

COTTON PRODUCTION IN NAMIBIA AND ITS EXPERIENCE SINCE 1997/8 TO 2006/07 CROPPING SEASON

T E ALWEENDO

Ministry of Agriculture Water and Rural Development, Private Bag 13184 Tel 0926461- 2087067, Fax 0926461 – 2087068, alweendo@mawrd.gov.na, Windhoek, Namibia

INTRODUCTION

Cotton was first introduced to Okavango Region in 1990 by South African Company namely Tongat Cotton in 1990. During that period, farmers were contracted to grow the cotton crop through the First National Development Corporation (FNDC). The contract agreement entered between the growers and the company stipulated that growers can only sell their produce to that company. To this end, growers were provided with all the production inputs (seeds, fertilizers and harvesting bags). However, no efforts were made by the company to empower farmers through training in order to transfer knowledge and skills that will not only ensure continuation of cotton farming but the sustainability aspects of cotton production by farmers as well. Cotton production therefore came to a standstill when the company unceremoniously abandoned the project.

In addition, cotton was not only introduced as a crop diversification exercise, but as a strategy to both enhance rural income as well as risk mitigation measures. In furtherance of that effort, trials were conducted at several locations in the following regions: Caprivi, Okavango, Oshikoto, Oshana and Omusati.

The above exercise has resulted in the identification of the following promising varieties from South Africa and Zimbabwe: *Tetra*, *Siokra*, *Delta opal* and CA223. These varieties have shown consistent performance over the years in terms of yield and fiber quality. Furthermore, they exhibited some degree of resistant to pest and diseases.

In order to consolidate the above gains, a multi- stakeholder Cotton Task Team (CTT) was established, whose purpose was to further enhance the promotion of cotton farming in the communal areas of Namibia.

The above cited efforts have culminated in the considerable number of communal farmers venturing into cotton production. Majority of the producers are made up of cotton farmers from Okavango (40%) and Oshikoto (24%) respectively.

During the 2002/03 and 2003/04 cropping seasons, the production of cotton experienced a tremendous increase both yield and hectares under cultivation. During the period under discussion, cotton production can be summarized as follows: **Under rain fed conditions**

- a) Small holder farmers produced between 400-1000 kg/ha.
- b) Under controlled environment (research stations) cotton trials yielded between 800 – 1000kg/ha.

Under irrigation

- c) Commercial farming sector produced between 3000 - 4000kg/ha.

In 2004/05 to 2007/08 production has decline in both commercial and communal areas due to the following reasons;

Low prices paid to farmers; High cost of inputs such as seeds and fertilizers; Inadequate staffing especially at both professional and technician level to cover the targeted areas; Lack interaction with other farmers working with cotton production

Lack of information of setting the indicative seed cotton prices prior to the start of buying season Cotton sector development strategy that aim on the basis of optimizing the growth of cotton sector in Namibia ; Labor competitive with food crops and cultural believes; The development of new ginnery to give further incentive; Private sector participation and involvement in the cotton sector development; Inadequate capacity to produce and provide adequate cotton seeds to farmers; Poor coordination between farmers, researchers and extension officers; No proper Cotton development plan implemented during the two cropping seasons for the small scale farmers; Slow pace of developing a suitably qualification Researchers and development Cadres and lack of liberalization of marketing of seed cotton

2.0 OBJECTIVES

The Directorate of Agricultural Research and Training (DART) within the Ministry of Agriculture, Water and Forestry (MAWF) have been conducting research trials on cotton evaluation and production since 1998. The main objectives of this project are;

- To test for adaptability of several cotton varieties under Namibian farming conditions.
- To determine varieties which meet the needs of growers in terms of yield and other desirable traits such as fiber quality;
- To diversify the cropping base using cotton as cash crop;
- To recommend varieties which are suitable under the Namibian conditions;

3.0 CHALLENGES

The increase in production could not be sustained because of following challenges which posed serious threats to cotton production in Namibia.

3.1 PRICE

The ever fluctuating and unstable world cotton price results in cotton farmers especially in commercial sectors to switch from cotton to more viable and profitable crops such as maize and wheat.

3.2 INPUTS FOR COTTON

Cotton farming is a highly intensive cropping enterprise, for which majority of the inputs (seed, fertilizers and pesticides) is imported and exceedingly expensive and therefore beyond the means of small scale aspiring cotton farmers. In spite of provision of production inputs by cotton agency, in most instances the production costs are so high that resource poor farmers hardly get any meaningful return from their investments and this scenario seriously discourages aspiring cotton growers in the process.

3.3 TRANSPORT AND STORAGE

In all cotton production area, there is no depot to which farmers could bring their produce. This leads to farmers incurring high transport cost when the agent collects the cotton bales from producers because transport costs are passed on to farmers.

3.4 QUOTAS

The agent that is responsible for marketing cotton from Namibia to South Africa normally stops its market initiatives once it reaches its export quota for that year. This unfortunate state of affairs leaves cotton farmers with a lot of cotton bales unsold. Some farmers are still left with unsold cotton bales to this date.

3.5 GINNERY

Lack of primary processing facilities, such as a Ginnery, presents an overburdening constraint in cotton promotional efforts in Namibia.

3.6 GLOBALIZATION

Issues of globalization seriously affect cotton production in Namibia as Namibia cannot compete with giant cotton producers such as China, Brazil and India just to mention but a few. Namibia does not have competitive advantage over these countries in terms of the required production factors.

3.7 TRAINED PERSONNEL

Due to lack of trained personnel and equipment to conduct fibre analysis in the country, Namibia sends raw cotton samples to Cotton South Africa yearly for fibre analysis, a process which is very costly.

In addition, inadequate expertise in cotton research and production in Namibia (breeders, pathologist and entomologists) is not only a nagging bottleneck but presents an overriding constrain.

3.8 SEED COTTON MARKETING

The buyer of seed cotton Agri Business Consultant in the Northern Communal Areas as agent for Clark Cotton has introduced a new marketing strategies for the 2003/04 cotton sales. However the following changes were made by Clark Cotton; Clark Cotton will not responsible for transporting seed cotton from communal areas to Grootfontein. Cotton payment will only be done when seed cotton arrived at Clark Cotton Depots in South Africa, General farmers support initiative, the certain pertinent were observed. There were few entities that formalized to operate in groups because of little knowledge to go into cooperative way, Farmers representatives and co ordinations were loose information at village level, and Farmers lack the initiative or common sense in an organized manner

4.0 COTTON PRODUCTION

4.1 Seed cotton Yield

Seed cotton yields were determined and evaluated using **Sigma Stat 2.0 Statistical packages**. For the eight cropping seasons their yield data had shown statistically significant differences across localities as indicated on table 1.

In all eight cropping seasons varieties "*Tetra*", "*Siokra V15*" CA 223 and "*Delta opal*" had consistently performed better than others.

The four varieties namely **Tetra, Sokra V15, CA223 and Delta opal** were also recorded to be adapted and resistance to Namibia's biotic and abiotic stress.

Yield data had shown statistically significant differences among varieties across localities and within the same locality. These could attribute to the following factors: **poor rainfall distribution, low soil fertility (low soil nutrient availability to plants), moisture stress**

(long drought spell), extremes high temperature experienced during the growing period, and the management practices to cotton production

Table 1: Indicating the best four varieties seed cotton yield in tons per hectare for seven growing seasons (1998/99 – 2005/06)

Cultivar Name	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Tetra	1.33	1.09	0.51	0.63	0.78	0.87	1.02	1.40
Siokra V15	0.73	0.95	0.82	0.65	0.87	0.80	0.80	0.90
CA 23	0.67	0.67	0.86	0.68	0.50	0.67	0.68	0.75
Delta opal	0.80	1.00	0.68	0.67	0.81	0.79	1.10	1.20
Mean	0.88	0.93	0.72	0.66	0.74	0.79	0.90	0.81

4.2 Seed Cotton Classification

Classification currently consists of determinations of staple length, length uniformity, strength and the micronaire that used in raw cotton produce in Namibia. **All cotton produced in Namibia is classified by Seed Cotton Company of RSA lint standards grade.**

Most of the cotton cultivars grown in Namibia were graded between **HX, HA, and HB grades hand picked cotton** according to RSA grading standard

4.3 Micronaire (Fineness)

The fiber quality analysis results in term of fineness had shown statistical different among cultivars **Tetra, CA223 and Siokra V15 performed better than others, while Delta opal had recorded the least micronaire (fineness).** Micronaire was influenced by environmental conditions such as moisture, extremes high temperature, sunlight, low soil nutrients and extremes in plant or boll population during the seven growing seasons.

Table 2: Indicating the best four varieties seed cotton macronaire for seven growing seasons (1998/99 – 2005/06)

Cultivar Name	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Market value N\$/K of seed cotton
Tetra	3.9	3.3	3.8	3.2	4.3	4.1	3.3	4.3	2.80 – 3.16
Siokra V15	4.1	3.3	3.4	3.4	3.9	4.0	3.5	4.3	2.80 – 3.16
CA 23	3.8	3.3	3.7	3.4	4.0	3.5	3.2	4.5	2.80 – 3.16
Delta opal	3.9	3.2	3.2	3.0	4.1	3.8	2.8	4.2	2.80 – 3.16
Mean	3.9	3.3	3.5	3.3	4.1	3.9	3.2	3.8	2.80 - 3.16

4.4 Staple length in millimeter (mm)

For the eight consecutive cropping seasons cultivar *Delta opal* and *CA223* consistently performed better than others, followed by *Siokra V15*, while *Tetra* recorded the least staple length in (mm).

Fiber staple length was largely determined by variety, but cotton plants were exposed to extreme high temperature, water stress or nutrient deficiencies and the variety that shorten the staple length

Table 3: Indicating the best four varieties average fiber analyses in term of staple length in (mm) for the seven growing seasons (1998/99 to 2005/06)

Cultivar Name	Average seed cotton fibre staple length for the seven growing season in (mm)								Degree of staple length (mm)
	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	
Tetra	26.3	26.9	28.0	27.2	24.9	26.5	28.7	29.1	Medium to long staple
Siokra V15	27.7	27.5	28.6	27.3	25.7	26.5	28.6	30.1	Medium to long staple
CA 23	27.0	27.9	28.8	29.2	27.9	26.3	29.2	33.2	Medium to long staple
Delta opal	27.7	27.0	28.0	20.0	25.7	26.4	28.2	30.4	Medium to long staple
Mean	27.18	27.33	28.35	25.93	26.05	26.43	28.68	27.18	Medium to long staple

4.5 The fiber strength (g/tex)

For the eight consecutive growing seasons, variety *CA223* had performed better than others, followed by *Siokra V15*, tetra recorded the least average strength in (g/tex). The fiber strength had been influenced the following factors: extremes high temperature during the growing season, moisture stress and low soil nutrients

Table 4: Indicating the best four varieties average fiber analysis in term of strength (g/tex) during the seven growing seasons (1998/99 to 2005/06).

Cultivar Name	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Degree of strength of seed cotton
Tetra	22.5	23.9	35.5	24.6	26.6	33.1	26.3	27.3	Very strong, intermediate to weak
Siokra V15	23.4	23.3	35.7	27.2	26.2	32.6	35.7	36.8	Very strong to

									intermediate
CA 23	21.4	24.1	24.1	38.0	29.4	32.1	33.8	34.9	Very strong, intermediate to weak
Delta opal	23.5	22.3	35.0	26.7	30.8	33.0	27.6	28.6	Very strong, strong, average to intermediate
Mean	23.0	23.4	36.1	27.0	28.25	32.7	30.85		

5.0 An evaluation of small scale cotton production in Namibia

MAWF envisages the promotion of cotton as **cash crop** in Namibia **to promote** crop diversification as strategy to enhance rural income and reduce the risk of inherent in farming system in Namibia. **Cotton was chosen as one of the crop diversification option and in 2003/04 cotton evaluation was carried out in order to determine the progress in achieving the cotton development plan and in the same cropping season cotton production continuing to increase, but decline in 2004/05 and 2005/06 due to poor marketing strategy, transport and absent of the ginnery.**

The yield of cotton production under small scale holder farmers was continuing increasing; farmers in Kavango and North central were interested in growing cotton, because the climatic conditions were good for cotton production in these regions in Northern Namibia

The area under cotton production in communal areas during the **2003/04 was 260ha, estimated yield per hectare 400 – 1000kg/ha** and total cotton production was estimated **70,550kg for 2003/04, Kavango region which had recorded the highest cotton production 46,800kg and Oshikoto region 14,000kg**

The table 5: Indicating the cotton production in different region produced by small holder farmers

Region	No of farmer	Hectare planted	Estimated average yield Kg
Kavango	73	117	400
Oshikoto	43	35	400
Caprivi	9	29	400
Oshana	26	17	250
Omusati	17	14	150
Ohangwena	11	12	200
Total	178	260	300

The following constrains contributed to the lower yields; training on cotton production, poor soils (availability of plant nutrient), no pest control, late planting and late weeding or no weeding

Table 6: Indicating cotton produced and area planted by region as from 2000 - 2004

Region	No of farmer	Hectare planted	Estimated average yield Kg	Estimated total production
Kavango	73	117	400	46,800
Oshikoto	43	35	400	14,000
Caprivi	9	29	400	11,000
Oshana	26	17	250	4,000
Omusati	17	14	150	2,100
Ohangwena	11	12	200	2,400
Total	178	260	300	70,550

Gross margins analysis can be used as a tool to establish whether cotton contributes to the growth of farmer's income

Estimated gross margin and yield per farmer in Kavango and Oshikoto region are presented on table 9 and 10 for the 2003/04 growing season

The transport cost is calculated by using current rate of 150/ton charged to Agro – Business and Consulted and the seed cotton price at N\$3.10/Kg was used. The farmer input costs were not used, because farmers used own oxen and family labor The 53% of farmers interviewed obtained a gross margin of more than N\$1000/ha and the cost of

production per hectare at N\$1,200. The break even yield 400kg/ha calculated @ N\$3.10(Rate for 2003/04) the 53% of farmers obtained yield per hectare more or equal 800kg/ha, 37% of farmers obtained yield of more or equal to 400kg/ha and 10% of farmers obtained yield of less than 400kg/ha.

The farmers obtained yield of 800kg/ha were successful they cover all operational costs as assumed to be @ N\$1,200/ha under dry land, the 37% were also successful they yield was ranging from 400 – 750kg/ha, but the 10% were unsuccessful they yield was ranging from 200 – 350kg/ha

Table 7: gross margin for small holder cotton farmers in Kavango region during 2003/04 season

Name of farmer	Area planted (ha) ²	Estimated yield (kg)	Estimated Revenue (N\$)	Variable cost (N\$)	Estimated cross margin (N\$)
Mbambo J	20	15,000	46,500	16,474	30,026
Yitanga M	1	900	2,790	348	2,442
Tuneya M	1	700	2,170	360	1,810
Shuka F	1	1,200	3,720	585	3,135
Mukerembe T	1	1,100	3,410	675	2,735
Mashave M	2	1,500	4,650	125	3,525
Letesia M	1	1,200	3,720	460	3,260
Diyeve	1	800	2,480	395	2,085

Table 8: Gross margin for small holder cotton farmers in Oshikoto region during 2003/04 season

Name of farmer	Area planted (ha) ²	Estimated yield (kg)	Estimated Revenue (N\$)	Variable cost (N\$)	Estimated cross margin (N\$)
Nikodemus D	1	1,000	3,100	385.0	2,715.0
Ndemweiimba E	1	800	2,480	385.0	2,095.0
Nambadi E	0.6	600	1,860	325.0	1,535.0
Lakanemo H	0.5	500	1,550	192.5	1,357.5
Vilho F	0.5	400	1,240	225.0	1,015.0
John H	0.8	600	1,860	470.0	1,390.0
Ileni Project	1	300	930	225.0	705.0
Uukule A	1.5	1,300	4,030	725.0	3,305.0

6.0 CONCLUSION

The Ministry of Agriculture Water and Forestry under the Directorate of Agricultural Research and Training sub division of Agronomy and Horticulture currently has **not enough cotton cultivars to satisfy the newly textile industry to be established** in Namibia in near future to demand for different types of fibre. **Continuous research has to be done to improve the genetic composition of new cultivars and to overcome current limitations.** Therefore **new cotton cultivars are to be tested annually** on various soil types in the different climatologically zones before the best ones are released for the production purposes in both commercial and communal areas.

However to release all varieties in Namibia its need a thoroughly tested over a wide range of seasons and good sites to come up with the best varieties for each site or region and the varieties that are resistance to sucking insects such as aphids, leafhoppers (jassids) and for diseases such as alternaria, fusarium wilt, and wet weather blight t which are the common diseases in Namibia.

The results indicated that under Namibian conditions varieties ***Tetra, Siokra V15, CA223 and Delta opal*** are the most suitable varieties for the dry land condition. Over the eight growing seasons these varieties have performed well and these could be attributed to the following traits among others including; **the varieties have been identified as varieties with high potential, they are far more resistance to drought, resistance to pests such as jassids and aphids and diseases such as bacterial blight and verticillium wilt, high fiber quality and high yield indications to date than other varieties currently grown and their market value are favorable, because high value of fiber quality**

Seed cotton marketing presently is problematic due to the conditions set by buyers and other agents on transport and payment The current proposal by Jireh Ginning to set up gin at Rundu was questionable, which government has imposed a moratorium on governments guarantees

Agribank loan Cotton Task Team and Ministry Agriculture Water Forestry and Agribank should look into implementing a 5 year access to a loan without applying the guarantee should cover 1 – 100 hectares per farmer

Inputs supply: Government should consider intervening (subsidize inputs supply through private sectors or farmers organizations)

Training; Initiatives from farmer's organizations be supported and pursued through extension and farmers needs

Seed cotton marketing; Government should consider intervening (subsidize) in transport and cotton sales through interested private sectors or farmers associations and money from the Government guarantee fund should be used to pay farmers on the time of weighing cotton and

The Clark Cotton (buyer) will pay the money back to Agribank when cotton arrived in South Africa in order to avoid delay payment to farmers

Ginnery; Government should try to work toward the establishment of the gin to start processing cotton and A gin with a capacity of 5000tons as starting initiatives will be viable

The Cotton Task Team should discuss this matter vigorously with the Ministry of Trade and Industry and other potential investors to promote local gin

7.0 RECOMMENDATIONS

The combined effects of the volatile world cotton price and the Namibian production constrains put cotton farming in a precarious situation resulting in the viability of cotton industry in Namibia to be highly questionable. On the basis of the aforementioned challenges, the following interventions are recommended:

- 7.1 Efforts should be geared towards diversifying into those crops for which Namibia has a comparative and competitive advantage such as helping the promising and upcoming horticultural and fruit crop producers around water sources (Olushandja dams, Okavango and Zambezi).
- 7.2 Establishment of strategically located collection points across the cotton producing areas. Specific sites to be identified jointly with respective regional authorities, traditional authorities and farmers associations.
- 7.3 Establishment of at least two cotton gins with a minimum capacity of 5000 tons one each in Omuthiyagwiipundi (Oshikoto Region) and Rundu (Okavango Region) respectively.

