

Purple mammoth top – *Brassica campestris spp. Rapa*

Purple Mammoth Tops turnips are a popular option in cover crop and forage mixtures. Their large taproot has the potential of reaching down to 1.5m – playing a significant role in alleviating compaction, aerating the soil, and improving water infiltration. The turnip’s quick establishment and dense leaves cover the soil and effectively suppress weeds. Brassicas are known for their ability of capturing residual soil nitrogen after a crop harvest.



Strengths

- 5-10t DM/ha/season
Depending on environmental conditions and management
- Drought tolerant
- Relieves compaction
- Aerates the soil
- Scavenges nutrients
- Suppresses weeds
- Palatable to livestock

Limitations

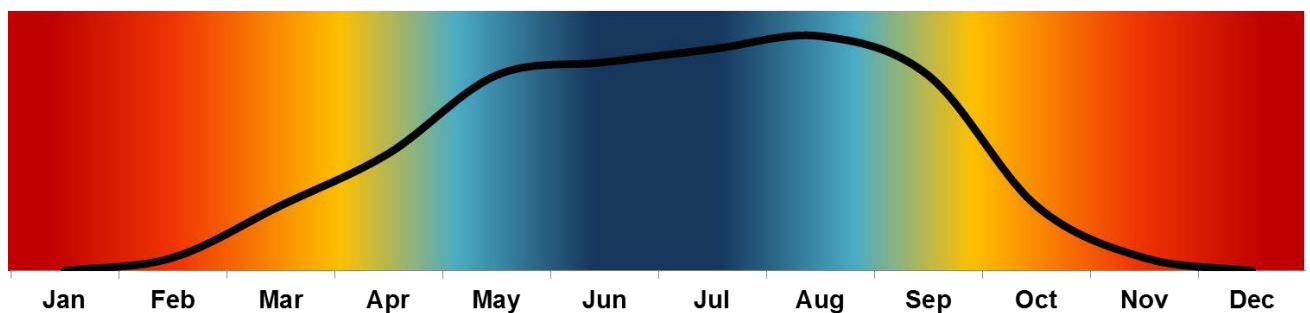
- If not managed, can be harmful to livestock
- Sensitive to common insect pests

What can it be used for?

Cover Crop: Turnips assist in achieving various soil health objectives. Best paired with temperate cereals and legumes at a low seeding rate.

Grazing: Turnip plants are best grazed at 30 cm in height. The pasture should be grazed for a short time and the livestock removed to allow the plants to regrow. Livestock eat the stems, leaves and roots of the plant.

Production potential: Yields of 5 to 10 t/ha depending on environmental and management conditions. The higher seeding rate will result in a higher proportion of leaves to roots in turnips. Yields are also dependent on soil fertility and climatic conditions.



Relative growth curve of a Purple mammoth top stand - one year cycle

Metabolic disturbances in animals on cultivated pastures:

As most Brassicas have a low fibre content, it is important that turnips not constitute more than 75% of the ruminant's diet. Health disorders such as bloat, atypical pneumonia, nitrate poisoning and hypothyroidism can occur.

Establishment

Climate: Turnips are used mainly in the colder regions and require a minimum temperature of 7°C to germinate. Preferred soil temperatures of around 10°C to 15°C.

Moisture: This species can produce a good crop when receiving an annual rainfall of 300 - 500 mm. An increase in production yields can be obtained if irrigation is applied.

Soil: Grow best in a moderately deep loam, fertile and slightly acid soil. Turnips do not perform well in high-clay soils with poor drainage.

Fertilization: Nitrogen (N) and phosphorous (P) are the most important elements in forage production.

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment***	75-120	60	30-60
Seasonal application (kg/ha)	40-150**	Use removal rates	
Production - Removal rates (kg/ton):			

*Fertilizer just after establishment (kg/ha)

**Selected rate should maximise profit

***Determined by production potential

Phosphorus (P) and potassium (K) can be recycled back to pastures when grazed by animals. 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. It is however necessary to do annual soil analysis to determine the level to which recycling occurred. The difference should be fertilized.

Methods: Turnip seed is small. Best results are achieved when planted into a firm, fine seedbed with adequate moisture for germination and development.



Seeding rate: Seeding rate can vary between 2 – 5kg / ha depending on planting method, moisture (annual rainfall, dryland / irrigation), and area.

Planting time: Turnip is best established during the Autumn months.

Management

Utilisation: Turnip plants can be grazed when the plant reaches 30cm in height – usually 70-90 days after planting. A strip grazing system is desirable to ensure even grazing. Do not graze turnips when immature.

Resources

1. Truter, W., Dannhauser, C., Smith, H. and Trytsman G. 2016. **Integrated crop and pasture-based livestock production systems**. Grain SA.
<https://www.grainsa.co.za/conservation-agriculture-part-23> (Access date 24 April 2020).
2. Reed, K. 2008. Turnip. Pastures Australia.
<https://keys.lucidcentral.org/keys/v3/pastures/Html/Turnip.htm> (Access date 24 April 2020).
3. Ammann, S., Nash, D. and Goodenough, D. 2016. Fodder radish and other forage brassicas. Department of agriculture and rural development, Province of Kwazulu-Natal.
https://www.kzndard.gov.za/images/Documents/researchandtechnologydevelopment/publications/Research_and_Technology_Bulletins/2015.17-Fodder-Radish-and-other-forage-brassicus.pdf (Access date 24 April 2020).

