

Overview

Grain sorghum has become an increasingly popular grain crop grown for silage, and more recently headlage. Headlage refers to the plant being harvested at the first leaf at the top of the plant (consisting mainly of the sorghum grain head) leaving behind the fibrous stem. Whilst headlage and grain sorghum silage yield less than forage sorghum varieties, the higher starch concentrations can help offset the amount of purchased grain in a dairy enterprise. DAF scientists have proven headlage's starch availability and digestibility is superior compared to forage and grain sorghum silage.

Headlage is a cheaper energy source for cows compared to traditional grains, with almost the equivalent nutrient composition. It is superior to forage sorghum silage as it has higher levels of metabolisable energy (ME), crude protein (CP), starch and significantly lower amounts of neutral detergent fibre (NDF). Forages lower in fibre should be a priority for subtropical dairy farmers, as lower fibre can increase intake and can lead to greater milk production resulting in greater margin over feed costs (MOFC). When the season and feed supplies are in favour, headlage can prove to be a worthwhile stored starch supply for future use.



Growing & Harvesting

- Standard agronomic practices should be followed for establishing and growing grain sorghum crops. Planting rates of 4.5-6 kg/ha for irrigated and 2-4.0 kg/ha for dryland crops are suggested in QLD.
- When harvesting headlage, grain should be left to mature just past the soft dough stage, slightly longer than regular silage (~110d). When chopping, the plant should be cut below the first leaf (flag leaf).
- A draper style harvester front (Honey Bee) should be used with rollers tightened to crack the grains which improves digestibility.
- Harvest at 50-55% dry matter (DM), inoculating at 1.5 times the rate you would inoculate regular sorghum silage.

Nutritional Value & Yield

- The inclusion of silage in a cows diet is often limited by the amount of NDF that it contains. Headlage contains both leaf and grain and is low in NDF (~25%) when compared to other silages.

- Headlage's quality allows greater inclusion rates in the diet than silage, but also provides greater forage material when compared to grain. Table 2 outlines the nutritional composition, which highlights grain sorghum headlage as a very attractive feed option.

Table 2: Comparison of nutritional composition of headlage, silage and grain for white sorghum.

	Headlage	Silage	Grain
ME(mJ/kg)	11-12	9-11	13-14
CP	10-13%	10-12%	11-13%
NDF	25-30%	35-40%	8-10%
Starch	46-56%	30-35%	65-75%

- DAF's C4Milk Project has produced headlage yields of between 6.0 - 8t DM/ha across various demonstration sites.
- A second cut of silage and third cut of the same crop for a higher fibre product called footlage, are solutions for the use of residual material. Yield's measured by DAF (2015) resulted in 14.6t DM/ ha silage and 6.3t DM/ha footlage.
- The ratoon crop does not produce as high a grain yield as the first and should be taken as a whole silage crop or harvested before flowering as a high quality forage. If the recovery is too poor for a mechanical harvest it may be successfully grazed with dry stock.

Table 1: Yield and dry matter results for DAF sorghum trial (2015).

	DM (%)	Yield (t DM/ha)
Silage	40.0	14.6
Headlage	50.4	6.5
Footlage	29.7	6.3

Economic Value

- Grain sorghum headlage is the most cost effective source of starch at \$0.25/kg in the sorghum feed alternatives as shown above in Table 3.

- Grain sorghum is a low input crop providing harvest options depending on the seasonal conditions.
- Whilst sorghum silage is generally lower in starch availability and perhaps slightly higher in NDF, growing costs are considerably less than corn and can result in much lower financial risk.

Table 3: Comparison of nutritional composition of headlage, silage and grain for white sorghum.

	Starch %DM	CP %	Yield t DM/ha	As fed \$/t	\$/kg Starch
Sorghum headlage	51	13	7	77	0.25
Sorghum silage	33	11	13	42	0.30
Forage sorghum silage	12	9	17	40	0.98
Sorghum grain	68	11	-	352	0.54
Corn Silage	38	9	19	61	0.39
Corn grain	66	11	-	350	0.59



Scan this QR code for links to C4Milk financial analysis.

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