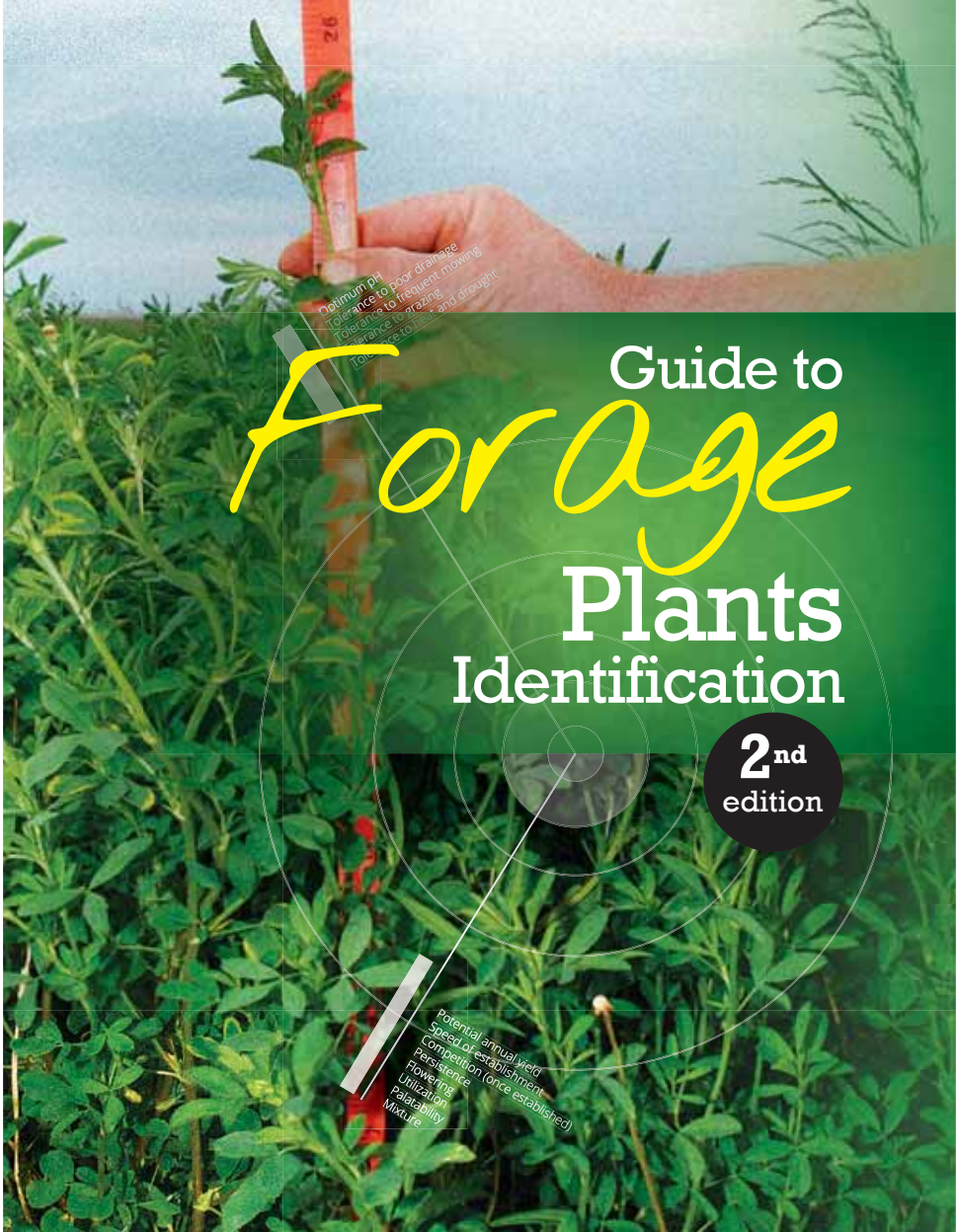


Guide to Forage Plants Identification

2nd edition

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*

Printing
- *Imprimerie M. Carrière Inc.*

© Conseil québécois des plantes fourragères 2013

Copyright 2013
Library and Archives Canada
Bibliothèque et Archives nationales du Québec

CQPF
CONSEIL QUÉBÉCOIS DES PLANTES FOURRAGÈRES

valacta

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*.

Ministère de l'Agriculture des Pêcheries et de l'Alimentation
Québec

Agriculture et Agroalimentaire Canada
Agriculture and Agri-Food Canada
Canada

Guide to Forage Plants Identification

Identification of forage grasses 4

Identification of forage legumes 6

Forage grasses:

1- Reed Canary Grass 11

2- Meadow Bromegrass 17

3- Smooth Bromegrass 22

4- Orchardgrass 27

5- Tall Fescue 33

6- Timothy 38

7- Ryegrass (Perennial) 43

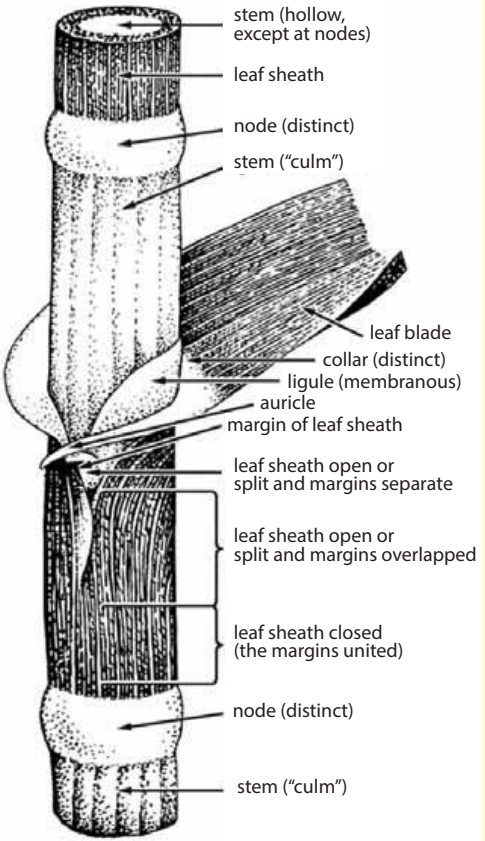
Forage legumes:

8- Trefoil 52

9- Alfalfa 56

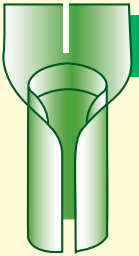
10- White Clover (Ladino) 61

11- Red Clover 64



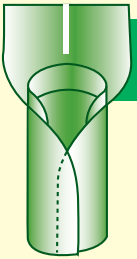
Source: www.omafra.gov.on.ca/english/livestock/beef/facts/06-095.htm

Sheath



Split with margins separate

- Bluegrass



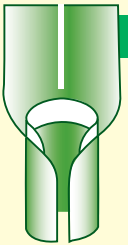
Split with margins overlapping

- Orchardgrass
- Tall fescue
- Timothy
- Reed Canary Grass

Closed with margins united

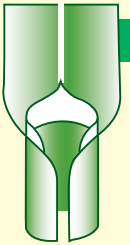
- Meadow and smooth bromegrasses

Ligule



Membranous

- Meadow and smooth bromegrasses
- Tall fescue
- Annual and perennial ryegrasses



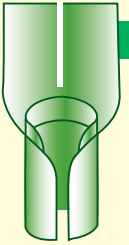
Pointed

- Orchardgrass
- Timothy
- Reed Canary Grass

Auricles

Claw-like, encircles the stem

- Tall fescue

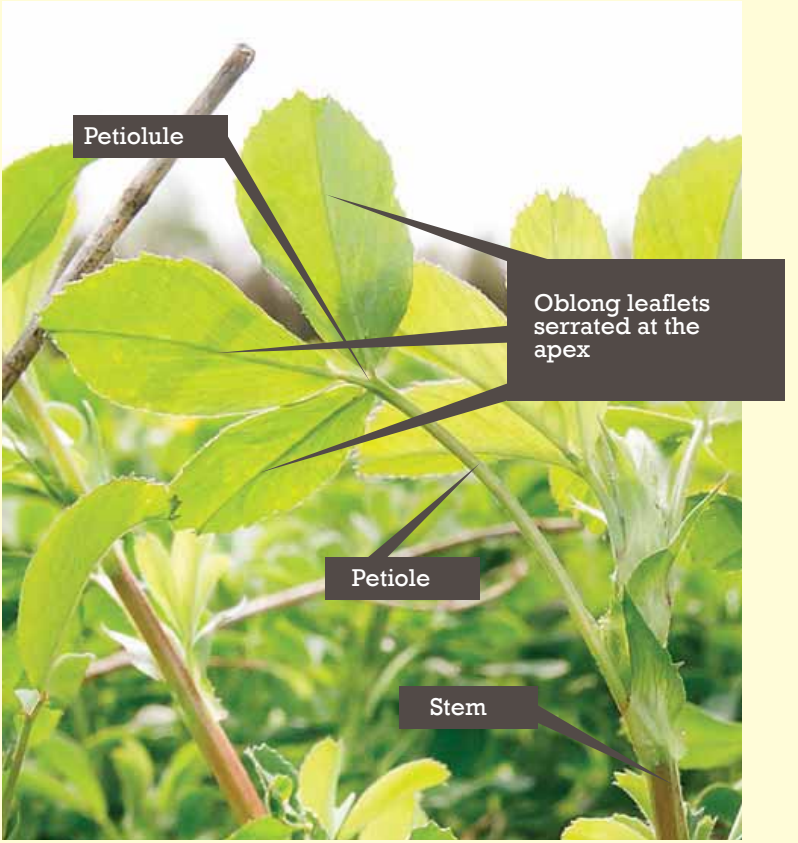


Absent

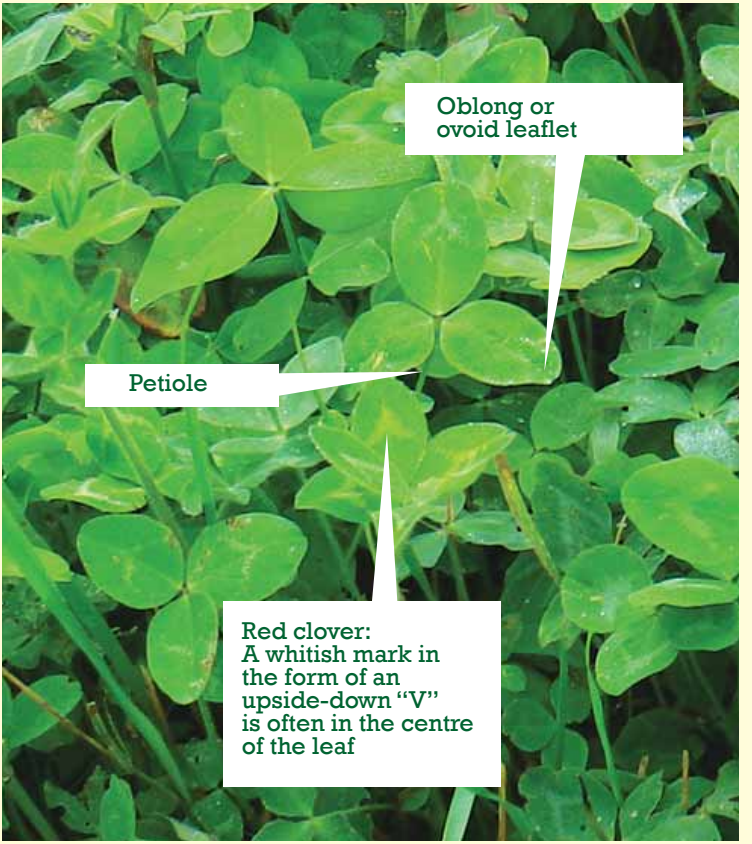
- Meadow and smooth bromegrasses
- Timothy
- Orchardgrass
- Reed canary grass

Source: www.ipm.ucdavis.edu/PMG/WEEDS/ID/3sheath.html

Alfalfa

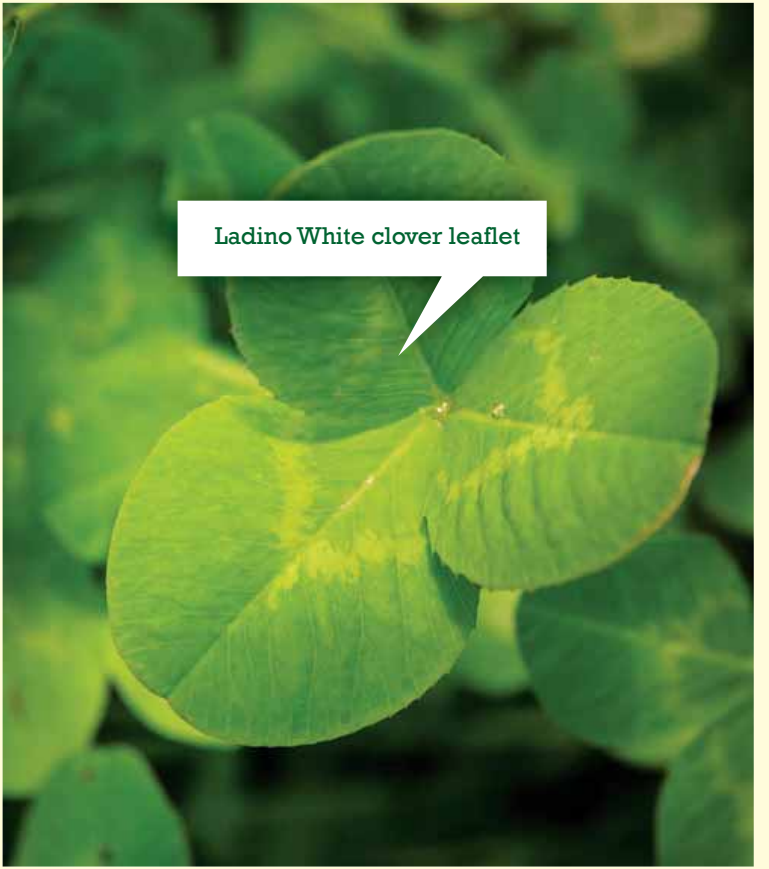

Petiolule
Oblong leaflets serrated at the apex
Petiole
Stem

Clover


Oblong or ovoid leaflet
Petiole
Red clover: A whitish mark in the form of an upside-down "V" is often in the centre of the leaf

Clover

Clover



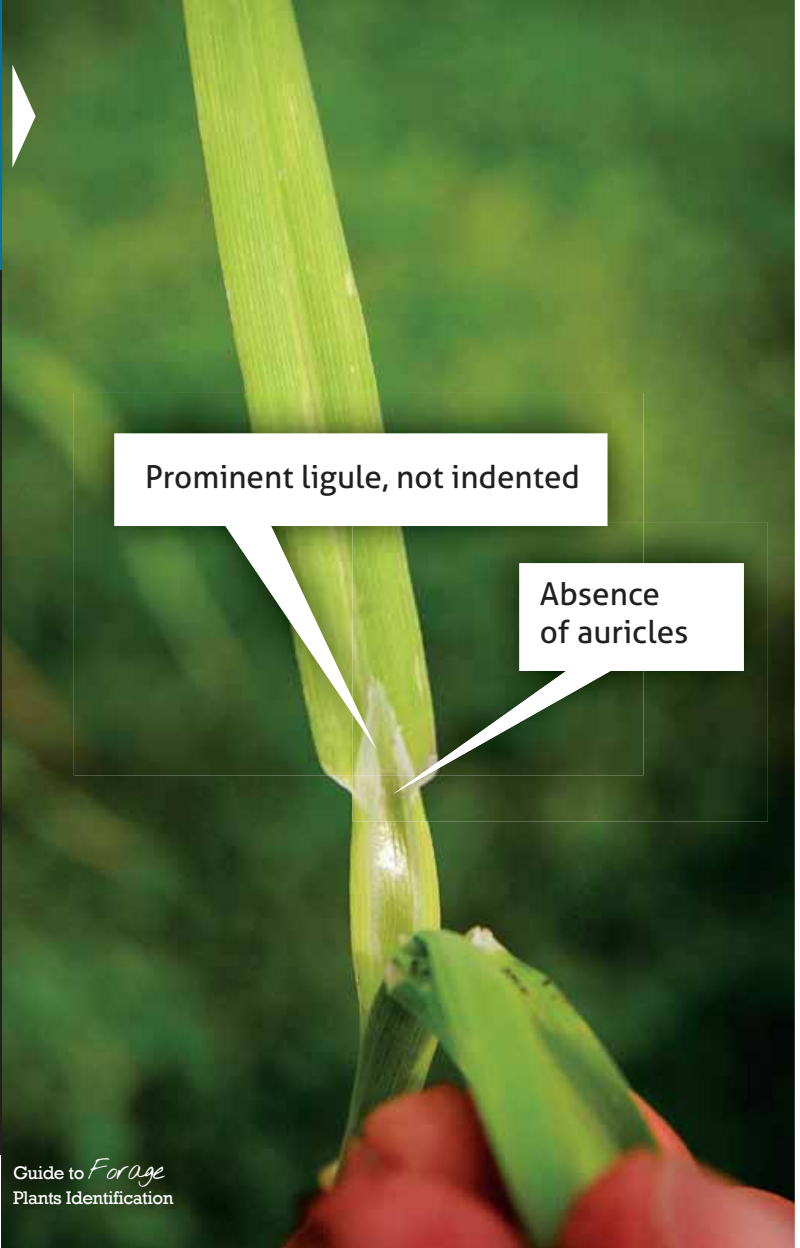
Forage grasses:

Guide to Forage Plants Identification

1

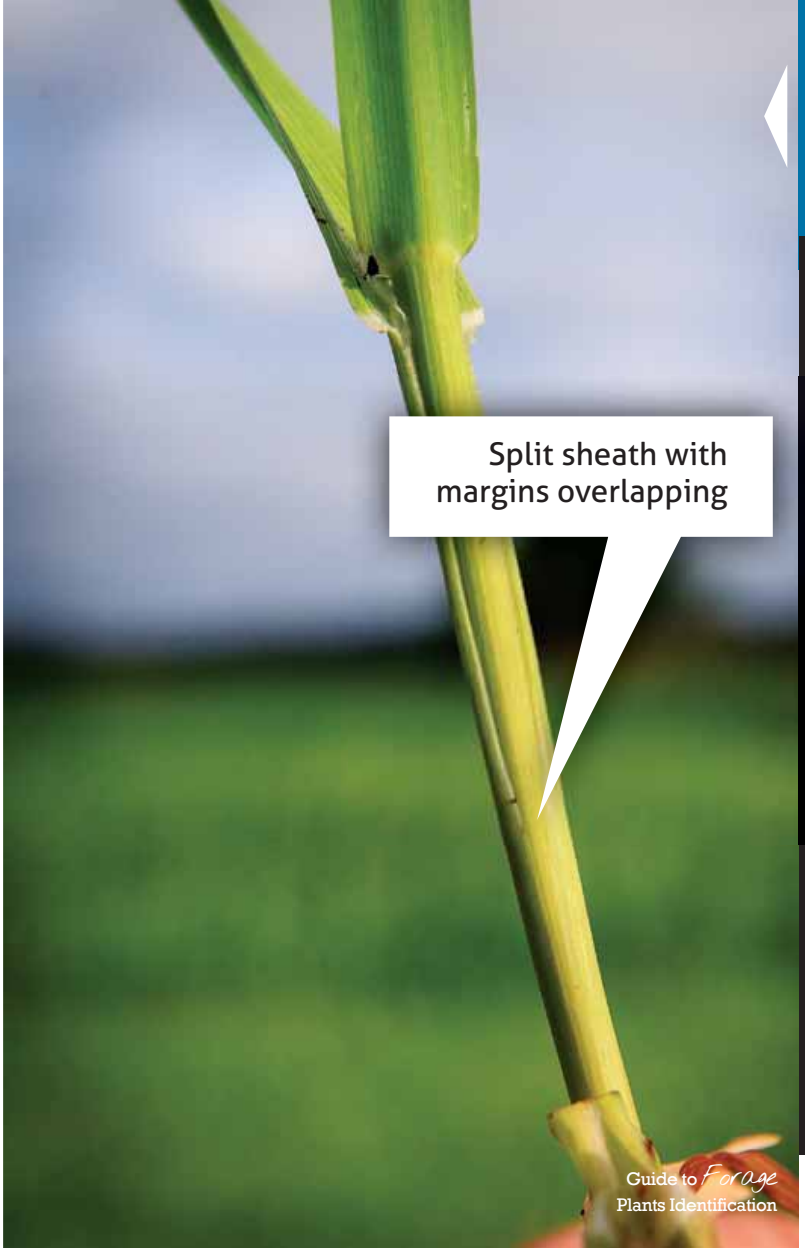
REED CANARY GRASS

1 REED CANARY GRASS



1

REED CANARY GRASS



1 REED CANARY GRASS

Vegetative stage

1

REED CANARY GRASS

1

REED CANARY GRASS

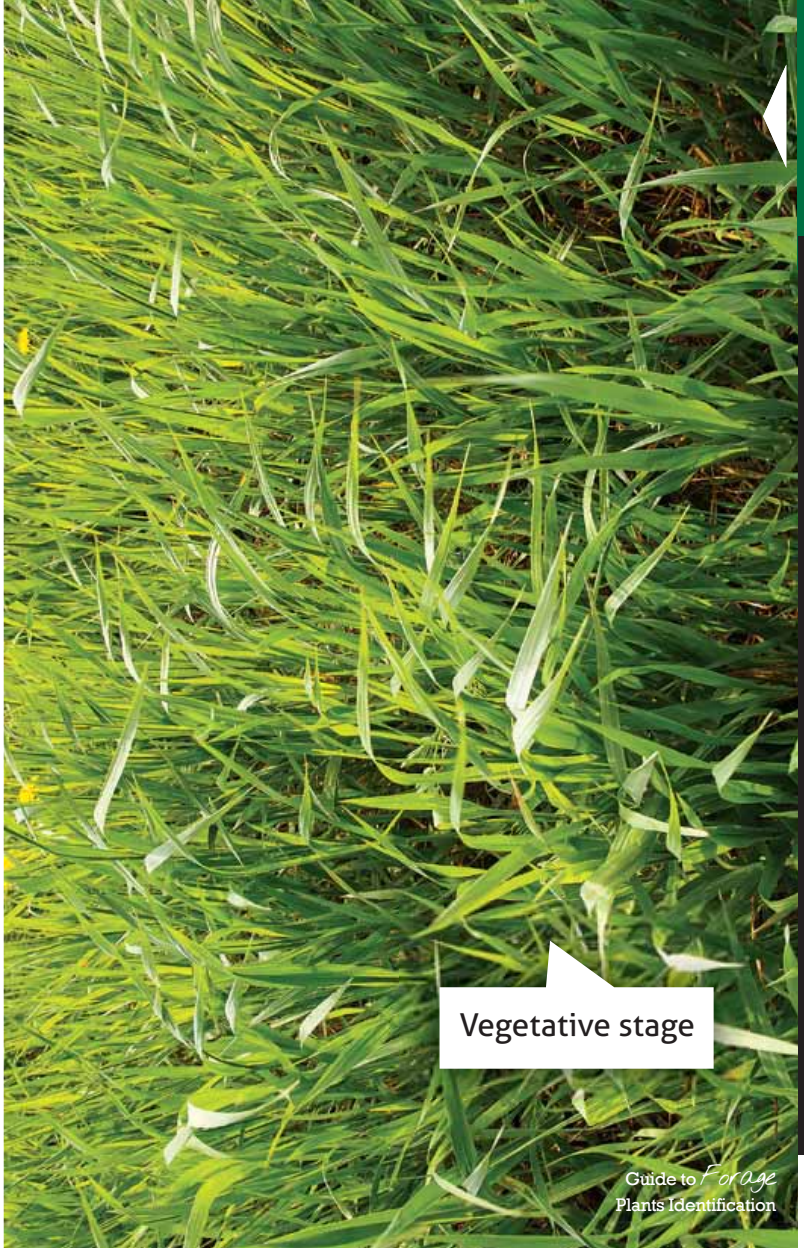
Characteristics

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

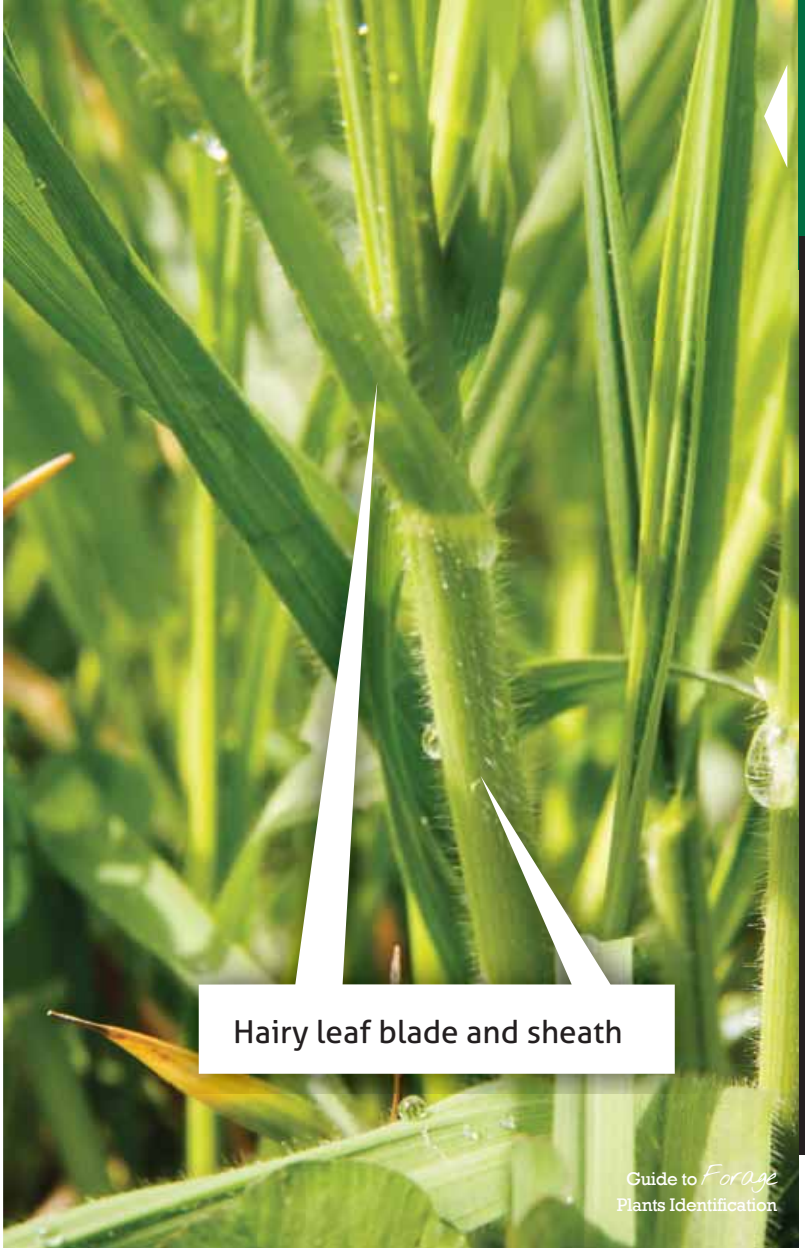
- *Suitable for all soil conditions and has better tolerance for soil acidity than most other recommended forage grasses.*
- *Hay for dry cows.*



2

MEADOW BROMEGRASS

2 MEADOW BROMEGRASS

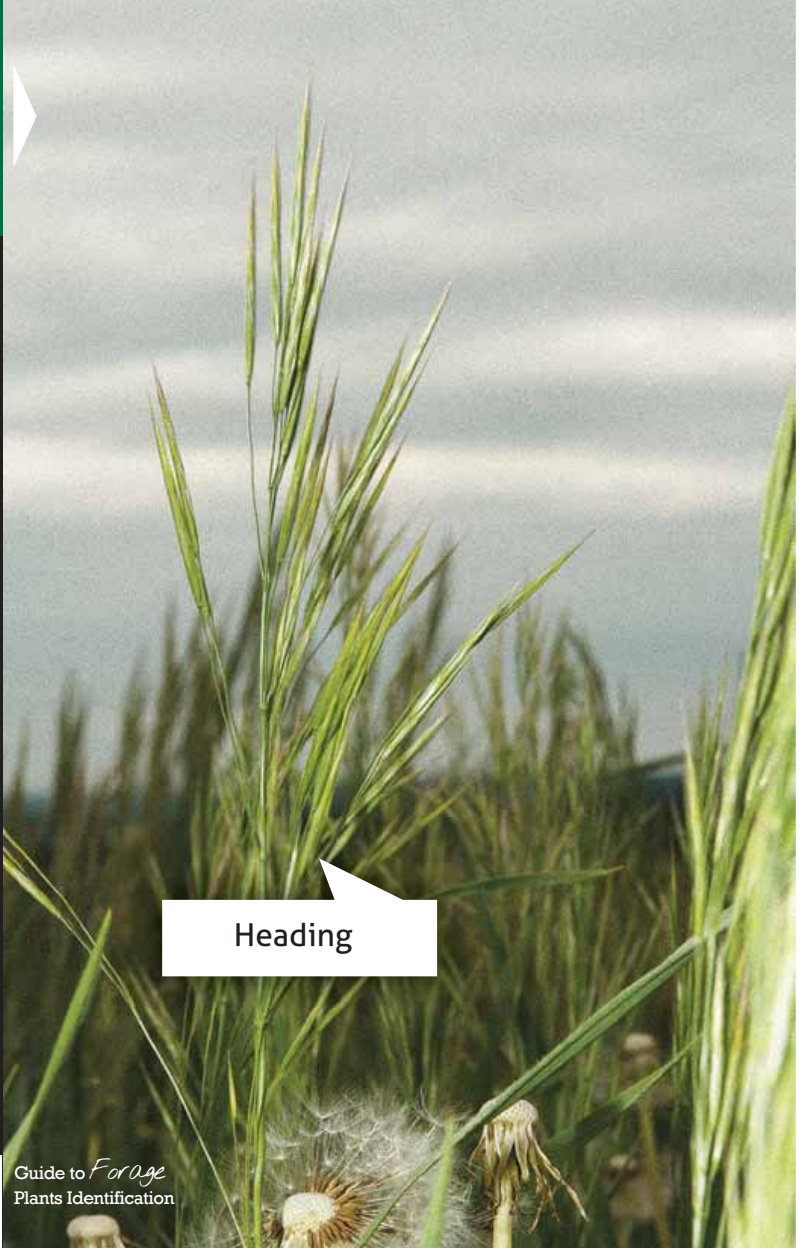


2

MEADOW BROMEGRASS

2

MEADOW BROMEGRASS



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

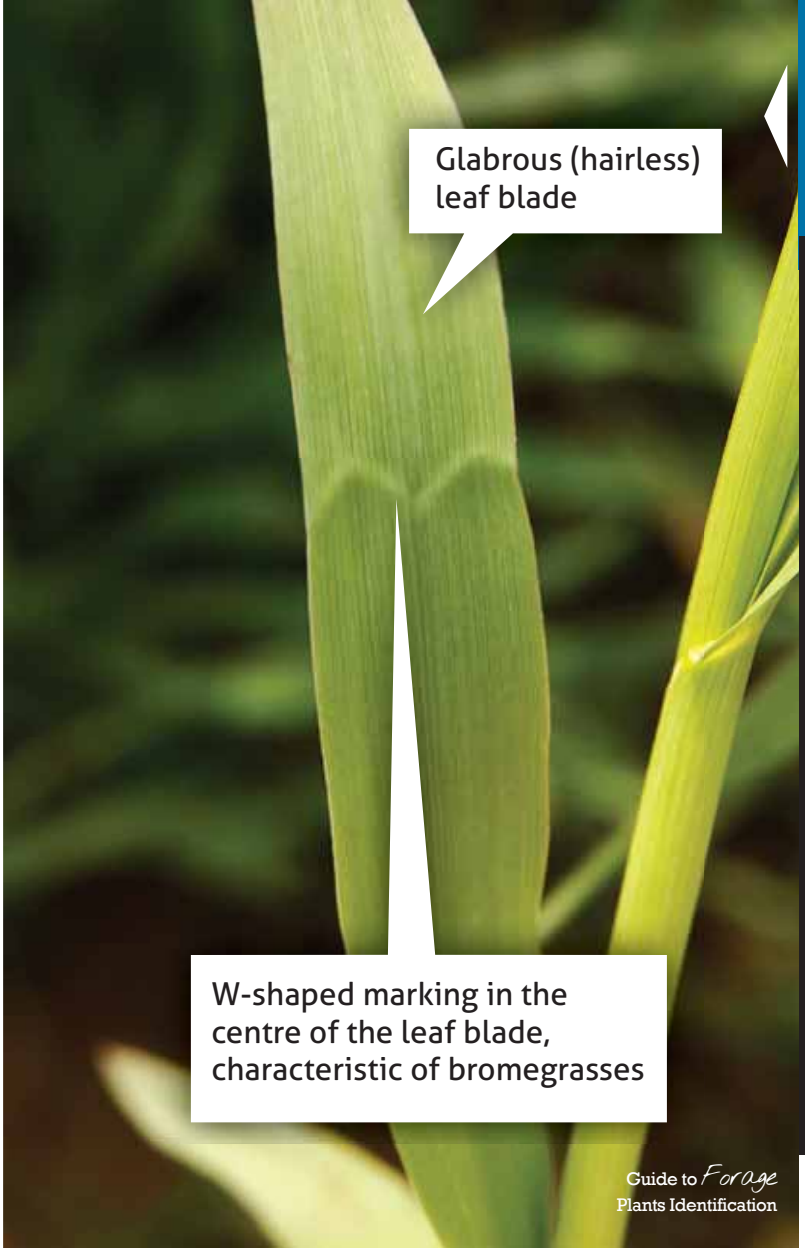
Recommendations of the authors

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

- *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.*

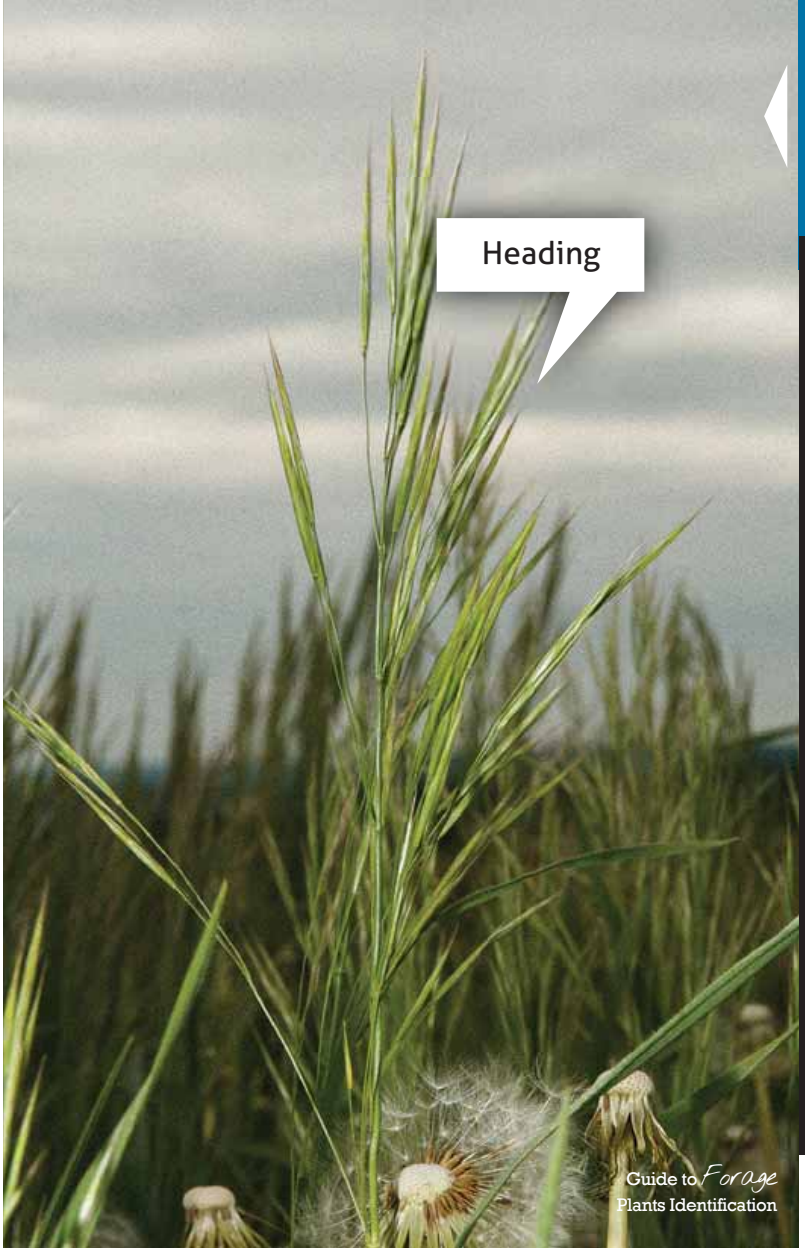
SMOOTH BROMEGRASS

Vegetative stage



SMOOTH BROMEGRASS

SMOOTH BROMEGRASS



SMOOTH BROMEGRASS

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

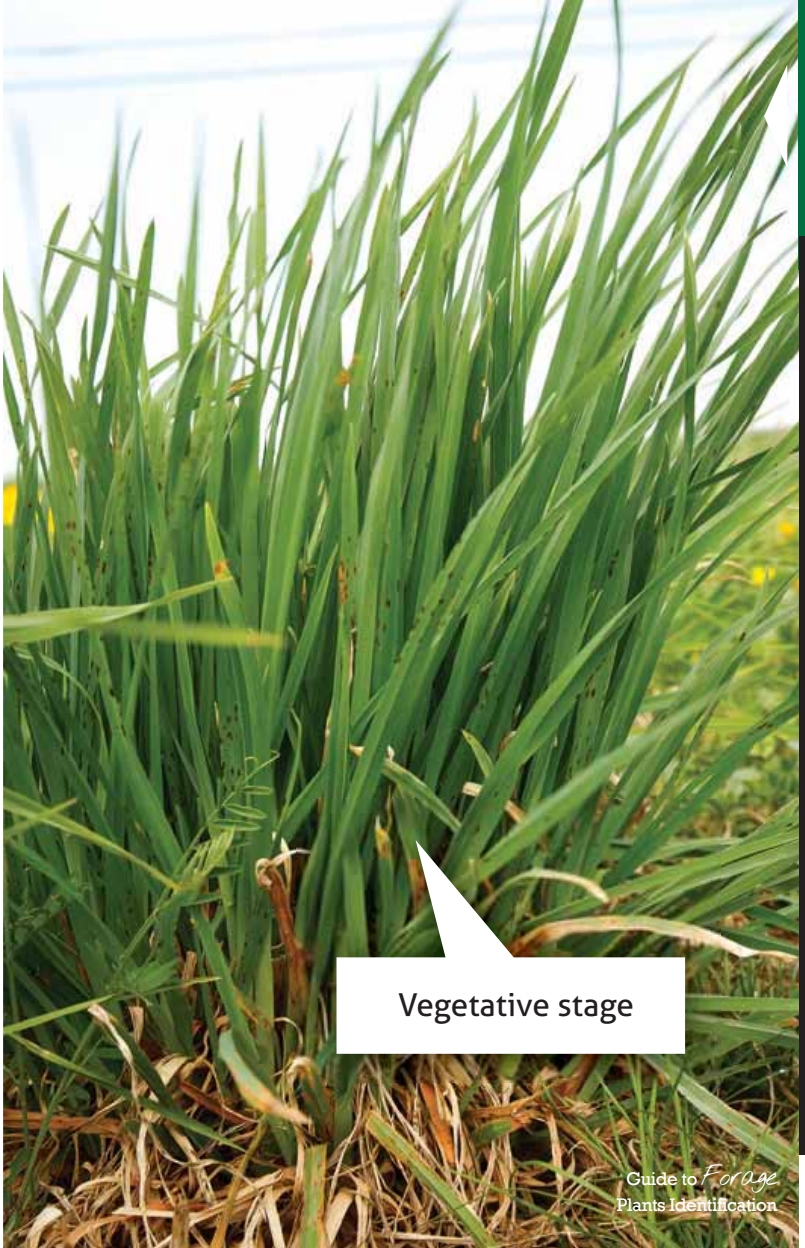
Recommendations of the authors

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

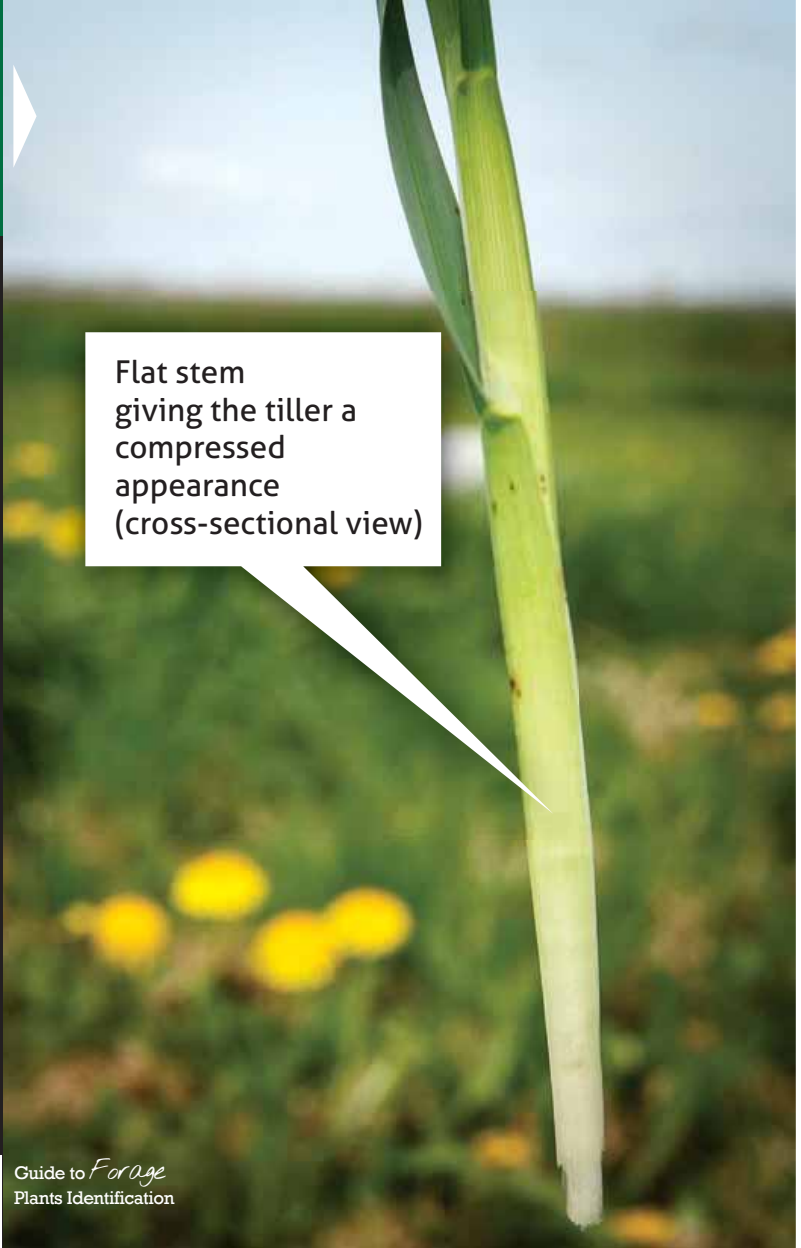
- *Large seed difficult to plant. Seeding can be done by broadcasting or using a special brome seed box.*

4

ORCHARDGRASS



4 ORCHARDGRASS

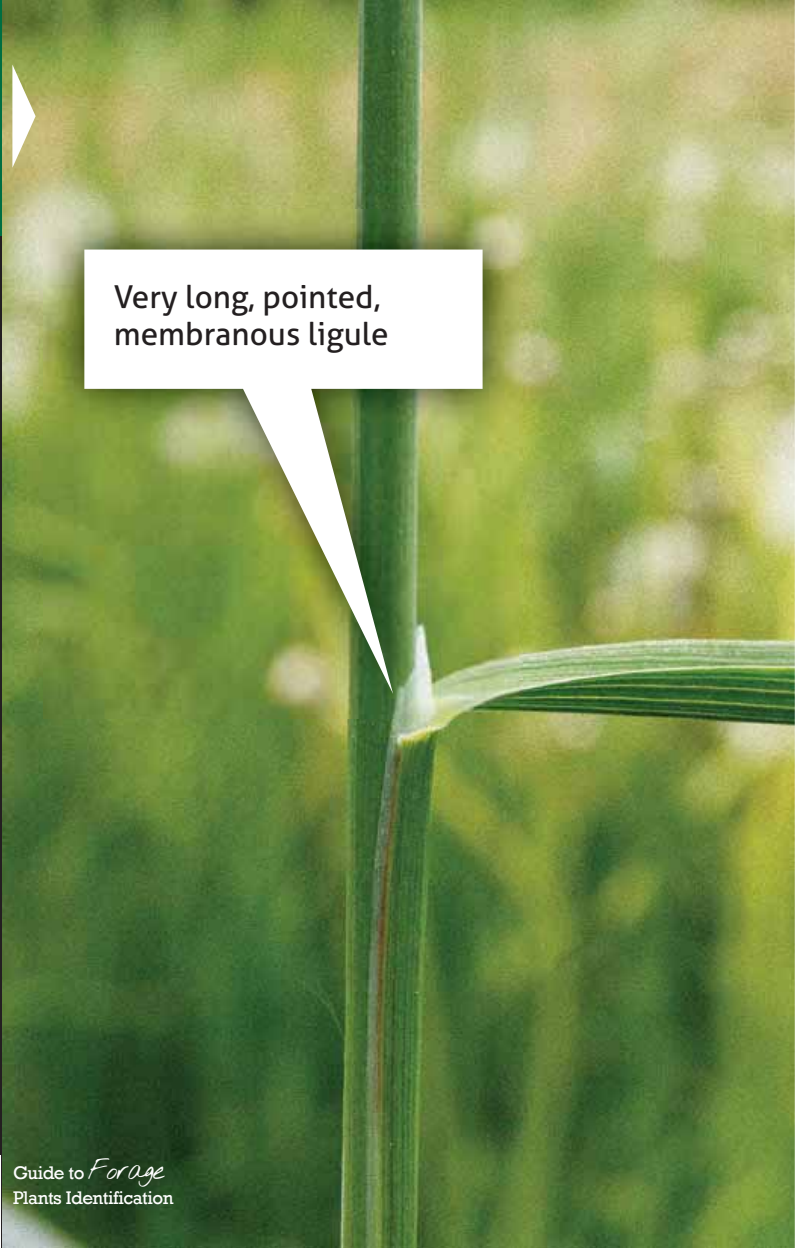


4

ORCHARDGRASS

4

ORCHARDGRASS



4

ORCHARDGRASS

4

ORCHARDGRASS

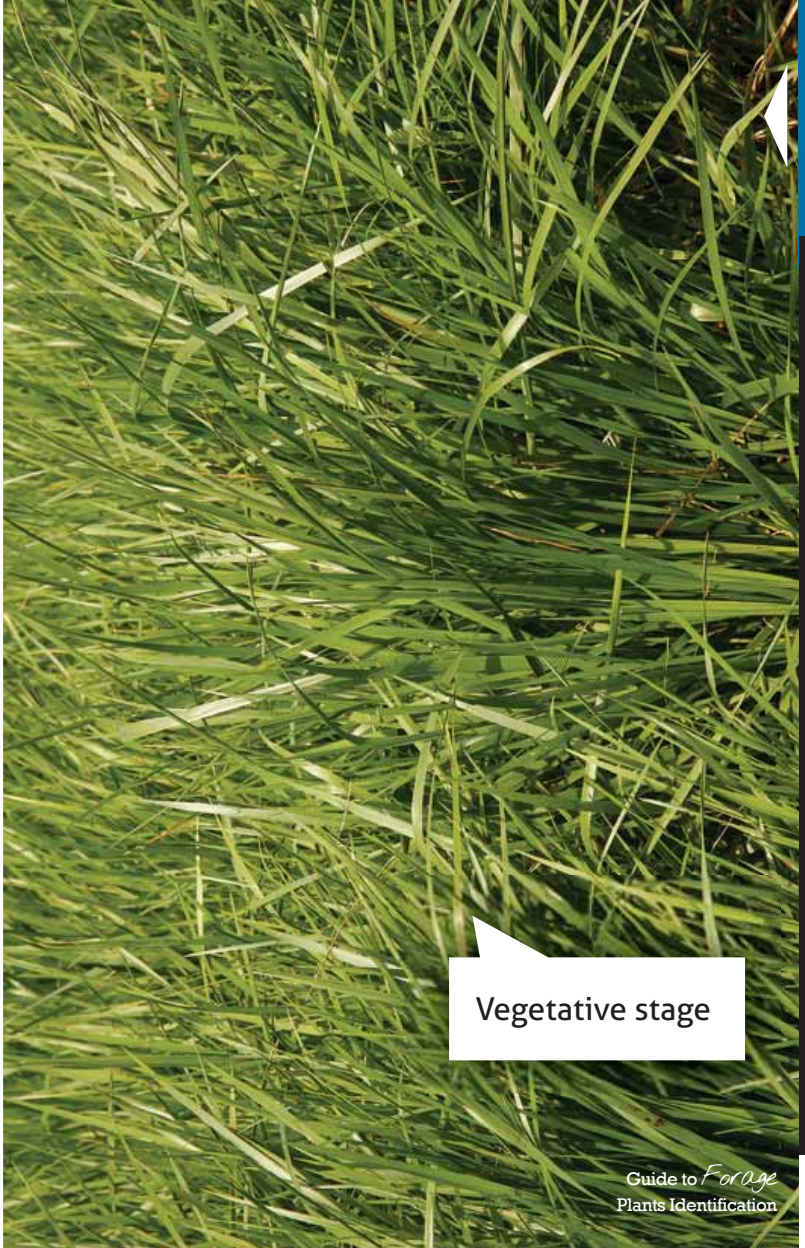
Characteristics

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.*



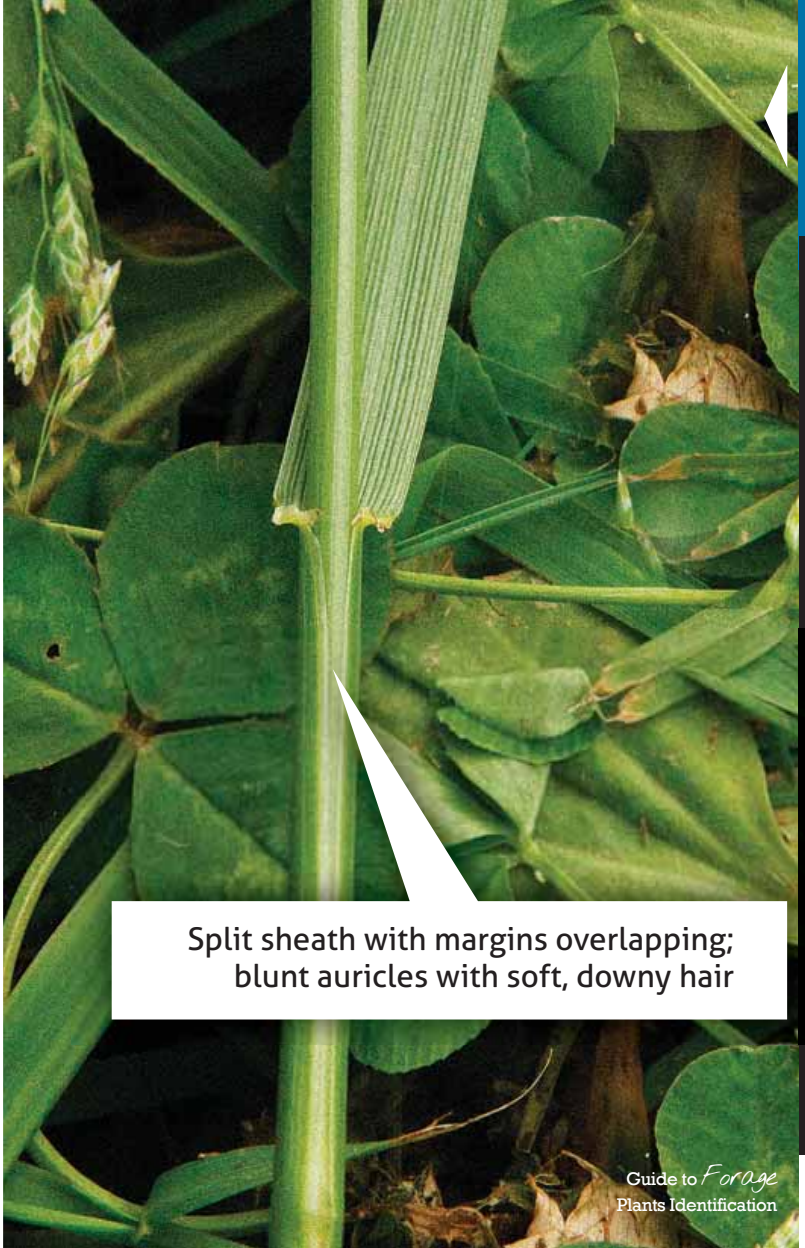
5

TALL FESCUE

5

TALL FESCUE

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



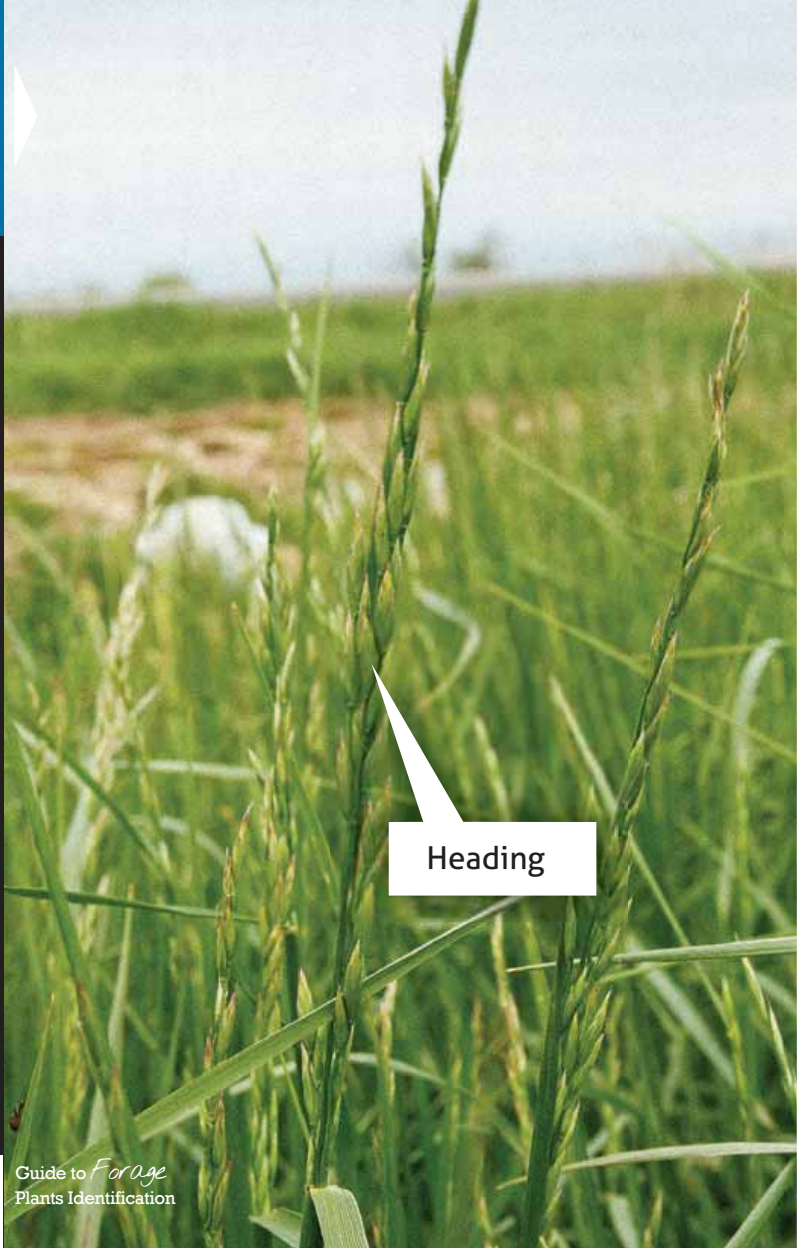
5

TALL FESCUE

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

5

TALL FESCUE



Characteristics

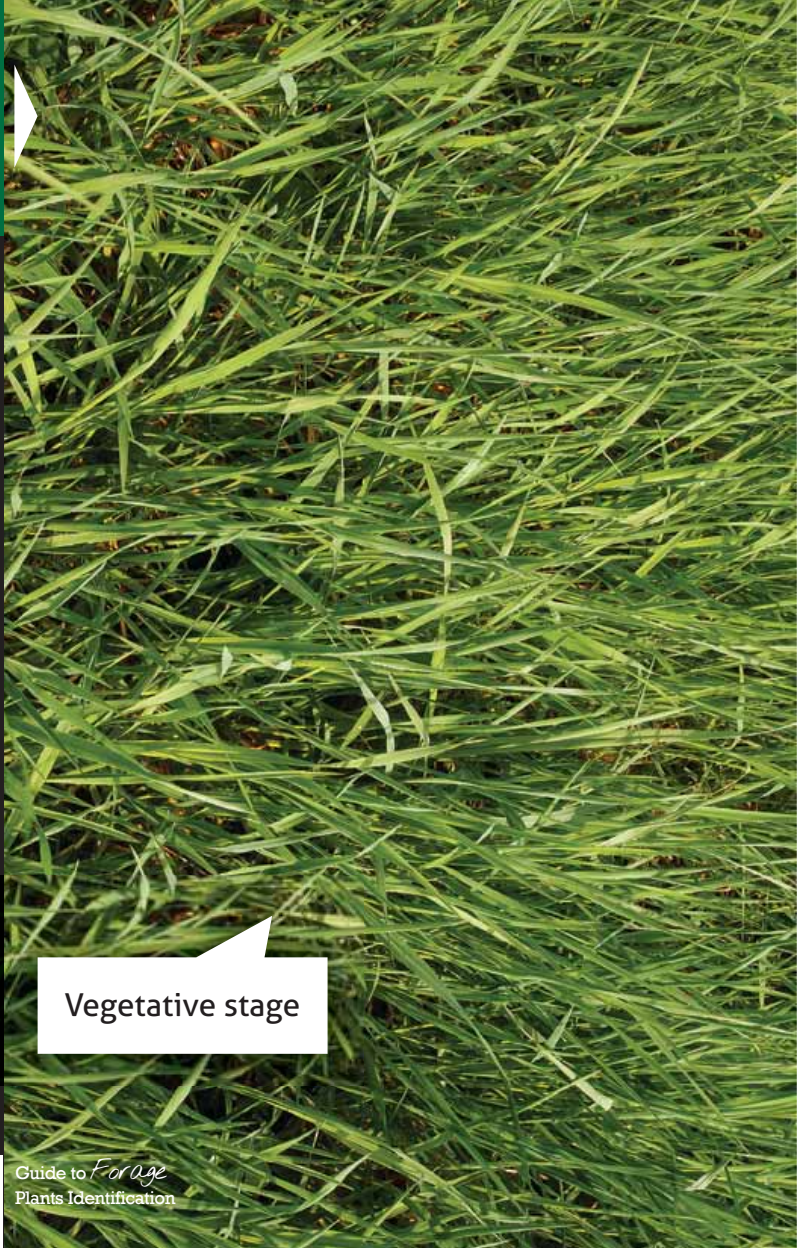
Optimum pH	5.8 to 6.5
Tolerance to poor drainage	Good
Tolerance to frequent mowing	Very good
Tolerance to grazing	Good
Regrowth	Very good
Tolerance to heat and drought	Good (also in autumn)
Speed of establishment	Fast
Competition (once established)	Strong
Persistence	Average to good
Heading	Semi-late

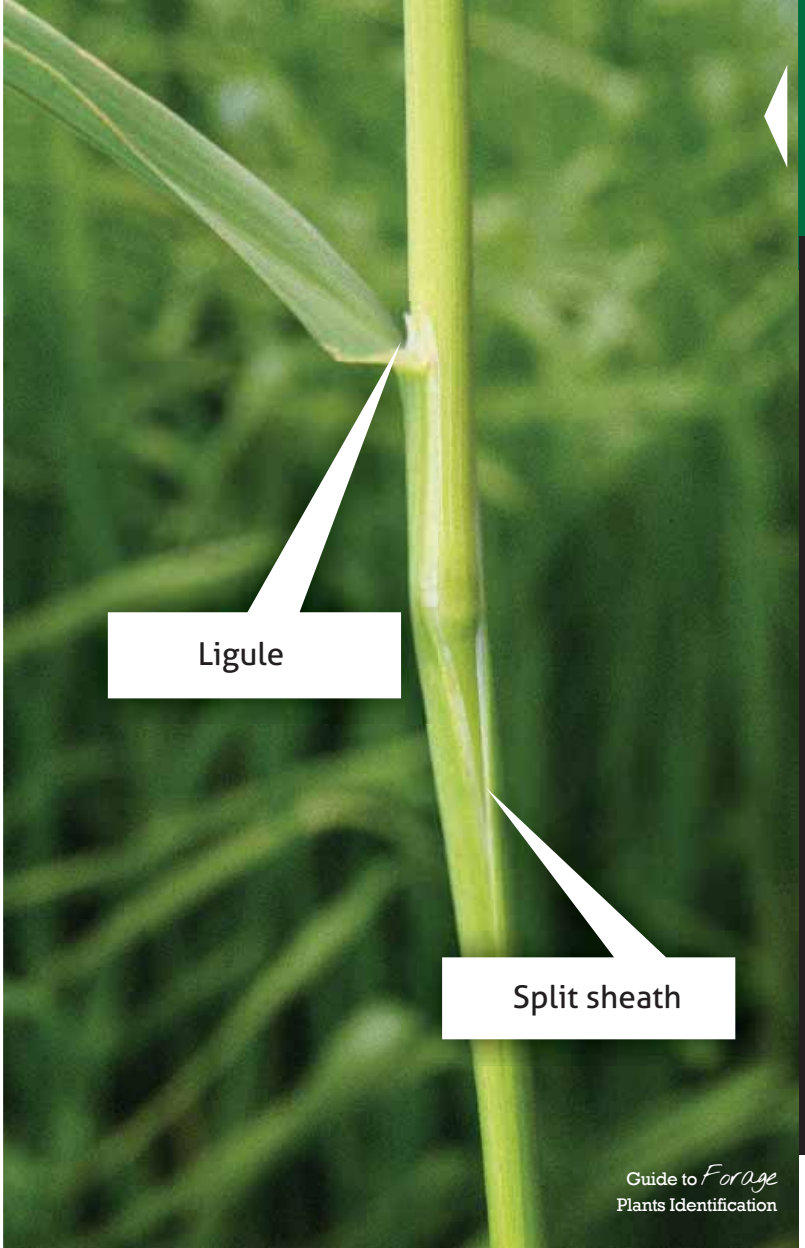
Recommendations of the authors

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.*

6 TIMOTHY



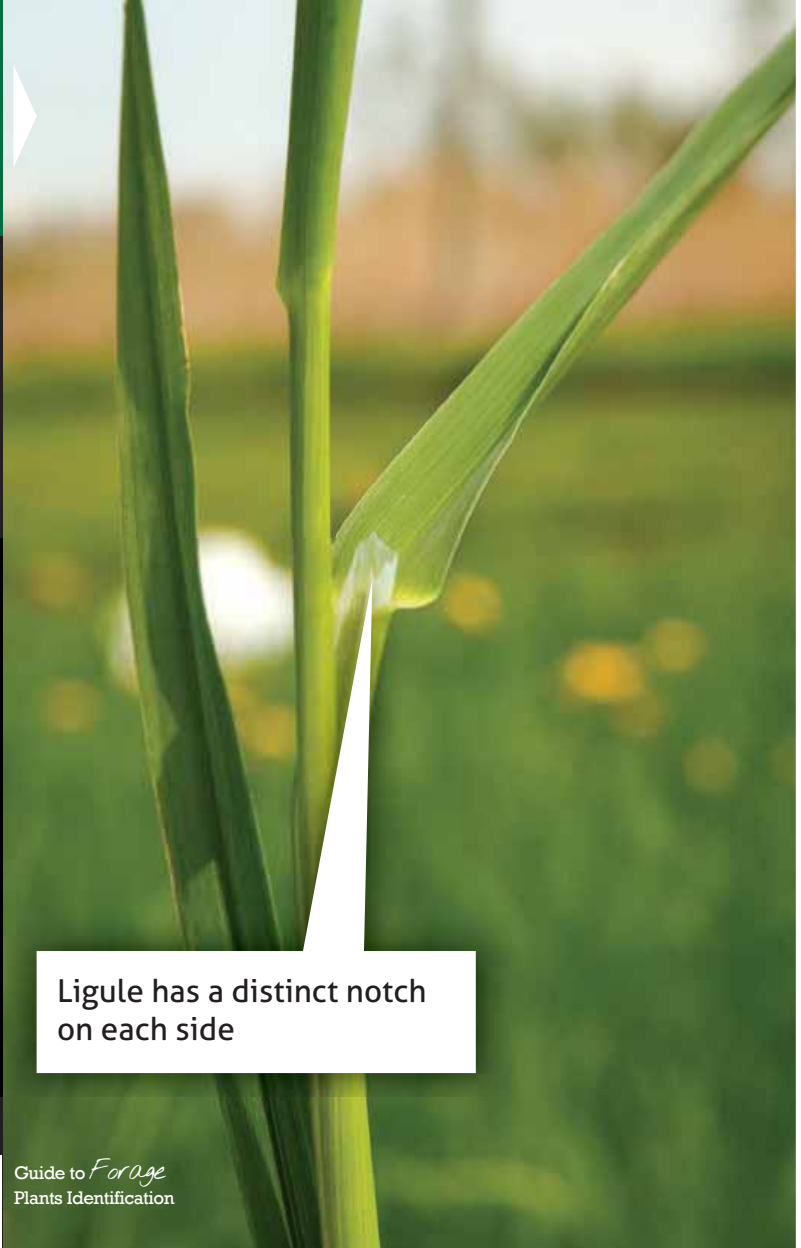


6

TIMOTHY

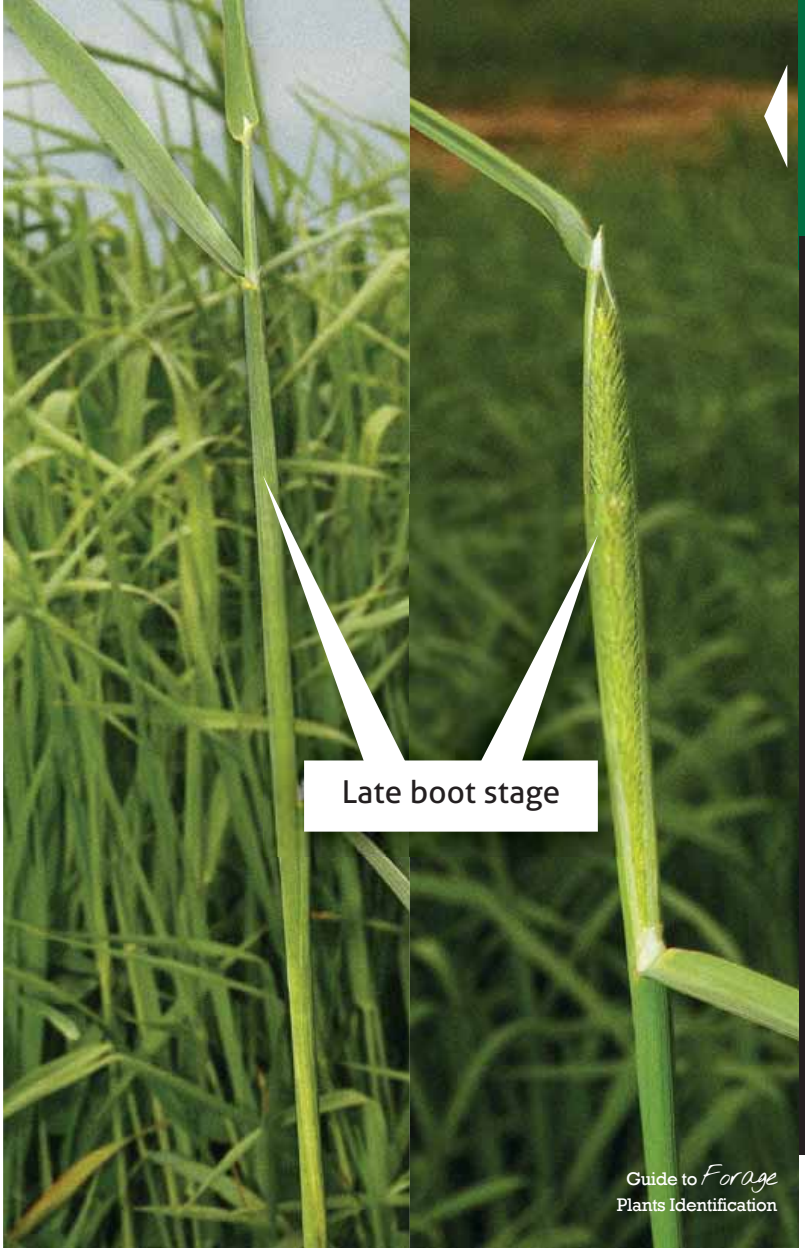
6

TIMOTHY



6

TIMOTHY



6 TIMOTHY

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 / bromegrass, alfalfa / bromegrass

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

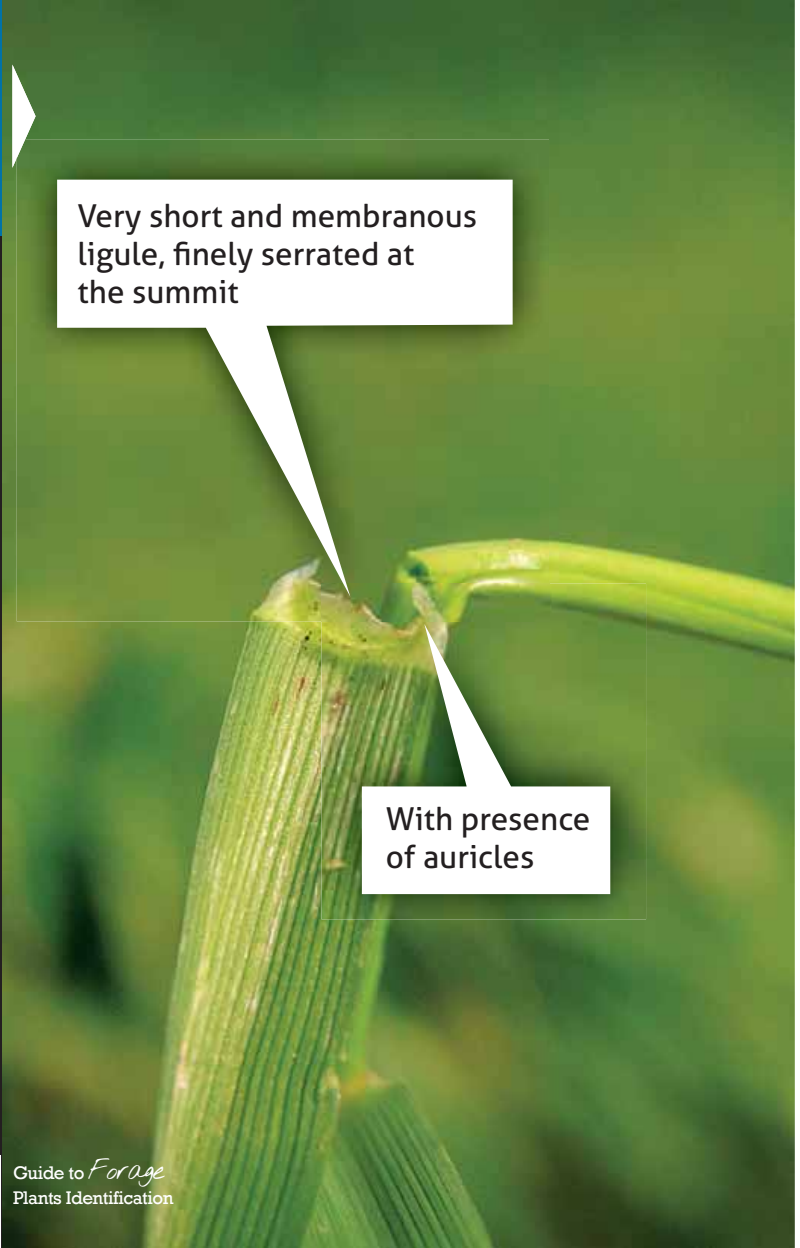
7

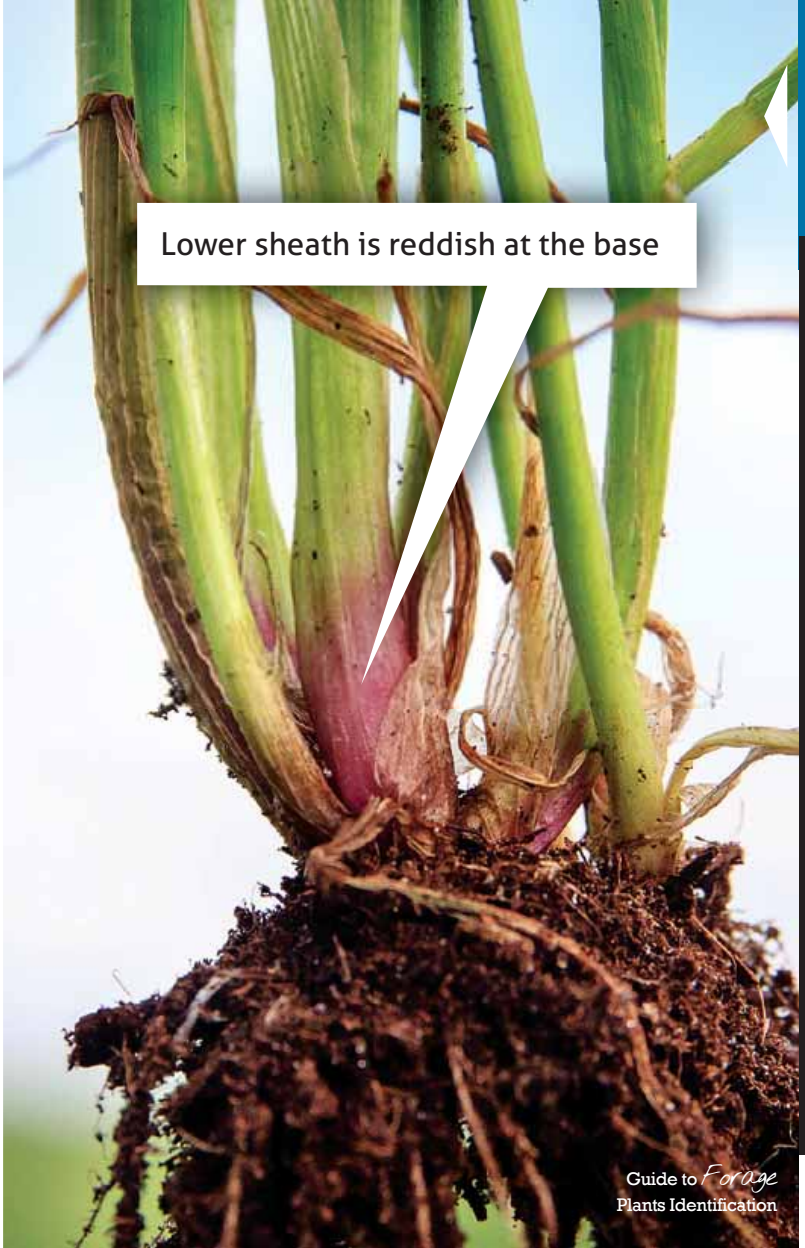
RYEGRASS

Vegetative stage

7

RYEGRASS


Very short and membranous ligule, finely serrated at the summit
With presence of auricles

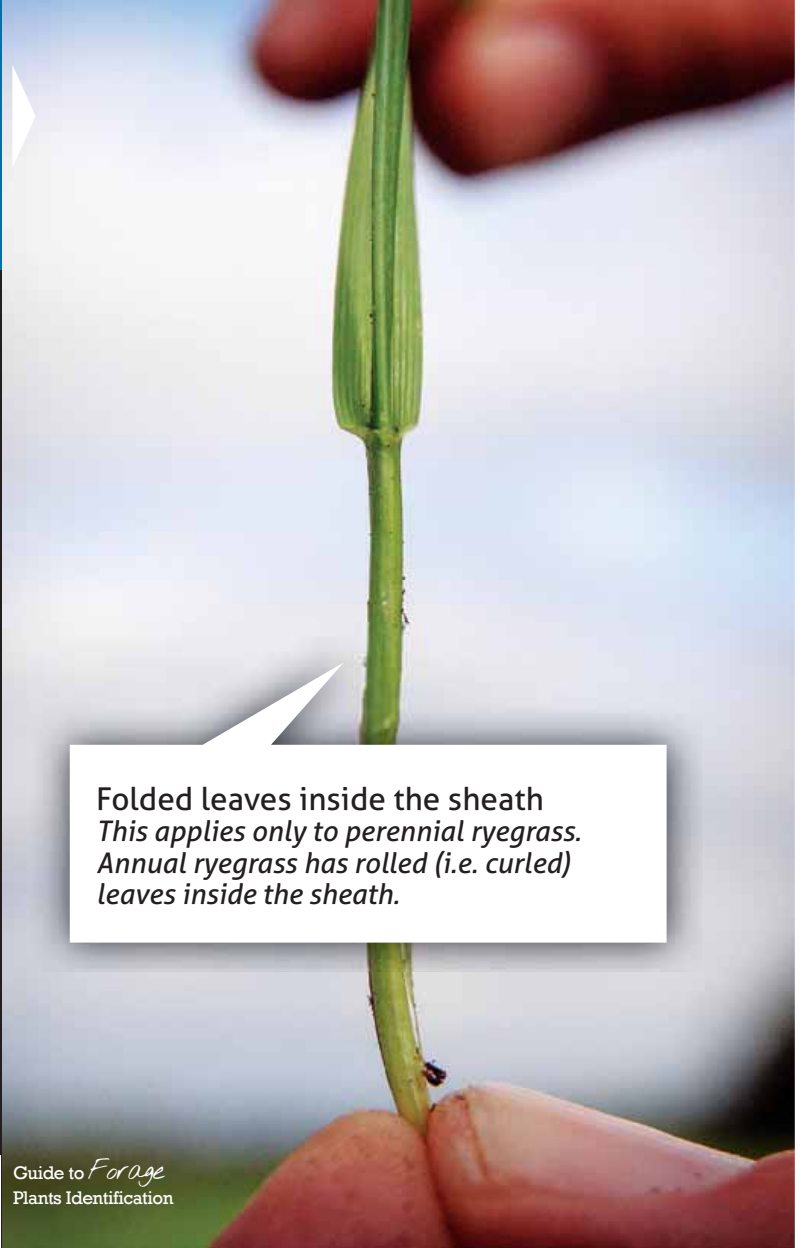


7

RYEGRASS

7

RYEGRASS



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

Leaf blade very glossy
on lower surface

7 RYEGRASS

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.*

7

RYEGRASS ANNUAL

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

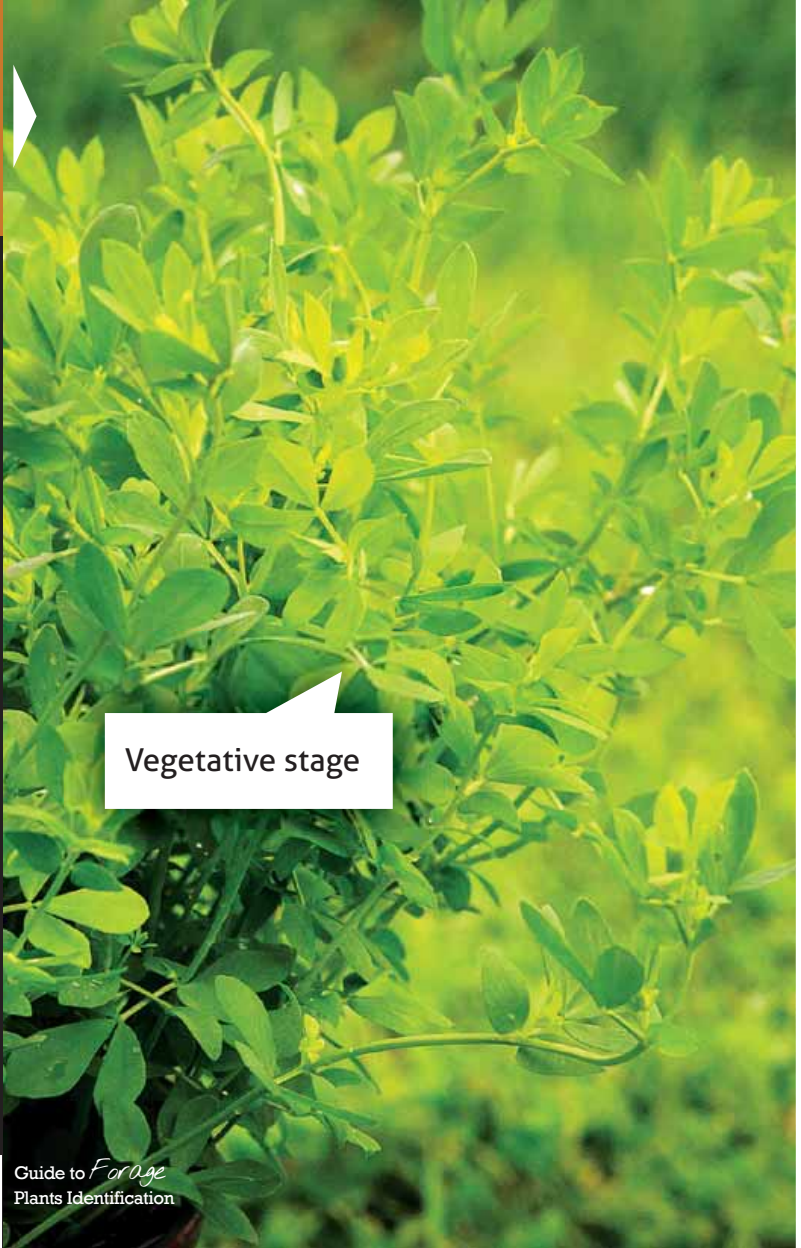
- *Ryegrass can accumulate nitrates.*
- *Difficult to make dry hay with.*

Forage legumes:

Guide to Forage Plants Identification

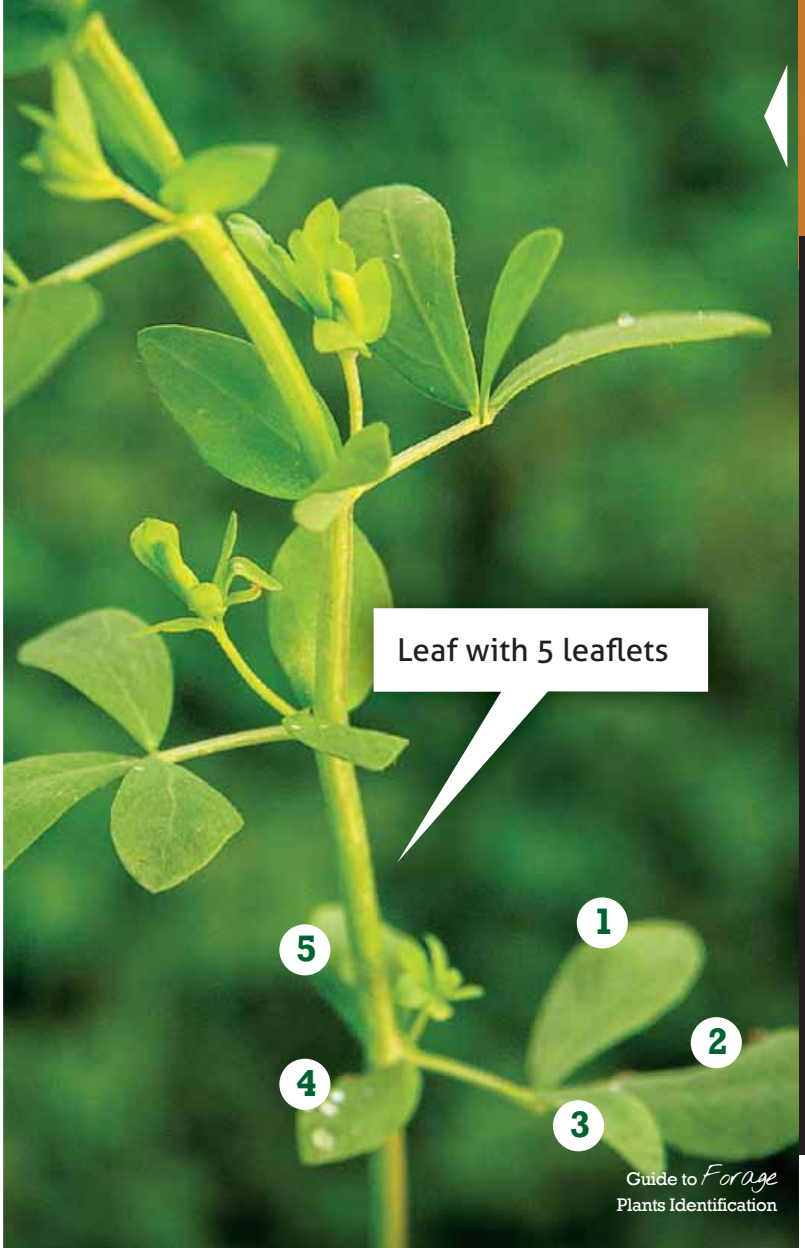
8

TREFOIL BIRDSFOOT



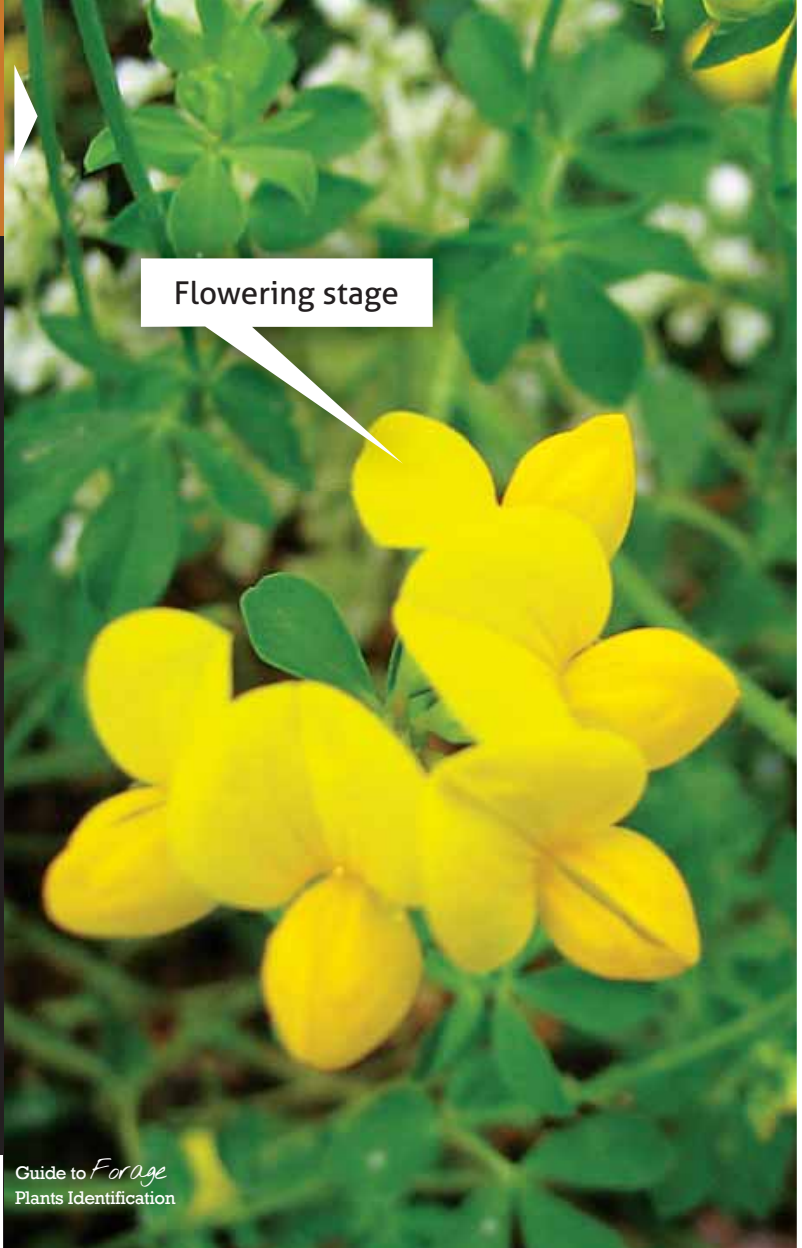
8

TREFOIL BIRDSFOOT



8

TREFOIL BIRDSFOOT



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

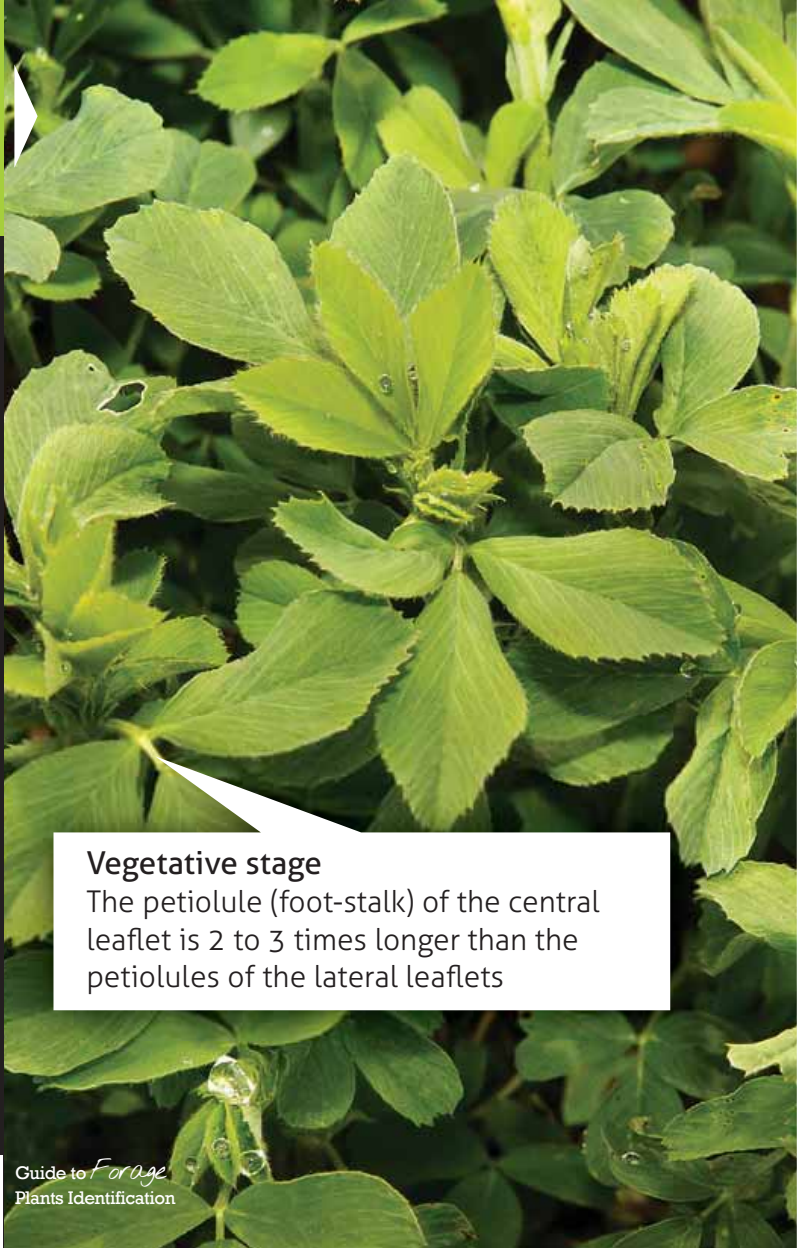
Recommendations of the authors

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.*

9

ALFALFA



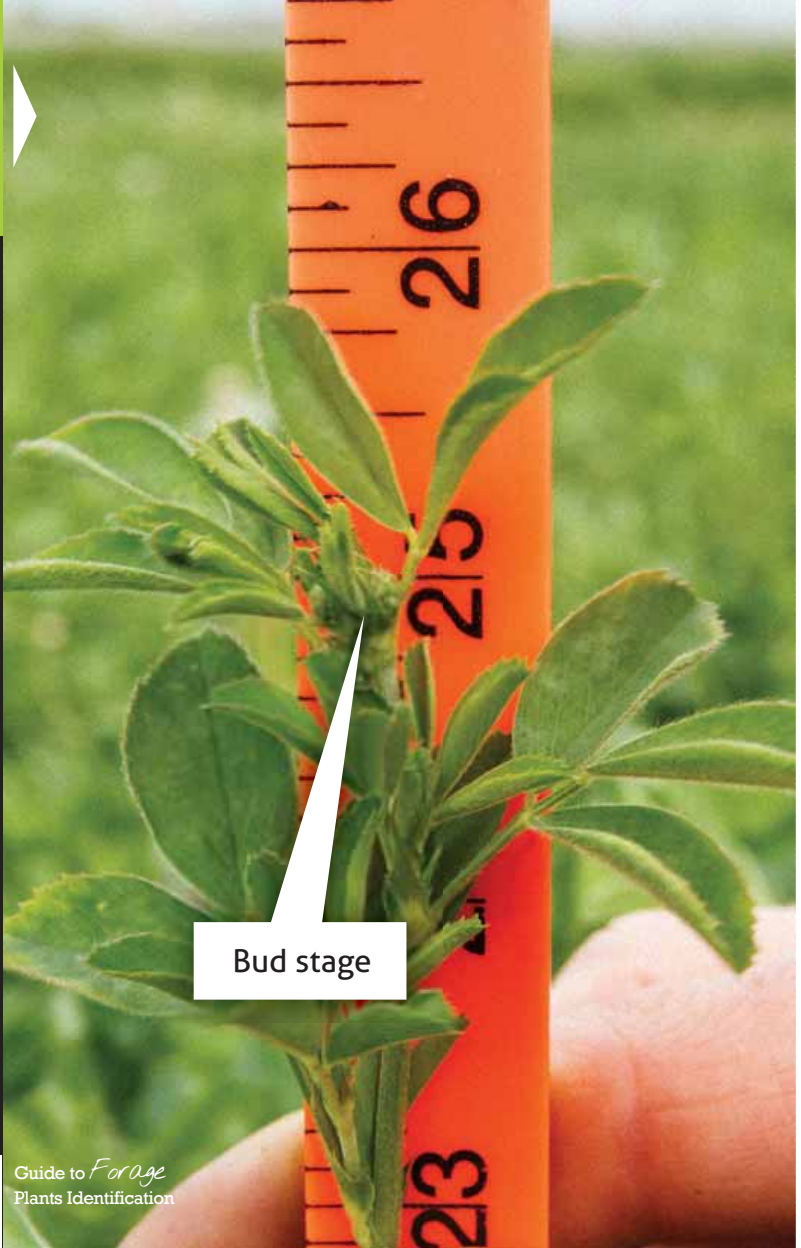
Vegetative stage
The petiolule (foot-stalk) of the central leaflet is 2 to 3 times longer than the petiolules of the lateral leaflets

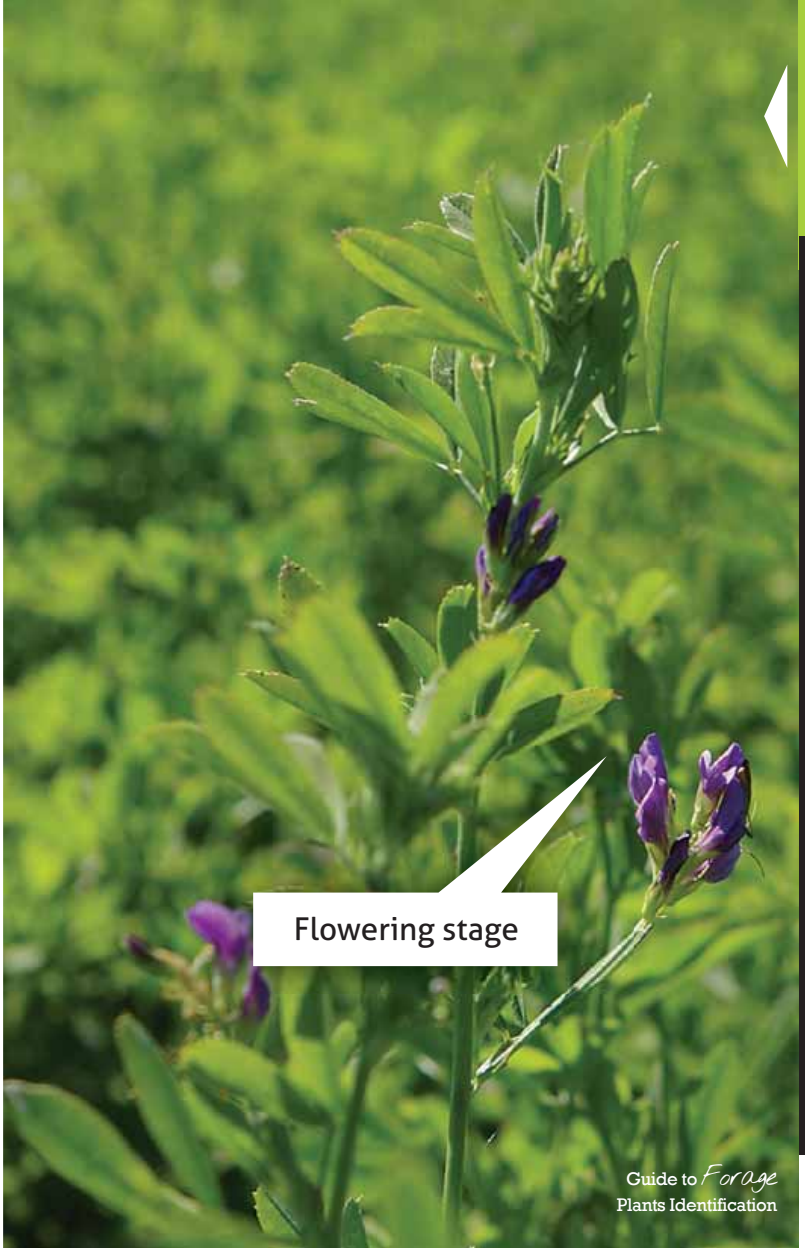
9

ALFALFA

9

ALFALFA





9

ALFALFA

9

ALFALFA

Characteristics

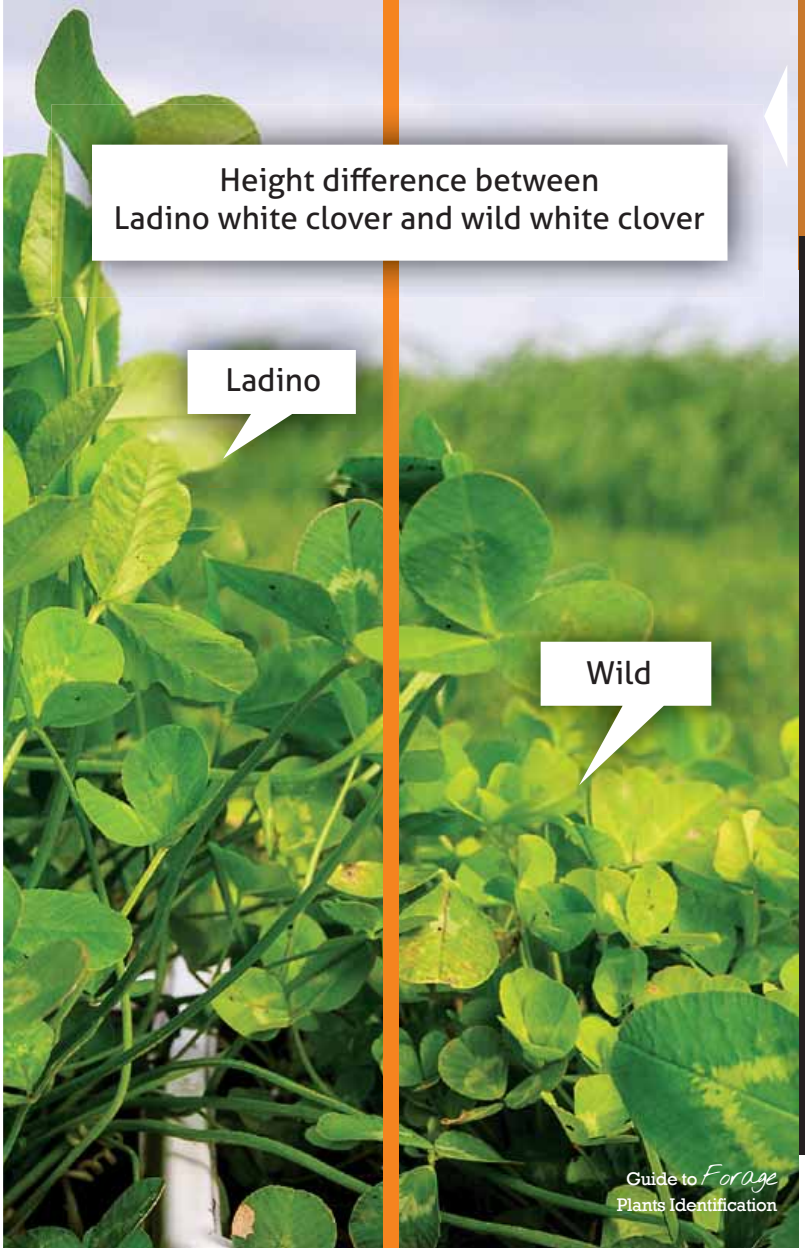
Optimum pH	6.6 to 7.0
Tolerance to poor drainage	Very sensitive
Tolerance to frequent mowing	Moderate
Tolerance to grazing	Low
Tolerance to heat and drought	Low
Speed of establishment	Fast
Competition (once established)	Strong
Persistence	3 to 5 years
Flowering	Early

Recommendations of the authors

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

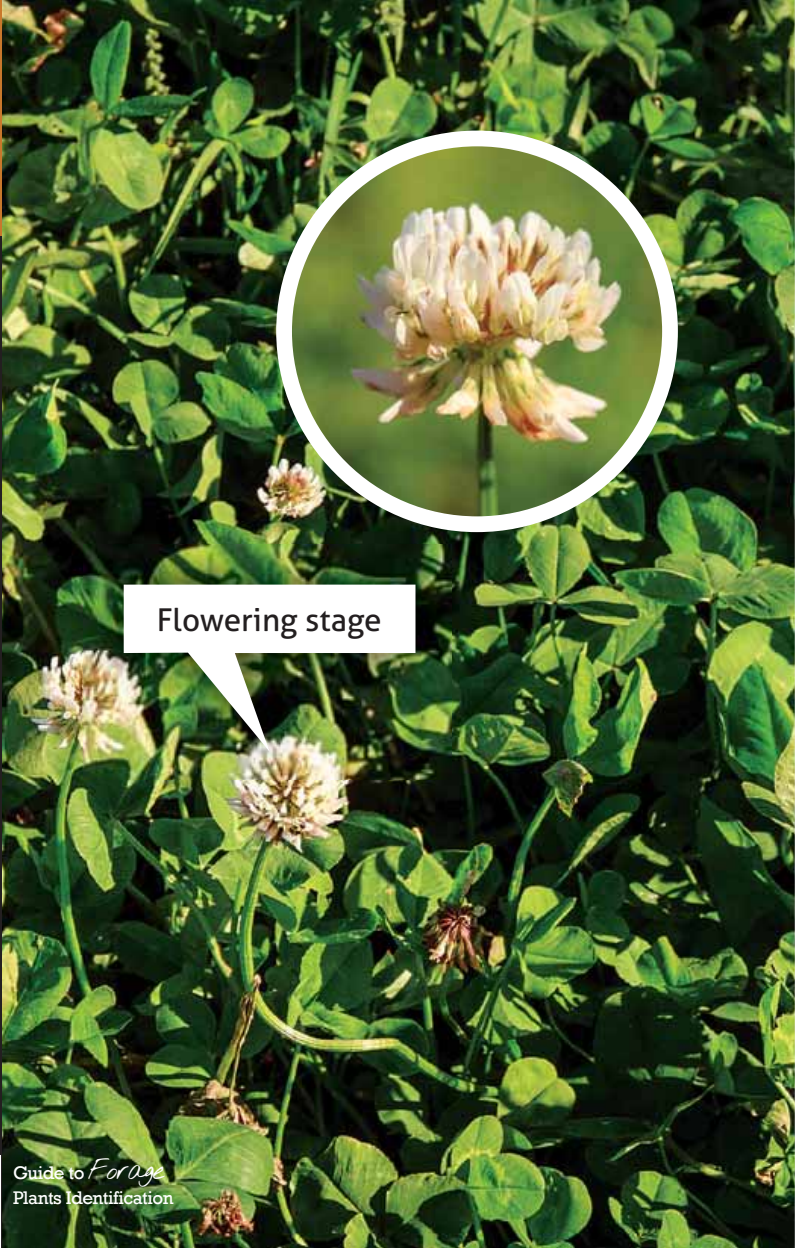
- *Needs to have a rest period in the fall. Be careful of deficiencies in potassium and boron.*

WHITE CLOVER LADINO



10

WHITE CLOVER LADINO



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.*

11

RED CLOVER

Seedling

11

RED CLOVER

Vegetative stage (with buds)

11

RED CLOVER

11

RED CLOVER

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

CQPF
CONSEIL QUÉBÉCOIS DES PLANTES FOURRAGÈRES

valacta

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.*

Ministère de l'Agriculture des Pêcheries et de l'Alimentation
Québec

Agriculture et Agroalimentaire Canada
Agriculture and Agri-Food Canada
Canada