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## Seed yam production using single node vine from plants in aeroponics

Norbert Maroya<sup>1</sup>; Morufat Balogun<sup>1,2</sup>; Beatrice Aighewi<sup>1</sup>; P. Lava Kumar<sup>1</sup>, Samson Ogbole<sup>1</sup> and Robert Asiedu<sup>1</sup>

<sup>1</sup>International Institute of Tropical Agriculture, PMB. 5320, Oyo Road Ibadan, Nigeria

<sup>2</sup>University of Ibadan, Department of Crop Protection and Environmental Biology, Ibadan, Nigeria  
[n.maroya@cgiar.org](mailto:n.maroya@cgiar.org) ; Registration ID # 3362

### 1- Introduction

The Temporary Immersion Bioreactor System (TIBS) and the Aeroponics System (AS) are novel and effective technologies for seed yam production initiated by IITA under YIIFSWA Project. The effectiveness of these technologies was revealed through the quality and the quantity of yam planting materials (tubers, bulbils and vine cuttings) generated by TIBS plantlets in aeroponics. This poster is presenting some facts and figures of field performance of single node vine cuttings generated from TIBS plants in aeroponics.

### 2- Materials and Methods

One node vine cuttings generated from seven varieties growing in aeroponics (5 *D. rotundata* and 2 *D. alata*) were rooted in pot and transplanted in field under irrigation at the density of 0.75m X 0.25cm in row 10m. Each row was planted with 40 plantlets. Only poultry manure was applied at land preparation.



Table 1: one node vine cuttings generated from AS

S/N	Variety	July	Aug	Sept	Oct	Total number of plants	Rooted vine cuttings per plant	Average % of survival
1	TDr 95/19177	1086 (3)	1301 (1)	925 (3)	1284 (3)	30	3495	95
2	TDr 95/18544	1120 (1)	174 (2)	599 (3)	1634 (3)	12	4117	98
3	TDr 95/19158	260 (1)	-	-	-	1	260	98
4	TDr 97/00913	-	534 (2)	-	-	2	534	87
5	TDr 96/00626	-	200 (1)	-	-	1	200	83
6	TDa 98/01176	4771 (3)	882 (3)	1132 (3)	1220 (3)	10	3711	95
7	TDa 98/01168	81 (1)	-	750 (2)	3	3	277	90
<b>Total</b>		<b>2794</b>	<b>2820</b>	<b>2696</b>	<b>4928</b>	<b>39</b>	<b>18348</b>	
<b>Average</b>		<b>399</b>	<b>403</b>	<b>385</b>	<b>690</b>	<b>5</b>	<b>2620</b>	<b>92</b>

One TIB unit with plantlets ready for planting in AS



Tubers of TDr 95/19177 harvested on 6th January 2016 at Ibadan



Development of field planted with one node cuttings plantlets from AS



Transplanting of potted one node vine plantlets in field

### 3- Results

An average of 300 one node cuttings is generated per plant in 4 months with 92% of well developed potted plantlets, transplanted in field. The results at harvest are summarized in table 2&3 with 87% of plants at harvest for TDr 95/19177 and 94% for TDa 98/01176. The tubers weight at harvest correspond to an average yield 16.8 t/ha par for *D. rotundata* and 18.5 t/ha for the *D. alata*. The average tuber weight after 5 months growth was 245g for TDr 95/19177 and 187g for TDa 98/01176 (less than 20% senescence).

Table 2 & 3: Seed yam tuber yield performance of one node vine cuttings (case of TDr 95/19177 and TDa 98/01176) at Ibadan

Variety TDr 95/19177	No of stands planted	No of stands at harvest	No of tubers per row	Tubers weight (kg)	% stands at harvest	No of tuber per plant	Tuber weight per tuber (g)	Average weight per tuber (g)
ROW 2	40	39	56	14.3	98%	1.4	365.6	254.6
ROW 3	40	34	53	10.4	85%	1.6	304.7	195.5
ROW 4	40	31	46	13.1	78%	1.5	421.6	284.1
<b>Average</b>	<b>40.0</b>	<b>34.7</b>	<b>51.7</b>	<b>12.6</b>	<b>87%</b>	<b>1.5</b>	<b>364.0</b>	<b>244.7</b>

Variety TDa 98/01176	No of stands planted	No of stands at harvest	No of tubers per row	Tubers weight (kg)	% stands at harvest	No of tuber per plant	Tuber weight per tuber (g)	Average weight per tuber (g)
Row 2	40	35	73	9.4	88%	2.1	268.9	128.9
Row 3	40	40	95	15.1	100%	2.4	376.5	158.5
Row 4	40	38	63	17.2	95%	1.7	452.4	272.9
<b>Average</b>	<b>40.0</b>	<b>37.7</b>	<b>77.0</b>	<b>13.9</b>	<b>94%</b>	<b>2.0</b>	<b>365.9</b>	<b>186.8</b>

### 4- Conclusion

The TIBS plantlets used as pre-basic seed and directly planted in aeroponics are sources of important clean quantity of one node vine cuttings used to produce basic seed yam tuber weighing more than the 150g size recommended. The average number of tubers 52 and 77 per row corresponds to 69,000 and 103,000 tubers per hectare weighing at least 245g and 187 g respectively for TDr 95/19177 and TDa 98/01176.

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