Within the sorghum family there is a wide range of crop types with differing characteristics, each group having been bred and selected for a special purpose. Given high temperatures and irrigation, sorghums have high yield potential but are more sensitive to low temperatures than either maize or Echinochloa type millet. They are therefore more popular in New South Wales and Queensland than Victoria, where the effective growing season for sorghum is shorter.

Fodder sorghums are less demanding than maize for soil type, moisture supply and weed control and can be grazed, fed as green chop, cut for hay or silage or used as carry-over standing feed. However, because they contain prussic acid when young and become very fibrous when mature, careful management is important for good livestock performance, and they are generally unsuited to grazing with sheep.

Varieties
The three main categories of fodder sorghum are:

- Forage sorghums
- Sudan grasses
- Sweet sorghums

Some of the commercially available varieties of fodder sorghum are listed below.

Table 1. Varieties of fodder sorghum

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forage sorghum</td>
<td>Sorghum × Sudan hybrids</td>
<td>Cow pow, Super Chow, Speedfeed, Super Sudax, Nectar, Jumbo</td>
</tr>
<tr>
<td>Sudan grass</td>
<td>Hybrids</td>
<td>Superdan, Betta-Dan</td>
</tr>
<tr>
<td>Sweet sorghum</td>
<td>Hybrids</td>
<td>Honeygraze, Sugargraze, Supersweet</td>
</tr>
<tr>
<td></td>
<td>Grain type</td>
<td>FS 26, Feed 'N' Grain</td>
</tr>
</tbody>
</table>

Characteristics

Forage sorghums
These are sorghum × sudan grass hybrids. This is the most popular group of fodder sorghum and there are many commercial varieties. They are used mainly for grazing at a leafy stage between 0.75 - 1.25 m tall but may also be cut for hay or silage. Plant breeders have developed late-flowering hybrids to delay the decline in quality with maturity.

Sudan grasses
These are thinner in the stems and leafier, than the sorghum hybrids, recover well from hard grazing and have lower prussic acid content. However they are slightly lower in total yield.

Sweet sorghum
These have been selected for their high soluble sugar content. They have thicker stems than the sorghum × sudan grass crosses and do not recover well from cutting or grazing. They can grow very tall (up to 3.5 metres) and yield up to 30 tonnes DM/ha when allowed to grow from November to March (140-150 days). They are palatable, though very fibrous and although sometimes used as standover feed, are best utilised as fine-crop silage. Lodging of tall crops can occur and the harvesting of tall thick crops can be difficult. The quality of fodder is poor, digestibility being around 55% and protein levels very low (from 3.5-5.5%), which restricts its use.

Seedbed and sowing
Select as good a soil type as is available and ensure adequate grading and drainage. Prepare a seedbed of medium to fine tilth and plant from mid November when the soil temperature has reached 18°C. Seed should be sown into good moisture at a depth of 30-50 mm. Usually pre-irrigation is required. Seeding rates are 15-20 kg/ha for cutting or grazing varieties, or 10-15 kg/ha for sweet sorghum.

Fertiliser
Fodder sorghums respond well to highly fertile conditions. Phosphorus and nitrogen are the major limiting elements in northern Victoria.
**Phosphorus**
Apply 25-40 kg/ha of P at or before sowing, but beware of high rates of concentrated fertiliser being in contact with the seed.

**Nitrogen**
Apply 50 kg/ha N at sowing or soon after each cut or grazing, or every six weeks with sweet sorghum. Total nitrogen requirements will vary according to paddock fertility but more than 200 kg/ha N may be required to maximise yield. Nitrogen may be applied to the growing crop by dissolving urea in the irrigation water if there is a re-use system to catch runoff water. Sufficient nitrogen should be applied to keep the foliage dark green at all times.

**Weed control**
Broadleaf weeds are seldom a problem in these crops because they are smothered; however, summer grass weeds such as barnyard grass can be competitive.

Pre-irrigation to germinate weeds, followed by cultivation and sowing, will allow the crop to emerge before any further weed strike. Good crop establishment will then normally ensure that the crop outgrows the weed competition. In bad situations chemical weed control may be required. Suitable grass herbicides are metolachlor or atrazine.

**Insect pests**
These are not normally a problem, however, in the first crop after pasture, wireworms and pasture weevils may attack the seed or young seedlings. Consult your district agronomist for the best control measure.

**Prussic acid poisoning**
All sorghum species contain cyanogenic glucosides, which when eaten by stock, are converted to prussic acid (hydrocyanic acid) in the rumen and can cause poisoning. The risk of prussic acid poisoning can be significantly reduced by the following means.

- Do not graze the crop when it is showing signs of severe stress caused by factors such as low soil moisture, cold or frost. Initial growth after stress is also high in prussic acid.
- Do not introduce hungry stock to forage sorghum - feed them first.
- Do not graze the crop until it reaches about 0.6 metres high.
- Introduce only a few animals initially rather than the whole herd and observe their reaction. If animals refuse to graze, remove them promptly.
- Provide sulphur salt licks to stock. This sulphur supplementation helps animals to detoxify the prussic acid.
- Select lower-risk varieties as there are differences in prussic acid levels between cultivars.

- Check fences to prevent uncontrolled access and back-grazing of new growth.

Hay cut from sorghums containing high levels of prussic acid can also cause poisoning when fed out at a later date. Making silage is safer and so far in Australia there have been no reported cases of poisoning when sorghum has been conserved as silage.

**Utilising forage sorghum and Sudan grass**

**Grazing**
Crops should be grazed ideally between 0.75-1.25 m tall. Grazing management of irrigated crops is difficult because crop growth is very rapid at this stage and irrigations have to be fitted in. Systematic control of stock is important to get the best out of the crop. Grazing when the growth is too young increases the risk of prussic acid poisoning and reduces crop growth potential, while grazing too late means poorer quality feed and reduced regrowth.

For best regrowth do not graze to lower than 150 mm. Three to four grazings of the crop at ideal height are normal for a full season. If grazing pressure is too low then the crop should be cut to keep it under control.

**Hay and silage**
Crops of sorghum and sudan grass can be successfully conserved as hay but should be cut while the crop is 1.2 m tall, or less, to reduce coarse stalk content. Dense crops make the best hay. A hay conditioner is essential to crush the juicy stalks and ensure even drying of the crop.

Silage can also be successfully made from these crops. The crop should be cut, wilted then fine chopped and ensiled in a well sealed bunker at a dry matter content of 28-35%.

**Utilising Sweet Sorghum**
A mature crop of sweet sorghum has a digestibility of around 55% (ME 7.5 MJ/kg) and a protein content of 5% or less, making it unsuitable as a feed for lactating dairy cows or young stock. It is best used for maintaining dry cattle but mineral and protein supplements should be given if pasture is not available.

It is important to realise that sweet sorghums do not regrow well after grazing or cutting and are thus best left to grow to maturity for a single harvest or grazing. The options are to either harvest the crop for silage or to leave it standing to be grazed in April, May or June. The feed value of a standing crop will deteriorate with time and there is no opportunity to grow a winter crop.

**Feed quality**

**Effect of maturity**
The digestibility and protein content of sorghums decline with maturity, as shown below. Protein content is influenced by nitrogen fertiliser; deficient crops will have lower values than those shown.
Table 2. Effect of maturity on the feed quality of fodder sorghums

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Forage Sorghum</th>
<th>Sweet Sorghum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Leafy</td>
<td>Flowering</td>
</tr>
<tr>
<td>Crop height</td>
<td>1.2 m</td>
<td>2 m</td>
</tr>
<tr>
<td>Dry matter %</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>Fibre %</td>
<td>30</td>
<td>37</td>
</tr>
<tr>
<td>Digestibility %</td>
<td>62-65</td>
<td>58</td>
</tr>
<tr>
<td>Protein %</td>
<td>9.5-11.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Summary

Fodder sorghum will give high dry matter yields in hot summers in northern Victoria if given enough water and fertiliser. Forage quality is not adequate for a sole milking ration and must be supplemented for protein. The rapid decline in quality with maturity makes grazing management difficult. However, well managed leafy crops can be productive for hay or silage conservation.

Sodium and sulphur supplementation

Sorghum is naturally low in both sodium and sulphur content. Research has demonstrated vastly improved animal performance when stock grazing fodder sorghum are supplemented with salt licks containing 5-10% sulphur. Another advantage of sulphur supplementation is a reduction in the potential for prussic acid poisoning.