Die verbouing en die produksiepotensiaal van turksvy kultivars / Cultivation and production potential of cactus pear cultivars

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SITE SELECTION

- Climate:
  - Warm summers
  - Cool winters
  - Rainfall: 300-700 mm/year
  - Sensitive to hail damage
  - Full sun

- Soils:
  - Well drained, cannot tolerate water logged soils
  - Any soil type, clay to sand
  - pH of 6.5-7.0

- Slope
  - N = warmer, ripen earlier
  - S = cooler, ripen later

- Fence off to avoid damage by livestock/game
SOIL SAMPLING AND PRE-PLANT FERTILISATION

- Soil sampling
  - Top (0-300mm)
  - Sub-soil (300-600mm)
  - Fertilisation should be based on soil analysis results

- Apply lime/gypsum/phosphates pre-plant

- Optimal plant nutrient levels

<table>
<thead>
<tr>
<th>Element</th>
<th>Optimal level (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus (P)</td>
<td>15-20</td>
</tr>
<tr>
<td>Calcium (Ca)</td>
<td>&gt;400</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>100-150</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>&gt;150*</td>
</tr>
</tbody>
</table>

* Ca:Mg 3:1-8:1
Sensitive to high Na (max. 150 ppm) and Cl levels
# MAINTENANCE FERTILIZATION (kg/ha)

<table>
<thead>
<tr>
<th>Element</th>
<th>Element</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN (28% N)</td>
<td>Nitrogen</td>
<td>75</td>
<td>210</td>
<td>320</td>
<td>430</td>
</tr>
<tr>
<td>Super phosphate (10,5% P)</td>
<td>Phosphate</td>
<td>40</td>
<td>120</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>KCl (50% K)</td>
<td>Potassium</td>
<td>50</td>
<td>120</td>
<td>160</td>
<td>200</td>
</tr>
</tbody>
</table>

Johan Potgieter
CULTIVAR SELECTION

• Fruit production
  • Export – Fruit colour red/pink/yellow
    – Very competitive
  • Local market - Fruit colour white or green
    – Market small
    – Fresh produce markets?
    – Niche markets are profitable
  • Cultivar / environmental interaction – harvest date
    – Harvest dates off all cultivars – January – February
    – Price at its lowest

• Animal feed
  • Use cultivar with the highest yield potential
  • No significant differences in acceptability to animals
  • Cladodes as well as fruit
CARE FOR YOUNG PLANTATIONS

- Insect control, scout regularly and control if observed
  - Cochineal
  - Cactoblastis (cactus pear moth)
- Flower removal
- Fertilisation, not too much N
- Pruning in following winter to shape plant
WEED CONTROL

- Very sensitive for weed competition.
- Methods
  - Mechanically
  - Chemically
- Shallow root systems
Pruning

• Optimal fruit production
  • Prune in June, July.
  • Plant height less than 2 m.
  • No overlapping cladodes.
  • Cladodes must not touch the ground.

• Optimal cladode production.
  • Any time of the year.
  • Intensity and frequency is an important factor.
  • Rotational harvesting?
  • Reduction in fruit production.
CHEMICAL WEED CONTROL

- Herbicides containing glyphosate recommended.

- Products to be used.

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Commercial name</th>
<th>Formulation*</th>
<th>Dosage</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>glyphosate</td>
<td>Roundup Mamba</td>
<td>SL 360 g/L</td>
<td>2-8 L/ha</td>
<td>Annual/perennial weeds and nut sedges</td>
</tr>
<tr>
<td></td>
<td>Glyphogan 360 SL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glyphosate</td>
<td>Stirrup</td>
<td>AL 144 g/L</td>
<td>5-7.5 L/ha 5-22.5 L/ha</td>
<td>Annual Perennials</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glyphosate trimesium</td>
<td>Touchdown</td>
<td>SL 720 g/L</td>
<td>0.33-6 L/ha</td>
<td>Annuals/perennials</td>
</tr>
</tbody>
</table>

* Formulation: SL= soluble liquid, AL= apply undiluted

Important: prevent spray drift.

Carefully follow the instructions on the label.
ORCHARD SANITATION

- Pruned pads, thinned fruitlets and pads broken off by wind needs to be collected on a regular basis and destroyed.

- Pads laying around serves as host plants for cochineal, cactoblastis and various diseases.

- Detached pads must be destroyed by means of a hammer mill or fed to livestock.
PEST AND DISEASES
Cactus Moth

*Cactoblastis cactorum*

Adult moth

Papal cocoon

Eagstick wit eggs
Sept – Oct & Feb- March

Adult Larva

Yung Larva
Cochineal
*Dactylopius opuntiae*
PEST CONTROL

- Control:
  - scout weekly, spot spraying, repeat,
  - mechanically: (small-scale) old brush/broom head, insecticide,
  - chemically with high pressure (1200-20 000 kPa), tractor driven sprayer,
  - destroy any infected plants in 2 km radius

- prune plants to minimise hiding places,
## CHEMICAL PEST CONTROL (COCHINEAL)

<table>
<thead>
<tr>
<th>A. I.</th>
<th>Commercial name</th>
<th>Formulation</th>
<th>Dosage (per 100 L water)</th>
<th>Withholding period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbaryl</td>
<td>Carbaryl, Karbaspray, Sevin</td>
<td>WP</td>
<td>200 g</td>
<td>1</td>
</tr>
<tr>
<td>methidathion</td>
<td>Ultracide, Suprathion</td>
<td>WP</td>
<td>50 g/L</td>
<td>1</td>
</tr>
<tr>
<td>methidathion</td>
<td>Ultracide, Suprathion</td>
<td>EC</td>
<td>50 ml</td>
<td>1</td>
</tr>
<tr>
<td>parathion</td>
<td>Parathion, Avima, Plaschem</td>
<td>EC</td>
<td>60 ml</td>
<td>21</td>
</tr>
</tbody>
</table>
RECOMMENDED CULTIVARS
Cladode production for the 2009/10 season
Cumulative cladode production for 5 years

Cladode production t ha⁻¹

R1259
R1260
Rossa
Sicilian
Morado
Santa
R1251
Fusicaulis
Gymno
Postmasbu
Turpin
Tormentos
Berg x
Schagen
Malta
Cross X
Vryheid
Van As
Meyers
Skinners
Zastron
Roedtan
Nepgen
Sharsheret
Robusta x
Amersfoort
Direkteur
American
Muscatel
Blue Motto
Arbiter
Corfu
Agerian
Messina
Poly Poly
Ficus-
Robusta
Monterey
Mexican
Fruit production for the 2009/10 season

Fruit production (t/ha)
# RECOMMENDED CULTIVARS FOR THE CENTRAL HIGH VELD

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Ranking</th>
<th>Fodder</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sicillian Indian Fig</td>
<td>1</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Ofer</td>
<td>2</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Rossa</td>
<td>3</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Morado</td>
<td>4</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R1259</td>
<td>5</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Nudosa</td>
<td>6</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Santa Rosa</td>
<td>7</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>R1260</td>
<td>8</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>R1251</td>
<td>9</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Gymno Carpo</td>
<td>10</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Zastron</td>
<td>23</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
RECOMMENDATIONS

- Start small, expand as knowledge increases
- Choose the correct cultivar
- Manage the orchard well
- Introduce water-harvesting techniques to improve plant productivity/drought tolerance
- Get expert advice
- Real value is in value adding – fruit and cladodes
SUMMARY AND CONCLUSIONS

– The traditional animal feed cultivars (Robusta and Monterey) are the poorest performers.
– The use of cultivated cactus pear orchards as a feed source is a new concept to farmers.
– The crop has a potential of switching between feed and fruit production depending on the need and circumstances.
– Cactus pears are an ideal crop for communal and developing farmers to stabilise food security.
– One of the most versatile crops.
– Lack of creativity is our biggest constraint.