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Oats – *Avena sativa*

Oats is an annual temperate grass or cereal, grown as either a forage- or grain crop. It is categorized as a forage cereal together with Rye and Triticale. As a forage crop it can be utilised as grazing, hay or silage. Like all forage cereals, it is categorized according to its growth form, as a **Spring-**, **Intermediate-** or **Winter** type. **Spring types** have no requirement for vernalisation (prolonged cold period) and becomes reproductive at specific day lengths. **Winter types** do have vernalisation requirements, and will only become reproductive after exposure to cold enough periods, for long enough. **Intermediate types** lie between Spring- and Winter types on a sliding scale. Often produced under irrigation, but requires at least 400 mm rainfall per annum for Winter rainfall areas or 500 mm rainfall per annum for Summer rainfall areas.



Strengths

- 15 t DM/ha/season under full irrigation
- 2 - 8 t DM/ha/season under dry land or supplemental irrigation.
- **Depending on environmental conditions and management**
- Relatively drought tolerant
- Good palatability and digestibility
- Good suppression of nematodes
- Good cover crop

Limitations

- Less cold tolerant than Rye and Triticale
- Low risk of causing bloat
- Low risk of causing Nitrate poisoning



What can it be used for?

Grazing: Grazing systems are usually practised under dry land conditions, but more success can be achieved under supplemental/ full irrigation.

Hay: Oats make very good hay, due to its inflorescence being softer than that of Rye and Triticale. Spring type oats will give higher production of better quality for hay production.

Silage: Often practiced when double cropping is done with a summer crop like maize. Spring type oats will give higher production of better quality.

Cover Crop: The extensive root system protects soil against soil erosion, while the reduction of nitrate leaching by scavenging Nitrogen and suppression of weeds makes this crop ideal to include in a cover crop mixture. It improves the soil by stabilising soil aggregates, reducing compaction, improving water infiltration rate and builds organic material. Oats is relatively tolerant to saline soil conditions. Black Oats also extracts some heavy metals from the soil.

Production potential: Up to 15 t DM/ha/season (40 – 45 tons silage) under full irrigation is possible. A more likely yield of 2 – 8 t DM/ha/season can be reached under dry land or supplemental irrigation. Yields are dependent on soil fertility, climatic conditions and frequency of utilisation. Oats produce well in autumn and spring, but very poorly in the coldest months. Its growth period is determined by the growth form and management. True spring types will be ready for ensiling in September in most areas. True winter types can produce forage up to November if managed properly and climatic conditions allow it ^(1, 2).



SEED



SEED TREATMENT



FORAGE

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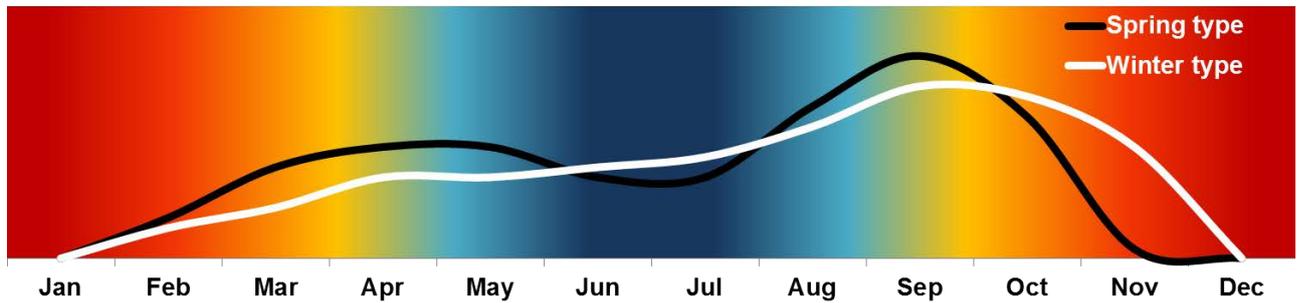
LAND REHABILITATION



COVER CROPS



Advance Seed



Relative growth curves of Spring and Winter type Oats stands - one year cycle

Metabolic disturbances in animals on cultivated pastures:

Low risk of Frothy Bloat: Build-up of gas in the rumen due to stable foam forming, causing animals to suffocate.

Low risk of Nitrate poisoning: Nitrate build up in plants under periods of poor growth, especially after high N fertilisation.

Establishment

Climate: Oats is widely adapted to various climatic conditions.

Moisture: Under dryland conditions it requires at least 400 mm per annum in Winter rainfall areas or 500 mm per annum in Summer rainfall areas. Moisture conservation will greatly improve production if low summer rainfall is expected. Production can be greatly increased under irrigation.

Soil: Soil with a good moisture retention capability will be beneficial under dry land conditions, especially for the longer growers. It is very acid tolerant and can grow in soils with pH (KCl) levels of > 4.5. The ideal pH is however > 5.

Fertilization: Oats responds well to fertilization if moisture availability is not limiting. A soil analysis before establishment is essential ^(1, 2, 3).



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FORAGE

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	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment***	20-40*	20	100
Seasonal application (kg/ha)	40-150**	Use removal rates	
Production - Removal rates (kg/ton):			
Good quality fodder	34	2.8	34.9
Average quality fodder	20	2.2	22.2
Poor quality fodder	9	1.5	15.4

*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 ⁽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 planting/sowing will ensure good seed-soil contact (especially for the bigger seeds) and subsequently better germination and establishment. Alternatively seed can be planted below the soil surface up to 5cm deep.

Our prescribed seeding rate:

	Rows ^(1, 2)			Broadcast ^(1, 2)
	Low potential	Medium potential	High potential	
Irrigation	-	-	70-80 kg/ha	100 kg/ha
Dryland	30-35 kg/ha	50-60 kg/ha	-	-

Planting time: Plant in February/ March (cooler areas) and March/ April (warmer areas)

Management

Utilisation: Oats makes very good hay, due to its inflorescence being soft. It can therefore be cut at a soft dough stage, and produce very good quality hay. Bales can be used to supplement a fodder flow plan or can generate income from sales. Best yields are obtained under irrigation.



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Spring type oats will give higher production of better quality. Care should be taken to prevent bloat occurring in animals even though the risk is low. Cultivar selection will have an influence on production at different times of autumn, winter and spring.

Cultivars

Maluti

Maluti is a true Spring-type oats developed by the ARC

Saia

Saia is black oats (*Avena strigosa*) and is normally cultivated as a cover crop/ green manure because of the good effect it has on soil health.

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. Feedipedia, Animal Feed Resources Information System, Oats (*Avena sativa*) - <http://www.feedipedia.org/node/500>
4. Die invloed van verbouingspraktyke op die opbrengs en kwaliteit van Rog-, Korog-, en hawerweidings in die Transvaalse middelveld. Johan van Bosch, 1999.
5. Dannhauser CS. 1991. Die bestuur van aangeplante weiding in die somerreëval-dele, vol. 1. Warmbad
6. Truter, WF. Dannhauser, CS, Smith, H. and Trytsman, G. 2014. *Avena sativa* (Oats). Integrated Crop and Pasture-based livestock production systems. Conservation Agriculture – Part 12. SA Grain. ISSN 1814-1676. Page 36-38.



SEED



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FORAGE

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