ADAMA

WE ARE

All In on you

2023 PRODUCT GUIDE | WESTERN CANADA

Listen • Learn • Deliver

ADAMA.COM

HERBICIDE

FUNGICIDE

INSECTICIDE

WE ARE

All In on you

1. Understanding challenges [Listen]
2. Staying responsive [Learn]
3. Providing answers [Deliver]

ADAMA

We believe advancing ag advances the world. That's why we're all in on developing what Canadian growers need to meet increasing demand. Learning from you inspires us, and we know innovation has to start with your input.

Through our conversations with you, we've seen the pressure Canadian growers are under to produce more with less. There is an immediate need for responsive, sustainable solutions, and we can't stop advocating for Canadian farmers. As long as you have challenges, ADAMA promises to stay agile and provide timely and efficient answers that help you get the most out of each acre.

With the largest library of actives in the world, an R&D focus on improving crop protection formulations, and a growing global network of manufacturing plants, ADAMA is uniquely positioned to deliver. We proudly offer a suite of ever-evolving herbicide, fungicide and insecticide options you can customize to create easy-to-use solutions that protect your ROI and deliver results. We're all in on keeping crop protection simple, innovative and effective.

Thank you for choosing ADAMA.

Sincerely,

Cornie Thiessen
General Manager, Canada at ADAMA Agricultural Solutions

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ADAMA.COM

“Our customers tolerate a lot of uncertainty. I am proud to work for ADAMA, where we are confidently delivering the products needed to ensure our growers have a successful crop.

Andrew Kaminsky
Area Business Manager, Eastern Manitoba

QUICK REFERENCE

CONTROL TIPS BY CROP

CONTROL TIPS BY CROP

		Wheat	Durum Wheat	Winter Wheat	Barley	Oats	Field Corn	Soybeans	Dry Beans	Page
WEED CONTROL	PRE-SEED									
	2,4-D ESTER 700	•		•	•		•			15
	BROMOTRIL®	•	•	•	•	•	•			18
	EMPHASIS™	•			•	•				20
	INVOLVE® 50 WDG	•	•	•	•	•		•	•	22
	PRIORITY®	•	•		•	•				25
	SQUADRON® II	•		•	•					28
	GRASSY									
	ARROW® 240 EC							•	•	31
	ARROW ALL IN®							•	•	33
	BISON® 400 L	•	•	•	•					35
	BRAZEN™ II	•			•					37
	LADDER ALL IN®	•	•							39
	LEOPARD®							•	•	41
	CEREAL BROADLEAF									
	2,4-D ESTER 700	•		•	•		•			43
	BADGE®	•	•	•	•	•	•			46
	BROMOTRIL®	•	•	•	•	•	•			48
	ESTEEM®	•	•		•					50
	FORCEFIGHTER® M	•	•	•	•					52
	INVOLVE® 50 WDG	•	•	•	•	•		•	•	54
	MCPA ESTER 600	•	•	•	•	•				56
	OUTSHINE®	•	•		•	•				59
	RUSH® 24	•	•		•					61
	THRASHER®	•	•		•					64
	TOPLINE®	•	•		•	•				66
	PULSE & SOYBEAN BROAD SPEC									
	DAVAI® 80 SL							•	•	69
	PHANTOM® 240 SL							•	•	73
	PYTHON™							•	•	75
	QUASAR®							•	•	77
	SQUADRON® II	•		•	•					79
	HARVEST AID									
	ARMORY® 240							•	•	83
INSECT CONTROL	SILENCER® 120 EC	•	•	•	•	•	•	•	•	89
	SOMBRERO® 600 FS	•	•	•	•	•	•	•		91
	ZIVATA™	•	•	•	•	•	•	•	•	93
DISEASE CONTROL	BUMPER® 432 EC	•	•	•	•	•	•	•	•	97
	CUSTODIA®	•	•	•	•	•		•		99
	ORIUS® 430 SC	•	•	•	•	•				102
	SORADUO™	•	•	•	•					104
	SORATEL™	•	•	•	•	•	•	•		106
	TOPNOTCH™	•	•	•	•	•		•	•	109

⚠ Always read and follow pesticide label directions.

QUICK REFERENCE

CONTROL TIPS BY CROP

		Field Peas	Lentils	Chickpeas	Canola	Flax	Sunflowers	Potatoes	Page
WEED CONTROL	PRE-SEED								
	BROMOTRIL®					•			18
	EMPHASIS™				•				20
	INVOLVE® 50 WDG	•	•	•					22
	SQUADRON® II	•	•	•				•	28
	GRASSY								
	ARROW® 240 EC	•	•	•	•	•	•	•	31
	ARROW ALL IN®	•	•	•	•	•	•	•	33
	LEOPARD®	•	•	•	•	•			41
	CEREAL BROADLEAF								
	BADGE®					•			46
	BROMOTRIL®					•			48
	MCPA ESTER 600					•[1]			56
	PULSE & SOYBEAN BROAD SPEC								
	DAVAI® 80 SL	•	•[2]						69
	DAVAI A PLUS™	•	•[2]						71
	PHANTOM® 240 SL	•							73
	PYTHON™	•							75
	QUASAR®	•							77
	SQUADRON® II	•	•	•				•	79
	HARVEST AID								
	ARMORY® 240	•	•	•	•	•	•	•	83
INSECT CONTROL	CORMORAN®							•	87
	SILENCER® 120 EC	•	•	•	•	•		•	89
	SOMBRERO® 600 FS				•				89
	ZIVATA™	•	•	•	•	•		•	93
DISEASE CONTROL	BUMPER® 432 EC				•				97
	SORATEL™			•	•	•			106
	TOPNOTCH™	•	•						109

[1] Non-low linolenic acid varieties.
[2] Imidazolinone-resistant lentils.

GRASSY WEED CONTROL

		Barnyard Grass	Green Foxtail	Persian Darnel	Proso Millet	Quack Grass	Volunteer Cereals	Volunteer Corn	Wild Oats	Yellow Foxtail	Desiccant
REGISTERED HERBICIDES	ARMORY® 240										●
	ARROW® 240 EC	●	●	●	●	●[1]	●	●	●	●	
	ARROW ALL IN®	●	●	●	●	●[1]	●	●	●	●	
	BISON® 400 L	●	●	●					●	●	
	BRAZEN™ II		●	●	●				●	●	
	DAVAI® 80 SL	●	●	●			●		●		
	DAVAI A PLUS™	●	●	●	●	●[1]	●	●	●	●	
	EMPHASIS™ + Glyphosate		●	●		●	●		●		
	INVOLVE® 50 WDG + Glyphosate		●	●			●		●		
	LADDER ALL IN®	●	●	●					●	●	
	LEOPARD®	●	●		●	●[1]	●	●	●	●	
	PHANTOM® 240 SL		●						●		
	PRIORITY® + Glyphosate		●	●			●		●		
	PYTHON™	●	●[3]	●			●		●[3]	●	
	QUASAR®	●[2]	●[3]				●		●[3]	●	
	SQUADRON® II	●	●	●					●	●	

For a complete listing of grassy weeds controlled for each product please refer to the product label.

[1] Use highest rate listed for control.
[2] Suppression.
[3] Including Group 1 resistant biotypes.

For tank mixes with registered pest control products, the entirety of both labels, including Directions For Use, Precautions, Restrictions, Environmental Precautions, and Buffer Zones must be followed for each product. In cases where these requirements differ between the tank-mix partner labels, the most restrictive label must be followed.

QUICK REFERENCE

BROADLEAF WEED CONTROL

		American Nightshade	Annual Sow Thistle	Canada Thistle	Cleavers	Common Ragweed	Dandelion	Kochia	Lady's Thumb	Lamb's Quarters	Narrow-leaved Hawk's Beard	Perennial Sow Thistle	Redroot Pigweed	Russian Thistle	Shepherd's Purse	Smartweed	Stinkweed	Volunteer Canola	Wild Buckwheat	Wild Mustard	Desiccant
REGISTERED HERBICIDES	2,4-D ESTER 700		•			•		•	•[2]	•	•	•[5]		•	•	•[2]	•	•[1]	•[2]	•	
	ARMORY® 240																				•
	BADGE®	•		•[4]		•		•	•	•		•	•	•	•		•	•[1]	•	•	
	BROMOTRIL®	•				•		•	•	•				•			•			•	
	DAVAI® 80 SL				•[5]					•			•		•		•	•[6]	•[5]	•	
	DAVAI A PLUS™				•[5]					•			•		•		•	•[6]	•[5]	•	
	EMPHASIS™ + Glyphosate	•	•	•	•	•	•	•	•	•	•		•	•	•		•	•	•	•	
	ESTEEM®		•	•	•	•	•	•		•		•	•	•	•		•	•		•	
	FORCEFIGHTER® M	•		•[4]	•[7]			•[78]	•	•		•	•	•	•	•	•	•	•	•[7]	
	INVOLVE® 50 WDG + Glyphosate			•[5]	•	•	•	•[78]	•	•	•		•	•	•		•	•[9]	•	•	
	OUTSHINE®				•[7]	•		•[7]		•			•		•	•	•	•	•	•	
	MCPA ESTER 600		•	•[2]			•	•	•[2]			•[2]	•	•	•[2]	•[2]	•			•	
	PHANTOM® 240 SL				•								•		•	•	•	•[6]	•[5]	•	
	PRIORITY® + Glyphosate		•[5]		•	•	•		•	•	•	•[5]		•	•	•	•	•[1]	•	•	
	PYTHON™				•[5]					•[7]			•[7]		•		•	•	•	•	
	QUASAR®									•			•				•	•[56]	•[5]	•	
	RUSH® 24		•[5]	•[5]	•	•	•[9]	•[7]	•[9]	•	•[9]	•[5]	•[9]	•[9]	•		•	•[1]	•[9]	•	
	SQUADRON® II							•	•	•			•	•	•		•	•[3]	•	•	
	THRASHER®	•				•		•	•	•			•	•	•		•	•	•	•	
	TOPLINE®		•[5]		•	•				•		•[5]	•	•	•	•	•	•[1]	•	•	

For a complete listing of broadleaf weeds controlled for each product please refer to the product label.

[1] All types.
[2] Use highest rate listed for suppression.
[3] Triazine resistant biotypes.
[4] Top growth control.
[5] Suppression.
[6] Non-Clearfield® varieties.
[7] Including ALS resistant biotypes (Group 2).
[8] Including glyphosate-resistant biotypes (Group 9).
[9] Control with additional 2,4-D.

INSECT CONTROL

REGISTERED INSECTICIDES				
CORMORAN®	SILENCER® 120 EC	SOMBRERO® 600 FS	ZIVATA™	
•	•	•	•	Aphid
•	•		•	Army Worm
	•		•	Bertha Armyworm
	•		•	Cabbage Seedpod Weevil
•	•		•	Colorado Potato Beetle
	•		•	Corn Earworm
	•		•	Cutworm
•	•		•	Diamondback Moth
•	•		•	European Corn Borer
	•	•	•	Flea Beetle
	•		•	Grasshopper
•	•		•	Lygus Bug
	•		•	Wheat Midge
		•		Wireworm

For a complete listing of insects controlled for each product please refer to the product label.

DISEASE CONTROL

REGISTERED FUNGICIDES						
BUMPER® 432 EC	CUSTODIA®	ORIUS® 430 SC	SORADUO™	SORATEL™	TOPNOTCH™	
					•	Anthracnose
				•	•	Ascochyta Blight
•						Blackleg
•				•	•	Crown Rust
•				•		Eyespot
•				•		Frogeye Leaf Spot
		•[1]	•[1]	•[1]		Fusarium Head Blight
•	•	•		•	•	Leaf Rust
•						Northern Corn Leaf Blight
•		•				Powdery Mildew
				•	•	Sclerotinia Stem Rot/White Mould
•	•	•			•	Septoria Leaf Blotch/Spot
•	•	•				Stem Rust
•	•	•			•	Stripe Rust
•	•	•		•	•	Tan Spot

For a complete listing of diseases controlled for each product please refer to the product label.

[1]Suppression only.

“What does having access to the world’s largest library of actives mean for all of our customers? Innovation, more often.

Ambrely Ralph
Product Launch Manager

HERBICIDE

WEED CONTROL

HERBICIDE

HERBICIDE

HERBICIDE • PRE-SEED

GROUP 4

2,4-D ESTER 700

Provides reliable control of broadleaf weeds as a pre-seed option with no re-cropping restrictions when applied in the fall.

ACTIVE INGREDIENT

2,4-D Ester 660 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 200 – 600 ml/ac
- Acres Treated: 17 – 50 ac/jug; 200 – 600 ac/drum; 1,665 – 5,000 ac/tote

PACKAGING

- Case: 2 × 10 L jugs
- Bulk: 120 L drums
- Tote: 1,000 L

WATER VOLUME

- Ground: 12.5 – 50 L/ac (5 – 15 US gal/ac)
- Aerial: Minimum 12 L/ac (3 US gal/ac)

RAINFASTNESS

- 2 hours

REGISTERED CROPS

- Barley
- Field corn
- Rye (spring, fall)
- Wheat (spring, winter)

For more information on in-crop use, see page 43.

WEEDS CONTROLLED

Susceptible Weed	Timing	Rate
Annual sow thistle		Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 200 – 300 ml/ac Large weeds, dry or cold weather, heavy infestations: 300 ml/ac Resistance increases with age.
Bluebur	Before 4-leaf stage	
Burdock	Before 4-leaf stage	
Cocklebur, Daisy fleabane, False flax, False ragweed, Flixweed, Giant ragweed, Goat's beard, Kochia, Lamb's quarters, Mustards (except Dog and Tansy)		
Narrow-leaved hawk's beard	In fall, and at 1 – 2 leaf stage in spring	
Plantain, Prickly lettuce, Ragweeds, Redroot pigweed, Russian pigweed, Russian thistle, Shepherd's purse, Stinging nettle, Stinkweed, Sweet clover (seedling), Thyme-leaved spurge		
Volunteer canola[1]	1 – 4 leaf stage	
Wild radish, Wild (prairie) sunflower		

[1] All types.

2,4-D ESTER 700

Harder-to-Control Weed	Timing	Rate
Curled dock	Before 4-leaf stage	Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 400 – 500 ml/ac Large weeds, dry or cold weather, heavy infestations: 500 ml/ac Resistance increases with age.
Dog mustard, Field pepper-grass, Flixweed (if treated before bolting in spring), Groundsel, Hairy galinsoga, Hawkweed, Heal-all		
Knotweed	Before 4-leaf stage	
Narrow-leaved hawk's beard (if treated before bolting in spring), Oak-leaved goosefoot, Pineappleweed, Prostrate pigweed, Purslane, Sheep sorrel, Tansy mustard, Tumble pigweed, Velvetleaf		
Volunteer canola[1]	4 – 6 leaf stage	

[1] All types.

Very-Hard-to-Control Weed	Timing	Rate
Biennial wormwood, Blue lettuce, Bull thistle, Burdock, Buttercup, Canada thistle, Chicory, Curled dock, Dandelion, Field bindweed, Field chickweed[2], Field horsetail[2], Gumweed, Hedge bindweed		Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 400 – 500 ml/ac Large weeds, dry or cold weather, heavy infestations: 500 ml/ac Resistance increases with age.
Hempnettle[2]	If treated before 4-leaf stage	
Hoary cress, Lady's thumb[2], Leafy spurge, Mouse-eared chickweed[2], Perennial sow thistle, Russian knapweed, Scentless mayweed, Smartweed[2], Tartary buckwheat, Teasel, Volunteer sunflower, Wild buckwheat[2]		
Yellow rocket	Controlled with applications before 4-leaf stage	

[2] Use highest listed rate for suppression.

HOW IT WORKS

Systemic activity hinders plant cell growth in newly forming stems and leaves promoting uncontrolled, unsustainable growth, causing stem curl-over, leaf withering and eventual plant death.

HERBICIDE

2,4-D ESTER 700

CROP STAGING

Crop	Timing	Rate
Barley, Rye, Wheat (spring, winter)	Pre-seed or pre-emergent	200 – 500 ml/ac
Fall rye, Winter wheat	Pre-seed or pre-emergent	200 – 500 ml/ac

REGISTERED AND SUPPORTED TANK MIXES

- BROMOTRIL®
- Gylphosate
- INVOLVE® 50 WDG

MIXING INSTRUCTIONS

1. ½ fill the tank with clean water.
2. Add the required amount of ADAMA 2,4-D ESTER 700 and agitate thoroughly.
3. Add any tank-mix partners.
4. Fill the tank and agitate again before use.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVAL

90 days

GRAZING RESTRICTIONS

30 days

STORAGE

- May be stored at any temperature.
- Shake well before using.

QUICK TIPS

Avoid spray drift to any off target vegetation. Coarse sprays are less likely to drift. Do not spray during periods of high winds.

HERBICIDE • PRE-SEED

GROUP 6

BROMOTRIL®

Tough broadleaf weed control with tank-mix flexibility and excellent crop safety.

ACTIVE INGREDIENT

Bromoxynil Octanoate Ester 240 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 490 ml/ac
- Acres Treated: 20 ac/jug

PACKAGING

- Case: 2 × 9.7 L jugs

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

30 minutes

REGISTERED CROPS

Crop	Stage
Barley, Oats, Wheat	Pre-seed burn-off with glyphosate

For more information on in-crop use, see page 48.

WEEDS CONTROLLED

Seedling up to 4-leaf stage:

- American nightshade
- Bluebur
- Cocklebur
- Common ragweed
- Cow cockle[1]
- Green smartweed
- Kochia[2]
- Lady's thumb
- Pale smartweed
- Pigweed[1]
- Russian thistle[2]
- Stinkweed[1]
- Velvetleaf[3]
- Wild mustard[1]

Seedling up to 8-leaf stage:

- Common buckwheat
- Common groundsel
- Lamb's quarters
- Tartary buckwheat
- Wild buckwheat

[1] In normal conditions, it will be controlled up to 4-leaf stage. Plants beyond this stage are unlikely to be controlled; the higher rate generally gives better results.
[2] Spray before plants are 2 inches high.
[3] Spray before plants are 3 inches high.

HERBICIDE

BROMOTRIL®

HOW IT WORKS

BROMOTRIL® is a contact herbicide which controls Group 2 and Group 9 resistant biotypes. Leaves will yellow in 2 – 4 days with complete control in 7 – 14 days.

REGISTERED AND SUPPORTED TANK MIXES

Pre-seed Herbicide:

· Glyphosate

MIXING INSTRUCTIONS

1. Fill spray tank ½ full with water.
2. Add recommended amount of tank-mix partner to the spray tank and agitate.
3. Add BROMOTRIL® (unless otherwise directed by label or tank-mix partner label)
4. Add the remaining amount of water while agitation continues.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVAL

30 days

GRAZING RESTRICTIONS

Do not graze or cut treated crops for forage until 30 days after application.

STORAGE

Do not freeze.

QUICK TIPS

Avoid spraying if temperatures are above 25° C. Leaf scorching may occur in corn and flax if applied during or after adverse growing conditions, such as cool and wet or hot (above 27° C) and humid weather. For best results, spray when weeds are in the seedling stage.

HERBICIDE • PRE-SEED

GROUP 6 & 14

EMPHASIS™

Pre-seed glyphosate partner that delivers multiple modes of action and fast burndown control of broadleaf and grasses including control of Group 2, 4, 5 and 9 resistant kochia and glyphosate-tolerant canola.

ACTIVE INGREDIENT

Carfentrazone-ethyl at 240 g/L as an EC = EMPHASIS™ A and bromoxynil octanoate ester at 240 g/L as an EC = BROMOTRIL® 240 EC

APPLICATION RATES AND ACRES TREATED

- Canola:
  - Rate: 15 ml/ac EMPHASIS™ A + 236 ml/ac BROMOTRIL® 240 EC
  - Acres Treated: 80 ac/case at the low rate of EMPHASIS™
- Wheat, Barley, Oats:
  - Rate: 30 ml/ac EMPHASIS™ A + 472 ml/ac BROMOTRIL® 240 EC
  - Acres Treated: 40 ac/case

PACKAGING

- Co-pack: 2 × 0.6 L EMPHASIS™ A + 2 × 9.7 L BROMOTRIL® 240 EC

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply by air.

RAINFASTNESS

6 hours

REGISTERED CROPS

Crop	Stage
Barley, Oats, Wheat, Canola	Spring pre-seed burn-off with glyphosate

HOW IT WORKS

EMPHASIS™ is a multi mode contact herbicide that controls broadleaf weeds including Group 2 and 9 resistant biotypes such as kochia. Within a few hours following application, the foliage of susceptible weeds shows signs of desiccation, and in subsequent days, necrosis and death of the plant occur.

MIXING INSTRUCTIONS

1. Fill spray tank with ½ of the volume of clean water needed.
2. With agitator running add the required amount of EMPHASIS™ A to spray tank.
3. Next add the required amount of BROMOTRIL® 240 EC.
4. Add more water, then add glyphosate.
5. Complete filling the tank to desired level.

CROP ROTATIONS

No restrictions.

STORAGE

Do not freeze.

EMPHASIS™

WEEDS CONTROLLED

When used as directed, the EMPHASIS™ co-pack will provide control of the listed weeds. See the individual labels of each tank-mix partner for specific rates and weed staging and always follow the directions for use of the most stringent label. Good spray coverage is essential for optimal weed control.

Weeds controlled by EMPHASIS™ alone	EMPHASIS™ A Rate	BROMOTRIL® Rate
Pre-plant scenario: Canola cropping systems		
80 ac/case	15 ml/ac	236 ml/ac
Black nightshade (up to 5 cm), Eastern black nightshade (up to 5 cm), Lamb's quarters (up to 7.5 cm), Morning glory (up to 3 leaves), Redroot pigweed, Tall waterhemp (up to 5 cm), Velvetleaf, Volunteer canola		
Weeds controlled when tank mixed with glyphosate plus weeds listed above by glyphosate rate*		
Cocklebur, Cow cockle, Green foxtail, Green smartweed, Lady's thumb, Smooth pigweed, Volunteer barley, Volunteer wheat, Wild mustard, Wild oats	0.5 REL/ac	180 g a.i./ac
Weeds listed above + Common ragweed, Wild buckwheat, Canada fleabane, Cleavers, Downy brome, Flixweed, Giant foxtail, Hempnettle, Persian darnel, Russian thistle, Stinkweed, Volunteer flax, Narrow-leaved hawk's beard	0.75 REL/ac	277 g a.i./ac
Weeds listed above + Annual bluegrass, Annual sow thistle, Canada thistle (rosette stage, summerfallow), Crabgrass, Dandelion (less than 15 cm), Kochia, Narrow-leaved vetch, Prickly lettuce, Quack grass (light to moderate infestations, 3 – 4 green leaves or more), Shepherd's purse	1 REL/ac	360 g a.i./ac
Pre-plant scenario: Wheat, barley and oat cropping systems		
40 ac/case	30 ml/ac	472 ml/ac
Weeds controlled by 80 ac EMPHASIS™ rate and weeds controlled at desired glyphosate rate plus: American nightshade, Bluebur, Carpetweed, Common buckwheat, Common groundsel, Common purslane, Common waterhemp, Hairy nightshade, Jimsonweed, Pale smartweed, Tansy mustard, Tartary buckwheat, Tumble pigweed		

*See glyphosate label for complete list of weeds controlled at each rate as the EMPHASIS™ + glyphosate combination controls ~70 weeds, not all are listed here.

QUICK TIPS

Wait at least 1 day after application before seeding. Allow adequate time for weed control. Avoid overnight storage of spray mixtures when possible. Check weather conditions in advance. Premixing EMPHASIS™ spray solutions in nurse tanks is not recommended. Use a water volume of at least 40 L/ac (10 US gal/ac) for adequate coverage.

HERBICIDE · PRE-SEED

GROUP 2

INVOLVE® 50 WDG

For control of dandelions and other broadleaf and grassy weeds in pre-seed applications (when tank mixed with glyphosate).

ACTIVE INGREDIENT

50% Tribenuron-methyl = WDG

APPLICATION RATES AND ACRES TREATED

- Rate: 6 g/ac
- Acres Treated: 80 ac/bottle; 800 ac/case

PACKAGING

- Case: 10 × 480 g bottles/case

WATER VOLUME

- Ground: 22 – 44 L/ac (5 – 12 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

1 hour

REGISTERED CROPS (PRE-SEED/POST-HARVEST)

- Canary seed
- Dry beans
- Faba beans
- Field peas
- Lupin
- Oats
- Soybean
- Spring barley
- Spring wheat
- Durum wheat
- Winter wheat

INVOLVE® 50 WDG may also be used as a summerfallow herbicide application.

For more information on in-crop use, see page 54.

WEEDS CONTROLLED BY INVOLVE® 50 WDG

- Annual sunflower
- Canada thistle (top growth control)
- Cow cockle
- Flixweed (fall rosettes and spring seedlings)
- Kochia (2 – 10 leaf)
- Lamb's quarters
- Narrow-leaved hawk's beard (fall rosettes and spring seedlings
- Prickly lettuce
- Redroot pigweed
- Russian thistle
- Shepherd's purse (fall rosettes and spring seedlings)
- Sweet clover
- Wild mustard
- Wild buckwheat[1]

[1] Suppression only.

HERBICIDE

INVOLVE® 50 WDG

WEEDS CONTROLLED BY INVOLVE® 50 WDG PLUS 0.5 REL/AC GLYPHOSATE

Broadleaf control:

- Canada fleabane
- Canada thistle[1]
- Common ragweed
- Cow cockle
- Dandelion
- Flixweed
- Hempnettle
- Kochia
- Lady's thumb
- Lamb's quarters
- Narrow-leaved hawk's beard
- Redroot pigweed
- Russian thistle
- Stinkweed
- Volunteer canola (including glyphosate-tolerant varieties)
- Volunteer flax
- White cockle[1]
- Wild mustard
- Wild buckwheat

Grass control:

- Downy brome
- Giant foxtail
- Green foxtail
- Persian darnel
- Volunteer barley
- Volunteer wheat
- Wild oats

[1] Suppression only.

HOW IT WORKS

INVOLVE® 50 WDG inhibits the production of the ALS enzyme, quickly causing plants to stop growing and become discoloured (red, yellow, purple) at the growing point and spreading to the entire plant within 1–3 weeks.

REGISTERED AND SUPPORTED TANK MIXES

- 2,4-D Ester
- AIM® EC
- Authority® 480
- Glyphosate

SUPPORTED ADJUVANTS

- Agral® 90 @ 0.35% v/v
- Not all tank mixes require an adjuvant, see label for details.

MIXING INSTRUCTIONS

1. Fill clean spray tank ½ full of clean water, start agitation.
2. Add the required amount of INVOLVE® 50 WDG and agitate until product is completely dispersed.
3. Add the required amount of glyphosate.
4. Add the required amount of surfactant, then fill tank with remaining water.
5. For repeat tank loads, empty the spray tank completely to avoid INVOLVE® 50 WDG from not dispersing or add to tank as a pre-slurry in 5–10 L of water.

HERBICIDE

INVOLVE® 50 WDG

CROP ROTATIONS

- 24 hours after application: spring wheat (including durum), winter wheat, spring barley, oats, canary seed or pulse crops (including dry bean, faba bean, field pea, lupin and soybean), alfalfa, red clover or alsike clover, smooth bromegrass, meadow bromegrass, timothy and creeping red fescue.
- 60 days after application: canola, flax and lentils.
- Post-harvest application in the fall may be seeded in the spring to: spring wheat (including durum), spring barley, oats, field corn, canary seed or pulse crops (including dry bean, faba bean, field pea, lupin and soybean), canola, flax, lentils, alfalfa, red clover or alsike clover, smooth bromegrass, meadow bromegrass, timothy and creeping red fescue or fields may be summerfallowed.

STORAGE

May be stored at any temperature.

QUICK TIPS

Degree of control and duration of effect depend on weed sensitivity, weed size, spray coverage and growing conditions. Activity of the herbicide mixture may be delayed by cold, dry conditions after application.

Injury to pulse crops may occur on coarse-textured soils, low in organic matter (less than 3%), or in fields with variable soils, gravelly areas, sandy areas or eroded knolls. Avoid planting pulse crops in soils containing more than 50% sand.

HERBICIDE • PRE-SEED

GROUP 2

PRIORITY®

The ideal glyphosate tank-mix partner for pre-seed burn-off with proven extended control of non-Clearfield® volunteer canola and winter annuals.

ACTIVE INGREDIENT

Florasulam 50 g/L = SC

APPLICATION RATES AND ACRES TREATED

- Rate: 40 ml/ac
- Acres Treated: 160 ac/jug

PACKAGING

- Case: 2 × 6.4 L jugs

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

30 minutes

APPLICATION TIMING

- Spring application: Prior to seeding, no later than 48 hours post seeding.
- Spring or fall application prior to cereals: Barley, Durum wheat, Oats, Spring wheat, Winter wheat.
- Chemfallow: Apply when weeds are actively growing in 1 – 4 leaf stage.
- Post-harvest: Apply from late September to freeze-up.

WEEDS CONTROLLED BY PRIORITY® + GLYPHOSATE AT 0.5 REL/AC

Controlled (2 – 4 leaf stage):

- Canada fleabane[2]
- Cleavers
- Common chickweed
- Common ragweed[2]
- Cow cockle
- Dandelion[3]
- Flixweed
- Hempnettle
- Lady's thumb
- Lamb's quarters
- Narrow-leaved hawk's beard[2]
- Redroot pigweed
- Russian thistle
- Shepherd's purse
- Smartweed
- Stinkweed
- Volunteer canola[4]
- Volunteer flax
- Volunteer wheat
- Wild buckwheat[5]
- Wild mustard

Grass weeds controlled:

- Downey brome
- Giant foxtail
- Green foxtail
- Persian darnel
- Volunteer barley
- Wild oats

WEEDS SUPPRESSED BY PRIORITY® + GLYPHOSATE[1]

- Kochia
- Annual sow thistle
- Perennial sow thistle[6]

[1] 180 g of active ingredient per acre.
[2] Less than 3 inches in height.
[3] Mature plants up to 12 inches in diameter, rosettes, and seedlings.
[4] Including all herbicide-tolerant canola varieties.
[5] Up to 5 leaves.
[6] Applications made at advanced stages will be less effective.

HERBICIDE

PRIORITY®

HOW IT WORKS

PRIORITY® inhibits the production of the ALS enzyme, quickly causing plants to stop growing and become discoloured (red, yellow, purple) at the growing point and spreading to the entire plant within 1 – 3 weeks.

REGISTERED AND SUPPORTED TANK MIXES

- ADAMA supports the use of any glyphosate salt (DMA, IPA or K+).

MIXING INSTRUCTIONS

1. Fill spray tank ½ full with water.
2. Start spray tank agitation.
3. Add the required amount of PRIORITY®.
4. Add tank-mix partner and continue to agitate.
5. Fill the tank with sufficient water to spray 40 L/ac of mixture.

Note: Do not add a surfactant to this tank mixture.

CROP ROTATIONS

- When applied prior to August 1: Barley, canola, oats, field peas and wheat (spring, durum, winter) can be seeded the following year.
- After August 1 and post-harvest: Barley, oats and wheat (spring, durum, winter) can be seeded the following year.

PRE-HARVEST INTERVAL

Do not harvest the treated crop within 60 days of application.

GRAZING RESTRICTIONS

Livestock may be grazed on treated crops 7 days following application.

STORAGE

- Do not freeze.
- Shake well before use.

QUICK TIPS

PRIORITY® can be mixed with the glyphosate of your choice. Remember not to mix different glyphosate salts (DMA, IPA or K+) together.

GROWING CONDITIONS

Marginal soil fertility, saline soils, extended periods of waterlogged-soil conditions, drought or seedling diseases can delay seedling development and emergence resulting in reduced crop stands. Fields with these conditions may show initial crop discoloration and be at greater risk of herbicide injury. In most cases crops will outgrow the symptoms but in severe situations especially where herbicide may have leached into the root zone may result in a reduced crop stand, yield, quality or delayed maturity may occur.

HERBICIDE • PRE-SEED

SAFACYN™

UNDER REVIEW

A new option for pre-seed burndown.

This product is currently under review for registration under the Pest Control Products Act. It cannot be manufactured, imported, distributed, or used in Canada at this time except for the purpose of conducting research under the Pest Control Products Regulations.

For more information visit: **adama.com/west-canada/en/new-products**

HERBICIDE • PRE-SEED

GROUP 5

SQUADRON® II

This broad-spectrum herbicide is registered for grassy and broadleaf weed control in a wide range of crops, most notably lentils, field peas and potatoes. It can work alone or in combination with recommended tank mixes.

ACTIVE INGREDIENT

75% Metribuzin = WDG

APPLICATION RATES AND ACRES TREATED

- Rate: 150 – 190 g/ac
- Acres Treated: 25 – 30 ac/bottle

PACKAGING

- 4 × 5 kg bottles

RAINFASTNESS

6 hours

REGISTERED CROPS

- Field peas
- Lentils
- Potatoes (including sprinkler irrigation)

For more information on in-crop use, see page 79.

WEEDS CONTROLLED

- Annual bluegrass[1]
- Ball mustard
- Barnyard grass[1]
- Bromegrass[1]
- Common chickweed[1]
- Common groundsel
- Corn spurry
- Cow cockle[1]
- Downy brome
- Flixweed
- Green foxtail[1]
- Green smartweed[1]
- Goose grass[1]
- Hempnettle[1]
- Kochia[1]
- Lady's thumb[1]
- Lamb's quarters[1]
- Night-flowering catchfly
- Persian darnel[1]
- Redroot pigweed[1]
- Russian thistle
- Shepherd's purse[1]
- Stinkweed[1]
- Tartary buckwheat
- Volunteer non-triazine-tolerant canola[1]
- Wild buckwheat[1]
- Wild mustard[1]
- Wild oats[1]
- Wormseed mustard
- Yellow foxtail[1]

[1] Pre-seed incorporated with Treflan™ EC or Rival® herbicide.

SQUADRON® II

HOW IT WORKS

Metribuzin inhibits the photosynthesis of grassy and broadleaf weeds. Used pre-emergent, susceptible weeds and crop seedlings emerge through treated soil, but 2 – 5 days later the weeds show chlorosis and necrosis. Plants treated post-emergence show chlorosis and necrosis between leaf veins, followed by wilting and death.

SOIL TYPES AND RESTRICTIONS

The recommended use rates of SQUADRON® II are dependent upon soil texture and the organic matter content of the soil being treated: coarse, medium and fine.

The following chart outlines the soil textures included in each of the soil texture groupings:

Coarse	Medium	Fine
Loamy sand, Sandy loam	Loam, Silt loam, Silt, Sandy clay loam, Sandy clay	Silty clay loam, Silty clay, Clay loam, Clay

- On variable soils with coarse sandy areas, some crop injury may occur on the sandy areas if the rate used is for the finer soil type.
- Sandy loam and silty clay loam soils are transitional soils and may be classified as medium-textured soils in some regions.
- Do not use this product on muck soils. If SQUADRON® II is applied to muck soils, subsequent crops may be injured.
- Do not use on coarse soils with less than 2% organic matter.

REGISTERED AND SUPPORTED TANK MIXES

Lentils and field peas (pre-seed incorporated):
- Treflan™ EC
- Dual II Magnum®
- Frontier®
- Linuron
- Trifluralin

Potatoes (pre-seed incorporated through irrigation system):
- Eptam® Liquid EC
- Glyphosate

SQUADRON® II

APPLICATION TIMING AND CROP STAGING

Crop	Crop Stage	Application Method
Field peas	Pea vines must be less than 6 inches long at time of post-emergent application.	Pre-seed incorporated (spring and fall)
Lentils	Vines must be less than 6 inches long or in 3–5 node stage.	Pre-seed incorporation (fall)
Potatoes	First use on a potato variety should be limited to a small test area to ensure varietal tolerance.	Pre-seed incorporated. Refer to the label for sprinkler irrigation application.

CROP ROTATIONS

Rotational crops such as non-triazine-tolerant canola (rapeseed) are sensitive to SQUADRON® II and may be injured if seeded in soil treated with SQUADRON® II during the year of application or the following crop year.

Fall seeded or cover crops such as wheat, oats and rye may be injured when seeded within the same season as the application of SQUADRON® II.

GRAZING

- Do not graze treated wheat or barley for 30 days after application.
- Do not graze peas, chickpeas or lentils for 70 days after application.

QUICK TIPS

New improved pan granulated formula which is the same concentration as our original formulation but with a new production method; it has a smaller particle size (averaging 4 microns) which disperses more rapidly and at rest stays suspended longer than the original metribuzin formulation (average particle size of 6 microns).

HERBICIDE • GRASSY

GROUP 1

ARROW® 240 EC

Get broad-spectrum grassy weed control in canola, pulses and other broadleaf and specialty crops.

ACTIVE INGREDIENT

Clethodim 240 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 50 – 150 ml/ac
- Acres Treated: 20 – 60 ac/case

PACKAGING

- Case: ARROW® 240 EC: 1 × 3 L jug; X-ACT® Adjuvant: 1 × 9 L jug

WATER VOLUME

- Ground: 20 – 90 L/ac (5 – 24 US gal/ac)
- Aerial: Do not apply by air.

RAINFASTNESS

1 hour

REGISTERED CROPS

- Alfalfa, seedling
- Beans
- Canola
- Chickpeas
- Flax
- Lentils
- Mustard
- Field peas
- Potatoes
- Soybeans
- Sunflowers

WEEDS CONTROLLED

Grass Species	Leaf Stage	Application Rates
Foxtail (green, yellow), Wild oats, Volunteer cereals (wheat, barley, oats)	2 – 4	50 ml/ac
Barnyard grass, Proso millet, Volunteer corn, Volunteer canarygrass, Witch grass	2 – 6	50 ml/ac
Barnyard grass, Crabgrass (smooth, large), Foxtail (green, yellow), Persian darnel, Proso millet, Quack grass suppression, Volunteer canarygrass, Volunteer cereals (wheat, barley, oats), Volunteer corn, Wild oats, Witch grass	2 – 6	75 ml/ac
Quack grass control	2 – 6	150 ml/ac

HOW IT WORKS

The active ingredient is translocated from the treated foliage to the growing points of the leaves, shoots and roots. Leaf foliage will first change from green to yellowish, then purplish and finally brown. Newest leaf of affected plant pulls out easily in 3 – 5 days. Time required for complete control is normally 7 – 21 days following treatment, depending on growing conditions and crop competition.

HERBICIDE

ARROW® 240 EC

CROP STAGING

- Most crops are tolerant at all stages, so target applications at the optimal weed stage.
- Always adhere to the pre-harvest interval for each crop.

REGISTERED AND SUPPORTED TANK MIXES

Herbicides:

- Canola: Lontrel™ XC or Muster®
- Clearfield® canola only: PHANTOM® 240 SL
- LibertyLink® canola only: Glufosinate
- Field peas: PHANTOM® 240 SL, DAVAI® 80 SL, Solo® ADV, QUASAR®
- Flax, including low linolenic acid varieties: BADGE® or Curtail® M
- Flax, not including low linolenic: Lontrel® or MCPA Ester 600
- Glyphosate-tolerant soybeans: Glyphosate
- Soybeans: DAVAI® 80 SL, QUASAR®

MIXING INSTRUCTIONS

1. Fill clean spray tank ½ full with water. Start agitation.
2. Add the correct amount of ARROW® 240 EC. Continue to agitate.
3. Add the correct amount of adjuvant X-ACT® along with the remaining amount of water necessary to fill the spray tank.
4. Continue to agitate or run the bypass system.
5. After any break in the spraying operation, agitate thoroughly before spraying again.
6. Do not allow the mixture to sit overnight.
7. If tank mixing, follow label directions for each tank-mix partner.

ADJUVANT RATE

- X-ACT® @ 0.5 – 1.0% v/v (Use a higher 1.0% v/v rate of X-ACT® for improved quack grass control)
- MSO @ 0.5% v/v
- NIS @ 0.25% v/v

CROP ROTATIONS

No restrictions when applied alone.

PRE-HARVEST INTERVALS

- Alfalfa: 30 days
- Canola, Beans, Flax (including low linolenic), Lentils, Potatoes, Chickpeas, Mustard: 60 days
- Soybeans, Field peas: 75 days
- Sunflowers: 72 days

GRAZING RESTRICTIONS

Do not cut treated crops for feed or graze until 60 days after application.

STORAGE

- May be stored at any temperature.
- Shake well before use.

QUICK TIPS

ARROW® 240 EC works best when applied to actively growing weeds. Regrowth of tillers may occur if applied to weeds under stress conditions.

HERBICIDE • GRASSY

GROUP 1

ARROW ALL IN®

Your best tank-mix partner for all glufosinate products. ARROW ALL IN® provides the convenience of a built-in surfactant and is available in bulk.

ACTIVE INGREDIENT

Clethodim 120 g/L EC

APPLICATION RATES AND ACRES TREATED

- Rate: 100 – 300 ml/ac
- Acres Treated: 20 – 60 ac/jug; 320 – 960 ac/drum

PACKAGING

- Case: 2 × 6 L jugs
- Bulk: 96 L drums

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply by air.

RAINFASTNESS

1 hour

REGISTERED CROPS

- Alfalfa, seedling
- Beans, dry (pinto, black, great northern, red, pink, navy)
- Canola
- Chickpeas (desi, kabuli)
- Field peas
- Flax
- Lentils
- Mustard (oriental, brown, yellow) (condiment type only)
- Potatoes
- Soybeans
- Sunflowers

WEEDS CONTROLLED

Grass Species	Leaf Stage	Application Rates
Foxtail (green, yellow), Wild oats, Volunteer cereals (wheat, barley, oats)	2 – 4	100 ml/ac
Barnyard grass, Fall panicum, Proso millet, Volunteer corn, Volunteer canarygrass, Witch grass	2 – 6	100 ml/ac
Barnyard grass, Crabgrass (smooth, large), Fall panicum, Foxtail (green, yellow), Persian darnel, Proso millet, Quack grass suppression, Volunteer canarygrass, Volunteer cereals (wheat, barley, oats), Volunteer corn, Wild oats, Witch grass	2 – 6	150 ml/ac
Quack grass control	2 – 6	300 ml/ac

HOW IT WORKS

The active ingredient is translocated from the treated foliage to the growing points of the leaves, shoots and roots. Leaf foliage will first change from green to yellowish, then purplish and finally brown. Newest leaf of affected plant pulls out easily in 3 – 5 days. Time required for complete control is normally 7 – 21 days following treatment, depending on growing conditions and crop competition.

HERBICIDE

ARROW ALL IN®

CROP STAGING

- Most crops are tolerant at all stages, so target applications at the optimal weed stage.
- Always adhere to the pre-harvest interval for each crop.

REGISTERED AND SUPPORTED TANK MIXES

- Flax: BADGE® (including low-linolenic varieties); MCPA Ester 600 (does not include low-linolenic varieties); Lontrel™ XC (does not include low-linolenic varieties); Curtail® M (including low-linolenic varieties)
- Canola: Lontrel™ XC; Muster®; PHANTOM® 240 SL or Pursuit® (Clearfield® canola only); Glufosinate (LibertyLink® canola varieties)
- Field peas: PHANTOM® 240 SL or Pursuit®, DAVAI® 80 SL, QUASAR®
- Soybeans (glyphosate-tolerant): Glyphosate, DAVAI® 80 SL, PHANTOM® 240 SL or Pursuit®; QUASAR®

MIXING INSTRUCTIONS

1. Fill clean tank ½ full with water and turn agitation on.
2. Add the required amount of tank-mix partner.
3. Add ARROW ALL IN® and agitate.
4. Optional: For use of ARROW ALL IN® alone (not in a tank mixture), add the correct amount of adjuvant.
5. Fill remainder of tank with water and continue agitating.
6. Agitate thoroughly after prolonged pauses.

*When mixing with glufosinate, first add ARROW ALL IN®, followed by glufosinate.

ADJUVANT RATE

An optional additional adjuvant may be used under circumstances of heavy weed pressure or when environmental conditions (e.g., drought) are not ideal for weed control.

- 30% phosphate ester surfactant @ 0.5% v/v
- Methylated seed oil @ 0.5% v/v
- Non-ionic surfactant @ 0.25% v/v

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVALS

- Alfalfa (seedling): 30 days
- Canola, Chickpeas (desi, kabuli), Dry beans (pinto, black, great northern, red, pink, navy), Flax (including low-linolenic acid varieties), Lentils, Mustard (oriental, brown, yellow) (condiment type only), Potatoes: 60 days
- Field peas, Soybeans: 75 days
- Sunflowers: 72 days

GRAZING RESTRICTIONS

Do not cut treated crops for feed or graze until 60 days after application.

STORAGE

Do not freeze.

QUICK TIPS

Most effective control is achieved when application is made prior to tillering when annual grasses are small and actively growing.

HERBICIDE • GRASSY

GROUP 1

BISON® 400 L

Get a wide window of application and excellent control of Persian darnel, wild oats and other grassy weeds with one of the most tank-mix flexible graminicides.

ACTIVE INGREDIENT

Tralkoxydim 400 g/L = SC

APPLICATION RATES AND ACRES TREATED

- Rate: 200 ml/ac
- Acres Treated: 40 ac/case

PACKAGING

- Case: BISON® 400 L: 1 × 8 L jug; Addit® Adjuvant: 1 × 8 L jug

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 12 – 18 L/ac (3 – 5 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

Field crops:

- Barley
- Rye (spring, winter)
- Triticale
- Wheat (spring, durum, winter)

Cereal crops underseeded to forage legumes:

- Alfalfa
- Birdsfoot trefoil
- Clovers
- Sainfoin

WEEDS CONTROLLED

Weed	Stage
Wild oats, Volunteer oats	1 – 6 leaf
Green foxtail, Yellow foxtail	1 – 5 leaf
Barnyard grass, Persian darnel	1 – 4 leaf

HOW IT WORKS

A systemic post-emergent herbicide that translocates the active ingredient to the growing point. Yellowing of the growing point in 1 – 3 weeks. The newest leaf pulls out easily in 3 – 5 days.

CROP STAGING

2-leaf to just before flag leaf emergence. Always read the label for tank-mixing instructions and additional restrictions.

HERBICIDE

BISON® 400 L

REGISTERED AND SUPPORTED TANK MIXES

Do not apply any broadleaf herbicide tank mixes to underseeded forage legumes.

Herbicides:

- 2,4-D Ester 700
- BADGE®
- BROMOTRIL®
- Curtail® M
- Estaprop® XT
- ESTEEM®
- Infinity®
- Infinity® FX
- Lontrel™ XC
- MCPA Ester 600
- Pixxaro™
- Prominex™
- RUSH® 24
- THRASHER®
- Trophy®

Insecticides:

- Decis®
- SILENCER® 120 EC
- ZIVATA™

Fungicides:

- BUMPER® 432 EC

MIXING INSTRUCTIONS

1. Begin to fill spray tank or premix tank with clean water, and engage agitator.
2. Agitation must be continued throughout the entire mixing and spraying procedure.
3. When the spray tank or premix tank is ¾ full of water, add BISON® 400 L. If more than 1 case of BISON® 400 L is to be used, add the BISON® 400 L from all cases prior to adding tank-mixed products or Addit® Adjuvant.
4. If tank mixing, add the recommended product(s) next.
5. Add Addit® Adjuvant, and continue to fill tank to desired level with water.

ADJUVANT RATE

Apply @ 0.5% v/v,adjust accordingly if reducing water volume.

CROP ROTATIONS

All major crops the year after treatment.

PRE-HARVEST INTERVAL

60 days

GRAZING RESTRICTIONS

- Immature cereal crops may be grazed or cut for hay 16 days after treatment.
- Mature straw may be fed to livestock.
- Do not feed or graze underseeded forage crops in the year of treatment.

STORAGE

- Do not freeze.
- Shake well before use.

QUICK TIPS

For optimal crop safety, spray in warm weather with moist soil. Avoid stressful growing conditions and avoid applying within 2 – 3 days of temperatures at 4° C or below.

HERBICIDE • GRASSY

GROUP 1

BRAZEN™ II

One of the most trusted and widely used graminicides for grassy weed control in spring wheat and barley with great tank-mix flexibility.

ACTIVE INGREDIENT

Pinoxaden 100 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 160 – 240 ml/ac
- Acres Treated: 40 – 60 ac/case; 320 – 485 ac/drum

PACKAGING

- Case: BRAZEN™ II: 1 × 9.7 L jug; Cohere™ Adjuvant: 1 × 11.3 L jug
- Bulk: BRAZEN™ II: 77.6 L drums; Cohere™ Adjuvant: 90.4 L drum

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 12 L/ac (3 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

- Barley
- Spring wheat

WEEDS CONTROLLED

- Green foxtail
- Persian darnel
- Proso millet
- Volunteer canary seed
- Volunteer oats
- Wild oats
- Yellow foxtail

HOW IT WORKS

BRAZEN™ II is absorbed by the leaves and is rapidly translocated to the growing points of leaves and stems. Thorough coverage of the plants is essential for consistent control. Actively growing susceptible grasses stop growing within 48 hours of treatment. Depending on species, growing conditions and crop competition, leaves and growing points turn yellow within 1 – 3 weeks after application. Further colour changes and loss of vigour will be observed, followed by a browning and control 3 – 5 weeks after application.

CROP STAGING

Crops/Weeds	Growth Stage
Barley, Spring wheat	1 leaf to flag leaf stage
Barnyard Grass, Green and yellow foxtail, Persian darnel, Proso millet, Volunteer canary seed, Volunteer oats, Wild oats	1 – 6 leaf, prior to 4th tiller

BRAZEN™ II

REGISTERED AND SUPPORTED TANK MIXES[1]

Herbicides:

- BADGE®
- Barricade® II
- BROMOTRIL®
- Cirpreme™ XC
- Curtail® M[2]
- ESTEEM®
- Exhilarate™
- FORCEFIGHTER® M
- Infinity®[2]
- Infinity® FX
- MCPA Ester 600[2]
- MCPA Amine (assume 500 series)
- OUTSHINE®
- Pixxaro™
- Pulsar®
- Refine® SG
- TOPLINE®
- Travallas®
- Trophy®[2]

Fungicides:

- BUMPER® 432 EC
- TOPNOTCH™

[1] Always consult the label of the broadleaf herbicide prior to use.
[2] For control of common ragweed and suppression of round-leaved mallow.

MIXING INSTRUCTIONS

1. Clean spray tank and ½ fill with clean water. Start agitation or bypass system.
2. If a broadleaf herbicide is to be used, add the product first prior to adding BRAZEN™ II and agitate for 2 – 3 minutes.
3. Add correct amount of BRAZEN™ II.
4. Agitate for 2 – 3 minutes.
5. Add correct amount of Cohere™ Adjuvant.
6. Agitate for 1 – 2 minutes before adding remainder of water and then maintain constant agitation.
7. After any break in spraying operations, agitate thoroughly before spraying again.
8. Use the spray suspension as soon as it is prepared.

ADJUVANT RATE

283 ml/ac; adjuvant co-pack

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVALS

- Grain, Straw: 60 days
- Hay: 30 days

GRAZING RESTRICTIONS

7 days

STORAGE

If frozen, allow product to thaw and agitate thoroughly prior to use.

QUICK TIPS

Apply to actively growing weeds for best results. An early application will maximize crop yields by reducing weed competition. Weeds emerging after application of BRAZEN™ II will not be controlled.

HERBICIDE • GRASSY

GROUP 1

LADDER ALL IN®

Trusted graminicide with a built-in surfactant for wheat.
Spend less time mixing and more time on the field.

ACTIVE INGREDIENT

Clodinafop-propargyl 80 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 283 – 356 ml/ac
- Acres Treated: 15 – 20 ac/jug; 255 – 320 ac/drum

PACKAGING

- Case: 2 × 5.66 L jugs
- Bulk: 90.6 L drums

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 12 L/ac (3 US gal/ac)

RAINFASTNESS

30 minutes

REGISTERED CROPS

- Wheat (spring, durum)

WEEDS CONTROLLED

Weed	Stage
Barnyard grass	1 – 5 leaf stage on main stem
Foxtail (green, yellow)	1 – 5 leaf stage on main stem
Persian darnel*	1 – 5 leaf stage on main stem
Voluntary canary seed	1 – 6 leaf stage on main stem
Volunteer oats (tame)	3 – 6 leaf stage on main stem
Wild oats	1 – 6 leaf stage on main stem

*Use higher rates when targeting Persian darnel.

HOW IT WORKS

LADDER ALL IN® is absorbed by the leaves and is rapidly translocated to the growing points of leaves and stems. Yellowing in 1 – 3 weeks. Complete control in 3 – 5 weeks after application.

CROP STAGING

Prior to emergence of 4th tiller.

HERBICIDE

LADDER ALL IN®

REGISTERED AND SUPPORTED TANK MIXES

Herbicides:
- 2,4-D amine
- Ally®
- BADGE®
- Barricade® II
- BROMOTRIL®
- Curtail® M
- Dicamba
- Dichlorprop-DX
- Estaprop® XT
- ESTEEM®
- FORCEFIGHTER® M
- Infinity®
- Infinity® FX
- Lontrel™ XC
- MCPA amine
- MCPA Ester 600
- MCPA sodium salt 300
- Mecoprop-P
- OUTSHINE®[1]
- Pixxaro™
- Pulsar®
- Refine® SG
- Retain®SG
- RUSH® 24
- Target®
- THRASHER®
- Travallas®
- Trophy®

Insecticides:
- Decis®
- SILENCER® 120 EC
- ZIVATA™

Fungicides:
- BUMPER® 432 EC

[1] Normal weed pressure use with high rate of LADDER ALL IN® low rate only with low populations and early application.

MIXING INSTRUCTIONS

1. Clean spray tank and ½ fill with clean water. Start agitation or bypass system.
2. If a broadleaf herbicide, insecticide or fungicide is to be used, add the product FIRST prior to adding LADDER ALL IN® and agitate for 2 – 3 minutes.
3. Add correct amount of LADDER ALL IN®. Agitate for 3 – 5 minutes before adding remainder of water and then maintain constant agitation.
4. After any break in spraying operations, agitate thoroughly before spraying again.
5. Use the spray suspension as soon as it is prepared.
6. If an oil film starts to build up in the tank, drain tank and then clean with a detergent.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVAL

60 days

GRAZING RESTRICTIONS

Observe a minimum of 3 days before grazing livestock on treated crops.

STORAGE

May be stored at any temperature.

QUICK TIPS

Avoid application when heavy rain is forecasted. Use higher application rate when targeting Persian darnel or in cases of heavy grassy weed infestation. LADDER ALL IN® contains an internal adjuvant; do not add an external surfactant.

HERBICIDE • GRASSY

GROUP 1

LEOPARD®

ADAMA's graminicide for hard-to-control clumping grass and volunteer cereals in canola, pulses, dry beans, flax, soybeans and forage crops.

ACTIVE INGREDIENT

Quizalofop-P-ethyl 100 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 150 – 290 ml/ac; standard rate 195 ml/ac
- Acres Treated: 30 – 50 ac/jug; standard 40 ac/jug

PACKAGING

- Case: 2 × 7.8 L jugs

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: 10 L/ac (2.5 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

- Alfalfa, seed
- Beans (dry & snap)
- Canola
- Chickpeas
- Peas (field & processing)
- Flax
- Hemp (grown for fibre, seed & oil)
- Lentils
- Mustard (oriental, yellow & brown)
- Soybeans

WEEDS CONTROLLED

Check label as weed stage controlled by LEOPARD® varies.

- Barnyard grass
- Downy brome
- Foxtail barley
- Green Foxtail
- Japanese brome
- Proso millet
- Quack grass (suppression at lower rates, control at higher rates)
- Volunteer cereals (wheat, barley, oats)
- Volunteer corn
- Wild oats
- Yellow foxtail

HOW IT WORKS

LEOPARD® is a selective postemergence herbicide for the control of annual and perennial grasses. LEOPARD® is a systemic herbicide which is rapidly absorbed and readily translocated for the treated foliage to the root systems and growing points of the plant. Treated plants show a reduction in growth and a loss of competitiveness. An early yellowing and browning of the younger plant tissues is followed by a progressive collapse of the remaining foliage. These symptoms will generally be observed in one to three weeks depending on the grass species treated and the environmental conditions. This product does not control sedges or broadleaf weeds.

CROP STAGING

- Most crops are tolerant at all stages, so target applications at the optimal weed stage.
- Always adhere to the pre-harvest interval for each crop.

LEOPARD®

REGISTERED AND SUPPORTED TANK MIXES

- Ally®
- Basagran®
- DAVAI® 80 SL
- Glufosinate
- Glyphosate
- PHANTOM® 240 SL
- PYTHON™
- QUASAR®

MIXING INSTRUCTIONS

1. Thoroughly clean the sprayer by flushing the system with water containing detergent.
2. Fill clean spray tank ½ full with water. Start agitation.
3. If tank mixing LEOPARD® with another pesticide, add tank-mix partner followed by adjuvant.
4. Ensure that the herbicide is completely mixed before proceeding to the next step.
5. Add the rest of the required water to the tank. Mix well before applying to the crop.

On repeat tank loads, ensure that the amount of spray solution left in the tank from the previous load is less than 10% of volume about to be mixed. Do not mix, load or clean spray equipment where there is a potential to contaminate wells or aquatic systems.

When mixing with glufosinate: Glufosinate + LEOPARD® + Surfactant
When mixing with glyphosate: Glyphosate + LEOPARD® + Surfactant

ADJUVANT RATES

LEOPARD® is not packaged with but requires an adjuvant such as:

- Merge® @ 0.5 – 1.0% v/v
- LI 700® @ 0.25 – 0.5% v/v
- Liberate™ @ 0.5% v/v

Or other non-ionic or methylated seed oil adjuvants

CROP ROTATIONS

No restrictions

PRE-HARVEST INTERVAL

- Faba beans, Red & Alsike clover, Beans (dry & snap): 30 days
- Canola: 64 days
- Lentils, Peas & Small red beans: 65 days
- Industrial hemp: 73 days
- Soybeans: 80 days
- Flax: 82 days
- Chickpeas: 85 days

GRAZING RESTRICTIONS

Do not cut treated crops for hay.

STORAGE

Do not freeze.

QUICK TIPS

LEOPARD® is safe on the crop at all stages, rates are dependent on weed stages.

Apply to wild oats before tillering for best results.

Use the higher adjuvant rate when targeting quack grass or wild oats, or when conditions are not conducive to good growth.

HERBICIDE • CEREAL BROADLEAF

GROUP 4

2,4-D ESTER 700

Enhanced tank-mix partner for hard-to-control broadleaf weeds in wheat, barley, rye and other crops.

ACTIVE INGREDIENT

2,4-D Ester 660 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 200 – 600 ml/ac
- Acres Treated: 17 – 50 ac/jug; 200 – 600 ac/drum; 1,665 – 5,000 ac/tote

PACKAGING

- Case: 2 × 10 L jugs
- Bulk: 120 L drums
- Tote: 1,000 L

WATER VOLUME

- Ground: 12.5 – 50 L/ac (5 – 15 US gal/ac)
- Aerial: Minimum 12 L/ac (3 US gal/ac)

RAINFASTNESS

- 2 hours

REGISTERED CROPS

- Barley
- Field corn
- Rye (spring, fall)
- Wheat (spring, winter)

For more information on pre-seed use, see page 15.

WEEDS CONTROLLED

Susceptible Weed	Timing	Rate
Annual sow thistle		Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 200 – 300 ml/ac Large weeds, dry or cold weather, heavy infestations: 300 ml/ac Resistance increases with age.
Bluebur	Before 4-leaf stage	
Burdock	Before 4-leaf stage	
Cocklebur, Daisy fleabane, False flax, False ragweed, Flixweed, Giant ragweed, Goat's beard, Kochia, Lamb's quarters, Mustards (except Dog and Tansy)		
Narrow-leaved hawk's beard	In fall, and at 1 – 2 leaf stage in spring	
Plantain, Prickly lettuce, Ragweeds, Redroot pigweed, Russian pigweed, Russian thistle, Shepherd's purse, Stinging nettle, Stinkweed, Sweet clover (seedling), Thyme-leaved spurge		
Volunteer canola[1]	1 – 4 leaf stage	
Wild radish, Wild (prairie) sunflower		

[1] All types.

2,4-D ESTER 700

Harder-to-Control Weed	Timing	Rate
Curled dock	Before 4-leaf stage	Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 400 – 500 ml/ac Large weeds, dry or cold weather, heavy infestations: 500 ml/ac Resistance increases with age.
Dog mustard, Field pepper-grass, Flixweed (if treated before bolting in spring), Groundsel, Hairy galinsoga, Hawkweed, Heal-all		
Knotweed	Before 4-leaf stage	
Narrow-leaved hawk's beard (if treated before bolting in spring), Oak-leaved goosefoot, Pineappleweed, Prostrate pigweed, Purslane, Sheep sorrel, Tansy mustard, Tumble pigweed, Velvetleaf		
Volunteer canola[1]	4 – 6 leaf stage	

[1] All types.

Very-Hard-to-Control Weed	Timing	Rate
Biennial wormwood, Blue lettuce, Bull thistle, Burdock, Buttercup, Canada thistle, Chicory, Curled dock, Dandelion, Field bindweed, Field chickweed[2], Field horsetail[2], Gumweed, Hedge bindweed		Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 400 – 500 ml/ac Large weeds, dry or cold weather, heavy infestations: 500 ml/ac Resistance increases with age.
Hempnettle[2]	If treated before 4-leaf stage	
Hoary cress, Lady's thumb[2], Leafy spurge, Mouse-eared chickweed[2], Perennial sow thistle, Russian knapweed, Scentless mayweed, Smartweed[2], Tartary buckwheat, Teasel, Volunteer sunflower, Wild buckwheat[2]		
Yellow rocket	Controlled with applications before 4-leaf stage	

[2] Use highest listed rate for suppression.

HOW IT WORKS

Systemic activity hinders plant cell growth in newly forming stems and leaves promoting uncontrolled, unsustainable growth, causing stem curl-over, leaf withering and eventual plant death.

HERBICIDE

2,4-D ESTER 700

CROP STAGING

Crop	Timing	Rate
Barley, Rye, Wheat (spring, winter)	4 leaf to flag leaf	Up to 500 ml/ac
Winter wheat, Fall rye	In spring, from full tillering to shot blade stage. Do not apply during and after flag leaf stage. Do not apply to seedling cereals in fall.	Up to 300 ml/ac
Field corn	Before corn is 6 inches tall or before the 6-leaf stage. Application at later stages will damage corn. If applying at later stage, use a shielded spray, keep spray off corn foliage. Do not apply within 2 weeks of silking and tasseling.	Up to 300 ml/ac
Established grasses for forage and seed production	In spring, up to shot blade of grasses or in fall after harvest. Application during flower or pollination development will reduce seed yield.	Up to 300 ml/ac (for seed production) Up to 600 ml/ac (hay and pasture crops)

REGISTERED AND SUPPORTED TANK MIXES

- Barricade® II
- BISON® 400 L
- BROMOTRIL®
- BUMPER® 432 EC
- INVOLVE® 50 WDG
- Traxos®

MIXING INSTRUCTIONS

1. ½ fill the tank with clean water.
2. Add the required amount of ADAMA 2,4-D Ester 700 and agitate thoroughly.
3. Add any tank-mix partners.
4. Fill the tank and agitate again before use.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVAL

90 days

GRAZING RESTRICTIONS

30 days

STORAGE

May be stored at any temperature. Shake well before using.

QUICK TIPS

Avoid spray drift to any off target vegetation. Coarse sprays are less likely to drift. Do not spray during periods of high winds.

HERBICIDE • CEREAL BROADLEAF

GROUP 4 & 6

BADGE®

Multi-mode of action tank-mix partner for cereals, flax and corn.

ACTIVE INGREDIENT

Bromoxynil 225 g/L and MCPA Ester 225 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 500 ml/ac
- Acres Treated: 20 ac/jug; 240 ac/drum; 900 ac/tote

PACKAGING

- Case: 2 × 10 L jugs
- Bulk: 120 L drums
- Tote: 450 L

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac) in cereals and flax; 80 – 120 L/ac (20 – 30 US gal/ac) in corn; 60 L/ac (15 US gal/ac) in forages
- Aerial: 8 – 20 L/ac (2 – 5 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

Field crops:

- Barley
- Canary seed
- Corn
- Fall rye
- Flax
- Oats
- Seedling grasses
- Timothy (established for seed production)
- Wheat (spring, winter, durum)

WEEDS CONTROLLED

- American nightshade
- Ball mustard
- Bluebur
- Canada thistle[1]
- Cocklebur
- Common buckwheat
- Common groundsel
- Common ragweed
- Cow cockle[2]
- Flixweed
- Green smartweed
- Kochia[3]
- Lady's thumb
- Lamb's quarters
- Night-flowering catchfly
- Pale smartweed
- Perennial sow thistle[1]
- Redroot pigweed
- Russian thistle[3]
- Scentless chamomile[4]
- Shepherd's purse
- Stinkweed
- Tartary buckwheat
- Velvetleaf[5]
- Volunteer canola (all types)
- Volunteer sunflower
- Wild buckwheat
- Wild mustard
- Wild tomato
- Wormseed mustard

[1] Top growth control.
[2] Up to 4-leaf stage.
[3] Spray before plants are 2 inches high.
[4] Spring annual only.
[5] Spray before plants are 3 inches high.

HOW IT WORKS

A combination of systemic and contact activity with weeds yellowing within 2 – 4 days and exhibiting abnormal growth (twisting and cupping of leaves) in 2 – 10 days.

HERBICIDE

BADGE®

CROP STAGING

Crop	Stage
Barley, Oats, Spring wheat, Durum	2 leaf to early flag
Canary seed	3 – 5 leaf
Corn	4 – 6 leaf
Fall rye	When growth commences in spring to early flag leaf.
Flax	2 inches to early bud stage. Best tolerance occurs when flax is 2 – 4 inches tall.
Seedling grasses	2 – 4 leaf
Timothy (established for seed production)	Prior to shot blade in the seed production year.
Winter wheat	2 – 4 leaf stage in the fall or after growth resumes up to early flag leaf.

REGISTERED AND SUPPORTED TANK MIXES

- Corn: Atrazine
- Flax: ARROW® 240 EC, ARROW ALL IN® or Poast®
- Oats: MCPA Ester 600
- Spring wheat and barley: Ally®, MCPA Ester 600, Refine® SG or BISON® 400 L
- Spring wheat only: LADDER ALL IN®, Everest® 3.0 or Traxos®
- Winter wheat: Refine® SG, Everest® 3.0 or MCPA Ester 600

MIXING INSTRUCTIONS

1. Fill clean spray tank ½ full with water.
2. Add the required amount of BADGE® and agitate thoroughly.
3. Fill the tank and agitate again before use.
4. If tank mixing with a grassy weed herbicide, read both labels and follow the more stringent directions for tank mixing.

CROP ROTATIONS

No re-cropping restrictions the year after treatment.

PRE-HARVEST INTERVAL

Flax: 60 days

STORAGE

Do not freeze.

GRAZING RESTRICTIONS

Do not graze treated grain or established timothy crops or cut for feed within 30 days of application.

QUICK TIPS

BADGE® herbicide is well known for being gentle on the crop.
Avoid spraying if temperatures are above 25° C.

HERBICIDE • CEREAL BROADLEAF

GROUP 6

BROMOTRIL®

Tough broadleaf weed control with tank-mix flexibility and excellent crop safety in cereals, corn and select forages.

ACTIVE INGREDIENT

Bromoxynil Octanoate Ester 240 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 490 – 570 ml/ac
- Acres Treated: 17 – 20 ac/jug; 200 – 240 ac/drum

PACKAGING

- Case: 2 × 9.7 L jugs
- Bulk: 116.4 L drums

WATER VOLUME

- Ground: 20 – 80 L/ac (5 – 20 US gal/ac)
- Aerial: 8 – 16 L/ac (3 – 5 US gal/ac) wheat and barley only

RAINFASTNESS

30 minutes

REGISTERED CROPS

Crop	Crop Leaf Stage
Alfalfa (seedling)	2 – 6 trifoliate
Alfalfa (established)	Spring: before the crop begins to shield the weeds
Barley, Oats, Triticale, Wheat (spring, durum)	2 leaf to early flag
Winter wheat	Fall: 2 – 4 leaf Spring: first growth to early flag
Corn (field, sweet)	4 to 8 leaf (beyond 8 leaf requires drop pipes)
Fall rye	Spring: from first growth to early flag
Flax	2 – 4 inches in height
Forage millet, Sorghum	4 leaf to 8 inches
Seedling grasses	2 – 4 leaf (year of establishment only)

For more information on pre-seed use, see page 18.

WEEDS CONTROLLED

Seedling up to 4-leaf stage:

- American nightshade
- Bluebur
- Cocklebur
- Common ragweed
- Cow cockle[1]
- Green smartweed
- Kochia[2]
- Lady's thumb
- Pale smartweed
- Pigweed[1]
- Russian thistle[2]
- Stinkweed[1]
- Velvetleaf[3]
- Wild mustard[1]

Seedling up to 8-leaf stage:

- Common buckwheat
- Common groundsel
- Lamb's quarters
- Tartary buckwheat
- Wild buckwheat

[1] In normal conditions, it will be controlled up to 4-leaf stage. Plants beyond this stage are unlikely to be controlled; the higher rate generally gives better results.
[2] Spray before plants are 2 inches high.
[3] Spray before plants are 3 inches high.

HERBICIDE

BROMOTRIL®

HOW IT WORKS

BROMOTRIL® is a contact herbicide which controls Group 2 and Group 9 resistant biotypes. Leaves will yellow in 2 – 4 days with complete control in 7 – 14 days.

SUPPORTED POST-EMERGENT TANK MIXES

Herbicides:

- Spring wheat: 2,4-D Ester, LADDER ALL IN®, MCPA Ester 600, BISON® 400 L, Traxos®
- Winter wheat: 2,4-D Ester, MCPA Ester 600, BISON® 400 L, Traxos®
- Barley: 2,4-D Ester, MCPA Ester 600, BISON® 400 L
- Oats: MCPA Ester 600
- Corn: Accent™, Atrazine, Banvel®(Dicamba), Ultim®
- Fall rye: MCPA Ester 600
- Flax: MCPA Ester 600 or MCPA-K
- Canary seed: MCPA Ester 600
- Seedling grasses: MCPA Ester 600

Fungicides:

- BUMPER® 432 EC

MIXING INSTRUCTIONS

1. Fill spray tank ½ full with water.
2. Add required amount of BROMOTRIL®. Begin agitation.
3. If tank mixing, add any tank-mix partners to the spray tank first, agitate and then add BROMOTRIL® (unless otherwise directed by the BROMOTRIL® and tank-mix partner label).
4. Add the remaining amount of water while agitation continues.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVAL

30 days

GRAZING RESTRICTIONS

- Do not use treated crops for grazing of livestock or green feed until 30 days after application.
- Do not cut treated crops for forage until 30 days after application.

STORAGE

Do not freeze.

QUICK TIPS

Avoid spraying if temperatures are above 25° C. Leaf scorching may occur in corn and flax if applied during or after adverse growing conditions, such as cool and wet or hot (above 27° C) and humid weather. For best results, spray when weeds are in the seedling stage.

HERBICIDE · CEREAL BROADLEAF

GROUP 4

ESTEEM®

Superior control of hard to control broadleaf weeds like thistle, cleavers and kochia in barley, spring wheat and durum.

ACTIVE INGREDIENT

Fluroxypyr 180 g/L, MCPA 2 EH Ester 600 g/L = EC
Clopyralid 360 g/L = SL

APPLICATION RATES AND ACRES TREATED

- Rate:
  - Low: 240 ml/ac Fluroxypyr; 280 ml/ac MCPA Ester 600; 84 ml/ac Clopyralid
  - High: 320 ml/ac Fluroxypyr; 365 ml/ac MCPA Ester 600; 111 ml/ac Clopyralid
- Acres Treated: 30 – 40 ac/case

PACKAGING

- Case: Fluroxypyr 180: 1 × 9.6 L jug; MCPA Ester 600: 1 × 11.01 L jug; Clopyralid 360: 1 × 3.32 L jug

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 12 – 20 L/ac (3 – 5 US gal/ac)

RAINFASTNESS

4 hours

REGISTERED CROPS

- Barley
- Wheat (spring, durum)

WEEDS CONTROLLED

Low rate of 40 ac/case will control:

- Annual sunflowers
- Burdock
- Canada thistle (low infestations)
- Cleavers
- Cocklebur
- Field horsetail (top growth)
- Flax
- Flixweed
- Lamb's quarters
- Plantain (top growth)
- Prickly lettuce
- Ragweeds
- Shepherd's purse
- Stinkweed
- Stork's bill
- Vetch
- Volunteer kochia
- Volunteer sunflowers
- Wild buckwheat
- Wild mustard
- Wild radish

High rate of 30 ac/case will control:

- Annual sow thistle
- Canada thistle (medium to high infestations, season long control)
- Chickweed
- Common groundsel
- Dandelions
- Hempnettle
- Perennial sow thistle (season long control)
- Redroot pigweed
- Roundleaf mallow
- Russian pigweed
- Tartary buckwheat
- Scentless chamomile
- Smartweed
- Volunteer canola

⚠ Always read and follow pesticide label directions.

HERBICIDE

ESTEEM®

HOW IT WORKS

The components of ESTEEM® move within the plant to control exposed and underground plant tissues. It mimics naturally occurring plant hormones which control weeds by disrupting normal plant growth patterns. Symptoms of effect include epinasty (twisting of the stems) and swollen nodes.

CROP STAGING

3-leaf stage to just before flag emergence

REGISTERED AND SUPPORTED TANK MIXES

- Assert® 300 SC
- BISON® 400 L
- BRAZEN™ II
- BroadBand®
- LADDER ALL IN®
- Puma® Advance
- Traxos®
- Varro®
- Simplicity™
- Simplicity™ GoDRI™

MIXING INSTRUCTIONS

1. ½ fill the tank with clean water and agitate during the entire mixing process.
2. Add any tank-mix partners that are a dry formulation.
3. Add the required amount of grassy weed tank-mix partner (always refer to product label to determine correct order).
4. Add the required amount of MCPA Ester 600 and fluroxypyr.
5. Add the required amount of ADAMA clopyralid.
6. Add any required adjuvant or surfactants.
7. Fill remaining tank with water.

CROP ROTATIONS

Barley, canola, flax, forage grasses, mustard, oats, rye and wheat can be seeded the following year.

If rotating to peas or soybeans, a rainfall of 140 mm (5.5 inches) between herbicide application and August 31, and an annual precipitation greater than 175 mm (6.9 inches) is required.

PRE-HARVEST INTERVAL

Do not harvest treated crop within 60 days of application.

GRAZING RESTRICTIONS

Do not graze livestock within 7 days of application.

STORAGE

Do not freeze.

HERBICIDE • CEREAL BROADLEAF

GROUP 4 & 6

FORCEFIGHTER® M

3 active ingredients and 2 modes of action to fight herbicide resistance and provide post-emergent control of broadleaf weeds in wheat and barley.

ACTIVE INGREDIENT

Fluroxypyr 180 g/L, Bromoxynil 225 g/L, MCPA 2 EH Ester 225 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 500 ml/ac Bromoxynil/MCPA Ester 600; 240 ml/ac Fluroxypyr
- Acres Treated: 40 ac/case; 480 ac/pallet

PACKAGING

- Case: Bromoxynil/MCPA Ester 600: 2 × 10 L jugs; Fluroxypyr: 1 × 9.6 L jug
- Bulk: Bromoxynil/MCPA Ester 600: 120 L drums; Fluroxypyr: 115.2 L drum

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

1 hour

REGISTERED CROPS

- Barley
- Wheat (spring, durum)

WEEDS CONTROLLED

- American nightshade
- Bluebur
- Burdock
- Canada thistle[1]
- Chickweed
- Cleavers (including Group 2 resistant biotypes)
- Cocklebur
- Common groundsel
- Cow cockle
- Flixweed
- Hempnettle
- Kochia (including Group 2 and glyphosate-resistant biotypes)
- Lady's thumb
- Lamb's quarters
- Night-flowering catchfly
- Perennial sow thistle
- Redroot pigweed
- Russian thistle
- Shepherd's purse
- Smartweed
- Stinkweed
- Vetch
- Volunteer canola
- Volunteer sunflower
- Wild buckwheat
- Wild mustard (including Group 2 resistant biotypes)
- Wild radish
- Wormseed mustard

[1] Top growth control.

HOW IT WORKS

Quickly causes plants to stop growing. Convenient co-pack controls a wide range of weeds, including glyphosate-resistant and Group 2 resistant kochia, Group 2 resistant cleavers and Group 2 resistant wild mustard.

HERBICIDE

FORCEFIGHTER® M

CROP STAGING

Crop	Stage
Wheat	2 leaf to early flag
Barley	2 leaf to early flag

REGISTERED AND SUPPORTED TANK MIXES

Wheat:
- BISON® 400 L
- BRAZEN™ II
- Everest® 3.0
- LADDER ALL IN®
- Simplicity™ GoDRI™
- Refine® SG
- Traxos®

Durum:
- Everest® 3.0
- LADDER ALL IN®
- Simplicity™ GoDRI™
- Traxos®

Barley:
- BISON® 400 L
- BRAZEN™ II

MIXING INSTRUCTIONS

1. Fill spray tank ½ full with water.
2. Add the required amount of FORCEFIGHTER® M and agitate thoroughly.
3. Add any tank-mix partners.
4. Fill the tank and agitate again before use.

CROP ROTATIONS

Can be seeded the following year to barley, canola, flax, forage grasses, lentils, mustard, field peas, rye and wheat.

PRE-HARVEST INTERVAL

60 days

GRAZING RESTRICTIONS

30 days

STORAGE

Do not freeze.

QUICK TIPS

FORCEFIGHTER® M's activity is influenced by weather conditions. The optimal temperature is 12 – 24° C. Avoid application 3 days before or after frost. Do not apply before the 2-leaf stage as crop injury may occur. Use 38 L/ac application volume when there is a heavy canopy or when most weeds are at an advanced stage of growth.

HERBICIDE · CEREAL BROADLEAF

GROUP 2

INVOLVE® 50 WDG

Well known ideal tank-mix partner for enhanced control of broadleaf weeds in barley and wheat.

ACTIVE INGREDIENT

50% Tribenuron-methyl = WDG

APPLICATION RATES AND ACRES TREATED

- Rate: 6 g/ac
- Acres Treated: 80 ac/bottle; 800 ac/case

PACKAGING

- Case: 10 × 480 g bottles/case

WATER VOLUME

- Ground: 22 – 44 L/ac (5 – 12 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

1 hour

REGISTERED CROPS (IN-CROP/POST-EMERGENT)

- Spring barley
- Wheat (spring, durum)

INVOLVE® 50 WDG may also be used as a summerfallow herbicide application.

For more information on pre-seed use, see page 22.

WEEDS CONTROLLED BY INVOLVE® 50 WDG

- Annual sunflower
- Canada thistle (top growth control)
- Cow cockle
- Flixweed (fall rosettes and spring seedlings)
- Kochia (2 – 10 leaf)
- Lamb's quarters
- Narrow-leaved hawk's beard (fall rosettes and spring seedlings)
- Prickly lettuce
- Redroot pigweed
- Russian thistle
- Shepherd's purse (fall rosettes and spring seedlings)
- Sweet clover
- Wild mustard
- Wild buckwheat[1]

[1] Suppression only.

HOW IT WORKS

INVOLVE® 50 WDG inhibits the production of the ALS enzyme, quickly causing plants to stop growing and become discoloured (red, yellow, purple) at the growing point and spreading to the entire plant within 1 – 3 weeks.

REGISTERED AND SUPPORTED TANK MIXES

- 2,4-D Ester
- AIM® EC
- Assert® 300 SC
- Authority® 480
- Dicamba
- Everest® 3.0
- Puma® Advance

HERBICIDE

INVOLVE® 50 WDG

SUPPORTED ADJUVANTS

- Agral® 90 @ 0.35% v/v
- Not all tank mixes require an adjuvant, see label for details.

MIXING INSTRUCTIONS

1. Fill clean spray tank ½ full of clean water, start agitation.
2. Add the required amount of INVOLVE® 50 WDG and agitate until product is completely dispersed.
3. Add the required amount of tank-mix partner.
4. Add the required amount of surfactant, then fill tank with remaining water.
5. For repeat tank loads, empty the spray tank completely to avoid INVOLVE® 50 WDG from not dispersing or add to tank as a pre-slurry in 5–10 L of water.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVAL

30 days

ADJUVANT RATE

Agral® 90 @ 0.35% v/v

STORAGE

May be stored at any temperature.

QUICK TIPS

Degree of control and duration of effect depend on weed sensitivity, weed size, spray coverage and growing conditions. Activity of the herbicide mixture may be delayed by cold, dry conditions after application.

Injury to pulse crops may occur on coarse-textured soils, low in organic matter (less than 3%), or in fields with variable soils, gravelly areas, sandy areas or eroded knolls. Avoid planting pulse crops in soils containing more than 50% sand.

HERBICIDE • CEREAL BROADLEAF

GROUP 4

MCPA ESTER 600

Provides reliable post-emergent control of broadleaf weeds and great tank-mix flexibility in wheat, barley, rye, oats, flax, pasture and non-cropland areas.

ACTIVE INGREDIENT

MCPA Ester 600 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 285 – 425 ml/ac
- Acres Treated: 24 – 35 ac/jug; 270 – 404 ac/drum

PACKAGING

- Case: 2 × 10 L jugs
- Bulk: 115 L drums

WATER VOLUME

- Ground: 40 – 75 L/ac or 10 – 20 US gal/ac
- Aerial: 10 L/ac or 3 US gal/ac (crop specific)

RAINFASTNESS

Avoid applying when rain is forecast.

REGISTERED CROPS

Crop	Timing*	Rate
Barley, Rye, Wheat (spring, durum)	From the 3-leaf expanded to the early flag-leaf stage. From milk stage to maturity.	Up to 425 ml/ac
Fall Rye, Winter Wheat	In spring, from full tillering to the shot blade stage. Do not apply during and after the flag-leaf stage. Do not apply to seedling winter cereals in the fall. GROUND APPLICATION ONLY.	Up to 425 ml/ac
Flax (non-low linolenic acid varieties)	When flax is between 5 cm in height to before bud stage. To minimize crop injury, spray at early growth stages, in the evening, and use higher water volumes.	Up to 285 ml/ac Caution: Early crop injury may be observed, but yield should not be affected.
Oats (not underseeded with legumes)	From the 1-leaf expanded to the early flag-leaf stage.	Up to 365 ml/ac

*Do not apply more than one treatment per year.

HERBICIDE

MCPA ESTER 600

WEEDS CONTROLLED

Susceptible weeds[2]:

- Annual sunflower
- Burdock[4]
- Cocklebur
- Flixweed[1]
- Lamb's quarters
- Mustards (except Dog and Tansy)
- Plantain
- Prickly lettuce
- Ragweeds
- Russian pigweed[1]
- Shepherd's purse[1]
- Stinkweed
- Vetch
- Wild radish

Harder-to-control weeds[3]:

- Annual sow thistle
- Biennial wormwood
- Blue lettuce[1]
- Bluebur
- Canada thistle[1]
- Corn spurry[1]
- Curled dock
- Dandelion
- Dog mustard
- Field bindweed[1]
- Field horsetail[1]
- Field pepper grass
- Goat's beard
- Gumweed
- Hairy galinsoga
- Hedge bindweed[1]
- Hempnettle[4]
- Hoary cress[1]
- Kochia
- Lady's thumb[1]
- Leafy spurge[1]
- Oak-leaved goosefoot
- Perennial sow thistle[1]
- Purslane
- Redroot pigweed
- Russian knapweed[1]
- Russian thistle
- Smartweed[1]
- Sweet clover[5]
- Tansy mustard
- Tartary buckwheat

[1] Use highest listed rate
[2] Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 235 ml/ac Large weeds, dry or cold weather, heavy infestations: 365 ml/ac. Susceptibility decreases with age.
[3] Small seedlings (2 – 4 leaf), growing rapidly, good growing conditions: 425 ml/ac Large weeds, dry or cold weather, heavy infestations: 610 ml/ac. Susceptibility decreases with age.
[4] Before 4-leaf stage
[5] Seedlings

HOW IT WORKS

Systemic post-emergence phenoxy herbicide that acts as a plant growth regulator to control broadleaf weeds by stimulating nucleic acid and protein synthesis, which impacts the cell division and respiration causing malformed leaves, stems and roots.

REGISTERED AND SUPPORTED TANK MIXES

Herbicides:

- BADGE®
- Barricade® II
- BISON® 400 L
- BRAZEN™ II
- BROMOTRIL®
- LADDER ALL IN®
- Travallas®

Fungicides:

- BUMPER® 432 EC

Insecticides:

- PYRINEX® 480 EC

MIXING INSTRUCTIONS

1. ½ fill the tank with clean water.
2. Add the required amount of ADAMA MCPA Ester 600 and agitate thoroughly.
3. Add any tank-mix partners.
4. Fill the tank and agitate again before use.

HERBICIDE

MCPA ESTER 600

CROP ROTATIONS
No restrictions.

PRE-HARVEST INTERVAL
7 days

GRAZING RESTRICTIONS
7 days

STORAGE
May be stored at any temperature.

QUICK TIPS

If product is exposed to temperatures below -20° C, it should be warmed to at least 5.0° C and mixed thoroughly before using.

Always read and follow registered product label instructions. It is an offence under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label.

HERBICIDE • CEREAL BROADLEAF

GROUP 2 & 4

OUTSHINE®

This herbicide gives you control of hard-to-kill annual broadleaf weeds in spring wheat, durum wheat, spring barley and oats.

ACTIVE INGREDIENT

- OUTSHINE® (2.5 g/L Florasulam + 100 g/L Fluroxypyr) = SC
- MCPA Ester 600 (600 g/L) = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 400 ml/ac OUTSHINE®; 235 ml/ac MCPA Ester 600
- Acres Treated: 40 ac/case

PACKAGING

- Case: OUTSHINE®: 2 × 8 L jugs; MCPA Ester 600: 1 × 9.33 L jug

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

2 hours

REGISTERED CROPS

- Barley
- Oats
- Wheat (spring, durum)

WEEDS CONTROLLED

- Annual sunflower
- Burdock
- Cleavers (including ALS-resistant biotypes)
- Cocklebur
- Common chickweed
- Flixweed
- Hempnettle (including ALS-resistant biotypes)
- Kochia (including ALS-resistant biotypes)
- Lamb's quarters
- Plantain
- Prickly lettuce
- Ragweed
- Redroot pigweed
- Russian pigweed
- Shepherd's purse
- Smartweed
- Stinkweed
- Stork's bill (suppression only)
- Vetch
- Volunteer canola (all varieties)
- Volunteer flax
- Wild buckwheat
- Wild mustard
- Wild radish

HOW IT WORKS

OUTSHINE®, applied early and thoroughly to the main flush of actively growing broadleaf weeds, quickly causes plants to stop growing, even if typical symptoms of dying weeds are not noticeable for 1–2 weeks after application.

CROP STAGING

2-leaf expanded to 6-leaf stage.

OUTSHINE®

REGISTERED AND SUPPORTED TANK MIXES

Barley:
- Assert® 300 SC
- BRAZEN™ II

Wheat (spring, durum):
- Assert® 300 SC
- BRAZEN™ II
- Everest® 3.0
- LADDER ALL IN®
- Sierra® 3.0
- Simplicity™ GoDRI™
- Traxos®
- Varro®

MIXING INSTRUCTIONS

1. Fill spray tank ½ full with water and begin agitation.
2. Add the required amount of OUTSHINE®.
3. Add the required amount of MCPA 2 EH Ester.
4. Continue filling the tank with sufficient water to spray 40 L/ac of mixture.
5. If tank mixing with a grassy weed herbicide, read both labels and follow the more stringent directions for tank mixing.

CROP ROTATIONS

- Can be seeded the following year to barley, canola, oats, peas, wheat, or fields to be summerfallowed.
- Do not use in successive years at the same site.

PRE-HARVEST INTERVAL

Do not harvest treated crop within 60 days of application.

GRAZING RESTRICTIONS

Do not graze livestock within 7 days of application.

STORAGE

- Do not freeze.
- Shake well before use.

QUICK TIPS

2 unique modes of action and 3 active ingredients provide resistance management and high performance.

HERBICIDE • CEREAL BROADLEAF

GROUP 4

RUSH® 24

Control a wide spectrum of broadleaf weeds like kochia, cleavers and wild buckwheat (including Group 2 resistant biotypes) in spring wheat, durum wheat and barley, with excellent grassy weed herbicide compatibility.

ACTIVE INGREDIENT

Fluroxypyr (180 g/L) = EC, 2,4-D Ester 700 (660 g/L) = EC

APPLICATION RATES AND ACRES TREATED

- Rate: Fluroxypyr 180: 240 ml/ac; 2,4-D Ester 700: 245 ml/ac
- Acres Treated: 40 ac/case; 480 ac/bulk co-pack

PACKAGING

- Case: Fluroxypyr 180: 1 × 9.6 L jug; 2,4-D Ester 700: 1 × 9.8 L jug
- Bulk: Fluroxypyr 180: 115.2 L drum; 2,4-D Ester 700: 117.6 L drum

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

2 hours

REGISTERED CROPS

- Barley
- Wheat (spring, durum)

WEEDS CONTROLLED

2 – 4 leaf stage unless otherwise noted:

- Annual Sunflower
- Bluebur
- Burdock
- Cleavers
- Cocklebur
- Field horsetail[1]
- Flixweed
- Goat's beard
- Hoary cress[1]
- Kochia[2]
- Lamb's quarters
- Plantain
- Prickly lettuce
- Ragweed
- Shepherd's purse
- Stinkweed
- Sweet clover
- Vetch
- Volunteer canola[3]
- Volunteer flax (½ – 5 inches)
- Wild buckwheat (1 – 6 leaf)
- Wild mustard
- Wild radish

For even tougher broadleaf weed control, add an additional 81 ml/ac (2 oz/ac) 2,4-D Ester:

- Blue lettuce[1]
- Dandelion[4]
- Docks
- Dog mustard
- Field bindweed[1]
- Field peppergrass
- Gumweed
- Russian thistle
- Smartweed
- Stork's bill (1 – 8 leaf)
- Hairy galinsoga
- Hedge bindweed
- Lady's thumb
- Leafy spurge[1]
- Narrow-leaved hawk's beard (1 – 2 leaf)
- Oak-leaved goosefoot
- Redroot pigweed
- Round-leaved mallow
- Tansy
- Tartary buckwheat
- Wild buckwheat (1 – 8 leaf)

WEEDS SUPPRESSED

- Annual sow thistle
- Canada thistle[1]
- Common chickweed (up to 3 inches)
- Hempnettle (2 – 6 leaf)
- Perennial sow thistle

[1] Top growth control only.
[2] Including biotypes resistant to Group 2 herbicides that inhibit the ALS enzyme.
[3] Including all herbicide-resistant canola varieties.
[4] Spring rosettes.

HERBICIDE

RUSH® 24

HOW IT WORKS

Group 4 herbicides disrupt normal plant growth, resulting in twisting and cupping of leaves, epinasty and death of susceptible plants in 2–10 days.

CROP STAGING

- 4-leaf to just prior to flag leaf emergence.

SUPPORTED TANK MIXES

Wheat only:
- Everest® 3.0
- LADDER ALL IN®
- Simplicity™ GoDRI™[1]
- Traxos®
- Varro®

Wheat and barley:
- Assert® 300 SC
- BISON® 400 L
- Puma® Advance

[1]Additional 2,4-D Ester is not recommended when mixing RUSH® 24 and Simplicity™.

MIXING INSTRUCTIONS

1. Fill the spray tank ½ full with water. With agitation running, add the required volume of fluroxypyr, followed by the required volume of 2,4-D Ester 700.
2. Fill tank with remaining water.
3. If tank mixing with a grassy weed herbicide, read both labels and follow the more stringent directions for tank mixing.

CROP ROTATIONS

The following crops may be grown 1 year after application:
- Barley
- Canola
- Flax
- Forage grass
- Lentils
- Mustard
- Oats
- Field peas
- Rye
- Wheat

PRE-HARVEST INTERVAL

60 days

STORAGE:

Do not freeze.

GRAZING RESTRICTIONS

- Do not feed or cut forage grasses for hay.
- Do not permit lactating dairy animals to graze cereal fields within 7 days of application. Do not harvest cereal crops for forage or cut hay within 30 days of application.
- Withdraw meat animals from treated fields at least 3 days before slaughter.

QUICK TIPS

Get optimal weed control by applying between temperatures of 12–24° C. Reduced activity will occur when temperatures are below 8° C or above 27° C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions.

HERBICIDE • CEREAL BROADLEAF

RUSH 24 ALL IN™

UNDER REVIEW

RUSH® 24 formulated, no longer a co-pack.

This product is currently under review for registration under the Pest Control Products Act. It cannot be manufactured, imported, distributed, or used in Canada at this time except for the purpose of conducting research under the Pest Control Products Regulations.

For more information visit: **adama.com/west-canada/en/new-products**

HERBICIDE · CEREAL BROADLEAF

GROUP 4 & 6

THRASHER®

Provides excellent dual modes of action for control of 26 tough broadleaf weeds (including Group 2 resistant kochia) in wheat and barley.

ACTIVE INGREDIENT

Bromoxynil Octanoic Ester 225 g/L
and 2,4-D 2 EH Ester 225 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 500 ml/ac
- Acres Treated: 20 ac/jug; 240 ac/drum; 2,000 ac/tote

PACKAGING

- Case: 2 × 10 L jug
- Bulk: 120 L drums
- Tote: 1,000 L

WATER VOLUME

- Ground: 20 – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 12 – 16 L/ac (3 – 4 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

- Barley
- Wheat (spring, durum)

WEEDS CONTROLLED (4-leaf stage unless otherwise noted)

- American nightshade
- Ball mustard
- Bluebur
- Cocklebur
- Common buckwheat (8 leaf)
- Common groundsel (8 leaf)
- Common ragweed
- Cow cockle
- Flixweed
- Green smartweed
- Kochia (2 inches high or 1 – 12 leaf)
- Lady's thumb
- Lamb's quarters (8 leaf)
- Night-flowering catchfly
- Pale smartweed
- Redroot pigweed
- Russian thistle (2 – 12 leaf)
- Shepherd's purse
- Stinkweed (8 leaf)
- Tartary buckwheat (8 leaf)
- Triazine-resistant pigweed
- Velvetleaf (3 inches high)
- Volunteer canola
- Volunteer sunflower
- Wild buckwheat (8 leaf)
- Wild mustard (8 leaf)

HOW IT WORKS

A combination of systemic and contact activity with weeds yellowing within 2 – 4 days and exhibiting abnormal growth (twisting and cupping of leaves) in 2 – 10 days.

CROP STAGING

4 leaf to early flag leaf.

THRASHER®

REGISTERED AND SUPPORTED TANK MIXES

Wheat (spring, durum) and barley:
- BISON® 400 L

Wheat (spring, durum) only:
- Everest® 3.0
- LADDER ALL IN®

MIXING INSTRUCTIONS

1. Fill the spray tank ½ full with water.
2. Add the required amount of THRASHER® and agitate thoroughly.
3. Fill the tank with remaining water and agitate again before use.
4. If tank mixing with a grassy weed herbicide, read both labels and follow the more stringent directions for tank mixing.

CROP ROTATIONS

No restrictions the year after application.

PRE-HARVEST INTERVAL

30 days

GRAZING RESTRICTIONS

- Do not permit livestock to graze fields within 30 days of application.
- Do not harvest, forage or cut for hay within 30 days of application.
- Withdraw meat animals from treated fields at least 3 days before slaughter.

STORAGE

- May be stored at any temperature.
- Shake well before using.

QUICK TIPS

For best results when there is a heavy crop canopy, or when the majority of the weeds are cow cockle, smartweed or pigweed, use higher water volumes. Spray when weeds are in the seedling stage.

Apply in good growing conditions. Application must be made before the crop canopy shields the weeds.

HERBICIDE • CEREAL BROADLEAF

GROUP 2 & 4

TOPLINE®

Gives you multiple modes of action and controls a wide spectrum of broadleaf weeds with excellent wild buckwheat, cleavers and chickweed control.

ACTIVE INGREDIENT

Florasulam 50 g/L = SC
MCPA 2-ethylhexyl Ester 600 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: Florasulam: 40 ml/ac; MCPA Ester 600: 230 ml/ac
- Acres Treated: 40 ac/case

PACKAGING

- Case: Florasulam: 1 × 1.6 L jug; MCPA Ester 600: 1 × 9.33 L jug

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

2 hours

REGISTERED CROPS

- Barley
- Oats
- Wheat (spring, durum)

WEEDS CONTROLLED

1 – 4 leaf stage:

- Ball mustard
- Burdock
- Common chickweed
- Cleavers
- Cow cockle
- Flixweed
- Hempnettle[1]
- Lamb's quarters
- Redroot pigweed
- Russian pigweed
- Prickly lettuce
- Ragweed
- Shepherd's purse
- Smartweed
- Stinkweed
- Sunflower (annual)
- Volunteer canola[2]
- Wild buckwheat
- Wild mustard

Suppressed:

- Annual sow thistle
- Canada thistle[1]
- Dandelion[1,3]
- Plantain[4]
- Perennial sow thistle
- Stork's bill[1]

[1] For heavy infestations, add 47 ml/ac of MCPA Ester 600 for improved control.
[2] Including all herbicide-resistant varieties.
[3] Seedlings and overwintered rosettes less than 6 inches.
[4] Top growth control only.

HERBICIDE

TOPLINE®

HOW IT WORKS

The Group 2 herbicide inhibits the production of the ALS enzyme in plants. This enzyme is essential for the production of certain amino acids required for plant growth. The Group 4 herbicide disrupts normal plant growth regulation, resulting in death of susceptible plants.

CROP STAGING

Expanded 3-leaf up to the 6-leaf stage.

SUPPORTED TANK MIXES

Wheat and barley:
- Assert® 300 SC
- BRAZEN™ II

Wheat only:
- Everest® 3.0
- LADDER ALL IN®
- Simplicity™ GoDRI™

MIXING INSTRUCTIONS

1. After filling the spray tank ½ full with water, and with agitation running, add the required amount of Florasulam 50 SC, followed by the required amount of MCPA 2 EH Ester 600.
2. Fill tank with remaining water.
3. If tank mixing with a grassy weed herbicide, read both labels and follow the more stringent directions for tank mixing.

CROP ROTATIONS

Wheat, barley, oats, canola and field peas may be grown the year following an application.

PRE-HARVEST INTERVAL

60 days

GRAZING RESTRICTIONS

- Do not cut for feed or hay or allow lactating dairy animals to graze treated crops or within 7 days of application.
- Withdraw meat animals from treated feed 3 days prior to marketing.

STORAGE

- May be stored at any temperature.
- Shake well before use.

QUICK TIPS

TOPLINE® is well suited to dark brown, black and grey soil zones where cleavers, hempnettle, wild buckwheat and volunteer canola are main concerns.

“I appreciate the opportunity to talk with my customers because every time I learn a little more about what they need. Listening is at the heart of everything we do.

Craig Olson
Area Business Manager, Southern Alberta

HERBICIDE • PULSE & SOYBEAN BROAD SPEC

GROUP 2

DAVAI® 80 SL

Proven broadleaf and grassy weed control in a convenient package that allows for flexible tank-mix options.

NOW REGISTERED ON IMI-TOLERANT LENTILS

ACTIVE INGREDIENT

Imazamox 80 g/L = SL

APPLICATION RATES AND ACRES TREATED

- Rate: 100 ml/ac
- Acres Treated: 80 ac/jug

PACKAGING

- Case: 2 × 8 L jugs

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

3 hours

REGISTERED CROPS

- Dry beans
- Field peas
- Imidazolinone-tolerant lentils
- Soybeans

WEEDS CONTROLLED

Broadleaf weeds: cotelydon to 4 leaf; Grasses: 1 – 4 true leaf:

- Barnyard grass
- Cleavers[1]
- Cow cockle
- Flixweed
- Green foxtail
- Green smartweed
- Japanese brome grass[1]
- Lamb's quarters
- Persian darnel
- Redroot pigweed
- Shepherd's purse
- Stinkweed
- Stork's bill
- Volunteer barley
- Volunteer canary seed
- Volunteer canola (non-Clearfield® varieties)
- Volunteer tame oats
- Volunteer wheat
- Wild buckwheat[1]
- Wild mustard
- Wild oats
- Yellow foxtail

[1]Suppression.

HOW IT WORKS

DAVAI® 80 SL is readily absorbed through both leaf and root uptake, and it is translocated in the plant to inhibit amino acid production and cell division. Plant growth is inhibited, and a few days after application, chlorosis and terminal bud injury become evident. Leaves and stems become yellow and purple, and root growth may be inhibited. Crop competition is quickly reduced, although complete plant death is relatively slow.

CROP STAGING

Crop	Stage
Dry beans, Soybeans	Emergence to 3 expanded trifoliate leaves
Field peas	1 – 6 true leaf
Imidazolinone-tolerant lentils	1 – 9 node

HERBICIDE

DAVAI® 80 SL

REGISTERED AND SUPPORTED TANK MIXES

- ARROW ALL IN®
- ARROW® 240 EC
- Basagran® Forté
- Broadloom®
- LEOPARD®
- PHANTOM® 240 SL

MIXING INSTRUCTIONS

1. Fill clean tank ½ to ¾ full of clean water and turn agitation on.
2. Add the required amount of DAVAI® 80 SL herbicide and continue to agitate.
3. If required, add the correct amount of tank-mix partner while agitating.
4. Add the required amount of adjuvant while agitating.
5. Continue agitating and fill the remainder of the spray tank with water.

ADJUVANT RATE

- Merge®, NORAC MSO, Hasten NT Ultra® or other methylated seed oil @ 0.50% v/v
- ADAMA Adjuvant 80, Agral® 90, Sentry™ @ 0.25% v/v

CROP ROTATIONS

- Barley
- Canary seed
- Canola
- Chickpeas
- Corn
- Field peas
- Flax
- Lentils
- Oats
- Soybeans
- Clearfield® sunflowers
- Wheat (spring, durum)

PRE-HARVEST INTERVALS

- Field peas: 60 days
- Dry beans: 75 days
- Imidazolinone-tolerant lentils: 60 days
- Soybeans: 85 days

GRAZING RESTRICTIONS

- Field peas: 30 days
- Imidazolinone-tolerant lentils: 20 days
- Do not graze all other treated crop.

STORAGE

Do not freeze.

QUICK TIPS

Cool weather conditions or drought will delay herbicidal activity and if prolonged, may result in poor weed control. Use of DAVAI® 80 SL herbicide in hot, humid weather may result in temporary leaf yellowing, leaf flecking, bronzing or burning. The crop usually outgrows this condition within 10 days. When weeds are stressed due to drought, flooding, hot or prolonged cool temperatures (15° C or less), control can be reduced or delayed since weeds are not actively growing. Weeds escapes or regrowth may occur under prolonged stress conditions or low fertility. Do not make applications to weeds stressed longer than 20 days due to lack of moisture, as unsatisfactory control can result.

See page 82 for additional re-cropping restrictions to consider for this product.

HERBICIDE • PULSE & SOYBEAN BROAD SPEC

NEW

GROUP 1 & 2

DAVAI A PLUS™

DAVAI® 80 SL conveniently packaged with ARROW ALL IN® the leading grass control product in pulses.

ACTIVE INGREDIENT

Imazamox 80 g/L = SL
Clethodim 120 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: ARROW ALL IN®: 150 ml/ac; DAVAI® 80 SL: 100 ml/ac
- Acres Treated: 40 ac/case

PACKAGING

- Case: DAVAI® 80 SL: 4 L jug; ARROW ALL IN®: 6 L jug

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

3 hours

REGISTERED CROPS

- Dry beans
- Field peas
- Imidazolinone-tolerant lentils
- Soybeans

WEEDS CONTROLLED

Broadleaf weeds: cotyledon – 4 leaf; Grasses: 1 – 4 true leaf:

- Barnyard grass
- Cleavers[1]
- Cow cockle
- Crabgrass (smooth, large)
- Fall panicum
- Flixweed
- Green foxtail
- Green smartweed
- Japanese brome grass[1]
- Lamb's quarters
- Persian darnel
- Proso millet
- Quack grass[1]
- Redroot pigweed
- Shepherd's purse
- Stinkweed
- Stork's bill
- Volunteer barley
- Volunteer canary grass
- Volunteer canary seed
- Volunteer canola (non-Clearfield® varieties)
- Volunteer cereals (barley, oats, wheat)
- Volunteer corn
- Wild buckwheat[1]
- Wild mustard
- Wild oats
- Witch grass
- Yellow foxtail

[1]Suppression.

HOW IT WORKS

DAVAI A PLUS™ combines 2 actives to tackle broadleaf and grassy weeds. See DAVAI® 80 SL and see ARROW ALL IN® for more information.

DAVAI A PLUS™

CROP STAGING

Crop	Stage
Dry beans, Soybeans	Emergence to 3 expanded trifoliate leaves
Field peas	1 – 6 true leaf
Imidazolinone-tolerant lentils	1 – 9 node

MIXING INSTRUCTIONS

1. Fill clean tank ½ to ¾ full of clean water and turn agitation on.
2. Add the required amount of ARROW ALL IN® herbicide and continue to agitate.
3. Add the required amount of DAVAI® 80 SL herbicide and continue to agitate.
4. If required, add the correct amount of tank-mix partner while agitating.
5. Add the required amount of adjuvant while agitating.
6. Continue agitating and fill the remainder of the spray tank with water.

ADJVANT RATE

No adjuvant required.

CROP ROTATIONS

Barley, Canary seed, Canola, Chickpeas, Corn, Field peas, Flax, Lentils, Oats, Soybeans, Clearfield® sunflowers, Wheat (spring, durum)

There are several factors that effect the re-cropping following an imidazolinone application. These include in order of importance:

1. **Product:** With imazethapyr for example being more persistent than imazamox.
2. **Soil moisture:** Need > 125 mm (5″) of rain between herbicide application and August 31 in the year of application.
3. **Organic matter:** Brown soil zone (< 3% organic matter) are more susceptible to carry over crop injury the year after application.
4. **Rate:** As affected by the crop – soil residues are the issue.
5. **Soil pH:** Persists longer in a pH < 5.5 – 6.

Depending on the following crop the level of sensitivity will vary. Please contact your local ADAMA ABM for more details.

PRE-HARVEST INTERVALS

- Dry beans: 75 days
- Field peas: 60 days
- Imidazolinone-tolerant lentils: 60 days
- Soybeans: 85 days

GRAZING RESTRICTION

- Field peas: 30 days
- Imidazolinone-tolerant lentils: 20 days
- Do not graze all other treated crop.

STORAGE

Do not freeze.

HERBICIDE • PULSE & SOYBEAN BROAD SPEC

GROUP 2

PHANTOM® 240 SL

Get early post-emergent broadleaf weed control in field peas, dry beans, alfalfa and soybean crops with extended control of select shallow germinating weeds to help minimize early season weed competition.

ACTIVE INGREDIENT

Imazethapyr 240 g/L = SL

APPLICATION RATES AND ACRES TREATED

- Rate: 85 ml/ac
- Acres Treated: 40 ac/jug

PACKAGING

- Case: 2 × 3.3 L jugs

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

3 hours

REGISTERED CROPS

- Alfalfa, established (for seed)
- Alfalfa, seedling (forage, seed)
- Dry beans (pinto, pink, red)
- Field peas
- Soybeans (Manitoba only)

WEEDS CONTROLLED

Check label as weeds controlled vary by crop.

Broadleaf weeds up to and including 4-leaf stage:

- Chickweed
- Cleavers
- Hempnettle
- Redroot pigweed
- Shepherd's purse
- Smartweed
- Stinkweed
- Volunteer canola (non-Clearfield®)
- Wild buckwheat[1]
- Wild mustard

Grassy weeds:

- Green foxtail
- Wild oats[2]

[1] Suppression only.
[2] Apply between the 2- and 4-leaf stage.

HOW IT WORKS

PHANTOM® 240 SL is a selective herbicide that can be applied as an early pre-seed, pre-seed incorporated, pre-emergent or post-emergent treatment in various crops. The application method depends upon the crop, anticipated weed spectrum and the preference of the applicator. With early pre-seed and pre-emergent treatments, susceptible weeds emerge, are present as stunted plants and then die. When PHANTOM® 240 SL is applied post-emergence, absorption may occur through both the roots and foliage. Susceptible weeds stop growing and eventually die.

HERBICIDE

PHANTOM® 240 SL

CROP STAGING

For best results, spray when weeds are in the seedling stage.

Crop	Crop Stage	Soil Zone
Alfalfa, established (seed production only)[1]	Apply before alfalfa reaches 12 inches.	N/A
Alfalfa, seedling (forage or seed)	After the 1st trifoliate leaf.	Black, grey wooded and irrigated brown soils.
Dry beans (pinto, pink, red)	Up to and including the 2nd trifoliate leaf.	Black, grey wooded and irrigated brown soils.
Field peas	Up to the 6th trifoliate leaf.	Black and grey wooded soils.
Soybeans (Manitoba only)	1–3 leaf	N/A

[1] Do not use in the last year of seed production.

REGISTERED AND SUPPORTED TANK MIXES

- ARROW® 240 EC
- ARROW ALL IN®
- Basagran® Forté
- Broadloom®
- DAVAI® 80 SL
- Glyphosate
- Linuron
- LEOPARD®
- SQUADRON® II

MIXING INSTRUCTIONS

1. Fill clean spray tank ½ to ¾ full of clean water and turn agitation on.
2. Add the required amount of PHANTOM® 240 SL and continue agitation.
3. Add the required amount of non-ionic surfactant and continue agitation.
4. Fill with remaining water.

ADJUVANT RATE

NIS @ 0.25% v/v

CROP ROTATIONS

1 year after application:

- Alfalfa
- Clearfield® canola
- Field peas
- Lentils
- Soybeans
- Spring barley
- Spring wheat

2 years after application:

- Non-Clearfield® canola
- Durum

PRE-HARVEST INTERVALS

- Dry beans, Soybeans: 100 days
- Field peas: 60 days

STORAGE

Do not freeze.

GRAZING RESTRICTIONS

- Do not graze or harvest seedling alfalfa within 14 days of treatment.
- Do not graze or harvest field peas for feed within 30 days of treatment.
- Do not graze other treated crops or cut for feed prior to crop maturity.

QUICK TIPS

PHANTOM® 240 SL requires moisture for activation. Soil-applied PHANTOM® 240 SL requires sufficient water within 7–10 days of application to moisten the soil to a depth of 2 inches for activation. If adequate moisture is not received within 7–10 days of application, perform a shallow inter-row cultivation 2–3 inches deep using a roller or S-tine cultivator to control escaped weeds until the field receives adequate moisture. For early pre-plant applications (soybeans only), more than 7–10 days may elapse before the receipt of adequate precipitation to activate the herbicide and reduce the risk of weed escapes.

See page 82 for additional re-cropping restrictions to consider for this product.

HERBICIDE • PULSE & SOYBEAN BROAD SPEC

GROUP 2 & 6

PYTHON™

PYTHON™ combines 2 powerful actives providing resistance management and broad spectrum weed control.

ACTIVE INGREDIENT

Imazamox 80 g/L and Bentazon 480 g/L = SL

APPLICATION RATES AND ACRES TREATED

- Rate: PYTHON™ A: 101 ml/ac; PYTHON™ B: 364 ml/ac
- Acres Treated: 40 ac/case

PACKAGING

- Case: PYTHON™ A: 1 × 4 L jug; PYTHON™ B: 2 × 7.26 L jug

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

6 hours

Requires UAN 28% @ 0.810 L/ac – not included.

REGISTERED CROPS

- Dry beans
- Peas
- Soybeans

WEEDS CONTROLLED

Unless otherwise noted below, apply to young and actively growing weeds.

Broadleafs: cotyledon – 4 leaf:

- Cleavers*
- Cow cockle
- Flixweed
- Green Smartweed
- Lamb's quarters[1]
- Redroot pigweed[1]
- Prostrate pigweed[1]
- Shepherd's purse
- Stinkweed
- Stork's bill
- Volunteer canola (including Clearfield® varieties)
- Wild buckwheat
- Wild mustard

Grasses: 1 – 4 leaf or early tillering:

- Barnyard grass
- Green foxtail (including Group 1 resistant)[2]
- Japanese brome grass*
- Persian darnel
- Volunteer barley
- Volunteer canary seed
- Volunteer wheat (including non-Clearfield® varieties)
- Wild oats (including Group 1 resistant)[2]
- Yellow foxtail

*Suppression only.

[1] PYTHON™ A + PYTHON™ B will provide more consistent control of prostrate pigweed, redroot pigweed and lamb's quarters including Group 2 resistant biotypes.

[2] PYTHON™ A Herbicide will not control weed biotypes that are multiple-resistant to both Group 1 and Group 2 herbicides.

HOW IT WORKS

The PYTHON™ co-pack combines two powerful actives. PYTHON™ A (imazamox) is systemic, readily absorbed through both leaf and root uptake and PYTHON™ B (bentazon) is a contact herbicide. Good coverage and early application will give the best results.

HERBICIDE

PYTHON™

CROP STAGING

- Dry beans: After first trifoliate leaf has fully expanded up to 2nd trifoliate leaf
- Soybeans: Cotyledon – 4 leaf stage
- Peas: 3 – 6 above ground nodes

REGISTERED AND SUPPORTED TANK MIXES

- ARROW® 240 EC
- ARROW ALL IN®
- LEOPARD®
- Glyphosate

MIXING INSTRUCTIONS

1. Fill clean spray tank ½ full with clean water. Start agitation system.
2. Add the required amount of PYTHON™ A. Continue to agitate.
3. Add the correct amount of PYTHON™ B. Continue to agitate.
4. Add UAN 28%.
5. Add recommended amount of adjuvant.
6. Complete filling with remaining water and continue agitation.

ADJVANT RATE

- Merge® @ 0.5% v/v
- NORAC MSO @ 0.5% v/v
- Hasten® NT Ultra @ 0.5% v/v
- Agral® 90 @ 0.25% v/v

CROP ROTATIONS

Barley, Canary seed, Canola, Chickpea, Clearfield® sunflowers, Field corn, Field pea, Flax, Lentils, Oats, Soybeans, Wheat (spring, durum)

PRE-HARVEST INTERVALS

- Dry beans: 75 days
- Peas: 60 days
- Soybeans: 85 days

GRAZING RESTRICTION

Do not graze treated crop. Peas may be fed to livestock 30 days after application.

STORAGE

Do not freeze.

QUICK TIPS

UAN 28% and an adjuvant are not included in the case but required (a reduction in weed control can be observed without the addition of a nitrogen source). Do not apply PYTHON™ to any crops that have been subjected to stress from conditions such as hail, flooding, hot, humid weather, drought, widely fluctuating temperature conditions, prolonged cold weather or injury from prior herbicide applications; as crop injury may result.

Bentazon is a contact herbicide, apply to small weeds for optimal broadleaf weed control. Apply at 40 L/ac water volume or higher.

See page 82 for additional re-cropping restrictions to consider for this product.

HERBICIDE • PULSE & SOYBEAN BROAD SPEC

GROUP 2

QUASAR®

Proven extended weed control of shallow germinating weeds like green foxtail and wild mustard.

ACTIVE INGREDIENT

Imazamox 80 g/L and Imazethapyr 240 g/L = SL

APPLICATION RATES AND ACRES TREATED

- Rate: DAVAI® 80 SL: 80 ml/ac; PHANTOM® 240 SL: 26 ml/ac
- Acres Treated: 80 ac/case

PACKAGING

- Case: DAVAI® 80 SL: 1 × 6.47 L jug; PHANTOM® 240 SL: 1 × 2.08 L jug

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

3 hours

REGISTERED CROPS

- Dry beans
- Field peas
- Soybeans

WEEDS CONTROLLED

Grass weeds (1 – 4 true leaf stage or early tillering):

- Green foxtail (including Group 1 resistant)[1]
- Tame oats
- Wild oats (including Group 1 resistant)[1]
- Yellow foxtail

Broadleaf weeds (cotyledon to 4-leaf stage):

- Chickweed
- Green smartweed
- Lamb's quarters
- Redroot pigweed
- Stinkweed
- Wild mustard

Weeds suppressed:

- Barnyard grass
- Volunteer barley
- Volunteer canola (non-Clearfield®)
- Wild buckwheat

[1]The QUASAR® tank mix will not control weed biotypes that are resistant to Group 2 biotypes.

HOW IT WORKS

The 2 active ingredients in QUASAR® are readily absorbed through both leaf and root uptake and are translocated in the plant to inhibit amino acid production and cell division. Plant growth is inhibited, and a few days after application, chlorosis and terminal bud injury become evident. Leaves and stems become yellow and purple, and root growth may be inhibited.

CROP STAGING

- Soybeans: 1 – 3 leaf
- Field peas: 1 – 6 true leaves
- Dry Beans: 1 – 2 leaf

REGISTERED AND SUPPORTED TANK MIXES

- ARROW® 240 EC
- ARROW ALL IN®
- Glyphosate
- LEOPARD®
- PYTHON™ B

QUASAR®

MIXING INSTRUCTIONS

1. Fill the spray tank ¾ full with water.
2. Add the required amount of DAVAI® 80 SL into the sprayer.
3. Add the required amount of PHANTOM® 240 SL into the sprayer.
4. Agitate until thoroughly mixed.
5. Continue agitation and add the required amount of the tank-mix partner.
6. Continue agitation and add the required amount of recommended adjuvant.
7. Complete filling the tank to the desired level with water.

ADJUVANT RATES

- Methylated seed oil (MSO) @ 0.5% v/v
- Non-ionic surfactant (NIS) @ 0.25% v/v

Refer to the DAVAI® 80 SL and PHANTOM® 240 SL labels for complete adjuvant and rate information.

CROP ROTATIONS

1 year after application:

- Canary seed
- Chickpeas
- Clearfield® canola
- Durum
- Field corn
- Field peas
- Lentils
- Spring barley
- Spring wheat
- Oats

2 years after application:

- Flax
- Non-Clearfield® canola
- Sunflowers

PRE-HARVEST INTERVALS

- Field peas: 60 days
- Soybeans: 85 days
- Dry beans: 75 days

GRAZING RESTRICTIONS

Do not graze treated crop. Field peas may be fed to livestock 30 days after application.

STORAGE

- Do not freeze.
- Shake well before use.

QUICK TIPS

Cool weather conditions or drought will delay herbicidal activity and if prolonged, may result in poor weed control. Use of QUASAR® co-pack in hot, humid weather may result in temporary leaf yellowing, leaf flecking, bronzing or burning. The crop usually outgrows this condition within 10 days. When weeds are stressed due to drought, flooding, hot or prolonged cool temperatures (15° C or less), control can be reduced or delayed since weeds are not actively growing. Weeds escapes or regrowth may occur under prolonged stress conditions or low fertility. Do not make applications to weeds stressed longer than 20 days due to lack of moisture, as unsatisfactory control can result.

See page 82 for additional re-cropping restrictions to consider for this product.

HERBICIDE • PULSE & SOYBEAN BROAD SPEC

GROUP 5

SQUADRON® II

Grassy and broadleaf weed control in a wide variety of crops, most notably lentils, field peas, chickpeas and potatoes. It can work alone or in combination with recommended tank mixes.

ACTIVE INGREDIENT

75% Metribuzin = WDG

APPLICATION RATES AND ACRES TREATED

- Rate: 80 – 300 g/ac
- Acres Treated: 15 – 65 ac/jug

PACKAGING

- 4 × 5 kg jug

RAINFASTNESS

6 hours

REGISTERED CROPS

- Chickpeas
- Field peas
- Lentils
- Potatoes (including sprinkler irrigation)
- Processing peas
- Spring barley
- Spring wheat
- Winter wheat

For more information on pre-seed use, see page 28.

WEEDS CONTROLLED

- Annual bluegrass
- Ball mustard[1,2]
- Barnyard grass
- Bromegrass
- Common chickweed[2,3]
- Common groundsel[1]
- Corn spurry[1]
- Cow cockle
- Downy brome[4]
- Flixweed[4]
- Green foxtail
- Green smartweed[2,3]
- Goose grass
- Hempnettle[2,5]
- Kochia
- Lady's thumb[2,3]
- Lamb's quarters[3]
- Night-flowering catchfly[1]
- Persian darnel
- Redroot pigweed[1,3]
- Russian thistle[6]
- Shepherd's purse[4]
- Stinkweed[2,3]
- Tartary buckwheat[1]
- Volunteer non-triazine-tolerant canola[2,3]
- Wild buckwheat
- Wild mustard[2,3]
- Wild oats
- Wormseed mustard[1]
- Yellow foxtail

[1] Control at 110 g/ac post-emergence.
[2] Suppression only in chickpeas and lentils as post-emergence application.
[3] Control at 80 g/ac post-emergence.
[4] Control at 225 – 300 g/ac post-emergence.
[5] Suppression at 80 g/ac post-emergence.
[6] Control at 150 g/ac post-emergence.

SQUADRON® II

HOW IT WORKS

Metribuzin inhibits the photosynthesis of grassy and broadleaf weeds. Used pre-emergent, susceptible weeds and crop seedlings emerge through treated soil, but 2 – 5 days later the weeds show chlorosis and necrosis. Plants treated post-emergence show chlorosis and necrosis between leaf veins, followed by wilting and death.

SOIL TYPES AND RESTRICTIONS

The recommended use rates of SQUADRON® II are dependent upon soil texture and the organic matter content of the soil being treated: coarse, medium and fine.

The following chart outlines the soil textures included in each of the soil texture groupings:

Coarse	Medium	Fine
Loamy sand, Sandy loam	Loam, Silt loam, Silt, Sandy clay loam, Sandy clay	Silty clay loam, Silty clay, Clay loam, Clay

- On variable soils with coarse sandy areas, some crop injury may occur on the sandy areas if the rate used is for the finer soil type.
- Sandy loam and silty clay loam soils are transitional soils and may be classified as medium-textured soils in some regions.
- Do not use this product on muck soils. If SQUADRON® II is applied to muck soils, subsequent crops may be injured.
- Do not use on coarse soils with less than 2% organic matter.

REGISTERED AND SUPPORTED TANK MIXES

Spring wheat and spring barley (post-emergent):
- MCPA amine
- 2,4-D amine
- Banvel® II
- Dicamba
- Target® Liquid

Field peas (post-emergent):
- MCPA sodium salt
- PHANTOM® 240 SL
- Venture® L

SQUADRON® II

APPLICATION TIMING AND CROP STAGING

Crop	Crop Stage	Application Method
Barley	2 – 5 leaf	Post-emergence
Wheat	2 – 5 leaf	Post-emergence
Field peas	Pea vines must be less than 6 inches long at time of post-emergent application.	Post-emergence incorporated (spring and fall)
Chickpeas	1 – 3 above ground nodes	Post-emergence
Lentils	Vines must be less than 6 inches long or in 3 – 5 node stage.	Post-emergence incorporation (fall)
Potatoes	First use on a potato variety should be limited to a small test area to ensure varietal tolerance.	Post-emergence incorporated. Refer to the label for sprinkler irrigation application.

CROP ROTATIONS

Rotational crops such as non-triazine-tolerant canola (rapeseed) are sensitive to SQUADRON® II and may be injured if seeded in soil treated with SQUADRON® II during the year of application or the following crop year.

Fall seeded or cover crops such as wheat, oats and rye may be injured when seeded within the same season as the application of SQUADRON® II.

GRAZING

- Do not graze treated wheat or barley for 30 days after application.
- Do not graze peas, chickpeas or lentils for 70 days after application.

QUICK TIPS

New improved pan granulated formula which is the same concentration as our original formulation but with a new production method; it has a smaller particle size (averaging 4 microns) which disperses more rapidly and at rest stays suspended longer than the original metribuzin formulation (average particle size of 6 microns).

NOTES

RE-CROPPING RESTRICTIONS FOR DAVAI® 80 SL, PHANTOM® 240 SL, PYTHON™ AND QUASAR®

There are several factors that effect the re-cropping following an Imidazolinone application. These include in order of importance:

1. Product: With imazethapyr for example being more persistent than imazamox.
2. Soil moisture: Need > 125 mm (5") of rain between herbicide application and Aug. 31 in the year of application.
3. Organic matter: Brown soil zone (< 3% organic matter) are more susceptible to carry over crop injury the year after application.
4. Rate: As affected by the crop – soil residues are the issue.
5. Soil pH: Persists longer in a pH < 5.5 – 6.

Depending on the following crop the level of sensitivity will vary. Please contact your local ADAMA ABM for more details.

HERBICIDE • HARVEST AID

GROUP 22

ARMORY® 240

Provides fast drydown of crops, protecting yield and grade, and reducing disease transmission late in the season.

ACTIVE INGREDIENT

Diquat 240 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Ground Rate: 360 – 1420 ml/ac
- Aerial Rate: 690 – 930 ml/ac
- Acres Treated: 7 – 28 ac/jug; 83 – 333 ac/drum; 320 – 1,250 ac/450 L tote; 700 – 2,775/1,000 L tote

Beans (White and Red-Kidney Beans, Soybeans and Adzuki), lentils, field peas, chickpeas, canola, mustard, flax, sunflowers:
- Ground: 500 – 690 ml/ac
- Aerial: 690 – 930 ml/ac

Legumes:
- Ground: 690 – 1090 ml/ac
- Aerial: 690 – 1090 ml/ac

Potatoes:
- Ground: 510 – 1420 ml/ac
- Aerial: 690 – 930 ml/ac

Oats:
- Ground: 360 – 510 ml/ac

PACKAGING

- Case: 2 × 10 L jugs
- Bulk: 120 L drums
- Tote: 450 L; 1,000L

WATER VOLUME

- Ground: 90 – 200 L/ac (24 – 53 US gal/ac)
- Aerial: Minimum 18 L/ac (5 US gal/ac)

RAINFASTNESS

30 minutes

REGISTERED CROPS

- Beans
- Canola
- Chickpeas
- Field peas
- Flax
- Legumes
- Lentils
- Mustard
- Oats
- Potatoes
- Soybeans
- Sunflowers

USES AND WEEDS CONTROLLED

- Potato vines
- Corn spurry in oats
- Desiccation for pulse, oilseed and legume forage seed crops

HOW IT WORKS

ARMORY® 240 works on contact to disrupt plant cells and is rainfast in 30 minutes, leading to more rapid drydown of plants and weeds when compared to systemic herbicides. Harvesting can typically begin within 4 – 10 days, depending on crop and weather conditions.

HERBICIDE

ARMORY® 240

REGISTERED AND SUPPORTED TANK MIXES

- Agral® 90, LI 700®, Liberate® and other NIS
- Carfentrazone

MIXING INSTRUCTIONS

1. Fill tank ¾ full with clean water.
2. Start agitation and continue throughout mixing and spraying.
3. Add correct amount of ARMORY® 240.
4. Add Agral® 90 adjuvant at 0.1% v/v or LI 700® at 0.25% v/v.
5. Fill with remaining water.

ADJUVANT RATE

- LI 700® @ 0.25% v/v
- Non-ionic surfactant (NIS) @ 0.10% v/v

GRAZING RESTRICTIONS

Crop waste remaining after harvest (e.g. pea vines, alfalfa stems) may be used as a feed supplement for livestock.

STORAGE

Do not freeze.

QUICK TIPS

Best results under cloudy conditions or in the evening. Suggested conditions for aerial applications are a temperature below 25° C, humidity above 50% and wind speed below 9 km/hr at flying height.

INSECTICIDE

PEST CONTROL

INSECTICIDE

INSECTICIDE

GROUP 4 & 15

CORMORAN®

Multiple modes of action for resistance management of Colorado potato beetle control in potatoes as well as a wide range of other insects in specialty crops.

ACTIVE INGREDIENT

Novaluron 100 g/L and Acetamiprid 80 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 180 – 360 ml/ac
- Acres Treated: 28 – 56 ac/jug

PACKAGING

- Case: 2 × 10.08 L jugs

WATER VOLUME

- Ground: 80 – 400 L/ac (20 – 105 US gal/ac)
- Aerial: Do not apply.

RAINFASTNESS

Avoid application when heavy rain is forecast.

REGISTERED CROPS

- Alfalfa (grown for seed)
- Potatoes
- Sweet corn

KEY INSECTS CONTROLLED

- Alfalfa looper
- Aphids
- Armyworm
- Cabbage looper
- European corn borer
- Leafhopper
- Lygus bug

HOW IT WORKS

CORMORAN® kills insect eggs by contact and larvae by ingestion. Containing 2 modes of action, CORMORAN® provides both rapid knockdown and residual control of insect pests.

CORMORAN®

CROP STAGING AND RATES

Crop	Insects Controlled	Rate	Application Instructions
Potatoes	Colorado potato beetle	180 – 280 ml/ac	For Colorado potato beetle, do not apply more than twice to a single generation and do not apply to successive generations. Do not apply more than once every 10 – 14 days.
	Armyworm, Cabbage looper	180 – 300 ml/ac	
	Leafhopper	200 – 300 ml/ac	
	Aphids, European corn borer	260 – 300 ml/ac	
Sweet corn	Aphids	200 – 280 ml/ac	Applications per season: 2, no more than once every 21 days. Use the higher rate for heavy infestations.
Alfalfa (grown for seed)	Alfalfa plant bug, Lygus bug	300 – 360 ml/ac	Apply prior to bloom up to when 50% of seed pods are ripe. Use higher rate for heavier infestations. Applications per season: 2. Do not apply more than once in 7 days. Do not exceed more than 720 ml/ac per season.

MIXING INSTRUCTIONS

1. Fill clean tank ½ full with clean water and start agitation.
2. Add required amount of CORMORAN® to the spray tank, while agitating.
3. Fill remainder of tank. Increase agitation if necessary to maintain surface action.
4. Maintain continuous agitation during application to assure uniform suspension. If mixture sits without agitation for extended periods, agitate the mixture for at least 10 minutes before use.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVALS

- Potatoes: 7 days
- Sweet corn: 10 days
- Alfalfa (grown for seed): 14 days

STORAGE

- Store in original, tightly closed container.
- Do not ship or store near food, feed, seed and fertilizers.
- Store in cool, dry, locked, well-ventilated area without floor drain.
- Keep away from fire or open flame, or other sources of heat.

QUICK TIPS

Consider early applications (before petal fall) of CORMORAN® to allow beneficial insects to build up later in the season. To minimize the possibility of transient effects on honeybee brood development, do not use CORMORAN® on blooming crops when bees are actively foraging. If orchards have been historically infested with mites or aphids, be sure to scout regularly and use miticides to control their populations.

INSECTICIDE

GROUP 3

SILENCER® 120 EC

Most trusted active ingredient used in Western Canada to control a wide range of insects in field, tree fruit and horticulture crops.

ACTIVE INGREDIENT

Lambda-cyhalothrin 120 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 17 – 94 ml/ac; standard rate: 34 ml/ac
- Acres Treated: 40 – 220 ac/jug; standard rate: 110 ac/jug
- Standard rate is applicable for most pests, refer to label for more information.

PACKAGING

- Case: 4 × 3.785 L jugs

WATER VOLUME

- Ground: 40 – 80 L/ac (10 – 20 US gal/ac)
- Aerial: 4 – 16 L/ac (1 – 4 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

- Alfalfa
- Beans
- Canola
- Cereals (wheat, barley, oats)
- Corn (field)
- Flax
- Potatoes
- Soybeans

SILENCER® 120 EC is registered for use on more than 30 crops; refer to the label for more information.

KEY INSECTS CONTROLLED

- Alfalfa weevil
- Armyworm
- Bean aphid
- Bertha armyworm
- Cabbage looper
- Cabbage seedpod weevil (adults)
- Corn earworm
- Crucifer flea beetle
- Cutworms
- Diamondback moth larvae
- European corn borer
- Fall armyworm
- Grasshoppers
- Imported cabbageworm
- Lygus bug
- Pea aphid
- Potato flea beetle
- Potato leafhopper
- Soybean aphid
- Tarnished plant bug
- Tuber flea beetle

HOW IT WORKS

Fast-acting stomach and contact insecticide.

INSECTICIDE

SILENCER® 120 EC

APPLICATION TIMING AND CROP STAGING

Bertha Armyworm: Apply when the insects are at a vulnerable stage (early larval instars). Consult provincial guidelines for treatment threshold and advice.

Diamondback Moth Larvae: Apply when the insects are at a vulnerable stage (early larval instars). Consult provincial guidelines for treatment threshold and advice.

Flea Beetles: Begin scouting for feeding damage within a week of emergence. Apply to crop at first signs of feeding. SILENCER® 120 EC can also be used to spray a 15 m strip around the field edge to reduce insect migration.

Grasshoppers: Apply the low rate (26 ml/ac) up to the 3rd nymphal stage (1 cm long), or when insect numbers are low. Apply the high rate (34 ml/ac) when grasshoppers are larger, up to but not including winged adults (up to 2.5 cm in length) or when insect numbers are high.

Potato Insects (except Colorado Potato Beetle): Apply when insects or feeding damage appears. Timing of applications should be based on the presence of vulnerable pest developmental stages and significant populations as determined by local monitoring.

Consult the label for complete crop list and insect timing.

REGISTERED AND SUPPORTED TANK MIXES

Herbicides:
- Assert® 300 SC
- BISON® 400 L
- BRAZEN™ II
- Everest® 3.0
- LADDER ALL IN®
- SQUADRON® II

Fungicides:
- Allegro®
- BUMPER® 432 EC
- SORATEL™
- TOPNOTCH™

MIXING INSTRUCTIONS

Confirm compatibility in advance by premixing small proportional quantities of water with SILENCER® 120 EC and the tank-mix partner.

CROP ROTATIONS

No restrictions the year following treatment.

PRE-HARVEST INTERVALS

- Corn (field): 21 days
- Legumes (soybeans, beans, field peas, faba beans, chickpeas, lentils): 21 days
- Oilseeds: 7 days
- Potatoes: 7 days
- Timothy: 14 days
- Wheat, Barley, Oats: 28 days

GRAZING RESTRICTIONS

DO NOT cut treated fields for silage/forage. DO NOT graze treated fields. DO NOT feed treated crops to livestock. For grasses/non-grasses grown for seed production only, DO NOT feed seed screenings and aftermath to livestock.

STORAGE

Do not freeze.

QUICK TIPS

Apply below temperatures of 25° C. Apply in the evening or early morning when temperatures are cool to get the best control. Wait 24 hours before re-entry.

INSECTICIDE · SEED TREATMENT

GROUP 4

SOMBRERO® 600 FS

Flexible seed treatment partner that gives you long-lasting, early season control of wireworms and flea beetles – in cereals, oilseeds, soybeans and corn.

ACTIVE INGREDIENT

Imidacloprid 600 g/L = SC

APPLICATION RATES AND ACRES TREATED:

Please refer to the label for application rates or the table below as these vary based on seed type.

PACKAGING

- Case: 8 × 1.54 L jugs

WATER VOLUME

Dilute in sufficient liquid to achieve uniform coverage on the seed.

RAINFASTNESS

N/A

REGISTERED CROPS

- Barley
- Canola[1]
- Corn[1]
- Mustard[1]
- Oats
- Soybeans
- Wheat (durum, spring, winter)

[1] Registered for use on this seed in commercial seed treatment facilities only.

KEY INSECTS CONTROLLED

- Bean leaf beetle
- Corn flea beetle
- Flea beetle
- Seed corn maggot
- Soybean aphid
- Wireworms

HOW IT WORKS

SOMBRERO® 600 FS contains a proven, highly effective seed treatment insecticide that gives you broad-spectrum control of above and below ground pests. Once treated seed is planted, the active ingredient in SOMBRERO® 600 FS is released and forms a protective barrier around the seed. As the plant grows, systemic action transports SOMBRERO® 600 FS throughout the developing stem and leaves, ensuring lasting insect control and giving the crop the defense to grow to its potential.

REGISTERED AND SUPPORTED TANK MIXES

- Allegiance®
- Apron Maxx® RTA®
- EverGol® Energy
- Insure® Cereal FX4
- Insure® Pulse
- Rancona® Trio
- Raxil® MD
- Raxil® Pro
- Trilex® EverGol®
- Vibrance® Quattro
- Vibrance® Maxx RFC

MIXING INSTRUCTIONS

1. Add fungicide.
2. Add coating agents.
3. Add SOMBRERO® 600 FS.

INSECTICIDE

SOMBRERO® 600 FS

APPLICATION RATES

A colourant MUST be added in accordance with the PCP Act and the Seeds Act Regulations.

Crop	Insect	Rate	Application Information
Barley, Oats, Wheat (durum, spring, winter)	Wireworms	17 – 50 ml/ 100 kg seed	Dilute in sufficient liquid to achieve uniform coverage on the seed.
Canola/ Mustard	Flea beetle	667 – 1333 ml/ 100 kg seed	In areas where flea beetle populations are high, use the higher application rate.
Corn, Field corn for seed production	Wireworms	21.3 ml/ 80,000 seeds	Dilute in sufficient water to achieve uniform coverage on the seed. Ensure seed is adequately coloured. Other polymers and coating materials may be required.
Field corn for seed production	Corn flea beetle	80 ml/ 80,000 seeds	
Soybeans	Soybean aphid, Bean leaf beetle, Seedcorn maggot, Wireworm	104 – 208 ml/ 100 kg seed	Use the higher rate for early planting, when insect populations are expected to be high, and to extended control period for aphids. Dilute in sufficient liquid to achieve uniform coverage on the seed.

STORAGE

- Do not freeze.
- Agitate vigorously before using.

USE RESTRICTIONS[1]

1. Do not use treated seed for food, feed or oil processing.
2. Do not graze or feed livestock on treated areas for 4 weeks after planting.
3. Mustard greens grown or harvested from SOMBRERO® 600 FS treated seed can't be used for human consumption.
4. Treated canola, rapeseed or mustard (condiment type only) seed stored for periods exceeding 6 months may decrease in germination at a faster rate than untreated seed. Treated seed stored for more than 6 months should be tested for germination before planting. Do not store treated seed above 25° C or in direct sunlight.
5. This chemical demonstrates the properties and characteristics associated with chemicals detected in ground water. Using it in areas where soils are permeable, or the water table is shallow, may result in ground water contamination.

[1] All bags containing treated seed must be labelled or tagged. Please see label for instructions.

QUICK TIPS

For optimal insect control, make sure to get good coverage.
For resistance management, rotate SOMBRERO® 600 FS with different groups that control the same pests in a field.

INSECTICIDE

NEW GROUP 3

ZIVATA™

An innovation in insect control giving you the same trusted results in a more sustainable formulation with a better user experience.

Low VOC
FORMULATION TECHNOLOGY

ACTIVE INGREDIENT

Lambda-cyhalothrin 120g/L as an EC

APPLICATION RATES AND ACRES TREATED

- Rate: 17 – 94 ml/ac; standard rate for most pests: 34 ml/ac
- Acres Treated: 45 – 240 ac/jug; standard rate: 120 ac/jug

PACKAGING

- Case: 2 × 4.08 L jugs

WATER VOLUME

- Ground: 40 – 80 L/ac (10 – 20 US gal/ac)
- Aerial: 4 – 16 L/ac (1 – 4 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

- Alfalfa
- Beans
- Canola
- Cereals (wheat, barley, oats)
- Corn (field)
- Flax
- Potatoes
- Soybeans

ZIVATA™ is registered for use on more than 30 crops; refer to the label for more information.

KEY INSECTS CONTROLLED

- Alfalfa weevil
- Armyworm
- Bean aphid
- Bertha armyworm
- Cabbage looper
- Cabbage seedpod weevil (adults)
- Corn earworm
- Crucifer flea beetle
- Cutworms
- Diamondback moth larvae
- European corn borer
- Fall armyworm
- Grasshoppers
- Imported cabbageworm
- Lygus bug
- Pea aphid
- Pea leaf weevil
- Potato flea beetle
- Potato leafhopper
- Soybean aphid
- Tarnished plant bug
- Tuber flea beetle

HOW IT WORKS

ZIVATA™ is a synthetic pyrethroid insecticide formulated with an improved, plant-based solvent that offers fast-acting stomach and contact effects against a broad spectrum of insect pests. This renewably sourced formulation has low volatile organic properties and improves the user experience with a reduced drift potential and product volatility.

ZIVATA™

REGISTERED AND SUPPORTED TANK MIXES

Herbicides:
- Assert®
- BISON® 400 L
- BRAZEN™ II
- Everest®
- LADDER ALL IN®
- SQUADRON® II

Fungicides:
- Allegro®
- BUMPER® 432 EC
- SORATEL™
- TOPNOTCH™

MIXING INSTRUCTIONS

Compatibility should always be confirmed by premixing small proportional quantities of water, ZIVATA™, and the tank-mix partner in advance.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVALS

- Corn (field): 21 days
- Legumes (soybeans, beans, field peas, faba beans, chickpeas, lentils): 21 days
- Oilseeds: 7 days
- Potatoes: 7 days
- Timothy: 14 days
- Wheat, Barley, Oats: 28 days

GRAZING RESTRICTIONS

DO NOT cut treated fields for silage/forage. DO NOT graze treated fields. DO NOT feed treated crops to livestock. For grasses/non-grasses grown for seed production only, DO NOT feed seed screenings and aftermath to livestock.

STORAGE

Do not freeze.

QUICK TIPS

Control of some insect species with pyrethroid insecticides decreases as temperature rises (above 25° C). For best results, apply ZIVATA™ during the early morning before temperatures rise, and during the evening, past the heat of the day. Use sufficient water for thorough coverage.

FUNGICIDE

DISEASE CONTROL

FUNGICIDE

FUNGICIDE

GROUP 3

BUMPER® 432 EC

Economical fungicide used at herbicide timing in cereals for leaf disease and early protection against blackleg in canola.

Low VOC FORMULATION TECHNOLOGY

ACTIVE INGREDIENT

Propiconazole 432 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 60 – 120 ml/ac
- Acres Treated: 40 – 80 ac/jug

PACKAGING

- Case: 2 × 4.8 L jugs

WATER VOLUME

- Ground: 80 L/ac (20 US gal/ac)
- Aerial: 16 – 20 L/ac (4 – 5 US gal/ac)

RAINFASTNESS

1 hour

REGISTERED CROPS

- Barley
- Canary seed
- Canola
- Corn
- Dry edible beans
- Oats
- Soybeans
- Wheat (spring, winter, durum)

KEY DISEASES CONTROLLED

- Blackleg
- Net and spot blotches
- Powdery mildew
- Rusts
- Septoria spots and blotches
- Scalds
- Tan spots

HOW IT WORKS

Broad-spectrum, systemic activity with excellent leaf surface protection and translocation within the plant for additional disease prevention.

APPLICATION TIMING AND CROP STAGING

Crop	Diseases	Timing
½ rate at 60 ml/ac		
Barley	Net blotch	As early as the 2-leaf stage.
Wheat	Septoria leaf spot, Tan spot	
Full rate at 120 ml/ac		
Barley	Leaf and stem rust, Septoria leaf spot, Net blotch, Powdery mildew, Scald, Spot blotch	At the first sign of disease, usually at the beginning of stem elongation. Before head is ½ emerged.
Oats	Crown rust, Septoria leaf blotch	
Wheat	Leaf and stem rust, Powdery mildew, Septoria glume blotch, Septoria leaf spot, Stripe rust, Tan spot	
Canary seed	Septoria leaf mottle	At emergence of the flag leaf.
Canola	Blackleg	Rosette stage, between 2nd true leaf and bolting.
Corn	Eye spot, Grey leaf spot, Helminthosporium leaf spot, Northern corn leaf blight, Rusts, Southern corn leaf blight	When disease first appears.
Soybeans (for seed)	Frogeye leaf spot, Aerial web blight	When disease first appears. Under severe disease pressure, make a 2nd application 14 days after the first.
Dry edible beans	Rust	At the first detection of disease and a 2nd application 14 – 21 days later.

FUNGICIDE

BUMPER® 432 EC

SUPPORTED TANK MIXES

Herbicides:
- Wheat and barley:
  - 2,4-D Ester 700
  - BADGE®
  - BRAZEN™ II
  - BROMOTRIL®
  - MCPA Ester 600
- Wheat only:
  - LADDER ALL IN®

Insecticides:
- SILENCER® 120 EC
- ZIVATA™

MIXING INSTRUCTIONS

1. Fill spray tank ½ full with water and gently agitate.
2. Add the required amount of BUMPER® 432 EC and agitate thoroughly.
3. Continue filling the tank with water until the tank is ⅞ full and, if applicable, add the required amount of tank-mix partner.
4. Complete filling the spray tank with water, maintaining agitation during mixing and spraying operations.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVALS

- Beans: 28 days
- Canola: 60 days
- Cereal crops (wheat, barley, oats): 45 days
- Corn: 14 days
- Soybeans: 50 days

GRAZING RESTRICTIONS

Do not graze livestock within 3 days of spraying.

STORAGE

May be stored at any temperature.

QUICK TIPS

BUMPER® 432 EC should be applied as a preventative disease control measure. Established diseases are more difficult to control and may have already reduced crop vigour.

FUNGICIDE

GROUP 3 & 11

CUSTODIA®

A multi-mode of action fungicide offering preventative and curative protection of the flag leaf against rust and all other major leaf diseases.

ACTIVE INGREDIENT

Tebuconazole 200 g/L and Azoxystrobin 120 g/L = SC

APPLICATION RATES AND ACRES TREATED

- Rate: 190 – 250 ml/ac
- Acres Treated: 40 – 53 ac/jug

PACKAGING

- Case: 2 × 10.08 L jugs

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: 20 L/ac (5 US gal/ac)

RAINFASTNESS

Avoid applying when heavy rainfall is in the forecast.

REGISTERED CROPS

- Barley
- Oats
- Soybeans
- Wheat (spring, winter, durum)

KEY DISEASES CONTROLLED

- Leaf rust
- Stem rust
- Stripe rust
- Septoria leaf blotch
- Tan spot
- Net blotch
- Spot blotch

HOW IT WORKS

CUSTODIA® is a broad-spectrum, preventative fungicide with systemic and curative properties recommended for the control of many important plant diseases. CUSTODIA® may be applied as a foliar spray in spray programs or in tank mixes with other crop protection products. All applications must be made according to the use directions that follow.

CROP STAGING

Crop	Diseases	Application Timing	Rate
Wheat (spring, winter, durum)	Leaf rust, Stem rust, Stripe rust, Septoria leaf blotch, Tan spot	Apply CUSTODIA® to leaf foliage at the first sign or very early stage of disease, up to the beginning of heading. Use of the higher rate should be considered when weather conditions are conducive to heavy disease development.	190 – 250 ml/ac
Barley	Net blotch, Spot blotch, Leaf rust, Stem rust, Stripe rust, Septoria leaf blotch, Tan spot	Apply CUSTODIA® to leaf foliage at the first sign or very early stage of disease, up to the beginning of heading. Use of the higher rate should be considered when weather conditions are conducive to heavy disease development.	190 – 250 ml/ac

CUSTODIA®

CROP STAGING

Crop	Diseases	Application Timing	Rate
Oats	Crown rust, Stem rust, Septoria leaf botch	Apply CUSTODIA® foliar fungicide at the very early stages of disease development.	190 ml/ac
Soybeans	Asian soybean rust, Frogeye leaf spot	Apply CUSTODIA® foliar fungicide at the very early stages of disease development. Use of the higher rate should be considered when weather conditions are conducive to heavy disease development or when heavy disease pressure is present.	190 – 250 ml/ac

REGISTERED AND SUPPORTED TANK MIXES

Manipulator™

MIXING INSTRUCTIONS

1. Fill the clean spray tank ¾ full with clean water.
2. Add the required amount of CUSTODIA® Foliar Fungicide into the sprayer and agitate thoroughly.
3. Continue agitation and add the required amount of the tank-mix partner.
4. Complete filling the tank to the desired level with water.

CROP ROTATIONS

No restrictions.

PRE-HARVEST INTERVALS

- Mature grains: 45 days
- Forage, hay: 36 days

GRAZING RESTRICTIONS

Do not allow livestock to graze or feed green forage to livestock prior to 6 days after treatment. Straw cut after harvest may be fed or used for bedding.

STORAGE

Do not freeze.

QUICK TIPS

CUSTODIA® should be applied at flag leaf for optimal leaf disease control. Pathogens coverage is key; do not use less than recommended water volumes. For fusarium control, we would recommend an application of ORIUS® 430 SC fungicide at full head emergence after CUSTODIA® at flag leaf. For resistance management, CUSTODIA® contains Group 3 and 11 fungicides. When possible, rotate the use of CUSTODIA® or other Group 3 and 11 fungicides with different groups that control the same pathogens.

FUNGICIDE

MAXENTIS™

UNDER REVIEW

Multi-mode of action fungicide.

This product is currently under review for registration under the Pest Control Products Act. It cannot be manufactured, imported, distributed, or used in Canada at this time except for the purpose of conducting research under the Pest Control Products Regulations.

For more information visit: **adama.com/west-canada/en/new-products**

FUNGICIDE

GROUP 3

ORIUS® 430 SC

Economical fusarium and leaf disease protection in cereals.

ACTIVE INGREDIENT

Tebuconazole 430 g/L = SC

APPLICATION RATES AND ACRES TREATED

- Rate: 89 – 118 ml/ac
- Acres Treated: 80 – 100 ac/jug

PACKAGING

- Case: 2 × 9.44 L jugs

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: 20 L/ac (5 US gal/ac)

RAINFASTNESS

Avoid applying when heavy rainfall is in the forecast.

REGISTERED CROPS

- Barley
- Oats
- Wheat (spring, winter, durum)

KEY DISEASES CONTROLLED

- Fusarium head blight (suppression)
- Net blotch
- Powdery mildew
- Rusts (leaf, stem, stripe)
- Scald
- Septoria glume blotch
- Septoria leaf blotch
- Spot blotch
- Tan spot

HOW IT WORKS

ORIUS® 430 SC Foliar Fungicide can be applied as a post-emergent treatment in wheat (spring, winter, durum), barley and oats for the suppression of fusarium head blight and control of foliar diseases.

CROP STAGING

Crop	Diseases	Application Timing	Rate
Wheat (spring, winter, durum)	For suppression of Fusarium head blight, for control of Septoria glume blotch	For optimum suppression of fusarium head blight and control of septoria glume blotch, apply ORIUS® 430 SC Foliar Fungicide within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower. **Spray coverage is essential:** Ensure thorough coverage of all wheat heads.	118 ml/ac
	Rusts (leaf, stem, stripe), Septoria (leaf blotch), Tan spot	Apply ORIUS® 430 SC Foliar Fungicide to leaf foliage at the first sign or very early stage of disease, especially if weather conditions are conducive to disease development, up to the end of the flowering stage. Considered using the higher rate when weather conditions are conducive to heavy disease development.	89 – 118 ml/ac
	Powdery mildew		118 ml/ac

FUNGICIDE

ORIUS® 430 SC

Crop	Diseases	Application Timing	Rate
Barley	Net blotch, Spot blotch, Scald, Rusts (leaf, stem and stripe), Septoria leaf blotch, Powdery mildew	Apply ORIUS® 430 SC Foliar Fungicide at the very early stages of disease development. Consider using the higher rate when weather conditions are conducive to heavy disease development.	89 – 118 ml/ac
Oats	Stem rust, Crown rust	Apply ORIUS® 430 SC Foliar Fungicide at the very early stages of disease development.	89 ml/ac

REGISTERED AND SUPPORTED TANK MIXES

None on label; consult the labels of the tank-mix partners or your local Adama Area Business Manager.

MIXING INSTRUCTIONS

1. Fill clean sprayer tank ¾ full with clean water.
2. Add the required amount of ORIUS® 430 SC Foliar Fungicide into the sprayer and agitate throughly.
3. Continue agitation and add the required amount of the tank-mix partner.
4. Add the required amount of recommended registered non-ionic surfactant at 0.125% v/v with the agitation remaining on.
5. Complete filling the tank to the desired level with water.

CROP ROTATIONS

No restrictions.

SURFACTANT RATE

Non-ionic surfactant at 0.125% v/v

PRE-HARVEST INTERVALS

Wheat, barley, oats: Applications may not be made within 36 days of harvest.

GRAZING RESTRICTIONS

Do not allow livestock to graze or feed green forage to livestock prior to 6 days after treatment. Straw cut after harvest may be fed or used for bedding.

STORAGE

Do not freeze.

QUICK TIPS

ORIUS® 430 SC should only be applied when the risk of fusarium head blight infection is high. Consult your local extension authority regarding the need for ORIUS® 430 SC. Head blight is extremely difficult to control. Fusarium head blight outbreaks occur when the weather is warm and wet at the flowering to soft dough stages. **Timing of application is critical:** For optimum suppression of fusarium head blight and control of septoria glume blotch, apply ORIUS® 430 SC Foliar Fungicide within the time period from when at least 75% of the wheat heads on the main stem are fully emerged to when 50% of the heads on the main stem are in flower. **Spray coverage is essential:** Ensure thorough coverage of all wheat heads.

FUNGICIDE

NEW GROUP 3

SORADUO™

Advanced disease protection powered by Asorbital® Formulation Technology. SORADUO™ provides proven fusarium protection in wheat and barley.

POWERED BY Asorbital® FORMULATION TECHNOLOGY

ACTIVE INGREDIENTS

Prothioconazole 250 g/L = EC and
Tebuconazole 430 g/L = SC

APPLICATION RATES AND ACRES TREATED

- Rate: 162 ml/ac SORADUO™ A + 94 ml/ac SORADUO™ B
- Acres Treated: 60 ac/case

PACKAGING

- Co-pack: 1 × 9.71 L SORADUO™ A + 1 × 5.65 L SORADUO™ B

WATER VOLUME

- Ground: 40 – 80 L/ac (10 – 20 US gal/ac)
- Aerial: 10 L/ac (3 US gal/ac)

RAINFASTNESS

Avoid applying when rain is forecast.

REGISTERED CROPS

- Barley
- Wheat (durum, spring, winter)

HOW IT WORKS

SORADUO™ is a combination of a triazole fungicide that features Asorbital® Formulation Technology and broad-spectrum system activity plus long-lasting foliar protection.

CROP STAGING

Crop	Disease	Application Timing	Rate
Barley	For suppression of fusarium head blight (fusarium spp.)	70 – 100% head emergence to 3 days after full head emergence	162 ml/ac SORADUO™ A + 94 ml/ac SORADUO™ B
Wheat (durum, spring, winter)		75% head emergence – 50% main stem flower	

Maximum 1 application per year.

REGISTERED AND SUPPORTED TANK MIXES

Optional: Non-ionic surfactant (NIS) @ 0.125% v/v.

MIXING INSTRUCTIONS

1. ½ fill the tank with clean water.
2. Add required amount of SORADUO™ B.
3. Add required amount of SORADUO™ A.
4. Add optional non-ionic surfactant (NIS).
5. Fill the tank and agitate again before use.

⚠ Always read and follow pesticide label directions.

FUNGICIDE

SORADUO™

CROP ROTATIONS
No restrictions.

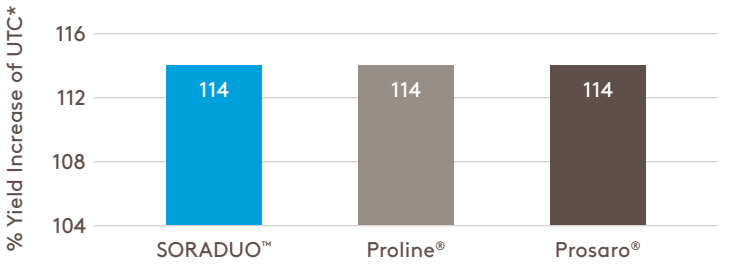
GRAZING RESTRICTIONS
6 days

PRE-HARVEST INTERVALS
36 days

STORAGE
Do not freeze.

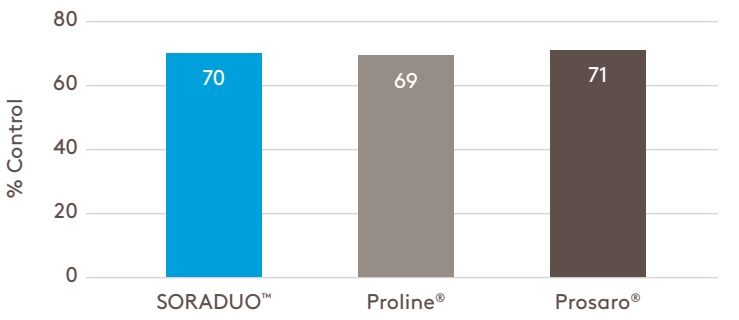
TIMING AND RATE OF DATA BELOW
- Sprayed at heading
- SORADUO™ = Prothioconazole 162 ml/ac + Tebuconazole 94 ml/ac
- Proline® = 138 ml/ac
- Prosaro® = 324 ml/ac

FUSARIUM CONTROL IN CEREALS – YIELDS
Summary of 35 trials from 2019-2021
(wheat = 14, barley = 10, durum = 7, winter wheat = 4)



*Untreated Check

FUSARIUM CONTROL IN CEREALS
Summary of 31 trials from 2019-2021
(wheat = 13, barley = 10, durum = 7, winter wheat = 1)



QUICK TIPS

Fusarium head blight outbreaks in wheat and barley occur when the weather is warm and wet at head emergence and flowering. Timing of application is critical when providing protection against fusarium head blight.

FUNGICIDE

GROUP 3

SORATEL™

Advanced disease protection powered by Asorbital® Formulation Technology. Offering a flexible application window, SORATEL™ is proven to protect a wide variety of crops from disease, including sclerotinia in canola.

POWERED BY Asorbital® FORMULATION TECHNOLOGY

ACTIVE INGREDIENT

Prothioconazole 250 g/L = EC

APPLICATION RATES AND ACRES TREATED

- Rate: 160 – 320 ml/ac; standard rate: 240 ml/ac
- Acres Treated: 60 – 120 ac/case; standard rate: 80 ac/case

PACKAGING

- Case: 2 × 9.6 L jugs

WATER VOLUME

- Ground: Minimum 40 L/ac (10 US gal/ac)
- Aerial: Minimum 20 L/ac (5 US gal/ac)

RAINFASTNESS

Avoid applying when heavy rainfall is in the forecast.

REGISTERED CROPS

- Barley
- Borage
- Brassica carinata
- Canola
- Chickpeas
- Crambe
- Corn
- Flax (linseed)
- Oats
- Oriental mustard
- Rapeseed
- Soybeans
- Wheat (spring, durum, winter)

KEY DISEASES CONTROLLED

- Ascochyta blight
- Asian soybean rust
- Crown rust
- Eyespot
- Frogeye leaf spot
- Fusarium head blight
- Gibberella ear rot
- Glume blotch
- Grey leaf spot
- Leaf rust
- Net blotch
- Northern blight
- Scald
- Sclerotinia stem rot
- Speckled leaf blotch
- Spot blotch
- Tan spot

HOW IT WORKS

SORATEL™ is a triazolinthione broad-spectrum systemic fungicide with Asorbital™ Formulation Technology. Asorbital™ Formulation Technology combines its unique mix of solvents and surfactants, delivering enhanced penetration efficiency and includes a built-in adjuvant.

CROP STAGING

Crop	Diseases	Application Timing	Rate
Barley	Fusarium head blight[1]	70 – 100% head emergence	240 – 320 ml/ac
	Net blotch, Scald, Spot blotch	First sign of disease	160 – 240 ml/ac
Canola	Sclerotinia stem rot	20 – 50% bloom	240 – 280 ml/ac

⚠ Always read and follow pesticide label directions.

FUNGICIDE

SORATEL™

Crop	Diseases	Application Timing	Rate
Chickpeas	Ascochyta blight	First sign of disease	240 – 320 ml/ac
Corn (field, sweet and popcorn, including seed production)	Eyespot, Fusarium[1], Gibberella ear rot[1], Grey leaf spot, Northern blight, Rust	First sign of disease Apply from the development stage of corn between the tip of stigmata visible (silking, BBCH 63) to the stigmata drying (silk browning, BBCH 67)	323 ml/ac
Oats	Crown rust	First sign of disease	240 ml/ac
Soybeans	Asian soybean rust, Frogeye leaf spot	First sign of disease	160 ml/ac
Wheat (spring, durum, winter)	Fusarium head blight[1], Glume blotch	75% head emergence – 50% main stem flower	240 – 320 ml/ac
	Leaf rust, Speckled leaf blotch, Tan spot	First sign of disease	240 ml/ac

[1] Suppression

REGISTERED AND SUPPORTED TANK MIXES

Insecticides:

- Coragen®
- Decis®
- SILENCER® 120 EC
- ZIVATA™

MIXING INSTRUCTIONS

1. Add ½ of the required amount of water to the spray or mixing tank and start agitation.
2. Add the required quantity of SORATEL™ to the water and complete filling with water to the required total volume.
3. Maintain agitation throughout mixing and spraying.

CROP ROTATIONS

Treated areas may be replanted with any crop specified on the label as soon as practical after the last application. For crops not listed on the label, do not plant back within 30 days of last application.

PRE-HARVEST INTERVALS

- Wheat (spring, durum, winter), Barley, Oats: 30 days
- Canola, Rapeseed, Oriental mustard, Brassica carinata, Flax, Crambe, Borage: 36 days
- Corn (field, sweet, popcorn): 14 days
- Chickpeas: 7 days
- Soybeans: 20 days

STORAGE

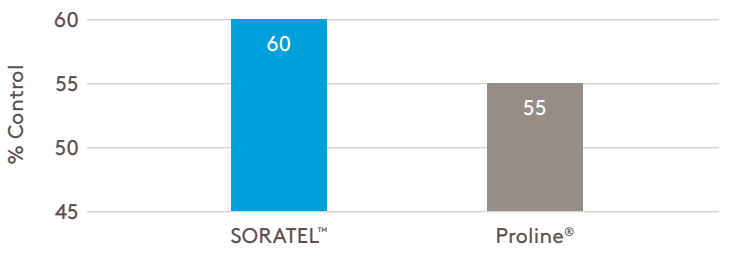
Do not freeze.

Asorbital® Formulation Technology was developed by and is unique to ADAMA worldwide. Products with this enhanced technology offer reduced run-off and photodegradation, improved rainfastness and more thorough protection of the foliage. SORATEL™ is the first of many ADAMA products to come that will include Asorbital® Formulation Technology and be available to Canadian Farmers in the future.

SORATEL™

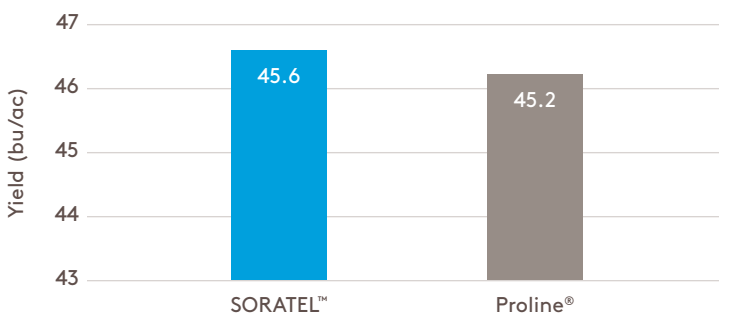
SCLEROTINIA CONTROL IN CANOLA

Summary of 6 small plot replicated trials conducted by independent researchers in Western Canada



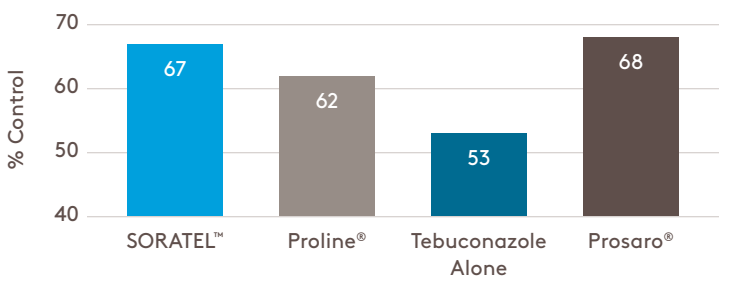
SORATEL™ IN CANOLA YIELDS

Summary of 7 farmer applied trials conducted in Western Canada in 2020



FUSARIUM CONTROL IN CEREALS

Summary of 35 small plot replicated trials conducted by independent researchers across Canada between 2018-2020



FUNGICIDE

GROUP 3 & 11

TOPNOTCH™

Broad-spectrum disease control in multiple crops including cereals, field peas, edible beans and soybeans.

ACTIVE INGREDIENT

Azoxystrobin 143 g/L and Propiconazole 124 g/L = SC

APPLICATION RATES AND ACRES TREATED

- Rate: 210 – 620 ml/ac
- Acres Treated: 14 – 40 ac/jug

PACKAGING

- Case: 2 × 8.6 L jugs

WATER VOLUME

- Ground: 40 L/ac (10 US gal/ac)
- Aerial: 20 L/ac (5 US gal/ac)

RAINFASTNESS

Avoid applying when heavy rainfall is in the forecast.

REGISTERED AND SUPPORTED CROPS

- Barley
- Edible beans
- Field peas
- Lentils
- Oats
- Rye
- Soybeans
- Triticale
- Wheat

KEY DISEASES CONTROLLED

- Anthracnose
- Ascochyta blight
- Barley leaf rust
- Mycosphaerella blight
- Net and spot blotches
- Powdery mildew
- Scald
- Septoria spot
- Stripe rust
- Tan spot
- Wheat leaf rust
- White mould[1]

[1] Suppression only.

HOW IT WORKS

Used as both a curative and preventative fungicide, TOPNOTCH™ has broad-spectrum, systemic and contact activity.

APPLICATION TIMING AND CROP STAGING

Crop	Diseases	Application Timing	Rate
Barley	Barley net blotch, Barley scald, Septoria leaf spot, Stripe rust, Barley leaf rust, Tan spot	Apply once between stem elongation and half-head emergence.	210 ml/ac
Beans, Field peas, Lentils, Soybeans	Mycosphaerella blight, Anthracnose	Make the first application at the first sign of disease. Apply the high rate only under conditions of high disease pressures. A second application 14 days later may be needed if conditions persist. Good spray coverage and canopy penetration are important for best results.	310 – 620 ml/ac
	Powdery mildew, White mould (suppression only)		310 ml/ac
Oats	Barley net blotch, Crown rust, Septoria leaf spot	Apply once between stem elongation and half-head emergence.	210 ml/ac

FUNGICIDE

TOPNOTCH™

Crop	Diseases	Application Timing	Rate
Rye	Septoria leaf spot, Barley scald, Tan spot	Apply once between stem elongation and half-head emergence.	210 ml/ac
Triticale	Septoria leaf spot, Tan spot	Apply once between stem elongation and half-head emergence.	210 ml/ac
Wheat	Septoria leaf spot, Tan spot, Stripe rust, Wheat leaf rust	Apply once between stem elongation and half-head emergence.	210 ml/ac
Durum wheat	Septoria leaf spot, Tan spot, Stripe rust	Apply once between stem elongation and half-head emergence.	210 ml/ac

REGISTERED AND SUPPORTED TANK MIXES

Herbicides:
- ARROW® 240 EC
- ARROW ALL IN®
- BRAZEN™ II
- Broadband®
- LADDER ALL IN®
- LEOPARD®
- Glufosinate
- Post Ultra®
- Sierra®
- Traxion™
- Traxos®

Insecticides:
- Coragen®
- Decis®
- SILENCER® 120 EC
- Voliam Xpress®
- ZIVATA™

Fungicides:
- Quadris®

MIXING INSTRUCTIONS

1. Fill spray tank ½ – ⅔ full with water.
2. With agitator running, add required amount of TOPNOTCH™ and continue agitating while adding remainder of the water.
3. Begin application after TOPNOTCH™ is completely dispersed into the mix water, and maintain agitation during spraying operation.

CROP ROTATIONS

Do not plant any other crop intended for food, grazing or any component of animal feed or bedding within 105 days of application.

PRE-HARVEST INTERVALS

- Cereals: 45 days
- Field peas, Beans, Soybeans, Lentils: 30 days

GRAZING RESTRICTIONS

Do not graze pea vines. 30 days for all other crops.

STORAGE

Do not freeze.

QUICK TIPS

Good spray coverage and canopy penetration are important to achieve the best results.

NOTES

TANK MIXING INSTRUCTIONS

W.A.M.L.E.G.S METHOD

W	**Wettable** powders, dispersible granules, soluble granules (WG, DF, SG, WP, SP)
A	**Agitate** tank mix thoroughly
M	**Micro-encapsulated** suspensions (ME)
L	**Liquid** flowables and suspensions (SC, SL, SN, LI, SU, SE)
E	**Emulsifiable** concentrate formulations (EC)

Fill spray tank nearly full with water.

G	**Glyphosate** formulations
S	**Surfactants**

Some herbicide labels list a specific mixing sequence. In absence of specific directions, a recommended sequence for adding pesticide formulations to a tank partially filled with water is the **W.A.M.L.E.G.S method**. Each ingredient must be uniformly mixed before adding the next component. For example, a soluble powder must be completely dissolved before adding the next component. Adjuvants are added in the same sequence as pesticides: ammonium sulfate is a soluble powder, oil adjuvants are emulsifiable concentrates and most surfactants are solutions. Within each group, usually add the pesticide before the adjuvant. For example, add a soluble-powder pesticide before ammonium sulfate.

Know the benefits and risks of tank mixing before you make an application. In some cases, compatibility of two or more chemicals is based on the order in which they are added to the tank mix.

Tank mixing can lead to a variety of mishaps if not done correctly. Being aware of the benefits and risks while following the proper guidelines is critical to ensuring the success of any tank mix procedure and application.

This information is presented in good faith for your reference. Always read and follow product label directions before tank mixing.

AERIAL APPLICATION

	ADAMA PRODUCT NAME	AERIAL APPLICATION	WATER VOLUME
HERBICIDES	2,4-D ESTER 700	Yes	12 L/ac
	ARMORY® 240	Yes	90 – 200 L/ac
	ARROW® 240 EC	No	–
	ARROW ALL IN®	No	–
	BADGE®	Yes (wheat, barley, and oats only)	8 – 20 L/ac
	BISON® 400 L	Yes (cereal crops)	12 – 18 L/ac
	BRAZEN™ II	Yes	12 L/ac
	BROMOTRIL®	Yes (wheat and barley only)	8 – 16 L/ac
	DAVAI® 80 SL	No	–
	DAVAI A PLUS™	No	–
	EMPHASIS™	No	–
	ESTEEM®	Yes	12 – 20 L/ac
	FORCEFIGHTER® M	No	–
	INVOLVE® 50 WDG	No	–
	LEOPARD®	Yes	10 L/ac
	MCPA ESTER 600	Yes	12 L/ac
	OUTSHINE®	No	–
	PHANTOM® 240 SL	No	–
	PYTHON™	No	–
	RUSH® 24	No	–
	SQUADRON® II	No	–
	THRASHER®	Yes	12 – 16 L/ac
	TOPLINE®	No	–
INSECTICIDES	CORMORAN®	No	–
	SILENCER® 120 EC	Yes	4 – 16 L/ac
	SOMBRERO® 600 FS	No	–
	ZIVATA™	Yes	4 – 16 L/ac
FUNGICIDES	BUMPER® 432 EC	Yes	16 – 20 L/ac
	CUSTODIA®	Yes	20 L/ac
	ORIUS® 430 SC	Yes	20 L/ac
	SORADUO™	Yes	20 L/ac
	SORATEL™	Yes	20 L/ac
	TOPNOTCH™	Yes	20 L/ac

For emergency medical help or health/safety concerns, call ProPharma immediately at 1-877-250-9291 (24 hours a day).

In the event of a spill, leak or fire, call INFOTRAC immediately at 1-800-535-5053 (24 hours a day) – For emergency medical help or health/safety concerns, call ProPharma immediately at 1-877-250-9291 (24 hours a day).

Metric Unit	Imperial Multiply by	Imperial Unit	Metric Multiply by	Metric Unit
LINEAR centimetre (cm)	x 0.39	inch	x 2.54	**LINEAR** centimetre (cm)
AREA				**AREA**
square metre (m^2)	x 1.2	square yard	x 0.84	square metre (m^2)
hectare (ha)	x 2.5	acres	x 0.4	hectare (ha)
VOLUME				**VOLUME**
litre (L)	x 0.22	Imperial gallon	x 4.55	litre (L)
litre (L)	x 0.27	U.S. gallon	x 3.79	litre (L)
PRESSURE				**PRESSURE**
kilopascals (kPa)	x 0.14	psi	x 6.9	kilopascals (kPa)
WEIGHT				**WEIGHT**
gram (g)	x 0.04	oz	x 28.35	gram (g)
kilogram (kg)	x 2.2	lb	x 0.45	kilogram (kg)
AGRICULTURAL				**AGRICULTURAL**
litres per hectare (L/ha)	x 0.09	Imperial gallons per acre	x 11.23	litres per hectare (L/ha)
litres per hectare (L/ha)	x 0.11	U.S. gallons per acre	x 9.35	litres per hectare (L/ha)
litres per hectare (L/ha)	x 0.36	quarts per acre	x 2.81	litres per hectare (L/ha)
litres per hectare (L/ha)	x 0.71	pints per acre	x 1.41	litres per hectare (L/ha)
millilitres per hectare (ml/ha)	x 0.015	Imperial fl. oz per acre	x 70.17	millilitres per hectare (ml/ha)
millilitres per hectare (ml/ha)	x 0.014	U.S. fl. oz per acre	x 73.05	millilitres per hectare (ml/ha)
kilograms per hectare (kg/ha)	x 0.89	lb per acre	x 1.12	kilograms per hectare (kg/ha)
grams per hectare (g/ha)	x 0.014	oz per acre	x 70	grams per hectare (g/ha)

EXAMPLE: To convert centimetres to inches, multiply by 0.39; conversely, to convert inches to centimetres, multiply by 2.54.

Active Ounces per Acre	Formulation (ml per acre)					Acres Treated per 10 L jug				
	300	400	500	600	700	300	400	500	600	700
1	94	70	57	47	41	107	142	177	212	247
2	187	140	113	94	81	53	71	88	106	124
3	281	211	170	142	121	36	47	59	71	82
4	374	281	227	189	162	27	36	44	53	62
5	468	351	283	236	202	21	28	35	42	49
6	562	421	340	283	243	18	24	29	35	41
7	655	491	397	331	283	15	20	25	30	35
8	749	562	453	378	324	13	18	22	27	31
9	842	632	510	425	364	12	16	20	24	28
10	936	702	567	472	405	11	14	18	21	25

Recommended rates have been rounded to whole numbers.

General Cleaning Practices for Sprayer Equipment

1. Once tank is empty clean sprayer in an area that will not allow the contamination of water bodies, sources, crops or other areas that are not accessible to others, pets and livestock.

2. **Rinse 1** – rinse equipment, removing any product adhering to the inside of the tank. Fill tank to 10% full of water and herbicide recommended rinse solution (see below). Agitate for 15 minutes.

3. Flush Rinse 1 through the booms, hoses and nozzles then drain.

4. Once done flushing, disassemble all strainers, filters, nozzles, screens, diaphragms and boom ends where residue can get tied up. Clean separately with an ammonia solution of 100 ml/10 L water. Inspect thoroughly and reassemble.

5. **Rinse 2** – fill tank to 10% full of water and add the Rinse 2 solution if needed (see below) while agitating. Charge up the booms and continue to agitate for 15 minutes before flushing out again.

6. Complete additional rinses as requested from the table below, by filling, agitating and flushing the system with the recommended solution each time.

7. **Final Rinse** – fill tank to 10% full of clean water and flush through the booms and hoses. Remove end caps/open ball valves and flush water through to ensure no spray solution is trapped. Drain any remaining water.

GENERAL PRACTICES

HERBICIDE	HERBICIDE NUMBER OF RINSES			
	1	2	3	4
2,4-D ESTER 700	W	D or 1%A	W	
ARMORY® 240	W	1%S	W	
ARROW® 240 EC	W	D	W	
ARROW ALL IN®	W	D	W	
BADGE®	W	D or 1%A	W	
BISON® 400 L	W	D or 1%A	W	
BRAZEN™ II	D	W		
BROMOTRIL®	D	W		
DAVAI® 80 SL	W			
DAVAI A PLUS™	W	D	W	
EMPHASIS™	D	W	3%A	W
ESTEEM®	W	D or 1%A	W	
FORCEFIGHTER® M	W	D or 1%A	W	
INVOLVE® 50 WDG	W	1%A	W	W
LADDER ALL IN®	W			
LEOPARD®	W	1%A	1%A	W
MCPA ESTER 600	W	1%A	W	
OUTSHINE®	W	1%A	W	
PHANTOM® 240 SL	W			
PRIORITY®	W	1%A	W	
PYTHON™	D	W	W	
QUASAR®	W			
RUSH® 24	W	D or 1%A	W	
SQUADRON® II	D	D	D	W
THRASHER®	1%P	1%A	W	
TOPLINE®	W	D + 1%A	W	

If a tank-mix partner is used, always check tank-mix partner label for any additional clean up procedures.

Be cautious with dry granular products, like florasulum, which can severely harm a sensitive broadleaf crop if not properly cleaned out.

WARNING: Never mix chlorine (bleach) and ammonia, as a reaction producing toxic gas can occur.

	SOLUTION
A	Ammonia Solution (minimum 3% ammonia – Finish or Flush)
D	Detergent Solution
S	Non-Ionic Surfactant
W	Water

CONTACT INFO

PROSAR (U.S. & Canada):
1.800.331.3148

INFOTRAC: 1.800.535.5053

PROVINCIAL AG OFFICES:

Agriculture and Agri-Food Canada
1341 Baseline Road
Ottawa, ON K1A 0C5
Toll-free: 1.855.773.0241
Email: info@agr.gc.ca
agr.gc.ca

Alberta Agriculture and Forestry
Ag-Info Centre
7000-113th Street
Edmonton, AB T6H 5T6
Phone: 403.742.7901
Toll-free in Alberta:
310.FARM (3276)
Email: duke@gov.ab.ca
agric.gov.ab.ca

Manitoba Agriculture, Food and Rural Development
Find a GO Office at
gov.mb.ca/agriculture
Email: mafweb@gov.mb.ca

Saskatchewan Ministry of Agriculture
45 Thatcher Drive East
Moose Jaw, SK S6J 1L8
Agriculture Knowledge Centre
Toll-free: 1.866.457.2377
saskatchewan.ca/agriculture

ASSOCIATIONS AND COUNCILS:

Canola Council of Canada
400-167 Lombard Avenue
Winnipeg, MB R3B 0T6
Phone: 1.866.834.4378
canolacouncil.org

Canadian Canola Growers Association
400-1661 Portage Avenue
Winnipeg, MB R3J 3T7
Phone: 204.788.0090
Toll-free: 1.866.745.2256
ccga.ca

Manitoba Canola Growers
400-167 Lombard Avenue
Winnipeg, MB R3B 0T6
Phone: 204.982.2122
Email: info@canolagrowers.com
canolagrowers.com

SaskCanola
212-111 Research Drive
Saskatoon, SK S7N 3R2
Phone: 306.975.0262
Toll-free: 1.877.241.7044
Email: info@saskcanola.com
saskcanola.com

Alberta Canola Producers Commission
14560-116 Avenue NW
Edmonton, AB T5M 3E9
Phone: 780.454.0844
Email: web@albertacanola.com
albertacanola.com

Pulse Canada
1212-220 Portage Avenue
Winnipeg, MB R3C 0A5
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Email: office@pulsecanada.com
pulsecanada.com

Alberta Pulse Growers
5007B-49 Avenue
Leduc, AB T9E 6M6
Phone: 780.986.9398
Toll-free: 1.877.550.9398
pulse.ab.ca

Saskatchewan Pulse Growers
207-116 Research Drive
Saskatoon, SK S7N 3R3
Phone: 306.668.5556
Email: pulse@saskpulse.com
saskpulse.com

Manitoba Pulse & Soybean Growers
P.O. Box 1760
38-4th Avenue NE
Carman, MB R0G 0J0
Phone: 204.745.6488
Toll-free: 1.866.226.9442
manitobapulse.ca

Soy Canada
130 Albert Street, Suite 1607
Ottawa, ON K1P 5G4
Phone: 613.233.0500
Email: info@soycanada.ca
soycanada.ca

Canadian Special Crops Association
1215-200 Portage Avenue
Winnipeg, MB R3C 0A5
Phone: 204.925.3780
specialcrops.mb.ca

CONTACT INFO

Cereals Canada
604-167 Lombard Avenue
Winnipeg, MB R3B 0V3
Phone: 204.942.2166
Email: info@cerealscanada.ca
cerealscanada.ca

Alberta Wheat Commission
#200, 6815-8th Street NE
Calgary, AB T2E 7H7
Phone: 403.717.3711
Toll-free: 1.855.917.3711
albertawheat.com

BC Grain Producers Association
Box 6004
Fort St. John, BC V1J 4H6
Phone: 250.785.5774
Toll-free: 1.866.716.7179
Email: info@bcgrain.com
bcgrain.com

Manitoba Wheat and Barley Growers Association
38-4th Avenue NE
Box 2280
Carman, MB R0G 0J0
Phone: 204.750.2656
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mbwheatandbarley.ca

Western Canadian Wheat Growers
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Saskatoon, SK S7H 5H9
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Ottawa, ON K1R 7S8
Phone: 613.233.9954
Email: president@ggc-pgc.ca
ggc-pgc.ca

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albertabarley.com

SaskBarley Development Commission
Bay 6A-3602 Taylor Street East
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info@saskbarleycommission.com
saskbarleycommission.com

Prairie Oat Growers Association
Box 20106
Regina, SK S4P 4J7
Phone: 306.530.8545
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Manitoba Corn Growers Association
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38-4th Avenue NE
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Saskatchewan Flax Development Commission
A5A-116-103rd Street East
Saskatoon, SK S7N 1Y7
Phone: 306.664.1901
Email: saskflax@saskflax.com
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Flax Council of Canada
465-167 Lombard Avenue
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Phone: 204.982.2115
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flaxcouncil.ca

Manitoba Flax Growers Association
465-167 Lombard Avenue
Winnipeg, MB R3B 0T6
Phone: 204.982.3990
Email: mfga@mymts.net
mfga.ca

National Sunflower Association of Canada
Box 1269
Carman, MB R0G 0J0
Phone: 204.745.6776
canadasunflower.com

Saskatchewan Seed Potato Growers Association
Box 386
Outlook, SK S0L 2N0
Phone: 306.876.2078
sspga.ca

Potato Growers of Alberta
6008-46 Avenue
Taber, AB T1G 2B1
Phone: 403.223.2262
Email: pga@albertapotatoes.ca
albertapotatoes.ca

CEREAL GROWTH STAGES

LEGEND
HERBICIDE: BROADLEAF
HERBICIDE: GRASSES

Winter Wheat	Wheat	Barley	Corn	Oats	Rye	PRODUCT
•	•	•	•		•	2,4-D ESTER 700
•	•	•	•	•		BADGE®
•	•	•			•	BISON® 400 L
	•	•				BRAZEN™ II
•	•	•			•	BROMOTRIL®
•	•	•				FORCEFIGHTER® M
•	•	•		•		EMPHASIS™
	•	•				ESTEEM®
•	•	•				INVOLVE® 50 WDG
	•					LADDER ALL IN®
•	•	•		•	•	MCPA ESTER 600
	•	•				OUTSHINE®
•	•					PRIORITY®

BBCH GROWTH STAGE	Pre-Seed	Germination			Tillering				Stem Elongation							Heading		Ripening
	00	0	5	9	10–13	21	25	29	30	31	32	37	39	45		49–51	61	70–92
2,4-D ESTER 700																		
BADGE®																		
BISON® 400 L																		
BRAZEN™ II																		
BROMOTRIL®																		
FORCEFIGHTER® M																		
EMPHASIS™																		
ESTEEM®																		
INVOLVE® 50 WDG																		
LADDER ALL IN®																		
MCPA ESTER 600																		
OUTSHINE®																		
PRIORITY®																		

LEGEND
HERBICIDE INSECTICIDE FUNGICIDE

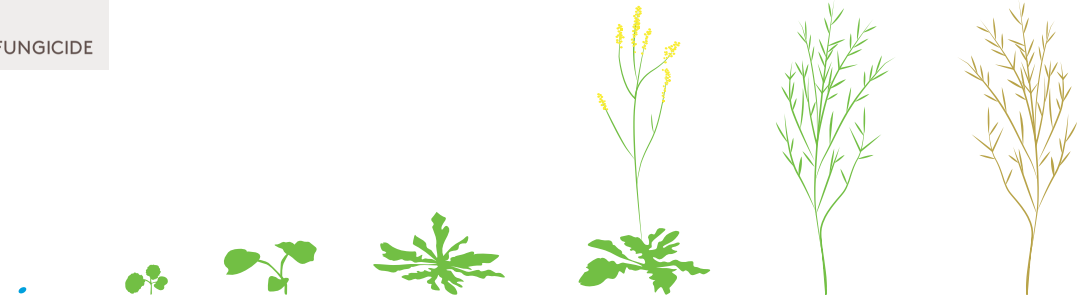
PRODUCT	Winter Wheat	Wheat	Barley	Corn	Oats	Rye
RUSH® 24		•				
SQUADRON® II		•	•			
THRASHER®		•	•			
TOPLINE®		•	•		•	
SILENCER® 120 EC†		•	•		•	•
SOMBRERO® 600 FS	•	•	•		•	
ZIVATA™		•	•	•	•	
BUMPER® 432 EC	•	•	•	•	•	•
CUSTODIA®	•	•	•			
ORIUS® 430 SC	•	•	•		•	
SORADUO™	•	•	•			
SORATEL™	•	•	•	•	•	•
TOPNOTCH™		•	•		•	•

BBCH GROWTH STAGE	Pre-Seed	Germination			Tillering				Stem Elongation						Heading		Ripening
	00	0	5	9	10–13	21	25	29	30	31	32	37	39	45	49–51	61	70–92

† Dependent on PHI

CANOLA GROWTH STAGES

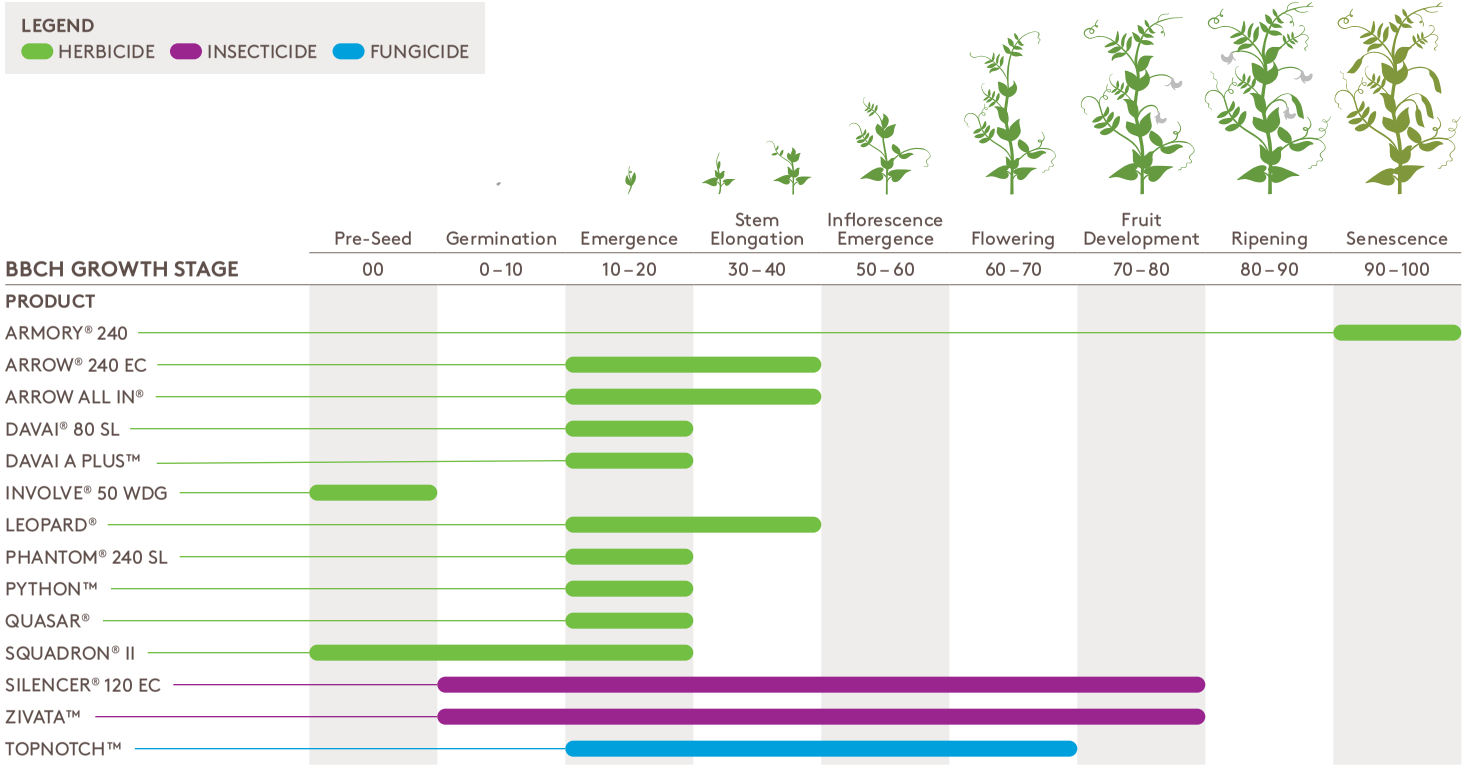
LEGEND
HERBICIDE INSECTICIDE FUNGICIDE



BBCH GROWTH STAGE	Pre-Seed	Germination	Leaf Development	Tillering	Stem Elongation	Inflorescence Emergence	Flowering	Podding	Ripening	Senescence
	00	0 – 9	10 – 19	20 – 29	30 – 39	50 – 59	60 – 69	70 – 79	80 – 89	90 – 99
PRODUCT										
ARMORY® 240										●
ARROW® 240 EC		●	●	●	●					
ARROW ALL IN®		●	●	●	●					
EMPHASIS™	●									
LEOPARD®		●	●	●	●					
SILENCER® 120 EC†		●	●	●	●	●	●	●	●	
SOMBRERO® 600 FS	●									
ZIVATA™		●	●	●	●	●	●	●	●	
BUMPER® 432 EC			●	●	●					
SORATEL™							●			

†Dependent on PHI (7 days)

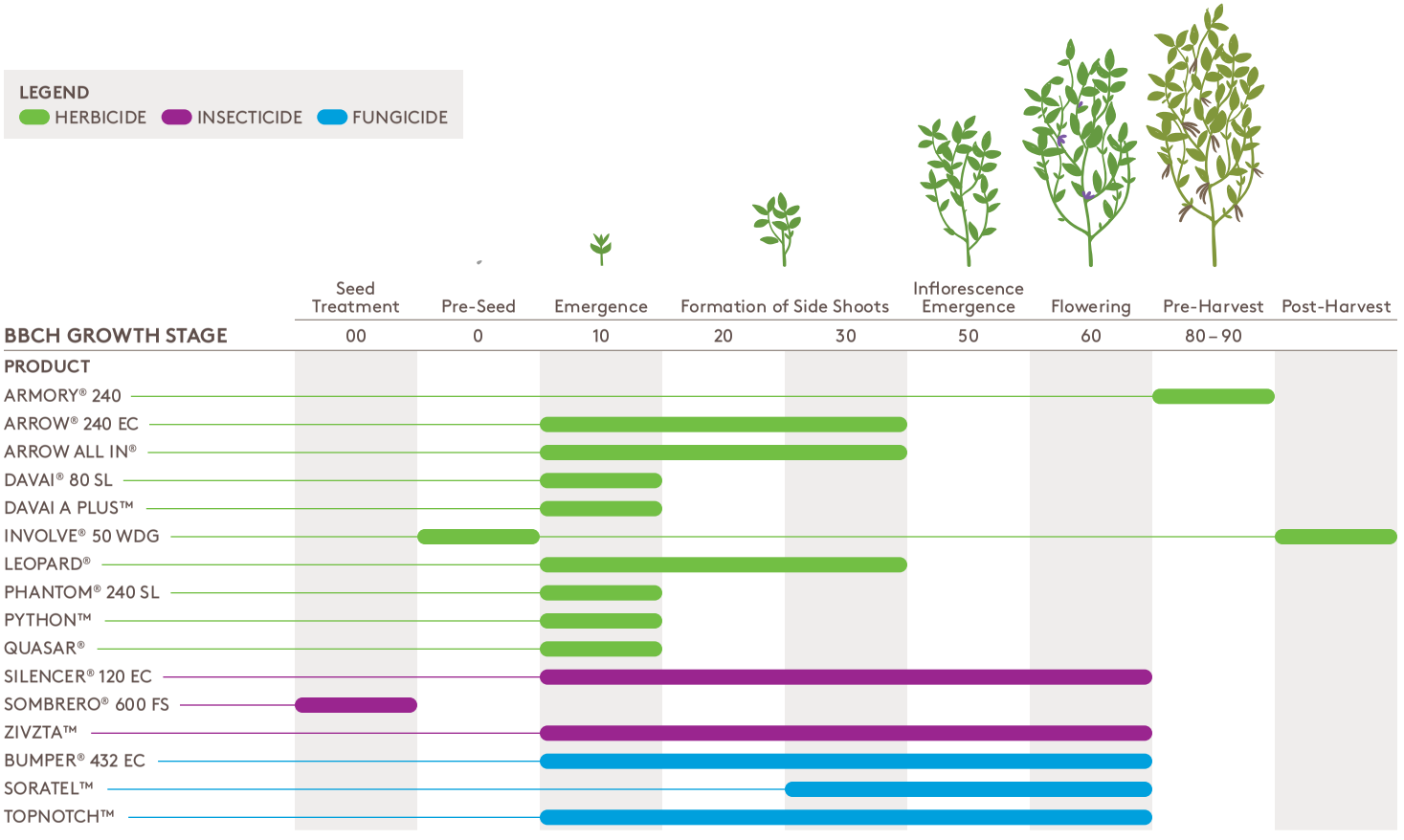
PEA GROWTH STAGES



POTATO GROWTH STAGES

LEGEND
HERBICIDE INSECTICIDE FUNGICIDE

	Pre-Seed	Seedling Pre-Emergence	Early Post-Emergence	Leaf Development	Tuber Initiation	Tuber Number Set	Flowering	Senescence Begins	Potato Harvest
BBCH GROWTH STAGE		00	10	20	40	50	60	90	99
PRODUCT									
ARROW® 240 EC Open crop stage 60 days before harvest			■	■	■				
ARROW ALL IN® Open crop stage 60 days before harvest			■	■	■				
ARMORY® 240 Potato vine killing 14 days before harvest								■	
SQUADRON® II Pre-emergence, early post-emergence (less than 10 cm high) 60 days before harvest		■	■	■					
CORMORAN® Appropriate stage of pest 7 days before harvest			■	■	■	■	■	■	
SILENCER® 120 EC Appropriate stage of pest 7 days before harvest		■	■	■	■	■	■	■	
ZIVATA™ Appropriate stage of pest 7 days before harvest		■	■	■	■	■	■	■	


LEGEND
HERBICIDE
INSECTICIDE
FUNGICIDE
Seed Treatment
Pre-Seed
Emergence
Formation of Side Shoots
Inflorescence Emergence
Flowering
Pre-Harvest
Post-Harvest
BBCH GROWTH STAGE
00
0
10
20
30
50
60
80 – 90
PRODUCT
ARMORY® 240
ARROW® 240 EC
ARROW ALL IN®
DAVAI® 80 SL
DAVAI A PLUS™
INVOLVE® 50 WDG
LEOPARD®
PHANTOM® 240 SL
PYTHON™
QUASAR®
SILENCER® 120 EC
SOMBRERO® 600 FS
ZIVZTA™
BUMPER® 432 EC
SORATEL™
TOPNOTCH™

“Offering customized solutions keeps things simple. No complicated programs or bundles — just clean fields and healthy crops.

Neil Abrahamson
Area Business Manager, Central Saskatchewan & Manitoba Parkland

Where has all the innovation gone?

While many crop protection companies have turned their attention to the development of seed technologies and collecting "big data", only ADAMA remains unapologetically committed to providing the kind of innovative crop protection solutions Canadian growers need today.

WE ARE **A**gile **I**nnovation

Filling the innovation void with unique mixtures and formulations.

WE ARE **A**ctive **I**ngredients

Leveraging the world's largest library of actives to speed up the pace of innovation.

WE ARE **A**ll About **I**nput

Listening to growers to ensure we're answering their greatest needs.

WE ARE **A**gri-Retail **I**nclusive

Partnering with retailers to deliver greater value to them and their customers.

WE ARE

All In on you

ADAMA

How can you inspire more innovation? Simply tell your ADAMA representative what you're looking for or visit **ADAMA.COM**

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