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Growing Grain Sorghum in the Northern Territory

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INTRODUCTION

Dryland grain sorghum has been the only crop grown consistently in the NT over the past two decades. It is used in the local stockfeed market and has been grown successfully between Daly Waters and Darwin, with the main growing areas being Douglas Daly and Katherine. Dryland grain sorghum can be grown in regions where the average wet season rainfall is between 700 mm and 1,400 mm. Although yields of 4.5 t/ha to 5.0 t/ha have been achieved in small areas, more realistic commercial yields would be 2.5 t/ha to 3.5 t/ha. As well as grain, sorghum provides a very useful stubble for grazing. Weight gains for cattle on sorghum stubble have been recorded at up to 1 kg/head/day in the early to mid dry season.

RECOMMENDED SORGHUM VARIETIES AND SOWING TIME

Since the sorghum varieties recommended for the Top End are fairly insensitive to daylength, flowering time is influenced by time of planting, maturity type, and nutrient and water availability. Depending on the variety, planting times will vary, but as most of the recommended varieties are medium to late maturing, early planting is essential to make full use of the growing season and optimise potential yields. Mid to late December is the optimum sowing time with early January being reasonable. Crops sown after the first week of January are likely to experience moisture stress towards the end of the season and significant yield loss.

For more information, see Technote No. 109 *Grain Sorghum Variety Evaluation Trials for the Douglas Daly District, NT*.

SOILS AND LAND PREPARATION

Most sorghum production has been on the red earth soils, which vary from clay loams to loamy sands. Common problems experienced on these soils include erosion, especially with the sandy loams, soil surface crusting and extremely high soil surface temperatures at establishment. The soils are well drained, highly weathered with a neutral pH (6.5-7.0). The clay loams will compact under conventional tillage systems and can crust if a mulch is not retained.

To offset these physical problems with the soil, conservation tillage systems are recommended for dryland crop production in the NT. With these systems, mulch from the previous year's crop and from pasture or grass weeds, is retained on the soil surface. This mulch will:

1. Conserve soil moisture.
2. Protect soil from the impact of raindrops i.e. avoid runoff and reduce erosion.
3. Reduce surface crusting.
4. Reduce soil surface temperatures.
5. Give greater efficiency of moisture use.

PESTS

Insects such as small grasshoppers and locusts can attack emerging seedlings and cause considerable damage in some cases. This usually happens when the crop is planted into a green or dying mulch in which pests have been feeding. The pests then move onto the emerging crop as the mulch is killed from the knock-down herbicide. An application of Chlorpyriphos with a boomspray will provide control. This may be mixed with a pre-emergent or knockdown herbicide.

Other pests that occur in conjunction with conservation tillage include wireworms and false wireworms, which attack the seedling below the soil surface. Effective control measures include:

- In-furrow application of Chlorpyriphos.
- Treatment of seed with Gaucho®.

FERTILISER

A soil test will assist in determining nutrient requirements.

The most commonly cropped soils - the red earths - are inherently low in phosphorus, sulphur, nitrogen and some trace elements. Potassium is generally deficient in sandy soils. The quantity and type of fertiliser required will depend on the cropping history and the geographical location of the site. Table 1 lists the amount in kg/ha of the main elements required to produce a reasonable (2.5-3.5 t/ha) crop of grain sorghum in areas with common nutrient deficient soils. As well as those listed, others such as magnesium and boron should be checked for your area. Research has shown that higher responses are achieved if phosphorus and nitrogen are banded under the seed. Phosphorus, sulphur, zinc and copper can be applied some time prior to sowing. Nitrogen and potassium should be applied immediately pre-sowing or at sowing with best results obtained by topdressing part of the nitrogen three to four weeks after sowing.

Table 1. Quantity of elements required to produce a crop of sorghum on a Tippera clay loam soil

Element	kg/ha
Nitrogen	70
Phosphorous	28
Sulphur	28
Zinc	5

A dryland sorghum crop requires approximately 15 kg of nitrogen to produce one tonne of grain. So, for a yield of 4 t/ha you will need approximately 60 kg/ha of nitrogen. This assumes a recovery rate of 100%, which is not possible. Therefore the most cost effective rate of nitrogen fertiliser is about 70 kg/ha.

The type of nitrogen fertiliser must be considered as loss of nitrogen through volatilisation and/or leaching is common. Urea has the highest content of nitrogen present, however it can easily be lost to the atmosphere through volatilisation if surface-applied, particularly in dry conditions. Ammonium nitrate and sulphate of ammonia are relatively stable formulations; however, the proportion of nitrogen in each is lower than that in urea. Additionally, sulphate of ammonia, if used consistently over a number of years can increase soil acidity. If the seed and sulphate of ammonia are sown together, the zone around the seed in the soil may be acidified, affecting establishment.

Where sorghum is sown into a pasture legume ley, the amount of nitrogen applied to the crop may be reduced, because of a possible contribution of nitrogen by the legume pasture.

Grain sorghum varieties are constantly changing. Therefore a DBIRD Agricultural Extension Officer should be consulted for more current advice on techniques, suitable varieties and agronomic principles for growing grain sorghum in the Top End of the Northern Territory.

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REFERENCES

DBIRD Agnote “Insects at Crop Establishment” No. I6

DPIFM Agnote “Pests and Diseases of Sorghum” No. C2

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“Ergot of Sorghum”. Plant Quarantine Leaflet No. 77. Australian Quarantine Inspection Service.

“Striking the Balance” Sustainable Farming and Grazing Systems for the Semi-Arid Tropics of the NT. Ed. Fergal O’Gara.

DPIFM Technote “Grain Sorghum Variety Evaluation Trials for the Douglas Daly District, NT” No. 109.

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