



Department of Agriculture

# Dairynotes

Reviewed 2006



## Summer forage crops on dairy farms

Summer forage crops can produce a large bulk of green feed over summer and early autumn, particularly if irrigated, but this feed is often low in energy and protein. Some varieties can be toxic at certain growth stages. They are generally grown to be grazed but some can be conserved as hay or silage. Maize is almost always conserved as silage to ensure that the cobs and stems are chopped and thoroughly mixed. Grain sorghum may be an alternative to maize for silage where conditions are less than ideal for maize.

### Types of summer forage crop

The types of summer forage crops, their main characteristics and some varieties of each are shown below.

Crop type	Varieties	Toxicity	Crude protein %	Energy MJ/kg DM	Likely yield DM - t/ha Irrigated	Comments
Sudan grasses	Bettadan, Superdan	Generally low	10 - 15	7 - 9	10 - 15	Fine stems
Forage sorghums	Jumbo, Super Sudax, Speedfeed	Potentially high	10 - 15	7 - 9	10 - 15	
Sweet sorghums	Mega Sweet, Supersweet	Potentially high	10 - 15	6 - 7	10 - 15	
Sweet sorghum/Sudan grass	Nectar, Sweet Lush, Betta Graze	Potentially high	10 - 15	7 - 9	10 - 15	
Grain sorghum	Chopper, Graze-n-sile	Potentially high	8	8 - 10	9 - 15	Silage
Japanese millet	Japanese, Shirohie	Nil	10 - 15	9 - 11	8 - 10	Some salt tolerance
Pearl millet	Nutrifeed, Supermill 11	Nil	10 - 20	9 - 12	10 - 15	Doesn't tolerate waterlogging
Maize	DK689,	Nil	5 - 8	9 - 11	15 - 25	Silage

	Hicorn75, Pioneer 3335					
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## Forage crop toxicity

Forage Sorghums, Sweet Sorghums and Sudan Grasses contain compounds which are converted to prussic acid when eaten by stock. For these compounds, levels are highest in

- Plants under six weeks old
- Plants stressed from lack of moisture or from frost
- Young regrowth

Conserving suspect crops as hay generally does not reduce the risk from toxicity.

To reduce risk when grazing these crops, do not graze them until they are at least 50 cm tall, do not put hungry stock onto suspect crops and provide licks containing salt and at least 10% sulphur.

## Management

### *Irrigated crops*

These crops generally establish better in cultivated soil than where they are direct drilled. Seeding into moist soil will promote quick germination but seeding dry then irrigating can also be successful. None of these crops like being waterlogged for any length of time. If salinity is a problem, Japanese millet is the preferred crop.

Irrigated grazing crops should be seeded with a nitrogen/phosphorus fertiliser and should receive 40 - 50 kg/ha of nitrogen after each grazing.

Irrigated crops are expensive to establish and grow. Seed (25 kg/ha @ \$4.50/kg), fertiliser (300 kg/ha nitrogen/phosphorus fertiliser @ \$350/t plus 200 kg/ha urea @ \$400/t) and water (\$150/ha) costs add up to about \$450/ha, plus labour costs for fertilising and watering, assuming the crop is grazed. Conserving the crop as hay/silage or cutting and feeding it adds to the cost. Flood irrigated crops will need between 5 and 8 TCM/ha irrigation water, depending on when they are planted, soil type and the weather over summer (TCM = thousand cubic metres).

The Sudan Grasses, Forage Sorghums and their crosses should be grazed when they are between 0.8 and 1.0 m tall. Grazing earlier than this could see problems with toxicity; crop quality declines rapidly once plants get much above this height.

The Sweet Sorghums can be allowed to grow for longer to provide a bulk of feed for autumn grazing.

The millets should be grazed when they get to about 0.3 m tall. If they are allowed to grow much taller than this, quality drops off rapidly.

All crops should be strip grazed to reduce wastage.

Grain sorghums cut for silage will regrow but this growth will be toxic until plants reach a height of about 1 metre. It is probably more useful to spray the crop out and plant pasture. Planting pasture early gives it a chance to establish before winter slows growth.

### Summary of planting and cutting information under irrigation

Crop	Seeding rate kg/ha	Time of planting and min soil temp	Optimum grazing stage	Number of grazings or silage cuts	Weeks to first grazing	Weeks between grazings
Sudan grasses	25	Nov to Jan 16°C - 18°C	0.8 - 1.0 m	2 - 4	5 - 6	4 - 5
Forage sorghums	15 - 25	Nov to Jan 16°C - 18°C	0.8 - 1.0 m	2 - 4	5 - 6	4 - 5
Sweet sorghums	15 - 20	Nov to Jan 16°C - 18°C	1.5 - 3.0 m	1 - 2	5 - 6	4 - 5
Sweet sorghum/Sudan grass	15 - 20	Nov to Jan 16°C - 18°C	0.8 - 1.0 m	2 - 4	5 - 6	4 - 5
Grain sorghum	8	Nov to Jan 16°C - 18°C	Early dough	1	12- 14	No regrowth
Japanese millet	10	Oct to Jan 14°C - 18°C	0.3 m	2 - 4	5 - 6	4 - 5
Pearl millet	10	Nov to Jan 18°C	0.3 m	2 - 4	5 - 6	4 - 5
Maize	25 - 30	Nov to Dec 14°C - 16°C	Grain in early dough (Milcline 2.5)	1	14 - 16	No regrowth

## Maize

For maize, cost of inputs will be around \$2,000/ha to grow and harvest the crop as silage, with labour and feeding out costs to be added.

If you decide to plant maize for silage, don't cut corners. Good weed and African Black Beetle control are essential, as is ridging on flood-irrigated land. Maize is a high-input crop and you need to be prepared to spend the time and money necessary to allow it to realise its potential.

### Suggested budget for a maize crop/ha

	Labour	Tractor	Inputs	Total/ha
<b>Preparation</b>	\$215	\$204	\$183	\$602
<b>Fertiliser</b>	\$8	\$4	\$447	\$459
<b>Planting</b>	\$15		\$340	\$355
<b>Water</b>	\$71		\$177	\$248
<b>Harvesting</b>			\$759	\$759
<b>Total</b>	\$309	\$208	\$1906	\$2423

#### Assumptions:

Labour @ \$15/hour

Tractor @ \$15 - \$18/hour

Includes hire of tractor, precision planter and ridger and harvesting by contractor

#### Applying:

180 kg/ha nitrogen (N)

80 kg/ha phosphorus (P)

170 kg/ha potassium (K)

30 kg/ha sulphur (S)

6 ML/ha water

A Farmnote on growing maize for silage is in preparation.

## Dryland

Light cultivation will help conserve soil moisture and assist establishment.

Dryland crops are generally seeded at about half the seeding rate of irrigated crops. They need to receive their fertiliser at seeding and a nitrogen/phosphorus fertiliser should be used. DAP or Agras at about 300 kg/ha have given good results.

They are relatively inexpensive to establish. Seed (10 kg/ha @ \$4.50 /kg) and fertiliser (300 kg/ha @ \$350/t) costs will be about \$150/ha, with cultivation and seeding costs on top.

### Some trial results

A comprehensive evaluation of forage crops under almost ideal conditions at Harvey back in the 1980s produced high yields of generally low quality forage. Some varieties have changed since then but others are still being used. The table below shows typical yields and quality for the different crop types in this trial.

Crop type	Dry matter t/ha	Crude protein %	Energy MJ/kg DM
Sudan grasses	15	10	7.0
Sorghum/sudan grasses	16	6	7.0
Sweet sorghums	37	5	6.0
Japanese millet	11	10	7.5
Pearl millet	11	9	7.5
Maize	40	5	7.5

The sweet sorghums were allowed to grow right through summer to be cut for silage while the others provided two or three grazings. In this trial, maize yielded about 40 t/ha dry matter but a recent more commercial crop at Wokalup yielded about 22 t/ha and this was considered a very good crop.

### Farmer experience

A crop of Nutrifeed (Pearl Millet) grown under sprinkler irrigation at Boyanup produced just over 14 t/ha dry matter over summer, of which about 11 t/ha was utilised. The paddock was cut for hay, cultivated and the crop planted just before Christmas. It was grazed three times between January and March. Energy remained at about 11 MJ/kg DM and crude protein at about 20% right through summer.

A dryland crop of Jumbo planted at Boyanup in late November and sampled in late January yielded about 10 t/ha dry matter at 10 MJ/kg DM and 10% crude protein in the good bits. The crop was very variable, with crop height ranging from 0.8 m up to 1.6 m. Dryland crops often produce only one good grazing, with the amount of regrowth depending on summer rain. In very dry summers, they can fail completely.

### Where do they fit in?

Summer forage crops can produce useful feed over summer but you need to be sure that the cost is justified.

On irrigation farms, a forage crop is generally the first crop planted after land forming. Forage crops are easier to establish than pasture in summer, they generally handle hot weather better than pasture and they allow options for weed control before pasture is planted in autumn.

Staggered planting goes some way to preventing all the forage crop being ready for grazing at the same time but this can still be a problem. Don't put the milkers into an over mature crop just to clean it up - use dry stock for this and keep the milkers on your highest quality feed.

If a dryland summer forage crop is being planted as part of a renovation program for deteriorated pasture, make sure you know why your pasture has deteriorated before you spend money on the crop.

Planting the crop after harvesting pasture for silage or hay means that you won't be sacrificing spring pasture growth but you will need to reseed the pasture in autumn.

Be very careful with crops which have the potential to be toxic, especially if they become stressed through of lack of moisture after the first grazing. Summer/autumn rain will stimulate fresh growth which can be very toxic. Millets are the safest option.

**More information:**

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