



Sesame (*Sesamum indicum* L.) Baseline Survey in Taraba State, Nigeria.

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ABSTRACT

Sesame (*Sesamum indicum* L.) is one of the most important oil seed crop in Nigeria. It is one of the highest in oil content (50-52%), protein (17-19%), and carbohydrates (16-18%). Because of the high unsaturated fat and methionine contents, sesame seed and oil are in high demand in Nigeria as export materials. Since the bulk of domestic Sesame production has potential for foreign markets especially in Europe, the need for increased research in respect of the crop is urgent. There had not been preliminary information on status of sesame production in Taraba State. Questionnaires were administered among farmers in a participatory manner. Data were collected on cropping systems, cultural practices, yield levels, constraints to production and utilization. Responses obtained from farmers were analysed using non-parametric or descriptive statistics. The data was summarised into averages, percentages or ranges. The surveyed showed that most of the farmers cultivated between 1-3 ha of sesame more than ten years ago. The cropping system has been intercrop mostly with sorghum, groundnut and maize. 5 – 14 % of the farmers cultivated sesame as a sole crop. Also more than 40 and 38 % of the farmers interviewed identified cercospora leafspot and webworm respectively to be the most important pests in sesame. In conclusion, more research effort to finding solution to the challenges of pests, diseases, weeds and poor soil fertility problems in sesame is strongly advocated for in this part of the country. This will encourage the farmers to cultivate more hectarages of sesame considering many years of experience they have in producing the crop. The findings provide important guides to formulate good farmer - consumer oriented researches that will help to address these constraints and to improve the livelihoods of farmers in their rural communities.

1.0 INTRODUCTION

Since antiquity, Sesame (Beniseed) has been used as a valued oil crop. The Sesame belongs to the family Pedaliaceae and of the genus *Sesamum*. Sesame (*Sesamum indicum* L.) is an important food and cash crop in Nigeria. Average yield of the crop in the country is about the lowest in the world arising from what may be termed as sustained neglect of the crop in terms of research, extension and policy initiatives (Kalu and Adeyemo, 1998). Most of the main Beniseed experimental stations in Mokwa, Osara, Yandev, Beli, Lafia and Kwali dated back to 1959 have been closed down or work de-emphasized (Kalu and Adeyemo, 1998). It is also worthy of note that Sesame is an orphan crop internationally because it is not represented by any international research institute, though here in Nigeria it is covered by two research institutes i.e. National Cereal Research Institute (NCRI) Badeggi and Institute for Agricultural Research (IAR) Zaria. Research and extension efforts have not only been very marginal but have also been on a progressive decline in recent years. Among the oil crops, Sesame is one of the highest in oil content (50-52%), protein (17-19%), and carbohydrates (16-18%) (Uzoh, 1998; Baydar *et al.*, 1999; Uzun *et al.*, 2002; Were *et al.*, 2006). Therefore, because of the high unsaturated fat and methionine contents, Sesame seed and oil are in high demand in Nigeria as export materials. Since the bulk of domestic Sesame production has potential for foreign markets especially in Europe, the need for increased research in respect of the crop is urgent. There had not been documented evidence of preliminary information on status of sesame production in Taraba State. This paper reports the results of a study on farmers' production constraints, field pests, weeds and pest control practices in the study areas.

2.0 METHODOLOGY

Taraba State is located at the north eastern part of Nigeria. It lies between latitude 6° 30' and 8° 30' north of the equator and between longitude 9° 00' and 12°

00' east of the Greenwich meridian. The State shares boundaries with Bauchi and Gombe States in the north, Adamawa State in the east, and the Cameroon Republic in the south. The State is bounded along its western side by Plateau, Nassarawa and Benue States. The State has a land Area of 60,291km² (Tunwari and Nahunnaro, 2016). It is divided into sixteen Local Government Areas (LGAs) and three Senatorial districts (Taraba north, central and south). Major crops produced in the state include maize, rice, sorghum, millet, groundnut, sesame, Bambara nut, yam, sweet potato and cocoyam.

2.1 Data Collection

Focus group discussions were held with average of 12 farmer groups per five wards each from five LGAs (Wukari, Takum, Donga, Ussa and Ibi), predominantly sesame producing areas in the state. The discussion helped to determine the years of farmers experience in sesame production, hectarage cultivated, major cropping system, important weeds spp., major pests and diseases and management practices. A semi-structured questionnaire was administered to 300 farmers in their local language spread across the wards to supplement findings from the group discussions. The data collected was computed based on percentages.

3.0 RESULTS AND DISCUSSION

Results of farmers experience in sesame production indicated that most farmers (48, 57, 53, 49, 41 %) in Wukari, Takum, Donga, Ussa and Ibi respectively had been cultivating for more than 10 years, while among the farmers interviewed in the areas only 3 – 15 % of the farmers were new entrants in sesame cultivation with 1- 3 years' experience. This implies that farmers in Taraba State have been cultivating sesame for many years ago. This support USAID MARKETS (2009) who reported that one of the major sesame production areas were Nassarawa, Benue and Taraba.

Table 1: Farmers experience in Sesame production in Taraba State, Nigeria in 2015

Years	Local Government Areas				
	Wukari	Takum	Donga	Ussa	Ibi
1-3	3.0	6.0	6.0	10.0	15.0
4-6	19.0	15.0	18.0	19.0	17.0
7-9	30.0	27.0	23.0	26.0	27.0
10 and above	48.0	57.0	53.0	49.0	41.0

Table 2 presents the hectarages of sesame cultivated in Taraba State. The result showed that 49 – 70 % farmers cultivated up to 1-2 ha of sesame, 22 – 43 % utilized between 3-5 ha, 4 – 5 % cultivated between 6-

9 ha and only 2 – 4 % were engaged in 10 ha and above. This means that most farmers in this part of the country cultivate sesame majorly in small scale.

Table 2: Sesame hectares cultivated in Taraba State, Nigeria in 2015

Hectarages (ha)	Local Government Areas				
	Wukari	Takum	Donga	Ussa	Ibi
1-2	51.0	70.0	59.0	49.0	52.0
3-5	42.0	22.0	35.0	43.0	42.0
6-9	4.0	5.0	4.0	5.0	5.0
>10	3.0	3.0	2.0	4.0	3.0

Table 3 indicated the major sesame cropping system in Taraba state. Among the farmers interviewed 34 – 49 % of the sesame farmers intercropped with sorghum. 25 – 35 % intercropped sesame with groundnut. 10 – 27 % intercropped millet with maize; while 5 – 14 % grew sole sesame. This implies that most farmers in Taraba State rarely cultivate sole

sesame, but intercrop sesame with other crops particularly sorghum, groundnut and maize. This agrees with Olukosi *et al.* (1991) who reported that mixed farming and mixed cropping had been traditionally practiced and were still very common in Nigeria.

Table 3: Percentage Sesame Intercropped system in Taraba State, 2015, Nigeria in 2015

Cropping System	Local Government Areas				
	Wukari	Takum	Donga	Ussa	Ibi
Sole	5.0	11.0	14.0	10.0	8.0
Sesame / Ground nut	35.0	25.0	26.0	30.0	35.0
Sesame/ Sorghum	49.0	42.0	38.0	34.0	43.0
Sesame / Maize	10.0	22.0	22.0	27.0	14.0

Table 4 shows the important weed species infesting sesame and sorghum fields during production in Taraba state. Among farmers interviewed, 60% perceived that *Rottboellia cochinchinensis* dominated crop fields. This was followed by 13 % *Commelina benghalensis*, 12 % *Digitaria horizontalis*, 8%

Imperata cylindrica, and 4% *Pennisetum pedicellatum*. This shows that, farmers in the state are faced with the challenge of itch grass infestation in fields occupied by sesame crop, followed by tropical spiderwort.

Table 4: Important weed species in Sesame field in Taraba state cropping season, Nigeria in 2015

Weed Species	Common Name	Family	Growth Habit	% Respondent
<i>Rottboellia cochinchinensis</i>	Itchgrass	Poaceae	AG	63.0
<i>Imperata cylindrical</i>	Spear grass	Poaceae	PG	8.0
<i>Pennisetum pedicellatum</i>	-	Poaceae	AG	4.0
<i>Commelina benghalensis</i>	Tropical spiderwort	Commelinaceae	PSp	13.0
<i>Digitaria horizontalis</i>	Crabgrass	Poaceae	PG	12.0

PG = Perennial Grass, AG = Annual Grass, PSp = Perennial Spiderwort, ABL = Annual Broadleaf, PS = Perennial Sedge. - = Not Available

Farmers listed a total of 16 production constraints of which 5 were diseases, 5 pests, 5 abiotic constraints such as drought or low soil fertility (Table 5). Cercospora leafspot disease was reported as the most important diseases (42 – 53 %) across the 5 local governments (LG) follow by Leaf curl virus, while the least was bacterial blight disease. This confirms report by Tunwari and Nahunnaro (2016) that cercospora leafspot was the most prevalent in Nigeria

and elsewhere. It was further revealed that the sesame webworm (*Antigastra catalaunalis* Dup.) and the gall midge (*Asphondylia sesami* Felt.) were found to be the most numerous with averagely 40% and 30.8% occurrences, respectively in all the LGs visited. This confirms report by Egonyu *et al.* (2005) that webworm and gall midge were the most important in occurrence.

Table 5: Percentage (%) farmers' responses to pest, diseases and other sesame production constraints in Taraba State, Nigeria in 2015

Constraints	Percentage response				
	Wukari	Takum	Donga	Ussa	Ibi
Diseases					
Cercospora leafspot	40	52	47	53	45
Leaf curl	30	30	29	29	35
Fusarium wilt	20	13	18	11	11
Alternaria blight	6	3	4	4	6
Bacterial blight	4	2	2	3	3
Pests					
Web worm	38	47	45	45	43
Gall midge	26	30	35	32	30
Whiteflies	14	11	7	9	14
Aphids	10	4	6	6	5
Termites	12	8	7	8	8
Abiotic constraints					
Drought	35	28	19	14	23
Poor germination	20	14	15	25	15
Poor yield	39	27	25	32	19
Lack of manure or fertilizers	4	7	18	15	23
Poor soil fertility	2	24	23	13	20

The results on production practices showed that farmers employed a range of practices in sesame production namely: early planting, use of improved varieties, intercropping, pesticide application, use of herbicides, crop rotation, burning of crop residues, fallowing among others (Table 6). Among the recommended management practices, early sowing was the management common and was being practiced by 89 % of the farmers. Pesticide application and fertilizer application were the least employed with 5.7 % and 9.8 % of farmers interviewed implementing them respectively. 46 % of the farmers practiced crop rotation, while 31.4 % reported that they adopt fallows for exhausted fields. Also 8.3 % burned crop debris after harvest. 58 % farmers weeded their farms twice during the growing season, while 39 % weeded only once during the

season. Control of diseases in Nigeria has depended on some cultural practices and on multiple applications of fungicides, though fungicidal treatment was not reported by farmers as one of the management practices. Effective and long-term control of fungal diseases can be achieved by applying recommended fungicides at the recommended time intervals. Combination of several control strategies is recommended (Kucharek, 2004). Reduction of initial inoculum is achieved through cultural measures such as crop rotation, removal of volunteer plants, and burial of crop residue (Shokes and Culbreath 1997). In addition, low to moderate resistance is present in some released cultivars and much effort has been directed at developing cultivars with high levels of disease resistance.

Table 6: Mean Percentage (%) sesame management practices in Taraba State, Nigeria in 2015

Management practices		No of practicing farmers	% farmers responses
Varieties planted	Improved	111	37
	Local	189	63
Weeding regime	Once	117	39
	Twice	174	58
	Thrice	9	3
Inter cropping	Yes	219	73
	No	81	27
Pesticide application	Yes	17.1	5.7
	No	282.9	94.3
Fertilizer application	Yes	294	9.8
	No	270.2	90.2
Crop rotation	Yes	138	46
	No	162	54
Burning of crop residues after harvest	Yes	111	37
	No	189	63
Fallowing fields	Yes	112.5	37.5
	No	187.5	62.5
Planting date	Early planting	267	89
	Late planting	33	11
Herbicide	Yes	225	75
	No	75	25

4.0 CONCLUSION

More research effort towards finding solution to the challenges of low yield in sesame is strongly advocated for this part of the country as this will encourage the farmers to cultivate more hectares of sesame since they have many years of experience in the production of the crop. Also the farmers need to be sensitized on the practice of fertilizer, fungicide and pesticide application, to increase sesame production for food security in Nigeria.

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