



Journal of Applied Sciences

ISSN 1812-5654

science
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Constraints to Improved Cotton Production in Katsina State, Nigeria

O.B. Adeniji

Institute for Agricultural Research, Ahmadu Bello University, P.M.B. 1044, Zaria, Nigeria

Abstract: This study aims at providing insight into the constraints inhibiting technology adoption behavior of cotton farmers in Katsina state, Nigeria. The samples comprise of 250 farmers selected from Malumfashi, Funtua and Daudawa in Katsina state Nigeria. Data collected from the respondents were analysed using descriptive statistics. The results show that the major constraints facing farmers as identified by about 80% are lack of fertilizer, frequency of spray, market opportunities. Others are inadequate knowledge of the production packages and non availability of these technologies. Given the result, it was concluded that cotton production in the study area is affected by lots of constraints. It was suggested that drastic improvement on the conditions of farmers be made through efforts on the constraints identified.

Key words: Cotton production constraints, Nigeria

INTRODUCTION

Agriculture constitutes one of the most important sectors of Nigeria economy. The sector is particularly important in terms of employment generations and its contribution to the Gross Domestic Product (GDP) and export earning. However, the sector has been characterized since 1970s by declining productivity and increase dependence on import of food and raw materials (Manyong *et al.*, 2005)

Efforts have been made by various tiers of government to reverse the trend by diversification of the productive base through increased production of cash crops like cotton, rubber, palm oil and ground nut as they were the main export crops of the country where large revenue have been generated in the 1960s (Idem, 1999).

The major consequence of neglect of the agricultural sector in Nigeria during the oil boom years (1970-1980s) was the decline in total food and fibre production and the astronomical rise in input prices. These general problems of agricultural sector also affect the cotton industries which has hitherto played an important role in the economy.

Cotton production has a relatively long history in Nigeria. The cultivation of the crop started well before the colonial era even though it was not produced in commercial quantities until the onset of the activities of the British Growing Association in 1903, since then considerable attention and resources have been devoted to the improvement of cotton production and utilization by both the public and the private organisations. Cotton is grown as a cash crop by about 0.8 million farmers on a total estimated area ranging from 0.6-0.8 million hectares. The major feature of cotton production in Nigeria is that

about 80% of total production is by peasant farmers under rainfed conditions with simple tools and animal drawn implements (Onu and Atala, 1992; Adeniji, 2002)

Cotton (*Gossypium hirsutum* L.) is an important cash crop in Nigeria which produces lint and seed that serve as raw materials for the local textiles and seed crushing industries. In addition, cotton seed provides edible oil for human consumption while cotton seed cake are used as raw materials for livestock feeds due to high protein content. Until recently, cotton was the fifth most important export crop and a major source of foreign exchange for the country.

Unfortunately, total production remains far below the national requirements of the textile and the oil mills. This is as a result of low average yield of the crop on farmers plot of about 400-500 kg seed cotton per hectare which is below the genetic yield potential (2.5-3.0) tons seed cotton/ha, of the varieties being grown and yield that are obtainable on research plots (1.5-2.5 tons ha⁻¹) (Ogunlela, 2004).

The impact of this is that most textile and oil mills operate far below capacity because of inadequate raw materials. A package of improved technology for cotton production has been introduced by the Institute for Agricultural Research, Samaru (IAR) to farmers in Katsina State. The IAR is responsible for all aspect of cotton research and production of breeder seed. Currently three short staples varieties have been released (Samcot 8, 9 and 10) the potential yield of these varieties range between 1000-1500 kg ha⁻¹.

This research examines factors that are associated with cotton yield level on farmers field vis a vis the improved technologies disseminated by IAR to bring about increased production of cotton in Nigeria. It is

imperative that the constraints inhibiting the performance of cotton sector be identified with a view of unlocking them and creating a conducive investment climate in the sector.

The objectives of this study were therefore to determine factors inhibiting mass usage of the recommended practices and identify factors that could help farmers to ameliorate these constraints.

MATERIALS AND METHODS

The study covers selected villages in Katsina State northern Nigeria where cotton growing is prominent. Katsina state, the area of study lies in the sahel/Sudan agro-ecological zone of Nigeria. Three Villages-Daudawa, Malumfashi and Funtua were purposively selected because of high concentration of cotton farmers and proximity to IAR where proven cotton technologies are being disseminated to farmers. The state is favourable climatically to cotton cultivation. This ecological factor also enables farmers to cultivate a wide variety of food crops such as cereals, grains, legumes etc. Data collection was done through the use of interviewed schedule during 2002 farming seasons. A random sampling technique was used for the choice of respondents within each of the selected zone. One hundred farmers were selected from Funtua, 75 farmers from Malumfashi and Daudawa respectively. The difference in sample size was due to high concentration of farmers in Funtua. In all, 250 farmers were interviewed to determine the rate of technological change in the area. Information collected included parameters such as farmer's age, number of plots, total farm size under cultivation, cropping pattern inputs used and yield.

The package examined included use of improved variety seed (Samcot 8, 9, 10) time of planting, plant density, fertilizer recommendation, cultural practice and crop protection. These technologies have been disseminated through various media like Agricultural Development Programmes (ADPs), extension activities, The National Agricultural Extension and Research Liasion Services (NAERLS) which has the national mandate for extension in the whole country, mass media and so forth. Packages of recommendations produced for the cotton crop by researchers are simplified and transmitted to the extension workers who in turn educate the cotton farmers on available new technologies.

RESULTS AND DISCUSSION

With the introduction of innovations goes the responsibility of identification of user's constraints in the

adoption and innovations and feedback to research. This is critical extension function to ensure development of useful, relevant and adaptable technologies.

According to Onyenweaku (2000) farmers are beset with a lot of constraints that prevent them from adopting recommended practices. A number of questions were directed to respondents with the aim of eliciting the constraints. A total of eight major constraints were identified. Number of their occurrence and their percentages were recorded and each was given a rank.

Cotton is one of the major crops grown in the selected villages. It is grown as sole and in mixture with maize, sorghum, cowpea etc. About 73% of the respondents planted cotton in mixture. The average hectare of sole crop cotton was 1.46 ha.

Peasants farmers prefer to grow cotton in mixture as a risk aversion strategy in case of crop failure or lack of market, thus farmers take crucial decisions in allocation of limited resources such as farm land, labour and cash to a number of crop and other activities which support their domestic food needs. This is not unconnected with low profitability associated with cotton production relative to other crops especially food crop which may bring farmers greater financial gains.

The average yield obtained by majority (75%) of the farmers was 600 kg ha⁻¹. This is below potential yield obtainable from the use of recommended practices as observed in research field ranging from 1.5-2.5 tons. The generally low yield recorded on farmers field have been adduced with factors such as late planting of cotton, inadequate fertilizer application, drought and so forth. Table 1 shows that about 80% of the respondents planted their cotton late that is late June/early July, this usually affect the yield of cotton.

Since the recommended cotton varieties require 140-180 days to reach maturity the recommended sowing date for cotton in the major growing zone is mid-June which is always the time rains have established so that the crop can take full advantage of the growing season. However, most farmers in the study area planted their cotton late in July. The main reason given by 70% of the respondents was that they prefer to plant their food crop first and then later use the remaining area/labour for planting of cotton. Studies have shown that reduction in seed cotton yield can be attributed to delayed planting (Ogunlela, 2004).

Another constraints identified by over 70% of her respondents was pest and diseases. Cotton as a crop is susceptible to attack by numerous insects and diseases through out the life cycle and the effective control of these is inevitable if reasonable yield is expected. The most important group of insect in terms of economic costs is the bollworm.

Table 1: Distribution of respondents according to constraints faced in cotton production

Constraints	Frequency	Percentage	Rank
Late planting	176	70	1
Frequency of spray	137	55	2
Labour for harvest	130	52	3
Time of spraying	107	43	4
Marketing	100	40	5
Frequency of harvest	106	42	6
Storage after harvest	96	39	7
Land preparation	89	36	8
Delay in payment for cotton bought	79	32	9
Rain during spraying	41	16	10

Apart from their ability to reduce yield certain cotton pest can also cause reduction of lint quality (*Dysdercus* sp.) causes discoloration of the cotton lint, which automatically represent a serious decline in quality and substantial reduction in price. About 60% of the respondents said their farms were attacked by aphids, bacteria blight (*Xanthomonas malvacearum* F. Smith) downson and alternaria leaf spot (alternaria macopora Zim) the spread of these two diseases is capable of destroying an entire cotton crop.

Most of the farmers (55%) complained of not having enough money to purchase chemicals to combat these diseases, although the economic advantage of spraying could lead to increase yield thereby justify the costs, the invested. Top on the list was the problem of frequency of spraying. Cotton requires constant spraying to get the maximum yield.

Investments on purchasing spray equipment and agro chemical could constitute a burden on farmers. Spaying is one of the most difficult tasks for the farmers to perform successfully on their own. It requires skills that are new to most traditional farmers. Small-scale farmers spray against pest mainly on a curative basis approximately twice per season whereas cotton requires about six spray to do well.

Also the efficacy of spraying may not be quickly obtained as there are a lot of fake chemicals in the market. This emphasizes the need for more extension activities on integrated pest management that will reduce the number of spray.

Another constraints identified by 52% (Table 1) was availability of labour during harvest. Cotton unlike other crops has to be picked many times, which means payment for labour. If not picked on time the quality can be affected because it can change colour or be contaminated by foreign particles that might lower the grade in the market.

Cotton requires constant labour at harvest and during production (planting, weeding, thinning) and because it can itch, most labourers are scared to work on cotton farms. In addition, it competes with other crops like

maize, millet for labour in allocation of small holders resources. The allocation of farmer's resources to cotton will depend on the comparative advantage enjoyed by cotton compared with the competing crops.

Labour intensiveness and capital investment associated with cotton production renders it a disadvantaged crop amongst the competing crops such as cereals and pulses which are also grown by farmers. This becomes relevant when one compares the very low yield of cotton and relatively high yield obtained from cereals requiring less labour and other investment.

Most of the operations involved in cotton production are still being done manually and of these harvesting and weeding appears to be the most labour intensive.

While the average labour requirement for the production of one hectare of cotton under improved system is about 430 man-hour, about 15% of this is required for fertilizer application, while some 63% is used in harvesting operation. However, with mechanized systems much labour is saved but this is still not within the reach of average peasant farmers.

Marketing of cotton is another constraints identified by 40% of the respondents. Most of them suffer in the hands of unscrupulous middle men who often exploit and rob them of benefits of their effort. The problem is compounded because of lack of interference by government on matters affecting marketing and pricing of cotton (Chikwendu *et al.*, 1993).

Nigeria has liberalized its commodity market in recent years and cotton is one of the commodity freely traded. The dissolution of the marketing board in 1986 allows supply and demand forces to determine the cotton prices. This disrupted the organizational framework of cotton production, processing marketing and finance.

The fourth problem identified by about 43% of the respondents is time of spraying. If this is not done as and when due the desired result/yield would not be obtained. Farmers were further beset with frequency of harvest; this was identified by 42% of the respondents. Cotton unlike other crops has to be picked many times which means payment for labour. If not picked on time, the quality can be affected because it can change colour or be contaminated by foreign particles that might lower the grade.

Another constraint respondents had was storage after harvest indicated by 39% of the respondents this is because most farmers did not have store, hence they were compelled to sell cotton immediately after harvest and it is possible that the price at this time is not high enough to enable the farmers to break even, let alone to make profit from the enterprise.

Moreover, there is the problem of land preparation mentioned by 36% of the respondents this ranked 8th. To

get maximum yield, cotton has to be planted in early June, this is equally the time of planting of other crop like maize, sorghum and millet. Thus, cotton competes with these crops for labour of tractor services as the case may be for land preparation.

Other constraints identified were delay in payment, mentioned by 32% of the farmers. Farmers may be compelled at times to sell to ginners and merchants on credit, either for financial problems or otherwise. Most often, they would not be paid and by the time such money is paid it is possible it might have lost value. The least production problems identified by respondents was rain during spraying 16% this is because the chemicals (insecticides) would be washed away and this, might necessitate another spraying.

Other highlighted problems which are ranked by respondents from very high to low are presented in Table 2.

The results indicated that majority (over 50%) of the respondents rated most of the listed problems very high. For instance, high cost of production was rated by 68% of the farmers, while transportation problem was indicated by 61% of the respondents. Other problems highlighted are problem of storage indicated by 55%, shortage of funds, by 54% inputs problem was stated by 53% of the respondents. Many of the respondents view the problem as being moderate.

The view of KTARDA and IAR fibre research programme: The views of Katsina State Agricultural and Rural Development Authority and IAR on factors favoring/hindering the adoption of improved practices for cotton production were pooled together and presented in Table 3.

Simplicity of usage, availability of seed, relevance to farmers need, adequate publicity and proximity to research institute were factors facilitating adoption.

On the other hand, the factors hindering adoption-included lack of funds, non-availability of input and seed, inadequate publicity, complexity of some of the packages, especially herbicides and non- availability of market outlet for cotton produce.

Table 2: Other problems facing the respondents in cotton production

Problems	Very high	High	Moderate	Low	Total
	----- (%) -----				
High cost of Production	68	24	8	-	100
Transportation	61	11	14	14	100
Storage	55	12	25	8	100
Fund	54	16	24	6	100
Input	53	21	20	6	100
Pests	45	32	22	1	100
Price	39	18	36	7	100

Table 3: KTARDA/IAR views on factors favouring/ hindering adoption

Factors favouring	Factors hindering
Simplicity of usage	Lack of fund
Relevance to farmers economy need	Non availability of inputs
Availability of seed	Complexity of some packages
Proximity to research institute	Availability of market for produce
Adequate publicity	Poor infrastructure
No. other viable alternative	Inconsistent government policy

Table 4: Distribution of respondents according to the type of assistance needed

Type of assistance	Frequency	Percentage
Credit facilities	150	60
Provision of input	50	20
More extension advice	25	10
Researchers to visit field	20	8
Rehabilitate farm centers	5	2
Total	250	100

Assistance needed: Farmers were asked to list the kind of assistance needed to enable them improve their production. Table 4 shows that the area where assistance is mostly needed was the provision of credit facilities. This was mentioned by 60% of the respondents. It was followed by provision of necessary inputs mentioned by 20% of the farmers, more extension advice indicated by 10% of the respondents. Other needs expressed by the farmers were the desire for researchers to come to the field to have on the spot assessment of their problems and rehabilitation of farm service center identified by 2% of the respondents.

CONCLUSION AND RECOMMENDATIONS

From the foregoing findings, these conclusions may be drawn it is possible to grow cotton profitably if it is taken as a package. The study shows that yields are low due to poor quality of cotton seed, adoption of minimum input production packages as a result of lack of credit.

Provision of enabling environment by government in form of regulatory measures for marketing and prices will go a long way to facilitate increased cotton production.

Most farmers depend on government for inputs and untimely supply or failure by government agencies concerned to supply input affect production. There is the need for effective cotton production education and enlightenment on better management practices to facilitate high profitable venture/enterprise. Government and Non Governmental Organizations should assist farmers to alleviate various problems to encourage increase production.

Based on the findings of this study, extension services should as a matter of urgency be intensified and directed at educating farmers to embark on increased production of cotton. Such educative programme would help farmers identify how to make cotton growing

profitable. Adoption of cotton production package is highly recommended. Farmers are known to be responsive to change in income adapting readily to the enterprise with great return. In order for farmers to get maximum benefits of scientific ideas, it is necessary to adopt all the innovative practices as a package or bundle.

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