# PROMOTION OF STRIGA TOLERANT MAIZE VARIETY IN TUDUN SAIBU, SOBA LOCAL GOVERNMENT AREA, KADUNA STATE

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**ABSTRACT**
On- farm demonstration was conducted at Tudun Saibu in Soba LGA Kaduna State, Nigeria during the 2012wet season to create awareness, training and establishment of demonstration plot to compare the performance of improved maize Striga-tolerant variety Acr. 97 TZL Comp. 1-W strip cropped with soyabeans (TGX 1448-2E) as a trap crop and farmers' variety planted sole to control or manage *Striga hermonthica*. A group of fifty-seven farmers were purposively selected as maize farmers group. This selection was done in consultation with the group, village head, Village Extension Agents in charge of the area, availability of land infested with striga and inputs. . The demonstrations were conducted on two farmers' plots infested with Striga. The two plots were planted side by side (experimental and control plots) for farmers themselves to compare the performance. Simple descriptive statistics and t-test analysis were employed to treat the data. The results indicated that improved maize Striga-tolerant variety, strip- cropped with soyabeans significantly produced higher yield of 18.90kg and the farmer's variety was 7.52kg.Also, the striga-tolerant maize variety was taller than the farmers' variety planted sole with 234.73cm and 153.70cm respectively, Based on this study it was concluded that strip cropping of soyabean with Striga-tolerant maize variety assisted in controlling *Striga hermonthica,* which resulted in increase in yield, and could lead to improvement in standard of living of the farmers. The study recommended the use of soyabean as a trap crop for control of Striga, the use of Striga- tolerant maize variety, Acr. 97 TZL Comp. 1-W for control of *Striga.* The extension staff at all levels should be trained to educate the farmers on this technology.
**Keywords:** Demonstration, awareness creation, and Striga tolerant

## INTRODUCTION

The name maize is derived from an *Arawak-Carib*word, '*Mahiz'*. It is also known as 'Indian Corn' and in America simply as 'Corn' (Purseglove, 1972). According to Matsuoka *et al*. (2002), all maize arose from a single domestication in southern Mexico about 9,000 years ago and later, spread from this region over the Americas and Europe. Maize *(Zea mays* L) is a cereal of the grass sub-family *Pannicoideae,* and family *Poaceae.*, It is an important grain crop of the world that is used as an animal feed supplement for silage making, human consumption and the straw for bedding. It also has values such as provision of a high dry matter, starch and fibre in the diet(Acquaah, 2005). Onwueme (1991) reports that maize is currently replacing traditional cereal crops such as sorghum and millet in subsistence farming systems in Northern Nigeria. This is attributed to increased demand for maize for the preparation of various food items and industrial purposes.

The availability of high yielding maize varieties has further attracted more producers and increased production of the crop in the country. In 1994, the estimated total production of maize in Nigeria was 6.90MT from an estimated area of 5.43milion hectares of land (Lagoke et al., 1997). Unfortunately, increased production has been constrained by factors such as drought, Downey mildew, Maize Streak Virus and most of all is Striga spp. infestation which hinders maize production and decreases its yield. *Strigahermonthica*reduces the yield of maize by 80 - 100% up when infection occurs at an early growth stage (Kim *et* a/., 1988; Lagoke*et al.,* 1994).

Parasitic weed (Striga species) problem is endemic in the study area which leads to the decline in maize production in the infested farms .During field observation, it was found that most of the farmers were small scale and are still practising their traditional ways of controlling *Striga*by abandoning their infested lands. This has resulted to poverty, due to the *Striga* infestation.

This study is expected to provide valuable information and training on improved *Striga* management practice. However, with the development of sustainable technologies in *Striga* control by research, farmers should be stimulated to embrace the challenges of tackling Striga infestation in their communities. It will also increase public awareness on recent research findings through understanding the benefit and encourage adoption, integration of the technology in farming systems.

The broad objective of this study was to promote the adoption of Striga control practices through the cultivation of improved maize Striga-tolerant variety strip- cropped with soybeans. The specific objectives were to:

i. create awareness on the superiority of improved striga tolerant maize variety strip-cropped with soyabeans
ii. train farmers on the recommended Striga control technologies/skills.
iii. determine the difference between the improved *Striga*-tolerant maize variety on growth rate and yield with the local variety

## METHODOLOGY

The soyabeans variety used in the demonstration was TGX 1448-2E developed by the International Institute for Tropical Agriculture (IITA), Ibadan. The soyabeans variety is non-shattering, moderately resistant to *Cercospora* leaf spot disease, high yielding and is capable of stimulating high Striga seeds germination (Lagoke *et al*, 1997).

The maize variety, ACR 97TZL Comp. 1-W, is an improved open pollinated and *Striga*-tolerant variety which has been released by the Institute for Agricultural Research, Ahmadu Bello University Zaria (IAR/ABU). It is moderately tall in height and late maturing variety.

The demonstrations were conducted on two farm lands infested with *Striga* and were established in June 2012. A Simple Paired Plot Design (SPPD) were placed side by side with normal agronomic practices in the same field as a way for farmers themselves to compare the performance. Each plot measures 50m length and 25m width i.e. 25x50m. Treatment include a strip cropped of soyabeans TGX- 1448-2E identified as a potential trap crop with maize *Striga* tolerant variety, ACR 97TZL Comp. 1 -W, compare with farmers local maize variety planted sole.

The land was ploughed, harrowed and ridged 75cm apart. Maize was sown at an inter row spacing of 25cm between stands, which occupies two ridges, and soyabeans was drilled to one ridge i.e. in strip, maize occupied two (2) ridges and soyabean one (1) ridge spread all over the first plot. All the agronomic practices were carried out at the same time the same method. The two plots were hoe-weeded at three weeks after sowing (3 WAS) and five weeks after sowing (5 WAS) and earthed up at *8* weeks after sowing (8 WAS) followed with hand pulling of other weeds except *Striga*..Fertilizer was applied to the maize at the recommended rate of 120KgN/ha and $60KgP_20_5$ and $60KgK_20$ using 20:10:10 compound fertilizer and Urea. The nitrogen was split applied at six weeks after sowing. The strip cropped soyabean received a basal $50KgP_20_5$ using single superphosphate (SSP 18% $P_20_5$)

For the purpose of this study, both primary and secondary data were collected. Primary data were collected from the field observations of *Striga* parameter which include *Striga* shoot count, plant height, stand count at harvest, crop vigour score, yield and yield components of maize and soyabeans. While the secondary information data comprised of mainly documented and reviewed works on the use of different improved varieties of *Striga* control.

Simple descriptive statistics were used for objective one and two while t-test analysis was employed for objective three respectively.

## RESULTS AND DISCUSSION

Table 1 Awareness of improved maize Striga tolerant strip cropped with soyabean to control Striga among farmers in the study area, Tudun Saibu

**Table 1: Awareness**

| Participants | Frequency | Percentage |
|---|---|---|
| Number aware | 0 | 0.0 |
| Number not aware | 57 | 100.0 |
| Total | 57 | 100.0 |

Table 1 shows that before the creation of awareness among farmers in the area none of the farmers has any knowledge about improved maize Striga tolerant variety. Demonstration plots were established to create farmers awareness in the study area. The rate of awareness of improved maize Striga tolerant variety (Acr. 97TZL Comp. 1-W) among the farmers was 100%.

**Table 2: Famers trained on various agronomic practices of improved maize Striga tolerant variety production**

| Agronomic activities | Number of Farmers Trained | Number of Farmers that understood | Number of Farmers who did not understand (%) |
|---|---|---|---|
| Land preparation /ridging | 57 | 57 | - |
| Planting/Spacing | 57 | 55 | 2 |
| Weeding | 57 | 57 | - |
| Fertilizer application method | 57 | 56 | 1 |
| Harvesting | 57 | 57 | - |
| Storage method | 57 | 55 | 2 |
| Seed treatment | 57 | 57 | - |

**Determination of differences between the improved maize Striga tolerant variety on growth rate and yield with the local variety under t-test analysis**

In trying to find out whether the differences exists in terms of growth rate and yield between the improved Striga tolerant variety and the farmers variety, thirty (30) maize stands were randomly selected each from the two (2) plots out of the plant population. Their heights were measured in cm at 12 weeks after sowing and at the harvest period their yield i.e. grain yield were also collected.

The yield obtained from the improved variety was 18.90kg and the farmer's variety was 7.52kg while the mean height of the improved variety was 234.73cm and that of the local variety was 153.70cm. These were subjected to t-test analysis. The following are the results obtained from the analysis.

The following formula was employed in determining whether there is significant different in the growth rate of improved maize Striga tolerant variety and farmer's variety

$$t = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2+S_2^2}{n^1n^1}}} = \sqrt{\frac{234.73 - 153.70}{\frac{3.692 + 2.20}{30*30}}} = 122.78$$

$X_1$ =Mean plant height of the Striga tolerant variety
$X_2$ = Mean plant height of the local variety
$S_1$ = Standard deviation of the Striga tolerant variety
$S_2$ =Standard deviation of the local variety
$n_1$ = Sample size of the improved variety
$N_2$ = Sample size of the local variety

From the result of the analysis, the t-calculated was 122.79, while the table t-value at 5% level of significance was 1.812. The calculated value was greater than the critical value therefore the hypothesis of no significant difference in the growth rate of *Striga* tolerant and local variety is rejected and the alternative that the Striga tolerant variety is better than the local variety is accepted.

**ii. Analysis on yield**

From the formula:

Where:
$X_1$ = Mean yield of Striga tolerant variety
$X_2$ = Mean yield of the local variety
$S_1$ =Standard deviation of the *Striga* tolerant variety
$S_2$ = Standard deviation of the local variety
$n_1$ = Sample size of the improved variety
$n_2$ = Sample size of the local variety

From the results, the calculated t-value was 10.43 while the critical value was 1.182 at *5%* level of significant. Since the calculated value is greater than the table (critical) value, the null hypothesis of no significant different in the yield is rejected. Therefore the Striga tolerant maize variety is better in yield.

## CONCLUSION AND RECOMMENDATIONS

This study reveals that strip cropping of soyabean with Striga tolerant maize variety assisted in controlling Striga hermonthica, which resulted in increase in yield, and could lead to improvement in standard of living of the farmers.

Based on the findings of the study the following recommendations are therefore suggested.

The use of soyabean as a trap crop for control of Striga. The use of Striga tolerant maize variety, Acr.97 TZL Comp. 1-W for control of *Striga.*

The extension staff at all level should be trained to educate the farmers on this technology. Effort should be intensified to enable more farmers understand the full detail of the technology.

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