

Forage Adaptation & Comparison Guide

Manitoba
Agriculture
and Food



Seedbed Preparation

Increasingly, forage growers are successfully establishing forage stands without tillage. Benefits of zero-tillage forage establishment are:

- ❖ Lower costs and labour;
- ❖ Better seed bed moisture conservation
- ❖ Standing "dead mulch" protects emerging crop from drying-out and sandblasting.

If seeding into an existing forage stand:

- ❖ Apply 1L/acre glyphosate
- ❖ Apply fertilizer according to soil test recommendations

If conventional tillage practices are being used, prepare a fine, firm, shallow seedbed.

Seeding Depth

Seed shallow (3 to 1 inch) into a firm seed bed. Seed at 3 inch for small-seeded forages, such as timothy, on heavy soils. Seed up to 1 inch for larger seeded forages such as intermediate wheatgrass, or alfalfa on lighter soils.

Spring Seeding

The best time to seed forages is in the early spring, as soon as field conditions permit. The cool, moist conditions of early spring are most favourable for the germination and growth of both grasses and legumes. The moist conditions also allow for a shallow seeding depth, which is very important for quick establishment of the forage crop.

Summer Seeding

If there is adequate moisture, forages can be seeded from late July to mid-August. During this period, grasses only should be seeded. The legumes require a longer growing period to ensure winter survival.

Dormant Fall Seeding

Use dormant seeding in problem areas that are not suitable for seeding in the spring and summer. An example is areas prone to ponding in the spring. Dormant seeding can be attempted when the soil temperatures approach the freezing point and germination is unlikely. The seed germinates in the spring when the growing conditions will be close to ideal. However, a warm moist fall or early snowfall can raise the soil temperatures sufficiently to cause the seed to germinate; these seedlings will die over winter.

Cover Crops

Cover crops compete severely with the forage crop for light, moisture and nutrients, reducing winter survival and yield the following year. However, they are often used to reduce weed competition, sand-blasting and desiccation. If they are used, reduce cover crop seeding rate and nitrogen rates by half, and harvest as green feed to reduce competition. It is important to bale the green feed promptly to eliminate seedling death under the swath.

Legumes

Forage	Use	Longevity	Winter Hardiness	Drought Tolerance	Flooding Tolerance	Salinity Tolerance	Alkalinity Tolerance	Acidity Tolerance	Preferred Climate and Growing Conditions	Growing Period	Positive Features	Negative Features	Plant Type
Alfalfa	Hay & Pasture	Long	Good	Good	Low	Low to Moderate	Moderate to High	Low	Widely adapted to most Manitoba soils but will not tolerate areas that have periodic flooding.	Spring - Fall	Easy to establish. High yields, rapid regrowth. Highest nutrition of all forages.	Bloat hazard. Needs good drainage.	Tap, Branch, Rhizomatous, Creeping Rooted
Alsike Clover	Hay & Pasture	Short	Fair	Poor	Moderate	Low	Low to Moderate	Moderate	Prefers low-lying moist areas.	Spring	Easy establishment. Tolerant to poor drainage and acid soils.	Bloat hazard. Short life span and low yield.	Branched
Birdsfoot Trefoil	Pasture	Long	Good	Moderate	High	Low to Moderate	Moderate	Moderate to High	Prefers moist areas.	Spring - Fall	Non bloating - reseeds itself. Feed value similar to alfalfa.	Poor seedling vigor. Poor competitor and low yield.	Tap Rooted with Branches
Cicer Milkvetch	Pasture	Long	Good	Moderate to High	Low	Moderate	Moderate	Moderate	Widely adapted but exhibits its creeping habit best on more coarse textured soils.	Late Spring - Fall	Non bloating. Hardier than alfalfa. Very aggressive once established.	Slow to establish. Hard seeds. Slow regrowth after grazing.	Creeping Rooted
Kura Clover	Pasture	Long	Good	Moderate	Moderate	Unknown	Unknown	Moderate	Tolerates low fertility and soil acidity, wet soils and some flooding.	Spring - Fall	Has good grazing resistance. Has a deep root system. Rapid regrowth. Will do well under conditions that are less than optimal for alfalfa.	Very slow to establish. Bloat hazard. Low growth habit.	Rhizomatous Creeping Roots
Red Clover	Hay & Pasture	Short	Poor	Low	High	Low	Moderate	Moderate	Best suited to humid areas with moderate temperatures.	Spring	Easy establishment. Tolerates wetter and more acid soils than alfalfa.	Causes bloat. Short life span.	Tap Rooted with Side Branches
Sainfoin	Pasture	Long	Fair	High	Low	Low	High	Low	Best on brown and dark brown soil areas. In very dry areas it yields poorly. Does well on thin gravelly soils.	Spring - Summer	Non bloating. More drought and cold tolerant than alfalfa.	Poor regrowth. Slow to establish.	Tap Rooted
Sweet Clover	Hay & Silage	2 years	Fair	Moderate to High	Low	Moderate	Moderate	Low	Especially productive on fertile soils.	Spring of second year	Widely adapted. Good for soil and drainage improvement.	Low palatability unless harvested early. Self seeds.	Tap Rooted
White Clover	Pasture	Short to long	Good	Poor	Low to Moderate	Low	Low	Moderate	Prefers well drained silt loams to clay soils that have a constant supply of moisture	Spring - Fall	Will reseed. Resistant to grazing with good regrowth. Excellent quality.	Low producing. Bloat hazard. Shallow root system.	Rhizomatous

Grasses

Forage	Use	Longevity	Winter Hardiness	Drought Tolerance	Flooding Tolerance	Salinity Tolerance	Alkalinity Tolerance	Acidity Tolerance	Preferred Climate and Growing Conditions	Growing Period	Positive Features	Negative Features	Plant Type
Altai Wild Ryegrass	Pasture	Long	Excellent	High	Low	Very High	Moderate to High	Low to Moderate	Loam & clay soils best - but grows on a wide range of soils.	Early Spring - Mid Summer	Suitable for extending the grazing season - salt tolerant retains nutritional value late into fall and winter.	Slow to establish, poor competition	Bunch Grass
Annual (Italian) Ryegrass	Hay & Pasture	Short annual 1 year	Poor	Low	High	Low	Moderate	Moderate	Produces best on soils of medium to high fertility and grows best with adequate moisture.	Spring - Fall	Easy to establish. Very palatable. Makes good hay or silage. Can be used for companion crop.	Does not withstand drought or hot weather.	Bunch Grass
Creeping Foxtail	Pasture	Long	Good	Low	High	Moderate	Moderate	Moderate	Adapted to areas where reed canarygrass grows well and soil moisture is continually available.	Early Spring - Fall	Suitable for erosion control. Spreads rapidly once it is established.	Light, fluffy seed. Slow establishment. Poor competition during first 6 weeks.	Sod Forming
Creeping Red Fescue	Pasture Lawn	Long	Excellent	Moderate	Moderate	Low	Moderate	Moderate	Does best in high rainfall areas. Will grow in wide range of soil types.	Spring - Fall	Tolerates close grazing. Tolerates areas too dry for Timothy. Grows well late summer to freeze up and retains good quality.	High moisture requirement. Vulnerable to crown and root rots and snow mold.	Sod Forming
Crested Wheatgrass	Pasture & Hay	Long	Excellent	Moderate to High	Low	Low to Moderate	Moderate to High	Low	Adapted to dry areas with good soils but will also establish on lighter soils.	Early Spring	Excellent for spring pasture. Easy to grow. Withstands close grazing and trampling.	Does not tolerate cool, wet soils. Poor quality after heading out.	Bunch Grass
Dahurian Wild Ryegrass	Pasture	Short	Good	Moderate	Low	High	Moderate	Low	Adapted to all soil zones.	Spring - Fall	Highly competitive and quick to establish.	Short lived.	Shallow Rooted Bunch Grass
Intermediate Wheatgrass	Hay & Pasture	Short	Good	Moderate to High	Low	Low	High	Low	Well drained soils with ample moisture	Late Spring - Mid Summer	Easy to establish. Good haygrass with alfalfa. Outyields CWG and Smooth Brome.	Less winter hardy and drought tolerant than CWG.	Sod Forming

Grasses

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Kentucky Blue Grass	Pasture Lawn	Long	Excellent	Moderate	Moderate	Low	Low	Low	Prefers cool and humid. Grows on most soils.	Spring - Fall	Tolerates close and frequent defoliation. Useful in erosion control.	Goes dormant in hot, dry weather. Slow to establish. High moisture requirement. Lower yielding.	Sod Forming
Meadow Bromegrass	Hay & Pasture	Long	Good	High	Low	Low	Moderate	Moderate	Grows well on most soils where Smooth Brome does well.	Early Spring - Late Summer	Very palatable. Good regrowth after grazing or cutting. Less aggressive than Smooth Brome.	Mainly a pasture grass. Difficult to put up as hay when in pure stand.	Bunch Grass
Meadow Fescue	Pasture	Short - Medium	Good	Moderate	High	Low to Moderate	Low	Moderate	Prefers soil with good moisture and good drainage.	Early Spring - Late Fall	Best for pasture. Good fall pasture - stays green late in fall.	Susceptible to heavy grazing. Slow regrowth. Susceptible to leaf rust.	Bunch Grass
Meadow Foxtail	Pasture	Long	Good	Low	High	Low	Moderate	High	Prefers cool moist conditions. High water table.	Early Spring - Fall	Earliest grass to grow in spring. Very palatable when young. Seeds fall off and reseeds self.	Light, fluffy seed. Susceptible to drought. Seeds need to be coated for seeding.	Bunch Grass
Orchard grass	Hay & Pasture	Short	Fair	Moderate	Low to Moderate	Low	Low	Moderate	Prefers moist conditions. Sandy soils are too dry for good growth unless in high rainfall area.	Spring - Fall	Easy to establish. Very palatable. Fast regrowth. Makes good hay with alfalfa.	Needs high nitrogen for good production. Only moderately winter hardy. Subject to overgrazing.	Bunch Grass
Perennial Ryegrass	Hay & Pasture	Short 2-3 years	Poor	Low	Low	Low	Moderate	Moderate	To produce high yields it requires high precipitation and fertility. Adapted to wide range of soils.	Spring - Fall	Good seedling vigor, rapid development, high yield and quality. Can be grazed within 2 months after seeding.	High nitrogen input for high production. Needs lots of moisture but will not tolerate flooding. Prone to winter kill.	Bunch Grass
Pubescent Wheatgrass	Hay & Pasture	Medium	Good	Moderate to High	Low	Low to Moderate	Moderate	Low	Widely adaptable with respect to precipitation, temperature, elevation, and low fertility soil.	Early Spring - Mid Summer	Has the ability to stay green into the summer months. Hardier than Intermediate Wheat Grass.	Strong creeping roots get sod bound and result in unproductive stand after a few years.	Sod Forming
Russian Wild Ryegrass	Pasture	Long	Excellent	Very High	Low	Very High	High	Moderate	Can be grown on a wide range of soils. Most productive on fertile loams.	Early Spring - Mid Summer	Salt tolerant, early growth and good for winter grazing.	Poor seedling vigor, slow to establish.	Bunch Grass
Smooth Bromegrass	Hay & Pasture	Long	Excellent	Moderate	Moderate	Low to Moderate	Moderate	Moderate	Well adapted to all soils in Manitoba.	Mid Spring - Mid Summer	Winter hardy. Good yield. Palatable even at mature growth stage.	Seed is long, light and difficult to sow. (bridging) Becomes sod bound. Slow regrowth.	Sod Forming
Tall Fescue	Pasture	Long	Good	Moderate to High	Moderate to High	High	High	Very High	Variety of soils. Does well on wet, poorly drained soils.	Late Spring - Fall	Suitable for late fall grazing or stock piling. Easy to establish. Good regrowth. It is one of the more drought resistant grasses.	Slow to cure when used for hay. Starts growing later than many other grasses in spring.	Bunch Grass
Tall Wheatgrass	Pasture Hay	Long	Excellent	Low	High	High	Low to Moderate	Low to Moderate	Adapted to saline and imperfectly drained alkali soils.	Late Spring - Mid Summer	Salt tolerant. High nutrition in early heading stage.	Slow to establish. Poor vigor and competitive ability. Coarse when mature.	Bunch Grass
Timothy	Hay & Pasture	Medium	Good	Low	High	Low	Low	High	Cool moist areas with good drainage.	Spring - Summer	Low seed costs. Easily established. Excellent hay for horses. Goes well with alfalfa mixture. Suitable for hay export market.	Susceptible to heat and low moisture conditions. Low palatability at maturity.	Bunch Grass

Native Grasses*

Forage	Use	Longevity	Winter Hardiness	Drought Tolerance	Flooding Tolerance	Salinity Tolerance	Alkalinity Tolerance	Acidity Tolerance	Preferred Climate and Growing Conditions	Growing Period	Positive Features	Negative Features	Plant Type
Big Bluestem	Pasture	Long	Good	Moderate	Moderate	Moderate	Moderate	Moderate	Grows under a wide range of conditions.	Late Spring - Fall	Good growth during mid summer when cool season grasses are dormant. Nutritious.	Light, fluffy seed.	Sod Forming
Green Needlegrass	Pasture	Long	Good	High	Moderate	Moderate to Low	Moderate	Moderate	Performs best on medium to heavy textured soils. Prefers moist sites with good drainage.	Late Spring - Mid Summer	Palatable and nutritious. Tolerant to drought and grasshopper damage.	Seed has high level of dormancy. Easily overgrazed.	Bunch Grass
Little Bluestem	Pasture	Long	Good	High	Low	Moderate	Moderate	Moderate	Sandy, gravelly soils with shallow water table or where snow accumulates. Common on prairie upland.	Late Spring - Fall	Highly nutritious and palatable when grazed at early stage.	Light, fluffy seed. Becomes unpalatable in the fall.	Bunch Grass
Northern Wheatgrass	Pasture	Long	Good	Very High	Moderate	Moderate	Moderate	Low	Prefers medium to coarse textured soil.	Mid Spring - Mid Summer	Suitable for erosion control. Easy to establish. Produces good ground cover.	Tends to get sod bound. Becomes wiry and unpalatable in the fall.	Sod Forming
Reed Canarygrass	Hay & Pasture	Long	Good	Moderate	Very High	Low	Moderate	Moderate	Moist cool climate. Poorly drained areas subject to temporary flooding.	Spring - Summer	Grows well in wet area. Withstands flooding for up to 2 months. Grows tall, good yield.	Slow to establish. Nutrition and palatability low when mature.	Sod Forming
Slender Wheatgrass	Hay & Pasture	Short	Good	Moderate	Low	High	High	Low	Adapted to wide range of soils but prefers sandy loams.	Mid Spring - Mid Summer	High salinity tolerance. Cures well on stem. Good seedling vigor and fast establishment.	Less competitive and persistent than other wheatgrasses. Not resistant to close or heavy grazing.	Bunch Grass
Streambank Wheatgrass	Hay & Pasture	Long	Good	Very High	Moderate	Low to Moderate	Moderate	Low	Widely adapted - tolerates periodic flooding but requires well-drained soils.	Mid Spring - Mid Summer	Good for soil and water conservation. Can be used for lawns, playgrounds and parking lots.	Low in production. Unpalatable when mature.	Sod Forming
Switch grass	Pasture	Medium	Fair	Low	Moderate	Moderate	Low	Low	It has potential for good summer pasture when enough moisture. Grows best on loam and sandy loams.	Late Spring - Fall	Warm season grass. Can be used for summer pasture when cool season grasses go dormant.	Slow establishment. Should not be cut or grazed the first year. Becomes unpalatable after maturity.	Bunch Grass
Western Wheatgrass	Hay & Pasture	Long	Excellent	High	Moderate to High	High	High	Moderate	Widely adapted - prefers heavy somewhat alkaline soil.	Early Spring - Fall	Salt tolerant and long-lived. Nutritious and productive under moderate grazing. Suitable for erosion control.	Slow to establish. Sensitive to overgrazing.	Sod Forming

*These grasses are indigenous to North America. Available varieties have been improved through plant breeding programs.

For more information contact your local Forage Specialist:

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Brandon - Jane Thornton - 726-6409

Portage la Prairie - Vaughn Greenslade - 239-3366

TIPS

- ❖ Always buy good quality, clean seed.
- ❖ Soil test and plan for weed control especially during establishment year.
- ❖ Choose forages that suit your soil and climatic conditions.
- ❖ Choose forages that meet the needs of your total forage system.
- ❖ Be patient during establishment year, forages are slow to start.

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