

**Legumes**

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**Legumes**

	Use	Longevity	Winter Hardiness	Tolerance to:			Preferred Climate & Growing Conditions
				Drought	Flooding	Salinity	
<b>Alfalfa</b>	Hay & Pasture	Long	Good	Good	Low	Low to Moderate	Widely adapted to most soil zones but will not tolerate areas that have periodic flooding.
<b>Alsike Clover</b>	Hay & Pasture	Short	Fair	Poor	Moderate	Low	Prefers low lying moist areas.
<b>Birdsfoot Trefoil</b>	Pasture	Long	Good	Moderate	High	Low to Moderate	Prefers moist areas.
<b>Cicer Milkvetch</b>	Pasture	Long	Good	Moderate to High	Low	Moderate	Widely adapted but exhibits its creeping habit best on more coarse textured soils.
<b>Red Clover</b>	Hay & Pasture	Short	Poor	Low	High	Low	Best suited to humid areas with moderate temperatures.
<b>Sainfoin</b>	Pasture	Long	Fair	High	Low	Low	Best on brown and dark brown soil zones. In very dry areas it yields poorly. Does well on thin gravelly soils.
<b>Sweet Clover</b>	Hay & Silage	2 Years	Fair	Moderate to High	Low	Moderate	Especially productive on fertile soils.

## Alfalfa

### **General Description**

Alfalfa is a deep-rooted, long-lived perennial legume with wide adaptation. Alfalfa is high yielding and high in quality, but requires good fertility and large quantities of water for optimum productivity. It is grown primarily for hay, but can be ensiled, or used as pasture, either alone or in combination with grasses

Alfalfa has three general types of root system: tap root, branch root, and creeping root.

- Tap Root – Tap root system consists of one main deep-penetrating root with some smaller lateral roots. Under favourable conditions the tap root may penetrate 15 to 20 feet. The deep rooting habit makes alfalfa a very drought resistant plant.
- Creeping Root – Creeping rooted plants develop secondary root stalks from the main roots which are capable of becoming independent plants. Creeping-rooted alfalfas are generally more persistent and tolerate adverse conditions such as drought, grazing, and winter severity.
- Branch Root – Branch root alfalfas have characteristics of both tap root and creeping root plants and adapt their rooting structure depending on the conditions they are grown under. Branching of the tap root and greater fibrous root mass develop under conditions of high moisture as an attempt by the plant to keep its roots above the water table and avoid stresses.

### **Usage**

*Hay:* High yielding and excellent quality for hay. One to three hay cuts may be taken each year depending on the variety selected and management factors.

*Pasture:* Highly palatable and good regrowth. Risk of bloat can be reduced by proper management and by including grass in the pasture mixture.

### **Adaptation**

Alfalfa is well adapted to a wide range of soil and climatic conditions. Performs best on fertile loamy soils. Moderate tolerance to drought, salinity and alkalinity.

### **Limitations**

Alfalfa is intolerant of flooding or poor soil drainage during the growing season. Alfalfa plants are sensitive to carbohydrate depletion in the roots and proper harvest management must be followed to avoid stand loss. Risk of bloat in ruminant animals is a concern and proper management is required to reduce this risk. Alfalfa is very sensitive to soil acidity.

*Seeding rate:* See Chart in the Forage Agronomic Guide.

*See Forage Adaptation Chart in the Forage Agronomic Guide.*

## Sweet Clover

### **General Description**

Sweet clover is a fast growing deep-rooted biennial legume with wide adaptation. High yielding hay crop and recognized for its soil improvement properties.

### **Usage**

*Hay:* High yielding for hay. Must be cut early (before full bloom) to maintain quality.

*Pasture:* Not widely used for pasture. Risk of bloat somewhat lower than with alfalfa. Risk of bloat can be reduced by proper management and by including grass in the pasture mixture.

*Soil Builder:* Sweet clover is widely used as a green manure and soil improvement crop. The deep penetrating tap-root opens up the subsoil, improving aeration, and providing large amounts of nitrogen to the soil.

### **Adaptation**

Sweet clover is well adapted to a wide range of soil and climatic conditions. Winter hardy and productive. Grows best on clay-loam, well drained, neutral or alkaline soils. Drought resistant and tolerant to moderate salinity.

### **Limitations**

Sweet clover is intolerant of flooding or poor soil drainage during the growing season. Sweet clover contains coumarin which makes it less palatable to livestock than other legumes. Mold in sweet clover may convert coumarins to dicoumarol, a blood anti-coagulant. Animals fed moldy sweet clover may suffer from sweet clover bleeding disease. Low-coumarin varieties like NORGOLD should be selected for better palatability and to reduce the risk of the bleeding disease. Risk of bloat in ruminant animals is a concern and proper management is required to reduce this risk. Sweet clover is very sensitive to soil acidity.

*Seeding rate:* See Chart in the Forage Agronomic Guide.

*See Forage Adaptation Chart in the Forage Agronomic Guide.*

## Red Clover

### ***General Description***

Red clover is a tap-rooted, short-lived perennial legume. Red clover develops a tap root with many side branches. There are single and double cut types available.

### ***Usage***

*Hay:* Good yield and quality for hay. Difficult to dry down due to high moisture content. Cut at 10% bloom for best quality hay.

*Pasture:* Not widely used for pasture. Regrowth after haying can be grazed. Risk of bloat can be reduced by proper management and by including grass in the pasture mixture.

### ***Adaptation***

Red clover is best suited to high moisture areas and is adapted to various soil types. Tolerates acid soils better than other legumes. Does not tolerate lengthy drought or salinity.

### ***Limitations***

Red clover is short lived (2-3 productive years). Intolerant of drought or salinity. Difficult to dry down for hay.

Seeding rate: See Chart in the Forage Agronomic Guide.

See Forage Adaptation Chart in the Forage Agronomic Guide.

## Alsike Clover

### **General Description**

Alsike clover is a short lived perennial legume with deep non-creeping branch roots and fine stems. Used in both hay and pasture situations.

### **Usage**

*Hay:* Good yielder under high moisture conditions. Usually seeded in mixtures with grasses such as timothy.

*Pasture:* Highly palatable and good regrowth. Regrowth after haying can be grazed.

### **Adaptation**

Alsike clover is best suited to cool low-lying wet soils. Withstands spring flooding up to 6 weeks and tolerates poorly drained soils. Adapted to alkaline and acidic organic soils.

### **Limitations**

Alsike clover is not tolerant of drought or high temperatures. Low tolerance for salinity and shade.

Seeding rate: See Chart in the Forage Agronomic Guide.

See Forage Adaptation Chart in the Forage Agronomic Guide.

*Note: not recommended for hay/pasture horse mix*

## White Clover

### **General Description**

White clover is a shallow rooted legume. The three types of white clover are: Ladino (large white clover), White Dutch (intermediate or common white clover) and the wild type (low growing or small white clover). The Ladino and Dutch types are usually short lived and the wild type is long lived.

### **Usage**

*Hay:* The Ladino type is the only white clover suitable for hay. High quality forage.

*Pasture:* Highly palatable and nutritious with rapid regrowth. Risk of bloat can be reduced by proper management and by including grass in the pasture mixture. The wild types can withstand close grazing.

### **Adaptation**

White clover is best suited to moist well drained loamy soils. White clover will tolerate slightly acidic soils, but is not saline or alkaline tolerant. Wild types are most persistent.

### **Limitations**

White clover has low drought tolerance due to its shallow root system. Intolerant of prolonged flooding or waterlogged soils. High temperatures and lengthy drought can kill a stand. Wild types are winter hardy whereas the Ladino and Dutch types are not.

*Seeding rate:* See Chart in the Forage Agronomic Guide.

*See Forage Adaptation Chart in the Forage Agronomic Guide.*

## Birdsfoot Trefoil

### **General Description**

Birdsfoot trefoil is a fine stemmed medium to long-lived perennial legume. Mature plants develop a strong deep tap root system with many side branches. There are two types of birdsfoot trefoil: Empire type and European (common) type. The Empire type is the most winter hardy and commonly grown.

### **Usage**

*Hay:* High quality forage for one cut hay system. Lower yielding than alfalfa. Difficult to dry down due to high amount of water in plant. Crop may lodge.

*Pasture:* Bloat safe. Highly palatable but poor regrowth. Withstands grazing better than most legumes. Regrowth after haying can be grazed.

### **Adaptation**

Birdsfoot trefoil is best suited to moist areas and is more tolerant of unfertile soils than alfalfa. Widely adapted to soil types. Birdsfoot trefoil has good tolerance to alkalinity and acidity, withstands several weeks of spring flooding, and tolerates water logged soils.

### **Limitations**

Stand persistence can be limited due to management factors. Does not compete well with other plants. Poor drought tolerance. Low-moderate salinity tolerance.

*Seeding rate:* See Chart in the Forage Agronomic Guide.

See Forage Adaptation Chart in the Forage Agronomic Guide.

## Sainfoin

### **General Description**

Sainfoin is a short to medium-lived perennial legume that develops deep branched tap roots. Sainfoin is less hardy than alfalfa and is suited more to the dark brown and moist brown soil regions.

### **Usage**

*Hay:* Good quality forage for one cut hay system. Erect growth. Regrowth is slower and yield is lower compared to alfalfa. Cut at 50-100% bloom for best combination of tonnage and yield.

*Pasture:* Bloat safe. Excellent quality and palatability and retains its leaves and quality longer than alfalfa. Earlier spring growth than alfalfa. Regrowth is slow and continuous grazing will result in stand loss.

### **Adaptation**

Sainfoin performs best on well drained soils with good moisture holding capacity. Adapted to dry soils and will grow well on thin, gravelly soils. Tolerates drought but growth will be reduced. Should be grown in areas with at least an average of 12" of annual precipitation. Easy to establish but not competitive with other plants.

### **Limitations**

Sainfoin does not tolerate salinity, acidity, spring flooding or water-logged soil conditions. Sensitive to over-grazing and does not compete well with other forage species in a mixture. Recovery after grazing or haying is slow.

*Seeding rate:* See Chart in the Forage Agronomic Guide.

See Forage Adaptation Chart in the Forage Agronomic Guide.

## Cicer Milkvetch

### **General Description**

Cicer milkvetch is a long-lived perennial legume that spreads through an extensive vigorous rhizome rooting system. Cicer milkvetch is a bloat safe legume option for pastures.

### **Usage**

*Hay:* Good quality hay that typically yields 20% less than alfalfa. Low leaf loss during harvesting.

*Pasture:* Bloat safe. Excellent quality and palatability. Starts spring growth later than alfalfa but retains quality better late in the fall. Tolerates grazing well.

### **Adaptation**

Cicer milkvetch is widely adapted to a variety of soil textures and climatic zones. Best suited to areas with average annual precipitation of 16" and coarser soil types. Tolerant to moderate levels of drought, salinity, alkalinity, and acidity. Resistant to pocket gopher damage.

### **Limitations**

Cicer milkvetch is difficult to establish due to low seedling vigour and hard seed which reduces germination. Two to three seasons are frequently required to establish this legume. Low tolerance to spring flooding.

*Seeding rate:* See Chart in the Forage Agronomic Guide.

*See Forage Adaptation Chart in the Forage Agronomic Guide.*