

RANGE & PASTURE MANAGEMENT GUIDE

More grass. More options. More profit.





Solutions for the Growing World.

A COMPLETE GRASS MANAGEMENT PLAN



An Integrated Pasture Management Plan to increase grass productivity employs techniques such as grazing rotations, herbicides, fertility analysis, mechanical brush management and regular pasture health assessments.

To reduce weed, brush and tree encroachment over the long term, herbicide applications are often part of the plan. Herbicides offer a long-term, proactive strategy with lasting results, and are a highly effective alternative to short-term, quick-fixes such as mowing and cultivation.

Before choosing a herbicide, consider the severity of your problem, the cost of lost production, and the level of effort you're prepared to put into rejuvenation. But be aware that when grass production is declining, there is a high cost associated with doing nothing and ignoring the problem.

Each pasture has a life of its own. In some, weeds encroach from the perimeters while in others, weeds and brush consistently crowd out more and more grass. And in many, trees and woody species spread over larger and larger portions of land.

BREAKING UP PERMANENT PASTURE IS COSTLY

With today's herbicide solutions available to control weeds, brush and trees while increasing grass productivity, breaking permanent pasture should be considered only as a last resort. A mechanical approach is very costly, increases soil degradation and erosion, and in most cases will require re-seeding of grass. In the best case scenario, improved grass production is 24 to 36 months away, whereas a herbicide solution can give you results within the same season.

USING FIRE MANAGEMENT FOR BRUSH AND TREE CONTROL

Fire management is a natural and effective strategy for increasing pasture productivity, however caution must be exercised to limit the risk of a fire that cannot be controlled and can become an unnecessary liability.

MAKING A CHANGE FOR THE BETTER

You can make a positive change to the health and productivity of your pastures by implementing an Integrated Pasture Management program that will assist you to control the weeds, brush and trees that crowd valuable grass. With a little planning and forethought, you can increase your grass production which leads to higher profits and a sustainable grazing resource for the future.

No doubt you have already observed different levels of grass production on your range and pasture land. Annual rainfall, soil quality, erosion, shade and the type of existing vegetation all work together to affect grass productivity. For example, certain areas of your land may consistently produce valuable grass while other areas have reduced productivity due to encroachment from weeds and brush.

Start improving your grass stands by analyzing these factors:

- Grazing management plan Are you sticking to your rotational grazing plan? Do you limit the time stock grazes the stand?
- Grass stand fertilization Have you soil tested in areas of poor grass production?
- Moisture management Can you improve snow trapping techniques?

Growing more grass on your rangeland and pasture gives you more flexibility when making your ranch management decisions. This guide outlines the benefits, costs and appropriate solutions associated with increasing grass production and the sustainability of your rangeland and pasture.

- Grass species Is it time to introduce new species through replanting or overseeding?
- Weed and brush control Are weeds and brush steadily encroaching on your pasture land? Are stocking rates declining?

FEWER WEEDS, MORE GRASS

When weeds and brush start to take over pasture and rangeland, grass production suffers. However, when you take definite measures to control both weeds and brush, grass production increases not only the first year, but in subsequent years as well.

Research on 14 pasture and rangeland locations across the Prairie provinces shows that in the first year Reclaim[™] was applied, grass production increased by an average of 101% or 1,318 lbs/ac dry matter. The second year following treatment, the average increase was 77% or 873 lbs/ac dry matter.



Increase in grass 1 year after treatmeant with Reclaim

Treated Untreated

1,318 lbs/ac dry matter 1 year after treatment.



Increase in grass 2 years after treatmeant with Reclaim

Source: 2008-2010 Dow AgroSciences field trials across western Canada. Pasture conditions and grazing management influence grass response in different geographic areas.

THE VALUE OF GOOD GRASS



More grass is a valuable contributor to the bottom line of every ranch operation.

Increase grass production and you can:

- Graze your cattle longer in the fall and turn them out earlier in the spring. More grazing days reduce winter feed costs and contribute directly to the bottom line.
- Graze more cattle on the same number of acres. Higher stocking density also increases competition for feed between animals so each animal spends more time grazing and less time wandering.

More grass also contributes to:

- Better herd condition.
- Higher weaning weights.
- Less time and fewer equipment costs associated with finding or producing feed.
- Fewer weeds imported in bales of hay.
- Improved ability of pastures to withstand drought.
- Improved grass vigor.

MORE GRASS EQUALS INCREASED GRAZING EFFICIENCIES

The grazing animal should not harvest every pound of forage produced – some must be left behind to ensure vigorous re-growth. Typical utilization rates* for Alberta conditions are 50%, giving rise to the "take half, leave half" principle.

Forage utilization rate – Dry Matter (DM)

Untreated area: $50\% \times 1,185$ lbs/ac DM = 592.5 lbs/ac DM

Treated area: $50\% \times 2,058$ lbs/ac DM = 1,0 /ac DM

Based on average grass production increase two years following treatment with Reclaim.

Livestock forage requirements – Animal Day (AD)

- The amount of forage an animal will consume in a day is termed an 'Animal Day.'
- Cattle will consume 1.5% to 3% of their body weight per day on a dry matter basis.
- A cow/calf pair will consume approximately 2.5% to 3%.
- The calf is included with the cow until the calf is approximately 600 lbs.

1,350 lb cow x 3% DM intake/day = 40.5 lbs/cow/day.

Animal Days per Acre (ADA) for treated versus untreated – based on a 1,350 lb cow:

Untreated: 592.5 lbs/ac DM

40.5 lbs/ac DM

= 14 animal days/ac (ADA)

Treated: 1,029 lbs/ac DM

40.5 lbs/ac DM

= 25 animal days/ac (ADA)

Calculating stocking rate on an 80 acre pasture using ADA

Untreated: 80 ac x 14 ADA = 1,120 Animal Days

Treated: 80 ac x 25 ADA = 2,000 Animals Days

If the goal is to graze for 120 days, the stocking rate is:

Untreated:

1120 Animal Days

120 days of grazing

= 9.3 cows can be grazed on 80 ac for 120 days

Treated: 2,000 Animal Days

120 days of grazing

= 16.6 cows can be grazed on 80 ac for 120 days



Untreated pasture

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Treated pasture

*All calculation formulas are from the Pasture Planner booklet produced by the West Central Forage Association. "Where we have sprayed with Grazon™ nothing grows there except grass.

Before we used Grazon, we were running 200 to 300 head and now we run about 700 head. We want to leave the calves on the cows a little longer so they get a little heavier. Because of the grass and good rotations, the calves come out heavier in the fall and are ready for the feedlot.

Driving around the country I see pastures that could be running 20 to 30 more cows if they were just cleaned up a bit. Grazon is a great product – really, what would a guy do without it!"

Ben Holfer Farm Boss Sunnybend Colony, Westlock AB

"I have implemented a program for my pastures that includes spraying, fertilizing and grazing management. By spraying Grazon productivity has doubled from what it was so I can graze more cattle than I could before on these pastures.

I plan on using Reclaim now. It covers a larger weed spectrum and it is supposed to do a good job on buckbrush. With the test plots I have seen you can really see where the product was and wasn't applied.

Pasture management is important. These products allow you to control the weeds that the cows don't eat and still get more productive grass."

Don Bonham Delburne AB

WEEDS

At first glance a pasture may look green and healthy, but upon closer inspection, you may find weeds that are robbing valuable forage from your pastures and profitable weight gain from your cattle.

Left untreated, weeds can rob a pasture of up to 63% of forage yield, while invasive weeds can rapidly take over a pasture – both significant reasons to know what is going on in your pastures and how to identify unwanted species.



Scentless chamomile

Quickly invades where competition from other species is poor. Low feed value and unpalatable to most livestock.



Tall buttercup

Poor forage value and bitter juices cause inflammation of the mouth and intestinal tract. Rare cases of poisoning reported.



Wild caraway

Invasive and can quickly displace nearly all other vegetation. Infestations in forage crops have led to weed seed dispersal in baled hay. Not utilized by livestock as forage.



Oxeye-daisy

Poor forage value and strong odor that livestock will avoid which allows it to compete with grass stands.



Spotted knapweed

Competes for moisture and nutrients in early spring. Reported to produce chemicals that prevent the establishment of neighboring plants.



Orange & yellow hawkweed

Untreated infestations quickly form dense mats of rosettes that exclude nearly all other vegetation. Very difficult to control once established. Unpalatable to livestock. Rangelands stressed by overgrazing are highly susceptible to invasion.

WEEDS & SHRUBS

Large areas of permanent pastures in western Canada are overgrown with low to medium-size shrubs such as buckbrush, wolf willow and wild rose. These shrubs compete directly with your grass for moisture and nutrients and cover the ground, reducing the amount of sun that reaches your grass and substantially reducing your grass production and land utilization.



Western snowberry (buckbrush)

Prefers dry, open areas and spreads rapidly by root suckers to form dense thickets. Poor feed value and low palatability for most livestock.



Wild rose

Highly competitive and spreads extensively through rhizomes. Produces woody growth that is unpalatable and will be avoided by livestock.





Rapid, woody growth that outcompetes more desirable forage.





Shrubby cinquefoil

Low-growing with many branches. Bark is rough and shredded. Produces an abundance of viable seed. Poor palatability to animals.

Canada thistle

Easily established with extensive root systems. Spiny leaves are unpalatable to livestock creating a barrier to grazing.



Dandelion

Highly-competitive with desirable grasses. Plants produce and disperse large numbers of viable, reproducing seeds.



Pasture sage (fringed)

Drought tolerant with low palatability due to aromatic oil.



Prairie sage

Rhizomatous growth habit with poorer forage value and marginal palatability. Can be an indicator of over-grazing.



Common tansy

Takes over areas where the preferred forage stand has been reduced due to overgrazing. Causes abortion if eaten in smaller quantities and death if eaten in larger quantities.



Absinth wormwood

Invades areas where there is a lack of competition due to overgrazing. Strong odor which livestock avoid.



Low everlasting sage (pussy-toes)

Poor forage for livestock. Increases with heavy grazing. White or faint pink flowers and mat-forming with leafy stolons.



Wild strawberry

Invasive, highly adaptive plant with rhizomes. Common throughout most regions with low growth habit and low palatability. Can be an indicator of over-grazing.

TREES

Tree encroachment can have an even more profound effect on grass yield than weeds. If left unchecked, total pasture area can be reduced by up to five percent per year. The carrying capacity of wooded rangeland is up to 70% less than native grassland. As tree cover increases, carrying capacity decreases which further reduces your efficiencies.



Aspen, White poplar

Rapid encroachment and heavy suckering when cut or damaged. Adapted to a wide range of soils and moisture conditions.



Birch

Readily suckers to produce new plants. Very competitive species that can form extensive stands.



Willow

Spreads by extensive creeping rhizome, often forming dense thickets that are highly competitive.



It is important to control deep-rooted perennials before they take over and control your pasture, however these types of weeds are difficult to control. Alternative methods such as herbicides offer an effective management tool.



Leafy spurge

Perennial with deep, extensive rhizomes and tall, erect growth habit. Has been known to cause problems in livestock if eaten, including irritation of the mouth and stomach.



Toadflax

Aggressive perennial plant that can quickly replace grass. Spreads rapidly by rhizomes and winged seeds, forming creeping, dense patches.



The standard for broad spectrum control of tough weeds and shrubs.

EXTENDED WEED AND SHRUB CONTROL

The following broadleaf weeds, invasive plants and shrubs are controlled for 24 months after application as indicated on the label:

- Canada thistle⁺
- Buckbrush (western snowberry)
- Dandelion
- Pasture sage (fringed sage)
- Prairie sage
- Shrubby cinquefoil
- Wild rose
- Wolf willow (silver-berry)

Depending on the target shrub and weed species, Reclaim can provide extended control thus increasing the length of time until re-treatment is necessary.

PRODUCT DESCRIPTION

Reclaim is a selective broadleaf weed and shrub control herbicide for use in rangeland and permanent pasture. Reclaim provides extended control of shrubs and broadleaf weed species, which increases the time before re-treatment is required (this will be dependent on the rate applied and the target shrub and weed species). Reclaim is absorbed by the leaves and roots and translocated throughout the plant causing death.

GUIDELINES FOR USE

One case of Reclaim will treat 20 acres. Reclaim is registered for ground, aerial and spot application methods. For best results, apply Reclaim in a minimum of 20 gal/ac (80 L/ac) of water by ground and 5 gal/ac (20 L/ac) of water by air. Reclaim requires the addition of a non-ionic surfactant such as Ag-Surf, Agral 90 or Citowett Plus at 0.2% v/v or 2 liters per 1,000 liters spray solution. Most warm and cool season rangeland and pasture grasses are tolerant of Reclaim applications at the registered rate. Do not spray if injury to existing forage legumes cannot be tolerated. Do not apply Reclaim within the drip line of desirable trees, and take appropriate measures to prevent application or drift onto plants and trees that are not intended for control.

TIMING

Reclaim should be applied after the target weed and shrub species have emerged and prior to plant growth ceasing and leaves hardening off. Shrub species will develop a waxy cuticle on the leaf surface resulting in reduced uptake and control later in the season.

An application that will provide control to all species of shrubs and weeds must occur when all target species have emerged. Plants, specifically perennial weeds and shrubs that have not emerged at the time of application, will not be controlled.

Refer to the product label for complete use directions.

GRAZING RESTRICTIONS

There are no grazing restrictions for livestock other than a seven-day restriction for lactating dairy cows. Reclaim works like a natural growth-regulating hormone found only in plants and not in livestock and wildlife. Cattle do not metabolize Reclaim – when ingested, Reclaim is rapidly excreted from the body in the urine and does not accumulate in the animal.

RESULTS

Reclaim is absorbed by the leaves and roots, translocating throughout the plant, causing the plant to die. Most susceptible weeds and shrubs will be controlled within four to eight weeks following an application. When compared with other methods of pasture rejuvenation, Reclaim provides timely, increased grass production and extended weed and shrub control.

'Removal of competing vegetation may result in new Canada thistle shoots emerging.



TECHNICAL UPDATE

Research trials indicate activity on the following broadleaf weeds and shrubs in the season of application:

- Absinth wormwood
- Annual sunflower
- Annual sow-thistle
- Ball mustard
- · Biennial wormwood
- Bluebur
- Blue lettuce*
- Buckbrush
- (western snowberry)
- Burdock
- Canada fleabane
- Canada thistle
- Canada goldenrod
- Chickweed
- Clover (red, white)
- Cocklebur
- Common groundsel
- Common ragweed
- Common tansy
- Corn spurry
- Cow cockle
- Cudweed
- Curly dock
- Dandelion
- Docks
- Dog mustard

- Field bindweed*
- Field horsetail*
- Field peppergrass
- Field scabious
- Fireweed
- Flixweed
- Goat's beard
- Green smartweed
- Gumweed
- Hairy galinsoga
- Hedge bindweed
- Hemp-nettle
- Hoary cress
- Horse-nettle
- Kochia***
- Lady's-thumb
- Lamb's-quarters
- Leafy spurge*
- Musk thistle
- (nodding thistle)
- Narrow-leaved
- hawk's-beard
- Oak leaf goosefoot
- Ox-eye daisy (pre-bud)
- Pasture sage
- (fringed sage)
- Perennial pepperweed
- Perennial sow-thistle
- Plantain
- Plumeless thistle
- Prairie sage Prickly lettuce

- Prostrate pigweed
- Pussytoes
- Ragweed
- Redroot pigweed
- Russian knapweed
- Russian thistle***
- Scentless chamomile
- Shepherd's-purse
- Shrubby cinquefoil
- Spotted knapweed
- Stinkweed
- Stork's-bill
- Sweet clover
- Tall buttercup
- Tartary buckwheat
- Tumbleweed
- Vetch
- Volunteer alfalfa
- Volunteer canola**
- Western ragweed
- Wild buckwheat
- Wild mustard
- Wild radish
- Wild rose
- Wild strawberry
- Wolf willow (silver-berry)
- Yarrow***
- Yellow star thistle
- * Top growth control only
- ** All varieties of volunteer canola
- *** Suppression



Invasive weed control for sustainable pasture management.

WEEDS CONTROLLED OR SUPPRESSED

- Absinth (wormwood)
- Annual sow-thistle
- Biennial wormwood
- Bitter sneezeweed
- Blue lettuce
- Bluebur
- Bull thistle
- Burdock
- Buttercup
- Canada fleabane
- Canada goldenrod
- Canada thistle
- Cocklebur
- Common broomweed
- Common chickweed
- Common plantain
- Common purslane
- Common ragweed
- Cudweed
- Curly dock
- Daisy fleabane
- Dandelion
- False flax
- Field bindweed
- Flixweed
- Fuller's teasel
- Goat's beard
- Goosefoot
- Groundsel
- Gumweed
- Hairy buttercup
- Hairy fleabane
- Hawkweed
- Heal-all
- Hedge bindweed
- Hoary cress
- Horsenettle
- Kochia
- Lamb's-quarters

- Mouse-eared chickweed
- Musk or nodding thistle
- Mustards
- (except dog and tansy)
- Narrow-leaved hawk's-beard
- Oxeye daisy
- Peppergrass
- Perennial sow-thistle
- Pineappleweed
- Plumeless thistle
- Prickly lettuce
- Prostrate pigweed
- Ragweed
- Redroot pigweed
- Russian pigweed
- Russian thistle
- Scentless chamomile
- Sheep sorrel
- Shepherd's purse
- Smartweed
- Spotted knapweed
- Stinging nettle
- Stinkweed
- Sulphur cinquefoil
- Sweet clover
- Tall buttercup
- Tall ironweed
- Tansy ragwort
- Tartary buckwheat
- Tropic croton
- Tropical soda apple
- Velvetleaf
- Volunteer canola
- Western ragweed
- Wild radish
- Wild sunflower
- Yellow rocket
- Yellow star thistle

PRODUCT DESCRIPTION

Restore II is a systemic, post-emergence broadleaf herbicide designed for the management of a broad spectrum of broadleaf weeds and invasive species in rangeland and permanent grass pastures. It contains a Group 4 active ingredient that works like a natural growth regulating hormone found only in plants. It is absorbed by the leaves and roots, translocating through the plant, causing it to die. Mammals do not metabolize Restore II.

GUIDELINES FOR USE

Restore II is a co-formulated solution packaged in 2×9.7L jugs. One case treats 20 acres. Apply in a minimum of 20 gal/ac total spray solution for ground applications and 5 gal/ac solution for aerial applications. For backpack applications to small areas, create a 0.24% solution with 10L of water. Thoroughly and uniformly wet the foliage of all target plants but not to the point of runoff.

Apply to actively growing weeds, after emergence, prior to flowering. Application timing to provide control of all species of weeds must occur when all target species have emerged. Plants which have not emerged at the time of application will not be effectively controlled (especially perennial weeds). For best results, apply when the primary target weed is most actively growing, after emergence, prior to flowering.

Most warm and cool season rangeland and pasture grasses are tolerant of Restore II applications at the registered rate. Do not spray if injury to existing forage legumes cannot be tolerated. Do not apply Restore II within the drip line of desirable trees, and take appropriate measures to prevent application or drift onto plants and trees that are not intended for control.

Refer to the product label for complete use directions.

TIMING MULTIPLE SPECIES

Timing application to a broad range of weeds may be challenging since emergence and growth stages may occur at different stages throughout the season. Keep the following in mind as you make your timing decision:

- Target your timing on the most problematic weed. For example, if your primary target is absinth wormwood, timing will likely be earlier (May 15 to June 15). If the primary target is Canada thistle, you need to wait long enough for the majority of the thistles to emerge (July 1 to July 30).
- Apply Restore II when the primary target weed is most actively growing. If environmental stresses such as severe drought or extended periods of heat are inhibiting growth, this may decrease efficacy.
- Restore II can only control weeds and root systems that get treated; if some weeds have not emerged at the time of application, these weeds will not have the same level of control as weeds that were fully emerged.

GRAZING RESTRICTIONS

There are no grazing restrictions for livestock other than a seven-day restriction for lactating dairy cows. Restore II works like a natural growth-regulating hormone found only in plants and not found in livestock and wildlife. Mammals also do not metabolize Restore II – when ingested, Restore II is rapidly excreted from the body in the urine, and thus does not accumulate.

SAFETY

Restore II has low impact on the environment, based upon a combination of unique and improved features for the control of invasive weeds in rangeland and pastures compared to currently registered products. This low impact is confirmed through favorable data and risk assessments presented for toxicological, eco-toxicological and environmental fate effects.

RESULTS

Restore II is absorbed by leaves and roots, translocating throughout the plant, causing the plants to die. Depending on the weed species, you can expect to see results within hours or days. Plant growth will stop within 24 to 48 hours after treatment. Most annual, susceptible weeds will be controlled within four to eight weeks following application. A successful application of Restore II will provide a notable improvement in grass production.



"Six years ago we helicopter-sprayed Grazon on about 500 acres. We had a major infestation of knapweed and smaller areas of burdock and hound's-tongue. The pasture was very thin amongst the knapweed but since we sprayed, it's now very healthy and thick. There is a distinct line between where we sprayed and where we missed that can be seen one kilometer away, down the road. Because of the thicker pasture, the invasive weeds have not been able to come back.

The extra pasture that has grown in these areas has extended our grazing period by two whole weeks. I am very happy with the product."

Doug Simons Manager

Copper Creek Ranch, Princeton BC

"We run a cow calf operation west of Didsbury, Alberta. We used Restore on 100 acres of tame pasture to control tall buttercup, thistles and dandelion and it worked great. We've noticed a lot thicker grass in the pasture and the cattle have more to graze.

We have a bigger window for grazing and because we don't have any invasive species in our pasture we've improved our profitability. If you let the invasive species in, before too long you'll have decreased the pasture's productivity." Darcy Coleman

Didsbury AB



Trusted broadleaf weed and tree control.

WEEDS AND TREES CONTROLLED OR SUPPRESSED

Grazon XC, at the labeled rate of 1.9 L/ac (weed control) and 2.5 L/ac (tree rate), can be used to manage weeds and trees including:

- Aspen
- Balsam poplar
- Birch
- Canada thistle
- Chamomile
- Common ragweed
- Common yarrow
- Dandelion
- Dock
- Goldenrod

- Prickly lettuce
- Sow thistle
- Spotted knapweed
- Sweet clover
- Western snowberry
- Wild carrot
 - Wild prairie rose
 - Wild rose
 - Willow
- Refer to the product label for complete use directions.

PRODUCT DESCRIPTION

Grazon XC is a convenient new formulation of Grazon[™] and is effective against a broad spectrum of undesirable trees and weeds in permanent pastures. Grazon XC contains an innovative new 2,4-D unique to Dow AgroSciences. This new formulation of 2,4-D contributes to Grazon XC's lower use rates while providing the same trusted control as Grazon. Grazon XC provides long-lasting control and is most effective on the foliage of actively-growing plants. The unique chemistry moves through the plant to control even the roots. This is especially important for biennial and perennial species as they have large root systems.

GUIDELINES FOR USE

Grazon XC can be applied by ground or air. Apply in a minimum of 20 gal/ac (80 L/ac) of water by ground or 5 gal/ac (20 L/ac) of water by air. Use coarse sprays to minimize drift. For backpack applications to small areas, create a 0.67 % solution of Grazon XC in water for weed and shrub control, or a 2 % solution of Grazon XC in water for tree control. For example, mix 67 ml of Grazon XC with 10 L of water. For all applications, coverage of the targeted foliage is very important. Do not apply Grazon XC within 1.5 times the height of desirable trees and take appropriate measures to prevent application or drift onto plants and trees that are not intended for control. Do not spray if injury to existing forage legumes cannot be tolerated. Most warm and cool season rangeland and pasture grasses are tolerant to Grazon XC.

TIMING MULTIPLE SPECIES

Timing a broad range of weeds may be challenging since emergence and growth stages may occur at different times throughout the season. Keep the following in mind as you make your timing decision:

- Target your timing on the most problematic weed. For example, if your primary target is Canada thistle, you need to wait long enough for the majority of the thistles to emerge (July 1 to July 30).
- Apply Grazon XC when the primary target weed is most actively growing. If environmental stresses such as severe drought or an extended period of heat are inhibiting growth, this may decrease efficacy.
- Grazon XC can only control weeds and root systems that get treated; if some weeds have not emerged at the time of application, these weeds will not have the same level of control as weeds that were fully emerged.

GRAZING RESTRICTIONS

When applying Grazon XC there are no grazing restrictions for beef livestock other than a seven-day restriction for lactating dairy cows. Withdraw meat mammals from areas treated with Grazon XC at least three days before slaughter.

RESULTS

Initially, target plants will show limited visual activity following an application of Grazon XC, however, plant growth will stop. More effects can be observed between 45 to 60 days following application. A successful application of Grazon XC will provide a notable improvement in increased grass production.



Effective control of leafy spurge and toadflax.

WEEDS CONTROLLED

Tordon 22K can be used as a broadcast spray at a rate of 1.8 L/ac to control:

Russian knapweed

Spotted knapweed

 Sow thistle Toadflax*

• Scentless chamomile

- Canada thistle
- Diffuse knapweed
- Field bindweed*
- Leafy spurge*
- Pasture sage
- Poverty weed
- * For spot treatment where less than 50% of the hectare is treated, a rate of 3.6 L/ac may be used.

To control infestations, plan for a sequential treatment in one or two years following initial application.

Refer to the product label for complete use directions.

PRODUCT DESCRIPTION

Tordon 22K is effective against deep-rooted, perennial broadleaf weeds due to its systemic activity. It translocates throughout the weed's roots, providing complete control.

GUIDELINES FOR USE

Tordon 22K can ONLY be applied by ground application equipment. Apply at a rate of 1.8 L/ac in 160 to 324 L/ac of water using a broadcast sprayer. For backpack applications to small areas create a 0.5% solution of Tordon 22K in water. For example, mix 50 ml of Tordon 22K with 10 L of water. Apply the mixture to achieve total coverage of target plants. Apply the solution to the weeds and an area around the infestation to avoid "donuting" (runners sending up shoots outside the treated area). Use coarse sprays to minimize drift. For all applications, coverage of the weed foliage is very important.

Most warm and cool season rangeland and pasture grasses are tolerant to Tordon 22K, however, grass vigor may be reduced for a period of up to two years while the active ingredient is metabolized by the grass. Be sure to prevent spray drift by taking necessary precautions, as even small amounts could damage desirable vegetation. Do not spray on areas where damage to legumes cannot be tolerated.

Tordon 22K is persistent in the soil. Very permeable (>40% sand) soils should not be treated if shallow (less than 6 feet) underlying aquifers are present. Observe precautions described on the product label to minimize spray drift during application.

Do not apply Tordon 22K within 1.5 times the height of desirable trees, and take appropriate measures to prevent application or drift onto plants and trees that are not intended for control.

TIMING

Tordon 22K may be applied on rangeland and pasture to control weeds when fully developed green leaves are present and the weeds are actively growing. For control of leafy spurge, application should be timed when the plants are in true flower stage, which occurs when the green flowers are present inside of the yellow bracts. Application in late summer or in periods of dry weather when plants are not actively growing may result in unsatisfactory control.

GRAZING RESTRICTIONS

There are no grazing restrictions for livestock other than a six-week restriction for lactating dairy animals. Wildlife grazing treated vegetation will not be adversely affected.

RESULTS

Initially, target plants will show limited visual activity following an application of Tordon 22K. Effects including twisting of stems and cupping of leaves can be observed between 45 to 60 days following an application.

HOW HARD CAN IT BE TO KILL A FEW WEEDS?

You'd be surprised. Certainly, burning, mowing and reseeding are all options, however when deciding what method is right for your operation, it's important to consider cost, convenience, effectiveness and physical disruption on your pasture's grass stand and to your cattle operation.

There are pros and cons to each.

- Controlled burning isn't always "controlled" and poses a risk to environmental and personal safety

 an increased risk of wildfire and hazardous health conditions.
- Brush suckers and invasive weeds move back in almost immediately.
- Mowing makes the pasture look better temporarily, but often makes the problem worse by encouraging undesirable root systems to spread and shoot up new growth.
- Ripping up and reseeding is expensive, hard on equipment and sometimes unsuccessful, taking valuable pasture out of production.

Herbicides designed to improve grass production in rangeland and permanent pastures can be a highly effective and convenient alternative – one definitely worth looking into for your grazing management plan.

CHOOSE YOUR METHOD OF APPLICATION

As you build your grass management plan, there are a variety of application methods to choose from based on the species you want to control and the density of infestation.

Ground Broadcast

Ground application is an excellent way to control weed infestations and shorter brush infestations on even terrain.

- Keep the boom high enough to clear foliage and provide suitable coverage, but low enough to minimize the chance of drift.
- Carefully calibrate your equipment to ensure precise application and economical use of your herbicide investment.
- GPS guidance and foam markers can help you to avoid skips or excessive overlaps.
- Coverage is critical to this method's effectiveness using a minimum water volume of 20 gallons per acre will ensure best coverage.
- For optimum results, wait for the full population to emerge with leaves fully expanded, and when plants are actively growing (typically before flowering).







Aerial Broadcast

Aerial application is the most feasible – and cost-effective way to treat large areas when dense brush growth and rough pasture terrain limits your ability to reach target species with ground application equipment. Plant height can also prohibit access, even with moderate brush infestations.

With fixed-wing and rotary aircraft, apply Reclaim, Restore and Grazon XC herbicides in five gallons of total spray volume per acre for best coverage and results.

Treating Dense Infestations and Large Areas

If your target vegetation includes hard-to-control perennial weeds, shrubs and trees, make sure to keep water volumes up to maximize coverage of weeds.

Timing

Timing an application can be a challenge, and it is important that you time the application based on weed growth and staging. Because range and pasture herbicides are growth inhibitors, target weeds must be actively growing at the time of application for effective control. Only weeds and shrubs that have emerged at the time of application will be controlled. Application to weeds and shrubs under conditions of extreme moisture stress will reduce the long-term level of control.

90% Control – even with the outstanding control of undesirable vegetation that Range & Pasture products provide, there may be some weeds and shrubs present following an application. What does 90% control look like? "On the community pasture we use Grazon for brush control. Cost-wise, it's beneficial because you save time and money over using a Cat and breaking up the land. We have a lot of buckbrush in the clearings so we will use Reclaim on that this year.

It's important that we take care of the pasture. The more grass there is the better the condition the pasture will be which means we are able to run a few more AUM's on it and get a few more days out of it."

Doug Hess President Minburn PGR

"We have been using Grazon for four seasons on our community pastures. Depending on the situation we use various pasture management methods to control unwanted vegetation including bulldozing, mowing, burning and chemical treatments. When we apply Grazon to poplar and willow regrowth, we find that it gives us better and longer-term control. We also use it to control buckbrush (western snowberry), burdock and other undesirable plant species.

Grazon knocks out any competitive weeds plus the woody species which gives us improved forage production and improves the health of the pasture."

Darrell Skrypnyk

Construction and Services Coordinator Agri Environmental Services Branch (AESB), Brandon MB

"Two years ago I had a 10 acre trial on my land sprayed with Reclaim. It cleaned it right up and really smoked the buckbrush. Since then I have noticed an increase in grass production in that area."

Doug Hess President Minburn PGR



STEWARDSHIP AND BEST PRACTICES.

Dow AgroSciences Range & Pasture products are effective tools in managing weeds and brush in permanent pasture and grazed rangeland. Understanding precautions, restrictions, and how to steward Range & Pasture products properly is important to ensure satisfactory results and to protect desirable species and the environment.





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.
- HAY, SOIL AND MANURE MANAGEMENT
- Soil from treated areas should not be moved to areas where sensitive plants may be planted within 5 years.
- Manure from livestock consuming treated grass should not be used for compost or around susceptible plants.Clippings from grass which have been treated with Dow AgroSciences Range & Pasture herbicides should not be used for composting or mulching.

- 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.



BUFFERS





- Reclaim and Restore II should NOT be used over-the-top of desirable trees. They should only be used up to the drip line (outermost edge of the tree canopy) of desirable trees. Use additional caution around lateral root systems, shallow rooting species and those that propagate vegetatively through layering.
- Grazon XC and Tordon 22K should NOT be used overthe-top of desireable trees. Applications should remain a distance of 1.5× the height of desirable trees at all times.
- Do not apply Grazon XC or Tordon 22K to coarse texture soils (>40% sand) with a high water table (within 1.8 metres or 6 feet of the soil surface).

GRAZING & CUTTING RESTRICTIONS



- No grazing restrictions for livestock.
- 7 day grazing restriction for lactating dairy animals for Restore, Reclaim or Grazon XC; 6 weeks for Tordon 22K.
- Withdraw all animals 3 days priorto slaughter
- If forage must be removed from a treated area following an application, do not cut within 30 days after application with Restore II, Reclaim or Grazon XC; 6 weeks with Tordon 22K.
- If livestock is being moved from a pasture treated with Dow AgroSciences Range and Pasture herbicides to a legume based pasture it is recommended that animals be grazed on an untreated, non legume based pasture for 3 days when treating with Restore or Reclaim and 7 days when treating with Grazon XC or Tordon 22K.

RE-SEEDING & GRASS TOLERANCE



- Newly seeded grass should not be sprayed the season of seeding, secondary root development and a minimum of 4 leaf surfaces must be established, well past seedling stage.
- Safe to established grasses.
- Grasses may be seeded 10 months following an application.
- Legume re-establishment may be affected for up to 5 years.
- Soil organic matter, rainfall and temperature all affect the rate of degradation.
- Avoid applications 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.

APPLICATION TIPS



Absinth Wormwood

Treat in the juvenile stage, when actively growing. Plants become much harder to control at the mature stage after bolting and stems become woody. Typically late May and June.





Canada thistle

Spray once all thistles have emerged and prior to the bud stage. For infestations that have been established for >2 years, either broadcast or spot applications may be required in subsequent years to manage the problem and to remove heavy infestations. Typically in mid June to late July.

Spotted knapweed

Apply prior to flowering in the spring. Application during the summer will provide control; however, either broadcast or spot applications may be required in subsequent years to manage the problem and to remove heavy infestations. Typically late May and June.



Dandelion

Apply anytime from early spring when rosettes are first emerging up to the end of flowering. Typically late May to Mid July.



Tall buttercup

Apply anytime from early spring when rosettes are first emerging up to the end of flowering. Typically late May to Mid July.



Silverberry (wolf willow)

Apply to actively growing plants, after full leaf expansion but prior to the development of a waxy cuticle on the leaf of the shrub. Typically June to mid July.



Western snowberry (buckbrush)

Apply to actively growing plants, after full leaf expansion but prior to the development of a waxy cuticle on the leaf of the shrub. Late springs will delay full leaf out and applications should be delayed. Control will be reduced if applied later in the season, past mid-July, once plants have hardened off. Typically June to mid July.



Wild rose

Apply to actively growing plants, after full leaf expansion. Typically June to mid July.

BROADCAST & SPOT SPRAYING

	Broadcast Application 20 gal/ac water volume	Spot Application Mixing in 10 L water	For Backpack/ Spot Application:	
Restore II *	20 ac/case	24 ml	 Thoroughly and uniformly wet the foliage, but not to the point of run-off. Apply to foliage until wet, up to the point of run-off. Maximum 	
Reclaim *	20 ac/case PLUS 0.2% v/v non-ionic surfactant	2.3g (`1 tsp) Reclaim A 20 ml Reclaim B 20 ml Surfactant		
Grazon XC ■	1.9 L/ac for weed control. Tree rates: contact Dow AgroSciences.	67 ml (i.e. 0.67% solution)	one application per year for all treatments.	
Tordon 22K ■	1.84 L/ac	50 ml (i.e. 0.5% solution)		

WATER VOLUMES

Ground: Minimum 20 gal/ac **Aerial:** Minimum 5 gal/ac

RAINFAST



- Restore II
- Reclaim
- Grazon XC
- Tordon 22K

Accomplish More. On the same acres. Call the Solutions Center at 1.800.667.3852 or visit www.dowagro.ca.

