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ASSESSMENT OF THE EFFECT OF TRAINING IN GOOD AGRONOMIC PRACTICES ON THE PRODUCTIVITY OF DECENTRALIZED VINE MULTIPLIERS IN SWEETPOTATO VINE PRODUCTION IN ABIA STATE, NIGERIA

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Abstract
The study assessed the effect of training in good agronomic practices on the productivity of decentralized vine multipliers in sweetpotato vine production in Abia State. Multi-stage random sampling technique was used to select respondents for the study. The three agricultural zones were involved. Two blocks each were randomly selected from the three agricultural zones in the State given a total of 6 blocks; two circles were randomly selected from each block making it twelve (12) circles. Ten (10) sweetpotato farmers were randomly selected from each circle, making a total of 120 farmers for the study. Data were analyzed using descriptive and inferential statistics. The result showed that majority (63.33%) of the DSVMs were males and 81.67% were married with 61.67% having household size that fell between 5-8 persons. The result, also, showed that 98% of the DVMs had access to sweetpotato vine demonstration farm and had training on improved agronomic practices. The level of constraints to sweetpotato vine production was high with the grand mean of 2.43. The t- test analysis result revealed that there was significant difference between sweetpotato vine yield before and after DVMs' training on good agronomic practices in vine production at 5% level. The study, therefore, concluded that the DVMs in Abia State had increased yield in vine production after training on good agronomic practices but were faced with many challenges in vine production. It is recommended that DVMs should continue to utilize the good agronomic practices they were trained on since it has increased the yield of vines produced.

Key words: DVMs, Sweetpotato, Vine, Production and Abia State.

Introduction

Sweetpotato (*Ipomoea batata (L) Lam*) is an important tropical root crop. It belongs to the morning-glory family known as *convolulaceae* and it originated from Latin America (Low *et al*., 2009). It is the only member of the genus ipomoea whose roots are edible and is one of the world most important food crops due to its high yield and nutritive value (Korieocha, 2013).

There is high demand for clean planting materials, that is, sweetpotato vines (Schulte-Geldermann, *et al.* 2012). According to Adesina *et al.* (2017) for farmers to meet up with the increasing demand, there is a need for availability of sweetpotato vines that are free from virus infection in order to maximize yield.

The Decentralized Vine Multipliers Model was introduced as a means of scaling out clean sweetpotato vines through the relevant stakeholders to the farmers to ensure high yield and productivity by farmers. This is implemented through the activities of farmers' associations, out-growers, Non-governmental organizations (NGOs), cooperative societies and other seed producers with strong interest in sweetpotato vine production in many sweet potato growing ecologies in Nigeria. This is an outcome of the collaboration between CIP and NRCRI during the Sweetpotato Action for Security and Health in Africa (SASHA) Project. Therefore, there is need to assess the effect of training in good agronomic practices on the productivity of decentralized vine multipliers in sweetpotato vine production in the States to know how effective it was in vine production. Specifically, the study: described the socio-economic characteristics of the farmers; examined the farmers' willingness to buy sweetpotato vines; ascertained the farmers' access to sweetpotato demonstration farm; describe the constraints militating against farmers' production of sweetpotato vine and determine the difference between sweetpotato vine yield before and after DVM training.

Methodology

The study was carried out in Abia State, Nigeria. Multi-stage random sampling technique was used to elicit data from the farmers. The three agricultural zones were involved. Two blocks each were randomly selected from the three agricultural zones in the State making a total of 6 blocks; two circles were randomly selected from each block making it twelve (12) circles. Ten (10) sweetpotato farmers were randomly selected from each circle, making a total of 120 farmers for the study. Data were analyzed using descriptive statistics such as percentages, mean and were presented in tables and charts while the inferential statistics used was z-test statistics. The z test model is specified thus:

$$z = \frac{\left|\bar{x}_1 - \bar{x}_2\right|}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Where z = calculated value of difference between means

$\bar{x}_1$ = Mean yield score of sweetpotato vines in bundles before DVM training

$\bar{x}_2$ = Mean yield score of sweetpotato vines in bundles after DVM training

n_1 = Sample size

n_2 = Sample size

S_1^2 = Sample variance

S_2^2 = Sample variance

Results and Discussion

Socio-economic characteristics of the DVMs

The result of the socio-economics characteristics showed that majority (63.33%) of the farmers were males, most of them were between ages of 30 and 49 years. It revealed that the farmers were within the active and productive working class. This is in agreement with Nze and Azubuike (2016) who stated that most farmers in the Zone were in their active ages. Majority (81.67%) of them were married and 61.67% of the farmers had household size that fell between 5-8 persons. Emaziye (2015) opined that most farmers were married with large household size. The result showed that greater proportion (64.17%) of the farmers had secondary education. Ifenkwe and Izuogu (2015) stated that education and training enhance farmers' productivity and innovativeness. The farmers had less than 1ha of sweetpotato vine farms. This showed that they are small scale farmers. The result, also, revealed that 35.83% of the farmers have been on sweetpotato vine production between 6-10years. According to Arimi (2014) higher number of years of experience in farming helps a farmer to increase productivity.

Table 1 Socioeconomic characteristics of the respondents (N120)

Variables	Frequency	Percentages
Sex		
Female	44	36.67
Male	76	63.33
Age		
20-29	2	1.67
30-39	46	38.33
40-49	58	48.33
50-59	14	11.67
Marital status		
Married	98	81.67
Single	22	18.33
Household size		
1-4	18	15.00
5-8	74	61.67
9-12	28	23.33
Education		
Primary	15	12.50
Secondary	77	64.17
Tertiary	28	23.33
Farm size		
<1ha	48	40.00
1-1.9ha	40	33.33
2-2.9ha	32	26.67
Farming Experience		
1-5	29	24.17
6-10	43	35.83
11-15	33	27.50
16-20	13	10.83
Above 20	2	1.67

Access to improved sweetpotato demonstration farm

Figure 1 shows that the 93% of the Decentralized Vine Multipliers (DVMs) had access to improved sweetpotato demonstration farm where technologies for sweetpotato vine production were show cased for increased yield. This implies that the farmers had knowledge and skill in vine production. This finding agrees with the findings of Ukoha *et al.* (2016) that farmers from participate in workshop trainings to equip and keep them abreast with major happenings in the field of agriculture.

Figure 1 DVMs' Access to Improved Sweetpotato Demonstration Farm (n=120)

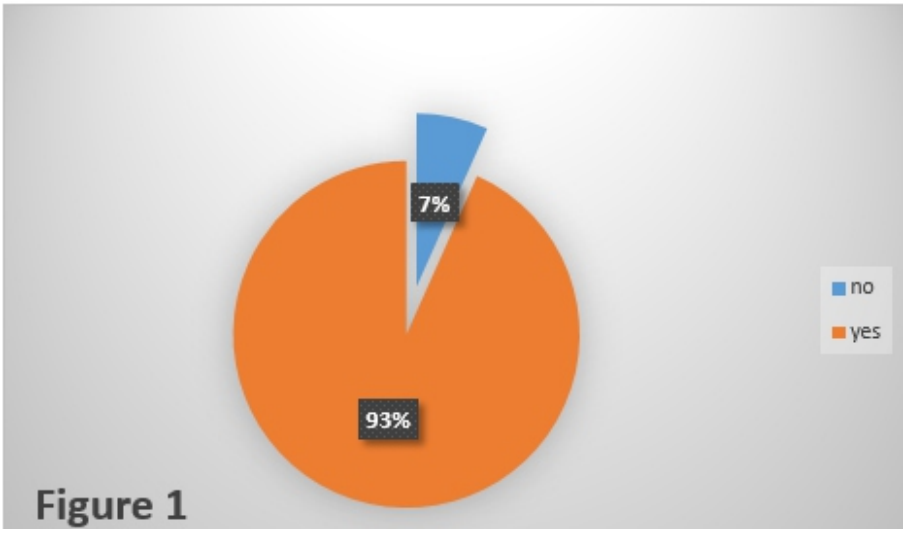
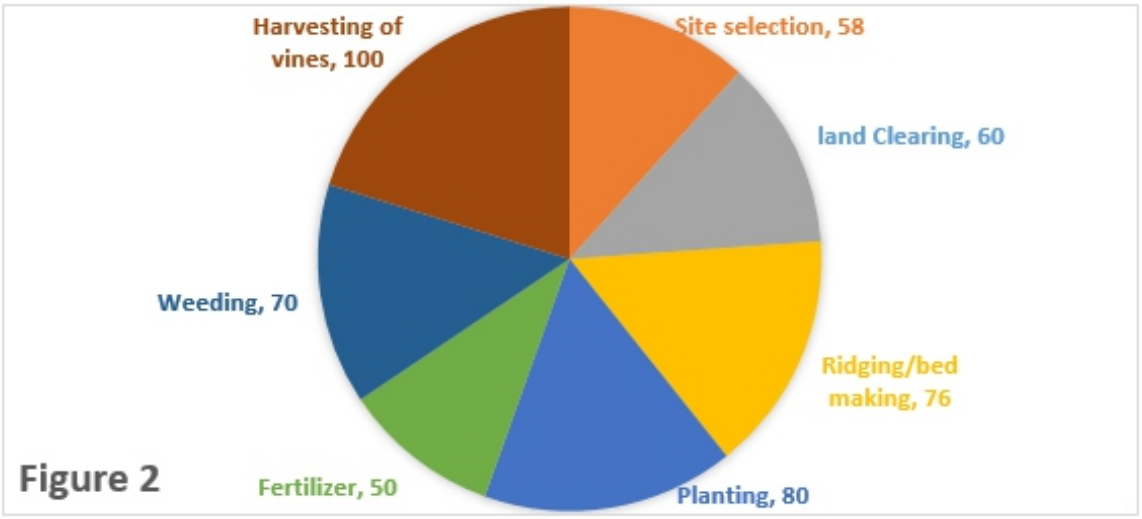


Figure 2 shows that the Decentralized Vine Multipliers (DVMs) have been trained on improved agronomic practices such as site selection, land clearing, ridging and bed making, vine planting, fertilizer application, weed management and harvesting of vines. This training enabled them to acquire the necessary skill for sweetpotato vine production. The findings revealed that training on good agronomic practices have been extended to the DVMs. Training on improved agronomic practices will empower the vine multipliers to produce clean sweetpotato vines for increased yield. It is expected that positive effect on the farmers' knowledge acquired through training would bring improvement in food crop farming and enable the farmer to do better in their farming activities (Nwokocha, 2017).

Figure 2 Training of DVMs on Good Agronomic Practices (n=120)



Source: Field Survey, 2021 Multiple Responses Recorded

Constraints to sweetpotato vine production

Table 2 shows the mean rating of respondents' constraints to sweetpotato vine production which include lack of finance, high cost of fertilizer and high cost of herbicide which showed = 3.00 respectively. Climate change and high cost of transportation showed = 2.90 respectively, storage (= 2.85), high cost of labour (= 2.73), low market price (= 2.45), diseases and pest showed = 2.03. The grand mean showed 2.43, indicating high level of challenges faced by the DVMs in sweetpotato vine production. According to Oni (2013) identification of the constraints or challenges in the agricultural sector is a necessary step to unlock the factors inhibiting performance of the sector towards promotion and growth of the sector.

Table 2 DVMs' constraints to sweetpotato vine production (n=120)

Variables	Serious	Moderate	Never	Total	Mean $\bar{x}$	Decision
Low finance	120(360)	0(0)	0(0)	360	3.00	Constraints
Lack of land	28(84)	46(92)	46(46)	222	1.85	Not constraint
High cost of sweetpotato vines	0(0)	4(8)	116(116)	124	1.03	Not constraint
High cost of fertilizer	120(360)	0(0)	0(0)	360	3.00	Constraints
High cost of herbicides	120(360)	0(0)	0(0)	360	3.00	Constraints
Disease and pests	8(24)	108(216)	4(4)	244	2.03	Constraints
High cost of labour	92(276)	24(48)	4(4)	328	2.73	Constraints
Low market price	60(180)	54(108)	6(6)	294	2.45	Constraints
Low demand of sweetpotato vines	4(12)	52(104)	64(64)	180	1.50	Not constraint
Storage	108(324)	6(12)	6(6)	342	2.85	Constraints
Climate change	108(324)	12(24)	0(0)	348	2.90	Constraints
High cost of transportation	112(336)	4(8)	4(4)	348	2.90	Constraints
Grand mean					**2.43**	

Source: Field Survey 2021.

Note: ≤ 2.00 Not or Low constraint, ≥ 2.00 constraints. Bench mark mean score =2.00.

Difference between sweetpotato vine yield before and after DVM training

The t-test analysis result showed that there was significant difference in vine production with DVMs at 5% level. The t--test statistic in Table 3 shows significant difference ($P< 0.05$) in vine yield before and after DVM training in Abia State, Nigeria. From the result, vine mean yield before DVM training was 35.70 bundles/ha, while vine mean yield after DVM training was 78.05 bundles/ha. There was sweetpotato vine yield difference of 42.35 bundles between vine yield before and after DVMs training. This implies that the DVMs had increased yield in sweetpotato vine after training on good agronomic practices on sweetpotato vine production. This finding is in agreement with Agbarevo and Mazza (2018), who reported that increase in farmers' yield as a result of application of better technologies can be used to measure the success of agricultural development programme. The value of t-calculated (82.514**) is greater than the value of t-tabulated (1.96). This implies that DVMs had increased vine yield.

Table 3 Difference between sweetpotato vine yield before and after DVM training

Source of Variation	N	Mean (bundle/ha)	Standard Deviation	P value	t-cal	t-tab
Vine yield after DVM training	120	78.05	26.4143	0.05	1.96	82.514**
Vine yield before DVM training	120	35.70	12.2971			

Source: Field Survey, 2021. Significant at 5% level. Decision: Null Ho Rejected.

Conclusion and Recommendations

The study, therefore, concluded that the DVMs in Abia State had increased yield in vine production after training on good agronomic practices but were faced with many challenges in vine production. It is recommended that DVMs should continue to utilize the good agronomic practices they were trained on since the training has increased the yield of vines produced. Government of Abia State should help the DVM farmers with subsidized price of fertilizers and herbicides to enable them purchase enough for sweetpotato vine production.

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