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FARMERS' PRODUCTION PRACTICES, INCIDENCE, AND MANAGEMENT OF PESTS AND DISEASES, EXTENSION SERVICES, AND FACTORS LIMITING COTTON PRODUCTION AND QUALITY IN SOUTH AFRICA

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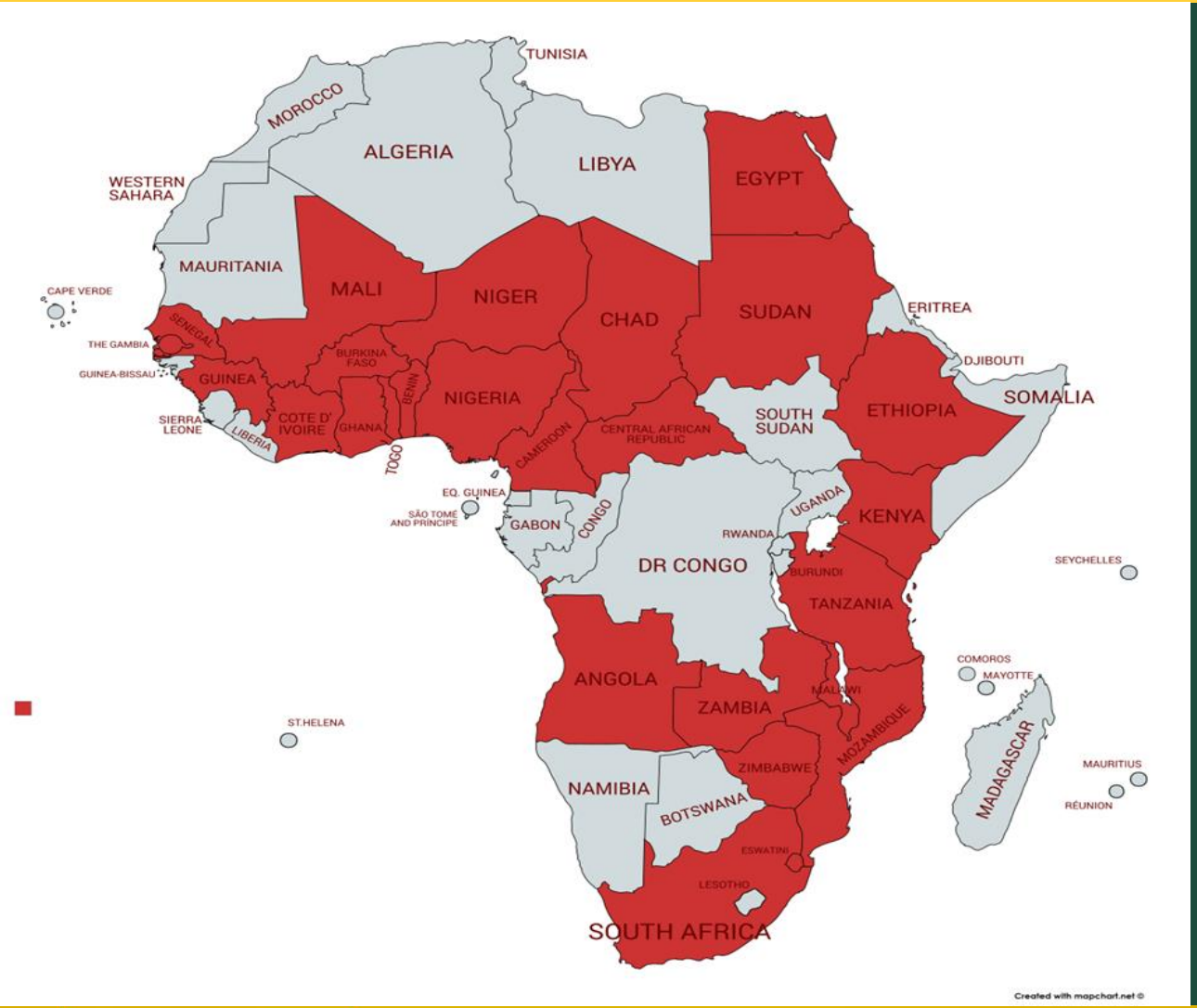
Cotton Production - Africa



- Mostly smallholders - small plantation
- Mainly family farms - intensive labour
- Average lint cotton yields - 350kg/ha
- > 20 countries - Sub-Saharan Africa
- Benin, Mali, Burkina Faso, and Ivory Coast - 50% production
- > 80% cotton produced is exported
- Cotton Market - $ 5.78 billion in 2023

Background

- Cotton (*Gossypium hirsutum* L.) – cash and fibre crop
- Factors affect production - low yields, input costs, pests, and weeds
- Pests and diseases – cause 60% losses in cotton production
- Pests significantly affect production resulting in low yields & poor quality
- Successful control strategy – integrated management practices
- No recent information on farmers perceptions and practices
- Last survey of cotton pests was conducted more than 2 decades ago
- Need to obtain an insight into farmers' knowledge and needs

Aim & Objectives

- **Aim:**
  - To survey the current status of pests on cotton and production practices
- **Objectives:**
  - To evaluate farmers' knowledge and perceptions of cotton pests
  - To examine farmers' current practices in managing cotton pests
  - To identify challenges and intervention opportunities to develop an efficient integrated pest management programme

Farmers' Survey

- Survey was done in 3 provinces - Mpumalanga, KwaZulu-Natal & Limpopo
- Survey conducted April - August 2017
- Farmers were selected from producer list
- Interviews depended participation & availability of farmers
- Electronic & physical surveys of commercial and smallholder farmer

Data Collection

- Questionnaire - to obtain information on cotton production practices
- Questionnaire was tested and modified according
- English – translation was done into the language of the farmers
- 140 respondents without compensation for responding
- The questionnaire required approximately 10 minutes to complete
- All information was confidential and not shared
- Results were expressed in percentages

Questionnaire

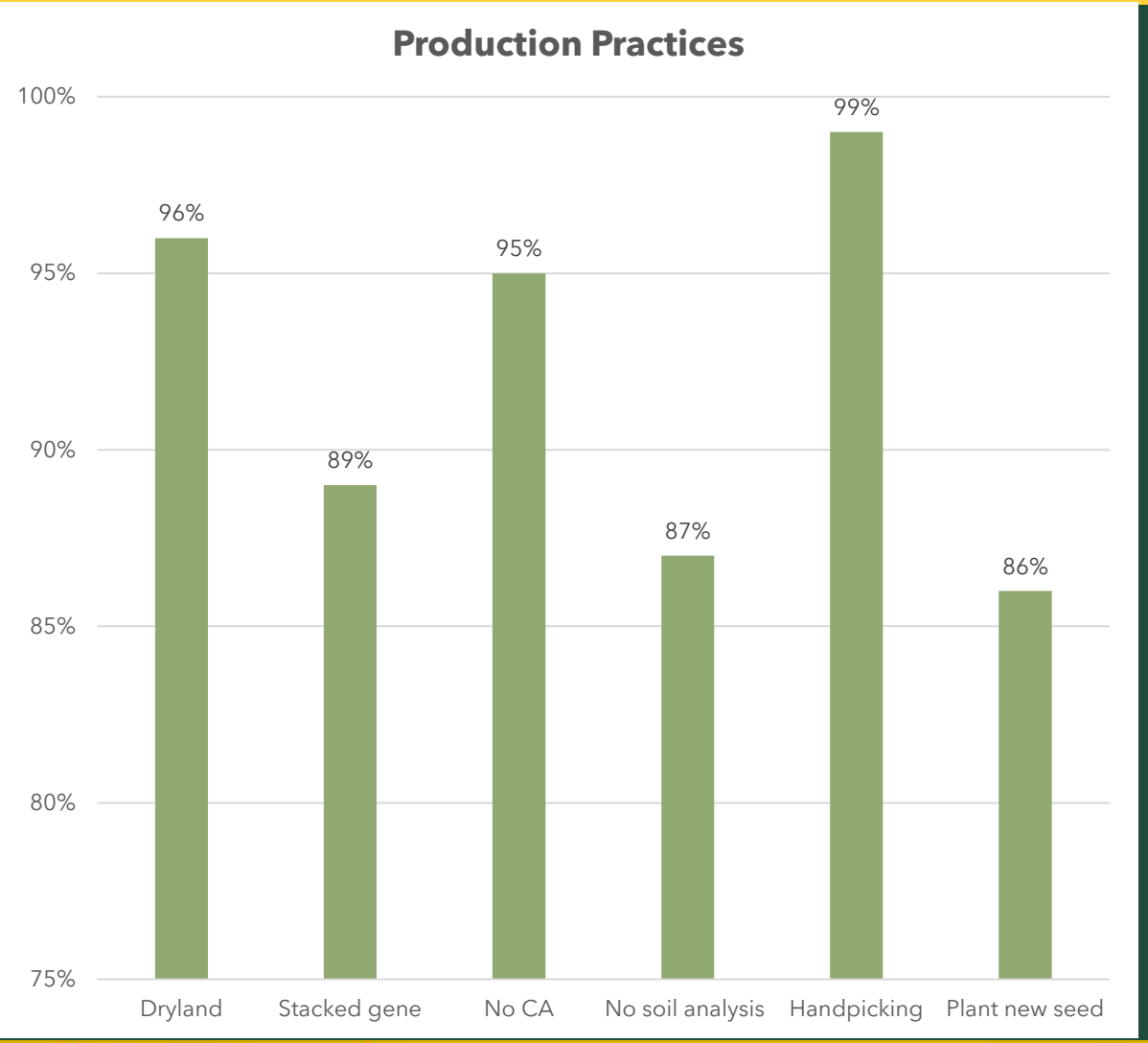
DATA GROUP	DESCRIPTION
Farm details	Farm is situated; hectares planted under irrigation and dryland; climatic conditions and soil type
Production practices	Varieties planted; conservation agriculture; soil analysis; harvest method; average yield; cotton seed leftover
Incidence & management of pests and diseases	Resistance of the variety to diseases and insects; incidence of diseases and pests; management strategies
Extension service & factors limiting the yield	Advice on variety selection; advisors' visitation; seed supply; factors limiting; difficulties in controlling weeds; research required

Farm Details

VARIABLES	n = 140 (%)
Area where the farm is situated	
KZN	70%
Limpopo	2%
Mpumalanga	28%
Soil type	
Clay	16%
Loam	22%
Loam clay	3%
Sandy	56%
Sandy loam	3%
Mean rainfall	
KZN	498 mm
Limpopo	500 mm
Mpumalanga	350 mm
Mean temperature	
KZN	29°C
Limpopo	25°C
Mpumalanga	26°C

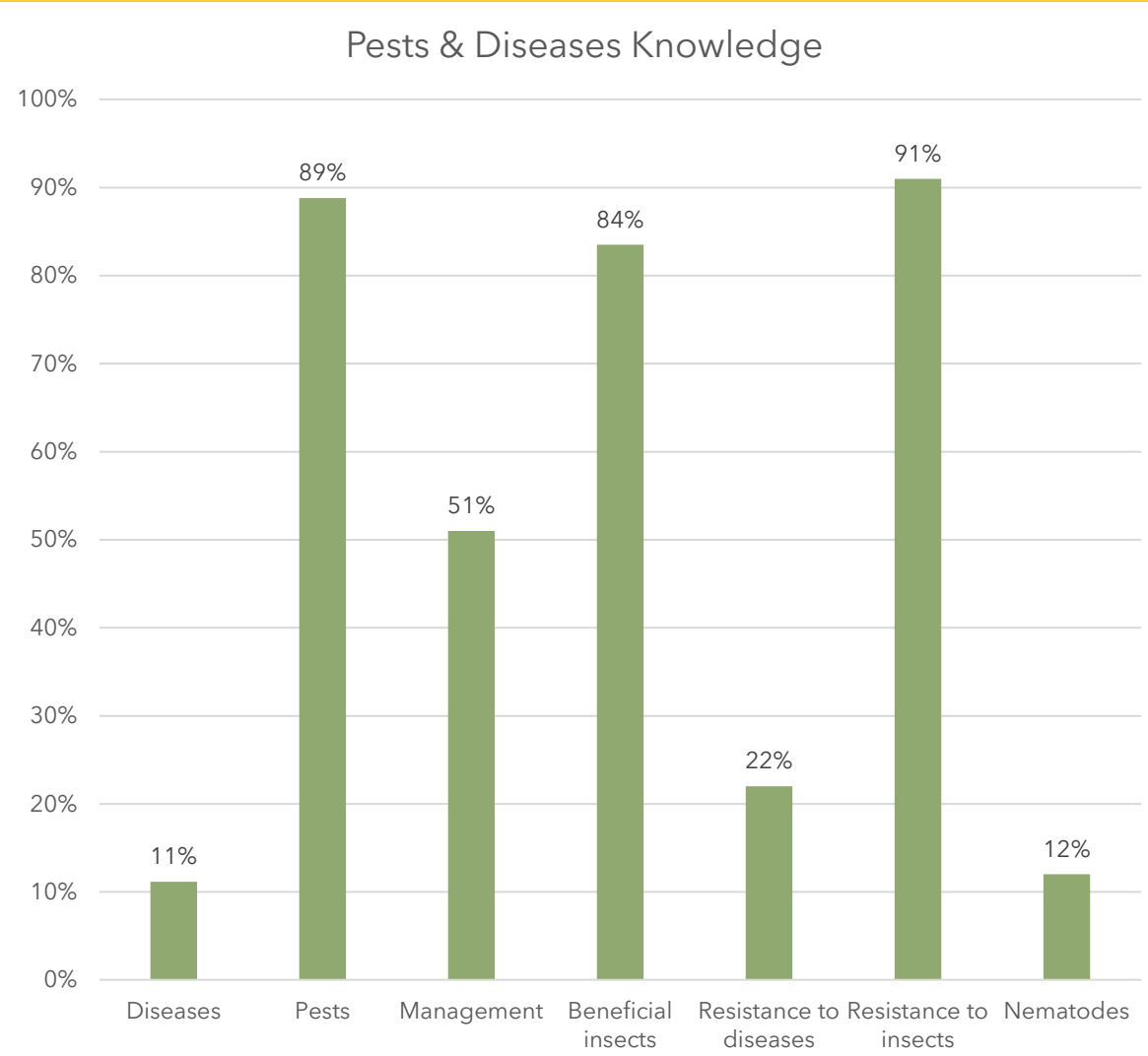
- KwaZulu-Natal - largest area
- More than 56% sandy soils
- Average rainfall of 450 mm
- Rain is crucial after planting or during emergence - 15 to 20 mm
- Average temperature of 26.7°C
- Optimal germination - 28°C to 30°C
- Top soil - 18°C or higher for 10 days

Production Practices



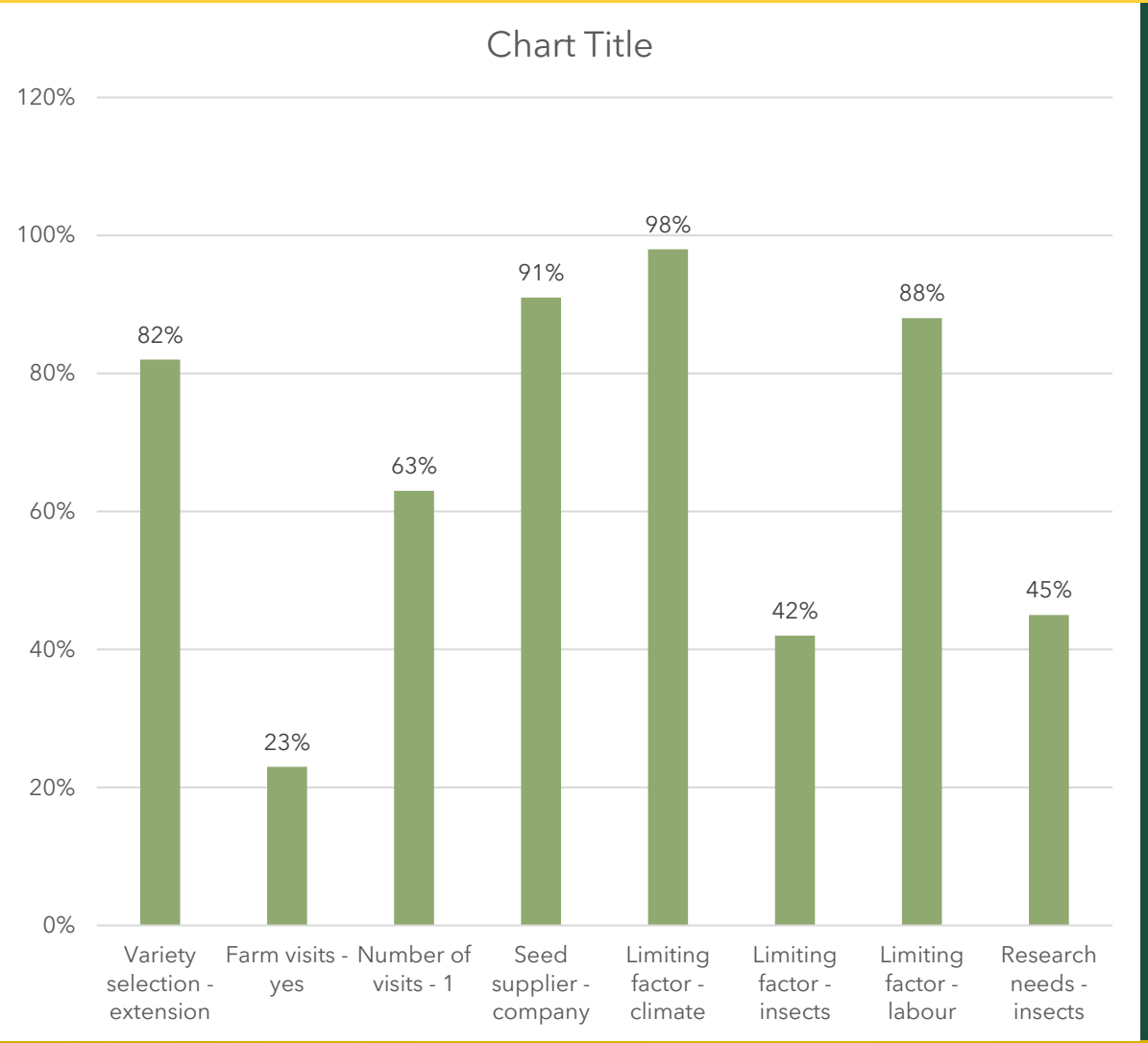
- Dryland cotton – less than 1 000 kg/ha
- Stacked gene - resistance to bollworms, leafhoppers and herbicides
- Mostly no CA – water conservation & sustainable cropping systems
- No soil analysis - financial constraints & lack of information
- Handpicking - more expensive
- Most farmers planted new seeds

Pests & Diseases



- Diseases awareness was low - *Verticillium* wilt is key
- Most were familiar with key pests
- Most farmers used chemical control
- High prevalence of beneficial insects
- Most were aware of insect resistance varieties but not of diseases
- Most not aware of nematodes

Support & Limiting Factors



- Support from the extension officers
- Only 23% had a visit by a researcher
- Visits at least once per season
- Seeds purchased from seed companies
- Climate – constraint to production
- Insect infestation & labour costs affected production
- Low yields – research on pest control

Conclusion

- Most farmers produce cotton on a small scale under dryland conditions
- Average seed cotton yield of less than 1 000 kg/ha
- Most farmers have knowledge of insect pests
- Mainly rely on synthetic pesticides to control pests and diseases
- Main constraints in cotton production include climatic conditions, labour costs, and insect infestations

Recommendations

- Research - genetic improvement and development of new varieties
- New mechanization technologies to reduce the costs of labour
- Government must subsidize the input costs to maximize profit
- Development of guidelines on best cultivation techniques
- Technology transfer to enhance farmers' awareness of cotton pests, their control and implementation of conservation agriculture, as well as the value of soil analysis

Thank You