

Red Clover – *Trifolium pratense*

Red clover is a perennial forage legume. It establishes and produces quickly but its poor persistence limits the lifespan to 2-3 years. It has a prostrate, stoloniferous growth habit. It is very palatable, nutritious and highly digestible. The deep taproot system, enables the plant to extract water from deep soil layers. It is most often used with White Clover in mixtures with grass species, thereby effectively improving the quality of a pasture. Red Clover has very good summer production (relative to White Clover) and this is the sought after quality and reason for including it with White Clover. It requires a minimum average of 750 mm per year, however when produced under irrigation production is optimised and stress limited.



Strengths

- 5 – 10 t DM/ha/season
Depending on environmental conditions and management
- Perennial species
- Fixes atmospheric nitrogen (N)
- Adds quality to protein, digestibility and dry matter to grass pastures

Limitations

- Danger of causing bloat in livestock
- Poor persistence

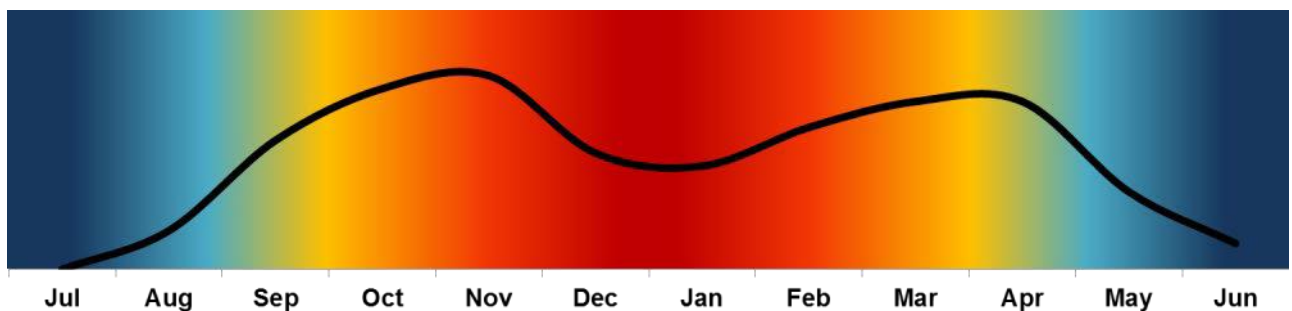


What can it be used for?

Grazing: Red Clover is best utilized with White Clover as a component in a blend with Rye grass, Tall Fescue or Cocksfoot. Stands are less likely to cause bloat when grazed with a grass component.

Cover Crops: Red 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. Red clover extracts some heavy metals from the soil.

Production potential: Red Clover is not a high producing crop and can produce between 5 – 10 t DM/ha/season. This depends on the soil fertility, environmental conditions and frequency of utilisation. The reason for including it in a blend is to add value in the form of good bypass protein and improved digestibility ⁽¹⁾.



Relative growth curve of an established Red 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, causing animals to suffocate.

Phytoestrogens: Red clover may contain phytoestrogen levels high enough to have a hormonal effect on animals. Sheep are more susceptible than cattle.





Establishment

- Climate:** Red Clover is very widely adapted to various climatic conditions. It does however thrive in cool, wet climates.
- Moisture:** Under dryland conditions it requires at least 750 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 Red 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:** Red 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 ^(1,3).

	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	
Production - Removal rates (kg/ton):			
Good quality fodder	44	3.5	30
Average quality fodder	32	2.4	24
Poor quality fodder	24	2	18

* Determined by production potential

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





Other elements that are essential for successful Red 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 ⁽⁵⁾. 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 Red clover may contain the required *Rhizobium* bacteria, therefore; inoculating seed prior to planting can be beneficial but not necessary.

Our prescribed seeding rate:	Blend ⁽¹⁾		Pure stand ⁽¹⁾	
	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 Red Clover is in late summer or early autumn (February – April). In a blend the best time to plant should correspond with the ideal time to plant 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.





Always ensure sufficient tannin rich hay as a supplement or bloat prevention products.

Cultivars

Kenland

Kenland is a tall growing, short-lived, cultivar with erect, leafy stems. It has good resistance to a number of fungal infections. It has superior yields to other red clovers, and has good persistence.

Red Gold

Red Gold is a red clover cultivar with exceptional winter production.

Resources

1. Pasture Handbook, Kejafa Knowledge Works, ISBN 0-620-31994-1
2. USDA-NRCS - Plant fact sheet- Red Clover - http://plants.usda.gov/factsheet/pdf/fs_trpr2.pdf.
3. Feedipedia - Animal feed resources information system – Red clover (*Trifolium pratense*) - <http://www.feedipedia.org/node/246>
4. Penn State College of Agricultural Science: Extension –
5. <http://extension.psu.edu/plants/crops/forages/species/red-clover>
6. <http://extension.psu.edu/plants/crops/soil-management/cover-crops/management-of-red-clover-as-a-cover-crop>
7. <http://extension.psu.edu/plants/crops/forages/hay-and-silage/harvest-management/harvest-management-of-red-clover>
8. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreënvaldele, vol. 1. Warmbad
9. University of Wisconsin-Extension – Red Clover – Establishment ,Management and Utilisation, A3492

