



Factors Limiting Cotton Productivity in Uganda

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ABSTRACT

Cotton is one of the major traditional export crops in Uganda. The crop is grown by smallholder farmers on 1 ha or less, with average yield of 388 kg/ha. Seed cotton yields, however, range between 200 kg/ha in the North-East to 1000 kg/ha in the West. At research institutes, yields of between 1500 kg and 2500 kg/ha are obtainable. The huge yield gap between the actual and the potential is attributed to a number of factors. Due to continuous cultivation in most parts of the country, soil fertility is on the decline and pest incidences, on the increase. Recommended agronomic practices such as optimum plant populations, timely sowing and fertilizer uses are not practiced by farmers. Socio-economic factors such as labour, capital, cotton farm size and profitability also influence cotton productivity. Now that seed cotton marketing is liberalized, farmers are eager to resume cotton growing. To narrow down the gap between the potential and farmers' yields, concerted efforts are needed from all stakeholders. Soil fertility and pest problems should be tackled urgently. Farmers should be encouraged to use locally available materials like bio-fertilizers and botanicals. Farmers should, in addition, have access to credit. Cotton demand should be stimulated by sell of lint and seeds to local consumers such as textile mills, oil processors, soap and feed factories.

Introduction

Cotton was introduced in Uganda in 1903 by the colonial government. Production grew rapidly until the mid 1930s when coffee began to compete in the cash crop markets. Cotton output and area continued to grow at a slower rate until around 1970, when the area under cultivation peaked at 881,000 ha and production reached 466,000 bales or 86,900MT of lint (Table 1 and figure 1) and also attained self sufficiency in edible oil production.

Due to economic mismanagement and social strife which prevailed in the late 1970s and 1980s, cotton production declined dramatically to as low as approximately 11,000 bales in 1987/88 (Table 1).

The yields of Uganda Cotton from 1924 through to 1968 varied between 200 kg and 450 kg/ha of seed cotton (Carr,1993). In 1978/79, cotton yield showed the lowest level of 50 kg/ha (Table 2). The yield from 1981 to 1996 ranged between 100 kg and 500 kg/ha (Figure 2). The yield levels are low, compared with that obtained at research institutes which range between 1500 and 2500 kg/ha.

Importance of cotton in Uganda

Cotton and coffee were Uganda's most important export crops, providing cash income for millions of smallholder families. Cotton exports contribution to Uganda's total export earnings was the largest ever reported in 1925 with a 95% share, then it declined to 25% in the 1950s when its significance was overshadowed by coffee. By 1970, the share of cotton export had once more risen to 30-35 per cent. This was partly due to the increase in demand for cotton instead of synthetic fiber. Although it declined to 2% in 1989

and 1.9% in 1991 (MFEP, 1992), its intrinsic nature forms backward and forward linkages for the country's industrial development.

In some parts of Uganda, 50% of the population directly depend on cotton as a reliable source of cash income.

Agricultural policy in Uganda aims at diversifying agricultural exports to reduce dependence on coffee, to stimulate domestic agro-industrial development and to create employment and promote rural development (Kiepels, 1994). Cotton plays a role in export crop diversification plans. However, the government accepts that there is rapid population growth with consequent diminishing opportunities to expand total area under cultivation. This, therefore, necessitates emphasis on crop yield improvements.

Current cotton production trend in Uganda

Cotton is grown in Uganda as a rainfed crop, predominately by smallholder farmers with average cotton field size ranging from 0.45 to 1.0 hectare. Over 80% of Uganda's cotton is grown in the districts of Mbale, Pallisa, Soroti, Kumi in North Eastern Uganda; Tororo, Kamuli and Iganga in South Eastern; Apac, Lira, Nebbi in Northern, and Kasese, Hoima, Bushenyi and Masindi in Western (Figure 3).

Two cotton types namely Serere Albar Type Uganda (SATU) and Bukalasa Pedigree Albar (BPA) used to be grown in the country. The trend, however, is towards production of BPA only. BPA has slightly better growth, yield and fiber qualities than SATU and performs well in about 80% of cotton growing areas of Uganda.

Cotton seed yield in Uganda averages 388 kg/ha. The yields, however, range between 200 kg/ha in the North-East to 1000 kg/ha in the West. At Serere (SAARI) and Namulonge (NAARI) Agricultural Research Institutes, seed cotton yields range between 1500 kg/ha and 2500 kg/ha. There is thus a huge yield gap between what farmers obtain and what is achievable.

Causes of low cotton productivity in Uganda

In Uganda, the decline or variation in total cotton production and yield per unit area results from a complex of bio-physical and socio-economic factors.

In the last thirty years, Uganda's population has more than doubled. This has led to shrinking of plot sizes for all crops. Land fragmentation is on the increase and farmers are compelled to use available land for most cash and food crops. Population increase has led to continuous cultivation. With only about 1% of the population using inorganic fertilizers, soil fertility has declined tremendously. Indeed, according to the author, the single most limiting factor of current crop production in Uganda is soil fertility. Farmers now obtain only about 100 kg/ha of seed cotton in places like Kumi and Soroti, where 500 kg/ha used to be the yield level.

Intensive agriculture has also increased pest and disease problems. When shifting cultivation was in practice, pest and disease incidences were minimal and no control measures were necessary, except when major outbreaks occurred. DDT (Dichloro-Diethyl Trichloro Ethane) was introduced on cotton in 1950s. Since then more effective, environmentally friendly pesticides have been introduced. To the dismay of Entomologists, pest problems on cotton and other crops have worsened. It is, therefore, not surprising that the use of pesticides on cotton is being reviewed and more realistic Integrated Pest Management (IPM) technique have been opted for.

Research efforts at institutes have resulted in the production of sound agronomic packages. These include high yielding and disease tolerant or resistant varieties, time of sowing, spacing or plant population, pest control regimes and fertilizer recommendations. Attempts have been made to introduce these packages to farmers. Perhaps due to lack of understanding farmers' circumstances, researchers have achieved very little. Farmers have continued farming the way their ancestors did.

As pointed out earlier, due to economic mismanagement and social strife that prevailed in the late 1970s and 1980s, cotton production declined dramatically to as low as approximately 11,000 bales in 1987/88. With a few exceptions, cotton prices have stagnated in the past decade. Consequently, farmers have to produce more cotton to cover the cost of a recommended package of insecticide than they did in the 1970s, resulting in increasing numbers of farmers

who can no longer afford the full recommended spray requirement and either use less than the recommendations or cease spraying altogether. This has significantly reduced yields given the dominant role that insect control plays in determining potential yields (Carr, 1993).

Cotton growing competes with other crops for agricultural land and other production inputs. Being a labour intensive crop, farmers often opt for the easier to produce and better paying crops like maize, beans and cassava. Unlike cotton, the other crops are food and cash crops as well and therefore offer food security in the home.

Suggestions for improvement

The small-scale, resource limited farmers in Uganda are still willing and interested in growing cotton. To some, it is a way of life. To others, cotton after harvesting offers a good seedbed for small seeded cereals like finger millet. To others, cotton generates income at the time it is needed most, in December.

The yield gap of cotton between researcher and farmer should be narrowed, to help farmer produce cotton economically. National average yields of 388 kg/ha can be raised to between 500 and 700 kg/ha by simply following the agronomic recommendations. Higher yields can be realized by adding inputs like fertilizers. Whatever recommendations are made, however they should be cost effective.

The use of bio-fertilizers like leguminous plants as green manure or as intercrops would be a viable undertaking. This could be supplemented by use of botanicals as pesticides. Farmers who are interested and are capable, should have access to credit for land preparation, inputs and equipment. Finally, the demand for seed cotton could be stimulated by selling lint and seeds to local consumers such as textile mills, oil processors, soap and feed factories.

References

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Figure 1. Area under cotton in Uganda(1961-1996).

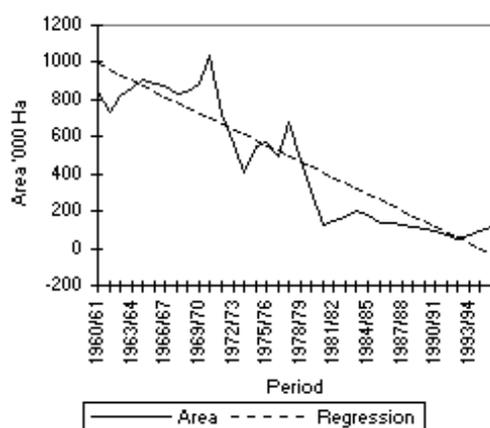


Figure 2. Seed cotton yield per hectare in Uganda (1961-1996).

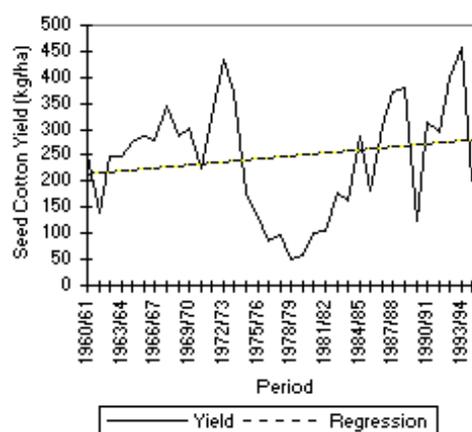


Table 1. Cotton area, yield and production in Uganda (1960-95).

Period	Area '000 ha	Yield kg/ha		Production. MT Lint
		S/C	Lint	
1961-65	839.4	245.45	81.82	209,103
1966-70	893.0	270.89	90.30	240,705
1971-75	562.8	294.68	98.23	164,360
1976-80	415.6	79.79	26.60	32,526
1981-85	167.6	173.20	57.73	29,806
1986-90	115.2	125.69	41.90	13,252
1991-95	83.2	331.33	110.44	26,814

Source: CDO Publication, 1996

Table 2. Five year average yield of lint in Kg/ha by country from 1946 to 1985.

Country	46-50	51-55	56-60	61-65	66-70	71-75	76-80	81-85	86-90	91-95
USA	303.3	331.8	478.8	535.3	544.1	530.3	543.0	586.9	702.1	747.6
Brazil	149.5	194.7	187.5	217.2	242.6	249.6	257.8	247.0	300.6	369.9
China	72.3	114.6	213.2	265.1	378.2	513.4	466.7	700.8	793.9	787.2
Egypt	563.2	488.9	514.8	605.3	674.6	757.4	780.8	995.9	829.2	866.0
India	105.8	102.5	104.2	131.0	135.1	154.3	161.0	182.5	254.2	290.1
Pakistan	148.5	202.6	193.0	255.6	290.1	339.9	285.9	341.6	548.8	652.7
Mexico	299.8	351.9	474.9	580.7	701.5	801.9	919.8	922.6	1030.2	729.7
Cent. Asia	357.0	526.1	699.8	682.3	808.8	882.0	874.2	834.2	781.5	784.6
Uganda	79.1	94.0	99.1	81.8	90.3	98.2	26.6	57.7	41.9	110.4
Other ¹	123.8	138.2	164.7	267.9	321.7	367.0	382.1	415.7	505.7	516.3
Non USA	153.2	183.6	219.5	277.6	331.8	389.9	387.1	448.4	520.8	553.0
Total	202.3	222.2	263.7	325.2	360.1	410.7	410.2	466.7	544.0	582.1

^{1/} Includes Uganda

Source: World Bank 1995, after ICAC World Statistics, October 1994

Figure 3. Cotton growing districts in Uganda.

