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REGULAR ARTICLE

RESPONSES OF SOME COWPEA VARIETIES TO TWO *STRIGA* STAINS IN NIGERIA

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SUMMARY

The research was conducted in a greenhouse at the Internatinal Institute of Tropical Agriculture (IITA) to investigate the response of eighteen (18) cowpea varieties to two (2) *Striga gesnerioides* strain from Samaru of Kaduna Stete and Mingibir in Kano state Guinea and Sudan savannah of Northen Nigeria respectively. A total of 0.5g of the available *S. gesnerioides* seed from each location was infested in eighteen pots. The dormancy was broken followed by planting of the Cowpea variety. It was observed that the angiospermic parasite response to some Cowpea varieties while some of the *Striga* was not sensitive to the root exudates. Samarium strains posses high number of *Striga* emergence but produce high yield. Compared to that of Mingibir. No any response in B301 in both the Samaru's and Mingibir's strains.

Keywords: Striga, Cowpea Samaru's and Mingibir's strains.

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1. Introduction

Striga which is parasitic angiosperm belonging to the family Scropylariaceace, which are generally known as witch weeds or makasa, kudiya or wutar dawa" in Hausa language its has various debilitating effects inflicted upon it host it's a flowering plant which attack crop and produced no yield and can even completely kill the plant if its highly susceptible (Dube and oliver, 2001)

The *Striga* spp lives as obligate parasites whose seed persist in the soil for as long 20 years the *Striga* attach its self to the roots and when the cowpea roots produce nutrient it sock by the *Striga* which formed total distraction of the crop. The *Striga* takes about 4_10 weeks to complete its life cycle (Emechebe, et al 1991) some species attack millet and maize (cereals) while another is specific to cowpea (legumes) that is its host specific, depending on the intent of impastation, reduction in per hectare grain yield of 30_60% are common. *Striga* it must severe in low moisture, low fertility soil and the thousand of seed it produce can remain dormant but viable for many years. Practical control method consists of a combination of crop rotation with non host weed sanitation and resistance voucher.

Once *Striga* become established in a field eradication is very difficult parasitic weed such as the *Striga* affect the lives over 100 million people in Africa are infect.40% of arable land in savanna region between 10 and 100 percent of loss in crop yield is causes by parasitic weeds, Striga gesnerioides is the widely distributed species in Africa parasitizing cowpea, tobacco, and also the

Striga hermonthica parasitizing crops such as sorghum, millet, rice and sugarcane.

In Nigeria, *Striga* occur in the savanna and Sahel zone which constitute about 40% may be affected within the next years (Laycock, 1989)

Information on the biology of *Striga* is sacredly, Parker, (1984) and Ba (1977) studies the embryology, morphology, anatomy polylogenic position of different striga species, according to them *Striga* gesnenoides, is a serious parasite on cowpea causes large yield losses in west Africa as such it host specificity, germination, effect on host is considered in this investigation.

This research work is aimed to observe the responses of some cowpea varieties to two *Striga* strain in some parts of Nigeria in respect to Striga emergence, the number of *Striga* after washing the soil. Number of plant emergences. number of plant at thinning harvest, and 50% flowing, the highs of the plant at harvest.

2. Materials and Methods

The research was conducted at international institute of tropical agriculture IITA, Kano station.

Study Area

The study areas are Samaru Zaria, Kaduna state of Nigeria. Located in the Northern guinea savannah region which is characterized by low rainfall and long dry periods. This is in addition to the devastation caused by man through bush clearing for agriculture. The trees, which are taller and bigger in this area than in the northern part of the Guinea savannah, are easily exploited due to accessibility over the grassland terrain. The term derived savannah is given to its southern portion, which today marks the transition between the two broad groups of vegetation types in Nigeria: the forest in the south and the true savannah in the north. The Guinea savannah, with its typically short trees and tall grasses, is the most luxuriant of the savannah vegetation belts in Nigeria and the second is Mingibir Kano state in Northern Sudan savannah It spans almost the entire northern states bordering the Niger Republic and covers over one quarter of Nigeria's total area. The low annual rainfall of usually less than 1000 mm and the prolonged dry season (6-9 months) sustain fewer trees and shorter grasses than the Guinea savannah. It is characterised by abundant short grasses of 1.5-2m and few stunted trees hardly above 15m. It is by far the most densely human populated zone of northern Nigeria. Thus, the vegetation has undergone severe destruction in the process of clearing land for the cultivation of important economic crops such as cotton, millet, maize and wheat. This is in addition to devastation due to animal husbandry, especially cattle rearing, which is greatly favoured in this belt because the area is relatively free from tse-tse fly. The trees of the Sudan savannah include the acacia, the shea-butter, baobab and the silk cotton (Muhammad and Amusa, 2003).

Green House Experiment

The Striga seeds were collected randomly from the two study areas Samaru and Minjibir respectively. The pots were filled with soil containing small amount of manure and watered for one day as reported by (Muhammad and Amusa, 2003).

Infestation of *Striga* with sand

9g of the available *Striga* seeds was weighed by the use of electric balance. The soil was sieve with micro sieve so that the soil particle and *Striga* seed are of the same size, 43.2g of soil was also obtain in the laboratory using electric balance, the soil and *Striga* seed were mix trolley then one spatula was infested on each pot which equivalent to 0.5g of *Striga* on each pot, the same procedure is repeated to munjibir, they were watered for ten days before planting

Planting period

The pots were labeled according to cowpea variety, 18 varieties contains the samaru *Striga* seeds are levels with s. the same procedure is done to munjibir *Striga* seeds. The experiment is replicated three times.

3. Results and Discussion

Based on the research conducted on this project 99% of the cowpea varieties has respond to the parasite from the two strain {Munjibir and Samaru}, because they show poor yield, stunting and the rate of *Striga* germination was very high, (Tables 1 and 2) there is also total destruction of cowpea varieties this also agree with the findings of Atokple, and Emechebe. 1993.and Adam, (1990) which say Striga gesnerioides has reach greatest diversity and is the well know *Striga* spp that cause greatest yield loses.

From the result the rate of *Striga* germination was very high, this show that the *Striga* seeds from each stain are sensitive to the varieties roots exudates but the samaru strain are highly sensitive to the cowpea varieties than the mungibir strain since the result show high number of *Striga* germination in samaru than the mungibir stained and samaru strain germinate each in some varieties than the mungibir strain.

In some varieties the *Striga* was stimulated to germinate but does not affect the growth or yield of the cowpea variety like M, IT04K-227-4, M IT98KD 288, S. IT04K-343-1, S. IT98K-506-1, S Aloka. Local. Among the varieties ITO3K-130 contain high number of *Striga* in Samuri stain while ITA99K-216-48-1 contain high rate of *Striga* germination in Mungibir stain some varieties of both mungibir and samaru strain reaches machinery and produces yield but of all the high number of *Striga* germination in samaru stain they provide more yield than the Mungibir strain.

The response of IT98KD-288 is very high because the first variety that emerge in both. But variety B301 does not response to the strain, No *Striga* germination they provide good yield no sign of stunting or chlororises in both SB301, MB301.

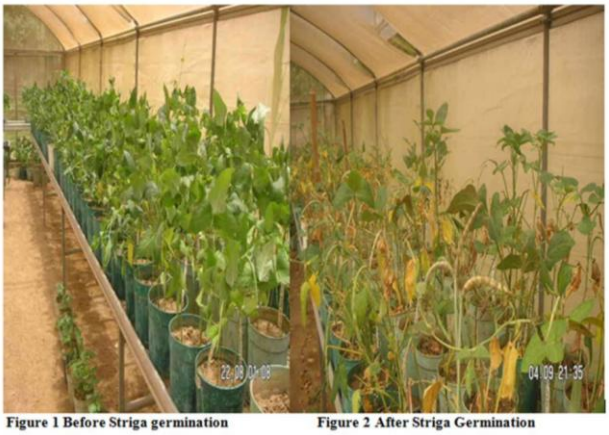

Figure 1 Before Striga germination

Figure 2 After Striga Germination

Figure 3 Striga at full germination

Figure 4 Attachment of the Striga after washing

Table 1. Minjibir Strain

VARIETY X MUNJIBIR STRIGA	Strain		DAYS OF STRIGA IMG	NO OF STRIGA IMG PER POT	NO OF STRIGA AFTER WSH	NO OF PLANTS EMERGED	NO OF PLANTS AT THINNING	PLANTS AT HARVEST	DAYS TO 50% FLOWERING	NO OF PODS	HEIGHT OF THE PLANT AT HARVEST
IT97K-573-2-1	Minjibir	REP1	0	0	0	4	3	3	45	0	30
	Minjibir	REP2	40	1	2	2	2	2	45	0	35
	Minjibir	REP3	0	0	0	4	3	3	45	0	29
IT04K-343-1	Minjibir	REP1	0	0	0	6	3	3	0	0	30
	Minjibir	REP2	0	0	0	6	3	3	0	0	25
	Minjibir	REP3	43	3	4	6	3	2	0	0	27
IT04K378-4	Minjibir	REP1	0	0	0	3	3	3	48	6	35
	Minjibir	REP2	0	0	0	3	3	3	47	4	40
	Minjibir	REP3	44	4	6	4	3	3	48	5	23
IT04K-227-2	Minjibir	REP1	0	0	0	6	3	3	49	4	32
	Minjibir	REP2	0	0	0	3	3	3	46	6	29
	Minjibir	REP3	42	0	0	2	2	3	49	5	29
IT99K—7-22-2-2	Minjibir	REP1	42	3	9	3	3	3	50	1	35
	Minjibir	REP2	43	0	2	6	3	3	0	0	30
	Minjibir	REP3	43	0	1	6	3	3	0	0	29
IT03K-130	Minjibir	REP1	46	14	20	2	2	2	49	4	24
	Minjibir	REP2	40	9	15	6	3	0	48	3	20
	Minjibir	REP3	44	12	20	4	3	0	50	2	26
IT99K-216-48-1	Minjibir	REP1	40	26	26	5	3	3	48	6	25
	Minjibir	REP2	44	27	27	6	3	3	48	2	28
	Minjibir	REP3	40	15	20	6	3	1	48	2	40
IT98KD-288	Minjibir	REP1	44	3	7	4	3	2	40	9	41
	Minjibir	REP2	40	16	28	6	3	0	44	6	42
	Minjibir	REP3	46	12	22	6	3	3	45	4	50
IT98K-494-6	Minjibir	REP1	0	0	2	6	3	3	44	7	18
	Minjibir	REP2	0	0	0	6	3	3	46	7	12
	Minjibir	REP3	42	1	1	4	3	3	47	5	30
IT00K-901-5	Minjibir	REP1	41	16	25	5	3	3	47	7	26
	Minjibir	REP2	47	2	3	3	3	3	44	0	30
	Minjibir	REP3	43	10	20	4	3	3	46	0	25
IT99K-213-11-1	Minjibir	REP1	42	1	3	4	3	3	0	2	35
	Minjibir	REP2	40	11	20	3	3	3	0	4	33
	Minjibir	REP3	0	0	0	2	2	2	41	3	20
IT04-225-1	Minjibir	REP1	46	29	35	1	1	1	45	6	35
	Minjibir	REP2	0	0	0	6	3	3	45	3	32
	Minjibir	REP3	0	0	0	3	3	3	48	4	33
B301	Minjibir	REP1	0	0	0	6	3	3	48	3	45
	Minjibir	REP2	0	0	0	4	3	3	50	0	46
	Minjibir	REP3	0	0	1	6	3	3	48	2	30
IT00K-835-45	Minjibir	REP1	42	38	40	4	3	3	49	7	28
	Minjibir	REP2	43	17	25	4	3	3	48	5	30
	Minjibir	REP3	41	4	10	6	3	3	48	6	30
ALOKA LOCAL	Minjibir	REP1	43	10	10	3	3	3	42	4	19
	Minjibir	REP2	45	1	2	3	3	3	40	3	20
	Minjibir	REP3	0	0	0	6	3	3	42	11	25
IT99K-494-3	Minjibir	REP1	0	0	6	2	2	2	40	10	27
	Minjibir	REP2	0	0	1	3	3	3	40	6	28
	Minjibir	REP3	43	7	8	3	3	3	48	8	32
IT97K-277-2	Minjibir	REP1	46	2	2	5	3	3	49	2	30
	Minjibir	REP2	41	0	0	6	3	3	40	2	31
	Minjibir	REP3	0	0	0	5	3	3	40	1	16
IT98K-506-1	Minjibir	REP1	42	6	6	6	3	3	48	0	17
	Minjibir	REP2	41	10	16	5	3	3	40	0	16
	Minjibir	REP3	46	2	8	6	3	3	41	0	18

Table 2. Samaru Strain

VARIETY X SAMARU STRIGA	Strain		Days of *Striga* img	No of *Striga* img per pot	No of *Striga* after wsh	No of plants emerged	No of plants at thinning	Plants at harvest	Days to 50% flowering	no of pods	height of plants at harvest
IT97K-573-2-1	Samaru	REP1	0	0	2	6	3	3	42	4	30
	Samaru	REP2	0	0	1	5	3	3	46	7	35
	Samaru	REP3	0	0	4	2	2	2	43	4	29
IT04K-343-1	Samaru	REP1	44	5	5	4	3	1	41	3	30
	Samaru	REP2	0	0	6	6	4	2	40	3	25
	Samaru	REP3	43	3	14	3	3	3	43	5	27
IT04K378-4	Samaru	REP1	0	0	3	2	2	2	40	6	35
	Samaru	REP2	46	1	1	1	1	1	40	3	40
	Samaru	REP3	41	1	6	4	3	3	41	8	23
IT04K-227-2	Samaru	REP1	46	2	2	6	3	1	40	4	32
	Samaru	REP2	41	27	29	5	3	3	45	9	29
	Samaru	REP3	42	22	24	3	3	2	44	6	35
IT99K—7-22-2-2	Samaru	REP1	45	12	18	4	3	2	0	0	30
	Samaru	REP2	0	0	0	2	3	2	46	5	29
	Samaru	REP3	0	0	0	3	2	3	50	1	24
IT03K-130	Samaru	REP1	40	1	6	3	3	0	40	5	20
	Samaru	REP2	44	21	26	6	3	0	49	2	26
	Samaru	REP3	41	8	20	2	4	1	46	4	25
IT99K-216-48-1	Samaru	REP1	42	18	25	1	2	3	0	0	28
	Samaru	REP2	43	3	4	3	1	3	0	0	40
	Samaru	REP3	40	3	6	4	3	2	0	0	41
IT98KD-288	Samaru	REP1	44	17	17	4	3	2	0	0	42
	Samaru	REP2	40	17	20	4	3	0	0	0	50
	Samaru	REP3	46	18	18	4	3	2	0	0	40
IT98K-494-6	Samaru	REP1	41	6	6	3	3	1	45	9	18
	Samaru	REP2	41	16	16	3	3	2	45	9	15
	Samaru	REP3	45	9	11	6	3	1	41	7	30
IT00K-901-5	Samaru	REP1	0	0	0	4	3	3	43	4	18
	Samaru	REP2	45	9	17	3	3	2	46	3	22
	Samaru	REP3	45	18	19	3	3	3	44	3	20
IT99K-213-11-1	Samaru	REP1	46	8	12	4	3	3	48	2	33
	Samaru	REP2	43	4	8	4	3	3	47	6	36
	Samaru	REP3	44	9	9	6	3	1	40	6	30
IT04-221-1	Samaru	REP1	0	0	10	1	1	1	40	4	27
	Samaru	REP2	40	3	3	3	3	2	40	0	30
	Samaru	REP3	44	20	25	6	3	3	41	1	22
B301	Samaru	REP1	0	0	1	3	3	3	44	1	25
	Samaru	REP2	0	0	0	2	2	2	44	11	50
	Samaru	REP3	0	0	0	4	3	3	40	8	35
IT00K-835-45	Samaru	REP1	43	2	10	6	3	3	40	6	51
	Samaru	REP2	42	1	5	4	3	2	47	4	50
	Samaru	REP3	41	12	17	1	1	0	46	2	52
ALOKA LOCAL	Samaru	REP1	40	2	15	5	3	3	45	6	28
	Samaru	REP2	45	1	3	4	3	3	44	4	16
	Samaru	REP3	43	1	2	4	3	0	44	1	22
IT99K-494-3	Samaru	REP1	45	25	25	6	3	3	46	3	23
	Samaru	REP2	45	6	7	5	3	3	48	10	28
	Samaru	REP3	47	5	5	3	3	2	42	5	24
IT90K-277-2	Samaru	REP1	0	0	1	6	3	2	41	4	30
	Samaru	REP2	0	0	0	5	3	3	51	0	34
	Samaru	REP3	0	0	0	4	3	2	43	0	40
IT98K-506-1	Samaru	REP1	46	1	5	5	3	1	43	0	48
	Samaru	REP2	42	9	11	6	3	3	46	6	50
	Samaru	REP3	45	4	6	4	3	3	48	0	41

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