

## Arrowleaf Clover – *Trifolium vesiculosum*

Arrowleaf clover is a winter annual clover with an erect growth habit. This makes it suitable for inclusion in blends for grazing and hay making. It is often included in mixtures with other cool season species to improve the quality of the forage. The minimum rainfall requirement for Arrowleaf Clover production is 750 mm per annum, but stands under irrigation show higher, more reliable production.



### Strengths

- 5-10 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
- Low bloating occurrence
- Very palatable and nutritious forage
- This clover is capable of large seed yield

### Limitations

- Seedlings are slow growing and drought sensitive

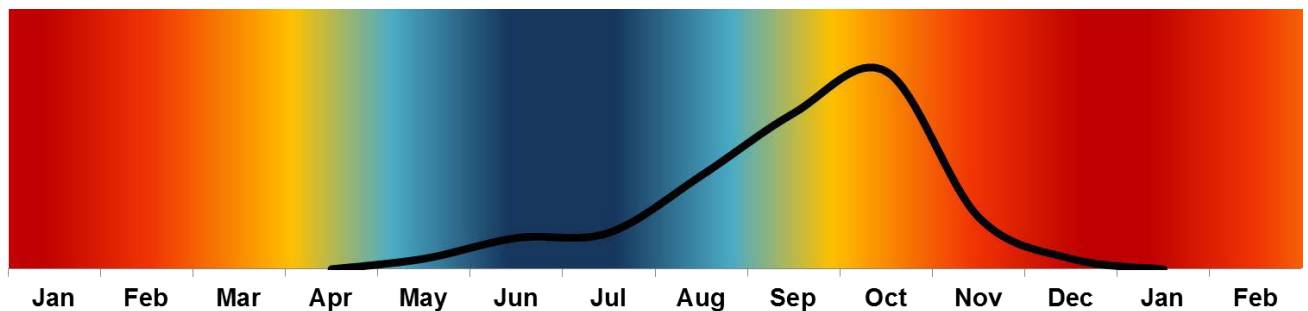


## What can it be used for?

**Grazing:** Ideal winter grazing with high organic matter production.

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

**Production potential:** A production potential of 5 – 10 t DM/ha/season can be achieved, but this depends on soil fertility, environmental conditions and frequency of utilisation <sup>(1, 2)</sup>.



Relative growth curve of an Arrowleaf 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.





## Establishment

- Climate:** Arrowleaf Clover is widely adapted, but is most suited to cool winter rainfall areas.
- Moisture:** Under dry land conditions it requires at least 750 mm per annum. Best production is achieved under irrigation. It does not tolerate waterlogged conditions so irrigation scheduling is critical on soils that are not well drained.
- Soil:** It is widely adapted but requires high fertility soil. Well drained soils with a soil pH (KCl) between 5.5 and 6.5 is recommended to ensure optimal growth for both plant and its bacterial symbionts
- Fertilization:** Arrowleaf 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, 2)</sup>.

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment*	0	20-30	140
Seasonal application (kg/ha)	0**	Use removal rates	
<b>Production - Removal rates (kg/ton):</b>			
Good quality fodder	45	3.8	31
Average quality fodder	32	3	24
Poor quality fodder	21	2.2	17

\* Determined by production potential

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

Phosphorus (P) and Potassium (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 <sup>(5)</sup> can be recycled. It is however necessary to do annual soil analysis to determine the level to which recycling occurred. The difference should be fertilized.





COVER CROPS & FORAGES

**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.

**Our prescribed seeding rate:**

	Broadcast <sup>(1, 2)</sup>	
	Uncoated	AgriCOTE®
	8-10 kg/ha	8-10 kg/ha

**Planting time:** The best time to establish Arrowleaf Clover is during February/March in cool areas, while March to May would be more appropriate in warmer areas. In a blend, the best time to plant should correspond with the best time to plant the main component of the blend.

## Management

**Utilisation:** Ideally, Arrowleaf Clover should not be grazed until the plants are at least 12 cm tall. Livestock should not be allowed to graze plants shorter than 7 cm to allow strong regrowth. If the stands are utilized for hay or silage making, limited regrowth can be expected from mechanically harvested stands. This is mostly due to the later stage of harvesting.

## Cultivars

### Zulu

Zulu was developed in South Africa and has higher production than most other imported cultivars. It has a vernalisation/cold requirement and flowers late.





## Resources

1. Pasture Handbook, Kejafa Knowledge Works, ISBN 0-620-31994-1
2. Gids tot die volhoubare produksie van weiding. Alles oor natuurlike veld en aangeplante weiding vir kleinvee, grootvee en wildboere. Prof Hennie Snyman, 2012.
3. FAO - <http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000504.htm>
4. USDA – Plant Fact Sheet - Moss, T. C. 2011. Plant fact sheet for arrowleaf clover (*Trifolium vesiculosum*). USDA-Natural Resources Conservation Service, Jamie L. Whitten Plant Materials Center, Coffeerville, MS. 38922
5. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreëvaldele, vol. 1. Warmbad.

