

SUDAN COTTON CROP DEVELOPMENTS DURING THE LAST 10 YEARS

By Sudan Delegation to the Icac-13th Meeting of the Inter-Regional Cooperative Research Network On Cotton

Introduction:

Potentially Sudan has huge and diversified agricultural resources for sustainable agricultural development. The great-untapped agricultural potentialities qualify the country to be self-sufficient and a net exporter for many agricultural commodities. The Government of Sudan and as part of its strategic orientation to accelerate agricultural development, issued so many programs, the Green Mobilization Program and the Executive Program for Agricultural Revival (EPAR). Although at a slow pace, the execution of those programs is now giving good results in promoting agricultural development. The agricultural sector is now growing and continuing domination of Sudan economy, providing the livelihood for most of the people in the country and availing a big share of inputs for the country's agro-industries. Main agricultural products are sugar cane, cotton, cereals, oil seeds, gum Arabic, livestock and food products.

The cotton Sector

Cotton is one of the most important crops produced in Sudan. It was the main foreign exchange earner contributing considerably to foreign exchange proceeds. More than three hundred thousand families in the Sudan are still depending on cotton for earning their livelihood. Several other thousands are engaged in Cotton related activities. Cotton is grown in Sudan under various topographical and environmental conditions, utilizing various methods of irrigation, and using different applications of chemical inputs. It is cultivated in clay soil in Gezira ,Rahad, New Halfa, Suki, Blue Nile, White Nile, schemes .In silt soil in Tokar of Eastern Sudan and in heavy clay soil in Nuba Mountains area of Western Sudan. Categorized by system of irrigation it is grown by gravity and pumps in Gezira, Rahad, New Halfa (Girba), White Nile, Blue Nile, and Suki Schemes. By flood in Tokar Delta and Khor Abohabil . By rain in Kurdofan ,Darfour , Blue Nile, Senar and Gdarif.

Varieties and hybrids planted

The most popular varieties grown are; Barakat 90 (*Gossypium barbadense*) represents extra-fine cotton category covers 4% of the total cultivated area. After Bt cotton adoption. Seeni 1, Seeni 2 Bt cotton varieties and Hindi 1 and Hindi 2 Bt cotton Hybrids contribute more than 95% of the cotton area. Fiber quality of varieties and hybrids are shown in Table (1).

Cotton Insects in Sudan

Signs of climate change are reflected in rainfall amount distribution and time affecting sowing date and appearance of new insect pests. Cotton Insects complex in Sudan has changed; bollworm and jassid are no longer the main insect pests. Recently, Cotton Mealy bug and Bacterial blight are the new ones

Last 10 years situation of cotton in Sudan

During the last 10 years Sudan cotton area, productivity and production fluctuated sharply. The smallest area (23.3 thousand ha) was harvested in 2009-2010, with a small volume of produce lower than 10 tons. The largest area (123 thousand ha) was harvested in 2011-2012 with a disappointingly low volume of production of 42000 tons. Table (2) shows Sudan cotton area, productivity and production during the last ten years.

Sudan Cotton Production in 2017/2018

Season 2018 estimation figures are at high levels amounting up to around 184000 ha for area and about 236000 tons for production.

As mentioned above the (EPAR) created a beneficial atmosphere for mobilizing the whole community and encouraging its participation in the agricultural activities. The private sector was given a big room and it is playing a significant role in agricultural production in the country. Private sector Companies were strongly enrolled in investing in cotton production. The revival of the present cotton production situation in the Sudan has been attributed to reform issues considered in the five-year program. The five-year economic reform program 2015-2019 put more emphasis on cotton production improvement, aiming to fill the gap of oil production share, which declined in the year 2011 to restore stability and to achieve positive growth rates.

Outlook for Sudan Cotton future within the program

Cotton productivity increased to 950-1000 kg lint/ha with the introduction of GE cotton 2012-2015. *Gossypium Barbadense* yield increased during the past two years to 750-900 kg/ha. Recently cotton becomes the most profitable crop therefore, farmers become more interested in cotton cultivation. The reason for this shift is the sharp decrease in cost of production related to crop protection specially boll worms and jassid and the considerable increase in productivity. Farmers have shifted to Bt cotton hybrid to gain more profits. Maintaining productivity at the range of 1000 kg lint/ha, adopting the cotton five-year economic reform program cotton production is expected to increase to 882 thousand tons by the end of 2019.

Policies associated with Cotton in the five-year economic reform program

- A. Reduce production costs and increase production in the existing agricultural schemes
- B. implementing the outputs of development strategy and develop the traditional rain sector
- C. Adoption of appropriate technology packages for production including plant density, fertilizer, land preparation, improved seeds and the use of modern technology such as laser leveling
- D. linking agricultural production and export
- E. upgrading of the agricultural technologies
- F. adopting agricultural insurance against natural hazards and funds
- G. promotion of cotton farming to increase self-sufficiency and increase export by providing promotional prices for Cotton producers
- H. encouraging smart partnerships with domestic and foreign private sector in agricultural sector in the areas of production and marketing and export
- I. increase cotton production through:
 - 1) mapping of cotton varieties to balance supply and demand of different quality types for domestic and export needs
 - 2) encourage rain-fed cotton production for its lower cost of production and high quality
 - 3) support for agricultural research to develop varieties with high yield and better qualities suitable for domestic consumption and export
 - 4) promote scientific research in genetic engineering to develop bollworm resistance in long staple varieties for export
 - 5) Relate price and quality and encouraging producers by announcement of prices early in each season
 - 6) Adoption of modern agricultural technologies with proper agricultural financing and the establishment of a fund to focus prices .
 - 7) production expansion of transgenic cotton farming
 - 8) Utilization of agricultural mechanization in planting and harvesting.

8- Cotton Research Program

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General Cotton Research Objectives:

- ❖ Development of varieties fitting to different climatic zones, having different balances of fiber characteristics, getting by textile and spinning progress.

- ❖ To develop crop production practices to maximize yield from improved genotypes including management of a biotic stresses
- ❖ To develop effective and economic plant protection measures for the management of biotic stresses
- ❖ Upgrading of productivity through multidisciplinary technical approach package adoption fitting into ICM strategy.

Multi-disciplinary research

The release of Bt cotton varieties has provided a concrete platform for a multidisciplinary research. Integrated management of cotton requires implementation of the agricultural packages timely integrated with other elements of production inputs, financing and agricultural policies. As each component has a positive impact on yield depending on the existence or absence of other elements. Thus, the integrated management of inputs and agricultural operations represents the only mechanism for sustainable cotton farming. The main goal of integrated management is to maintain plant health through coordinated tactics in crop production and protection system.

More emphases have been given to extra-fine cotton research in the sense that this type of cotton is of immense importance in the marketing policy of Sudan.

Lately, New Extra-fine cotton lines have been developed with intermediate reaction to bacterial blight disease. The advantage seed cotton yield of the lines over Barakat 90 was in the range of 4-28 per cent. They had longer, stronger and finer fibers compared to Barakat-90. The lines were earlier cropping and gave 45.6-61.2 per cent of their yield in the first pick compared to 43.5 for Barakat-90. Hence these lines signify improvement in seed cotton yield, fiber quality, earliness of maturity and reaction to bacterial blight in Sudan extra-fine cotton.

In addition to the commercial Chinese Bt cotton variety, one more Chinese (China2) variety and two Indian hybrids were released for commercial production. The two Indian hybrids are characterized by good fiber quality that meant to improve Sudan cotton marketability. Research is being conducted to optimize the Bt cotton varieties needs; irrigation water, fertilizers and other protection measures for sucking pests like Jassid.

Table (1): Fiber properties for commercial and some newly released varieties

variety	Length (mm)	Mic.	Strength g/tex
Barakat-90			
Hindi 1 (hybrid)	28.3	4.4	30.2
Hindi 2 (hybrid)	29.1	4.6	29.8
Seeni 1	27.9	4.5	27.9
Seeni 2	27.1	4.9	27.

Table (2): Sudan cotton area (ha), Production (1000 Tons) during the last ten Seasons

Season	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Area 1000ha	85.3	23.5	41.4	123.1	48.5	52.7	89	60	95	184
Production 00Ton	29	10	12	42	16	35	31	46	105	236