Vegetation Management Guide

The Professional’s Choice for Stewardship, Support and Innovation.
Leaders in vegetation management for more than 50 years, Corteva Agriscience™ is committed to delivering effective solutions to professional vegetation managers for use on utility, roadside, rail and bareground rights-of-way.

Our dedicated industrial vegetation management specialists ensure you have the support you need to carry out your vegetation management programs and our product solutions deliver industry leading results.

As a long-standing industry supporter, we take great pride in continuing to be your trusted partner every step of the way.

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Corteva Agriscience: Total Portfolio Solutions

Whether it’s weeds, brush, trees or non-selective control you are looking to achieve, Corteva Agriscience has a total portfolio solution to fit your needs.
ClearView™ herbicide is the industry standard selective herbicide for the professional vegetation manager, delivering consistent, high-performing, extended broadleaf weed and shrub control with flexible rates.

WHY USE CLEARVIEW?
• High performing and consistent.
  – Extended, selective control of broadleaf weeds on Canadian rights-of-way.
  – Controls 65 weed and brush species including Canada thistle, wild parsnip, baby’s breath, knapweed, and hawkweed.
• Flexible.
  – Multiple labeled rates for flexibility in application.
  – Use alone or in combination with other products for background control.
  – Formulated as a convenient water-dispersible granule, with low use rates.
• Peace of mind.
  – No grazing restrictions for livestock or wildlife.
  – Can be applied to the dripline of desirable trees.
  – Controls broadleaf weeds and brush without harming grass.

WEEDS CONTROLLED
• Absinth wormwood
• Baby’s breath
• Ball mustard
• Black henbane
• Bluebur
• Brown knapweed
• Canada fleabane
• Canada goldenrod¹
• Canada thistle
• Chickweed
• Clover (red, white)
• Common groundsel
• Common ragweed
• Corn spurry
• Cow cockle
• Cudweed
• Curly dock
• Dandelion
• Diffuse knapweed
• Field scabious
• Fireweed
• Fixweed
• Green smartweed
• Hemp-nettle
• Hoary alysum
• Horse-nettle
• Japanese knotweed
• Lady’s-thumb
• Lamb’s-quarters¹
• Musk thistle
• Narrow-leaved hawk’s-beard
• Ox-eye daisy (pre-bud)
• Perennial pepperweed
• Perennial saw thistle
• Plumeless thistle
• Prickly lettuce
• Prostrate pigweed
• Purple loosestrife
• Pussys toes
• Russian thistle¹
• Scentless chamomile
• Shepherd’s purse
• Spotted knapweed
• Stinkweed
• Stork’s-bill
• Sweet clover
• Tall buttercup
• Tansy
• Tansy buckwheat
• Volunteer alfalfa
• Volunteer canola¹
• Western ragweed
• Western white clover
• Wild buckwheat¹
• Wild carrot
• Wild mustard
• Wild parsnip
• Wild rose
• Wild strawberry
• Wild yarrow
• Yellow hawkweed
• Yellow star-thistle

¹Suppression
²Non ALS resistant biotypes
³All varieties except ALS resistant canola

ClearView™ herbicide has multiple rate structures on the label, allowing you the flexibility to choose the most suitable rate to fit your needs. 230 g/ha is the highest labelled rate; it will provide the most effective, longest lasting control. However the mid-rate of 170 g/ha is also very effective. One case will treat 16 ha at the 230 g/ha rate, or 21.6 ha at the 170 g/ha rate.

ClearView requires the addition of Gateway™ adjuvant at 0.2% v/v.

Individual plant applications: 2.3 g of ClearView, 20 mL of surfactant, in 10 L of water. Thoroughly wet, but not to the point of runoff.

• Water volume:
  – Broadcast: Apply in a minimum of 200 L/ha total solution.

When to apply
• Target weeds and shrubs will be controlled when they are actively growing and present at time of application.
  – Weeds: Apply to actively growing weeds, after emergence, prior to flowering.
  – Shrubs: Apply to actively growing shrubs, after full leaf expansion, but prior to the development of a waxy cuticle on the leaf of the shrubs.

Rainfast
2 hours

 Bareground
• Labelled tank mixes: VF480™, glyphosate and Arsenal herbicides
• Other tank mixes, such as OcTTain™ XL, Torpedo™, EsplAnade and LongRun™ herbicides are supported under the PMRA tank-mix policy. Please contact your Corteva Agriscience™ representative.

Mixing instructions
1. Fill the spray tank ¾ full of clean water.
2. Add the required amount of ClearView herbicide with the agitation running.
3. Add Gateway at 0.2% v/v or 2 L/1,000 L of spray solution.
4. Some tank mixes are designed to pre-slurry with water. Thoroughly wet, but not to the point of runoff. Pre-slurrying with water may be necessary where there is little or no agitation, or an injection system is being used.
5. Add antifoaming agent such as Halt.

Grazing
There is no grazing restriction on livestock or wildlife grazing treated areas.

Optimizing performance
• Apply to actively growing weeds and shrubs.
• Avoid applying to plants under stress.
• Pre-slurrying ClearView is recommended.

Tree safety
ClearView™ herbicide should NOT be used over the top of desirable trees. Application may be made up to the drip line (outermost edge of the branches) of desirable trees. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through root suckers.

Please refer to Tree Safety, page 32 for additional information.

1. Fill the spray tank ¾ full of clean water.
2. Add the required amount of ClearView herbicide with the agitation running.
3. Add Gateway at 0.2% v/v or 2 L/1,000 L of spray solution.
4. Add Antifoaming agent such as Halt.

Don’t apply to actively growing weeds or shrubs. Avoid applying to plants under stress.

Pre-slurrying ClearView is recommended.

ClearView™ herbicide is the industry standard selective herbicide for the professional vegetation manager, delivering consistent, high-performing, extended broadleaf weed and shrub control with flexible rates.
Lontrel™ XC herbicide provide professional vegetation managers with excellent control of Canada thistle and other broadleaf weeds in close proximity to most tree species.

WHY USE LONTREL XC?

• **Performance.** Control of tough broadleaf weeds such as Canada thistle.
• **Selective.** Targeted applications allow for control of undesirable species while being safe to grass and other desirable vegetation.

WEEDS CONTROLLED

- Alsike clover
- Canada thistle
- Common groundsel
- Common ragweed
- Kudzu
- Ox-eye daisy
- Perennial sow thistle
- Scentsless chamomile
- Sheep sorrel
- Spotted knapweed
- Vetch
- Volunteer alfalfa
- Wild buckwheat

USE GUIDELINE

Rates and packaging

- Lontrel XC is packaged in 4 x 2.67 L jugs.
- Apply Lontrel XC at 0.25-0.50 L/ha depending on weeds present and level of Canada thistle control required. Refer to the Weeds Controlled table on the product label for appropriate application rate.
- For best results, apply in 200 L/ha total spray solution.

When to apply

- Apply to target weeds when they are actively growing.
- Only weeds present at the time of application will be controlled.

Rainfast

2 hours

Optimizing performance

- Apply to actively growing weeds. Avoid applying to plants under stress.
- Applications of Lontrel XC should be made when Canada thistle, perennial sow thistle and scentsless chamomile are in the rosette to pre-bud stage of growth.
- Best results are obtained when Canada thistle is actively growing and soil moisture is adequate for rapid growth.
- Under dry soil conditions and poor growing conditions, Canada thistle control may be severely reduced.

Grazing

- There is no restriction for livestock grazing treated areas.

Milestone™ herbicide for the professional vegetation manager delivers highly selective control of invasive broadleaf weed species with low use rates, tank-mix flexibility and a liquid formulation.

WHY USE MILESTONE?

• **Invasive weed control.** Controls a wide range of invasive plants and broadleaf weeds.
• **Selective.** When applied at recommended rates, provides effective control of labeled weeds and does not harm grass and desirable plant species.
• **Tank mixability.** Excellent tank mix partner with Torpedo™, EsplAnade, Arsenal, LongRun™, or VP480™ herbicides for total vegetation control.

WEEDS CONTROLLED

- Absinth wormwood
- Canada fleabane
- Canada thistle
- Canadian goldenrod
- Common ragweed
- Common tansy
- Common yarrow
- Cudweed
- Curly dock
- Dandelion
- Diffuse knapweed
- Fuller’s teasel
- Hairy buttercup
- Hairy fleabane
- Horsenettle
- Musk or nodding thistle
- Ox-eye daisy
- Perennial sow thistle
- Plumeless thistle
- Prickly lettuce
- Scentless chamomile
- Spotted knapweed
- Tall buttercup
- Tall ironweed
- Tansy ragwort
- Tropical soda apple
- Tropic croton
- Western ragweed
- Yellow star-thistle
- Scentless chamomile
- Spotted knapweed
- Tall buttercup
- Tall ironweed
- Tansy ragwort
- Tropical soda apple
- Tropic croton
- Western ragweed
- Yellow star-thistle

*Suppression
1 Apply to plants in the bolting stage of development.
2 Apply to plants in the pre-bud stages of development.
3 Apply to plants at the rosette through to bolting growth stage.
Weed Control

WHY USE OCTTAIN XL?

• Performance. Controls a wide range of broadleaf weeds, including Group 2 and 9 resistant kochia up to 50 cm in height.
• Flexible. Can be used as a stand-alone treatment, or tank mixed with products such as ClearView™, Milestone, Torpedo and VP480 herbicides.
• Economical. Cost-effective weed control for vegetation managers.

WEEDS CONTROLLED

- Bluebur
- Blue lettuce
- Burdock
- Canola (all varieties)
- Cleavers
- Cocklebur
- Dandelion
- Dock
- Dog mustard
- Field bindweed
- Field horsetail
- Field peppercress
- Flixweed
- Goat’s-beard
- Gumweed
- Hairy galinsoga
- Hedgethief
- Hemp-nettle
- Hoary cress
- Hawkweed
- Horseweed
- Knotweed
- Lamb’s-quarters
- Mustards (except green & grey tansy)
- Oak-leaved goosefoot
- Oakleaf plantain
- Pincly lettuce
- Ragweed
- Redroot pigweed
- Round-leaved mallow
- Russian thistle
- Shepherd’s purse
- Smartweed
- Stinkweed
- Stork’s-bill
- Tansy mustard
- Tansy mustard
- Tartary buckwheat
- Vetch
- Volunteer flax
- Volunteer sunflower
- Wild buckwheat
- Wild radish
- Wild buckwheat

WEEDS SUPPRESSED

- Annual sow thistle
- Canada thistle
- Chickweed
- Perennial sow thistle
- Redroot pigweed

MILESTONE™ Weed Control

WHY USE OCTTAIN XL?

• Performance. Controls a wide range of broadleaf weeds, including Group 2 and 9 resistant kochia up to 50 cm in height, with tank mix flexibility for roadside or bareground applications.

WHEN TO APPLY

Apply to target weeds when they are actively growing.
Only weeds present at the time of application will be controlled.
Apply to actively growing weeds, after emergence, prior to flowering.

Rainfast

2 hours

Bareground

• Tank mix Milestone with VP480™, Arsenal, EsplAnade or LongRun™ herbicides for applications where total vegetation control is desired. Refer to product label for rates.
• Other tank mixes, such as OcTTain™ XL and Torpedo™ herbicides, can be supported under the PMRA tank-mix policy. Please contact your Corteva Agriscience™ representative.

Tank mixes

• Registered tank mix with 2,4-D for enhanced spectrum of control
• Milestone at 0.5 L/ha tank mixed with 2,4-D Amine will provide activity on the following additional species:
  - Annual sow thistle
  - Bluebur
  - Blue lettuce
  - Burdock (<4 leaf)
  - Bull thistle
  - Buttercup
  - Common plantain
  - Common tansy
  - Curled dock (<4 leaf)
  - Dandelion
  - Docks
  - Dog mustard
  - Field bindweed
  - Field horsetail
  - Field peppercress
  - Flixweed
  - Goat’s-beard
  - Gumweed
  - Hawkweed
  - Haary cress
  - Hoary cress
  - Peppergrass
  - Perennial sow thistle
  - Ragweed
  - Stinging nettle
  - Sweet clover
  - Perennial
  - Sow thistle
  - Ragweed
  - Stinging nettle
  - Sweet clover

Optimizing performance

Apply to actively growing weeds. Avoid applying to plants under stress.

Grazing

There is no restriction on livestock and wildlife grazing treated areas.

Tree safety

Milestone should NOT be used over the top of desirable trees. Application may be made up to the drip line (outermost edge of the branches) of desirable trees. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through layering.

Please refer to Tree Safety, page 32 for additional information.

DRIP LINE

NO SPRAY

DRIP LINE

3 Top growth control only
4 Spring rosettes
5 Including Group 2 and 9 resistant biotypes
6 1- to 6-leaf
7 1. Top growth control only
2. Spring rosettes
3. Including Group 2 and 9 resistant biotypes
4. 1- to 6-leaf
**OCTTAIN™ XL SIGHTLINE™**

**Weed Control**

**WHY USE SIGHTLINE?**

- **Broad spectrum.** The widest spectrum for extended control of broadleaf weeds, invasive plants and shrubs.
- **Kochia control.** Exceptional post-emergent control of kochia, including ALS and glyphosate resistant biotypes.
- **Bareground.** Can be tank mixed with VP480 and Torpedo herbicides or other non-selective products to achieve total vegetation control.
- **Multiple modes of action.** Three different active ingredients and two modes of action in one box.

**WEEDS CONTROLLED**

- Absinth wormwood
- Baby’s breath
- Ball mustard
- Black henbane
- Bluebur
- Brown knapweed
- Canada fleabane
- Canada goldenrods
- Canada thistle
- Chickweed
- Clover (red, white)
- Common groundsel
- Common ragweed
- Common tansy
- Corn spurry
- Cow cockle
- Cudweed
- Curly dock
- Dandelion
- Diffuse knapweed
- Field scabious
- Flixweed
- Green smartweed
- Hemp-nettle
- Hoary alyssum
- Horsenettle
- Japanese knotweed
- Kochia
- Lady’s-thumb
- Lamb’s-quarters
- Musk thistle
- Narrow-leaved hawk’s-beard
- Ox-eye daisy (pre-bud)
- Pasture sage
- Perennial pepperweed
- Perennial sow thistle
- Plumeless thistle
- Prairie wild rose
- Prickly lettuce
- Prostrate pigweed
- Purple loosestrife
- Puslytoes
- Russian thistle
- Scentless chamomile
- Shepherd’s purse
- Spotted knapweed
- Stinkweed
- Stork’s-bill
- Sweet clover
- Tall buttercup
- Tartary buckwheat
- Volunteer alfalfa
- Volunteer canola
- Western ragweed
- Western snowberry (buckbrush)
- Wild buckwheat
- Wild carrot
- Wild mustard
- Wild parsnip
- Wild rose
- Wild strawberry
- Yarrow
- Yellow hawkweed
- Yellow star-thistle

**USE GUIDELINE**

**Rates and packaging**

- 2 x 9 L case (5.8 to 11.25 ha/case).
- 36 cases per pallet.

**Broadcast foliar applications**

- 1.6 L/ha for control of smaller kochia and other broadleaf weeds in non-crop areas.
- 3.1 L/ha for control of larger kochia (up to 50 cm) and other broadleaf weeds in non-crop areas.

**Spot applications with hose and handgun or backpack sprayers**

- 16-31 mL in 10 L of spray solution.
- 1,600-3,100 mL in 1,000 L of spray solution.

**When to apply**

- When weeds are actively growing, optimally between 12 C and 24 C.
- Control will be reduced if frost occurs three days before or after application.
- When applying to large kochia (20-50 cm) use the 3.1 L/ha rate.

**Rainfast**

1 hour

**Tank mixes**

- For bareground control, tank mixes such as VP480™, Torpedo™, Arsenal, EsplAnade and LongRun™ herbicides are supported in non-cropland areas under the PMRA tank mix policy. Please contact your Corteva Agriscience™ representative.

**Mixing instructions**

1. Fill the spray tank with 1⁄2 to 3⁄4 of the required amount of water.
2. Continue agitation throughout the mixing and spraying procedure.
3. Add any required water conditioners.
4. Add any tank-mix partners that are a dry formulation.
5. Add any tank-mix partners that are liquid formulation.
6. Add the required amount of OcTTain™ XL.
7. Add any required adjuvant or surfactants.
8. Complete filling the sprayer tank with water.

Note: When tank mixing with Torpedo, the addition of Agral® 90 surfactant at 0.25% to 1% or equivalent non-ionic surfactant is required. If mixing issues are experienced, higher rates of 0.5% to 1% have been found to be beneficial in keeping multiple products in solution. Note: Gateway™ or Hasten adjuvants are not recommended when mixing Torpedo with OcTTain XL Agral 90 must be used.

**Grazing**

- There is no restriction on livestock and wildlife grazing treated areas.

**Re-entry intervals for applicators applying in non-crop areas**

- Re-entry interval for applicators – Until sprays have dried.

**WHY USE SIGHTLINE?**

- Broad spectrum. The widest spectrum for extended control of broadleaf weeds, invasive plants and shrubs.
- Kochia control. Exceptional post-emergent control of kochia, including ALS and glyphosate resistant biotypes.
- Bareground. Can be tank mixed with VP480 and Torpedo herbicides or other non-selective products to achieve total vegetation control.
- Multiple modes of action. Three different active ingredients and two modes of action in one box.
### Mixing instructions

Use 135-230 g/ha Sightline A herbicide tank mixed with 0.42-0.84 L/ha Sightline B herbicide. Note that the highest rate of Sightline B (0.84 L/ha) is required for control of kochia (2- to 8-leaf stage).

1. Fill the spray tank 3⁄4 full of clean water.
2. Add the required amount of Sightline A herbicide with the agitation running. Pre-slurrying with water may be necessary where there is little or no agitation, or an injection system is being used.
3. Add the required amount of Sightline B herbicide with moderate agitation running.
4. Add Gateway at 0.2% v/v or 2 L/1,000 L of spray solution.
5. Add antifoaming agent, such as Halt, if required.

Note: When tank mixing with Torpedo herbicide, the addition of Agral® 90 surfactant at 0.25% to 1% or equivalent non-ionic surfactant is required. If mixing issues are experienced, higher rates of 0.5% to 1.0% have been found to be beneficial in keeping multiple products in solution. Note: Gateway or Hasten adjuvants are not recommended when mixing Torpedo with Sightline. Agral 90 must be used.

### Optimizing performance

- **Apply to actively growing weeds and shrubs. Avoid applying to plants under stress.**
- **Kochia:** For longer lasting results on bareground sites, apply when the majority of the population has emerged. Plants not emerged at the time of application will not be controlled.
- Pre-slurrying Sightline A is recommended.

### Tree safety

Sightline should NOT be used over the top of desirable trees. Application may be made up to the drip line (outermost edge of the branches) of desirable trees. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through root shoots.

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**USE GUIDELINE**

**Rates and packaging**
- One case treats 8 ha or 20 ac at the highest rate.
- Case components: Sightline™ herbicide A – 1.84 kg, Sightline B – 6.72 L.
- Sightline requires the addition of Gateway™ adjuvant at 0.2% v/v.
- Broadcast applications: Apply in a minimum of 200 L/ha total solution.
- Individual plant applications: 2.3 g of Sightline A, 8.4 mL of Sightline B, and 20 mL of surfactant in 10 L of water. Thoroughly wet, but not to the point of runoff.

**When to apply**
- **Weeds:** Apply to actively growing weeds, after emergence, prior to flowering.
- **Shrubs:** Apply to actively growing shrubs, after full leaf expansion, but prior to the development of a waxy cuticle on the leaf of the shrubs.
- **Kochia:** For best results, apply to young plants once the majority of the kochia population has emerged, prior to seed set.

**Rainfast**
- 2 hours

**Bareground**
- Tank mix Sightline with VP480™ herbicide or another glyphosate for applications where total vegetation control is desired. Refer to product label for rates.
- Other tank mixes, such as Torpedo®, Arsenal, EsplAnade or LongRun™ herbicides are supported under the PMRA tank-mix policy. Please contact your Corteva Agriscience® representative.

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Please refer to Tree Safety, page 32 for additional information.
Tordon™ 22K herbicide for the professional vegetation manager provides the longest lasting control of deep-rooted, hard-to-control leafy spurge and toadflax.

WHY USE TORDON 22K?
• Extended control. Provides the longest lasting control of leafy spurge and toadflax.
• Easy to use. Liquid formulation packaged in convenient 10 L jugs.

WEEDS CONTROLLED
• Canada thistle
• diffuse knapweed
• Field bindweed
• Leafy spurge
• Pasture sage
• Perennial sow thistle
• Poverty weed
• Russian knapweed
• Scentless chamomile
• Spotted knapweed
• Toadflax

USE GUIDELINE
Rates and packaging
• Tordon 22K is packaged in 2 x 10 L jugs.
• Apply Tordon 22K at 1.1-4.5 L/ha. Use enough water to wet the weeds without run-off; 400-800 L of spray per treated hectare is usually required.
• For the control of leafy spurge, field bindweed and toadflax only, a spot treatment rate of 90 mL/100 m² may be used, provided no more than 50% of a hectare is treated.

When to apply
• Apply to target weeds when they are actively growing.
• Only weeds present at the time of application will be controlled.

Rainfast
2 hours

Optimizing performance
• Do not apply to soils that are very permeable (textures of sandy loam to sand) throughout the entire profile and that also have an underlying shallow aquifer.
• Do not treat areas intended to be used for cultivated sensitive crops or other desirable plants in sequential years. Clippings from grass or crops that have been treated with Tordon 22K should not be used for composting or mulching, nor should the manure from animals grazing treated areas or fed treated forage be used around susceptible plants.
• Avoid application when heavy rain is forecast.

Grazing
• There is no restriction for livestock grazing treated areas.

Tree safety
Tordon 22K should NOT be used over the top of desirable trees. Application should remain 1.5x the height of off-target trees away. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through layering.

Aspect™ herbicide provides vegetation managers with extended control of woody species and broadleaf weeds.

WHY USE ASPECT HERBICIDE?
• Trusted results. Consistent, reliable extended control of woody species and broadleaf weeds such as birch, poplar, dandelion, and leafy spurge on rail, roadside and utility corridors.
• Selective. Controls woody species and broadleaf weeds without harming grass.

BRUSH AND BROADLEAF WEED SPECIES CONTROLLED
Brush species
• Alder
• Birch
• Cedar
• Maple
• Pine
• Poplar
• Spruce and other species

Broadleaf weeds
• Burdock
• Canada thistle
• Common ragweed
• Common yarrow
• Dandelion
• Dock
• Fleabane
• Goldenrod
• Leafy spurge
• Plantain
• Prickly lettuce
• Sweet and red clover
• Toadflax
• Vetch
• Wild carrot

USE GUIDELINE
Rates and packaging
• Aspect is packaged in 2 x 10 L jugs.
• For broadleaf weed control, apply 2.47-4.67 L/ha Aspect in a minimum of 200 L total spray solution.
• For woody plant control, apply up to 11.5 L/ha Aspect in a minimum of 200 L total spray solution.
• Directed stem applications: For control of woody plants, use 6.67 L/ha Aspect herbicide in 1,000 L water and apply to woody plants after the foliage is fully developed. Thoroughly and uniformly wet to the point of runoff.
• For increased efficacy and faster plant uptake for tough to control species such as leafy spurge, toadflax and coniferous trees such as spruce, use Gateway™ adjuvant at a rate of 0.25-0.375% v/v with Aspect.
• Refer to the product label for additional product information.

When to apply
• Apply to target weeds when they are actively growing.
• Only weeds present at the time of application will be controlled.

Rainfast
2 hours

Optimizing performance
• Do not apply to soils that are very permeable (textures of sandy loam to sand) throughout the entire profile and that also have an underlying shallow aquifer.
• Do not treat areas intended to be used for cultivated sensitive crops or other desirable plants in sequential years. Clippings from grass or crops that have been treated with Aspect should not be used for composting or mulching, nor should the manure from animals grazing treated areas or fed treated forage be used around susceptible plants.
• Avoid application when heavy rain is forecast.

Grazing
• There is no restriction for livestock grazing treated areas.

Tree safety
Aspect™ herbicide should NOT be used over the top of desirable trees. Application should remain 1.5x the height of off-target trees away. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through layering.

Please refer to Tree Safety, page 32 for additional information.
ClearView™ Brush

**HERBICIDE**

ClearView™ Brush herbicide provides elite control of the broadest spectrum of trees, brush, broadleaf weeds and can be applied to the dripline of desirable trees.

**WHY USE CLEARVIEW BRUSH?**

- **Elite performance.** Provides broad-spectrum control of broad leaf weeds, woody species and brush, including conifers as well as alder, ash, birch, poplar and willow.
- **Dripline safety.** Apply to the dripline of desirable tree species without risking root uptake or damage.

**WEEDS CONTROLLED**

**Broadleaf weed species**
- Absinth wormwood
- Ball mustard
- Bluebur
- Burdock
- Canada fleabane
- Canada goldenrod
- Canada thistle
- Chickweed
- Chicory
- Clover (red, white)
- Common groundsel
- Common ragweed
- Corn spurry
- Cow cockle
- Cudweed
- Curly dock
- Dandelion
- Field bindweed
- Field scabious
- Fireweed
- Fixiweed
- Green smartweed
- Hemp-nettle
- Horsenettle
- Lady’s-thumb
- Lamb’s-quarters
- Musk thistle
- Narrow-leaved hawk’s-beard
- Ox-eye daisy (pre-bud)
- Perennial pepperweed
- Perennial sow thistle
- Plumeless thistle
- Pinkly lettuce
- Prostrate pigweed
- Pussytoes
- Ragweed
- Russian thistle
- Scentless chamomile
- Shepherd’s purse
- Smartweed
- Smooth bedstraw
- Spotted knapweed
- Stinkweed
- Stark’s-bill
- Sweet clover
- Tall buttercup
- Tansy
- Tartary buckwheat
- Vetch
- Volunteer alfalfa
- Volunteer canola
- Western ragweed
- Western snowberry (buckbush)
- Wild buckwheat
- Wild lettuce
- Wild mustard
- Wild strawberry
- Yarrow
- Yellow star-thistle

**1 Suppression.**

**2 Non ALS resistant biotypes.**

**3 All varieties except ALS resistant canola.**

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**When to apply**

- Apply to target weeds and trees when they are actively growing.
- Only weeds and trees present at the time of application will be controlled.
  - **Weeds:** Apply to actively growing weeds, after emergence, prior to flowering.
  - **Trees:** Apply to actively growing shrubs, after full leaf expansion, but prior to the development of a waxy cuticle on the leaf of the shrubs.

**Rainfast**

- 2 hours

**Optimizing performance**

- Apply to actively growing weeds and shrubs. Avoid applying to plants under stress.
- For faster breakdown of coniferous species, use Gateway™ adjuvant at 0.25% by volume (250 mL/100 L of water). For maximum rainfastness, increase the rate to 0.375% (375 mL/100 L of water). Gateway should be added after the herbicide is thoroughly mixed.
- Do not treat areas intended to be used for cultivated sensitive crops or other desirable plants in sequential years. Clippings from grass or crops that have been treated with Aspect™ herbicide should not be used for composting or mulching, nor should the manure from animals grazing treated areas or feed treated forage be used around susceptible plants.
- For control of leafy spurge and toadflax under less-than-optimium growing conditions, add Gateway adjuvant at the rate of 0.25% by volume.

**Tree safety**

- Aspect should NOT be used over the top of desirable trees. Applications should remain 1.5x the height of off target trees away. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through layering.

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**USE GUIDELINE**

**Rates and packaging**
- This co-package contains:
  - ClearView™ herbicide: 0.92 kg
  - Garlon™ XRT herbicide (2 x 10 L cases)
- One case treats 4 ha or 10 ac at the highest labelled rates.
- Requires the addition of Gateway™ adjuvant at 0.25%-0.375% v/v.
- Use 135-230 g/ha of ClearView herbicide tank mixed with 2.5-5 L of Garlon XRT herbicide.
- For control of black spruce, use 230 g of ClearView herbicide and 4-5 L of Garlon XRT.
- Water volume:
  - 1,000 L/ha for hose and handgun applications
  - 400 L/ha for broadcast applications

**Application methods**
- Single stem foliar

For control of woody plants up to 2.5 m in height, use Garlon XRT herbicide at rates of 2.5-5 L tank mixed with ClearView at 135-230 g/ha in enough water to make 1,000 L of spray solution. Use the higher rate for late summer application when growth rates are reduced or when hard-to-control species are present. Spray brush to the point of runoff. Coverage should be thorough to wet all foliage.

**Optimizing performance**
- For best results, apply to actively growing weeds, shrubs and trees. Avoid applying to plants under stress.
- Pre-slurrying ClearView is recommended.
- Use higher rates when hard-to-control species such as ash, chokecherry, elm, maple (other than vine or big leaf), oak or pine are present. If lower rates are used on hard-to-control species, resprouting may occur and re-treatment may be necessary the following year.
- Avoid applications in hot temperatures. If temperatures reach 28 C or higher, cease applications for the day.

**Tree safety**
ClearView Brush should NOT be used over the top of desirable trees. Application may be made up to the drip line (outmost edge of the branches) of desirable trees. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through root shoots.

**TREES CONTROLLED**

**Woody species**
- Alder
- Ash
- Aspen
- Basswood
- Beech
- Birch
- Blackberry
- Buckthorn
- Cherry
- Chokecherry
- Cottonwood
- Dogwood
- Elderberry
- Elm
- Hawthorn
- Hickory
- Hap-hornbeam
- Honey locust
- Locust
- Maples
- Mulberry
- Oaks
- Poison oak
- Pines
- Pea
- Poplar
- Red maple
- Raspberry
- Sassayas
- Spruce
- Sumac
- Tamarack
- Tamarack
- Wild rose
- Willow
- Witch hazel

*These species may need to be re-treated the following year.

**When to apply**
- Apply to target weeds, shrubs and trees when they are actively growing.
- Only weeds, shrubs and trees present at the time of application will be controlled.
  - **Weeds:** Apply to actively growing weeds, after emergence, prior to flowering.
  - **Shrubs:** Apply to actively growing shrubs, after full leaf expansion, but prior to the development of a waxy cuticle on the leaf of the shrubs.
  - **Trees:** Apply after full leafout to actively growing trees, prior to autumn colouration.

**Rainfast**
- 2 hours

**Mixing instructions**
1. Fill the spray tank 3⁄4 full of clean water.
2. Add the required amount of ClearView herbicide with the agitation running.
3. Pre-slurrying with water may be necessary where there is little or no agitation, or an injection system is being used, or where herbicide is first added to a tank other than the spray tank.
4. Add the required amount of Garlon XRT herbicide with the agitation running.
5. Add the required amount of Gateway adjuvant at 0.25%-0.375% by volume.
6. Add antifoaming agent, such as Halt, if required.
7. Add water to make up to 1,000 L of spray solution.

Please refer to Tree Safety, page 32 for additional information.
Garlon™ RTU herbicide offers convenience and performance with the industry’s only ready-to-use herbicide.

**WHY USE GARLON RTU?**

- **Convenient, simple and precise.**
  - Year-round control of more than 30 deciduous tree species, including aspen, birch and poplar.
  - Designed for selective, direct stem application to woody species.
- **Application flexibility.**
  - Use anytime throughout the year when plants are dry.
  - Three application methods: streamline, one-sided and cut stump.
- **Ready to use.**
  - Formulated to be used right out of the container, no mixing required.

**TREES CONTROLLED**

- Alder
- Ash
- Aspen
- Basswood
- Beech
- Birch
- Blackberry
- Buckthorn
- Cherry†
- Chokecherry†
- Cottonwood
- Dogwood
- Elderberry
- Elm†
- Hawthorn
- Hickory
- Hop-hornbeam
- Honey locust†
- Locust
- Maples
- Mulberry
- Oaks†
- Pines†
- Poplar
- Red maple†
- Sassafras
- Sumac
- Sycamore
- Tamarack
- Wild rose
- Willow
- Witch hazel

†These species may need to be re-treated the following year.

**USE GUIDELINE**

**Rates and packaging**

- Garlon RTU herbicide is packaged in 13 L jerriboxes and can be added directly to backpack sprayers.
- It is formulated to be used right out of the container. No mixing is required.
- Garlon RTU is designed for selective, direct stem application to woody species.

**Application methods**

**Streamline**

This has proven to be the fastest and most effective method of selective basal bark application. Best results are on young, actively growing stems less than 8 cm in diameter.

- Achieving complete “wrap” of the solution around the entire stem circumference is essential for effectiveness.
- Spray 30-50 cm above ground level:
  - For stems less than 8 cm basal diameter, spray a band 5 cm wide on one side of each stem.
  - For stems 8-15 cm basal diameter, spray a band 5 cm wide on two sides of each stem (two-sided streamline).
- With sufficient volume, the treated zone should widen to encircle the entire stem circumference within 30 minutes.

**Cut Stump Treatment**

This method is excellent for prevention of re-sprouting.

It also reduces the need for repeated cutting of large diameter stumps of species that sprout from the base or suck from roots. Applications may be made to both old and freshly cut stumps.

- Thoroughly wet the stump, including:
  - Cut surfaces, especially the cambium layer just inside the bark.
  - The remaining bark to the ground line, including the root collar.

**When to apply**

- Optimal results are achieved when applications are made to young, vigorously growing stems that have not developed the thicker bark characteristic of slower growing older trees.
- For best results, apply when stem and bark are dry.
- Garlon RTU can be applied at any time, including the winter months, except when snow or water prevents spraying at the ground line.
“Free water” on stems resulting from melting frost, wet snow or rain, causes emulsification and failure to penetrate bark during streamline and stump treatments. Emulsified herbicide can run down the treated stem like water, showing no evidence of “wrap.” If the wetting front formed by the oil in the bark does not wrap, then control is likely to be incomplete. Tips for best results include:

**Frost**
- If no emulsification occurs (dry frost), then the solution is working. If the oil solution does not penetrate the frost (ice), shut down the application. Watch for frost as temperature rises above 0 C and moisture appears on stems.

**Potential spray drift**
- Keep application pressure low to prevent vapour drift. Small quantities of vapour drift, which may not be visible, can seriously injure susceptible plants and sensitive non-target vegetation.

**Rain**
- Basal bark and cut stump applications cannot be made to wet stumps or emulsification may occur and the target trees will not be controlled. However, rain immediately after an application will not affect the efficacy of the product as it will have already entered the bark.

**Snow**
- When snow prevents access to ground line at the base of target trees, one-sided application should be stopped. Two-sided streamline application should be used on larger stems to ensure wrap.

**Temperature**
- Garlon™ RTU herbicide can be applied at temperatures below –10 C anytime throughout the year. However, if temperature drops too low, and coagulation begins to occur, applicators should stop operations.

**Package disposal**
- Garlon RTU containers should not be reused for any purpose. For disposal, return to Univar Environmental Sciences™ (UES) as per their instructions.
- If the cardboard shows no sign of pesticide contamination, remove the plastic bag inserts and recycle the cardboard box locally. Collect empty plastic bags together and do not triple rinse.
- Return the plastic bag inserts or the whole package to Univar Environmental Services (UES) as per their instructions by contacting a Univar representative at 1-866-572-8240.

**Grazing**
- There is no restriction on livestock grazing treated areas.

**WHY USE GARLON XRT?**
- **Selective.** Desirable species such as forbs and wild flowers return post treatment much sooner than competitive alternatives.
- **Peace of mind.** Professional Vegetation Managers can confidently apply to the outer edge of desirable trees without risking potential root uptake or damage.
- **Industry leading.** The addition of Gateway adjuvant to Garlon XRT provides superior control of deciduous brush.

**TREES AND BRUSH SPECIES CONTROLLED**
- Alder
- Ash
- Aspen
- Basswood
- Beech
- Birch
- Blackberry
- Buckthorn
- Cherry
- Chokecherry
- Cottonwood
- Elderberry
- Elm
- Hawthorn
- Hickory
- Hop-hornbeam
- Honey locust
- Locust
- Maples
- Mulberry
- Oaks
- Poison oak
- Pines
- Poplar
- Red maple
- Raspberry
- Sassafras
- Sumac
- Sycamore
- Tamarack
- Wild rose
- Willow
- Witch hazel

**BROADLEAF WEEDS CONTROLLED**
- Burdock
- Chicory
- Curled dock
- Dandelion
- Field bindweed
- Lamb’s-quarters
- Ragweed
- Smartweed
- Smooth bedstraw
- Vetch
- Wild lettuce

*These species may require treatment at the higher rate and may need to be re-treated the following year, particularly if the original treatment was made at the lower rate.*
**Torpedo™**

Torpedo™ herbicide is a resistance management rotational tool for the professional vegetation manager providing extended, pre-emergent total vegetation control for bareground applications.

**WHY USE TORPEDO?**

- **Performance.** Provides long lasting, pre-emergent control of grasses and small-seeded broadleaf weeds.
- **Resistance management tool.** A combination of two active ingredients form two unique modes of action in one granule. Controls a broad spectrum of problem and glyphosate-resistant weeds.
- **Wide application window.** Pre and early post application timing for bareground and non-crop areas.
- **Low mobility.** Low risk of off-site movement.

**WEEDS CONTROLLED**

- Canada fleabane*  
- Common lambsquarters  
- Common ragweed*  
- Common waterhemp*  
- Dandelion  
- Eastern black nightshade*  
- Green foxtail  
- Green pigweed  
- Hairy nightshade  
- Kochia*  
- Large crabgrass  
- Palmer amaranth  
- Pennsylvania smartweed  
- Redroot pigweed*  
- Velvetleaf  
- Wild buckwheat  
- Wild mustard

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*Including Group 2, 5 and/or glyphosate resistant biotypes.
LongRun™ herbicide is a broad spectrum, systemic herbicide providing season-long control of key annual and perennial broadleaf weeds and grasses for total vegetation control on bareground sites.

WHY USE LONGRUN 25 WG HERBICIDE?
• Broad spectrum. Controls many annual and perennial broadleaf weeds and grasses.
• Wide application window. Can be applied any time of the year; best results are achieved with spring application.
• Season-long control. Following a spring application, LongRun herbicide can provide season-long control of labeled broadleaf weeds and grasses.

WEEDS AND GRASSES CONTROLLED
• Grasses (pre- and post-emergent control):
  - Downy brome
  - Green foxtail
  - Annual bluegrass
  - Giant foxtail
  - Yellow foxtail
  - Rough fescue

• Broadleaf weeds:
  - Canada horseweed/
  - Wild carrot
  - Annual sowthistle
  - Mare’s tail
  - Chamomile, mayweed
  - Common mallow

Please see label for more extensive list of weeds and grasses controlled.

USE GUIDELINE
Rates and packaging
• One case treats 18 ha at the highest labelled rate (4 x 2.72 kg containers per case).
• Non-crop, bareground and IVM rate 420-580 g/ha.
• Water volume:
  - Broadcast: Apply in a minimum of 100-300 L/ha total spray solution
  - Requires 0.5-1.0 cm moisture for activation.

When to apply
• Pre-emergence
  - Apply prior to weeds emerging
• Early post emergence
  - When weeds are emerging (<5 cm)
  - Will require the addition of a non-ionic surfactant (NIS) if glyphosate is not tank mixed
  - NIS at 0.25% w/v, 150-600 L/ha spray volume
• Post emergence
  - If weeds are greater than 5 cm, or very dense, a tank-mix partner should be used in addition to Torpedo™ herbicide to control emerged weeds

Tank mixes
• Labelled tank mixes: 2,4-D Ester, Vanquish, Barvel, Tordon™ 22K, Garlon™ herbicides.
• Other tank mixes, such as ClearView™, Milestone™, Sightline™, OcTain™ XL and VR480™ herbicides can be supported under the PMRA tank-mix policy.
  - Note: Gateway™ or Hasten adjuvants are not recommended when mixing Torpedo herbicide with OcTain XL and Sightline. Agral® surfactant must be used.

Mixing instructions
1. Fill clean spray tank 1⁄2 to 2⁄3 of desired level with clean water.
2. To ensure a uniform spray mixture, pre-slurry the required amount of Torpedo herbicide with water prior to addition to the spray tank. Use a minimum of 3.8 L (1 gallon) of water per 283 g (10 oz) of Torpedo herbicide.
3. While agitating, slowly add the pre-slurried Torpedo herbicide to the spray tank. Agitation should create a rippling or rolling action on the water surface.
4. After adding Torpedo, add tank mix partner product(s) in the following order:
   (1) water soluble granules;
   (2) wettable powders;
   (3) aqueous suspensions, flowables and liquids;
   (4) emulsifiable concentrates; and
   (5) solutions.
   Allow time for complete mixing and dispersion after each addition.
5. Fill spray tank to desired level with water. Agitation should continue until all spray solution has been applied. Aggressive over-agitation may cause precipitate to form on the tank walls.
6. Mix only the amount of spray solution that can be applied the day of mixing. Torpedo herbicide should be applied within six hours of mixing.
7. If product is allowed to settle, thoroughly agitate to re-suspend the mixture before spraying.

Optimizing performance
• Avoid application to plants under stress, or when prolonged periods without moisture are forecasted.
• Do not incorporate into the soil.
VP480™ herbicide provides high performance, non-selective control for the professional vegetation manager.

WHY USE VP480?
• Reliable. Trusted non-selective control of grasses and broadleaf weeds
• Innovative formulation. Rapidly absorbed by the plant for premium grass and weed control.
• Tank mix convenience. Can be used in combination with ClearView, Milestone, Sightline, Torpedo™ herbicides and other IVM registered products for bareground applications.

WEEDS CONTROLLED
• Annual broadleaf weeds
• Annual grasses
• Perennial broadleaf weeds
• Perennial grasses and sedges

USE GUIDELINE
Rates and packaging
• VP480 is packaged in 2 x 10 L jugs and 960 L totes.
• The use of a non-ionic surfactant such as Gateway™ adjuvant at 0.25 percent by volume (0.25 litre/100 litres spray volume) provides a maximum performance for all postemergence applications.
• Water tank volume: 150-450L/ha totally spray solution.

When to apply
• For preemergence application, rainfall or irrigation is needed for herbicide activation.
• The best control is obtained when LongRun 25WG Herbicide is applied either to weeds just prior to germination or to young, actively growing weeds.
• For optimal herbicidal activity, prior to application, the bed or soil surface should be reasonably even and clear of crop and weed residue.

Tank mixes
• Tank mixes, such as ClearView™, Milestone™, Sightline™, OcTTain™ XL and VP480™ herbicides can be supported under the PMRA tank-mix policy.

Mixing instructions
1. Ensure the spray system is clean and free of residues from previous applications.
2. Fill the spray tank 1/2 full with clean water.
3. Ensure the agitation system is operating and sufficient to provide uniform spray mixing during application and until the spray tank has been emptied.
4. Add the appropriate amount of this product to the spray tank.
5. Complete filling the spray tank to the desired level.
Prepare no more spray mixture than is needed for the immediate application. Avoid the overnight storage of LongRun 25WG Herbicide spray mixtures.

Optimizing performance
• LongRun is active in low concentrations and stays in the upper surface of the soil layer. Avoid disturbing soil surface after application.

USE GUIDELINE
Rates and packaging
• One case treats ~12 ha at the highest labeled rate (6 x 404g containers per case)
• 150-200g/ha.

When to apply
• For preemergence application, rainfall or irrigation is needed for herbicide activation.
• The best control is obtained when LongRun 25WG Herbicide is applied either to weeds just prior to germination or to young, actively growing weeds.
• The best control is obtained when LongRun 25WG Herbicide is applied either to weeds just prior to germination or to young, actively growing weeds.
• For optimal herbicidal activity, prior to application, the bed or soil surface should be reasonably even and clear of crop and weed residue.

Tank mixes
• Tank mixes, such as ClearView™, Milestone™, Sightline™, OcTTain™ XL and VP480™ herbicides can be supported under the PMRA tank-mix policy.

Mixing instructions
1. Ensure the spray system is clean and free of residues from previous applications.
2. Fill the spray tank 1/2 full with clean water.
3. Ensure the agitation system is operating and sufficient to provide uniform spray mixing during application and until the spray tank has been emptied.
4. Add the appropriate amount of this product to the spray tank.
5. Complete filling the spray tank to the desired level.
Prepare no more spray mixture than is needed for the immediate application. Avoid the overnight storage of LongRun 25WG Herbicide spray mixtures.

Optimizing performance
• LongRun is active in low concentrations and stays in the upper surface of the soil layer. Avoid disturbing soil surface after application.

Non-Selective Control
Non-Selective Control
Non-Selective Control
Gateway™ adjuvant is an innovative non-ionic, paraffinic oil blend surfactant developed for use with the IVM portfolio of products from Corteva Agriscience™.

WHY USE GATEWAY ADJUVANT?
• Industry leading technology. An innovative adjuvant formulation unique to Corteva Agriscience and non-ionic surfactants.
• Performance. Gateway improves plant uptake in challenging environmental conditions.
• Tank mixability. Labelled for use with the IVM portfolio of products from Corteva Agriscience requiring surfactants.

USE GUIDELINE

Rates and packaging
• Gateway is packaged in 4 x 4 L jugs.
• Use at 0.25-1.0% v/v (2.5 L -10 L Gateway adjuvant/1,000 L spray mixture).
• Use the higher rate in adverse conditions, such as dense weed populations, late weed growth stages, poor environmental conditions or with certain multiple-product tank mixes.
• Refer to individual herbicide product labels for additional details on rate of use and mixing instructions.

Tank mixes
• Gateway is recommended for use with the following Corteva Agriscience herbicide products: – ClearView™ – ClearView™ Brush – Sightline™ – Aspect™
• For additional products, see the Gateway label.

PRODUCT SOLUTIONS TO FIT YOUR NEEDS

| BROADLEAF WEEDS, SHRUBS AND GRASS | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE | HERBICIDE |
|----------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| ABSENTH WORMWOOD                | x         | x         | x         | x         | x         | x         |          |           |           |           |           |           |           |           |           |
| ALSIKE CLOVER                   | x         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| ANNUAL SOW THISTLE              | x         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| BABY’S BREATH                    |           | x         |           |           |           |           |           |           |           |           |           |           |           |           |           |
| BALL MUSTARD                     |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| BITER EMLERWEED                 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| BLACK HENBANE                    |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| BLUE LETTUCE (TOP GROWTH)       |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| BROOKELL H 4 LEAF               |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CANADA FLEABANE                 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CANADA GOLDENROD                |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CANADA HORSEWARE/ HARE’S TAIL   |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CANADA THISTLE                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CHEVELLE                      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CHERRY                       |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CLEavers                      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| CLOVER                         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| COCKLEBUR                      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| COMMON BROOMWEED               | x         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| COMMON GROUNDSEL               |           | x         |           |           |           |           |           |           |           |           |           |           |           |           |           |
| COMMON HALLLOW                 |           |           | x         |           |           |           |           |           |           |           |           |           |           |           |           |
| COMMON FLAXSTRAW               |           |           |           | x         |           |           |           |           |           |           |           |           |           |           |           |
| COMMON RAGWEED                 |           |           |           |           | x         |           |           |           |           |           |           |           |           |           |           |
| COMMON TANSY                   |           |           |           |           |           | x         |           |           |           |           |           |           |           |           |           |
| COMMON WATERHENP               |           |           |           |           |           |           | x         |           |           |           |           |           |           |           |           |
| COMMON YARROW                  |           |           |           |           |           |           |           |           | x         |           |           |           |           |           |           |
| CORN SIBURY                     |           |           |           |           |           |           |           |           |           |           | x         |           |           |           |           |
| CORN COOLER                     |           |           |           |           |           |           |           |           |           |           |           | x         |           |           |           |
| CUDWEED                         |           |           |           |           |           |           |           |           |           |           |           |           | x         |           |           |
| CURLY DOCK                      |           |           |           |           |           |           |           |           |           |           |           |           |           | x         |           |
| DANDELION                       |           |           |           |           |           |           |           |           |           |           |           |           |           |           | x         |
| DIFFUSE KNAPWEED               |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| DOWNY BROME                     |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| EASTERN BLACK NIGHTSHADE       |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| FIELD BROWNWEED                |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| FIELD HORSEFAIR (TOP GROWTH)   |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| FIELD SCABIOUS                  |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| FIREWEED                        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| FLAXWEED                        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| FULLER’S TEASEL                |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| GOAT’S BEARD                    |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |

28 29
<table>
<thead>
<tr>
<th>Broadleaf, Shrubs, and Grass</th>
<th>Milestone™ Herbicide</th>
<th>Milestone™+2,4-D Herbicidal System</th>
<th>ClearView™ Herbicide</th>
<th>ClearView™+2,4-D Herbicidal System</th>
<th>Aspect™ Herbicide</th>
<th>ClearView™ Brush Herbicide</th>
<th>Octtain™ XL Herbicide</th>
<th>Longrun™ Herbicide</th>
<th>Torpedo™ Herbicide</th>
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<tr>
<td>Hairy Fleabane</td>
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<td>Hairy Nightshade</td>
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<td>Hawksweed</td>
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<td>Hoary Alyssum</td>
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<tr>
<td>Hoary Cress (Top Growth)</td>
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<td>Horse Nettle</td>
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<td>Hound’s Tongue</td>
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<tr>
<td>Japanese Knotweed</td>
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<td>Kochia</td>
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<td>Kudzu</td>
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<tr>
<td>Lady’s-Thumb</td>
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<td>Lames–Quarters</td>
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<td>Leafy Spurge</td>
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<td>Mullen</td>
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<tr>
<td>Musk or Nodding Thistle</td>
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<tr>
<td>Mustard (except Green Swiss, Dog &amp; Grey Tansy)</td>
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<tr>
<td>Narrow-Leafed Haw’s-Beard</td>
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<tr>
<td>Orange Hawkweed</td>
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<tr>
<td>Gray-Eye Daisy</td>
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<td>Palmer Amaranth</td>
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<tr>
<td>Pasture Sedge (Fringed Sedge)</td>
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<td>Pennsylvania Smartweed</td>
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<td>Peppergrass</td>
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<td>Pepernial Pepperweed</td>
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<td>Pepernial Sow Thistle</td>
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<td>Elfinleaf Thistle</td>
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<td>Prostrate Pigweed</td>
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<td>Purple Loosetripe</td>
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<td>Ragweed</td>
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<td>Redroot Pigweed</td>
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<tr>
<td>Round-Lerived Mallow (1-6 Leaf)</td>
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<tr>
<td>Russian Knapweed</td>
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<tr>
<td>Russian Thistle</td>
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<td>x</td>
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<tr>
<td>Scentless Chamomile</td>
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<tr>
<td>Scotch Thistle</td>
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<tr>
<td>Sheep Sorrel</td>
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<tr>
<td>Shepherd’s Purse</td>
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</tbody>
</table>

This is meant as a reference guide; always read and follow label directions. If there is a species not listed here, you are seeking to control, please contact your Corteva Agriscience® representative for recommendations.

- **A**: Non-ALS resistant biotypes.
- **AA**: All varieties except ALS resistant canola.
- **AMA**: Apply Checkmate or 250 g for when plants are actively growing with the rate of 0.25% by volume (250 ml per 100 L of water).  Only apply to the bolting stage of development or at the fall. Plants will be controlled by mid-summer and fall application even though plants may not show any changes in form or stature the year of application.
- **AMA**: Apply Checkmate or 250 g for in plants in the bolting stage of development.

**Disclaimer**

- **For control of leafy spurge and thistles under less-than-optimum growing conditions, use a recommended surfactant such as (ultimately depends on the rate of 0.25% by volume (250 ml per 100 L of water).**
- **1**: Apply Checkmate or 250 g for in plants at the rosette through bolting growth stage.
- **2**: Ox-eye daisy: Apply to plants in the pre-bud stages of development.
- **3**: Yellow star-thistle: Apply to plants at the rosette through bolting growth stage.
- **4**: Diffuse knapweed (suppression): Apply to plants in the bolting stage of development.
- **5**: Sulphur cinquefoil (suppression): Apply to plants to any growth stage, but application by flowering will reduce seed production.
- **6**: Russian knapweed (suppression): Apply to plants at the pre-bud stages of development.
- **7**: Japanese knotweed (suppression): Apply to plants 0.9-1.2 m tall.
- **8**: Orange hawkweed: For seasonal and 12 month control, apply to plants in the bolting stage of development.
- **x**: Top growth control.
- **Suppression**
**TREE SPECIES**

| ALDER | ASH | ASPEN | BASSWOOD | BEECH | BIRD | BLACKBERRY | BUCKTHORN | CEDAR | CHERRY | CHOCKECHERRY | COTTONWOOD | DOGWOOD | ELDERBERRY | ELM | HAWTHORN | HICKORY | HONEY LOCUST | HOP-HORNBEAM | LOCUST | MAPLE | MULBERRY | OAKS | PINE | POISON OAK | POPULUS | RASPBERRY | RED MAPLE | SASSAFRAS | SPRUCE | SUMAC | SYCAMORE | TAMARACK | WILLOW | WITCH HAZEL |
|-------|-----|-------|---------|-------|------|------------|-----------|------|--------|-------------|------------|---------|-----------|-----|----------|--------|-------------|-------------|--------|--------|----------|-----|-------|----------|----------|--------|--------|----------|----------|--------|--------|
|       |     |       |         |       |      |            |           |      |        |             |            |         |           |     |          |        |             |             |       |        |          |     |       |          |          |        |        |          |          |        |

*These species may need to be re-treated the following year, particularly if the original treatment was made at the lower rate.

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**SUSTAINABLE VEGETATION MANAGEMENT**

The effective use of vegetation management herbicides is essential to controlling target weeds and brush. Corteva Agriscience™ is committed to providing vegetation management professionals with the products and tools to get the job done right and ensuring that the practices used are sustainable in the long term.

**STEWARDSHIP TRAINING AVAILABLE**

All Corteva Agriscience representatives can provide detailed information to answer your questions about products, application procedures and safety. Our representatives are available to train your applicators on a variety of subjects, including: Corteva Agriscience products, product application procedures, human health, safety and professionalism. Contact your Corteva Agriscience representative for details or to book a training session.

**MANAGING INVASIVE PLANTS CROSSES FENCELINES**

Invasive plant control is not only critical in industrial right of ways, roadside and other non-crop area vegetation management. It is also crucial on private permanent grass pastures and rangeland. Controlling invasive plants with a herbicide is an effective way to reduce the spread and infestation of a species that may have the potential to be detrimental to biodiversity and the ecosystem.

Corteva Agriscience offers effective herbicide solutions for invasive plant control on rangeland and permanent pastures. We also provide an educational brochure used by counties and municipalities to promote the control of invasive plants with area residents. To learn more about Corteva Agriscience herbicides designed for range and pasture use, please visit ivm.corteva.ca.

**PROTECTING POLLINATORS**

Bees are one of several types of pollinators that feed from flowers, transferring pollen in the process. Other examples include butterflies and hummingbirds.

Herbicides target a specific pathway in plants. These target sites do not exist in pollinators, including bees. For this reason, herbicides from Corteva Agriscience do not have an adverse effect on pollinators when used according to the label.

Controlling invasive species with herbicides is beneficial for ensuring food stability for pollinators. When invasive plants, such as spattered or diffused knapweed, overtake an area they can choke out a variety of native species. Invasive weeds can flower once annually, while native plants flower throughout the whole growing season, providing a continual food source for pollinators. By eliminating the invasive plant types, the native species will re-establish themselves from seed, providing more sustainable foraging ground and habitat for bees and other pollinators.

**SCIENCE BASED SOLUTIONS**

Corteva Agriscience is committed to investing globally in products specifically designed to meet the needs of the industrial vegetation management market. This investment funds active ingredient discovery for non crop uses, advancements in formulations that are easier to use, and a continued focus to make sure that our chemistry couples performance together with the highest standards in safety to applicators, the general public, wildlife, pollinators and the environment.
**USE AROUND TREES**

Aspect™, ClearView™, Milestone™, Tordon® 22K and Sightline™ herbicides may have activity on woody species, including trees, when applied to the soil within the root zone. These products should not be used as a spray application under the tree canopy.

ClearView, ClearView™ Brush, Garlon™ XRT, Garlon™ RTU and Milestone herbicides should NOT be used over the top of desirable trees. Application may be made up to the drip line (outermost edge of the branches) of desirable trees. Milestone, ClearView and Sightline can be applied up to the drip line of the following species:

- Ash
- Aspen
- Birch
- Black cherry
- Cottonwood
- Dogwood
- Eastern white pine
- Elm
- Fr
- Junipers
- Maple
- Oaks
- Ponderosa and lodgepole pines (may cause transient leaf curling that will disappear)
- Poplar
- Spruce species
- Sweetgum
- Willow

Use caution when using Milestone, ClearView and Sightline around the following species. Greatest caution should be taken around those species with extensive lateral root systems, shallow rooting species and those that propagate vegetatively through layering.

- Black locust
- Caragana
- Cedar
- Honey locust
- Redbud
- Mimosa
- Rose
- Other locust species

**APPLICATION TIMING**

Herbicide application should be made after the majority of the target weed populations have emerged and are actively growing.

- The ideal timing for application will generally be in June through to mid-July with the exception of Canada thistle, which enters its ideal timing in mid- to late July when the majority of plants have emerged.
- Timing varies from season to season due to environmental conditions that influence growth and plant staging.
- When targeting shrubs such as buckbrush or wolf willow, they must be fully leafed out prior to an application.

**HAY, SOIL AND MANURE MANAGEMENT**

Treated area:

Vegetation management products.

- Soil from treated areas should never be moved to areas where sensitive plants may be planted within five years.
- Manure from livestock consuming treated grass should never be used for compost or around susceptible plants.
- Clippings from grass that has been treated with Corteva Agriscience™ vegetation management products should never be used for composting or mulching.
- Please contact your Corteva Agriscience representative with additional questions regarding hay, soil and manure management.

CAUTION: DO NOT use Aspect, ClearView, ClearView Brush, Milestone, Tordon 22K or Sightline over the top of, or directly under, any desirable tree species; injury or death can also result from foliar applications to trees.
The use of multiple modes of action on key weeds will provide more effective control and will delay the onset of resistance. Products with multiple modes of action contain two or more active ingredients with different modes of action that deliver overlapping control on the same target weeds.

**MULTIPLE MODES OF ACTION**

- Newly seeded grass should not be sprayed until secondary root development and a minimum of four leaf surfaces have established – well past the seeding stage.
- Safe to established grasses.
- Grasses may be seeded 10 months following an application.
- Legume re-establishment may be affected for up to five years.
- Soil organic matter, rainfall and temperature all affect the rate of degradation.
- Avoid application under stress conditions when grass is not actively growing (hot or cold weather, excessive moisture, or drought) as grass injury, including leaf discoloration and stunting of growth in the season of application may result.

**RE-SEEDING AND GRASS TOLERANCE**

**HARD WATER AND PH**

Hard water is classified by high concentrations of cations such as Ca²⁺, Mg²⁺, Mn²⁺, Zn²⁺, Na⁺, K⁺, Al³⁺, or Fe³⁺ (Table 1). Hard water can be problematic because these cations can bind to the herbicide causing a decrease in efficacy of the product. Most research looking at herbicide antagonism with hard water has found Ca²⁺, Mg²⁺, Mn²⁺, Na⁺ and Fe³⁺ to be the most problematic. The pH of the water solution can also exaggerate the impact of hard water on the herbicide’s activity. Most post-applied herbicides are weak acids, meaning they have a pKa value less than 7.

**WATER QUALITY**

If the pH of the water is greater than the pKa of the herbicide, the product has a greater chance to dissociate. This results in the separation of the herbicide into negative ions, which can combine with the cations of the hard water, thereby reducing the efficacy of the product. Addition of ammonium sulfate (21-0-0-24) (AMS) can reduce the interaction between hard water and herbicides because the sulfate binds with the positive ions in the hard water and the ammonium binds to the herbicide, which actually helps the product to penetrate the plant cell membrane.

**Table 1: The World Health Organization’s classification of soft to extremely hard water**

<table>
<thead>
<tr>
<th>Mineral parts per million (ppm) in water</th>
<th>World Health Organization water classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 114</td>
<td>Soft</td>
</tr>
<tr>
<td>114 – 342</td>
<td>Moderately Hard</td>
</tr>
<tr>
<td>342 – 800</td>
<td>Hard</td>
</tr>
<tr>
<td>&gt;800</td>
<td>Extremely Hard</td>
</tr>
</tbody>
</table>

*Note: Some hard water test results will be in “grains,” which is the ppm divided by 17.*

**ALKALINITY**

Soft water can be high in bicarbonates (HCO₃⁻) or carbonate (CO₃²⁻), which can also interfere with some herbicides, similar to the hard water ions. When testing water for alkalinity, levels should be below 300 ppm.

**TURBID WATER**

Turbid water is a name used to describe a water source that has suspended particles which could include soil, organic matter, algae, salt or contamination from runoff. Herbicides have the potential to bind to these particles in the water source, tying up the active ingredient and decreasing the efficacy of the product. How well a chemistry binds to the sediment depends on their Koc ratio, which is the soil organic carbon sorption coefficient. A high Koc number means the product binds strongly to the particles – for example glyphosate at 26,000 mL/g, where lower numbers like dicamba (2 mL/g) do not bind as strongly. Aminopyralid and Picloram have relatively low Koc numbers, 10.8 and 16 mL/g, respectively. However, Triclopyr has been known to adsorb tightly to soil, with a Koc value of 780 mL/g. Therefore, it is extra important to have clean water when applying Triclopyr.

**Table 2: The pKa values of Aminopyralid, Triclopyr and Picloram**

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>pKa value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminopyralid</td>
<td>2.6</td>
</tr>
<tr>
<td>Picloram</td>
<td>2.3</td>
</tr>
<tr>
<td>Triclopyr</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Note pKa (log10) is an index to express acidity of aick – the smaller the value, the stronger the acid.
**WHAT CAN BE DONE?**

- Ensure water source is free from sediment – any amount of sediment can be problematic, if you visually see particles, consider a different water source.
- Perform a water analysis to determine suitability for herbicide applications (i.e., hardness, pH, total dissolved solids, etc.).

**Some labs that can perform this analysis:**
- Environmental Analytical Laboratory, Saskatchewan Research Council, 422 Downey Road, Saskatoon, SK Canada – src.sk.ca/analytical
- ALS Global – alsglobal.com has various labs across Canada that can perform well water testing.
- Some hard water/pH testers can be bought from local pool stores. These testers sometimes read hard water at 300 ppm whereas spraying hard water is considered 1000 ppm or higher.
- Ideal water pH for these weak acid herbicides is around 5-7.
- If the pH is too high (over 8), consider a different water source.

- Hard water: Studies by Thomas et al. (1996) and Zallinger et al. (2010) found AMS could be added to Picloram and Aminopyralid to mitigate hard water impacts, although there has not been a rate identified specifically for these products.
  - The recommended rates of AMS with glyphosate are 13:1-2% w/w (i.e., 1-2 kg/100 L of water), or 2.5-5% v/v of a 400 g/L AMS solution.
  - If water is over 1,000 ppm and you are applying Aminopyralid or Picloram, consider adding AMS at 20.4 g/L.
  - A jar test can be performed before putting any products in the spray tank to ensure they will not create any problems.
  - Follow all label directions for tank mixes and adjuvants.
  - For best results, Corteva Agriscience™ recommends using clean fresh water sources for spray solution. Using open bodies of water or poor quality water (sediment, hardness or high pH) as a source increases risk of having water issues.

**WHAT CAN BE DONE?**

- Picloram and Aminopyralid activity could be affected by hard water ions.
- Picloram and Aminopyralid can both be impacted by pH of water since it can cause them to break down into ions, allowing them to combine with hard water ions decreasing efficacy.
- Triclopyr formulated as an ester has the potential to bind to organic matter or sediment in the water and reduce efficacy.

**SUMMARY**

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**CONTACT US**

If you have a technical question, your Corteva Agriscience™ representative can help. If you require immediate attention, please call our Solutions Center at 1-800-667-3852.

**Corteva Agriscience Canada Inc.**
Suite 2450, 215-2nd Street SW
Calgary, AB T2P 1M4
Solutions Center: 1-800-667-3852
Fax: 1-888-296-6188
Website: www.ivm.corteva.ca

**Northern Alberta & Northern Saskatchewan**
Vegetation Management Specialist
Vaughn Leuschen
Cell: 780-721-3469
Fax: 780-340-3732
Email: vaughn.leuschen@corteva.com

**British Columbia**
Vegetation Management Specialist
Lisa Jarrett
Cell: 250-870-3734
Phone: 250-764-0873
Fax: 250-764-0828
Email: lisa.jarrett@corteva.com

**Ontario & Manitoba**
Vegetation Management Specialist
Holly Moffet
Cell: 403-394-6824
Email: holly.moffet@corteva.com

**Atlantic Canada & Quebec**
Vegetation Management Specialist
Justin Toner
Cell: 506-479-0444
Email: justin.toner@corteva.com

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**SUMMARY**

Questions?
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Visit us at ivm.corteva.ca