



Dow AgroSciences

RANGE & PASTURE MANAGEMENT GUIDE



Safe. Effective. Reliable.
Sustainable Pasture
Management Solutions.



Solutions for the Growing World

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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 up 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?
- Grass species – Is it time to introduce new species through replanting or overseeding?



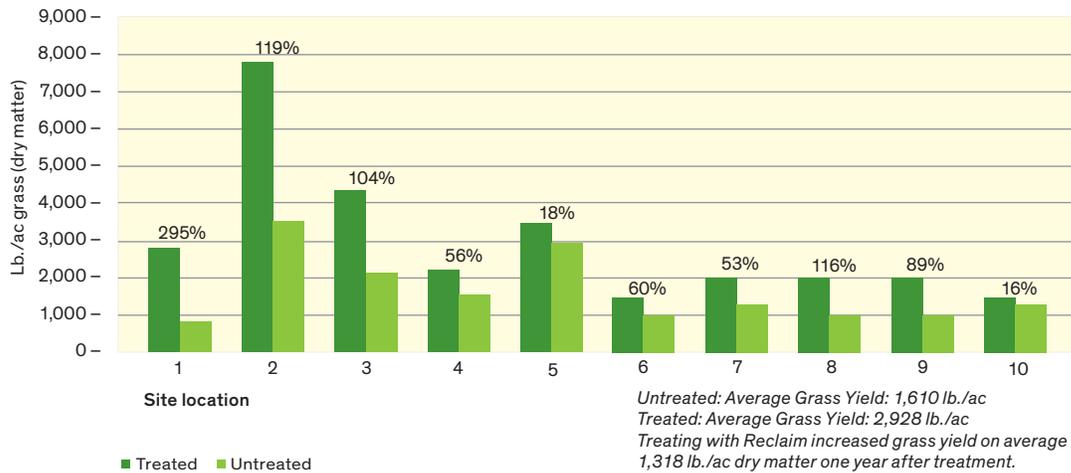
- Weed and brush control – Are weeds and brush steadily encroaching on your pasture land? Are stocking rates declining?

FEWER WEEDS, MORE GRASS

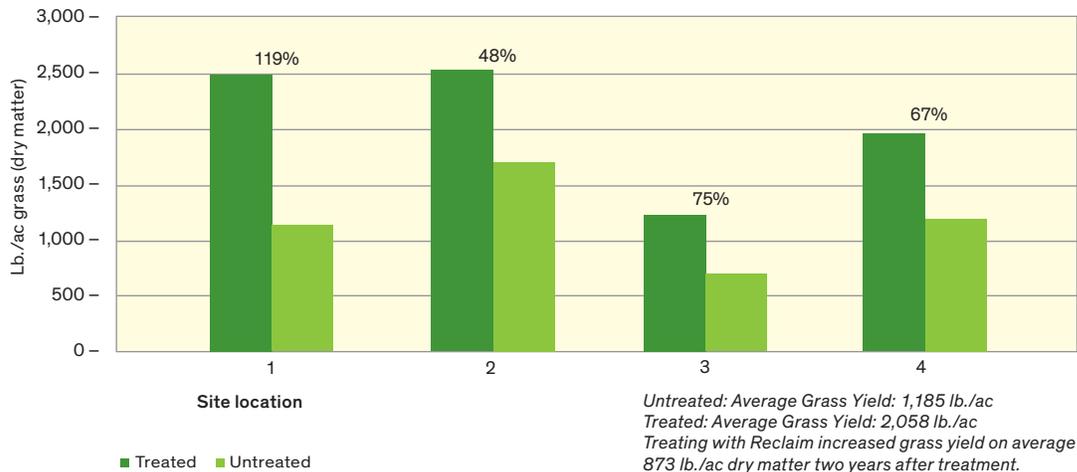
When weeds and brush start to take over pasture and rangeland, grass production suffers. However, when you take definite measures to control both weeds and brush, grass production increases not only the first year, but in subsequent years as well.

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 percent or 1,318 lb./ac dry matter. The second year following treatment, the average increase was 77 percent or 873 lb./ac dry matter.

Increase in grass one year after treatment with Reclaim



Increase in grass two years after treatment 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 percent, giving rise to the “take half, leave half” principle.

Forage utilization rate – Dry Matter (DM)

Untreated area:

$$50\% \times 1,185 \text{ lb./ac DM} = 592.5 \text{ lb./ac DM}$$

Treated area:

$$50\% \times 2,058 \text{ lb./ac DM} = 1,029 \text{ lb./ac DM}$$

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 lb.

$$1,350 \text{ lb. cow} \times 3\% \text{ DM intake/day} = 40.5 \text{ lb./cow/day.}$$

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

Untreated:

$$592.5 \text{ lb./ac DM}$$

$$\frac{40.5 \text{ lb./ac DM}}{592.5 \text{ lb./ac DM}}$$

$$= 14 \text{ animal days/ac (ADA)}$$

Treated:

$$1,029 \text{ lb./ac DM}$$

$$\frac{40.5 \text{ lb./ac DM}}{1,029 \text{ lb./ac DM}}$$

$$= 25 \text{ animal days/ac (ADA)}$$



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:

1,120 Animal Days

120 days of grazing

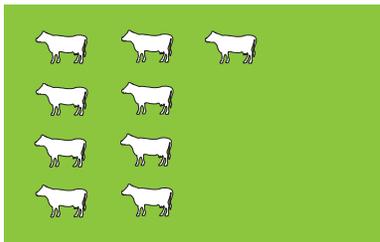
= **9.3 cows can be grazed on 80 ac for 120 days**

Treated:

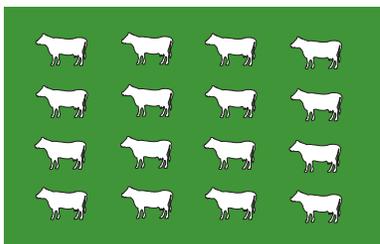
2,000 Animal Days

120 days of grazing

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



Untreated pasture



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

**Grazon is available in a convenient new formulation – Grazon XC.
***Reclaim is available in a convenient new formulation – Reclaim II.*

QUICK REFERENCE GUIDE

FOR CONTROL OF WEEDS, SHRUBS AND TREES

BROADLEAF WEEDS, SHRUBS AND TREES	RESTORE II	RECLAIM II	GRAZON XC	TORDON 22K
ABSINTH WORMWOOD		x		
ANNUAL SOW THISTLE	x	x		
ANNUAL SUNFLOWER		x		
ASPEN			x	
BABY'S BREATH		x		
BALL MUSTARD		x		
BALSAM POPLAR			sup-pressed	
BIENNIAL WORMWOOD	season-long	x		
BIRCH			x	
BITTER SNEEZEWEED	x			
BLACK HENBANE		x		
BLUEBUR	x	x		
BLUE LETTUCE	season-long			
BROWN Knapweed		x		
BULL THISTLE	x			
BURDOCK	x	x	x	
CANADA FLEABANE	x	x	x	
CANADA GOLDENROD	x	x	x	
CANADA THISTLE	x	x	x	x
CHICKWEED	x	x		
COCKLEBUR	x	x		
COMMON BROOMWEED	x			
COMMON GROUNDSEL	x	x		
COMMON PLANTAIN	x		x	
COMMON PURSLANE	x			
COMMON RAGWEED	x	x	x	
COMMON TANSY	su-pressed	x		
COMMON YARROW	su-pressed		x	
CORN SPURRY		x		
COW COCKLE		x		
CUDWEED	x	x		
CURLY DOCK	<4 leaf	x	x	
DAISY FLEABANE	x			
DANDELION	season-long	x	x	
DIFFUSE Knapweed	su-pressed	ΔΔ		x
DOG MUSTARD	x	x		

BROADLEAF WEEDS, SHRUBS AND TREES	RESTORE II	RECLAIM II	GRAZON XC	TORDON 22K
FALSE FLAX	x			
FIELD BINDWEED	season-long	top growth only		x
FIELD PEPPER-GRASS		x		
FIELD SCABIOUS		x		
FIREWEED		x		
FLIXWEED	x	x		
FULLER'S TEASEL	x			
GOAT'S BEARD	x	x		
GREEN SMARTWEED		x		
GUMWEED	season-long	x		
HAIRY BUTTERCUP	x			
HAIRY FLEABANE	x			
HAIRY GALINSOGA		x		
HAWKWEED	x	x		
HEAL-ALL	x			
HEDGE BINDWEED	season-long	x		
HEMP-NETTLE		x		
HOARY ALYSSUM		x		
HOARY CRESS	season-long	x		
HORSENETTLE	x	x		
JAPANESE KNOTWEED		x		
KNOTWEED	<4 leaf			
LADY'S-THUMB		x		
LAMB'S-QUARTERS	x	x		
LEAFY SPURGE	season-long		*	x
MOUSE-EARED CHICKWEED	season-long			
MUSK OR NODDING THISTLE	x	x		
MUSTARDS (EXCEPT DOG & TANSY)	x			
NARROW-LEAVED HAWK'S-BEARD	x	x		
OAK-LEAVED GOOSEFOOT	x	x		
ORANGE HAWKWEED		ΔΔΔ		
OX-EYE DAISY	x	x		
PASTURE SAGE (FRINGED SAGE)		x		x

BROADLEAF WEEDS, SHRUBS AND TREES	RESTORE II	RECLAIM II	GRAZON XC	TORDON 22K
PEPPERGRASS	x			
PERENNIAL PEPPERWEED		x		
PERENNIAL SOW THISTLE	x	x		x
PINEAPPLEWEED	x			
PLANTAIN		x		
PLUMELESS THISTLE	x	x		
POVERTY WEED				x
PRAIRIE SAGE		x		
PRAIRIE WILD ROSE		x	x	
PRICKLY LETTUCE	x	x	x	
PROSTRATE PIGWEED	x	x		
PURPLE LOOSESTRIFE		x		
PUSSYTOES		x		
RED CLOVER			x	
REDROOT PIGWEED	x	x		
RUSSIAN KNAPWEED	su-pressed	x		x
RUSSIAN PIGWEED	x			
RUSSIAN THISTLE	x	x		
SCENTLESS CHAMOMILE	x	x		x
SHEEP SORREL	x			
SHEPHERD'S PURSE	x	x		
SHRUBBY CINQUEFOIL		x		
SILVERBERRY (WOLF WILLOW)		x		
SMARTWEED (PENNSYLVANIA & GREEN)	x			
SPOTTED KNAPWEED	x	x		x
STINGING NETTLE	x			
STINKWEED	x	x		

BROADLEAF WEEDS, SHRUBS AND TREES	RESTORE II	RECLAIM II	GRAZON XC	TORDON 22K
STORK'S-BILL		x		
SWEET CLOVER	x	x	x	
TALL BUTTERCUP	x	x		
TALL IRONWEED				
TANSY RAGWORT	x			
TARTARY BUCKWHEAT	season-long	x		
TROPICAL SODA APPLE	x			
TROPIC CROTON	x			
TUMBLEWEED		x		
VELVETLEAF	x			
VETCH		x	x	
VOLUNTEER ALFALFA		x		
VOLUNTEER CANOLA	x	x		
WESTERN RAGWEED	x	x		
WESTERN SNOWBERRY (BUCKBRUSH)		x	sup-pressed	
WILD BUCKWHEAT		x		
WILD CARAWAY		x		
WILD CARROT		x	x	
WILD MUSTARD		x		
WILD PARSNIP		x		
WILD RADISH	x	x		
WILD STRAWBERRY		x		
WILD SUNFLOWER	x			
WILLOW			x	
YELLOW HAWKWEED		△△△		
YELLOW ROCKET	< 4leaf			
YELLOW STAR THISTLE	x	x		
YELLOW TOADFLAX			*	x

These tables are meant as a guide. Always read and follow label directions.

△△ Apply when plants are actively growing with the optimum time of application occurring from rosette to the bolting stages of development or in the fall.

△△△ Apply to plants in the bolting stage of development

*For control of leafy spurge and toadflax under less than optimum growing conditions, use a recommended surfactant such as Intake Adjuvant at the rate of 0.25 percent by volume (250 mL per 100 L of water)

IDENTIFICATION OF WEEDS, SHRUBS AND TREES

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 percent 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.

Invasive plants are those that can thrive and spread aggressively, to the extent that they are believed to cause damage to the environment. They have the ability to reduce the quality and quantity of forage available by making them less accessible or attractive to grazing animals and by competing with desirable range plants.



Absinth wormwood – weed, invasive

Treat in the juvenile stage, when actively growing. Best timing: early to mid-June.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore™ II (1 L/ac)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Aspen, white poplar – tree

Ensure active growth with no insect or disease pressures. Apply at full leaf until August on trees up to 12' in height.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Grazon XC for ground application and 1% v/v for aerial application.

Grazon XC (2.5 L/ac)



Birch – tree

Ensure active growth with no insect or disease pressures. Apply at full leaf until August.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Grazon XC for ground application and 1% v/v for aerial application.

Grazon XC (2.5 L/ac)



Canada thistle – weed, invasive

Spray once all thistles have emerged, prior to flowering – typically in mid-June to late July. For infestations that have been established for over two years, either broadcast or spot applications may be required in subsequent years to manage the problem and to remove heavy infestations.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Grazon XC (1.9 L/ac)

Restore II (1 L/ac)



Common tansy – weed, invasive

Apply from rosette to bolt.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Dandelion – weed

Apply anytime from early spring when rosettes are first emerging up to the end of flowering – typically late May to mid-July.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Grazon XC (1.9 L/ac)



Hawkweed species — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore II (1 L/ac)



Hound's tongue — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II – Control has been observed when applied at 20 ac/case for a wide variety of susceptible species.

Restore II – Control has been observed when applied at 1 L/ac for a wide variety of susceptible species.



Leafy spurge — *deep-rooted perennial, invasive*

Apply when actively growing when in full true flower, prior to seed set. Grazon XC will provide seasonal control of leafy spurge. Subsequent treatments may be required.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Grazon XC.

Tordon™ 22k (spot spray)

Grazon XC (1.9 L/ac)



Low everlasting sage (pussy-toes) — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.

Reclaim II – Control has been observed when applied at 20 ac/case for a wide variety of susceptible species.



Ox-eye daisy — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore II (1 L/ac)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Pasture sage (fringed) — *weed*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Prairie sage — *weed*

Apply when actively growing. Early to mid-June is ideal.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.

IDENTIFICATION OF WEEDS, SHRUBS AND TREES *(cont.)*



Scentless chamomile — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore II (1 L/ac)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Shrubby cinquefoil — *shrub*

Apply to actively growing plants, after full leaf expansion. The best timing is early/mid-June to early July.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)



Silverberry (wolf willow) — *shrub*

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 early June to mid-July.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)



Spotted knapweed — *weed*

Apply prior to flowering in the spring. Apply prior to flowering in the spring – typically late May to June. 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.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore II (1 L/ac)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Tall buttercup — *weed, invasive*

Apply anytime from early spring when rosettes are first emerging up to the later stages of flowering – typically late May to mid-July.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore II (1 L/ac)

Grazon XC – Control has been observed when applied at 1.9 L/ac for a wide variety of susceptible species.



Western snowberry (buckbrush) — *shrub*

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. 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.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)



White cockle — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II – Control has been observed when applied at 20 ac/case for a wide variety of susceptible species



Wild caraway — *weed, invasive*

Apply when actively growing, prior to flowering.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)

Restore II – Control has been observed when applied at 1 L/ac for a wide variety of susceptible species.



Wild rose — *shrub*

Apply to actively growing plants, after full leaf expansion – typically June to mid-July.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)



Wild strawberry — *weed*

Apply when actively growing.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Reclaim II.

Reclaim II (20 ac/case)



Willow — *tree*

Ensure active growth with no insect or disease pressures. Apply at full leaf until August, before trees are 12' tall.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Grazon XC for ground application and 1% for aerial application.

Grazon XC (2.5 L/ac)



Yellow toadflax — *deep-rooted perennial, invasive*

Apply when actively growing, when the majority of the population is flowering, prior to seed set. Grazon XC will provide seasonal control of yellow toadflax. Subsequent treatments may be required.

Add a non-ionic surfactant such as Intake at 0.25% v/v to Grazon XC.

Tordon 22k (broadcast – 1.8 L/ac; spot spray – 3.6 L/ac where no more than 50% of an acre is treated)

Grazon XC (1.9 L/ac)

Reclaim II™

HERBICIDE

Reclaim II delivers the most trusted extended control of broadleaf weeds and brush.

PRODUCT DESCRIPTION

Reclaim II is a selective broadleaf weed and shrub control herbicide for use in rangeland and permanent pasture. It provides extended control of shrubs and broadleaf weed species.

GUIDELINES FOR USE

One case of Reclaim II will treat 20 acres. Reclaim II is registered for ground, aerial and spot application methods. For best results, apply Reclaim II 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 II requires the addition of a non-ionic surfactant such as Intake at 0.2 percent v/v or 2 L per 1,000 L spray solution.

Most warm and cool season rangeland and pasture grasses are tolerant of Reclaim II applications at the registered rate. Do not spray if injury to existing forage legumes cannot be tolerated. Do not apply Reclaim 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.

EXTENDED WEED AND SHRUB CONTROL

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

- Western snowberry (*buckbrush*)
- Canada thistle¹
- Dandelion
- Pasture sage (*fringed sage*)
- Prairie sage
- Shrubby cinquefoil
- Wild rose
- Silverberry (*wolf willow*)

TIMING

Reclaim II 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.

Target timing to the most problematic plants. For example, if your primary target is buckbrush, timing will likely be earlier (June 1 to July 15). If the primary target is Canada thistle, wait long enough for the majority of thistles to emerge (July 1 to July 30). Call the Solutions Center for any questions on weed staging in your fields.

Environmental stresses such as severe drought or extended periods of heat may decrease efficacy.

Refer to the product label for complete use directions.

GRAZING RESTRICTIONS

There are no grazing restrictions for livestock; a seven day grazing restriction for lactating dairy animals. Withdraw all animals three days prior to slaughter. Reclaim II works like a natural growth-regulating hormone found only in plants and not in livestock and wildlife. Cattle do not metabolize Reclaim II – when ingested, Reclaim II is rapidly excreted from the body in the urine and does not accumulate in the animal.

RESULTS

Reclaim II is absorbed by the leaves and roots, translocating throughout the plant, causing the plant to be controlled. 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 II provides timely, increased grass production and extended weed and shrub control.

TANK MIXES

For control of low growing brush such as western snowberry and wild rose, as well as tree species such as willow & poplar growing in the same area; Reclaim II can be tank mixed with Grazon XC. Please contact your Dow AgroSciences representative for rate recommendations & timing.

¹Removal of competing vegetation may result in new Canada thistle shoots emerging.



WEEDS AND SHRUBS CONTROLLED

- Absinth wormwood
- Annual sow thistle
- Annual sunflower
- Baby's breath
- Ball mustard
- Biennial wormwood
- Black henbane
- Bluebur
- Brown knapweed
- Buckbush
- Burdock
- Canada fleabane
- Canada goldenrod
- Canada thistle
- Chickweed
- Clover
- Cocklebur
- Common groundsel
- Common ragweed
- Common tansy
- Corn spurry
- Cow cockle
- Cudweed
- Curly dock
- Dandelion
- Dog mustard
- Field bindweed*
- Field peppergrass
- Field scabious
- Fireweed
- Flixweed
- Goat's-beard
- Green smartweed
- Gumweed
- Hairy galinsoga
- Hawkweed
- Hedge bindweed
- Hemp-nettle
- Hoary cress
- Horse nettle
- Kochia (*Non ALS resistant biotypes*)
- Lady's-thumb
- Lamb's-quarters
- Musk thistle
- Narrow-leaved hawk's-beard
- Oak-leaved goosefoot
- Orange hawkweed**
- Ox-eye daisy
- Pasture sage
- Perennial pepperweed
- Perennial sow thistle
- Plantain
- Plumeless thistle
- Prairie sage
- Prickly lettuce
- Prostrate pigweed
- Purple loosestrife
- 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** (*all varieties*)
- Western ragweed
- Wild buckwheat
- Wild mustard
- Wild radish
- Wild rose
- Wild strawberry
- Wolf willow
- Yellow star thistle

*All varieties of volunteer canola

**Suppression

Restore II[™]

HERBICIDE

Restore II is an easy-to-use, broad spectrum product for the control of invasive broadleaf weeds.

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. Mammals do not metabolize Restore II.

GUIDELINES FOR USE

Restore II is a co-formulated solution packaged in two 9.7 L 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 percent solution with 10 L 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 that have not emerged at the time of application will not be effectively controlled (especially perennial weeds).

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.

WEEDS CONTROLLED OR SUPPRESSED

- Absinth wormwood
- Annual sow thistle
- Biennial wormwood
- Bitter sneezeweed
- Bluebur
- Blue lettuce
- Bull thistle
- Burdock
- Canada fleabane
- Canada goldenrod
- Canada thistle
- Canola (*all varieties*)
- 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
- Green smartweed
- Groundsel
- Gumweed
- Hairy buttercup
- Hairy fleabane
- Hawkweed
- Heal-all
- Hedge bindweed
- Hoary cress
- Horsenettle
- Knotweed
- Kochia
- Lamb's-quarters
- Leafy spurge
- Mouse-eared chickweed
- Musk or nodding thistle
- Mustards (*except tansy, dog mustards are controlled at the 2.12 L rate*)
- Narrow-leaved hawk's-beard
- Oak-leaved goosefoot
- Ox-eye daisy
- Pennsylvania ragweed
- Peppergrass
- Perennial sow thistle
- Pineapple weed
- Plumeless thistle
- Prickly lettuce
- Prostrate pigweed
- Redroot pigweed
- Russian pigweed
- Russian thistle
- Scentless chamomile
- Sheep sorrel
- Shepherd's purse
- Spotted knapweed
- Stinging nettle
- Stinkweed
- Sulphur cinquefoil
- Sweet clover
- Tall buttercup
- Tall ironweed
- Tansy ragwort
- Tartary buckwheat
- Tropic croton
- Tropical soda apple
- Velvetleaf
- Western ragweed
- Wild radish
- Wild sunflower
- Yellow rocket
- Yellow star thistle

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; a seven day grazing restriction for lactating dairy animals. Withdraw all animals three days prior to slaughter. 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.

RESULTS

Restore II is absorbed by leaves and roots, translocating throughout the plant, causing the plants to be controlled. 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

*Grazon is available in a convenient new formulation – Grazon XC.

**Restore is available in a convenient new formulation – Restore II.

Grazon™ XC

HERBICIDE

Grazon XC is the trusted solution for tree and broadleaf weed control in pasture.

PRODUCT DESCRIPTION

Grazon XC is effective against a broad spectrum of undesirable trees and weeds in permanent pastures. It provides long-lasting control and is most effective on foliage of actively growing plants. The unique chemistry moves through the plant to control even the roots. This is especially important when looking to control biennial and perennial species.

GUIDELINES FOR USE

Grazon XC is labeled for use at 1.9 L/ac for weed control, and up to 2.5 L/ac for tree control. A non-ionic surfactant such as Intake at 0.25% v/v for ground application and 1% v/v for aerial application should be added to achieve optimal control of tree species. 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 percent solution of Grazon XC in water for weed and shrub control, or a 2 percent solution of Grazon XC in water for tree control (67 mL of Grazon XC per 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. For control of leafy spurge and yellow toadflax under less-than-optimum growing conditions, use a recommended surfactant such as Intake at 0.25 percent v/v (250 mL per 100 L water). Subsequent treatments may be required to achieve complete control.

WEEDS AND TREES CONTROLLED

- Aspen
- Dandelion
- Toadflax
- Balsam poplar*
- Dock
- Vetch
- Birch
- Fleabane
- Wild carrot
- Burdock
- Goldenrod
- Wild prairie rose
- Canada thistle
- Leafy spurge
- Wild rose
- Common ragweed
- Plantain
- Willow
- Common yarrow
- Prickly lettuce
- Sweet clover

* Suppression

Refer to the product label for complete use directions.

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 livestock; a seven day restriction for lactating dairy animals. Withdraw meat mammals from areas treated with Grazon XC at least three days before slaughter.

TANK MIXES

For control of low growing brush such as western snowberry and wild rose, as well as tree species such as willow and poplar growing in the same area; Grazon XC can be tank mixed with Reclaim II. Please contact your Dow AgroSciences representative for rate recommendations & timing.

Tordon™ 22K

HERBICIDE

Provides the longest lasting control of deep-rooted perennial weeds such as leafy spurge and toadflax.

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 control.

GUIDELINES FOR USE

Tordon 22K can be used as a broadcast spray at a rate of 1.8 L/ac. 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 percent 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 (over 40 percent 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. See page 20 under Buffers.

WEEDS CONTROLLED

- Canada thistle
- Diffuse knapweed
- Field bindweed
- Leafy spurge
- Pasture sage
- Perennial sow thistle
- Poverty weed
- Russian knapweed
- Scentless chamomile
- Spotted knapweed
- Toadflax

For spot treatment where less than 50 percent 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.

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; 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 CONTROL A FEW WEEDS?

You'd be surprised. Certainly burning, mowing and re-seeding 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 after removal.
- 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 re-seeding 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).

Ninety percent 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 percent control look like?





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 II, Restore II and Grazon XC herbicides in 5 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 & 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.

“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 AUMs 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

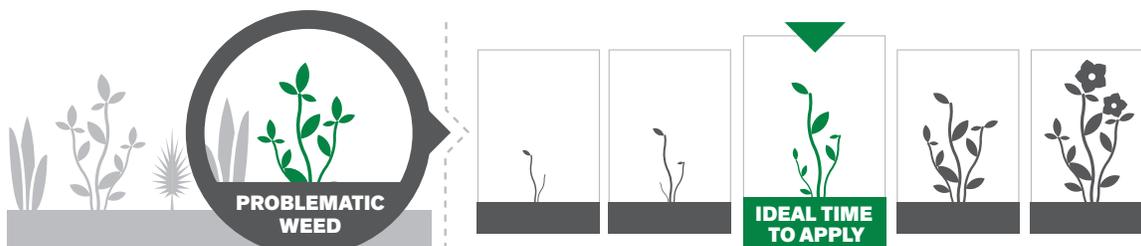
President, Minburn PGR

*Grazon is available in a convenient new formulation – Grazon XC.
***Reclaim is available in a convenient new formulation – Reclaim II.

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.



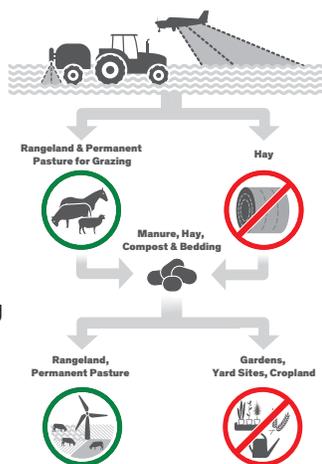
APPLICATION TIMING

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

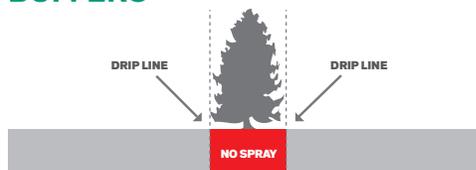
- The ideal timing for application will generally be in June through mid-July with the exception of Canada thistle which enters its ideal timing in mid- to late July when the majority of plants have emerged.
- Timing varies from season to season due to environmental conditions that influence growth and 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

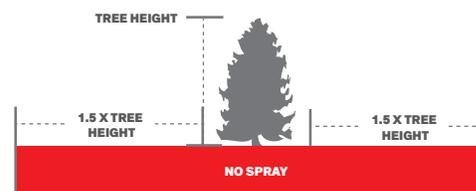
- Soil from treated areas should never be moved to areas where sensitive plants may be planted within five years.
- Manure from livestock consuming treated grass should never be used for compost or around susceptible plants.
- Clippings from grass that have been treated with Dow AgroSciences Range & Pasture herbicides should never be used for composting or mulching.



BUFFERS



- Reclaim II 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 over the top of desirable trees. Applications should remain a distance of 1.5x 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).
- Do not apply Grazon XC or Tordon 22K within 30 metres (approximately 100 feet) of an open water body (does not include dugouts) or as per provincial regulations.

GRAZING AND CUTTING RESTRICTIONS



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

Range & Pasture products are designed for permanent pasture and rangeland where grazing is the method of harvest. The manure or compost from an animal fed treated forage should only be used on appropriate use sites where the loss of broadleaf plants, including legumes, can be tolerated.

RE-SEEDING AND GRASS TOLERANCE



- Newly seeded grass should not be sprayed until secondary root development and a minimum of four leaf surfaces have established – well past the seedling 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 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.

BROADCAST AND SPOT SPRAYING

	Broadcast Application <i>20 gal/ac water volume</i>	Spot Application <i>Mixing in 10 L water</i>
Restore II ▲	20 ac/case	24 mL
Reclaim II ▲	20 ac/case PLUS 0.2% v/v non-ionic surfactant	2.3 g (1 tsp) Reclaim II A 17 mL Reclaim II 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)
Tordon 22K ■	1.84 L/ac	50 mL (i.e. 0.5% solution)
For Backpack/Spot Application:		
^ Thoroughly and uniformly wet the foliage, but not to the point of runoff.		
* Apply to foliage until wet, up to the point of runoff.		
Maximum one application per year for all treatments.		

WATER VOLUMES

Ground: Minimum 20 gal/ac

Aerial: Minimum 5 gal/ac

RAINFAST



For more information about Dow AgroSciences
Range & Pasture solutions please
visit our website at dowagro.ca, or
call our Solutions Center at **1-800-667-3852**.



Dow AgroSciences

Solutions for the Growing World

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