

Table 2.5-8. Comments on herbicides for small grains.

See specific product label to determine correct rate for soil type and weed species found in each field. Tables 2.5-5, 2.5-6, and 2.5-7 list characteristics and efficacy of herbicides. A good small grain stand is very competitive and normally does not require an herbicide treatment. It is important to control all existing vegetation at planting time, prior to no-till production.

Trade Name	Common Name	Site of Action Number	Application	Product/A	lb ai/A
2,4-D amine 4S	2,4-D	4	full tiller to prejointing (growth stages 3–6)	0.5–2 pt	0.25–1

- For use on wheat, barley, rye, and oats.
- Use lower rates for small annual weeds.
- Use lower rate (0.25 to 0.5 pt/A) if underseeded with legume (alfalfa, red or white clover are labeled; vetch and sweet clover will be severely injured).
- Spraying small grains too young or after jointing can result in reduced yields or uneven ripening.
- In general, apply when small grain is 4 to 8 inches tall.
- May be tank-mixed with Harmony Extra SG, Banvel, or Maestro (Buctril).
- No rotation restriction to soybean; 3-month rotation restriction to vegetables; see Table 2.1-11.

2,4-D LVE 4E	2,4-D	4	full tiller to prejointing (growth stages 3–6)	0.5–2 pt	0.25–1
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- For use on wheat, barley, rye, and oats.
- Use lower rates for annual weeds.
- For wild garlic or onion control, apply 1.5 to 2 pt.
- Avoid use if temperatures are expected to exceed 75°F.
- No rotation restriction to soybean; 3-month rotation restriction to vegetables; see Table 2.1-11.

Aim 2EC	carfentrazone	14	up to the jointing stage (growth stages 1–5)	0.5–2 fl oz	0.008–0.016
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- For use on wheat, barley, and oats to control certain broadleaves.
- Apply before weeds are 4 inches tall.
- May be tank-mixed with 2,4-D, MCPA, or other common small grain herbicides to improve control and increase weed spectrum. Some research has shown that Aim provides suppression of Star-of-Bethlehem and speedwell.
- No rotation restrictions to soybean or vegetables; see Table 2.1-11.

Axial XL 0.42L	pinoxaden	1	2-leaf to preboot (growth stages 2–8)	16.4 fl oz	0.053
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- For use on wheat or barley.
- Controls certain grassy weeds such as annual ryegrass, foxtails, barnyardgrass, and wild oat. (Apply Axial XL before weeds have more than 5 leaves on the main stem.)
- Axial XL does not control downy brome or ACCase-resistant grasses.
- Tank-mix with other labeled herbicides to enhance weed control spectrum.
- No rotation restriction to soybean; 30 days for leafy and root crops, all other vegetables after 90 days; see Table 2.1-11.

Axiom 68 DF	flufenacet + metribuzin	5 15	spiking to 2 leaf (growth stage 1)	4–10 oz	0.133–0.333 0.033–0.083
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- For use on wheat and triticale.
- Plant seeds 1 to 2 inches deep to improve crop safety; do not use on broadcast-seeded wheat.
- Apply when crop is between full germination and 2-leaf stage and when weeds have not germinated (preemergence) and 1-leaf stage. Apply prior to weed emergence to 1-leaf-stage weeds.

- Use rate depends on soil texture; see product label.
- Some crop varieties are more sensitive; see product label.
- No rotation restriction to soybean; 12-month rotation restriction to vegetables; see Table 2.1-11.
- *Water quality advisory.*

Banvel 4S	dicamba DMA salt	4	full tiller to jointing (growth stages 3–6)	2–4 fl oz	0.06–0.12
Clarity 4S	dicamba DGA salt			2–4 fl oz	
Engenia 5S	dicamba BAPMA salt			1.6–3.2 fl oz	
XtendiMax 2.9S/FeXapan	dicamba DGA salt with VaporGrip			2.75–5.5 fl oz	

- For use on fall-seeded barley and wheat only.
- Crop safety and weed control will be similar for all dicamba formulations.
- May be tank-mixed with Maestro (Buctril) or 2,4-D to broaden spectrum of control.
- Do not use if legumes are underseeded.
- No rotation restrictions.

Dimetric EXT 75WG/TriCor 75DF	metribuzin	5	2-leaf to 4-tiller (growth stages 1–5)	2–4 oz	0.047–0.19
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- For use on wheat and barley.
- For control of Group 2 (ALS) resistant common chickweed: Dimetric EXT is approved for use under 24(c) labels in Maryland, Pennsylvania, and West Virginia (expires Dec. 2020). and TriCor has a section 24(c) label in Virginia (expires December 2020).
- The typical use rate is 2–4 oz/A (3 oz/A is recommended) either in the fall or spring when the crop is in the 2-leaf to 4-tiller growth stage.
- Rate depends on soil texture; see product label.
- Local research has shown wheat safety is best with an early spring application (at greenup). Potential for injury increases with late spring applications or fall applications.
- Plant wheat at least 1 inch deep.
- Glory can be tank-mixed with other small grain herbicides to broaden control spectrum.
- Certain wheat and barley varieties are sensitive to metribuzin. Refer to the respective label for additional details on varieties and other use restrictions.
- In general, fall-applied herbicide generally provided more consistent common chickweed control, but spring metribuzin treatments were adequate as well.
- For best results, apply metribuzin when chickweed is small (4 to 6 inches in diameter).
- No rotation restriction to soybean; 4 to 18 months for vegetables; see Table 2.1-11.

Harmony Extra SG 50DF	thifensulfuron +	2	2-leaf to before visible flag leaf (growth stages 1–7)	0.45–0.9 oz	0.009–0.018
	tribenuron	2			0.005–0.009

- For use on wheat, barley, and oats.
- Controls wild garlic and broadleaf weeds. Tank-mix with Express 50SG for improved wild carrot control. Not recommended for cornflower.
- Rates depend on type of weeds and severity.
- For garlic control use higher rates of Harmony Extra SG plus 2,4-D when garlic is less than 12 inches tall.
- Always premix Harmony Extra SG in water before adding to the spray tank.
- Tank-mixing with Banvel or Maestro (Buctril) may result in reduced control of certain broadleaf weeds.
- Do not tank-mix with Malathion.
- Any crop may be planted 45 days after application; see Table 2.1-11.

Harmony SG 50DF	thifensulfuron	2	2-leaf to before visible flag leaf (growth stages 1–7)	0.45–0.9 oz	0.014–0.028
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- Harmony SG can be used on fall-seeded wheat, barley, triticale, and oats.
- Harmony SG controls wild garlic and broadleaf weeds. Not recommended for cornflower.
- The common rate is 0.75 oz/A, but higher or lower rates may be used.
- Tank-mix with other herbicides to increase weed control spectrum.
- Harmony SG also may be used as a preplant burndown application before small grain emergence.
- Any crop may be planted 45 days after application; see Table 2.1-11

Huskie 2.06L	pyrasulfotole +	6	first-leaf to flag-leaf emergence (growth stages 1–7)	11–15 oz	0.026–0.036
	bromoxynil	27			0.151–0.205

- For use on wheat, barley, and triticale.
- Huskie controls many annual broadleaf weeds.
- In some university trials, Huskie provided control of marestail at the rosette stage when applied in the spring.
- 4-month rotation restriction to soybean; more than 9 months for vegetables; see Table 2.1-11.

Maestro (Buctril 2E)	bromoxynil	6	emergence to boot stage (growth stages 1–9)	1–2 pt	0.25–0.5
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- For use on wheat, barley, rye and oats.
- May be applied to a small-grain/alfalfa underseeding.
- Apply before weeds have more than four leaves or are 2 inches tall, or rosettes exceed 1 inch in diameter.
- Use flat fan nozzles and a minimum of 10 gal/A for best results.
- Weak on chickweed and henbit.
- May be tank-mixed with Harmony Extra SG, MCPA, 2,4-D, or Banvel/Clarity.
- 30-day rotation restriction for all crops; see Table 2.1-11.

MCPA amine or ester 4L	MCPA	4	full tiller to prejoint stage (growth stages 3–6)	0.5–1 pt	0.25–0.5
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- For use on wheat, barley, rye, and oats.
- Safer on small grains underseeded with legumes than 2,4-D (amine formulation only), but use the lower rate (0.25–0.5 pt) and apply in 5–10 gal water/A; legumes should be 2 to 3 inches tall and cereal should be 8 inches tall to provide canopy to protect legume.
- For best results, apply while weeds are small, typically when cereal is 4 to 8 inches tall.
- No rotation restrictions are indicated.

Osprey 4.5 WDG	mesosulfuron	2	emergence to jointing stage (growth stages 1–5)	4.75 oz	0.013
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- For use on winter wheat and triticale.
- In our region, Osprey will be primarily targeted for control of annual ryegrass, including ACCase-resistant biotypes and downy brome.
- Applications should be made when weeds are young and actively growing at the 1-leaf to 2-tiller stage.
- To broaden weed control spectrum, Osprey may be tank-mixed with other herbicides, including Harmony Extra SG, Harmony SG, MCPA, Maestro (Buctril), and Stinger.
- Do not topdress with nitrogen fertilizer within 14 days following an Osprey application.
- Certain insecticides and fungicides may be tank-mixed.
- Soybean can be planted after 90 days of application, corn after 12 months, vegetables after 10 months, and alfalfa after 10 months; see Table 2.1-11.

Peak 57WDG	prosulfuron	2	3-leaf to before visible second node (growth stages 2–6)	0.25–0.5 oz (1 pack/6–12 A)	0.009–0.018 oz
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- For use on wheat, barley, oats, rye, and triticale.
- Peak controls wild garlic and broadleaf weeds.
- For best results apply when weeds are small and use the 0.5 oz/A rate if used alone.

- May be tank-mixed with Banvel/Clarity, 2,4-D, MCPA, or Maestro (Buctril) to broaden weed spectrum; however, certain application timing restrictions may apply.
- Do not apply organophosphate (op) insecticide 15 days before or 10 days after Peak application.
- Be cautious of crop rotation restrictions (10 months for soybean and 22 months for alfalfa; see label for other cropping restrictions); see Table 2.1-11.

PowerFlex HL 13WDG	pyroxsulam	2	3-leaf to jointing (growth stage 6)	2 oz	0.016
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- For use on wheat and triticale.
- Crop stunting and chlorosis is commonly observed with spring applications; stunted wheat can be observed for weeks after application. Stunting and chlorosis has not been observed with fall applications.
- The PowerFlex activity on certain grass and broadleaf weeds, including annual ryegrass, downy brome, and annual bluegrass, is improved with fall applications.
- Soybean can be planted 3 months after application. Vegetables can be planted after 9 to 12 months; see Table 2.1-11.

Prowl H2O 3.8SC	pendimethalin	3	first-leaf to before the flag leaf is visible (growth stages 1–7)	1.5–3 pt	0.7–1.4
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- For use on wheat or triticale.
- Wheat or triticale must be planted 0.5–1 inch deep to avoid crop injury.
- Must be applied before weed emergence. Any emerged weeds will not be controlled, so use a tank mixture to control emerged weeds
- For best results, apply Prowl H2O once the wheat rows are visible and before weeds have emerged.
- Prowl controls many annual grass and broadleaf weeds.
- Wheat or triticale must be planted 0.5 to 1 inch deep to avoid crop injury.
- No rotation restriction to soybean or vegetables; see Table 2.1-11.

Quelex 20.4WDG	halauxifen	4	2-leaf to flag leaf emergence (growth stages 2–8)	0.75 oz	0.005
	florasulam	2			0.005

- For use on wheat, barley, or triticale.
- Best to apply to small, actively growing weeds (2- to 4-leaf stage).
- Quelex is a slow-acting herbicide.
- Do not apply within 60 days of crop harvest.
- Rotation is 3 months to soybeans and 15 months to most vegetables; see Table 1-5.

Sharpen 2.85SC	saflufenacil	14	preplant or preemergence	1–4 fl oz	0.022–0.088
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- For use on wheat, barley, oats, rye, and triticale.
- Be sure seed row is sufficiently covered with soil to avoid washing and concentrating the herbicide in the seed zone.
- Apply Sharpen for burndown and/or limited residual control of certain annual broadleaf weeds; see Table 2.5-4.
- Sharpen does not control grass weeds.
- Do not apply Sharpen if crop has emerged.
- No rotation restriction to soybean; 1 to 5 months for vegetables, depending on species; see Table 2.1-11.

Starane Ultra 2.8L	fluroxypyr	4	2-leaf to early boot (growth stages 2–9)	4.8–6.4 fl oz	0.09–0.13
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- For use on wheat, barley, triticale, and oats.
- The Starane label claims to control bedstraw, chickweed, hemp dogbane, prickly lettuce, ragweed, and velvetleaf and to suppress bindweed, wild buckwheat, mustard species, and others.
- Starane provides good control of Group 2 (ALS) resistant common chickweed.
- 120-day rotation restriction to crops not listed, including soybean. 24(c) labels in Delaware and Virginia permit 90-day rotation to soybeans.

Stinger 3S	clopyralid	4	3-leaf to early boot (growth stages 2–9)	0.25–0.33 pt	0.1–0.125
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- For use on wheat, barley, and oats.
- For best results, apply while weeds are actively growing.
- For Canada thistle, apply when thistle is 1 to 2 feet tall.
- May be tank-mixed with any other small grain herbicide to increase weed spectrum. (Curtail is a premix of clopyralid and 2,4-D. See product label for details.)
- Do not use plant residues or manure from animals that consumed forage from treated areas for compost or mulch where susceptible plants may be grown the following season.
- 10.5-month rotation restriction to soybean for soils with greater than 2% organic matter; 18-month restriction for soils with less than 2% organic matter. See label, as vegetable rotation varies greatly by species; see Table 2.1-11.
- *Water quality advisory.*

Talinor 1.77EC	bicyclopyrone +	27	2 leaf-stage to pre- boot (growth stages 2–9)	13.7–18.2 fl oz	0.03–0.04
	bromoxynil	6			0.16–0.212

- For use on wheat or barley.
- Always add the directed rate of CoAct+ plus crop oil concentrate (preferred) or non-ionic surfactant.
- Best to apply to small, actively growing weeds.
- Rotation is 10 months to soybeans and 9 to 18 months to most vegetables; see Table 2.1-11.

Valor SX 51WDG or Valor EZ 4L	flumioxazin	14	early preplant	1–2 oz	0.032–0.064
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- For use on wheat only in Delaware, Maryland, New Jersey, Pennsylvania, and Virginia.
- Must be applied 7 days prior to planting in no-till or minimum-till wheat; 30-day preplant restriction from conventionally tilled wheat.
- When using as a burndown, apply 2 oz/A.
- Wheat must be planted a minimum of 1 inch deep.
- Valor improves control of horseweed and other broadleaf weeds when tank-mixed with other herbicides that broaden control spectrum.
- With sandy soils, stunting and stand loss can occur if seed is not planted at least 1 inch deep and heavy rain occurs shortly after application.
- No rotation restriction to soybean; more than 4 months for vegetables; see Table 2.1-11.

Zidua 85WDG or Zidua 4.17SC	pyroxasulfone	15	delayed pre- to early postemergence (4th tiller) (growth stages 1–3)	0.7–2.5 oz or 1.25– 4 fl oz	0.04–0.13
Anthem Flex 4SE	pyroxasulfone + carfentrazone	15 14		2–4.5 fl oz	0.004–0.01

- For use on wheat only.
- All products can be applied as a delayed preemergence (80% germination with 0.5-inch-long shoot to spiking) to control annual grasses and small-seeded broadleaf weeds.
- Do not use on broadcast seeded wheat; do not plant wheat deeper than 1.5 inches (but at least 1 inch deep).
- Do not apply if more than 0.25 inches of rain is expected within 48 hours.
- Crop injury may result under prolonged wet soil conditions.
- Consult label; soil texture influences rate.
- Zidua alone will not control emerged weeds; Anthem Flex contains carfentrazone (Aim), which will provide control of certain weed species if they are very small at time of application.
- No rotation restriction to soybean; 18 months for vegetables; see Table 2.1-11.
- *Water quality advisory.*