FORAGE FOR BEEF PRODUCTION

Forage sorghum is a valuable source of feed for beef production. Depending on intended use, there is a variety in the Pacific Seeds’ forage range to suit.

**How does forage sorghum perform in meeting nutritional requirements?**

Forage sorghum has a reputation of producing large quantities of feed quickly. Under average conditions it can produce 4t/ha of dry matter within 50 days of planting. However, its reputation for feed quality is not as impressive. When forage is not used at the ideal stage, continued rapid growth will result in large amounts of lower quality feed. For crops under favourable conditions this may be when the crop is only 80-100cm high. Table 1 illustrates the level of live weight gain that can be achieved from a well managed forage sorghum crop.

As the crop grows taller there will be more tonnes of feed per hectare, but feed will be of lower quality and animal performance will be reduced. This is illustrated in Table 2 with a crop of Jumbo being grazed at a later stage when 1.5m tall.

Even with the best grazing management there may be times when crops are being grazed after the ideal stage. This would normally mean reduced liveweight gains. But there is an alternative. It may be cost effective to provide a grain-based supplement to allow stock to make good use of the forage, but still achieve the higher rates of weight gain.

**Table 1.**

<table>
<thead>
<tr>
<th>Liveweight (kg)</th>
<th>Dry matter intake (kg)</th>
<th>Crude protein (%)</th>
<th>Crude protein (g)</th>
<th>Metabolisable energy (ME) (MJ/kg)</th>
<th>Total ME/day (MJ)</th>
<th>Potential liveweight gain (kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>5.8</td>
<td>18</td>
<td>1040</td>
<td>9.4</td>
<td>54</td>
<td>0.7</td>
</tr>
<tr>
<td>350</td>
<td>8.1</td>
<td>18</td>
<td>1458</td>
<td>9.4</td>
<td>76</td>
<td>1.0</td>
</tr>
<tr>
<td>450</td>
<td>10.4</td>
<td>18</td>
<td>1972</td>
<td>9.4</td>
<td>98</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Guide to protein and energy available from forage sorghum, grazed at an early growth stage. Numbers are based on an average crop of Jumbo being grazed by bullocks of a late maturing breed, when the crop is approximately 0.8m high (based on NDF of 52). Crops grown under poor conditions may have lower feed quality, which will lead to potential lower liveweight gain values.

**Table 2.**

<table>
<thead>
<tr>
<th>Liveweight (kg)</th>
<th>Dry matter intake (kg)</th>
<th>Crude protein (%)</th>
<th>Protein (g)</th>
<th>Metabolisable energy (ME) (MJ/kg)</th>
<th>Total ME/day (MJ)</th>
<th>Potential liveweight gain (kg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>5.1</td>
<td>16</td>
<td>816</td>
<td>8.6</td>
<td>44</td>
<td>0.5</td>
</tr>
<tr>
<td>350</td>
<td>7.2</td>
<td>16</td>
<td>1152</td>
<td>8.6</td>
<td>62</td>
<td>0.7</td>
</tr>
<tr>
<td>450</td>
<td>9.3</td>
<td>16</td>
<td>1488</td>
<td>8.6</td>
<td>80</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Guide to protein and energy available from forage sorghum, grazed later than ideal growth stage. These values are based on an average crop of Jumbo, being grazed by bullocks of a late maturing breed when the crop is approximately 1.5m high (based on NDF of 58%). Crops grown under poor conditions may have lower feed quality, which will lead to lower liveweight gain values.
FORAGE FOR MILK PRODUCTION

Best forage sorghum selection for milk production

| 1 | Pacific BMR           |
| 2 | Nutrifeed (pennisetum) |
| 3 | Superdan 2             |

Under favourable growing conditions forage sorghum can produce large quantities of feed. For example within 50 days after planting, under reasonable conditions, 4t/ha of dry matter can be achieved. Cows given only forage sorghum would probably not achieve maximum milk production.

Conversely a crop such as ryegrass may provide excellent feed quality but will not produce the high yields of forage sorghum. In most situations it will be best to use a range of forage crops in combination to meet herd demand.

Forage sorghum can be an important part of a feed ration, but it is important to understand how energy and protein values change as the forage gets taller. See the energy and protein graphs which appear on the individual forage sorghum product pages following this section of The Pacific Seeds 2008/2009 Yearbook.

Nutrition and milk protein levels

Many aspects of a dairy cow’s ration influence milk protein level. Individual components of the ration are important, as well as the balance of the ration:

- If the cow is getting insufficient protein in her diet, milk protein may be reduced; the ideal level is a diet average of 15-16%. In general, average diet protein levels above 16% will not raise milk protein levels.
- The concentrate (grain mix) to forage ratio is important and should be kept around 1 part concentrate to 2 parts forage sorghum.
- Legumes and young immature grasses are often chosen for feeding dairy cows as they have a high feed quality and cows will readily consume large quantities each day. However, these plants will have low plant sugar levels. If the diet is suspected of being low in sugars, supplementation may assist in maintaining or even lifting milk protein value. Sources of extra sugars could be:
  a) Access to a sweet sorghum. By seven weeks Sugargraze can have a sugar level of 12%.
  b) Providing a small amount of molasses in the diet. However, an excess of molasses will cause a reduction in milk fat percentage, so care is required to achieve the desired outcome.

The fibre requirements of a cow

The daily fibre requirements is another consideration for dairy cows as fibre is important in rumen function and affects the production of milk fat. Cows with a pasture or forage-based ration normally have an adequate fibre intake.

However fibre shortage may result from cows being given:

- Very lush forage (such as young oats)
- Excess grain (such as grain based compound feed or concentrate mix)

The proportion of grain in the total ration is important with the ideal ratio of grain concentrate to forage being 1 part concentrate to 2 parts forage sorghum.
FORAGE FOR SHEEP PRODUCTION

Best forage sorghum selection for sheep production

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superdan 2</td>
<td>Pacific BMR</td>
<td>Nutrifeed (pennisetum)</td>
</tr>
</tbody>
</table>

How can sheep make good use of forage sorghum?

Forage sorghum does have a reputation for being able to produce large amounts of feed quickly. Under reasonable conditions it can produce 4t/ha of dry matter within 50 days of sowing. In terms of height, if it is not grazed or cut it can grow to over 2m. It is reasonable to ask the question then “how can sheep benefit from forage that grows so tall?”

Within the forage sorghum group there are many different types and varieties. By choosing an appropriate variety and grazing it when young, high quality feed can be obtained. A good guideline is to graze between hip and ankle height to achieve the best quality feed. This means grazing the crop early and putting on sufficient stock to prevent the crop from growing too tall.

The sudan grass hybrids, with their fine stems and prolific tillering, are a good choice for sheep. The sudan grass hybrid Superdan 2, when grazed at 0.8m can provide feed with a metabolisable energy (ME) content of 9.3MJ/kg of dry matter and protein of over 20%. One of the keys to efficient use of Superdan 2 is early grazing. This combination of high feed quality and high carrying capacity makes Superdan 2 a very useful forage for many classes of sheep.

Other hybrids such as Pacific BMR (a brown mid rib forage sorghum) may also be suitable. The sweet sorghums such as Sugargraze are less suitable for direct grazing by sheep because of their thicker stems, which may be up to 25mm wide.

FORAGE FOR HAY PRODUCTION

Best forage sorghum selection for hay production

1. Choice of variety

If a forage crop is to be sown with the primary aim of making hay, a suitable variety should be chosen. The sudan grass hybrid Superdan 2 is well suited to this use. As not all crops and varieties are equally suitable for haymaking, care should be taken when making the final selection. Choose the variety that will give:

- The potential yield and quality required
- Rapid dry down (avoid crops with very thick stems)
- Good crop regrowth if required
- Flexibility in time of cutting without rapid deterioration. Later flowering varieties give such flexibility.

2. Crop growth stage

As shown in the graphs accompanying the Superdan 2 product page in the section following, the quality of forage crops changes over time, as they grow older and taller. The time to cut will depend on the quantity and quality of the hay required. Late cutting may lead to a potentially greater yield but the quality may be lower. For maximum quality, cut when crops are still in the young, vegetative stage. For forage sorghum, cut when the crop is approximately 1 to 1.3m tall. It is best to use a mower-conditioner, which will condition or crush the stems and reduce the drying time. Another advantage of early cutting is thinner stems, which allows easier conditioning, smaller windrows and faster drying.

3. Time of cutting

The accepted theory is that plant sugar levels are low in the morning and reach their daily peak during the afternoon. This is due to plants using energy (sugars) during the night for plant respiration. But sunlight activates photosynthesis, which restores the plant’s sugar levels.

The results to date suggest that there are both quality and palatability advantages to afternoon cutting. However, if the cut crop does not have sufficient time and heat to fully wilt before nightfall, it will continue to use up sugars until wilted by the heat of the following day. This negates the intended benefit. In recognising the potential benefits and limitations of current information, the conclusion is the best time for cutting hay is late morning.
Silage sorghum

In Australia many beef feedlots are located in areas where corn is not well adapted or where irrigation is not available. This has led to increased demand from the feedlot industry for an alternative, high energy silage source other than corn.

The higher energy value of corn silage is primarily due to the high grain content. Any factors such as moisture stress during flowering and seed set stages, which reduce grain content, may result in corn silage having a metabolisable energy level below 9.5MJ/kg dry matter. For this reason, in drier regions, sweet sorghum can provide a more reliable crop for silage.

The commercial silage sorghum hybrids have proven to be effective in providing good yields with metabolisable energy (ME) levels of over 9.5MJ/kg of dry matter and even above 10 MJ/kg. On average, silage sorghum protein values have tended to be at least two or three percentage units higher than maize silage. Further work is being done to develop even better hybrids for this important industry.

The silage sorghum Chopper has become a popular choice particularly under dryland conditions. For yield and feed quality data on Chopper, see the Chopper product pages in the following section of the Pacific Seeds 2007/2008 Yearbook.

Sweet silage sorghum

Under favourable dryland conditions 50 to 60 t/ha of silage can be expected from a sweet sorghum crop such as Sugargraze, ensiled at the milky-dough stage. Yield potential under irrigation is higher and can exceed 80 t/ha of silage.

Key features of sweet sorghum for silage:
- Good drought tolerance, due to ability to ‘shut down’ until it rains.
- Stressed crops recover well after rain and can still be ensiled.
- Crops can be grazed and then closed up for silage.
- Under suitable conditions, there may be post-harvest regrowth.
- Planting costs are low in comparison to maize (e.g. seed, fertiliser etc).
- Specialised planting equipment is not required; combines and air seeders are suitable.

<table>
<thead>
<tr>
<th>When you want a variety that:</th>
<th>Its most important feature should be:</th>
<th>The choice of variety to plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produces quality, high energy silage</td>
<td>High grain production</td>
<td>Chopper</td>
</tr>
<tr>
<td>Makes quality silage at maturity</td>
<td>High levels of soluble stem sugars</td>
<td>Sugargraze</td>
</tr>
</tbody>
</table>

Pacific Seeds Yearbook 2008/2009 - Forage Sorghum
**Sweet Jumbo LPA**

*LPA = Lower Prussic Acid. Formally PAC 8386.*

**EVERYTHING YOU’VE COME TO EXPECT FROM SWEET JUMBO, WITH LOWER PRUSSIC ACID**

**ULTRA LATE FLOWERING SORGHUM X SUDAN HYBRID**

**Key features**

In terms of its plant type Sweet Jumbo LPA is similar to Sweet Jumbo. Sweet Jumbo LPA has been selected for a lower level of prussic acid. Laboratory results have shown the prussic acid potential of this new hybrid to be well below that of Sweet Jumbo.

Sweet Jumbo LPA has been bred and selected for:
- Very high leaf production
- High sugar levels for good palatability
- A lower level of prussic acid (HCN)
- High dry matter yield.

The combination of these features should result in very good utilisation under all grazing conditions.

**Full season forage hybrid**

Like Jumbo and Sweet Jumbo, Sweet Jumbo LPA has the ultra late flowering characteristic, which means plants produce more leaf throughout the season. This results in better feed quality and improved animal performance. In South-East Queensland trials, sown in mid October, Sweet Jumbo LPA took 155 days to flower. This late flowering nature makes management easier, but it is still preferable to use the forage when it is around 1m tall. Under favourable conditions, regrowth is rapid with potential for a number of grazings throughout the season.

**Good vigour in cool soils**

Pacific Seeds recommends sowing after the soil temperature reaches 16°C or higher. However, many growers base their time of sowing more on when spring rainfall occurs than on soil temperature. In a series of trials, Sweet Jumbo LPA has been shown to have very good establishment in cool soils.

**Grazing management**

Sweet Jumbo LPA is ultra late flowering but this does not mean grazing should be unnecessarily delayed. It is still recommended to use the crop when it is around 1m tall. Under favourable conditions this height should be reached approximately six weeks after sowing.

**Ideal for grazing, greenchop or hay**

Sweet Jumbo LPA is a versatile hybrid, ideally suited to either intensive or range grazing. It can also be used for greenchop or for making hay, round bale or pit silage.
GUIDE TO SWEET JUMBO LPA PRODUCTION POTENTIAL

<table>
<thead>
<tr>
<th>SWEET JUMBO LPA</th>
<th>CONTINUOUS GRAZING</th>
<th>GOOD DRYLAND PARTIAL IRRIGATION</th>
<th>HAY PRODUCTION POTENTIAL WITH SOME IRRIGATION</th>
<th>SILAGE POTENTIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of 400kg beasts/ha</td>
<td>Rotational grazing</td>
<td>DM production</td>
<td>Tonnes of silage/ha at 68% MC</td>
<td></td>
</tr>
<tr>
<td>Coast or irrigation</td>
<td>Good dryland</td>
<td>Tough dryland</td>
<td>Number of weeks grazing</td>
<td>Grazings per season</td>
</tr>
<tr>
<td>Sweet Jumbo LPA</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>8-14</td>
</tr>
</tbody>
</table>

SWEET JUMBO LPA PROVIDES QUALITY OPTIONS

The need for a forage sorghum with options for quality hay or grazing led to a plant of Sweet Jumbo LPA by Lyle and Annette Sirett last summer.

The Siretts, from “Lynettsi”, Cecil Plains planted 19 hectares of Sweet Jumbo LPA in October 2007 to produce winter feed for their Droughtmaster cattle and also to generate cash flow from the sale of hay.

Sweet Jumbo LPA was chosen by Mr Sirett after consultation with Queensland Farmers Warehouse.

The crop was planted at a rate of 8kg/ha, minimum till, into light Cecil Plains soil.

Human bio-waste fertiliser was applied to the crop at a rate of 123.5t/ha preplant.

Mr Sirett said he had been using bio-waste as fertiliser for two years.

“It does wonders for this light country,” Mr Sirett said.

“I have achieved similar yields as growers on black soil, providing there is sufficient rainfall.

“The difference in the areas on my property that do and don’t have it applied is like chalk and cheese.”

Rainfall of 100mm prohibited access to the Sweet Jumbo LPA, resulting in it only being cut once.

“I would have gotten two cuts if I could have accessed it,” Mr Sirett said.

Nevertheless, Mr Sirett was happy with the resulting hay yield of 453 bales with dimensions of 1.5m x 1.2m.

Approximately half the Sweet Jumbo LPA bales have been sold, with the other half stored on farm as standby winter feed.

“The palatability is pretty good and I will grow it again,” Mr Sirett said.
NEW SUPERDAN TYPE HYBRID

Key features
Superdan was a significantly improved sudan grass hybrid compared to what was previously available. Now Superdan 2 delivers:

- Sudan X Sudan as is Superdan. Therefore fine stems and is ideal for hay
- Similar seed size to Superdan. Therefore use the same planting rates
- Higher leaf to stem ratio than Superdan
- Sweeter than Superdan
- More flexibility and easier to manage
- Flowers seven days earlier than Superdan on a mid October plant
- Agronomically similar to Superdan.

Late flowering
Although Superdan 2 is late flowering it is not ultra late flowering like Jumbo and is therefore not quite as productive in late summer. Shortening day lengths will induce Superdan 2 to flower around the end of January in Southern Australia.

Because of this delayed flowering, Superdan 2 produces a greater bulk of higher quality feed than traditional sudan grasses. This results in high dry matter production and high carrying capacity.

Grazing & cutting management
The grazing and cutting systems for Superdan 2 are the same as for other forage sorghums.

The speed and total recovery after haymaking, particularly in damp conditions, is excellent. Under favourable growing conditions Superdan 2 should reach one metre in height approximately seven weeks from planting. Fig 1 and 2 show the decline in digestibility and protein levels with age.

Superdan 2 will provide the best productivity if grazed from approximately one metre. This will ensure maximum quality and rapid regrowth.

For hay or round bale silage makers, Superdan 2 provides more flexibility than traditional forages due to its later flowering. For the best bulk it can be cut at two metres high but for better regrowth and higher quality feed, earlier cutting is recommended.

Fine stems make better hay
Superdan 2 has a much finer stem than other forage sorghums. This makes it ideal for hay production as the fine stems result in a quicker dry down. This also results in a softer, better quality hay.

Rapid regrowth
Superdan 2’s rapid regrowth means that there will be less time between grazings and cuttings. This increases its ability to carry large numbers of stock on a small area.

Ideal for sheep
Sheep prefer the finer stems of Superdan 2 to that of other forage sorghums. Superdan 2 is also very tolerant of heavy grazing.

Results from a trial conducted by Pacific Seeds Forage Team showing the effect of growth stage on crude protein and metabolisable energy of Superdan 2. Sampling started when the crop was 0.6m and continued at regular intervals for seven weeks until plants had flowered.
SUPERDAN 2 BEST CHOICE FOR HAY

Milton and Cheryl Fowler consider Superdan 2 their first choice for round bale hay for their stud cattle. The Fowlers operate a Red Angus cattle stud of 40 breeders and heifers with calves on their property “Donna Lyn” near Pittsworth.

They are long-term growers of Superdan 2 and value the variety’s leaf to stem ratio, which promotes the production of excellent quality hay.

“Superdan 2 is more flexible and easier to manage and the fine stems make better hay,” Mr Fowler said.

The Fowlers planted 16 hectares of Superdan 2 in late September 2007 at a rate of 8kg/ha into good moisture.

The crop was sown with a 24 run Sunshine combine into brown self-mulching soil.

“We selected it for its combined hay production and rapid regrowth for following grazings,” Mr Fowler said.

The paddock, one year fallow from grain sorghum, was treated with urea at planting time and 1.2l/ha of Roundup was applied preplant for weed control.

The Superdan 2 crop produced 472 bales (137cm x 122cm) from 16 hectares.

“It’s our first choice for round bale hay and stud beef cattle grazing,” Mr Fowler said.

SUPERDAN 2 FITS BENALLA OPERATION

A crop of Superdan 2 has served dual purposes for Stuart Robinson on his beef and prime lamb property near Benalla, Victoria.

“I planted Superdan 2 to prepare my paddocks for lucerne,” Mr Robinson said.

“I like the flexibility it gives me to clean paddocks and help with subsoil issues.

“I think it’s ideal for silage and has provided me with heaps of feed to fatten sheep and lambs.”

The crop was planted on November 8 into an old pasture paddock on border check flood irrigation.

It was sprayed preplant with Roundup and urea at 120kg/ha was applied after each cut (two applications).

The Superdan 2 was sown with a combine into good soil moisture at a depth of 25 millimetres at 25kg/ha.

MAP at 150kg/ha went down with the seed.

The Superdan 2 was irrigated a week before planting and backed up with flood irrigation between each cut of hay, approximately 1.6 megalitres per hectare for the life of the crop.

Rainfall was approximately 150mm through December, January and February.

Mr Robinson achieved two cuts from the 18 hectare crop, consistently yielding around 70 metric tonnes from each cut.

The first cut was done 50 days after sowing with the second cut 39 days after the first.

“I’m really impressed with the speed of growth and yield of Superdan 2, especially in the initial stages of growth,” Mr Robinson said.

“I’ll continue growing Superdan 2 because it does well on not much water.”
IDEAL FOR HAY, ROUND BALE SILAGE OR INTENSIVE GRAZING

NEW SUPERDAN TYPE HYBRID

Key features

- Quick flowering in 66 days (Superdan 2 flowers in 90 days and Speedfeed in 67 days on a mid October plant).
- Very fine stems, with prolific tillering (finer stems than Superdan 2).
- Rapid growth and regrowth, the fastest of all our varieties.
- Good cold soil emergence.
- Very high dry matter production (see table below).

PAC F8411 is the only quick flowering sudan x sudan hybrid commercially available. All other quick flowering varieties are sudan x sorghum hybrids with thicker stems. Because of this quick flowering characteristic it is ideally suited to the shorter growing season of Southern Australia and New Zealand or in situations where it can be well managed i.e. hay making or intensive grazing.

<table>
<thead>
<tr>
<th>HYBRID</th>
<th>CUT 1</th>
<th>CUT 2</th>
<th>CUT 3</th>
<th>TOTAL DM YIELD (t/ha)</th>
<th>INITIAL GROWTH FLOWERING TIME (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprint</td>
<td>3.7</td>
<td>6.5</td>
<td>5.1</td>
<td>15.4</td>
<td>66</td>
</tr>
<tr>
<td>Speedfeed 2</td>
<td>2.8</td>
<td>5.3</td>
<td>4.8</td>
<td>12.9</td>
<td>67</td>
</tr>
<tr>
<td>Bettergraze</td>
<td>2.9</td>
<td>5.2</td>
<td>4.5</td>
<td>12.6</td>
<td>67</td>
</tr>
</tbody>
</table>

DUAL OPTIONS TO FILL FEED GAP

A glowing report card from a 2006 crop of Superdan 2 led to an increased plant in the New South Wales Riverina in 2007.

“Last year we grew Superdan 2 on five hectares of flood irrigation to see how it would go and purchased 1000 lambs to finish on the sorghum,” Rennie grower Ken Forge said.

“This season we really increased our planting area to grow as much hay as possible to sell and use the rest for grazing.”

Mr Forge planted 40 hectares of Superdan 2 and five hectares of Sprint (trialled as Pac 8411) on October 28, 2007 at a rate of 25kg/ha.

The paddock was long fallow from lucerne.

Fertiliser applied at planting comprised 100kg/ha MAP and 70kg/ha urea. The crop was then top dressed with urea at 200kg/ha after the first cut.

The crop was sown into moisture between 50 and 75mm deep and then watered up. It was flood irrigation watered every three to four weeks and was pivot watered weekly.

“It (the Superdan 2) is a great crop for growing lots of feed and doesn’t take much water to achieve good crops,” Mr Forge said.

The crops produced two cuts of hay and 2000 crossbred ewes and lambs grazed on the residual growth for approximately five weeks, during which time stock was sold off.

“The Sprint was ready to graze at one metre high a week earlier than the Superdan 2 and the sheep graze the fine stems on both varieties down really well,” Mr Forge said.

“Next year I’ll increase the amount of area sown to Sprint for earlier feed in my system but keep the bulk of the crop Superdan 2 so I can manage the grazing rotation better.”

Ken Forge in a crop of Sprint (formerly known as Pac8411). Mr Forge grew Sprint and Superdan 2 over Summer 2007/2008.
SWEET SORGHUM X SWEET SORGHUM HYBRID

Key features

- Very high Dry Matter production
- Very high sugar levels
- Wide range of disease resistances
- Wide chopping window for quality silage.

Not only is it the preferred hybrid for later sowings to provide autumn-winter feed but it is also ideal for early sowings as it can be utilised at any stage during the summer, autumn or winter.

Recommended uses of Sugargraze

- Makes very good silage in areas less favourable to high grain crop yields (eg corn and sorghum)
- Ideal for pit silage.

Grazing and cutting management

- Grazing of young crops can commence once the feed is 1.5m high
- For maximum regrowth retain at least 15cm of stubble when grazed or cut for silage
- If used for hay the crop should be cut well before flowering, a mower conditioner is essential due to thick stalks.

Since the advent of sorghum ergot (*Claviceps africana*) the heads of flowering forage sorghum crops may be infected with ergot if conditions are favourable. For more details on ergot contact your local Dept of Agriculture.

Productivity and feed quality

The big benefit Sugargraze has over other forages is its very high sugar content. Sugargraze has been tested at 35% sugar by NSW Department of Agriculture.

The high sugar content improves feed quality, increases palatability and results in very minimal feed wastage even when used for late season and winter feed. The sugar levels in the plant increase as the plant matures with the highest levels occurring after flowering, during the seed set stage. This is the stage at which Sugargraze should be chopped for silage.

As well as the large increases in sugar content, other significant differences in feed quality occur, as shown below.

The slow decline in the digestibility percentage (as would be expected) is reversed and actually improves as the sugar levels rise. As feed energy level is closely linked to digestibility, the feed value remains good, apart from the falling protein level. This explains why many graziers report that cattle ‘do well’ on mature Sugargraze which appears dry and of little value.

Mature Sugargraze provides adequate energy for good weight gains. If other young feed is not available, protein supplementation to stock in the form of urea and some ‘protected’ protein would greatly improve livestock performance.

Results from a trial conducted by Pacific Seeds Forage Research Team showing the effect of growth stage on crude protein and metabolisable energy of Sugargraze. Sampling started when the crop was 1.4m and continued at regular intervals for eight weeks until plants had flowered.
SUGARGRAZER HELPS SPREAD RISK

Forage sorghum has many different areas of use on the North Coast of New South Wales.

One variety suited to this area of Australia is Sugargraze – a sweet sorghum x sweet sorghum hybrid bred for grazing, winter standover and pit silage.

Features of Sugargraze include very high dry matter production, very high sugar levels, a wide range of disease resistances and a wide chopping window for quality silage.

Grafton farmer Daniel McGettigan from “Hanging Rock Station”, west of Grafton, planted approximately 40.5 hectares of Sugargraze last season for round bale production and grazing.

Norco Grafton’s Steve Leeson said Mr McGettigan enjoyed multiple benefits from the Sugargraze crop.

These benefits include achieving extra weight gains and finishing cattle before winter set in.

Additionally, Mr McGettigan sees having round bale silage on hand as valuable in reducing the risk from variable seasonal conditions experienced in the region in spring.

Mr McGettigan also sells a percentage of round bale silage produced from his Sugargraze crop, providing a handy extra cash flow source.

“Mr McGettigan’s crop of Sugargraze produced over 1500 round bales off 100 acres,” Mr Leeson said.

“All indications are that he will be going ahead with it again next year.”
Sorghum x Sorghum

Maturity
Days to flower: 64-72 Qld; 70-78 NSW
Chopper reaches soft dough stage which is the recommended cutting stage, about 25 days after flowering or between 85-95 days from planting.

Plant type
A tall late maturing grain sorghum, Chopper grows to a height of 2 metres. It is a very vigorous plant with an attractive, broad shiny leaf. It produces a large, solid white grain sorghum head. Grain fill is excellent and grain size is medium to large. Chopper planting seed is large and vigorous, which makes it easy to plant and ensures good even establishment.

Yield potential
Under irrigated conditions Chopper has a grain yield potential of 7-9t/ha. Silage yields of 30 - 50t/ha @ 68% moisture content have been recorded.
Under dryland conditions grain yields vary from 2.5 - 5.5t/ha and silage yields from 20-35t/ha @ 68% moisture content.
While Chopper can produce a good grain yield it is not recommended as a grain hybrid, because the height of the plant would jeopardise the standability at full maturity.

Feed quality
Under good growing conditions the quality of silage obtained from Chopper will be similar to that achieved with corn.
- Digestibility: 60 - 65%
- Protein: 7 - 9.8%
- Metabolisable energy: 9 - 10.5 MJ/Kg

Planting recommendations
Chopper is recommended for use as pit or bunker silage, in irrigated or dryland situations. While potential yield of the initial crop is not as high as corn, Chopper’s ability to ratoon can give greater overall yields than corn in some situations. Chopper is considered a much more reliable option than corn in hot and/or dry conditions.

Planting rate
- Marginal dryland: 2.5 - 4 kg/ha
- Favourable dryland: 4 - 6 kg/ha
- Irrigated-high rainfall: 6 - 8 kg/ha

Cutting recommendations
It is important to cut Chopper when it reaches the milky to soft dough stage. Delaying cutting after this can affect the quality of the feed and may result in lodging of the crop. Soft dough stage should be reached 85-95 days from planting. At this time the crop will be around 68% moisture and can be ensiled without wilting.

Regrowth
In comparison to other silage sorghums Chopper has demonstrated excellent regrowth potential. Under good growing conditions a second cut is possible.
Second cut yields as high as 30t/ha @ 68% moisture have been recorded with grain yields of over 4t/ha.
Total yield over two cuts can exceed 60t/ha. Chopper may be grazed after cutting in these situations however, growers should be aware of prussic acid. Precautions taken in grazing other grain sorghum or forage sorghum regrowth should be followed especially if the crop is stressed, or has new regrowth.
The provision of salt licks with 10% sulphur will assist grazing animals to detoxify the prussic acid.
CHOPPER KEEPS PERFORMING AT ALLORA

After more than seven years, Chopper is still the silage sorghum of choice for the Christensen family’s Allora dairy.

Chopper is the primary feed source for the second generation dairy farmer’s herd of 140 Friesians.

It also provides stand-over feed in times of drought.

Scott Christensen continues to grow Chopper because of its feed quality, resilience in tough conditions and yield reliability.

“If it does get a bit dry the Chopper will hang in there,” Mr Christensen said.

“You know you are always going to get feed from a Chopper crop.”

The Christensen’s latest crop of Chopper produced 3000 tonnes of silage from 53 hectares – enough feed to last for an estimated 18 to 20 months.

The crop was planted in late November 2007 at a rate of 8kg/ha into a paddock fallow from Chopper the year prior.

Urea was added at planting time, with residual Nitrogen already present in the paddock from the previous year’s crop.

The Christensen’s silage operation comprises five pits and two buns, with the two biggest silage pits holding 1000 tonnes each.

The total silage produced on the property last summer was 3500 tonnes, 3000 tonnes of which came from the Chopper crop.

The protein level of the silage was 8.3% when tested in June 2008.

“Chopper has a bigger harvest window than corn and this is also one of the reasons I keep growing it,” Mr Christensen said.

“If you can’t get in to harvest it, it will wait and it still maintains its quality.

“It’s good quality feed.”
**SWEET SORGHUM X SUDAN HYBRID**

**Key features**

- The most versatile forage from Pacific Seeds. Nectar combines the easy grazing management of sweet sorghum with the high productivity and fast vegetative growth of sudan grass.
- It is ideally suited for grazing throughout summer and into late autumn, due to its high stem sugar content.
- Stems are smaller in diameter than Sugargraze, and will usually tiller more, particularly after grazing. Following grazing, regrowth is faster than Sugargraze.
- As with Sugargraze, (as plants mature), sugar content rises, resulting in improved feed palatability and energy levels.

**Grazing management**

Nectar can be used in the same manner as Sugargraze. However the faster regrowth of Nectar will give higher productivity. Similar growing management practices to Sweet Jumbo and Superdan should be used in high yielding situations.

Nectar is best used as follows:

- Planted during late summer to provide an autumn winter standover feed. (Since the advent of sorghum ergot (Claviceps Africana) late planted crops of forage sorghum may be infected with ergot if conditions are favourable. For more details on ergot contact your local Dept of Agriculture.)
- Can be planted in early summer and used as a summer grazing feed and also as autumn – winter feed. Grazing of young crops can commence once the feed is 1m high.
- As pit or round bale silage in areas less favourable to high corn yields.
- In combination with oats to provide much needed roughage.
- If regrowth is required after grazing or cutting for silage, retain at least 15cm (6in) of standing plant.

**Nectar and oats**

The use of Nectar in combination with oats has gained acceptance in the grazing industry for both cattle and sheep, as it provides much needed roughage in the initial stages of grazing when the oats are most lush. Nectar provides roughage if dry paddock grass is not available. It also reduces the need for hay supplement with the first grazing. The recommended sowing rate is to plant 0.25kg/ha of Nectar with the oats. Sowing rates higher than this result in too much competition for the oats. This technique is only suited to February – March sowings, depending on location.

**Productivity and feed quality**

Under intensive grazing, Nectar will out yield sweet sorghums, mainly due to its faster regrowth following grazing. Nectar has similar maturity to Sugargraze, making it easy to manage. Even if the crop has gone to head, the high sugar content results in good palatability and minimal feed wastage.

Nectar has shown the ability to outyield Sugargraze by 25% and is only 4% lower than Jumbo for total season yield (average results from 3 years of trials).

**Regrowth**

Nectar regrowth is faster than Sugargraze – but slightly slower than Superdan.
<table>
<thead>
<tr>
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<td>Sudan x sweet sorghum</td>
<td>late</td>
<td>Above 16°C</td>
<td>65-75,000</td>
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<td>5-8</td>
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<td>56-64</td>
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</tr>
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</table>

**Nectar Height v’s Protein**

**Nectar Height v’s Metabolisable Energy**

Results from a trial conducted by Pacific Seeds’ Forage Research Team showing the effect of growth stage on crude protein and metabolisable energy of Nectar. Sampling started when the crop was 1.0m and continued at regular intervals for eight weeks until plants had flowered.

**NECTAR A ‘WIN-WIN’ SITUATION**

For husband and wife Central Queensland hay producers Scott and Petria Grange, growing Nectar makes good business sense, and is also practiced by Scott’s father Len of Wowan.

“Nectar is an economical, productive crop for us and our clients ask for it so it’s a win-win situation for everyone,” Scott Grange said.

The Granges, from “Callara”, Biloela regularly grow Nectar and recognise the popularity of the variety among graziers.

Scott said Nectar’s characteristic thin stalks and abundant leaf produced good quality feed.

“With Nectar there is less stalk and more leaf and that’s what our customers want,” Mr Grange said.

“All the good stuff is in the leaf.”

The Granges planted two crops of Nectar over summer 2007/2008 in both irrigated and dryland paddocks.

Sowing began in September and comprised of an irrigated crop of 20 hectares at a planting rate of 37kg/ha and a dryland crop of 48.5 hectares with a planting rate of 25kg/ha.

Both zero till crops were planted in dry conditions using a Napier combine / press wheel.

Urea was applied prior to planting at a rate of 247kg/ha and Roundup (3l/ha) and 2,4-D (300ml/ha) were applied for weed control.

Scott said the crop displayed very good seedling vigour and produced good quality forage.

“We could stand in the crop and watch it grow,” he said.

At harvest, the dryland crop yielded 15 round bales per hectare, weighing 220kg each.

The irrigated crop was cut four times between late September and late March and yielded 27 round bales per hectare, also weighing 220kg each.
**Key features**

Nutrifeed is a high quality forage that can provide livestock productivity in summer similar to that of oats in winter. It has digestibility and protein levels similar to oats, ryegrass and Lab lab and unlike forage sorghum, contains no prussic acid. Nutrifeed has a valuable role to play in Australia’s grazing industry, especially in the more reliable rainfall areas of eastern Australia.

**Grazing management**

Nutrifeed poses no risk of prussic acid poisoning, therefore it can be grazed at a much earlier stage than forage sorghum. For best results graze early - as soon as the plants are not easily pulled out of the ground. There may not appear to be a lot of feed at this stage, but due to quick regrowth and high tillering capacity, feed supply is good. Early grazing will maximise protein and energy content, boosting animal productivity.

**High stocking rates**

Nutrifeed’s quick regrowth and lack of prussic acid means it can be grazed heavily for long periods.

**Soil and paddock selection**

Although Nutrifeed can produce exceptional livestock productivity, it does require suitable soil and management conditions to achieve this. Being a forage pennisetum, a good well drained soil is required. The rule of thumb “If it’s not good farming country, it’s not good for Nutrifeed” is an excellent one to start with. Because Nutrifeed has small seed (60,000 to 80,000 seeds/kg) it is important to plant into a well prepared seed bed where good soil to seed contact can be achieved.

**Top quality feed**

Figures 1 & 2 show the protein and digestibility of Nutrifeed as plants grow taller. From these graphs it is easy to compare the feed quality as the forage matures. Looking just at the graph lines the benefits of early grazing are clearly evident, i.e. using the crop before seven weeks of age or before 80cm in height. As similar patterns would apply to subsequent growth, frequent grazings of regrowth will also result in feed of the highest quality throughout the season.

When grazing is delayed beyond the ideal stage, Nutrifeed still provides better feed quality than forage sorghum.

This extended period of feed quality is a factor of the species but is also due to the late flowering nature of Nutrifeed. Nutrifeed amply provides the feed quality required for fattening or lactating animals at the ideal grazing stage (when crop is approximately 0.5m high) however it also maintains good feed quality even if grazing is temporarily delayed.

**High protein**

Based on data in Fig 1 & 2, the protein is adequate for cattle growth and fattening over an extended period and the feed only becomes marginal for milk production when the protein level falls below 15%.

**High energy**

Similarly the energy requirements for both lactating and fattening livestock can be met even if the crop is not grazed until eight weeks after planting. If grazing is delayed longer than this, the feed may be marginal for top productivity but still more than covers the needs of other classes of livestock. Maximum plant and animal productivity are obtained if grazing commences early and the feed is kept short and actively growing.

In summary, as many graziers have already discovered, Nutrifeed provides excellent milk production and cattle liveweight gains often in excess of 1kg/head/day.

**Moisture stress induced unpalatability**

Forage pennisetum is generally regarded as being very drought tolerant once the crop is established.

Even under severe moisture stress, Nutrifeed may not show many outward signs of stress apart from a slowing in growth rate. Plants may remain relatively green and fresh looking even when soil moisture is depleted and the crop is, in fact, under severe stress. By comparison, a forage sorghum crop under similar stress may show many outward signs such as leaf curling, leaf death and a blue-green plant colour.
Despite the lack of visible stress symptoms in forage pennisetums, they do suffer from severe moisture stress. Subsequently some unseen changes may occur which can affect the palatability of the forage.

**Soil factors**

If Nitrate N levels are higher than Phosphorus (as determined by a Bicarb P test) unpalatability is more likely. Conversely, if P levels are higher than N levels then unpalatability is less likely.

**What restores palatability?**

In the event of a crop becoming unpalatable, the only proven cure is a significant fall of rain (i.e. a drought breaking rain) or irrigation. The crop should become palatable within ten days after such rain provided it falls in the growing season and plants are able to resume growing.

Unfortunately no other attempted method of reversing the situation has provided consistent results.

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**HIGH PROTEIN, HIGH ENERGY SUMMER FEED**

Nutrifeed has long been on the menu for Peter and Pene Hood’s ewes at “Plainview”, near Pittsworth.

The Hoods run a mixed farm comprising a Texel sheep stud as well as grain sorghum, forage, wheat and barley crops.

Their sheep stock comprises 60 stud ewes and 300 commercial ewes.

The Hoods have been growing Nutrifeed – a high protein and high energy summer forage with the feed quality of oats – for the past ten years.

“We continue to grow Nutrifeed because it is a top quality feed,” Mr Hood said.

The Hoods achieved three grazings from their summer 2007/2008 Nutrifeed crop with high stocking rates of between 25 and 37 sheep per hectare.

Nutrifeed’s quick regrowth and lack of prussic acid means it can be grazed heavily for long periods.

The Hood’s Nutrifeed crop (six hectares) was planted in late October with a Gyril air seeder in 35.5 cm (14 inch) rows.

The crop was sown into heavy self mulching creek soil that had been one year fallow from Nutrifeed.

Nitrogen (60 units) and 1.2l/ha of Roundup were applied preplant.

“Nutrifeed is better suited to sheep than any other forage because of its higher protein and energy levels,” Mr Hood said.

“There is little waste for the sheep.”
Pacific BMR

BROWN MID RIB SORGHUM X SUDAN HYBRID

Pacific BMR is an exciting new release from Pacific Seeds.

Pacific BMR has the BMR gene giving improved digestibility and palatability (the benefits of BMR gene are explained below.)

Pacific BMR has the following benefits:

**Good standability**
Very sweet stems, particularly in older growth.

**What is BMR?**
The abbreviation BMR stands for brown mid rib, and refers to the colour of the middle rib in the leaves. In non BMR sorghum the middle ribs are usually green or white.

**What are the benefits of BMR?**
Forage sorghum developed and bred to contain the BMR gene, has less lignin and will be more digestible to stock. Having less lignin also means the plants are softer and easier for stock to graze. The net outcome of all this is animal productivity can be increased from this type of forage.

**Is there more than one type of BMR?**
Yes, there are a number of BMR genes originally developed at a prominent North American University. The nutritional benefits do vary with these different genes. Pacific Seeds has chosen BMR genes to provide the best combination of increased digestibility and agronomic performance.

**Will stems show some brown too?**
They can, particularly on the lower sections of stem above each node. In Pacific BMR there is usually a strong brown colour on stems.

**Do BMR plants have softer stems?**
Yes, the BMR advantage will be in both leaves and stems. Conventional forage sorghum stems can become increasingly hard with advancing height and maturity, but BMR stems will be softer and easier for stock to eat.

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What about standability?
Lodging can be a problem with some BMR varieties, if they are allowed to grow well beyond their ideal grazing height. In the Pacific Seeds Forage Breeding Program, good standability is an important breeding objective. Parent lines and hybrids are evaluated for standability under a range of environmental conditions.

**Pacific Seeds’ BMR hybrids**
Pacific Seeds evaluated an early flowering BMR hybrid in the mid 1990s, but its early maturity limited its performance. A lot of effort has gone into developing a later maturity hybrid, combining the BMR gene with other important forage characteristics. The first release from this work is a hybrid called Pacific BMR.

Laboratory analyses to date are very encouraging with Pacific BMR showing a digestibility advantage over other hybrids of 3-6%. This improved digestibility translates to an extra 0.3-0.7 MJ/kg in metabolisable energy (ME) value.

**Maturity**
Pacific BMR is later flowering than traditional forage sorghum. In south east Queensland, Pacific BMR sown in October will normally reach mid-flower in 83 days (early to mid January).

**Sweet stems**
Pacific BMR is significantly sweeter than other sorghum x sudan hybrids including Jumbo. This difference becomes more noticeable in the older growth. This results in increased palatability plus increased feed energy value.

**Suitable for grazing, hay, greenchop or silage**
Pacific BMR is suitable for intensive or range grazing, greenchop, hay or silage. For pit silage allow the crop to flower before cutting.
Results from a trial conducted by Pacific Seeds’ Forage Research Team showing the effect of growth stage on crude protein and metabolisable energy of Pacific BMR. Sampling started when the crop was 0.6m and continued at regular intervals for eight weeks until plants had flowered.

### PLANT TYPE AND PLANTING INFORMATION

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<thead>
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<tr>
<td>Pacific BMR</td>
<td>Sorghum x sudan</td>
<td>late</td>
<td>Above 16°C</td>
<td>32-36,000</td>
<td>3-5</td>
<td>5-10</td>
<td>15-20</td>
<td>59-65</td>
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</tr>
</tbody>
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### 48.5HA OF BMR GIVES 180 STEERS 6 WEEKS OF FEED

Steve and Janet Saal’s herd of 180 steers were “Lost in Forage” when introduced to a paddock of Pacific Seeds’ Pacific BMR in summer 2008.

Steve and Janet planted 48.5 ha of Pacific BMR forage sorghum on their Clermont property “Golden Downs” on December 15, 2007.

“When I put the steers in, the forage was so high I had to stand up on the motorbike seat to see them,” Steve said.

Pacific BMR is a summer forage variety bred to contain the brown mid rib (BMR) gene, giving improved digestibility and palatability.

Steve and Janet chose the variety based on feedback from other growers.

“The results the others had have been good so we thought we would try it,” he said.

The decision has proven to be wise, with the crop continuing to be a reliable food source.

Favourable seasonal conditions meant that the crop produced a good volume of quality feed for the stock.

“They (the steers) have been in there for six weeks and have only eaten the heads off,” Steve said.

“If we manage to look after it, the crop could well get us through winter.”

Steve Saal in a crop of MR-Maxi grain sorghum.
Not all BMR forage sorghums are the same. Pacific BMR has been bred for better palatability, digestibility and metabolisable energy while still maintaining agronomic performance. At Pacific Seeds, the brown mid rib is a visual expression of these traits, not a breeding goal in itself.

Chopped 

Preferential grazing of Pacific BMR, similar to that shown above, has been observed throughout all forage growing areas of Australia against all forage sorghum varieties yet compared.

Row 1 & 4 have had the chopper wheels pass over them at cutting. Rows 2 & 3 have had no traffic.

LET THE COWS TELL THE STORY ON PALATABILITY
PACIFIC BMR BOOSTS MILK PRODUCTION

Pacific BMR maximises crop yields and increases milk production for the Smith family at their dairy near Nobby in Queensland.

It also keeps their “girls” pretty happy too.

Peter and Debbie Smith have been growing Pacific BMR as feed for their “girls” - milking cows, dry cows and heifers – at “Hurston Downs” for the past nine years.

Peter Smith said he grew Pacific BMR because of the variety’s suitability for intensive grazing and because of its lower indigestible lignin levels (due to the BMR gene) and high digestibility.

The Smiths are prepared to adopt high inputs and a high planting rate with their Pacific BMR crops because of the positive results they have seen in yield and milk production.

“It’s better for milk than most other forages,” Mr Smith said.

“The cows seem to be able to break it down easier.”

The Smiths planted 16 hectares of Pacific BMR in late September 2007 at a planting rate of approximately 32.12kg/ha.

The irrigated paddock, one year fallow from forage sorghum, was watered up prior to planting.

At plant fertiliser comprised 148.2kg/ha Starter Z with 98.8kg/ha urea applied following each grazing.

Mr Smith bales the crop for hay and lets the herd graze on the regrowth. Or, he grazes it first and then bales for hay. The order is reversed depending on the season.

“We usually get three to four grazings out of the Pacific BMR, depending on the amount of feed available to us at the time,” Mr Smith said.

“When we bale it we usually yield around 44, 1.2 metre square bales from a hectare.”

The summer 2007 /2008 crop of Pacific BMR was strip grazed by the milkers, with bales kept for winter feed.

“It’s good hay,” Mr Smith said.

“These girls are pigs – they’ll eat the lot of it.”

FORAGE MAKES MOST OF WATER

The need for economical feed pre-empted the planting of Pacific BMR near Ovens (Victoria) last summer.

“We needed to grow as much high quality feed as possible on this leased country using our irrigation water for all our cows in another tough year and that’s why we chose Pacific BMR,” farm owner Scott McKillop said.

The 13 hectare forage sorghum crop produced three cuts of feed for the cows and young stock on the dairy, share farmed by the McKillop and McDonald families.

The crop was sown on November 24, 2007 at a rate of 40kg/ha with 125kg/ha Granulock® 15 into good soil moisture.

The Pacific BMR was grown in old tobacco country that had been fallow four years excepting annual weeds.

Prior to planting, the paddock was sprayed with Roundup and disk rotary hoed and harrowed to create a fine seed bed.

Gesaprim 600 was sprayed and incorporated at a rate of 1.5L/ha as a pre-emergent herbicide for Prince of Wales feather and summer grasses.

Urea was applied in mid-December and also in mid-January at 100kg/ha each time.

Good rainfall of approximately 250mm between December and March meant fixed sprinklers were only used on the crop three times.

The first cut of the crop was baled on January 12, seven weeks after planting. It yielded 12.5 bales/ha of round bale silage, with an average weight of 575kg at an estimated 45% dry matter.

The second cut was baled on February 24, six weeks after the first cut, and yielded 18.3 bales/ha with an average weight of 600kg at an estimated 40% dry matter.

The third cut, baled on April 18, was light due to cold weather experienced in late March.

This cut produced 67 round silage bales with an average weight of 550kg and between 45-50% dry matter.

Future plans for the paddock involved it being sprayed and sown to forage triticale for whole crop cereal silage or hay production, depending on the season’s finish.
# Suitability of Use

| FORAGE SORGHUM          | Sheep | Autumn Winter Stand- | Milk Production | Suitability to Finish Cattle | Round-bale Silage | Pit Silage | Hay | Carrying Capacity | Ease of management | Quick Spring Feed | Plant Type & Planting Information | Feed Quality and Management | Planting Rates (kg/ha) | Suitability to Finish Cattle | Round-bale Silage | Pit Silage | Hay | Carrying Capacity | Ease of management | Quick Spring Feed | Genetic Type | Time to Flower | Soil Temperature for Sowing | Seed count (seeds/kg) | Ideal Grazing Height (m) | Protein % | Digestibility % | Marginal Dryland | Good Dryland | Irrigation or High Rainfall |
|-------------------------|-------|----------------------|-----------------|-------------------------------|-------------------|------------|-----|-------------------|---------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------|-----------------|-----|-------------------|---------------------|---------------------|-----------------|-----------------|--------------------------|-------------------------|-----------------------|----------|---------------|-----------------|--------------|------------------|
| SWEET JUMBO LPA         | 2     | 13                   | 15              | 5                             | 4                 | 5          | 5   | 4                 | 5                   | 5                   | Sorghum x Sudan             | Ultra late               | Above 16°C            | 32,000 - 39,000 | 1 m            | 12 - 18          | 56 - 62          | 3 - 5             | 5 - 10           | 15 - 20        |
| SUGARGRAZE              | 2     | 15                   | 2               | 5                             | 4                 | 4          | 5   | 4                 | 5                   | 5                   | BMR Sorghum x Sweet sorghum| Late                      | Above 16°C            | 32,000 - 39,000 | 1.5 m          | 12 - 18          | 56 - 64          | 3 - 5             | 5 - 10           | 15 - 20        |
| PACIFIC BMR             | NS    | 1                    | 1.5             | 5                             | 4                 | 3          | 4   | 4                 | 5                   | 5                   | BMR Sorghum x Sudan       | Late                      | Above 16°C            | 32,000 - 36,000 | 1 m            | 12 - 18          | 59 - 65          | 3 - 5             | 5 - 10           | 15 - 20        |
| SUPERDAN 2              | 5     | NS                   | 4               | 5                             | 3                 | 4          | 4   | 4                 | 4                   | 4                   | Sudan x Sudan            | Late                      | Above 16°C            | 65,000 - 75,000 | 1 m            | 12 - 18          | 56 - 62          | 2 - 4             | 5 - 8            | 10 - 20        |
| SPRINT                  | 4     | NS                   | 4               | 5                             | 3                 | 4          | 5   | 5                 | 5                   | 5                   | Sudan x Sudan            | Quick                     | Above 16°C            | 60,000 - 70,000 | 1 m            | 12 - 18          | 56 - 62          | 2 - 4             | 5 - 8            | 10 - 20        |
| SPEEDFEED               | 5     | NS                   | 5               | 5                             | 1                 | 4          | 5   | 5                 | 5                   | 5                   | Sorghum x Sudan           | Quick                     | Above 16°C            | 30,000 - 35,000 | 1 m            | 8 - 16           | 55 - 60          | 3 - 5             | 5 - 10           | 15 - 20        |
| NECTAR                  | 3     | 4                    | 3               | 4                             | 3                 | 4          | 4   | 4                 | 4                   | 4                   | Sudan x Sudan            | Late                      | Above 16°C            | 65,000 - 75,000 | 1 m            | 12 - 18          | 56 - 64          | 2 - 4             | 5 - 8            | 10 - 20        |
| NUTRIFEED               | 4     | 1                    | 1               | 4                             | 3                 | 4          | 3   | 4                 | 3                   | 4                   | Pennisetum hybrid        | Ultra late               | Above 16°C            | 60,000 - 80,000 | 30 cm - 50 cm | 16 - 22          | 60 - 68          | 2 - 5             | 4 - 8            | 8 - 15          |
| CHOPPER                 |       | Pit silage only       | 5               |                               |                   |             |     |                   |                      |                     | Sorghum x Sorghum         | Med.-quick               | Above 16°C            | 28,000 - 35,000 | NS             | 9 - 11           | 60 - 68          | 2.5 - 4           | 4 - 6            | 6 - 8           |