



Guide to *Forage* Plants Identification

2nd
edition

Optimum pH
Tolerance to poor drainage
Tolerance to frequent mowing
Tolerance to grazing
Tolerance to heat and drought

Potential annual yield
Speed of establishment
Competition (once established)
Persistence
Flowering
Utilization
Palatability
Mixture

This guide, though not exhaustive, is designed to help you identify the main forage plants in Québec and become familiar with their characteristics. It was created to be easy to use wherever you are – out in the fields or on the farm. It is an educational tool that we hope will serve as a reference guide for agricultural producers, educators, trainers, advisors and other stakeholders of the forage sector. We would like to thank our collaborators who graciously gave their time and shared their knowledge in contributing to this guide.

Coordination

- Julie Baillargeon, Agronomist, M.Sc., Technology Transfer and Research Project Coordinator, Valacta
- Hélène Poirier, Agronomist, Project Manager, *Conseil québécois des plantes fourragères*

Authors

- Mario Gauthier, Agronomist, Strategic Advisor, Valacta
- Michel Carrier, Agronomist, Organic Farming Advisor, Valacta
- Robert Berthiaume, Agronomist, Ph.D., Expert in Forage Systems, Valacta

Révision

- Réal Michaud, Agronomist, Ph.D., Research Scientist, Agriculture and Agri-Food Canada
- Gilles Bélanger, Ph.D., Research Scientist, Agriculture and Agri-Food Canada

Translation

- James Lawler, Translator, Communications Specialist

Photography

- Audrey Martin, Photographer
- Valacta
- Semican

Graphic Design

- Tommy Ferland, *La Fabrik*

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Forage legumes:

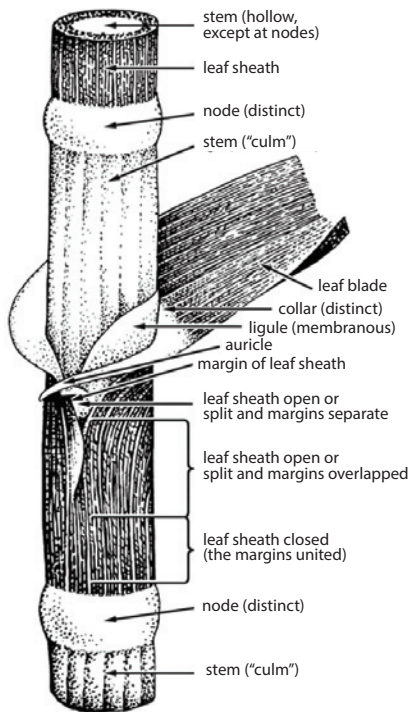
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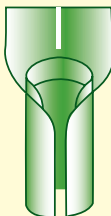
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IDENTIFYING FORAGE GRASSES



Sheath



Split with
margins separate

- Bluegrass



Split with
margins
overlapping

- Orchardgrass
- Tall fescue
- Timothy
- Reed Canary Grass



Closed with
margins united

- Meadow and smooth bromegrasses

Source: www.omafra.gov.on.ca/english/livestock/beef/facts/06-095.htm

Ligule



Membranous

- Meadow and smooth brome-grasses
- Tall fescue
- Annual and perennial ryegrasses



Pointed

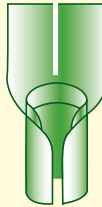
- Orchardgrass
- Timothy
- Reed Canary Grass

Auricles



Claw-like, encircles the stem

- Tall fescue



Absent

- Meadow and smooth brome-grasses
- Timothy
- Orchardgrass
- Reed canary grass

Alfalfa



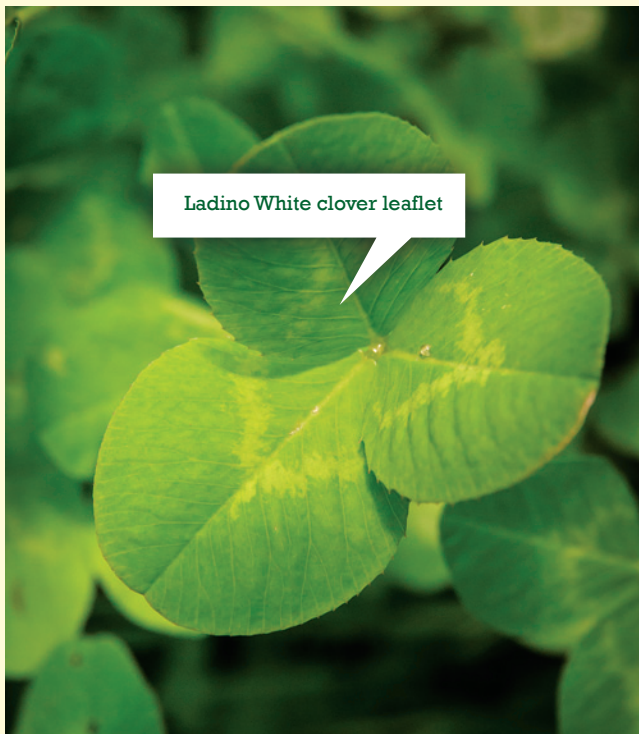
Clover



Clover



Clover




Forage grasses:

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REED CANARY GRASS

A close-up photograph of a Reed Canary Grass stem. The stem is green and has several long, narrow leaves attached. A white arrow points to a small, white, membranous structure on the stem, which is the ligule. A small water droplet is visible on one of the leaves.

Membranous ligule

Guide to *Forage*
Plants Identification

//

1

REED CANARY GRASS

Prominent ligule, not indented

Absence
of auricles

1

REED CANARY GRASS

Split sheath with
margins overlapping

1

REED CANARY GRASS

Vegetative stage

1

REED CANARY GRASS

Heading

Characteristics

Optimum pH	5.5 to 7.0
Tolerance to poor drainage	Very good. Recommended forage grass best adapted to soils with poor drainage
Tolerance to frequent mowing	Good
Tolerance to grazing	Good
Regrowth	Good
Tolerance to heat and drought	Good to very good
Speed of establishment	Slow
Competition (once established)	Strong
Persistence	Very good
Heading	Semi-early

Recommendations of the authors

Utilization	Silage, dry hay and pasture
Palatability	Good but decreases rapidly when heading begins
Mixture	Seeded pure or mixed with timothy or red clover

- Suitable for all soil conditions and has better tolerance for soil acidity than most other recommended forage grasses.
- Hay for dry cows.




Vegetative stage

A close-up photograph of a meadow brome grass stem. The stem is green and has several long, narrow, green leaves attached. The leaves are shown in detail, highlighting the closed sheath where the margins are united. A white callout box points to this feature.

Closed sheath with margins united



Hairy leaf blade and sheath

A photograph of a meadow brome grass plant. The plant has several long, slender, green leaves and a central inflorescence (head) with multiple spikelets. A white callout box with a pointer indicates the inflorescence. In the foreground, there are some dried, fluffy seed heads of the plant. The background is a blurred field of similar grasses under a cloudy sky.

Heading

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Very sensitive
Tolerance to frequent mowing	Very good
Tolerance to grazing	Excellent
Regrowth	Good
Tolerance to heat and drought	Good to very good
Speed of establishment	Slow
Competition (once established)	Average
Persistence	Good
Heading	Semi-early

Recommendations of the authors


Utilization	Pasture, silage and hay
Palatability	Very good
Mixture	Can be mixed with: red or ladino clover / timothy, alfalfa / smooth brome grass

- *Well adapted to the hay / silage and grazing / pasture systems. Retains quality until maturity.*
- *Large seed difficult to plant. Seeding can be done by broadcasting or using a special brome seed box.*



SMOOTH BROMEGRASS

Vegetative stage



Glabrous (hairless)
leaf blade


W-shaped marking in the
centre of the leaf blade,
characteristic of brome grasses

SMOOTH BROMEGRASS



SMOOTH BROMEGRASS

Closed sheath with
margins united,
rarely with hair



Heading

SMOOTH BROMEGRASS



Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Sensitive
Tolerance to frequent mowing	Low
Tolerance to grazing	Good
Tolerance to heat and drought	Good to very good
Regrowth	Average
Speed of establishment	Slow
Competition (once established)	Average
Persistence	Good
Heading	Semi-late

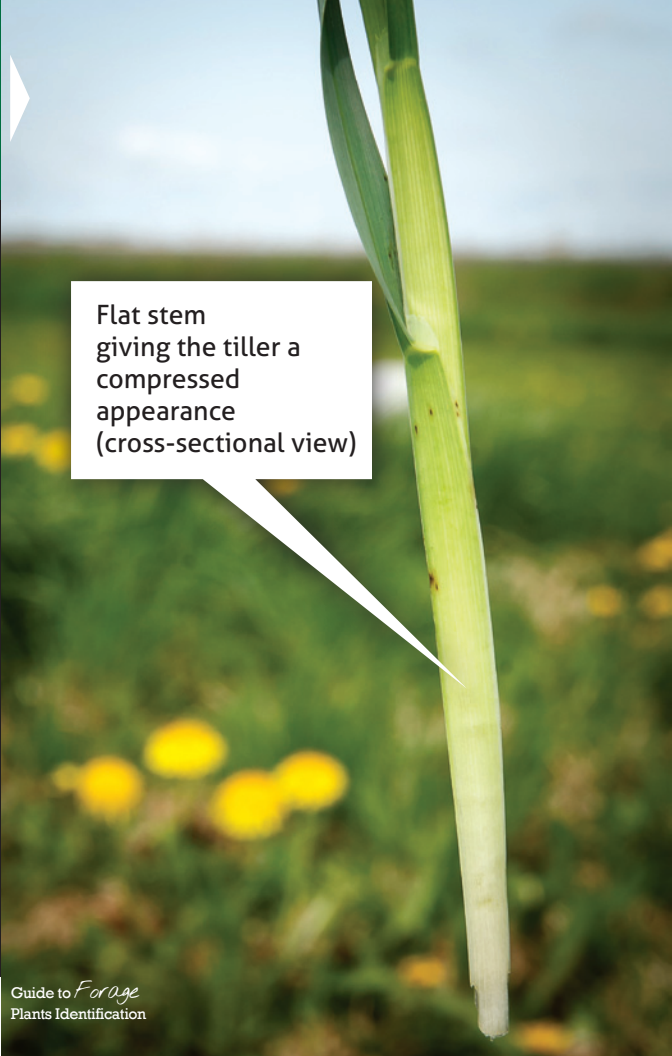
Recommendations of the authors

Utilization	Pasture, silage and hay
Palatability	Very good
Mixture	Can be mixed with: ladino clover / timothy, alfalfa / meadow brome grass


- Large seed difficult to plant. Seeding can be done by broadcasting or using a special brome seed box.



Vegetative stage



Flat stem
giving the tiller a
compressed
appearance
(cross-sectional view)




Flat stem giving
the tiller a
compressed
appearance
(front view)

4

ORCHARDGRASS

Very long, pointed,
membranous ligule

A photograph of a field of orchardgrass. The grass is green and has several tall, thin seed heads (panicles) that are beginning to form. A white callout box with a pointer indicates a specific part of the plant.

Heading

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Sensitive
Tolerance to frequent mowing	Very good
Tolerance to grazing	Very good
Regrowth	Good
Tolerance to heat and drought	Good
Speed of establishment	Fast
Competition (once established)	Strong
Persistence	Average
Heading	Early

Recommendations of the authors


Utilization	Silage, hay and pasture
Palatability	Good (before heading)
Mixture	Seeded pure or can be mixed with alfalfa or red clover

- High potassium absorption.
- Not recommended for dry cows.
- Harvest before heading. Highly stimulated by nitrogen, like all grasses.
- Late-maturing cultivars available.
- Hay – harvest before heading.



Vegetative stage

TALL FESCUE

A close-up photograph of a single, thick, green blade of Tall Fescue grass. The blade is elongated and shows prominent, parallel veins running along its length. The margins of the blade appear slightly rough or serrated. A white arrow points from the text box to the blade.


Thick, leathery blade, prominent veins on the upper face; blade has rough margins



Split sheath with margins overlapping;
blunt auricles with soft, downy hair

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TALL FESCUE



Heading

Characteristics

Optimum pH	5.8 to 6.5
Tolerance to poor drainage	Good
Tolerance to frequent mowing	Very good
Tolerance to grazing	Good
Regrowth	Very good
Tolerance to heat and drought	Good (also in autumn)
Speed of establishment	Fast
Competition (once established)	Strong
Persistence	Average to good
Heading	Semi-late

Recommendations of the authors

Utilization	Silage
Palatability	Low, especially in pasture
Mixture	Can be mixed with alfalfa or red clover

- *Tolerates brief flooding. Species most tolerant to acidity.*
- *Not recommended for pasture or hay due to its low palatability and leaf roughness.*

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TIMOTHY

Vegetative stage




Ligule

Split sheath

6

TIMOTHY



Ligule has a distinct notch
on each side

6

TIMOTHY

A close-up photograph of a Timothy grass plant in its late boot stage. The image shows a green stem with several long, narrow leaves. A white callout box with two lines pointing to the developing seed head is labeled "Late boot stage". The background is a blurred field of similar grass.

Late boot stage

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Moderate
Tolerance to frequent mowing	Low
Tolerance to grazing	Low to average
Regrowth	Poor
Tolerance to heat and drought	Low
Speed of establishment	Average
Competition (once established)	Average
Persistence	Excellent
Heading	Late

Recommendations of the authors

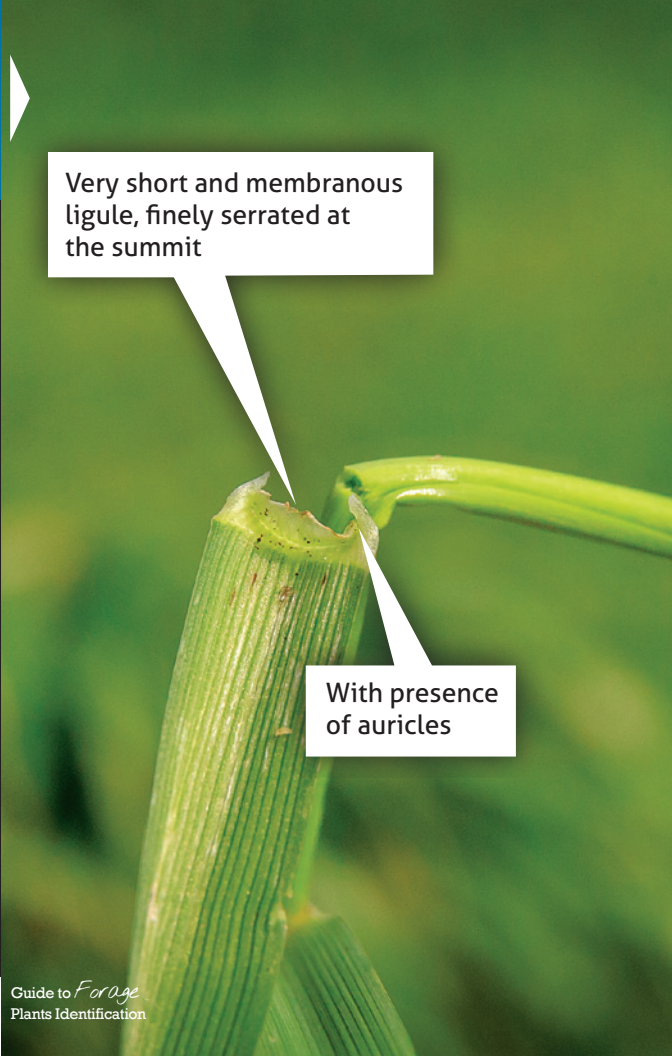
Utilization	Silage, hay and pasture
Palatability	Very good
Mixture	Can be mixed with red clover / brome grass, alfalfa / brome grass

- Low absorption of potassium.
- Hay for dry cows.

RYEGRASS

A close-up photograph of a dense clump of rye grass. The leaves are long, narrow, and bright green, with some showing signs of wear or aging. A white callout box points to a specific leaf.

Vegetative stage

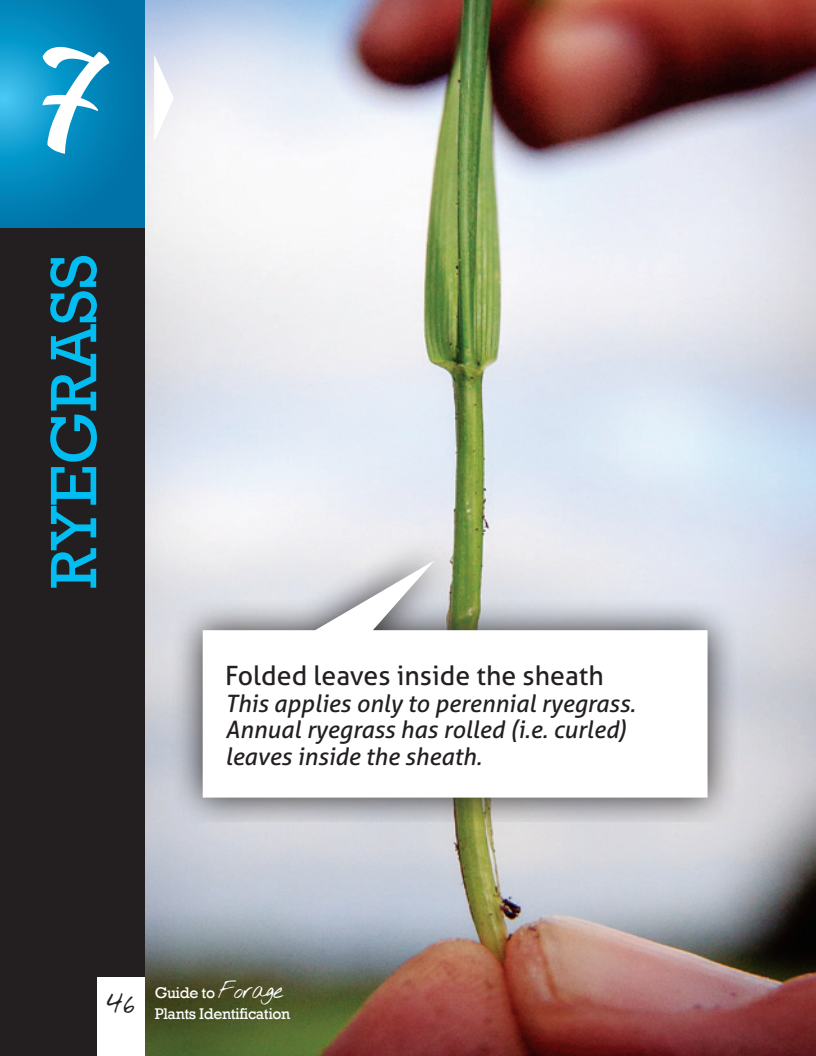


Very short and membranous
ligule, finely serrated at
the summit


With presence
of auricles

A close-up photograph of a ryegrass plant. The plant has several green, upright blades. The lower part of the plant, including the roots and the base of the blades, is covered in dark brown soil. A white callout box with a pointer indicates a specific feature on the lower sheath.

Lower sheath is reddish at the base



Folded leaves inside the sheath
*This applies only to perennial ryegrass.
Annual ryegrass has rolled (i.e. curled)
leaves inside the sheath.*

A close-up photograph of a green grass leaf. The leaf is long and narrow, with a prominent central vein. A white callout line points from a text box to the lower surface of the leaf blade. The background is a blurred green field.

Leaf blade very glossy
on lower surface



Heading

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Low
Tolerance to frequent mowing	Very good
Tolerance to grazing	Very good
Regrowth	Good
Tolerance to heat and drought	Low
Speed of establishment	Fast
Competition (once established)	Strong
Persistence	Low
Heading	Does not head out the year of establishment

Recommendations of the authors

Utilization	Pasture, emergency crop, silage
Palatability	Very good
Mixture	Seeded pure or with clover

- *Species not recommended for Québec because of its low level of hardiness.*
- *In summer, does not grow as well as annual ryegrass.*
- *Root system is not deep.*
- *Ryegrass can accumulate nitrates.*

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Low
Tolerance to frequent mowing	Very good
Tolerance to grazing	Good
Regrowth	Good
Tolerance to heat and drought	Low
Speed of establishment	Very fast
Competition (once established)	Strong
Persistence	Low
Heading	Heading in the seeding year for the Westerwold type only

Recommendations of the authors

Utilization	Emergency crop, cover crop (intercrop), green manure, additional pasture for end of summer, companion crop
Palatability	Good
Mixture	Seeded with red clover

- Ryegrass can accumulate nitrates.
- Difficult to make dry hay with.

Forage legumes:

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TREFOIL BIRD'SFOOT

A close-up photograph of a Trefoil Bird'sfoot plant, showing its characteristic trifoliate leaves and small yellow flowers. The plant is the central focus of the page, with a soft-focus background.

Vegetative stage



Leaf with 5 leaflets



TREFOIL BIRDFOOT

Flowering stage

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	The most tolerant of forage legumes recommended in Québec; tolerates a short period of flooding
Tolerance to frequent mowing	Low
Tolerance to grazing	Very good
Regrowth	Low
Tolerance to heat and drought	Moderate
Potential annual yield	Good
Speed of establishment	Slow
Competition (once established)	Weak
Persistence	Average to good
Flowering	Late

Recommendations of the authors

Utilization	Birdsfoot trefoil is a nonbloating forage legume that is well-suited for grazing pastures
Palatability	Good
Mixture	Seeded pure or mixed with grasses. Low tolerance for competition. Most suitable for long rotations.

- *Birdsfoot trefoil starts late in the spring and regrows slowly after mowing.*
- *Like alfalfa, birdsfoot trefoil needs rest in the autumn. The rest period begins about 10 days before that of alfalfa.*



Vegetative stage

The petiolule (foot-stalk) of the central leaflet is 2 to 3 times longer than the petiolules of the lateral leaflets



Seedling

A close-up photograph of an alfalfa plant stem with several green, serrated leaves. A white arrow points from a label to a small, developing bud on the stem. An orange ruler is held vertically next to the plant for scale, showing markings for 2/3, 2/5, and 2/6. A person's finger is visible at the bottom right, holding the ruler.

Bud stage



Flowering stage

Characteristics

Optimum pH	6.6 to 7.0
Tolerance to poor drainage	Very sensitive
Tolerance to frequent mowing	Moderate
Tolerance to grazing	Low
Tolerance to heat and drought	Low
Speed of establishment	Fast
Competition (once established)	Strong
Persistence	3 to 5 years
Flowering	Early

Recommendations of the authors

Utilization	Silage, hay
Palatability	Very good
Mixture	Seeded pure or can be mixed with tall fescue, timothy, brome grass or a combination of the 3.

- Needs to have a rest period in the fall. Be careful of deficiencies in potassium and boron.

Height difference between
Ladino white clover and wild white clover

Ladino

Wild

WHITE CLOVER LADINO

10

WHITE CLOVER LADINO



Flowering stage

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	More tolerant than red clover
Tolerance to frequent mowing	High
Tolerance to grazing	High. Recommended legume best adapted for grazing
Tolerance to heat and drought	Low
Potential annual yield	Good to very good
Speed of establishment	Average
Competition (once established)	Average. Poor tolerance for competition from tall grasses.
Persistence	Good
Heading	Mid-season

Recommendations of the authors

Utilization	Pasture
Palatability	Very good to excellent
Mixture	Mixed with grasses but limit the use of tall fescue due to its low palatability and leaf roughness unappreciated by animals

- *There are three types of white clover: wild, Dutch and ladino.*
- *Ladino white clover re-establishes itself through natural seeding and stolons.*
- *Ladino white clover can be seeded directly or by overseeding on frozen soil in pastures. Risk of causing bloat. Retains feed value.*



Seedling

RED CLOVER



Vegetative stage (with buds)

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RED CLOVER

Flowering stage

Characteristics

Optimum pH	6.0 to 6.5
Tolerance to poor drainage	Sensitive
Tolerance to frequent mowing	Moderate
Tolerance to grazing	Moderate
Tolerance to heat and drought	Low
Speed of establishment	Very fast
Competition (once established)	Very strong
Persistence	2 to 3 years
Flowering	Mid-season

Utilization	Silage, pasture and green manure
Palatability	Very good
Mixture	Can be mixed with tall fescue, timothy, bromegrass or a combination of the 3.

- *Contains phytohormones.*
- *Excellent forage for direct seeding in case of winter loss.*

Guide to *Forage* Plants Identification



Produced with funding from Agriculture and Agri-Food Canada and the *Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (Québec)* through the *Programme de soutien aux stratégies sectorielles de développement*.

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