

## White Clover – *Trifolium repens*

White clover is a perennial forage legume with a prostrate, stoloniferous growth habit. It is very palatable, nutritious and highly digestible. Trifoliate leaves are smooth and abundant. It has a deep primary taproot in the first season, with secondary roots taking over from season two when the primary tap root dies off. Clover is therefore not as drought tolerant as Lucerne. White clover is seldom planted in a pure stand. Its main application is to plant in blends with grass species, thereby improving the quality of a pasture. It is mostly produced under irrigation, but requires 800 mm rainfall if produced without irrigation.



### Strengths

- 5 t DM/ha/season  
**Depending on environmental conditions and management**
- Fixes atmospheric nitrogen (N).
- Adds quality to protein, digestibility and dry matter to grass pastures
- Good quality digestible protein
- Protected against overgrazing by stolons.
- Ability to reproduce with stolons

### Limitations

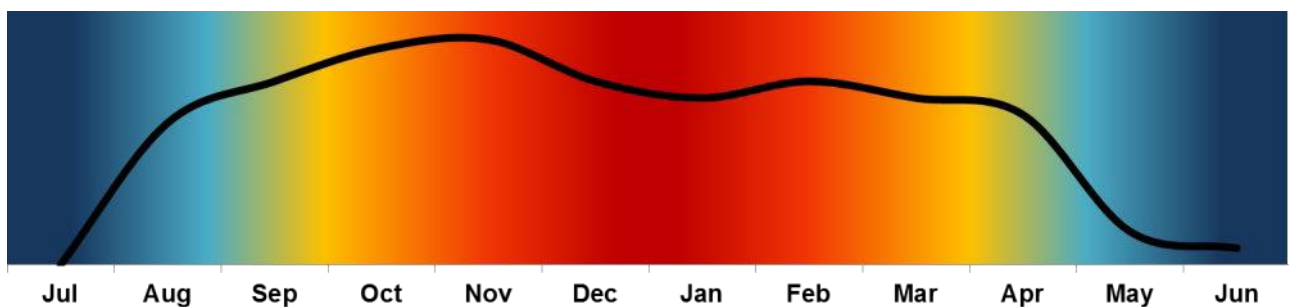
- Danger of causing bloat in livestock
- Low production crop

## What can it be used for?

**Grazing:** White Clover is best utilized as a component in a blend with Rye grass, Tall Fescue or Cocksfoot.

**Cover Crops:** White clover offers a wide spectrum of advantages to a cover crop blend. It builds the soil with organic material and nutrients that has been scavenged from the soil, and also introduces new Nitrogen through Nitrogen fixation. It protects the soil against soil erosion, improved water infiltration rate, breaking compaction and stabilising soil aggregates. White clover extracts some heavy metals from the soil.

**Production potential:** Clover is not a high producing crop, but 5 t DM/ha/season can be achieved. The reason for including clover in a blend is to add value in the form of good bypass protein and improved digestibility. Success depends on soil fertility, climatic conditions and frequency of utilisation <sup>(1)</sup>.



Relative growth curve of and established White Clover stand (one year cycle).

### **Metabolic disturbances in animals on cultivated pastures:**

**Frothy Bloat:** Build-up of gas in the rumen due to stable foam forming



## Establishment

**Climate:** White Clover is very widely adapted to various climatic conditions. It does however thrive in cool, wet climates. It is mostly produced with irrigation.

**Moisture:** Under dryland conditions it requires at least 800 mm per annum, provided that distribution correlates with its production curve, but production can be greatly increased under irrigation.

**Soil:** Does well on soils with good water retention capability and fertility with sufficient Calcium (Ca), Phosphorus (P) and Potassium (K) levels. Well drained soils with 0 % acid saturation are ideal as White Clover is very sensitive to high Al content in soils. A soil pH (KCl) > 5.5 is recommended to ensure optimal growth for both plant and its bacterial symbionts.

**Fertilization:** White clover is a legume and therefore fixes atmospheric N into a usable form of N. For this reason, no N should be applied when cultivating this crop. A soil analysis before establishment is essential <sup>(1, 3)</sup>.

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment*	0	30	120-140
Seasonal application (kg/ha)	0**	Use removal rates	
<b>Production - Removal rates (kg/ton):</b>			
Good quality fodder	47	3.5	32
Average quality fodder	40	2.8	26
Poor quality fodder	31	2	18

\* Determined by production potential

\*\*Fixed from atmospheric-N in symbiosis with *Rhizobium*





Other elements that are essential for successful White clover cultivation and their optimum levels are:

- Ca > 600 ppm
- Mg > 60 ppm

Phosphorus and K can be recycled back to pastures when grazed by stock. This is dependent on the grazing system and the type of animals used. Up to 40% of P and 90% of K can be recycled <sup>(4)</sup>. It is however necessary to do annual soil analysis to determine the level to which recycling occurred. The difference should be fertilized.

**Methods:** Establish on a firm, fine, weed free seed bed. Consolidating (rolling) the seedbed after sowing/planting will ensure good seed-soil contact and subsequently better germination and establishment. Seed must be inoculated with the correct bacteria before planting. Some soils previously planted to White clover do contain the required *Rhizobium* bacteria, therefore; inoculating seed prior to planting can be beneficial but not necessary.

**Our prescribed seeding rate:**

	Blend <sup>(1)</sup>		Pure stand <sup>(1)</sup>	
	Uncoated	AgriCOTE®	Uncoated	AgriCOTE®
Irrigation	2 – 3 kg/ha	2 – 3 kg/ha	6 – 8 kg/ha	6 – 8 kg/ha

**Planting time:** The best time to establish White Clover is in late summer or early autumn (February – April). In a blend the best time to plant should correspond with the ideal planting time of the main component of the blend.





## Management

**Utilisation:** The risk of bloat becomes high when more than 40-50% of the stand consists of Clover. Pure clover stands (Red and White blended) can be grazed; however, proper management is required to prevent animals from bloating.

## Cultivars

### **Kotare**

Kotare is a large leaved, highly productive cultivar suited to dairy, beef, or sheep and fat lamb grazing systems.

### **Haifa**

Haifa is a nutritious highly productive clover for beef and dairy cattle, sheep and fat lamb production. It has superior heat tolerance and persistence.

## Resources

1. Pasture Handbook, Kejafa Knowledge Works, ISBN 0-620-31994-1
2. USDA-NRCS - Plant fact sheet- White Clover
3. Feedipedia - Animal feed resources information system – White clover (*Trifolium repens*) - <http://www.feedipedia.org/node/245>
4. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreënvaldele, vol. 1. Warmbad

