

Herbicides for Winter Wheat

This publication primarily concerns chemical weed control. It is not intended to imply that cultivation or other non-chemical weed management techniques, particularly in row crops, are undesirable. One or two cultivations can greatly improve weed control.

Weed Response to Selected Wheat Herbicides When Applied According to Label Directions¹

Herbicide(s)	Crop tolerance	Winter Annuals											Summer Annuals, Broadleaf						Perennials			
		Grasses					Broadleaf						Summer Annuals, Broadleaf									
		Downy brome	Japanese brome	Cheat	Italian ryegrass	Jointed goatgrass	Blue mustard	Bushy wallflower	Tumble mustard	Field pennycress	Shepherdspurse	Flixweed/tansy mustard	Henbit	Wild buckwheat	Kochia	Lambsquarters	Prickly lettuce	Pigweed	Pennsylvania smartweed	Sunflower	Russian thistle	Field bindweed
PREPLANT																						
Amber	E	F	F-G	F	F-G	—	E	E ²	E	E	E	E	G	G	G ²	F	G	G-E	G	E	G ²	—
Olympus	G	F-G	G	G	—	—	F-G	G ²	F-G	G	F-G	F-G ²	F	—	—	—	—	—	—	—	—	—
Pre-Pare	G-E	P	F	F	P	—	F-G	G*	F-G	G	F-G	F-G	—	—	—	—	—	—	—	—	—	—
Reviton	E	—	—	—	—	—	G	G	E	E	E	E	E	G	G	G	G	G	G	E	G	—
PREEMERGENCE																						
Amber	E	F	F-G	F	F-G	—	E	E ²	E	E	E	E	G	G	G ²	F	G	G-E	G	E	G ²	—
Finesse	G-E	F	F-G	F	F-G	—	E	E ²	E	E	E	E	E	G	G ²	G	G	G-E	F	E	G ²	—
Olympus	G	F-G	G	G	—	—	F-G	G ²	F-G	G	F-G	F-G ²	F	—	—	—	—	—	—	—	—	—
Outrider	G-E	F-G	G	G	F	—	—	—	E	E	—	E	F-G	—	—	—	—	—	—	—	—	—
Pre-Pare	G-E	P	F	F	P	—	F-G	G*	F-G	G	F-G	F-G	—	—	—	—	—	—	—	—	—	—
Reviton	E	—	—	—	—	—	G	G	E	E	E	E	E	G	G	G	G	G	G	E	G	—
Zidua/Anthem Flex	F-G	F	F	F	G	—	—	—	—	F	F	F	F	—	F	F	—	—	—	—	—	—
POSTEMERGENCE																						
Affinity BroadSpec	G-E	—	—	—	—	—	G	E ²	G	E	E	G-E ²	G	F-G	G ²	E	G	G-E ²	E	G	G-E ²	—
Affinity TankMix	G-E	—	—	—	—	—	G-E	E ²	G	E	E	G-E ²	G	G	G ²	E	G	G-E ²	E	G	G-E ²	—
Aggressor (CoAXium wheat only)	G-E	G-E	G-E	G-E	G-E	G-E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Agility SG	G	—	—	—	—	—	E	E ²	E	E	E	E ²	G-E	E	E	E	G	G-E	E	E	E	—
Aim	G	—	—	—	—	—	—	G-E	F-G	E	F-G	G	—	F-G	F-G	F-G	—	G	—	—	F-G	—
Ally + 2,4-D	G-E	—	—	—	—	—	G-E	G-E	G-E	G-E	G-E	G-E	G	G	G ²	G-E	G	G-E	G	E	G-E	—
Ally Extra SG	G-E	—	—	—	—	—	G-E	E ²	G-E	E	E	G-E ²	E	G-E	G ²	E	G	G-E ²	E	E	G-E ²	—
Amber	E	—	—	—	—	—	E	E ²	E	E	E	E ²	F-G	G-E	G ²	F	G	G-E ²	E	E	G ²	—
Axial	G	—	—	—	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Batalium Amped	E	F-G	F-G	F-G	P-F	P-F	G-E	E	G-E	E	E	G	F	G-E	G-E	G-E	G	F-G	G-E	G-E	G	F
Beyond Xtra (Clearfield wheat only)	G	G-E	E	E	G-E	E	G	E	E	E	E	E	G-E	F	G ²	G	G	G ²	G	G ²	G ²	—
Bromoxynil	E	—	—	—	—	—	G-E	G-E	G-E	G-E	G-E	G	—	G-E	G	E	—	G	E	E	G	—
Bromoxynil MCPA	G-E	—	—	—	—	—	F-G	—	G-E	G-E	G-E	G-E	G	G-E	G	G-E	—	G-E	G-E	G-E	G-E	—
Carnivore	G-E	—	—	—	—	—	G	E	G	E	G-E	G	G	G	E	E	G	G	E	E	G-E	F
Dicamba	G	—	—	—	—	—	F	F	F	F-G	G	F	F	G-E	G-E	E	G	G-E	G-E	E	G-E	F-G
Dicamba + 2,4-D	F-G	—	—	—	—	—	F	G-E	G-E	G-E	G-E	G-E	P-F	G-E	E	E	E	E	E	E	G	E
Everest 3.0	E	P-F	G-E	G-E	F-G	—	G	E ²	G-E	E	E	G ²	—	P	—	—	—	F ²	—	—	—	—
Express	E	—	—	—	—	—	G	G ²	F-G	G	F-G	G ²	F-G	F	G-E ²	G-E	G	F ²	F-G	F-G	G ²	—
Finesse	G-E	—	—	—	F	—	E	E ²	E	E	E	E ²	E	G-E	G ²	E	E	E ²	G	E	G ²	—
Glean	E	—	—	—	F	—	E	E ²	E	E	E	E ²	G-E	G	G ²	G	G	E ²	G	G	G ²	—
Harmony SG	G-E	—	—	—	—	—	—	G-E ²	G	G-E	G	G ²	F-G	G	G ²	E	G	E ²	E	G	E ²	—

¹Weed response ratings refer to application according to label directions and with favorable growing conditions:

E = Excellent, G = Good, F = Fair, P = Poor, and — = weed not listed on the herbicide label.

²Except where resistant weed populations have developed.

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Weed Response to Selected Wheat Herbicides When Applied According to Label Directions¹

Herbicide(s)	Crop tolerance	Winter Annuals											Summer Annuals, Broadleaf							Perennials		
		Grasses					Broadleaf						Wild buckwheat	Kochia	Lambsquarters	Prickly lettuce	Pigweed	Pennsylvania smartweed	Sunflower		Russian thistle	Field bindweed
Downy brome	Japanese brome	Cheat	Italian ryegrass	Jointed goatgrass	Blue mustard	Bushy wallflower	Tumble mustard	Field pennycress	Shepherdspurse	Flixweed/tansy mustard	Henbit											
POSTEMERGENCE																						
Harmony Extra SG	G-E	—	—	—	—	—	G	G ²	G	G	G	G ²	G	G	E ²	E	G	E ²	E	G	E ²	—
Hoelon	G-E	—	—	—	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Huskie	E	—	—	—	—	—	E	E	E	E	E	E	G-E	G	G	G	E	G-E	—	E	E	—
MCPA	G-E	—	—	—	—	—	F	E	F	E	G	G	F	P	P	E	G	—	F	F	F	—
Metribuzin	F-G	F	G	F-G	F	—	F-G	G	G	G	G	G	G	—	—	—	—	—	—	—	—	—
Olympus	G-E	F-G	E	E	F	P	E	E ²	E	E	E	E ²	F	P	—	—	—	—	—	—	—	—
Orion	E	—	—	—	—	—	E	E	E	E	E	E	P-F	F-G	P	E	G	G ²	G-E	G	—	—
Osprey	G	F	F	F	E	—	—	—	—	—	F	—	F	—	—	—	—	F ²	—	—	—	—
Outrider	G-E	F-G	G-E	G-E	F	—	—	E ²	E	E	G	E ²	F	—	—	—	—	—	—	—	—	—
Peak	E	—	—	—	—	—	E	E ²	E	E	E	E ²	F	G-E	G ²	G	G	G-E ²	F	G	G ²	—
Pixxaro	E	—	—	—	—	—	F-G	—	—	F-G	—	G-E	F-G	G-E	E	G-E	G	F-G	—	G	G-E	—
PowerFlex HL, GR1	G-E	F-G	E	E	E	—	E	E ²	E	E	E	E ²	G	F	—	G	—	G ²	—	—	G ²	—
Pulsar	G	—	—	—	—	—	—	—	—	—	—	—	—	E	E	E	—	G	—	G	G-E	F
Quelex	E	—	—	—	—	—	E	E	E	E	E	E	G-E	G-E	F	E	F	G	E	F	—	F
Rave	G	—	—	—	—	—	E	E	E	E	E	E	G	E	G-E	E	E	E	G	E	G-E	F
Sentrallas	G-E	—	—	—	—	—	—	E ²	G-E	G-E	G-E	G-E ²	F	G	G-E	G-E	F-G	G ²	G	G	G	F
Starane NXT	G-E	—	—	—	—	—	G-E	—	G	E	E	—	—	G-E	G-E	G-E	G	F-G	G-E	G-E	G	F
Starane Ultra/ StareDown	G-E	—	—	—	—	—	—	F	—	F	—	F	—	G	G-E	—	—	—	—	—	F	—
Talinor	E	—	—	—	—	—	E	E	E	E	E	E	G-E	G	G	G	E	G-E	—	E	E	—
WideMatch, Colt	G	—	—	—	—	—	F	F	F	F	F	F	—	E	E	P	E	—	F	E	F	F
2,4-D	G	—	—	—	—	—	E	E	E	E	E	E	P	F	F-G	E	E	E	F	G	E	F-G

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E = Excellent, G = Good, F = Fair, P = Poor, and — = weed not listed on the herbicide label.

²Except where resistant weed populations have developed.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
HERBICIDES TO REDUCE TILLAGE IN FALLOW BEFORE PLANTING WINTER WHEAT		
1 to 3 pt of 4 lb/gal 2,4-D	2,4-D LVE (4) 0.5 to 1.5	Apply after wheat harvest and during fallow periods to control susceptible broadleaf weeds. Allow 2 weeks after a 0.5-inch rainfall for 2,4-D to degrade before planting wheat.
0.1 oz Ally or Metsulfuron + appropriate rate of tank mix herbicide	Metsulfuron (2) + tank mix partner 0.0038	For control of certain broadleaf weeds, apply as a postemergence treatment in fallow in combination with glyphosate, 2,4-D, dicamba, or residual fallow herbicides. Always apply with NIS. Do not apply Ally alone to fallow, and always till at least once before planting wheat. Ally should be used no more than once in a 22-month period, and any remaining broadleaf weeds should be controlled before they produce seed to minimize the risk of resistant-weed development.
0.28 to 0.47 oz Amber + appropriate rate	Triasulfuron (2) + tank mix partner 0.013 to 0.022	Apply after wheat harvest in the fall or spring. Must be tank-mixed with an herbicide having a different mode of action. Always apply with NIS. Do not apply any herbicide with the same mode of action within 12 (pH < 7.5) to 15 (pH > 7.5) months after Amber application. Do not rotate to oat, barley, or rye for 6 to 18 months; grain sorghum for 14 to 24 months; soybean or corn for 14 to 36 months; or any other crop until a field bioassay has been completed. Refer to the label for additional use and crop rotation guidelines.
0.25 to 4 pt Dicamba	Dicamba (4) 0.13 to 2	Controls many annual and perennial broadleaf weeds. Apply to emerged and actively growing weeds after crop harvest and before a killing frost. Crop injury can occur if the interval between application and planting is less than 45 days/pt of product used per acre. Can be tank-mixed with 2,4-D or glyphosate.
2 to 4 oz Distinct	Diflufenzopyr (19) + Dicamba (4) 0.027 to 0.054 + 0.069 to 0.138	Controls many annual broadleaf weeds. Apply to emerged and actively growing weeds after crop harvest and before a killing frost. Do not plant wheat until 30 days after a 1-inch rainfall is received following Distinct application. May be tank-mixed with glyphosate, 2,4-D, or other herbicides for broader spectrum weed control.
22 oz Facet L , 0.5 pt QuinStar 4L , or 5.3 oz QuinStar GT	Quinclorac (4) 0.26	Apply for control of actively growing bindweed with at least 4-inch vines anytime before planting wheat. Plant wheat at least 1 inch deep to avoid possible injury to wheat. Apply with COC or MSO adjuvant for optimal bindweed control. Do not plant any crop other than wheat or sorghum within 10 months after Facet application. Do not plant alfalfa or drybean for at least 24 months after application.
32 to 44 fl oz Fallow Master BS	Glyphosate (9) + Dicamba (4) 0.55 to 0.76 lb ae + 0.1 to 0.14	Fallow Master BS is a premix of 2.2 lb glyphosate and 0.4 lb dicamba (Banvel)/gal. Can control volunteer grains and certain annual weeds. Apply this product at least 15 days before planting wheat. Addition of 2% AMS by weight can increase performance.
0.2 to 0.4 oz Finesse	Chlorsulfuron (2) + Metsulfuron (2) 0.008 to 0.016 + 0.0016 to 0.0032	Apply after wheat harvest in the fall or spring for broadleaf weed control. Always apply with NIS. Use in combination with tillage and a planned herbicide rotation program with other herbicides having different modes of action to minimize herbicide resistance problems. Do not use Finesse, Glean, Ally, or Amber on the same field within 24 months after application. Any remaining broadleaf weeds should be controlled before they produce seed to minimize the risk of resistant weed development. Do not rotate to oat for 10 months; to grain sorghum for 4 to 48 months; to non-STS soybean for 14 months (east of Highway 183, west of the Flint Hills); or to any other crop until a field bioassay has been completed. STS soybean and IR corn hybrids can be planted 4 months after application if the soil pH is 7.5 or lower. Refer to the label for additional use and crop rotation guidelines.
12 to 48 oz of 3 lb/gal Glyphosate (see glyphosate table)	Glyphosate (9) 0.28 to 1.13 lb ae	For control of actively growing volunteer grains and some weeds, such as downy brome and mustards up to 6 inches tall. Glyphosate products differ in concentration and adjuvant requirements. Refer to specific product labels for rate and adjuvant recommendations. Can be used with dicamba or 2,4-D for enhanced control of certain broadleaf weeds. Apply 3 to 10 gallons of spray per acre. The addition of 2% AMS by weight or 17 lb/100 gal water can increase performance of glyphosate. Dust on plants can reduce performance of glyphosate.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
HERBICIDES TO REDUCE TILLAGE IN FALLOW BEFORE PLANTING WINTER WHEAT		
12 to 32 oz of 3 lb ae/gal Glyphosate (see glyphosate table) + 1 to 2 pt of 4 lb/gal 2,4-D*	Glyphosate (9) + 2,4-D (4) 0.28 to 0.75 lb ae + 0.5 to 1	For control of volunteer grains, downy brome, tansy mustard, and other weeds, apply to actively growing plants. The addition of 2% AMS by weight (17 lb/100 gal water) can increase performance of glyphosate. Glyphosate products differ in concentration and adjuvant requirements. Refer to specific product labels for rate and adjuvant recommendations.
2 to 4 pt Gramoxone SL 2.0 or 1.7 to 2.7 pt Gramoxone SL 3.0 or Helmquat	Paraquat (22) 0.5 to 1.0	May only be handled or applied by certified individuals. This contact herbicide is applied in clean water or nitrogen solutions to annual weeds 1 to 6 inches tall to control existing vegetation. Always apply with NIS. Can be tank-mixed with 2,4-D, or dicamba. Dust on plants can inactivate paraquat.
1.25 to 2.5 pt Kochiavore	Fluroxypyr (4) + Bromoxynil (6) + 2,4-D (4) 0.1 to 0.21 + 0.26 to 0.52 + 0.26 to 0.52	Controls many emerged broadleaf weeds, including kochia and Russian thistle. Use the higher rate for larger weeds and under less favorable conditions. Add high surfactant oils for enhanced weed control. Do not plant wheat until 30 days after application.
0.5 to 1 lb Metribuzin	Metribuzin (5) 0.38 to 0.75	Apply after wheat harvest in fall or in early spring. Can be tank-mixed with paraquat, glyphosate, or other burndown herbicides. Wheat can be seeded 120 days after application. Do not allow grazing of treated fields.
0.3 to 0.6 oz Panoflex	Thifensulfuron (2) + Tribenuron (2) 0.0019 to 00.38 + 0.0075 to 0.015	Can be applied anytime prior to planting or emergence of wheat for control of emerged susceptible broadleaf weeds. Always apply with NIS or oil concentrate. Often tank-mixed with other herbicides for broader-spectrum weed control and herbicide resistance management. Do not allow grazing on fields for 7 days after application.
1 to 3 fl oz Reviton	Tiafenacil (14) 0.022 to 0.066	Provides burndown of broadleaf and several grass weed species. Can be applied preplant or preemergence to wheat. May apply multiple treatments so long as the total Reviton applied during the crop production year is 6.0 fl oz per acre. Do not apply after wheat emergence, or severe crop injury will occur. For best results apply with MSO at 1% v/v or minimum of 1 pt per acre. UAN at 1.25 to 2% v/v or AMS at 8.5 to 17 lb/100 gal spray solution can be added for more consistent weed control. Reviton may be applied in combination with many other herbicides including 2,4-D, dicamba, glyphosate, or glufosinate.
1.5 to 2.5 oz Scoparia	Isoxaflutole (27) 0.047 to 0.078	A restricted use pesticide. Prohibited on fields that contain vulnerable sandy loam, loamy sand, or sand soils if the water table is less than 25 feet below the soil surface. Apply in the fall or early spring to stubble of harvested crops for residual control of unemerged kochia and Russian thistle in areas west of highways I-35, I-135, and 81. Do not apply to frozen soils. May be applied with dicamba or metribuzin for enhanced residual and control of emerged weeds. Do not plant wheat within 4 months of Scoparia application.
0.5 to 2.67 pt Scorch	Fluroxypyr (4) + Dicamba (4) + 2,4-D (4) 0.047 to 0.25 + 0.063 to 0.33 + 0.19 to 1.0	Controls many emerged broadleaf weeds including kochia and pigweeds. Use the higher rates and add COC for control of larger weeds and during less favorable conditions. Delay planting wheat 10 days for each pt of product applied.

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Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
HERBICIDES TO REDUCE TILLAGE IN FALLOW BEFORE PLANTING WINTER WHEAT		
1 to 4 oz Sharpen	Saflufencil (14) 0.022 to 0.088	Provides burndown and residual control of certain broadleaf weeds, including marestail and most mustard species. Can be applied preplant, preplant incorporated, or preemergence to wheat. May apply sequential treatments if applications are separated by at least 14 days. Do not apply after wheat emergence, or crop injury will occur. Apply with MSO at 1% v/v, minimum of 1 pt/a, plus 1.25 to 2.5% v/v liquid UAN fertilizer, or AMS at 8.5 to 17 lb/100 gal of spray solution. Do not exceed seasonal maximum of 4 fl oz Sharpen per cropping season. Do not graze or feed treated wheat to livestock until 30 or more days after treatment.
0.4 to 0.7 pt StareDown	Fluroxypyr (4) 0.14 to 0.25	Controls kochia, including ALS and glyphosate resistant biotypes, and certain other broadleaf weeds. Apply to actively growing weeds before they exceed 8 inches tall. Often applied as a tank-mix with other herbicides for control of grasses and other weeds.
0.5 to 1 pt Tordon 22K + 1 to 2 pt of 4 lb/gal 2,4-D	Picloram (4) + 2,4-D (4) Amine or LVE 0.13 to 0.25 + 0.5 to 1	Picloram is a restricted-use pesticide. For reduction of field bindweed and for control of many annual broadleaf weeds after wheat harvest and before planting winter wheat, barley, or oat in continuous small grain or small grain/fallow systems. Allow a minimum of 45 (0.5 pt Tordon) to 60 days (0.5 to 1 pt Tordon) between application and planting wheat. Do not treat with Tordon more than once each calendar year. Some injury to wheat can occur even when applied as directed, especially if dry conditions prevail. Consider the risk of crop injury, and apply as a spot treatment where feasible. Broadleaf crops are extremely susceptible to Tordon. Avoid spray drift, and do not rotate to susceptible broadleaf crops until 36 months after treatment.
3 to 4 oz Venue or 0.5 to 2 ET, Vida	Pyraflufen (14) 0.004 to 0.0053 or 0.0008 to 0.003	Contact herbicide with activity on some small broadleaf weeds. Suppression only of Palmer amaranth and marestail. Tank mix with another postemergence herbicide. A 1 to 2% v/v COC is recommended. May be applied up to 3 times per production year.
PREPLANT AND/OR PREEMERGENCE		
0.35 to 0.56 oz Amber	Triasulfuron (2) 0.016 to 0.026	Provides suppression of light to moderate populations of cheat, Japanese brome, and downy brome, and control of many broadleaf weeds. Apply preplant, preplant shallowly incorporated, or preemergence after wheat seeding but before wheat and grass emergence. Cheatgrass suppression depends on precipitation before emergence. Do not apply the 0.56 oz/a rate on soils with a pH > 7.5. Do not apply any herbicide with the same mode of action within 12 (pH < 7.5) to 15 (pH > 7.5) months after Amber application. Any broadleaf weeds that escape Amber control should be controlled in the spring with an herbicide having a different mode of action. Do not rotate to oat, barley, or rye for 6 to 18 months; grain sorghum for 14 to 24 months; soybean or corn for 14 to 36 months; or any other crop until a field bioassay has been performed. Refer to the label for additional use and crop rotation guidelines.
2 to 4.5 oz Anthem Flex	Pyroxasulfone (15) + Carfentrazone (14) 0.058 to 0.13 + 0.0042 to 0.0095	Apply as a delayed preemergence treatment after planting and 80% of the germinated wheat seedlings have a shoot at least an 0.5-inch long. Use the low rate on coarse-textured soils and the higher rates on medium- and fine-textured soils. Wheat should be planted between 1 and 1.5 inches deep. Provides residual control of Italian ryegrass and suppression of winter annual brome species. May control some emerged seedling broadleaf weeds, but not emerged grasses. May be tank-mixed with other registered herbicides.
0.5 oz Finesse	Chlorsulfuron (2) + Metsulfuron (2) 0.0195 + 0.0039	Provides suppression of light to moderate populations of cheat, Japanese brome, and downy brome and control of many broadleaf weeds. Apply preplant or preemergence to wheat seeding but before wheat and grass emergence. Cheatgrass suppression depends on precipitation before emergence. Do not use west of Highway 183. Do not apply to soils with a pH less than 5 or greater than 7.9. Any broadleaf weeds that escape Finesse control should be controlled with a sequential application of an herbicide having a different mode of action. Do not rotate to oat for 10 months, grain sorghum for 4 to 48 months; soybean for 14 months (east of Highway 183, west of the Flint Hills); or any other crop until a field bioassay has been completed. STS soybean or IR corn hybrids can be planted 4 months after application if the soil pH is 7.5 or lower. Refer to the label for additional use and crop rotation guidelines.

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PREPLANT AND/OR PREEMERGENCE		
0.6 oz Olympus	Propoxycarbazone (2) 0.026	Apply as a tank mix with glyphosate preplant/preemergence to wheat for suppression of later-germinating cheatgrass and certain broadleaf weeds. May be followed by a spring application of Olympus at 0.6 oz/acre, if needed, to provide adequate season-long control. Do not rotate to STS soybean for 4 months; grain sorghum for 6 months; cotton, sunflower, and non-STs soybean for 12 months (if cumulative precipitation exceeds 24 inches); corn can for 18 months (if cumulative precipitation exceeds 30 inches) after Olympus application. Rotation to other crops or with shorter interval requires successful completion of a field bioassay, and no sooner than 4 months after Olympus application.
0.67 oz Outrider	Sulfosulfuron (2) 0.031	Controls cheatgrass and certain broadleaf weeds. Apply after planting wheat but before wheat and weeds emerge. Preemergence treatments have been less consistent than fall post-emergence applications. If wheat is planted into dry soils and continued dry weather is forecasted, delay treatment until wheat and weeds have emerged and are growing actively. Wheat can be grazed anytime after treatment. STS soybean can be planted 3 months after treatment if soil pH is less than 7.5 and cumulative precipitation exceeds 18 inches. Cotton and non-STs soybean can be planted 12 months after treatment if soil pH is less than 7.5 and cumulative precipitation exceeds 30 inches. Planting sorghum, corn, or sunflower is not recommended until at least 22 months after treatment. Rotation to other crops or with shorter interval requires successful completion of a field bioassay, and no sooner than 3 months after application. The risk of Outrider carryover is greatest on high pH soils and with sorghum, sunflower, alfalfa, or canola.
6 oz Pixxaro	Fluroxypyr (4) + Halauxifen-methyl (4) 0.11 + 0.005	Burndown control only. Use at least 8 gallons of water per acre and nozzles that ensure medium or very coarse droplets. May be applied with up to 50% liquid fertilizer carrier, up to 30 pounds actual N. Do not plant corn or sorghum for 14 days; canola, cotton, soybean, or sunflower for 4 months; or alfalfa for 9 months.
0.2 to 0.3 oz Pre-Pare	Flucarbazone (2) 0.009 – 0.013 lb ai/a	Pre-Pare provides burndown and early season residual activity on many grass weeds, such as wild oat, green foxtail, and brome species, in addition to numerous small seeded broadleaf weeds. Pre-Pare is an optimal tank-mix partner and is recommended to be applied with preplant burndown applications of glyphosate. Pre-Pare can enhance the efficacy while providing early season residual activity to the glyphosate burndown program. Apply within 10 days of planting, rainfall or overhead irrigation is required to activate soil residual. Pre-Pare has a 0-day plant back interval to wheat. Refer to the product label for a complete list of rotational intervals as it relates to soil pH. Apply at 0.2 to 0.3 oz/a of Pre-Pare to winter wheat depending on soil pH and organic matter. When tank-mixed with glyphosate, follow the glyphosate rate and adjuvant recommendations of the glyphosate label.
1 to 3 fl oz Reviton	Tiafenacil (14)	Controls emerged grass and broadleaf weeds. Do not apply to emerged wheat. Use 1 fl oz when applying with glyphosate or glufosinate. Apply with MSO and AMS.
1 to 2 oz Sharpen	Saflufencil (14) 0.022 to 0.044	Provides burndown and residual control of certain broadleaf weeds, including marestalk and most mustard species. Can be applied preplant, preplant incorporated, or preemergence to wheat. May apply sequential treatments if applications are separated by at least 14 days. Do not apply after wheat emergence, or crop injury will occur. Apply with MSO at 1% v/v, minimum of 1 pt/a, plus 1.25 to 2.5% v/v liquid UAN fertilizer or AMS at 8.5 to 17 lb/100 gal of spray solution. Do not graze or feed treated wheat to livestock until 30 or more days after treatment.
1.25 to 3.25 oz Zidua SC	Pyroxasulfone (15) 0.037 to 0.11	Apply as a delayed preemergence treatment after planting and 80% of the germinated wheat seedlings have a shoot at least 0.5 inches long. Use 1.25 to 1.75 oz/a Zidua SC on coarse-textured soils, 1.75 to 2.5 oz/a Zidua SC on medium-textured soils, and 1.75 to 3.25 oz/a Zidua SC on fine-textured soils. Wheat should be planted between 1 and 1.5 inches deep. Provides residual control of Italian ryegrass and suppression of winter annual brome species. Does not control emerged weeds. May be tank-mixed with other registered herbicides.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
1.5 to 2 pt of 4 lb/gal 2,4-D LVE	2,4-D (4) 0.75 to 1 LVE	Can be used to control wild garlic (wild onion). The least injury to wheat can be expected if 2,4-D is applied after full tiller stage (when wheat is 4 to 8 inches tall) but before wheat plants elongate rapidly or enter joint stage. This rate will not consistently kill wild garlic, but it reduces production of aerial bulblets and knocks down tops of plants.
0.5 to 1 pt of 4 lb/gal 2,4-D LVE or 0.5 to 1.5 pt of 4 lb/gal 2,4-D amine	2,4-D (4) 0.25 to 0.5 LVE, or 0.25 to 0.75 amine	Controls many broadleaf weeds but not wild buckwheat. The least injury to wheat can be expected if applied between full tiller (about 4 to 8 inches) and early boot stages. Likelihood of injury is increased if 2,4-D is applied to wheat in the fall when it is not tillered fully. Can be applied in nitrogen fertilizers. Do not apply when wheat is between early boot stage and milk stage. Do not allow grazing on treated fields within 2 weeks after treatment.
0.4 to 1 oz Affinity BroadSpec, Rapport BroadSpec, or Audit 1:1	Thifensulfuron (2) + Tribenuron (2) 0.003 to 0.0156 + 0.003 to 0.0156	Controls many broadleaf weeds. For control of weeds less than 4 inches tall or across, apply after wheat is at the 2-leaf stage but before the flag leaf is visible. Apply with NIS at 0.12 to 0.5% v/v or an oil concentrate at 1% v/v. Apply as a tank mix with another broadleaf herbicide having a different mode of action in areas of known weed resistance and at rates of 0.6 or less. Generally recommended for use in western Kansas. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock.
0.6 to 1 oz Affinity TankMix, Rapport TankMix, or Audit 4:1	Thifensulfuron (2) + Tribenuron (2) 0.015 to 0.025 + 0.004 to 0.006	Controls many broadleaf weeds. Apply after wheat is in the 2-leaf stage but before the flag leaf is visible for control of actively growing weeds less than 4 inches tall or across. Apply with NIS at 0.25 to 0.5% v/v or with an oil concentrate at 1% v/v. Recommended to be used in combination with other wheat herbicides having a different mode of action. Generally recommended for use in eastern and central Kansas. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock.
8 to 12 oz Aggressor	Quizalofop (1) 0.055 to 0.083	Apply to CoAXium wheat only. Aggressor will severely injure or kill non-CoAXium wheat. Controls winter annual grasses, including cheatgrass, downy brome, jointed goatgrass, rye, volunteer cereals, and Italian ryegrass. Apply in the fall or spring between the 4-leaf to jointing stage of wheat for control of actively growing grasses before they exceed the 4 to 5 leaf stage. Does not provide residual weed control or control of any broadleaf weeds. Always apply with NIS or COC to optimize grass control. Do not tank-mix with DMA formulations of 2,4-D or MCPA or grass control will be severely reduced. To avoid crop injury, do not spray if the daily maximum temperature is not expected to exceed 40°F during the week following application. Do not apply more than 16 oz or make more than two applications per crop cycle. Do not harvest treated wheat for forage or hay within 60 days of application. Do not plant CoAXium wheat more frequently than every other year.
1.6 to 3.2 oz Agility SG	Thifensulfuron (2) + Tribenuron (2) + Metsulfuron (2) + Dicamba (4) 0.0047 to 0.0094 + 0.0024 to 0.0048 + 0.0019 to 0.0038 + 0.058 to 0.116	Agility SG is a premix of Ally Extra SG plus dicamba. Apply after wheat is in the 2-leaf stage but before jointing of wheat for control of most broadleaf weeds. Can be applied with water, liquid nitrogen fertilizer, or a mixture of both as a carrier. If 50% or more of the carrier is liquid nitrogen fertilizer, a surfactant is not recommended. Otherwise, apply with NIS at 0.125 to 0.25% v/v. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock. Crop rotation restrictions differ with application rate, soil pH, and geography. Do not rotate to sorghum, STS soybean, or proso millet for 4 months; corn for 12 months; sunflower for 10 to 22 months; non-STs soybean for 12 to 34 months; or other crops for 34 months unless a successful field bioassay is completed prior to planting the rotational crop.
0.5 to 1 oz Aim EC or Longbow EC	Carfentrazone (14) 0.008 to 0.017 or 2 lb/gallon	A contact herbicide for control of certain broadleaf weeds. Apply in the fall or spring to seedling weeds prior to the boot stage of wheat. Apply with NIS at 0.25% v/v. May cause leaf burn on wheat leaves, especially with warm conditions at and following application. Can be tank-mixed with Ally, Amber, dicamba, Express, Finesse, Harmony Extra, Peak, 2,4-D, or MCPA.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
0.1 oz Ally or Metsulfuron + 0.5 to 1 pt of 4 lb/gal MCPA or 2,4-D	Metsulfuron (2) + MCPA (4) or 2,4-D (4) 0.0038 + 0.25 to 0.50	Controls many broadleaf weeds. Apply with MCPA in the fall or spring after the 2-leaf stage but before the boot stage of wheat. Apply with 2,4-D in the spring after the wheat is fully tillered but before the early boot stage. Apply to small, actively growing weeds up to 2 inches tall or across. Surfactant should be used at 0.12 to 0.25% v/v. Do not rotate to sorghum, STS soybean, IR corn, or proso millet for 4 months; barley or oat for 10 months; non-IR corn for 12 months; non-STs soybean for 12 to 34 months; or sunflower for 22 months after Ally application. Do not use on soil with pH above 7.9.
0.3 to 0.5 oz Ally Extra SG	Thifensulfuron (2) + Tribenuron (2) + Metsulfuron (2) 0.0047 to 0.009 + 0.0023 to 0.0047 + 0.0019 to 0.0038	Controls many broadleaf weeds and wild garlic. For control of weeds less than 4 inches tall or across, apply after wheat is at the 2-leaf stage but before the flag leaf is visible. Apply with NIS at 0.12 to 0.25% v/v. Apply as a tank mix with another broadleaf herbicide having a different mode of action in areas of known weed resistance. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock. Do not apply to soils with a pH > 7.9. Crop rotation restrictions differ with application rate, soil pH, and geography. Refer to the label for crop rotation guidelines.
0.28 to 0.47 oz Amber	Triasulfuron (2) 0.013 to 0.022	Controls many broadleaf weeds. Apply before boot stage of wheat. Use the higher rate for control of wild buckwheat and extended residual control. Can be applied with water, liquid nitrogen fertilizer, or mixture of both as a carrier. If 50% or more of the carrier is nitrogen fertilizer, no surfactant is needed. Otherwise, apply with NIS at 0.25 to 0.5% v/v. Tank mixes can improve weed control and reduce risk of herbicide resistance problems. Amber can be tank-mixed with dicamba, bromoxynil, MCPA, Sencor, or 2,4-D. Do not apply any herbicide with same mode of action within 12 (pH < 7.5) to 15 (pH > 7.5) months after Amber application. Do not rotate to oat, barley, or rye for 6 to 18 months; grain sorghum for 14 to 24 months; soybean or corn for 14 to 36 months; or any other crop until a field bioassay is performed. Refer to label for additional use and crop rotation guidelines.
2 to 4.5 oz Anthem Flex	Pyroxasulfone (15) + Carfentrazone (14) 0.058 to 0.13 + 0.0042 to 0.0095	Apply to wheat from the spike up to the 4-tiller growth stage for residual control of Italian ryegrass and suppression of winter annual brome species. Use the lower rates on coarse-textured soils and the higher rates on fine-textured soils. Controls some emerged broadleaf weeds, but not emerged grasses. Do not harvest, feed, or graze within 7 days after application.
15 fl oz Axial Bold	Pinoxaden (1) + Fenoxaprop (1) 0.062 + 0.0825	Apply from emergence through boot stage to control emerged Italian ryegrass, wild oat, and other grass weeds. Weed control can be reduced when applied with broadleaf herbicides. May be applied with liquid nitrogen fertilizer. Do not graze for 30 days after application.
16.4 oz Axial XL	Pinoxaden (2) 0.054	Controls Italian ryegrass. Apply postemergence to actively growing plants when Italian ryegrass is in the 1- to 5-leaf stage and wheat is in the 2-leaf to pre-boot stage of growth. Do not graze livestock or harvest forage for hay from treated areas for a minimum of 50 days after application.
16 fl oz Batalium Amped	Flucarbazone (2) + Bromoxynil (6) + Fluroxypyr (4) 0.027 + 0.25 + 0.09 lb ai/a	Controls many troublesome grass and broadleaf weeds. Apply in the fall or spring from 2-leaf wheat up to 60 days prior to harvest. When applied alone or in tank-mixture with dry formulated or EC based herbicides used at less than 8 fl oz/a, add a high-quality basic blend at 0.5 to 1% v/v, or NIS at 0.25 to 0.5% v/v + UAN at 1 to 2 qt/a, or AMS at 1 to 2 lb/a. When applying in tank-mix with EC herbicides used at greater than 8 fl oz/a, include UAN at 1 to 2 qt/a or AMS at 1 to 2 lb/a and NIS at 0.25 to 0.5% v/v if not restricted by the tank-mix partner. Apply in water that is at least 50°F at 8 to 15 gal water/a for optimized performance. Do not tank mix with organophosphate or carbamate insecticides. Refer to the product label for crop rotational intervals.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
4 to 6 oz Beyond Xtra	Imazamox (2) 0.031 to 0.047	Apply to Clearfield wheat only. Beyond will severely injure or kill non-Clearfield wheat. Controls cheatgrass, jointed goatgrass, and many broadleaf weeds and suppresses feral rye. Can be applied to one gene Clearfield varieties between tiller initiation and jointing, and two gene Clearfield Plus varieties between 2-leaf and second joint. Fall applications have generally provided better control of winter annual grasses than spring applications. Do not apply more than 8 oz/a per growing season, which would allow for 4 oz/a in the fall followed by 4 oz/a in the spring for maximum feral rye suppression. Do not apply when wheat and weeds are dormant and not actively growing. Apply with NIS and nitrogen fertilizer additives. Liquid fertilizer should not exceed 50% of total spray volume. MSO can be used instead of NIS on 2-gene Clearfield wheat varieties for enhanced downy brome and rye control unless not allowed by tank-mix products. Do not use MSO on 1-gene Clearfield wheat varieties. Do not tank mix with sulfonylurea herbicides or apply within 7 days of an organophosphate insecticide. Do not plant corn, sorghum, cotton, or sunflower within 9 months of Beyond Xtra application.
1 to 2 pt Bison, Brox M, Maestro MA, or Wildcard Xtra	Bromoxynil (6) + MCPA (4) 0.25 to 0.5 + 0.25 to 0.5	Controls many broadleaf weeds. Apply to wheat after 3-leaf stage but before boot stage. Apply to seedling weeds before they reach size limits listed on the labels. Can be tank-mixed with Glean, Ally, Harmony Extra, Amber, Finesse, Sencor, or MCPA ester. Do not allow grazing on fields for 45 days after application.
1 to 2 pt Bromoxynil 2 + 0.5 to 1 pt of 4 lb/gal 2,4-D, or 1-2 pt DoubleUp B&D	Bromoxynil (6) + 2,4-D (4) 0.25 to 0.5 + 0.25 to 0.5	This is a tank mix of bromoxynil and 2,4-D. Can control wild buckwheat and other broadleaf weeds. Apply after tillering but before jointing stage. Apply before weeds are past 3- to 4-leaf stage or more than 2 to 6 inches tall. Do not allow grazing on fields for 45 days after application.
1 to 2 pt Carnivore	MCPA (4) + Bromoxynil (6) + Fluroxypyr (4) 0.21 to 0.42 + 0.21 to 0.42 + 0.084 to 0.17	Controls many broadleaf weeds. Apply to wheat from the 2-leaf to flag leaf emergence stages of growth for control of small actively growing weeds. Do not harvest treated forage or allow livestock to graze treated areas within 45 days after application.
1 to 1.33 pt Colt + Salvo or 1.25 to 2 pt Trump Card	Fluroxypyr (4) + 2,4-D (4) 0.09 to 0.165 + 0.375 to 0.66	Controls kochia, including ALS-resistant kochia, and most broadleaf weeds. Apply to small, actively growing weeds after winter dormancy and the 4-leaf stage of wheat but before the early boot stage of wheat. Do not harvest treated forage or allow livestock to graze treated area within 14 days of application. Do not plant any crop except wheat, barley, oat, corn, or sorghum within 120 days after application.
2 to 4 fl oz Dicamba	Dicamba (4) 0.06 to 0.125	Controls certain broadleaf weeds. Apply after the 2-leaf stage but before the wheat joints in the spring. Application after jointing increases the risk of crop injury. Generally applied as a tank mix with another broadleaf herbicide for broad-spectrum broadleaf weed control. Can be tank-mixed with Glean, Amber, Finesse, Ally, Express, Harmony Extra, bromoxynil, MCPA, or 2,4-D. Do not apply with surfactant unless tank mixing with a sulfonylurea herbicide. Refer to the label for grazing and hay restrictions.
2 to 4 fl oz Dicamba + 0.5 to 0.75 pt of 4 lb/gal 2,4-D	Dicamba (4) + 2,4-D (4) 0.06 to 0.13 + 0.25 to 0.38	Apply to small, actively growing weeds after winter dormancy but before joint stage of wheat. Controls wild buckwheat and other broadleaf weeds. Follow label restrictions for pasture and hay for lactating dairy animals.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
2 fl oz Everest 3.0	Flucarbazone (2) 0.027 lb ai/a	Everest 3.0 has activity on many grass weeds, such as wild oats, green foxtail, and brome species, in addition to numerous broadleaf weeds of importance like the mustard species. Tank-mixes with tribenuron containing herbicides can enhance the activity on certain grass weeds. Everest provides post-emergent and residual weed control. Apply to winter, spring, or durum wheat from 1-leaf up to 60 days prior to harvest at 2 fl oz/a. Winter wheat applications can be made in the fall or spring. Best weed control is observed when environmental conditions and soil fertility support vigorous growth of crop and weeds, wheat yield is optimized by early removal of grassy weeds. If applied alone or in tank mix with dry formulated or EC-based herbicides used at less than 8 fl oz/a, include a high-quality basic blend (0.5 to 1% v/v) or NIS (0.25 to 0.5% v/v) and a nitrogen source such as UAN (1 to 2 qt/a) or AMS (1 to 2 lb/a). An MSO (1% v/v) and nitrogen source may also be used. If applying Everest with EC-based herbicides used at greater than 8 fl oz/a, apply with a nitrogen source such as AMS (1 to 2 lb/a) or UAN (1 to 2qt/a). NIS may also be used if not restricted by the tank mix partner at 0.25 to 0.5% v/v. Everest can be tank-mixed with a variety of other wheat herbicides, refer to the product label for the complete list of approved tank mix partners. There is a 0-day plant back to wheat, consult the product label for other crop rotational intervals as it relates to soil pH.
0.25 to 0.5 oz Express	Tribenuron (2) 0.0078 to 0.015	Controls many broadleaf weeds but is weak on wild buckwheat and pigweed species. For control of weeds less than 4 inches tall or across, apply after wheat is in the 2-leaf stage but before the flag leaf is visible. Apply with NIS at 0.25% to 0.5% v/v. Apply as a tank mix with another broadleaf herbicide in areas of known weed resistance. Can be tank-mixed with MCPA, 2,4-D, dicamba, or bromoxynil. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock.
0.2 to 0.4 oz Finesse	Chlorsulfuron (2) + Metsulfuron (2) 0.008 to 0.016 + 0.0016 to 0.0031	Controls many broadleaf weeds. Apply after 2-leaf stage but before boot stage of wheat. Always apply with NIS at 0.25 to 0.5% v/v. Can be applied with liquid nitrogen fertilizer, but do not add surfactant if liquid fertilizer is the carrier. Use higher rate for wild buckwheat control and extended residual control. Tank mixes can improve weed control and reduce the risk of herbicide resistance problems. Finesse can be tank-mixed with dicamba, Butрил, MCPA, Sencor, or 2,4-D. Do not apply to soils with a pH below 5 or above 7.9. In the western tier of Kansas counties, the maximum use rate is 0.3 oz/a applied not more than once every 24 months. Do not rotate to oat for 10 months; grain sorghum for 4 to 48 months; non-STS soybean for 14 months (east of Highway 183, west of the Flint Hills); or any other crop until a field bioassay has been performed. STS soybean and IR corn hybrids can be planted 4 months after application if soil pH is 7.5 or lower. Refer to label for additional use and crop rotation guidelines.
0.17 to 0.33 oz Glean	Chlorsulfuron (2) 0.008 to 0.016	Controls many broadleaf weeds. Apply after the 2-leaf stage but before the boot stage of wheat for control of weeds less than 2 inches tall or across. Apply with NIS at 0.25% to 0.5% v/v. Can be applied with liquid N fertilizer, but do not use surfactant if liquid fertilizer is the carrier. Tank mixes can improve weed control and reduce the risk of herbicide resistance problems. Glean can be tank-mixed with MCPA, 2,4-D, bromoxynil, or dicamba. The maximum Glean use rate is 0.33 oz/acre, which can be applied once per crop period east of Highway 183 and once every 36 months west of Highway 183. Do not rotate to oat or barley for 10 months; grain sorghum for 4 to 48 months; non-STS soybean for 14 months (east of Highway 183, west of the Flint Hills); or any other crop until a field bioassay has been performed. STS soybean and IR corn hybrids can be planted 4 months after application if the soil pH is 7.5 or lower. Do not apply to soils with a pH above 7.9. Refer to the label for additional use and crop rotation guidelines.
0.45 to 0.9 oz Harmony Extra SG or 0.3 to 0.6 oz Treaty Extra	Thifensulfuron (2) + Tribenuron (2) 0.009 to 0.019 + 0.005 to 0.009	Controls many broadleaf weeds and wild garlic. For control of weeds less than 4 inches tall or across, apply after wheat is at the 2-leaf stage but before the flag leaf is visible. Apply with NIS at 0.12 to 0.25% v/v. Apply as a tank mix with another broadleaf herbicide having a different mode of action in areas of known weed resistance. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
0.45 to 0.9 oz Harmony SG + 0.5 to 0.75 pt of 4 lb/gal MCPA or 2,4-D	Thifensulfuron (2) + MCPA (4) or 2,4-D (4) 0.014 to 0.028 + 0.25 to 0.38	Controls many broadleaf weeds and wild garlic. Apply with MCPA in the fall or spring after the 2-leaf stage of wheat but before the flag leaf is visible. Apply with 2,4-D in the spring after wheat is fully tillered but before the flag leaf is visible. Apply with NIS at 0.12 to 0.25% v/v to small, actively growing weeds. Use 0.75 to 0.9 oz/a for wild buckwheat or wild garlic control. Does not provide residual weed control, but any crop can be planted 45 days after treatment. Do not feed forage from treated areas or allow livestock grazing within 7 days of application. Allow 30 days between application and feeding hay from treated areas to livestock.
1.33 to 2.67 pt Hoelon	Diclofop (1) 0.5 to 1	A restricted-use pesticide. Primarily used for Italian ryegrass control. Apply postemergence in the fall or spring before wheat jointing for control of Italian ryegrass with up to 2 tillers. Do not apply 2,4-D, MCPA, or dicamba within 5 days of Hoelon application, or grass weed control may be reduced. Do not apply when wheat and weeds are dormant and not actively growing. Do not allow livestock to graze treated fields for 28 days after treatment or harvest forage, hay, or straw from treated fields before grain harvest.
11 to 15 oz Huskie	Pyrasulfotole (27) + Bromoxynil (6) 0.027 to 0.036 + 0.15 to 0.21	Controls many broadleaf weeds as a fall or spring application when weeds are small and actively growing. Apply when wheat is between the 1-leaf and flag leaf emergence stages of growth. Can be tank-mixed with Ally, MCPA, 2,4-D, or dicamba. Apply with NIS at 0.25 to 0.5% v/v plus AMS at 0.5 to 1 lb/a or ammonium nitrogen fertilizer at 1 to 2 qt/a. Huskie may be applied with liquid nitrogen fertilizer as the spray carrier. Do not graze or harvest forage for 25 days after application.
13.5 to 18 fl oz Huskie FX	Pyrasulfotole (27) + Bromoxynil (6) + Fluroxypyr (4) 0.027 to 0.037 + 0.15 to 0.20 + 0.063 to 0.084	Controls many broadleaf weeds. Use 18 fl oz to control kochia and Russian thistle. Apply between 2-leaf and flag-leaf stages of wheat growth. Use a minimum of 10 GPA. Adjuvants determined by tank mix partners. May be applied with liquid N. Allow 25 days between application and feeding forage or hay to livestock. Animals that have consumed treated forage must be fed nontreated forage for 3 days before leaving property.
1 to 1.5 pt Kochiavore	Fluroxypyr (4) + Bromoxynil (6) + 2,4-D (4) 0.08 to 0.13 + 0.21 to 0.31 + 0.21 to 0.31	Controls many emerged broadleaf weeds, including kochia. Apply to small actively growing weeds when wheat is from the 4-leaf stage up to flag leaf emergence. Do not harvest treated forage or allow livestock to graze treated areas within 45 days of application.
0.5 to 1.5 pt of 4 lb/gal MCPA ester	MCPA ester (4) 0.25 to 0.75	Controls many broadleaf weeds. Apply to wheat from the 3-leaf to early boot stages of growth for control of small actively growing weeds. Much safer than 2,4-D as a fall treatment or on small wheat. Can be applied in nitrogen fertilizer and as a tank mix with many other herbicides. Do not allow livestock to graze treated wheat within 7 days after application.
2 to 10 oz Metribuzin	Metribuzin (5) 0.19 to 0.5	Can control winter annual weeds, such as cheat, downy brome, and mustards. Apply only on selected varieties of dryland winter wheat in fall or early spring. Wheat varieties differ in tolerance to metribuzin. Refer to the label for information on sensitive and tolerant varieties. Can be applied to wheat from the 2-leaf to jointing stage of growth, depending on application rate. Do not apply when wheat is in winter dormancy. Fall applications generally provide better cheatgrass control than spring applications. Can be tank-mixed with 2,4-D, dicamba, bromoxynil, Ally, Amber, Finesse, Glean, Harmony Extra, or MCPA. Crop injury can occur from application to wheat that was seeded less than 1 inch deep, on coarse-textured soils, soils low in organic matter, calcareous soils, or soils with a pH above 7.7. Do not allow grazing on treated fields for 14 days after application.
1 to 2 pt Moxy 2E	Bromoxynil (6) 0.25 to 0.5	This is a contact herbicide for control of several broadleaf weeds. Apply in fall or in spring to seedling weeds until wheat reaches boot stage. Fall applications provide the best control of weeds that emerge in the fall. Can control wild buckwheat in spring. Can be tank-mixed with MCPA, dicamba, Glean, Ally, Harmony Extra, Amber, Finesse, 2,4-D, or Sencor. Do not allow grazing on fields for 45 days after application.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
0.6 to 0.9 oz Olympus	Propoxycarbazone (2) 0.026 to 0.039	Controls cheatgrass and certain broadleaf weeds. Apply to small, actively growing weeds after wheat emergence but before the jointing stage of growth. Applications before wheat tiller initiation have a greater risk of stunting the crop. Cheat and Japanese brome are more susceptible than downy brome and generally are controlled adequately in both fall and spring with the 0.6 oz rate. Fall applications at 0.9 oz are recommended for downy brome control. Apply with NIS at 0.25 to 0.5% v/v. Liquid nitrogen fertilizer can be used as a spray carrier. Fall applications in liquid fertilizer solutions should not exceed 50% liquid nitrogen and no more than 30 lb of actual nitrogen per acre. Only add 0.25% v/v surfactant when applied with fertilizer carrier. Can be tank-mixed with 2,4-D, Ally, Amber, Finesse, Harmony Extra, MCPA, dicamba, Starane, or Rave. Do not rotate to STS soybean for 4 months; grain sorghum for 6 months; cotton, sunflower, and non-STs soybean for 12 months (if cumulative precipitation exceeds 24 inches); corn for 18 months (if cumulative precipitation exceeds 30 inches) after Olympus treatment. Rotation to other crops or with shorter interval requires successful completion of a field bioassay, and no sooner than 4 months after Olympus application.
17 oz Orion	Florasulam (2) + MCPA (4) 0.0044 + 0.31	Controls certain broadleaf weeds. Apply from the 3-leaf stage until jointing of wheat for control of small, actively growing weeds that have emerged at the time of application. Livestock can graze treated area 7 days after application. Do not apply within 60 days of harvest. Do not plant corn or sorghum within 3 months or alfalfa, soybean, and sunflower within 9 months after application. For kochia or Russian thistle control, tank mix with Starane or Huskie. Tank mix with metsulfuron for improved henbit control.
4.75 oz Osprey	Mesosulfuron (2) 0.013	Controls Italian (annual) ryegrass. Apply to actively growing weeds after wheat emergence but before the jointing stage of growth. Applications before wheat tiller initiation have a greater risk of stunting the crop. Must be applied with MSO or NIS plus nitrogen fertilizer adjuvants. Topdress liquid nitrogen fertilizer applications are not recommended within 21 days of Osprey treatment because of the increased potential for crop injury. Can be tank-mixed with Ally, Finesse, Harmony Extra, MCPA ester, or Starane Ultra. Do not plant barley, sunflower, soybean, or cotton until 90 days; corn until 12 months; or any other crop until 10 months after Osprey application.
0.67 oz Outrider	Sulfosulfuron (2) 0.031	Controls cheatgrass and certain broadleaf weeds. Apply after wheat is in the 2-leaf stage but before jointing for control of small, actively growing weeds. Fall applications have provided better cheatgrass control than spring applications. Do not apply when wheat and weeds are dormant and not growing actively. Apply with NIS at 0.5% v/v. Liquid nitrogen fertilizer can be used at a maximum of 50% of the spray carrier volume. NIS should be used at 0.25% v/v when fertilizer is part of the carrier. Can be tank-mixed with 2,4-D, Ally, Glean, Finesse, Express, Harmony Extra, bromoxynil, or MCPA. Wheat can be grazed immediately after application but should not be harvested for hay until 30 days after application. STS soybean can be planted 3 months after treatment if soil pH is less than 7.5 and cumulative precipitation exceeds 18 inches. Cotton and non-STs soybean can be planted 12 months after treatment if soil pH is less than 7.5 and cumulative precipitation is over 30 inches. Planting sorghum, corn, or sunflower is not recommended until at least 22 months after treatment. Rotation to other crops or with shorter interval requires successful completion of a field bioassay, and no sooner than 3 months after application. Risk of Outrider carryover is greatest on high pH soils.
0.25 to 0.5 oz Peak	Prosulfuron (2) 0.15 to 0.29	Controls many broadleaf weeds. For control of small weeds, apply after wheat is in the 3-leaf stage but before the second node is detectable in stem elongation. For wild buckwheat control, apply after true leaves have developed on seedling plants. Apply with NIS at 0.25 to 0.5% v/v. Apply as a tank mix with another broadleaf herbicide with a different mode of action in areas of known weed resistance. Can be tank-mixed at the lower application rates with 2,4-D, MCPA, dicamba, or Buctril. Do not rotate to soybean or canola for 10 months, alfalfa for 15 months, or sunflower for 24 months after Peak application. Do not allow grazing or feed forage from treated fields until 30 days after application.

* Numbers in parentheses indicate herbicide site of action; see p. 3 for more information. Products often are available in several formulations or brand names, and label information may vary. Refer to the Names, Toxicities, and Persistence table, p. 12.

Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
6 oz Pixxaro	Fluroxypyr (4) + Halauxifen-methyl (4) 0.11 + 0.005	Apply to actively growing wheat from 2-leaf to flag-leaf emergence. Use at least 8 gallons of water per acre and nozzles that ensure medium or very coarse droplets. May be applied with up to 50% liquid fertilizer carrier, up to 30 pounds actual N. Do not plant corn or sorghum for 14 days; canola, cotton, soybean, or sunflower for 4 months; or alfalfa for 9 months.
2 oz PowerFlex HL or GRI	Pyroxsulam (2) 0.0164	Controls cheatgrass, Italian ryegrass, and many winter annual broadleaf weeds. GRI herbicide is a component product available only in FMC PrecisionPac blends with other broadleaf herbicides, which may have different use guidelines and restrictions. Apply to small, actively growing weeds in wheat in the fall or spring from the 3-leaf stage up to jointing. Best control is obtained on grasses from 2-leaf to 2-tiller and before broadleaves are 2 inches tall or 2 inches in diameter. Cheat and Japanese brome are more susceptible than downy brome. Apply with NIS at 0.25 to 0.5% v/v, UAN fertilizer at 1 to 2 qt/acre, or AMS at 1.5 to 3 lb/a can also be added for enhanced weed control. Liquid nitrogen can be used as a spray carrier. The spray solution should not be more than 50% liquid nitrogen and should not exceed 30 lb of actual nitrogen per acre. Only use NIS at 0.25% v/v when applied in nitrogen carrier. May be tank-mixed with labeled rates of other broadleaf herbicides as needed for optimal control. Do not mix with products containing dicamba or amine formulations of 2,4-D or MCPA as these products may antagonize grass control. Soybean, sunflower, sorghum, and cotton can be planted after 3 months but not prior to April 30. Alfalfa, barley, canola, or corn cannot be planted for 9 months after PowerFlex HL application. Wheat should not be grazed until 7 days after application or harvested for hay until 28 days after application.
1.5 to 3 pt Prowl H₂O or Sattelite Hydrocap	Pendimethalin (3) 0.71 to 1.43	Prowl H ₂ O is an encapsulated formulation of pendimethalin that can be applied postemergence to wheat from the 1-leaf up to flag leaf emergence stage for preemergence residual weed control. Does not control emerged weeds, and performance will be variable depending on precipitation and weed germination patterns. Do not harvest wheat forage for 11 days, hay for 28 days, or grain for 60 days following application. Do not plant wheat for 4 months or sorghum for 10 months after application.
8.3 to 12.5 oz Pulsar	Dicamba (4) + Fluroxypyr (4) 0.05 to 0.07 + 0.06 to 0.09	Controls emerged kochia, Russian thistle, wild buckwheat, and certain other broadleaf weeds. Apply prior to the jointing stage of wheat to small, actively growing weeds. Addition of NIS at 0.125 to 0.25% v/v can improve weed control during periods of environmental stress. Can be tank-mixed with MCPA or other herbicides for enhanced control of mustard species. Do not allow livestock to graze treated areas or harvest treated forage within 7 days after application. Do not rotate to sorghum for 4 months; or alfalfa, canola, cotton, soybean, or sunflower for 9 months after Pulsar application.
0.75 oz Quelex	Halauxifen (4) + Florasulam (2) 0.0047 + 0.0047	Controls many emerged broadleaf weeds other than kochia. Apply to small actively growing weeds when wheat is from the 2-leaf stage up to flag leaf emergence. Apply with NIS at 0.2 to 0.5% v/v or oil concentrate at 0.5 to 1% v/v. Do not allow livestock to forage or graze treated areas within 7 days after application. Do not apply within 21 days before cutting for hay or 60 days before harvesting grain. Do not plant corn, sorghum, soybean, cotton sunflower, or oats, within 3 months; fall seeded canola within 5 months; alfalfa within 9 months; or any crop not listed on the label for 15 months following application. In the event of cereal crop failure, no-till soybean, no-till cotton, field corn, or sorghum may be planted 45 days after application of Quelex.
2 to 4 oz Rave	Triasulfuron (2) + Dicamba (4) 0.011 to 0.022 + 0.06 to 0.125	Rave is a premix of Amber and dicamba. Controls many broadleaf weeds. Apply after emergence but before jointing of wheat. Can be applied with water, liquid nitrogen fertilizer, or a mixture of both as a carrier. If 50% or more of the carrier is liquid nitrogen fertilizer, a surfactant is not recommended. Otherwise, apply with NIS at 0.25 to 0.5% v/v. Do not rotate to barley, oat, or rye for 6 to 18 months; corn for 14 to 36 months; sorghum for 14 to 24 months; STS soybean for 11 months; non-STs soybean for 14 to 26 months; or alfalfa for 24 months; and have a field bioassay performed, depending on soil pH and precipitation. In the event of catastrophic crop loss, grain sorghum and STS soybean can be planted 4 months after application if the grower is willing to accept the risk of crop injury. Refer to the label for additional use and crop rotation guidelines.

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Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
16.4 fl oz Rezuvant	Fluroxypyr (4) + Halauxifen (4) + Pinoxaden (1) 0.0045 + 0.1115 + 0.535	Apply from 2-leaf up to flag leaf emergence to control emerged grass and broadleaf weeds. Do not tank mix with any herbicides containing 2,4-D, pinoxaden, metsulfuron, triasulfuron, prosulfuron, or chlorsulfuron. May be applied with liquid nitrogen fertilizer. Do not graze for 30 days after application. Livestock grazing fluroxypyr-treated wheat must be fed nontreated forage for at least 7 days before moving off property. Do not plant canola, corn, cotton, soybean, sunflower, or sorghum for 4 months.
7 to 14 oz Sentrallas	Fluroxypyr (4) + Thifensulfuron (2) 0.07 to 0.14 + 0.014 to 0.027	Controls many broadleaf weeds, except ALS-resistant mustards. Apply to small actively growing weeds when wheat is from the 2-leaf stage up to flag leaf emergence. Apply with NIS at 0.06 to 0.25% v/v or oil concentrate at 1% v/v. Do not allow livestock to forage or graze treated areas within 7 days after application. Do not apply within 30 days before cutting for hay or 45 days before harvesting grain. Field corn, sorghum, wheat, barley and oats can be planted any time after application, but do not plant any other crops until 120 days after application.
14 to 27.4 oz Starane NXT	Fluroxypyr (4) + Bromoxynil (6) 0.064 to 0.125 + 0.25 to 0.5	Controls kochia and certain other broadleaf weeds. Apply to small actively growing weeds when wheat is from the 3-leaf stage up to flag leaf emergence. Starane NXT does not provide significant residual weed control. Do not allow livestock to graze or harvest for hay within 45 days after application. Oats, corn, and sorghum can be planted 30 days after application. Any crop can be planted 120 days after application.
0.3 to 0.4 pt Starane Ultra or StareDown	Fluroxypyr (4) 0.105 to 0.14	Controls kochia, including ALS-resistant kochia, and certain other broadleaf weeds. Apply to small, actively growing weeds after winter dormancy but before the early boot stage of wheat. Often applied as a tank mix with other herbicides for broad-spectrum broadleaf weed control. Do not harvest treated forage or allow livestock to graze treated area within 7 days of application. Do not plant any crop except wheat, barley, oat, corn, or sorghum within 120 days after application.
13.7 to 18.2 oz Talinor	Bicyclopyrone (27) + Bromoxynil (6) 0.033 to 0.044 + 0.16 to 0.21	Controls many broadleaf weeds as a fall or spring application when weeds are small and actively growing. Apply to wheat from the 2-leaf to flag leaf emergence. Apply with CoAct+ and COC adjuvants. Do not plant oat for 3 months, sunflowers for 9 months, alfalfa for 9 to 12 months, canola for 9 to 10 months, cotton or sorghum for 10 months, or soybeans for 10 to 12 months after application. Do not graze or harvest forage for hay for a minimum of 30 days after application.
1 oz Tarzec	Pyroxulam (2) + Halauxifen-methyl (4) 0.02 + 0.004	Tarzec can be applied annual grasses (including cheatgrass and Italian ryegrass) and broadleaf weeds (including mustards). Apply to actively growing weeds when wheat is 3 leaf to joint. Use 0.25% to 0.5% NIS or 1 to 1.25% COC when applied alone. See label instructions for tank mixing and applying in nitrogen fertilizer carrier. Do not plant cotton, grain sorghum, or sunflower for 3 months; soybeans for 5 months; or corn for 9 months after application.
18 to 24 oz Voucher	Fluroxypyr (4) + MCPA (4) 0.09 to 0.12 + 0.37 to 0.5	Controls emerged kochia and many other broadleaf weeds. Apply to small actively growing weeds when wheat is from the 3-leaf stage up to flag leaf emergence. Do not allow livestock to forage or graze treated areas within 7 days after application. Do not apply within 14 days before cutting for hay or 40 days before harvesting of grain or straw. Do not plant any crops other than wheat, barley, or oats within 120 days following application.
1 to 2 pt Weld or 1 to 1.5 pt Full Deck	MCPA (4) + Fluroxypyr (4) + Cloprialid (4) 0.22 to 0.47 + 0.08 to 0.16 + 0.0625 to 0.125	Controls many broadleaf weeds. Apply to wheat from the 3-leaf to flag leaf emergence stages of growth for control of small actively growing weeds. Do not rotate to alfalfa for 10.5 months, sorghum or canola for 12 months; soybean or sunflower for 12 to 18 months; or cotton for 18 months after application. Do not allow livestock to graze treated wheat within 7 days after application and do not cut for hay within 14 days after application.
14 fl oz WideARMatch	Fluroxypyr (4) + Halauxifen (4) + Cloprialid (4) 0.09 + 0.004 + 0.11	Apply from 2-leaf up to flag leaf emergence to control emerged broadleaf weeds. May be applied with liquid nitrogen fertilizer. Do not graze for 7 days after application. Livestock grazing treated wheat must be fed nontreated forage for at least 3 days before moving off property. Do not harvest hay from treated fields. See product label for rotation restrictions.

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Herbicides for Winter Wheat

Formulated product/acre*	Herbicide and lb active ingredient needed/acre	Comments and limitations
POSTEMERGENCE		
1.33 pt WideMatch, Colt, or Truslate	Fluroxypyr (4) + Clopyralid (4) 0.125 + 0.125	Controls Canada thistle, musk thistle, bull thistle, kochia, and wild buckwheat. Does not control most winter annual mustard species very well. Apply to small, actively growing weeds when wheat is from the 3-leaf through the flag-leaf emergence stage of growth. Do not plant alfalfa or grain sorghum for 10.5 months; soybean, dry bean, or sunflower for 10.5 to 18 months; or cotton until at least 10.5 months; and conduct a field bioassay after WideMatch application.
1.75 to 4 oz Zidua SC	Pyroxasulfone (15) 0.053 to 0.13	Apply to wheat from the spike up to the 4-tiller growth stage for residual control of Italian ryegrass and suppression of winter annual brome species. Does not control emerged weeds. May be tank-mixed with other registered herbicides. Wheat forage and hay can be fed or grazed 7 or more days after application.
PREHARVEST		
1 pt of 4 lb/gal 2,4-D LVE	2,4-D LVE (4) 0.5	Apply when wheat is in the hard dough stage to control large, actively growing broadleaf weeds that can interfere with harvest. A waiting period of 14 days is required before harvest. Weeds growing under limited moisture may not be controlled.
1 to 2 oz Aim EC or Longbow EC	Carfentrazone (14) 0.016 to 0.031 or 2 lb/gallon	For desiccation of susceptible broadleaf weeds. Apply after wheat is mature but at least 3 days before harvest. Always apply with 1% v/v COC in a minimum spray volume of 5 gal/a for aerial application and 10 gal/a for ground applications. Do not apply more than 2 oz of Aim during the growing season.
0.1 oz Ally or Metsulfuron	Metsulfuron (2) 0.0038	For control of broadleaf weeds, apply when wheat is in the dough stage and at least 10 days before harvest. Always apply with NIS at 0.25 to 0.5% v/v. Do not use on soils with a pH > 7.9. Weeds growing under limited moisture may not be controlled. Generally applied as a tank mix with glyphosate or 2,4-D.
0.5 pt Dicamba	Dicamba (4) 0.25	Apply when wheat is in the hard dough stage and green color is gone from nodes of stem for control of certain broadleaf weeds. A waiting period of 7 days is required before harvest. Do not allow grazing or use feed from treated area.
1 to 2 pt of 3 lb ae/gal Glyphosate (see glyphosate table)	Glyphosate (9) 0.5 to 1	For control of broadleaf and grass weeds that can interfere with harvest, apply when wheat is in the hard dough stage (30% or less grain moisture) and at least 7 days before harvest. Glyphosate products differ in concentration and adjuvant requirements. Refer to specific product labels for rate and adjuvant recommendations. Do not feed treated straw or permit dairy animals or meat animals being finished for slaughter to graze treated grain fields within 2 weeks after treatment. Not recommended for wheat being harvested for use as seed.
1 to 2 oz Sharpen	Saflufenacil 0.022 to 0.044	For desiccation of broadleaf weeds. Apply when wheat is in the hard dough stage (30% or less grain moisture) and at least 3 days prior to harvest. Treated straw may be grazed or fed to livestock.
1.5 to 2 fl oz Valor EZ	Flumioxazin (14) 0.033 to 0.044	Apply after wheat reaches the hard dough stage and grain is no more than 30% moisture. Use MSO at 1 qt per acre. Spray grade AMS at 2 to 2.5 lb per acre or UAN at 1 to 2 qt per acre may be added. May be applied with glyphosate. Must apply at least 10 days before harvest
FOR SPOT TREATMENT ONLY		
1.28 to 2.56 fl oz Glyphosate /gal spray solution (see glyphosate table)	Glyphosate (9)	Apply as spot treatment to control annual and some perennial weeds. Apply at the recommended stage of weed growth before wheat begins heading. Crop in treated area will be killed. Avoid drift outside target area.

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