Introduction

Gadam sorghum has semi-dwarf to medium height plants that grow with uniform plant population. It is a very early variety maturing in 85-95 days (in about 3 months depending on altitude and rainfall amount). This makes it an ideal variety for dry areas. The grain is chalky white. Currently, grain yield in ASALs is 2-4 (90kg) bags per acre with a break even above 5 (90kg) bags per acre. Use of growth enhancers supplemented with zinc mineral can improve grain yield and return to investment.

Requirements per acre of land

- Well prepared land
- 1 kg of 2% Zinc mineral
- 5 litres Growth enhancer (hormone)
- 3 kg sorghum seed
- Water
- Fertilizer - 50 kg DAP and 50kg CAN
- Labour

Land preparation

The field should be ploughed immediately after harvesting the previous crop. It requires a fine seedbed for better seedling establishment.
Plants
- Plant before or at the onset of rains by either drilling in the furrows made by oxen plough or tractor, or hill plant in the holes made with a Jembe or Panga
- Planting depth ranges between 2.5 to 4.0 cm, but when dry planted, the depth should be 5 cm
- Apply 50 kg DAP fertilizer
- Spacing: 90 x 20 cm
- Seed rate: 7-10 kg/ha or 3-4 kg/acre

Thin the soil to one plant per hill one week after emergence. The first weeding should be done two weeks after emergence. Second weeding is recommended during top-dressing. Chemical weeding can also be done in large-scale farms using recommended herbicides.

How to apply commercial growth enhancer
- Mix growth enhancer to water in the ratio of 1:2 (use 10 litres of the mixture in water for one acre)
- Add 960 g of 2% zinc mineral.
- Apply when the sorghum is at 4-5th leaf stage as top-dress.
- Also apply CAN (50kg per acre)

Protection of Sorghum
- Spray insecticide to control shoot fly one week after germination
- Look out for stem borer attack when the sorghum seedling is eight leaves or a month since emergence
- The leaves damaged by bollworm appear tattered and are stunted.

Control
- Spray with a systemic insecticide at an early stage to control shoot fly. Repeat spray one week later to ensure control of shoot fly, stem borers and bollworm larvae.
- If bollworm larvae attack ripening grain at soft dough stage. Spray with a contact insecticide like Lamdacyhalothrin 17.5g/l as active ingredient (Duduthrin) applied once at the rate of 80 l/acre.
Harvesting of Gadam Sorghum
Harvest sorghum at soft dough to salvage 90% yield.

Gross margin

Gross margin (KES) = Gross income - Gross expenditure

Expenditure per acre (KES)

<table>
<thead>
<tr>
<th>Input</th>
<th>Unit</th>
<th>Qty</th>
<th>Unit price</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hormone</td>
<td>Litres</td>
<td>5</td>
<td>1000</td>
<td>5000</td>
</tr>
<tr>
<td>2% zinc</td>
<td>kg</td>
<td>0.96</td>
<td>50</td>
<td>48</td>
</tr>
<tr>
<td>Seed</td>
<td>kg</td>
<td>3.00</td>
<td>125</td>
<td>375</td>
</tr>
<tr>
<td>Fertilizer (DAP)</td>
<td>Bag (50kg)</td>
<td>1</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>Fertilizer (CAN)</td>
<td>Bag (50kg)</td>
<td>1</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>Land preparation</td>
<td>contract</td>
<td>1</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td>Weeding</td>
<td>Person days</td>
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<td>500</td>
<td>4000</td>
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<tr>
<td>Bird scaring</td>
<td>Person days</td>
<td>15</td>
<td>500</td>
<td>7500</td>
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<tr>
<td>Total Cost</td>
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<td></td>
<td></td>
<td>25423</td>
</tr>
</tbody>
</table>

Gross Revenue per acre (KES)

<table>
<thead>
<tr>
<th>Season</th>
<th>Yield (kg)</th>
<th>Price/kg</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 300mm</td>
<td>2928</td>
<td>27</td>
<td>79056</td>
</tr>
<tr>
<td>below 300mm</td>
<td>1612</td>
<td>27</td>
<td>43524</td>
</tr>
</tbody>
</table>

Gross profit per acre (KES)

<table>
<thead>
<tr>
<th>Rainfall</th>
<th>Total revenue</th>
<th>Expenditure</th>
<th>Gross profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 300mm</td>
<td>79056</td>
<td>25423</td>
<td>53633</td>
</tr>
<tr>
<td>Below 300mm</td>
<td>43524</td>
<td>25423</td>
<td>18101</td>
</tr>
</tbody>
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All enquiries should be addressed to:
Centre Director:
KALRO-Katumani, Machakos-Wote Road
P.O. Box 340-90100 Machakos, Kenya
Mobile 254-0710906600
Email: kalro.katumani@kalro.org
Website:www.kalro.org/asal-aprp
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