Agriculture in Sub-Sahara Africa

Maize Breeding and Seed Production in Southern Africa
Introduction

- Gabor Barla-Szabo (MSD, DR, PhD)
- 1991-92 Univ of Pretoria: Visiting Professor
- 1993-2002 PHI Africa: Sub-Suhara QA Manager
- 2002-05 Syngenta SeedCo: Resarch and Production Manager
- 2004- present United Seeds corporation: Director, Product Development and Seed Production
Southern African Development Corporation (SADC)

- Includes 15 countries, 240 million people
- 10 mill sq Km, 150+ mill Ha arable land
- Maize is Staple Food and No 1 crop
- 40-45 million Ha maize production
  - White OP’s mostly
  - South Africa and Zambia Strong Seed Ind
- The rest 13 countries OP’s
- Lots (Losts nad Lots) of opportunities
- **Example:** In the past Nigeria was food exporter, today 80% of the food is imported.
South Africa

- 50 m population, 1.221 m sq km
- Pretoria, Cape Town, Bloemfounten
- 9 Provinces
- History
  - Hottentot-Koi, Bushman,
  - Bantu tribes moved in 800-600 years ago
  - European settlers after 1487, 1652 van Riebeeck
- Anglo Boer Wars
Southern African Development Corporation (SADC)

- Mixed economy, middle income nation 25\textsuperscript{th} Rank in GDP
  - Well developed fin, legal, info, transport system. Stock exchange is in the world best 20.
- Poverty, unemployment at rural areas
- Racial inequality, Affirmative action, BEE
- Crime, Corruption (Chomi), Regulations, HIV
- Overall, SA is the Leader Economy in Africa
<table>
<thead>
<tr>
<th>Region</th>
<th>Day length</th>
<th>Mean Temp.</th>
<th>Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry</td>
<td></td>
<td></td>
<td>&lt;300 mm</td>
</tr>
<tr>
<td>Tropical Lowlands</td>
<td>11 &lt; d &lt; 12.5 hrs</td>
<td>≥ 24 °C</td>
<td>600-1200 mm</td>
</tr>
<tr>
<td>Tropical Midaltitudes</td>
<td>11 &lt; d &lt; 12.5 hrs</td>
<td>18°C ≤ T &lt; 24°C</td>
<td>400-1000 mm</td>
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<tr>
<td>Subtropical Lowlands</td>
<td>12.5 ≤ d &lt; 13.4 hrs</td>
<td>≥ 24°C</td>
<td>400-600 mm</td>
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<td>12.5 ≤ d &lt; 13.4 hrs</td>
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<tr>
<td>Highlands/Temperate</td>
<td>d ≥ 13.4 hrs</td>
<td>T &lt; 18°C</td>
<td>600-900 mm</td>
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</tbody>
</table>
Agriculture of South Africa

- About 6 million Ha arable land
- 1+ m Ha irrigation with 2 crops/year
- Maize, Sunflower, Wheat, Beans, Cane, Fruits, Grape, Horticulture, Pastures
- Extensive Cattle and Sheep
- Strong Food Industry
  - Export orientated: Meat, Cereal, Oil, Fruit, Wine and Seed
- SA is Food Exporter
Maize Production

- 3 m Ha commercial farm land. 3-5t/Ha
- 0.5 million communal land. 0.5-1 t/Ha
- White-Yellow maize about 55:45%
- Corn Belt
  - North West, mainly W (dry, low popul)
  - Eastern Highveld mostly Y (good rain and yield)
  - Irrigation mainly Y (very high yield)
- SA is a maize exporter
Seed Industry in SA

- Seed Companies in SA
  - Monsanto (45% of the market)
  - PHI (25%)
  - Pannar (22%)
  - Others (8%)
    - Link Seed, Advance, K2, Agricole, United Seeds
- The Seed is part of food security
- Export
Focus of Breeding in SA

- High Yield
  - Prolific plants
  - GMOs
- Adaptability
  - High Yield under low
  - Extreme conditions
- Disease tolerance
- Standing
- Right colour
What Multie’s are doing better?

- Genetics
  - Long term continuity
  - New methods, gmo
  - Large amount spent
- Parent Seed
- Production
  - World Wide supply
- Conditioning
  - Simplified
- Marketing, PR
What small companies can do?

- Use the best available genetics
  - For ex: Open lines, expired patents, own developments
- Focus on visible benefits
  - Disease tol, cob size, kernel colour, etc.
- Join up in a co-operation with others
- Make it affordable for a market segment
  - Seed Price is 120-300USD/unit. We sell ours for 40-100 USD/unit.
- Make the farmers interested in production
Use of Heterotic Groups

Projects between heterotic groups

Pooling System Strategy
Southern Rhodesia 1952

- SR52, single cross
- One of the World oldest hybrid
- Cooking purpose
- Very large cob
- Very large kernels
- Problems
  - Lodging
  - Seed Production
Yellows

- US9600, US9610,
  - Med early, High performance, very Prolific
- US9770, US9772
  - Medium maturity Robust, impressive plants,
  - Good adaptability
White maize

- **US9747, US9745**
  - White grain maize
  - Very tolerant for biotic and a-biotic factors
  - Good yield under poor conditions
  - Very good price
- **US Zama**
Seed Production in SADC

- Seeds demand is about 15 million units
- Less than 5 million bags seed are sold
- SA and Zambia are self suppliers and exporters
- SA 1.4 million units
  - More than 60% is SC
  - 52% + GMO
- High quality
- World Standard
Goals of SC Field Production

- Grower selection
- Highest Seed Yield
- Use of cms sterility or mechanic detassel
- Outstanding Quality
  - Germ 95% <
  - Genetic Purity 97%<
  - Physical purity 99.9%<
- GMO production
Processing, Warehousing

- Seed Dryers
- Simplified cleaning
- Female seed size
- No of sizes 4 or 5
- Package is 80 MVK
- Cooling Stores
- Distribution and Return system
- QA and Lab control
Successes of United Seeds

- Local sales
  - Commercial farmers 5000 bags+
  - Tenders BEE partners 4000+
  - Export market 3000
  - Nigeria
  - Overseas: 1600 Ha seed production in Ethiopia
Thank You