply within 7 days of harvest.	A methylated seed oil or crop oil concentrate is required.
Ally XP	0.1 ounce	Broadleaf weeds	Do not apply within 10 days of harvest.	Used in combination with 2,4-D or glyphosate.
Antik EC	2.0 ounces	Broadleaf weeds	Do not apply within 7 days of harvest.	A methylated seed oil or crop oil concentrate is required.
Brash	1.4 pints	Broadleaf weeds	Do not apply within 14 days of harvest.	Reference remarks for 2,4-D and dicamba.
BurnMaster	1.2 pints	Broadleaf weeds	Do not apply within 14 days of harvest.	Reference remarks for 2,4-D and dicamba.
Dicamba (Various Products)	Various	Broadleaf weeds	Do not apply within 7 days of harvest.	Do not allow grazing or use feed from a treated area.
Flumi SX	1.5 to 2.0 ounces	Broadleaf weeds	Do not apply within 10 days of harvest.	Used in combination with 2,4-D or glyphosate.
Glyphosate (Various Products)	Various	Broadleaf and grass weeds	Do not apply within 7 days of harvest.	Not recommended for wheat harvested for seed.
Landmaster BW	2 pints	Broadleaf and grass weeds	Do not apply within 14 days of harvest.	Reference remarks for 2,4-D and glyphosate.
MSM 60	0.1 ounce	Broadleaf weeds	Do not apply within 10 days of harvest.	Use in combination with 2,4-D or glyphosate.
Patriot	0.1 ounce	Broadleaf weeds	Do not apply within 10 days of harvest.	Use in combination with 2,4-D or glyphosate.
Plotter	0.1 ounce	Broadleaf weeds	Do not apply within 10 days of harvest.	Use in combination with 2,4-D or glyphosate.
Purestand	0.1 ounce	Broadleaf weeds	Do not apply within 10 days of harvest.	Use in combination with 2,4-D or glyphosate.
Range Star	1.3 pints	Broadleaf weeds	Do not apply within 14 days of harvest.	Reference remarks for 2,4-D and dicamba.
Rifle-D	1.3 pints	Broadleaf weeds	Do not apply within 14 days of harvest.	Reference remarks for 2,4-D and dicamba.
Sharpen	1.0 to 2.0 ounces	Broadleaf weeds	Do not apply within 3 days of harvest.	Allow up to 10 days for optimum desiccation.
Valor EZ	1.5 to 2.0 ounces	Broadleaf weeds	Do not apply within 10 days of harvest.	Used in combination with 2,4-D or glyphosate.
WeedMaster	1.4 pints	Broadleaf weeds	Do not apply within 7 days of harvest.	Reference remarks for 2,4-D and dicamba.

For Table 5, the forage restrictions are divided into graze or hay categories. Additionally, the **mode of action** is the primary biochemical or biophysical event that an herbicide directly affects, killing the plant. Here are some things to know about different modes of action for Table 5:

- **ACCase** herbicides inhibit the enzyme acetyl-coenzyme A carboxylase in the pathway leading to lipid synthesis in plants.
- **ALS inhibitor** herbicides disrupt the pathways leading to amino acid production in plants, and include the chemical families sulfonylurea and imidazolinone.
- **EPSP synthase inhibitor** herbicides prevent the formation of amino acids used to form plant pigments.
- **TIR1 auxin receptor** (growth regulators) herbicides disrupt hormone balance and protein synthesis in the plant. This leads to weak cell walls and rapid cell proliferations.
- **Lipid synthesis inhibitor** herbicides stop the production of plant lipids. This stops the formation of cell membranes, which halts new plant growth.
- **Microtubule inhibitor** herbicides inhibit cell division and prevent shoot and root elongation.
- **Photosynthesis inhibitor** herbicides inhibit electron transport in the photosynthetic reaction of plants.
- **HPPD inhibitor** herbicides prevent the production of compounds that protect the plant from chlorophyll destruction.

Active Ingredient (Product Name)	Graze	Hay	Crop Rotation Restrictions	Mode of Action	Herbicide Group Number
2,4-D (Many Products)	See individual labels		Corn: anytime; sorghum, wheat: 0.5 months; cotton, soybeans: see labels.	T1R1 Auxin Receptors	4
2,4-D, Dicamba (Brash, BurnMaster, Rifle-D, Saddle-Up, Spitfire, WeedMaster)	Not prior to maturity	7 to 37 days	Cereals: 10 days per pint applied; other crops: 120 days.	T1R1 Auxin Receptors	4
2,4-D, Dicamba, Fluroxypyr (Scorch)	Not prior to maturity	7 days	Cereals: 10 days per pint applied; other crops: 120 days.	T1R1 Auxin Receptors	4, 4, 4
2,4-D, Bromoxynil, Fluroxypyr (Kochiavore)	45 days	14 days	Barley, wheat, corn, sorghum: 30 days; other crops: 120 days.	T1R1 Auxin Receptors + Photosystem II Inhibitors	4, 6
Aminopyralid (Malibu)	See label		Cereals, corn: 365 days; broadleaves: 2 years or more.	T1R1 Auxin Receptors	4
Bicyclopyrone, Bromoxynil octanoate (Talinor)	30 days	30 days	Barley, wheat: 1 month; oats: 3 months; cotton: 10 months; corn: anytime.	Photosystem II Inhibitors + HPPD Inhibitors	6, 27
Bromoxynil (Broclean, Brox 2EC, Maestro 2EC, Maestro 4EC, Moxy 2E)	45 days	See label	See individual labels.	Photosystem II Inhibitors	6
Bromoxynil, Flucarbazone-sodium, Fluroxypyr (Batalium II, Batalium Amped)	15 days	See label	Wheat: anytime; others are variable depending on soil pH.	ALS + Photosystem II Inhibitors + T1R1 Auxin Receptors	2, 4, 6
Carfentrazone-ethyl (Aim EC, Antik EC, Longbow EC)	7 days	7 days	Corn, cotton, sorghum, wheat: anytime; other crops: 12 months.	PPO Inhibitors	14
Chlorsulfuron (Glean XP)	0 days	0 days	Variable depending on soil pH and rainfall: see label.	ALS Inhibitors	2
Chlorsulfuron, Metsulfuron-methyl (Finesse Cereal and Fallow)	0 days	0 days	Variable depending on soil pH and rainfall: see label.	ALS Inhibitors	2, 2

Table 5. Herbicide Restrictions and Modes of Action continued

Active Ingredient (Product Name)	Graze	Hay	Crop Rotation Restrictions	Mode of Action	Herbicide Group Number
Clodinafop-propargyl (Discover NG, NextStep NG)	30 days	30 days	Wheat: anytime; all others: 30 days.	ACCase Inhibitors	1
Clopyralid (Bite, Clean Slate, GCS Clopy 360SL, Spur, Stigmata, Stinger)	7 days	Do not hay	Cereals, canola, corn: anytime; alfalfa, sorghum: 10.5 months; cotton: 18 months.	T1R1 Auxin Receptors	4
Clopyralid, Fluroxypyr (Colt AS)	7 days	14 days	Barley, corn, oats, wheat: anytime; alfalfa, sorghum: 10.5 months; cotton: 18 months.	T1R1 Auxin Receptors	4
Dicamba (Many Products)	See individual labels		See individual labels	T1R1 Auxin Receptors	4
Dicamba, 2,4-D (Dicamba + 2,4-D DMA, Range Star, Dicam De-Ester)	Not prior to maturity	7 days	Variable depending on application rate and rainfall: see label.	T1R1 Auxin Receptors	4
Diuron (Direx 4L, Diuron, Drill, Karmex DF)	See individual labels		At least 1 year for all crops.	Photosystem II Inhibitors	7
Fenoxaprop-p-ethyl (Double Check, Parity, Puma 1EC, Tacoma 1EC)	60 days	See label	See individual labels	ACCase Inhibitors	1
Florasulam, MCPA (Orion)	7 days	See label	Cereals: 1 month; corn, sorghum: 3 months; canola: 9 months; cotton: 12 months.	ALS Inhibitors + T1R1 Auxin Receptors	2, 4
Flucarbazone-sodium (Everest 3.0 AG, Pre-Pare 70% WDG)	7 days	See label	Cereals: 1 month; corn, sorghum: 3 months; canola: 9 months; cotton: 12 months.	ALS Inhibitors	2
Flufenacet, Metribuzin (Axiom DF)	30 days	See label	Corn, soybean: anytime; wheat, triticale: 7 days; cotton: 8 months; barley, oats: 1 year.	Photosystem II + Long Chain Fatty Acid Inhibitors	5, 15
Flumioxazin (Flumi SX, Valor EZ)	Must be 5 inches in height	See label	Variable depending on rate and tillage: see label; at least 30 days for wheat at 2 ounces per acre.	PPO Inhibitors	14
Fluroxypyr (Comet, Fancy, Flagstaff, Starane Ultra, StareDown, Stark Ultra)	7 days	14 days	Barley, oats, wheat: anytime; all others: 120 days.	T1R1 Auxin Receptors	4
Fluroxypyr, 2,4-D (Colt + Salvo)	14 days	14 days	Barley, oats, wheat: anytime; all others: 120 days.	T1R1 Auxin Receptors	4
Fluroxypyr, Bromoxynil (Starane NXT)	45 days	45 days	Wheat, barley, oats, corn, sorghum: 30 days; all others: 120 days.	T1R1 Auxin Receptors + Photosystem II Inhibitors	4, 6
Fluroxypyr, Clopyralid (Far Reach, WideMatch)	7 days	14 days	Barley, oats, wheat, corn: anytime; sorghum: 10.5 months; cotton: 18 months.	T1R1 Auxin Receptors	4
Fluroxypyr, Clopyralid, MCPA (Boomer)	7 days	14 days	Barley, oats, wheat: 30 days; corn: 60 days; sorghum: 10 months; cotton: 18 months.	T1R1 Auxin Receptors	4, 4, 4

Table 5. Herbicide Restrictions and Modes of Action continued

Active Ingredient (Product Name)	Graze	Hay	Crop Rotation Restrictions	Mode of Action	Herbicide Group Number
Fluroxypyr, Halauxifen-methyl (Pixxaro EC)	7 days	21 days	Barley, triticale, wheat: anytime; corn: 3 days; oats, sorghum: 14 days; cotton: 4 months.	T1R1 Auxin Receptors	4, 4
Fluroxypyr, Halauxifen-methyl, Pinoxaden (Rezuvant)	30 days	30 days	Barley, wheat: anytime; corn, oats, sorghum: 3 months; cotton, soybean: 4 months.	ACCase Inhibitors + T1R1 Auxin Inhibitors	1, 4, 4
Fluroxypyr, MCPA (Colt + Sword)	45 days	14 days	Barley, wheat, oats: anytime; all others: 120 days.	T1R1 Auxin Receptors	4
Fluroxypyr, Thifensulfuron-methyl, Tribenuron-methyl (Supremacy)	Do not graze	Do not hay	Barley, oats, wheat: anytime; corn, sorghum: 45 days; all others: 120 days.	ALS Inhibitors + T1R1 Auxin Receptors	2, 4
Glyphosate (Many Products)	7 days	7 days	None	EPSP Synthase Inhibitors	9
Glyphosate, 2,4-D (Landmaster BW)	14 days	See label	See label: unlabeled crops at least 29 days.	T1R1 Auxin Receptors + EPSP Synthase Inhibitors	4, 9
Halauxifen-methyl, Florasulam (Quelex)	7 days	21 days	Barley, wheat, triticale: anytime; corn, oats, sorghum, cotton: 3 months.	ALS Inhibitors + T1R1 Auxin Receptors	2, 4
Imazamox (Beyond, Beyond Xtra)	0 days	0 days	See label: state is split into two regions and is dependent on rate applied.	ALS Inhibitors	2
MCPA (MCP Ester, MCPA Amine, Rhomene MCPA Broadleaf, Rhonox MCPA, Sword)	See individual labels		Corn: anytime; sorghum, wheat: 0.5 months; cotton, soybeans: see labels.	T1R1 Auxin Receptors	4
MCPA, Bromoxynil (Bison)	45 days	See label	See label: at least 30 days.	T1R1 Auxin Receptors + Photosystem II Inhibitors	4, 6
MCPA, Bromoxynil, Fluroxypyr (Carnivore, Cleansweep M)	45 days	14 days	See label.	T1R1 Auxin Receptors + Photosystem II Inhibitors	4, 6
MCPA, Clopyralid, Fluroxypyr (Weld)	7 days	14 days	Barley, wheat, oats: anytime; all others dependent on various factors: see label.	T1R1 Auxin Receptors	4
Mesosulfuron-methyl (Osprey)	30 days	60 days	Wheat, triticale: 7 days; barley: 30 days; cotton, corn, sorghum: 90 days.	ALS Inhibitors	2
Mesosulfuron-methyl, Thiencazabone-methyl (Osprey Xtra)	30 days	60 days	Wheat, triticale: 3 months; cotton: 4 months; barley, corn, sorghum: 9 months.	ALS Inhibitors	2, 2
Metribuzin (Derive 4L and 75 DF, Dimetric DF 75% and EXT, Glory, Metribuzin 4L and 75, Metricor 4F and DF, Metrixx, Rancor 4 F and 75 DF, TriCor 4F and DF)	See individual labels		Corn: 4 months; barley, wheat: 8 months; cotton, sorghum: 18 months	Photosystem II Inhibitors	5
Metsulfuron-methyl (Ally XP, MSM 60, Patriot, Purestand, Plotter, Tide MSM 60 DF)	0 days	0 days	See labels: dependent on rainfall and soil pH.	ALS Inhibitors	2

Table 5. Herbicide Restrictions and Modes of Action continued

Active Ingredient (Product Name)	Graze	Hay	Crop Rotation Restrictions	Mode of Action	Herbicide Group Number
Metsulfuron-methyl, Thifensulfuron-methyl, Tribenuron-methyl (Ally Extra SG)	7 days	30 days	See label: dependent on rainfall and soil pH.	ALS Inhibitors	2, 2, 2
Metsulfuron-methyl, Chlorsulfuron (Cimarron Plus)	See label	See label	Wheat: 1 month; barley, oats: 10 months; all others dependent on rainfall and soil pH.	ALS Inhibitors	2
Paraquat (Gramoxone SL 3.0)	0 days	0 days	None	Photosystem I Electron Diverter	22
Pendimethalin (Pin-Dee 3.3 EC, Satellite HydroCap, Stealth, Prowl H2O)	11 days	28 days	Corn, cotton, soybean: anytime; wheat, barley: 4 months; sorghum: 10 months.	Microtubule Inhibitors	3
Pinoxaden (Axial XL, GCS Pinoxaden 0.8EC, Pina)	30 days	30 days	Wheat, barley: anytime; leafy and root crops: 30 days; all others: 90 days.	ACCase Inhibitors	1
Pinoxaden, Fenoxaprop-p-ethyl (Axial Bold)	30 days	30 days	Wheat, barley: anytime; leafy and root crops: 30 days; all others: 90 days.	ACCase Inhibitors	1, 1
Pinoxaden, Fluroxypyr (Axial Star)	30 days	30 days	Wheat, barley: anytime; all others: 4 months.	ACCase Inhibitors + T1R1 Auxin Inhibitors	1, 4
Propoxycarbazone-sodium (Olympus 70% WDG)	0 days	71 days	Wheat, triticale: anytime; sorghum: 6 months; cotton: 12 months; corn: 18 months.	ALS Inhibitors	2
Prosulfuron (Peak)	30 days	See label	See label: state is split into two regions and is dependent on soil pH.	ALS Inhibitors	2
Pyraflufen-ethyl (ET Herbicide, ETX Herbicide)	See label	21 days	Corn, cotton, triticale, wheat: anytime; oilseeds: 1 day; sorghum: 30 days.	PPO Inhibitors	14
Pyrasulfotole, Bromoxynil octanoate, Bromoxynil heptanoate (Huskie)	25 days	30 days	Wheat, barley, sorghum: 7 days; oats, triticale: 1 month; corn: 9 months.	Photosystem II Inhibitors + HPPD Inhibitors	6, 27
Pyrasulfotole, Bromoxynil octanoate, Bromoxynil heptanoate, Fluroxypyr (Huskie FX)	25 days	30 days	Wheat, barley, sorghum: 7 days; oats, triticale: 1 month; corn: 9 months.	T1R1 Auxin Receptors + Photosystem II Inhibitors	4, 6, 27
Pyrasulfotole, Bromoxynil, Thiencarbazone- methyl (Huskie Complete)	25 days	30 days	Wheat: 3 months; corn, canola, sorghum, oats, soybean: 9 months.	ALS + Photosystem II + HPPD Inhibitors	2, 6, 27
Pyroxasulfone (Zidua, Zidua SC)	7 days	7 days	Corn: anytime; all others dependent on rate applied: see label.	Long Chain Fatty Acid Inhibitors	15
Pyroxasulfone, Carfentrazone-ethyl (Anthem Flex)	7 days	7 days	Corn: anytime; all others dependent on rate applied: see label.	PPO + Long Chain Fatty Acid Inhibitors	14, 15

Table 5. Herbicide Restrictions and Modes of Action continued

Active Ingredient (Product Name)	Graze	Hay	Crop Rotation Restrictions	Mode of Action	Herbicide Group Number
Pyroxsulam (PowerFlex HL, GR1)	7 days	28 days	Wheat, triticale: 1 month; barley, corn, oats, sorghum: 9 months; cotton: 12 months.	ALS Inhibitors	2
Pyroxsulam, Halauxifen-methyl (Tarzec)	7 days	28 days	Wheat, triticale: 1 month; barley, corn, oats, sorghum: 9 months; cotton: 15 months.	ALS Inhibitors + T1R1 Auxin Receptors	2, 4
Quinclorac (Facet L, GCS Quinclo 4, Prize, QuinStar 4L)	0 days	7 days	Wheat, sorghum: anytime; corn, cotton: 10 months; alfalfa, peas: 24 months.	T1R1 Auxin Receptors	4
Quizalofop-P-ethyl (Aggressor, Aggressor AX, Se-Cure EC, Targa)	See individual labels		Cotton, wheat: anytime; corn, sorghum: 120 days.	ACCase Inhibitors	1
Saflufenacil (Sharpen)	30 days	30 days	Corn: anytime; all others dependent on rate applied: see label.	PPO Inhibitors	14
Sulfosulfuron (Cryder, Outrider)	0 days	30 days	Wheat: anytime; all others: 3 months.	ALS Inhibitors	2
Thifensulfuron-methyl (Harmony SG, Harmony GT XP, Thief, Treaty, Volta)	See individual labels		Cereals, corn: anytime; all others: 45 days.	ALS Inhibitors	2
Thifensulfuron-methyl, Tribenuron-methyl (Affinity BroadSpec, Audit 1:1, Civility Extra, Harmony Extra SG, Rapport BroadSpec, Treaty Extra, T-Square, Volta Extra, FirstShot SG Burndown)	See individual labels		Cereals: anytime; canola: 60 days; most others: 45 days, check individual labels.	ALS Inhibitors	2, 2
Tiafenacil (Reviton)	See label		Corn, wheat: anytime; others dependent on rate applied: see label.	PPO Inhibitors	14
Triasulfuron (Amber)	0 days	30 days	Wheat: anytime; others dependent on various factors: see label.	ALS Inhibitors	2
Triasulfuron, Dicamba (Rave)	0 to 7 days	7 days	Wheat: anytime; others dependent on soil pH: see label.	ALS Inhibitors + T1R1 Auxin Receptors	2, 4
Tribenuron-methyl (Express, Express XP, Taquet, Victory)	7 days	30 days	Barley, triticale, wheat: anytime; oats: 1 day; cotton, corn, sorghum: 14 days.	ALS Inhibitors	2
Tribenuron-methyl, Thifensulfuron-methyl (Panoflex)	7 days	See label	Barley, triticale, wheat: anytime; oats: 1 day; cotton, corn, sorghum: 14 days.	ALS Inhibitors	2, 2
Tribenuron-methyl, Thifensulfuron-methyl, Metsulfuron-methyl (Plotter Extra)	7 days	30 days	Wheat, triticale: 1 month; barley, oats: 10 months. See label for others.	ALS Inhibitors	2
Trifluralin (Treflan TR-10)	Do not graze or hay		Variable depending on rainfall: see label.	Microtubule Inhibitors	3

In the following tables, weed response ratings are based on an application according to label directions and favorable growing conditions. Efficacy ratings may not apply to areas where resistant weed populations have developed. Not all ratings are based on research in Texas and may be taken from other regional institutions. In the table, E=Excellent, G=Good, F=Fair, and P=Poor. A dash (-) indicates no data or not labeled for that particular weed species.

Table 6. Herbicide Efficacy Ratings: Grasses

Herbicides	Downy Brome	Cheat	Feral Rye	Italian Ryegrass	Japanese Brome	Jointed Goatgrass	Rescuegrass	Wild Oat
Preplant								
Amber Custom-Pak	F	F	P	F-G	F-G	P	P	P
Finesse Cereal and Fallow	P	P	P	G	P	P	P	P
Olympus 70% WDG	F-G	G	-	-	G	-	-	-
Pre-Pare 70% WDG	P	F	-	P	F	-	-	-
Reviton	-	-	-	-	-	-	-	-
Preemergence								
Amber Custom-Pak	F	F	-	F-G	F-G	-	-	-
Axiom DF	E	E	-	-	E	-	-	-
Finesse Cereal and Fallow	F	F	-	F-G	F-G	-	-	-
Olympus 70% WDG	F-G	G	-	-	G	-	-	-
Outrider	F-G	G	-	F	G	-	-	-
Pre-Pare 70% WDG	P	F	-	P	F	-	-	-
Reviton	-	-	-	-	-	-	-	-
Sharpen	-	-	-	-	-	-	-	-
Zidua SC/Anthem Flex	F	F	-	G	F	-	-	-
Post-emergence								
2,4-D	-	-	-	-	-	-	-	-
Affinity BroadSpec	-	-	-	-	-	-	-	-
Aggressor AX (CoAXium wheat)	G-E	G-E	-	G-E	G-E	-	-	-
Aim EC	-	-	-	-	-	-	-	-
Ally Extra SG	-	-	-	-	-	-	-	-
Amber Custom-Pak	-	-	-	-	-	-	-	-
Axial XL	-	-	-	E	-	-	-	E
Batalium Amped	F-G	F-G	-	P-F	F-G	-	-	-

Table 6. Herbicide Efficacy Ratings: Grasses continued

Herbicides	Downy Brome	Cheat	Feral Rye	Italian Ryegrass	Japanese Brome	Jointed Goatgrass	Rescuegrass	Wild Oat
Post-emergence continued								
Beyond Xtra (Clearfield wheat)	G-E	E	G	G-E	E	E	G	E
Carnivore	-	-	-	-	-	-	-	-
Dicamba	-	-	-	-	-	-	-	-
Dicamba + 2,4-D	-	-	-	-	-	-	-	-
Everest 3.0 AG	P-F	G-E	-	F-G	G-E	-	-	-
Express	-	-	-	-	-	-	-	-
Finesse Cereal and Fallow	-	-	-	-	-	-	-	-
Glean XP	P	P	P	F	P	P	P	P
Harmony SG	-	-	-	-	-	-	-	-
Harmony Extra SG	-	-	-	-	-	-	-	-
Hoelon 3EC	P	P	P	E	P	P	P	E
Huskie	-	-	-	-	-	-	-	-
MCPA	-	-	-	-	-	-	-	-
Metribuzin 75DF	F	F-G	-	F	F-G	-	-	-
Olympus 70% WDG	F-G	E	P	P-F	G-E	P	P	G
Orion	-	-	-	-	-	-	-	-
Osprey	F	P-F	P	G-E	F	P	P	E
Outrider	F-G	G-E	-	F	G-E	-	-	-
Peak	-	-	-	-	-	-	-	-
Pixxaro EC	-	-	-	-	-	-	-	-
PowerFlex HL	F-G	G-E	-	F-G	G-E	-	G	G-E
Pulsar	-	-	-	-	-	-	-	-
Quelex	-	-	-	-	-	-	-	-
Rave	-	-	-	-	-	-	-	-
Starane NXT	-	-	-	-	-	-	-	-
Starane Ultra	-	-	-	-	-	-	-	-
Talinor	-	-	-	-	-	-	-	-
WeedMaster	-	-	-	-	-	-	-	-
WideMatch	-	-	-	-	-	-	-	-

Table 6. Herbicide Efficacy Ratings: Broadleaf Weeds Part 1

Herbicides	Blue Mustard	Bushy Wallflower	Carolina Geranium	Chickweed	Corn Gromwell	Curly Dock	Cutleaf Primrose	Field Bindweed	Field Pennycress	Flixweed/Tansy Mustard	Henbit	Horseweed	Kochia
Preplant													
Amber Custom-Pak	E	E	E	E	-	G	E	P	E	E	G-E	G	F-G
Finesse Cereal and Fallow	E	E	E	E	E	G	E	P	E	E	E	G	F-G
Olympus 70% WDG	F-G	G	-	-	-	-	-	-	G	F-G	F	-	-
Pre-Pare 70% WDG	F-G	G	-	-	-	-	-	-	G	F-G	-	-	-
Reviton	G	G	-	-	-	-	-	-	E	E	E	-	G
Preemergence													
Amber Custom-Pak	E	E	-	-	-	G	E	P	E	E	G	G	F-G
Axiom DF	-	-	E	E	-	E	-	-	-	-	G	E	-
Finesse Cereal and Fallow	E	E	-	-	-	-	-	-	E	E	E	-	G
Olympus 70% WDG	F-G	G	-	-	-	-	-	-	G	F-G	F	-	-
Outrider	-	-	-	-	-	-	-	-	E	E	F-G	-	-
Pre-Pare 70% WDG	F-G	G	-	-	-	-	-	-	G	F-G	-	-	-
Reviton	G	G	-	-	-	-	-	-	E	E	E	-	G
Sharpen	-	-	-	E	-	-	G	G	-	G	F-G	E	G
Zidua SC/Anthem Flex	-	-	-	-	-	-	-	-	-	F-G	F	-	F
Post-emergence													
2,4-D	E	E	E	P	P	G	G	F-G	E	E	P	P	F-G
Affinity BroadSpec	G	E	F	E	G	E	F	P	G-E	G-E	G	F-G	G
Aggressor AX (CoAXium wheat)	-	-	-	-	-	-	-	-	-	-	-	-	-
Aim EC	G-E	G-E	-	P	-	-	F	F	E	G-E	G	F	G
Ally Extra SG	G-E	E	-	-	-	-	-	-	E	G-E	E	-	G
Amber Custom-Pak	E	G-E	-	-	-	-	G	P	E	G-E	F-G	G	F-G
Axial XL	-	-	-	-	-	-	-	-	-	-	-	-	-
Batalium Amped	G-E	E	-	-	-	-	-	F	E	G	F	-	G-E
Beyond Xtra (Clearfield wheat)	G	G-E	-	-	-	-	-	G	E	G-E	G-E	P	G

Table 6. Herbicide Efficacy Ratings: Broadleaf Weeds Part 1 continued

Herbicides	Blue Mustard	Bushy Wallflower	Carolina Geranium	Chickweed	Corn Gromwell	Curly Dock	Cutleaf Primrose	Field Bindweed	Field Pennycress	Flixweed/Tansy Mustard	Henbit	Horseweed	Kochia
Post-emergence continued													
Carnivore	G	E	-	-	-	-	-	F	E	G	G	-	E
Dicamba	F-G	F	-	-	-	-	-	F-G	F-G	F	F	P-F	G-E
Dicamba + 2,4-D	F	G-E	-	-	-	-	-	-	G-E	G-E	P-F	-	E
Everest 3.0 AG	G	E	-	-	-	-	-	-	E	G	-	-	-
Express	G	G	-	-	-	-	-	-	G	G	F-G	-	G-E
Finesse Cereal and Fallow	E	E	E	E	E	E	E	P	E	G-E	E	E	F-G
Glean XP	E	E	E	E	E	-	E	-	E	E	G-E	-	G
Harmony SG	-	G-E	-	-	-	-	-	-	G-E	G	F-G	-	G
Harmony Extra SG	G-E	G-E	F	E	G	E	F	P	G	G	G	F-G	G-E
Hoelon 3EC	-	-	-	-	-	-	-	-	-	-	-	-	-
Huskie	E	E	-	-	-	-	-	-	E	E	G-E	G-E	G
MCPA	F	E	-	-	-	-	-	F	G-E	G	F	P	P
Metribuzin 75DF	F-G	G	E	E	-	P	-	-	F-G	G	G	E	-
Olympus 70% WDG	G-E	G-E	P	G	P	-	P	P	E	E	F	-	P
Orion	E	E	-	-	-	-	-	-	E	E	P-F	-	P
Osprey	-	-	P	P	-	P	F	-	F	-	P-F	P	-
Outrider	-	E	-	-	-	-	-	-	E	E	F	-	-
Peak	E	G-E	-	G	-	-	G	P	E	E	P-F	F	F-G
Pixxaro EC	F-G	-	-	-	-	-	-	-	F-G	G-E	F-G	-	E
PowerFlex HL	E	E	F	F	G	P	-	-	G-E	E	F-G	F	-
Pulsar	-	-	-	-	-	-	-	F	-	-	-	-	E
Quelex	E	E	-	-	-	-	-	F	E	E	G-E	-	F
Rave	E	E	-	G	-	G	G	F-G	E	E	G	G	G-E
Starane NXT	G-E	-	-	-	-	-	-	F	E	-	-	-	G-E
Starane Ultra	-	F	-	-	-	-	-	G	F-G	F	-	G-E	G-E
Talinor	E	E	-	-	-	-	-	-	E	E	G-E	-	G
WeedMaster	-	-	G	F-G	-	F-G	-	-	-	-	F-G	E	-
WideMatch	F	F	-	-	-	-	-	F	F	F	-	-	E

Table 6. Herbicide Efficacy Ratings: Broadleaf Weeds Part 2

Herbicides	Lambsquarters	Pennsylvania Smartweed	Pepperweed	Pigweed	Prickly Lettuce	Red Horned Poppy	Russian Thistle	Shepherd's-purse	Smallseed Falseflax	Sowthistle	Sunflower	Tumble Mustard
Preplant												
Amber Custom-Pak	F	G	P	G-E	G	-	G	E	G	-	E	E
Finesse Cereal and Fallow	E	G	P	E	E	E	F-G	E	E	-	E	E
Olympus 70% WDG	-	-	-	-	-	-	-	F-G	-	-	-	F-G
Pre-Pare 70% WDG	-	-	-	-	-	-	-	F-G	-	-	-	F-G
Reviton	G	G	-	G	G	-	G	E	-	-	E	E
Preemergence												
Amber Custom-Pak	F	G	P	G-E	G	-	G	E	G	-	E	E
Axiom DF	-	-	E	-	-	-	-	F	-	G	-	-
Finesse Cereal and Fallow	G	F	-	G-E	G	-	G	E	-	-	E	E
Olympus 70% WDG	-	-	-	-	-	-	-	F-G	-	-	-	F-G
Outrider	-	-	-	-	-	-	-	-	-	-	-	E
Pre-Pare 70% WDG	-	-	-	-	-	-	-	-	-	-	-	F-G
Reviton	G	G	-	G	G	-	G	E	-	-	E	G
Sharpen	-	-	-	G	G	-	E	G-E	-	-	E	-
Zidua SC/Anthem Flex	F	-	-	-	-	-	-	F	-	-	-	-
Post-emergence												
2,4-D	E	F	E	G-E	G-E	-	E	G-E	G	-	G	E
Affinity BroadSpec	E	E	E	G-E	G	-	G-E	E	-	-	G	G
Aggressor AX (CoAXium wheat)	-	-	-	-	-	-	-	-	-	-	-	-
Aim EC	F-G	-	G	G	F	-	F-G	F-G	-	-	G	F-G
Ally Extra SG	E	E	-	G-E	G	-	G-E	E	-	-	E	G-E
Amber Custom-Pak	F	E	-	G-E	G-E	-	F-G	G-E	-	-	E	E
Axial XL	-	-	-	-	-	-	-	-	-	-	-	-
Batalium Amped	G-E	G-E	-	F-G	G	-	G	E	-	-	G-E	G-E
Beyond Xtra (Clearfield wheat)	G	G	-	G	G	-	G	G-E	-	-	G	E
Carnivore	E	E	-	G	G	-	G-E	G-E	-	-	E	G

Table 6. Herbicide Efficacy Ratings: Broadleaf Weeds Part 2 continued

Herbicides	Lambsquarters	Pennsylvania Smartweed	Pepperweed	Pigweed	Prickly Lettuce	Red Horned Poppy	Russian Thistle	Shepherd's-purse	Smallseed Falseflax	Sowthistle	Sunflower	Tumble Mustard
Post-emergence continued												
Dicamba	E	G-E	-	G-E	G	-	G-E	F	-	-	E	F-G
Dicamba + 2,4-D	E	E	-	E	E	-	E	G-E	-	-	G	G-E
Everest 3.0 AG	-	-	-	F	-	-	-	E	-	-	-	G-E
Express	G-E	F-G	-	F	G	-	G	F-G	-	-	F-G	F-G
Finesse Cereal and Fallow	E	G	P	E	E	E	F-G	E	E	-	E	E
Glean XP	G	G	P	E	G-E	E	G	E	E	-	F-G	E
Harmony SG	E	E	-	E	G	-	E	G	-	-	G	G
Harmony Extra SG	E	E	E	G-E	G	-	G-E	G-E	-	-	G	G
Hoelon 3EC	-	-	-	-	-	-	-	-	-	-	-	-
Huskie	G	-	-	G-E	E	-	E	E	-	-	E	E
MCPA	E	F	-	F	F-G	F	F	G	-	-	F	F
Metribuzin 75DF	-	-	E	-	-	-	-	F-G	-	-	-	G
Olympus 70% WDG	-	-	-	F	F	-	P	E	E	-	F	E
Orion	E	G-E	-	G	G	-	-	E	-	-	G	E
Osprey	-	-	P	F	-	-	-	P-F	-	-	-	-
Outrider	-	-	-	-	-	-	-	G	-	-	-	E
Peak	G	F	-	G-E	G	-	G	E	G	-	G	E
Pixxaro EC	G-E	-	-	F-G	G	-	G-E	-	-	-	G	-
PowerFlex HL	G	-	P	G	-	-	G	E	-	-	-	E
Pulsar	E	-	-	G	-	-	G-E	-	-	-	G	-
Quelex	E	E	-	G	F	-	-	E	-	-	F	E
Rave	E	G	G	E	E	-	G-E	E	G	-	E	E
Starane NXT	G-E	G-E	-	F-G	G	-	G	E	-	-	G-E	G
Starane Ultra	-	-	-	F	-	-	F	-	-	-	-	-
Talinor	G	-	-	G-E	E	-	E	E	-	-	E	E
WeedMaster	-	-	-	E	E	-	-	-	-	E	-	-
WideMatch	P	F	-	-	E	-	F	F	-	-	E	F

References

- Drake, D. (2023). *Northeast Texas IPM Newsletter*. Volume 7, Issue 6.
- Ellis, A. T., Morgan, G. D., & Mueller, T. C. (2008). Mesosulfuron-Resistant Italian Ryegrass (*Lolium multiflorum*) Biotype from Texas. *Weed Technology*, 22(3), 431–434. <https://www.jstor.org/stable/25195063>
- Heap, I. (2019). *The International Survey of Herbicide Resistant Weeds*. Retrieved March 30, 2019, from <http://www.weedscience.com>
- Maity, A., Singh, V., Martins, M. B., Ferreira, P. J., Smith, G. R., & Bagavathiannan, M. (2021). Species identification and morphological trait diversity assessment in ryegrass (*Lolium* spp.) populations from the Texas Blackland Prairies. *Weed Science*, 69(3), 379–392. <https://doi.org/10.1017/wsc.2021.18>
- Singh, V., Maity, A., Abugho, S., Swart, J., Drake, D., Bagavathiannan, M. (2020). Multiple herbicide-resistant *Lolium* spp. is prevalent in wheat production in Texas Blacklands. *Weed Technology*, 34(5), 652–660. <https://doi.org/10.1017/wet.2020.23>
- Tucker, K. P., Morgan, G. D., Senseman, S. A., Miller, T. D., & Baumann, P. A. (2006). Identification, Distribution, and Control of Italian Ryegrass (*Lolium multiflorum*) Ecotypes with Varying Levels of Sensitivity to Triasulfuron in Texas. *Weed Technology*, 20(3), 745–750. <https://www.jstor.org/stable/4495748>