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RESEARCH PAPER

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Effects of Time of Planting Sweet Potato (*Ipomoea batatas* (L.) Lam) for the Control of Weeds in Maize (*Zea mays* L.)

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ABSTRACT

A study was conducted in 2009 at the Teaching and Research Farm of the Department of Agronomy, Delta State University, Asaba Campus with the aim of evaluating the effects of time of planting of sweet potato for the control of weeds in maize. The treatments were planting of sweet potato and maize on the same day, planting of sweet potato two weeks before maize planting sweet potato two weeks after maize and planting of sole maize. Generally, the results showed that the performance of maize (planted two weeks before sweet potato) in terms of plant height, leaf area, number of leaves, days to 50% tasselling, number of grains / cob, number of rows/cob, 1000 grain weight and dry grain yield/plot was significantly higher compared to the other treatment (planting of sweet potato two weeks before maize planting sweet potato two weeks after maize and planting of sole maize) hence planting of sweet potato two weeks before maize should be recommended to farmers in Asaba agro ecological zone and its environs.

Keywords: Cover Crops, Weed Control, Maize and Sweet Potato.

INTRODUCTION

Maize also called corn is an important staple crop in Africa and the most widely distributed of the cereal crops in the world. It ranks 3rd following wheat and rice. It is highly valuable and used as feed for livestock and as a raw material for many industrial products. Each part of maize including the stalk, leaves, silk, cob and kernel has a commercial value (Agbogidi, 2006). Sweet potato belongs to the family Convolvulaceae and is widely cultivated vegetatively from vines. It ranks 7th in world food production, 4th in the tropics, 3rd within sub-Saharan Africa and 4th among the root crops of Nigeria (FAO, 2002). It is a food security item and dependable source of income for resource poor families in Nigeria (Ogunbodede and Olakojo, 2001). It is used as livestock feeds and for agro industrial and pharmaceutical raw materials. The leaves are used as vegetables, good source of roughage and protein for ruminants. It is one of the low growing crops whose canopy shades out weeds, protects the soil surface from direct impact of rain drops and reduces surface soil temperature (Akobundu, 1980; Ogunbodede and Olakojo, 2002; Okonmah, 2004). This study evaluated the best planting date to intercrop maize and sweet potato for timely weed control and enhance growth and yield.

MATERIALS AND METHODS

The study was conducted in 2009 at the Teaching and Research Farm of the Department of Agronomy, Delta State University, Asaba Campus (latitude 6° 14'N and longitude 6° 49'E) (Asaba Meteorological Station, 2009). T1S 48441 sweet potato variety and Hybrid (3x-yx) maize variety were produced from National

Root Crops Research Institute (NRCRI), Umudike, Abia State and Delta State Agricultural and Procurement Agency (DAPA), Ibusa, Delta State respectively. Beds were prepared and seeds were sown with the spacing of 75cm x 25cm following the method of Agbogidi (2006). Time of planting sweet potato constituted treatment; planting sweet potato and maize the same day (PSPMSD), planting of sweet potato two weeks before maize (PSP2WBM), and planting of sole maize (PSM) with twice weeding. Both growth parameters: plant height (cm), leaf area (cm²), number of leaves and days to 50% tasselling and yield parameters (number of grain/ cob, number of rows/cob, 1000g grain weight/plot to 14% moisture content (kg/ha) were taken. Data collected were analyzed by analysis of variance (ANOVA) while the Duncan's multiple range tests were used to separate significant means by SAS (2005).

RESULTS AND DISCUSSION

Generally, the performance of maize plants in PSP2WBM was better in all the growth characteristics measured as well as the yield components observed (Tables 1 and 2) respectively. The maize showed significant differences ($P \leq 0.05$) in plant height, leaf area, number of leaves, achieved 50% tasselling before others (46.3 days), had highest number of grain /cob (25.2), number of rows/cob (20.2), 1000 grain weight (15.6g) and dry grain yield/plot (850.4kg/ha). These are evident in both Tables 1 and 2. Planting of sole maize also showed an appreciable performance in all the agronomic characters measured when compared to Planting sweet potato and maize on the same day and planting of sweet potato two weeks after maize (PSP2WAM) (Tables 1 and 2) respectively.

The better performance in PSP2WBM could be due to the fact that sweet potato growing first and covering the surface of the soil before maize came up could have reduced maize exposure to direct sunlight and rainfall which agrees with the reports of Akobundu (1980) that the canopy of cover crops protects the soil surface from adverse environmental factors. It could be connected to the fact that sweet potato conserved or moderated the soil physio-chemical properties such as pH, organic

carbon and others thereby suppressing weeds and enhancing the growth and yield of maize as competition for bio-resources like water, space, nutrients and sunlight could have been reduced. This report is in harmony with earlier reports of Iken and Musa (2004). This study has demonstrated that planting sweet potato 2 weeks before planting of maize significantly increased the performance and yield of maize hence should be recommended to rural farmers in Nigeria as it also reduces weed infestation.

Table 1. Effects of time of planting sweet potato for the control of weeds on some agronomic parameters of maize.

Treatm ents plantin g time	Plant height/WAP					Leaf area/WAP					Number of leaves/WAP					Days to 50% Tassel 5
	2	4	6	8	10	2	4	6	8	10	2	4	6	8	10	
PSP2MS D	13.7c	27.7c	31.7d	62.6c	112.1b	111d	29.7c	86.7c	139.4c	224.2c	59d	55d	67c	71c	87d	43.3b
PSP2W BM	15.0a	29.9a	38.5a	70.5a	148.0a	133a	31.5a	97.3a	155.3a	255.9a	53a	73a	81a	96a	103a	45.3a
PSP2W AM	13.5c	21.2d	22.1c	67.4d	135.7c	137c	23.2d	80.2c	145.4c	214.7c	42c	54c	68c	74c	91c	48.7a
PSP1	13.8c	22.2b	22.3b	64.8d	142.5c	132b	29.4b	88.9c	150.5b	226.3b	47b	58b	71b	81b	92b	47.0c

Means with different letters in same the column are significantly different at P < 0.05 using Duncan's multiple range test.

Table 2. Yield and yield components of maize as influenced by time of planting of sweet potato for the control of weeds.

Yield and yield components of maize				
Time of planting	No of grains/cob	No of rows/cob	1000grain weight(g)	Dry yield/plot (kg/ha)
PSPMSD	22.5c	16.8d	12.7d	774.7c
PSP2WBM	25.2a	20.2a	15.6a	850.4a
PSP2WAM	22.8c	17.9c	12.9c	668.7d
PSM	23.5b	18.4b	13.4b	786.2b

Means with different letters in same the column are significantly different at ($P \leq 0.05$) using Duncan's multiple range tests

Keys

PSPMSD	=	Planting sweet potato and maize the same day
PSP2WBM	=	Planting sweet potato two weeks before maize
PSP2WAM	=	planting sweet potato two weeks after maize
PSM	=	Planting sole maize

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