

## Forage Legume Notes

### White Clover (*Trifolium repens*)

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#### Introduction

- White clover is one of the most important and widely distributed forage legumes in the world
- It is one of three trifolium or clover species which are commonly cultivated as a forage
- White clover is described as a short-lived perennial

#### Growth and Morphology

- Seedlings develop a slender taproot and have a rosette growth habit with very little primary stem elongation. The seedling tap root persists for 1 – 2 years only
- Within six to eight weeks of germination, stolons develop and adventitious roots form at each node along the stolon to serve as the primary root system. The stolons are indeterminate in growth habit. The plant spreads and survives by the development of stolons
- Roots are shallow and are usually less than 20 cm in length but sometimes are as long as 1 m
- White clover can be grouped into three categories according to leaf size; small, medium & large. Sown cultivars are usually medium and large leaf types
- Every three to four days new leaves are being formed. Old leaves fall off after about 40 days. Under most grazing conditions, only the petiole leaf stem and the leaves are consumed
- Flowering is a photo period response >13-16 h

#### Adaptation

- Very wide range of adaptation
- Optimum soil pH is 6.0-6.5. White clover is very sensitive to high soil aluminum levels which can occur when soil pH drops below 5.5
- White clover needs ample supplies of phosphorus and potassium

- Grows best under cool moist conditions, on fertile well drained soils. White clover does not do well on sandy soils, but does well on clay loams with good water holding capacity
- More compatible with bunch type grasses than with sod forming grasses

### **Advantages**

- Nitrogen fixation in nodules reduces the need for supplemental fertilizer
- Less supplemental nitrogen is a benefit to the environment as there is less chance of runoff and pollution of groundwater
- Less fertilizer applied means lower costs to the farmer
- In Nova Scotia fertility costs can be reduced by 70% by maintaining optimal legume proportions in pasture
- White clover increases palatability and forage quality (greater CP and digestibility) of pastures
- Protein quality is high, providing a wide spectrum of amino acids and proteins
- Rapid regrowth following grazing

### **Disadvantages**

- White clover prevents the use of common broad spectrum herbicide to control broadleaf weeds in pastures
- Lower yielding than many other forage legumes under a two cut system
- White clover is short lived and is less winter hardy than other forages
- It can cause bloat if clover/grass ratio is too high (>50%)

### **Varieties**

- The Atlantic Field Crops Committee recommends three varieties: Milkanova, Sacramento (Ladino) & Sonja. Sonja is the most commonly grown white clover in Atlantic Canada. It has excellent regrowth, very good winter hardiness and an approximate flowering date of June 26

### **Production**

- White clover is almost always grown with other grass species in order to reduce the risk of bloat and overwintering
- If white clover is to provide all of the N in a forage system, a content of 30 - 50% white clover on a dry matter basis is optimal
- The ability of white clover to overwinter is a combination of genotype and management. The clover should not be repeatedly cut too close throughout the season and it should be provided with an end of season rest period
- The key to keeping white clover productive in a pasture is low rates of N fertilizer, controlled grazing, a fall rest period and to not allow the grass component to get too tall
- The best method for establishment is to direct seed a suitable variety in a suitable forage mix
- Oversowing is an inexpensive alternative to conventional seeding. The clover is broadcast over existing pasture allowing for successful germination where conditions exist. This is most often done in late winter to early spring
- No-till sod seeding uses colters or rotary tillage to till a strip in which the seeds are planted
- Timing of planting should be in early spring in order to avoid dry conditions. The pH should be above 5.5 in order to optimize the nodulation. The seed should be properly inoculated with Rhizobium. The seed bed should be rolled firm. The seeding rate should be approximately 3 kg/ha at a 4:1 clover to grass ratio

**For more information, please contact:**

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