AN OVERVIEW OF SESAME PRODUCTION IN NIGERIA FROM 1961 TO DATE: A REVIEW

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ABSTRACT
Sesame (Sesamum indicum L.) commonly known as Beniseed is one of the cultivated oil seed crops in the world. Since its introduction to Nigeria after the Second World War, it has been regarded as a crop of minor importance compared to groundnut and other cash crops until in 1974, when it became one of the major cash earner in many northern states such as Benue, Gombe, Kano, Jigawa, Plateau, Kaduna, Borno, Nasarawa and Niger states. Huge market potential exists for sesame because the demand for its seeds and products is growing both at the National and International levels. Owing to its previous status as a minor crop, there has been little research efforts on the crop in the past but now, many research on how to enhance its growth and yield to meet the demand of the world teaming population has been intensified. This work therefore outline the major sesame producing areas in Nigeria, the production trend from 1960 to date, gave an overview of production practices across the production areas in Nigeria and discussed the major challenges to sesame production and its prospects to Nigerian economy. In conclusion, the paper recommended among other things: Capacity building on sesame crop improvement and post harvest handling to maintain the quality of produce; introduction and identification of better adaptable cultivars with better resistance to important diseases and pests that will increase sesame production and enhance growth domestic product thereby reducing over dependence on petroleum.
Keywords: *Sesamun indicum*, Benniseed prediction

INTRODUCTION
Sesame (*Sesamum indicum* L.) commonly known as Beniseed is one of the cultivated oil seed crops in the world. Since its introduction to Nigeria after the Second World War, it has been regarded as a crop of minor importance compared to groundnut and other cash crops. Sesame is widely grown in the Northern and Central part of the country initially as a minor crop until 1974, when it become one of the major cash earner in many northern states such as Benue, Gombe, Kano, Jigawa, Nasarawa, Plateau, Kaduna, and Borno states as well as the Federal Capital Territory (Haruna, 2011).

The demand for Sesame and its products is growing both at the National and International levels. Thus, huge market potential exists for sesame. Sesame is an excellent source of high quality oils. The oil is very stable and free from undesirable nutrition or flavour components. Sesame oil has a natural antioxidant which prevent aging and vital for the production of liver cells. It is resistant to rancidity hence it is being referred to as the ‘‘Queen of vegetable oil.’’ It is rich in protein. Its protein has amino acid profile and good nutritional value similar to soybean. It is these sterling attributes that is stimulating interest in the production and demand for the crop. The potential for sesame production in Nigeria is very high. An estimated 3.5 million hectares of the country’s agricultural land are suitable for its production.

In Nigeria, Sesame is produced mainly in the savanna agro-ecological zones by small holders’ farmers on relatively poor soils with limited inputs, thereby resulting in low average yield of 300 kg ha^{-1} compared with 1,960 kg ha^{-1} in Venezuela and 1,083 kg ha^{-1} in Saudi Arabia (Abubakar *et al*., 1998).

In the major sesame production zones in Nigeria, farmers use Beniseed in traditional food recipes and snacks, bulk of sesame produced is exported. There has been substantial growth in sesame production from 1960 to date as a result of increasing domestic and international market demand. This piece therefore seeks to give an overview of sesame production in Nigeria.

Major Sesame Producing Areas in Nigeria
In Nigeria, sesame is produced mainly in the savanna agro-ecological zones by small holders’ farmers on relatively poor soils. The major sesame producing areas in Nigeria are north central part of the country which includes Nasarawa, Kogi, Benue and Niger; and some part of the far north Jigawa, Kano, Yobe, Gombe, Bauchi, Borno and Taraba (Haruna and Alhassan, 2005).

Seasame Production Trend in Nigeria
Figure 1 below shows the sesame production trend in Nigeria from 1961 to 2010. A year after independence, Nigeria produced 56,000 metric tons of sesame. In 1962, the production figure increased to 60,000 MT and thereafter, dropped and continued to fluctuate from 1963 to 1970 where the production figure was 30,000 MT. The production picked up from 1989 to 2010 where the figure rose from 40,000

to 149,410 MT per annum. The fluctuation in the production figure from 1961 to 2010 could be attributed to the fact the total land area cultivated per annum also changes (Figure 2).

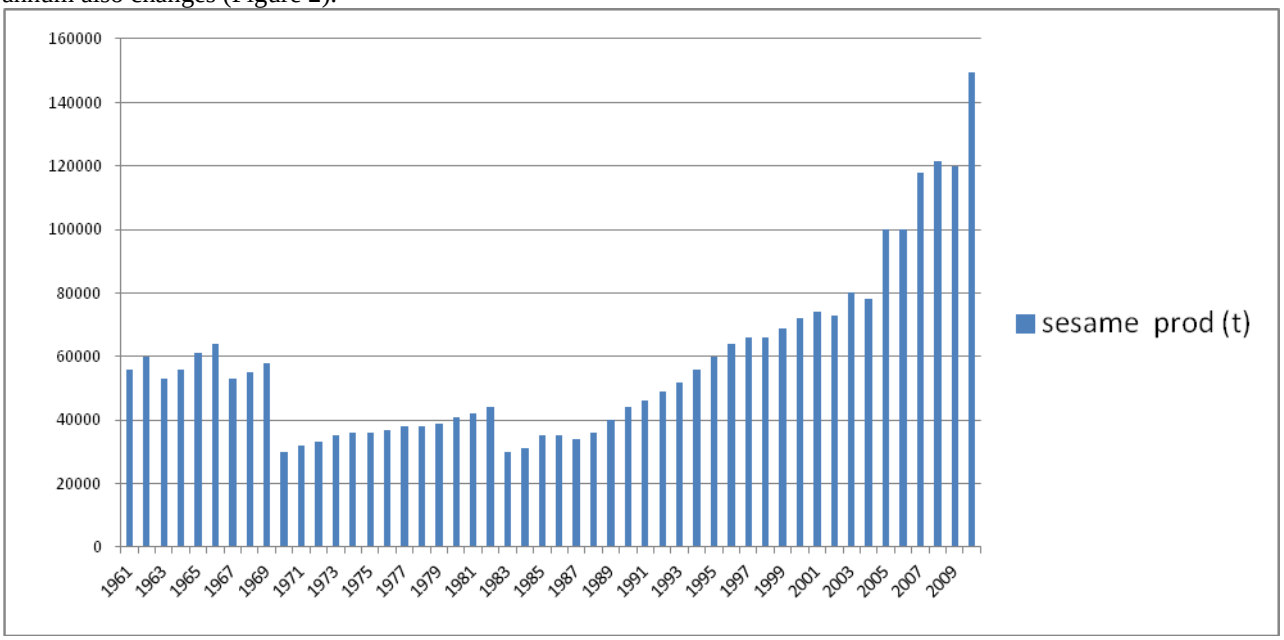

Fig. 1: Sesame production trend in Nigeria
Source: FAOSTAT, 2015

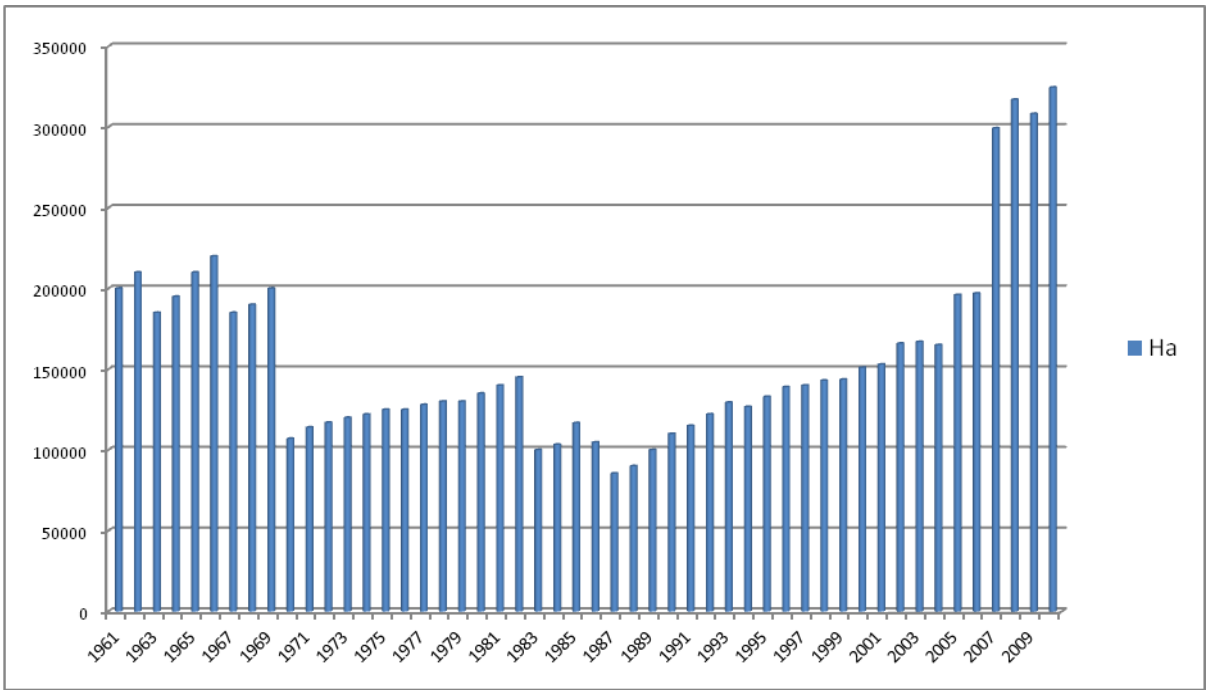

Fig. 2: Area of sesame cultivated from 1961 to 2010
Source: FAOSTAT, 2015

National and World Production Figure

Asia and Africa are the major producers of sesame in the world, with Asia producing more than half of the world output. In Asia, India, Myanmar and China are the leading producers while in Africa, Sudan, Uganda, Ethiopia and Nigeria are the major producers. In 2007, Asia produced 2.4 million metric tons of seed, Africa produced 1.2 million metric tons of sesame and Nigeria produced 110,000 metric tons (FAO, 2008).

In Nigeria, Sesame is produced mainly in the savanna agro-ecological zones extensively by small holders using manual labour and limited inputs, and on relatively poor soils thereby resulting in low average yield of 300 kg ha^{-1} compared with 1,960 kg ha^{-1} in Venezuela, 1083 kg ha^{-1} in Saudi Arabia, 517 kg ha^{-1} in Ivory Coast and 510 kg ha^{-1} in Ethiopia (Abubakar *et al*., 1998). From 1961 to 1978, the national average for sesame production has been between 280 to 292kg ha^{-1} but, from 1979 to 2010, the national average has been between 300 to 460kg ha^{-1} (Fig. 3).

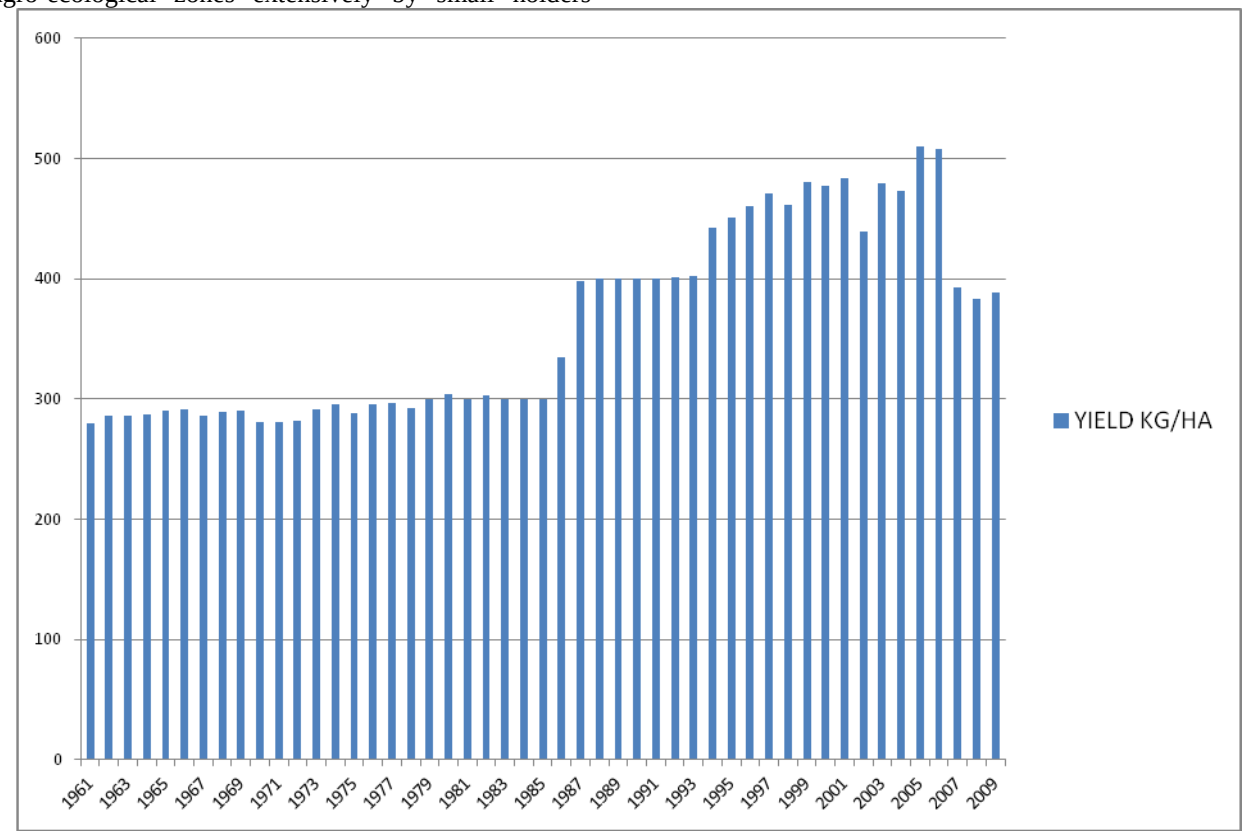

Fig 3: National average yield of sesame (Kg/ha) 1961 - 2010
Source: FAOSTAT, 2015

Sesame Production Practices in Nigeria

In most of the sesame producing zone, sesame is mainly grown under rain fed condition. Growing sesame during the dry season using irrigation is not a common practice. In the far north, sesame is grown with the onset of the rains around June to July. Lands are usually well prepared, ridges constructed and seeds sown in rows. In the north central part of the country, sesame is grown mainly towards the end of the rains (September) because of the heavy rainfall that occur there. Lands are usually well prepared and sowing done by broadcasting on the flat or on the ridges. The predominant planting method in the north central is by broadcasting which is usually the reason for low yield in the zone because it does not allow for certain agronomic practices such as hoe weeding, fertilizer application to be carried out. Also, because of the overcrowded population, branching is seriously affected, plants are usually thin and short with few number of pods. In the far north farmers do apply fertilizer but in the north central, fertilizers are rarely applied because here, they are grown after the second major crop is harvested (Haruna and Abimiku, 2012). The varieties of sesame usually grown here and their characteristic features are outline in Table 1 below:

Table 1: Basic Agronomic Characteristics of Sesame seed varieties

variety	Days to maturity	Seed colour	Seed size	Oil content (%)	Potential yield kg ha^{-1}
NCRIBEN-O1M (530-6-10)	102-115 (medium)	White	3mm	45	1000
NCRIBEN -O2M TYPE 4	102-115 (medium)	Light brown	3mm	45	750
NCRIBEN O-31 (Goza-25)	125 – 140 (late)	White	2mm	40	600
E-8	90 (early)	Light brown	3.6mm	50	1000
Yandev -55	125 (late)	Light brown	2.5mm	45	600
Ex Sudan	90-100 (early)	White	3.8mm	50	1000

Source: Raw Materials Research and Development Council (2004).

Major Challenges of Sesame Production in Nigeria

Despite its nutritional and high value crop, research on sesame has been limited worldwide and so it has been produced under traditional management practices. Sesame yields are highly variable depending upon the growing environment, cultural practices and the type of cultivar. Sesame is a low yielder and worldwide average yields are low (Brigham, 1985). The major constraints in sesame production worldwide are lack of wider adapting cultivars, shattering of capsules at maturity, no synchronous maturity, poor stand establishment, lack of fertilizer responses, profuse branching, and low harvest index (Ashri, 1994). Besides this, lack of appropriate storage facilities and mechanical mixtures of different variety seeds has been reported as a problem in Nigeria (Haruna and Alhassan, 2005). Thus, blending of varieties should be avoided to provide adequate seed cleaning of up to 99- 99.5% purity is required (Wijnands *et al*., 2007).

Beside this, diseases and insect pests cause severe yield losses. Sesame webworm (*Antigastra catalaunalis*) and sesame gall midge (*Asphondylia sesami*) were reported to be the major insect pest of sesame (Okidi, 2002; Ssekabembe *et al*., 2006). Ssekabembe (2007) indicated that two times application of pesticide for sesame pests after 2 and 4 weeks of crop emergence control the sesame webworm (*Antigastra catalaunalis*).while control of the gall midge (*Asphondylia sesame*) requires a systemic insecticide. It can be suggested that efficient research strategy may be required to reduce the effect of various yield reducing factors in sesame production.

Despite the high potential for increased production of sesame and the rapidly growing demand in the international market for Nigerian sesame, it has been observed that the supply chain of sesame also suffers from different challenges including the adulteration of sesame or mixing of sesame with different sources of varying quality and lack of transparency among chain actors. Sesame being sold as plain seed, while quality characteristics such as oil content, percentage of admixture, fatty acid profile are not commonly analyzed due to lack of capacity to accurately measure the quality standards of sesame. Thus, it is believed that selecting and grading sesame according to its quality and clearly specifying its characteristics, such as its origin (for traceability), or whether it is organic or a speciality, etc., can create higher market prices as well as fulfill buyer expectations in the end market (Sorsa, 2009). This necessitates the coordination of different stakeholders at any stage in production, post harvest handling and processing steps to obtain better quality.

Sesame Improvement efforts in Nigeria

In Nigeria, concerted efforts have been made by researchers from NCRI Badegi to come up with an improve sesame variety that will address some of the problems affecting the productivity of the crop. Iwo (2002) evaluated 7 sesame genotypes and concluded that E-8 has the potential to grow well under favourable condition while, Other genotypes 530-6-1, Type 4 (1), Goza-25 and the check (Yandev 55) can perform better under poor environmental condition.

Future Opportunities and Prospects of Sesame Production

The current production of sesame seed is highly dependent on high marketable value and suitability of environmental conditions especially in the far north and the north central areas of Nigeria. The suitability of environmental condition for sesame crop production and the presence of genetic diversity of sesame in Nigeria would give better possibility or potential for improvement. The proximity of the country to international market and the high market demand for Nigerian sesame seed can be considered as another opportunity. The oil qualities of varieties currently

under production are relatively good and encouraging but needs to improve further. Though there is an effort by some research centres in Nigeria (National Cereal Research Institute, Badegi) in variety development and agronomic research but yet it is not enough to bring impact in increasing production and productivity of sesame. Diseases and insects are causing significant yield loss in sesame crop.

CONCLUSION

To solve the different challenges and improve production potential as well as quality of sesame crop, the use of improved technologies is highly recommended. Thus, it is important to focus on the following points:

- the need of the collaborative efforts of all concerned stakeholders including government organizations, researchers, NGOs, private investors and farmers…etc, in the improvement of the crop.
- Capacity building on sesame crop improvement and post harvest handling to maintain the quality of produce.
- Introduction and identification of better adaptable cultivars with better resistance to important diseases and pests.
- Development of high yielding potential variety with improved quality traits through application of modern breeding techniques.
- Development of improved agronomic and management practices.
- Environmental clustering for high oil quality as oil quality is influenced by environmental factors.
- Attention should be given to start refining processes for oil seeds in Nigeria than importing refined edible oil with comparable value that is being obtained from expert earnings from oilseeds.

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