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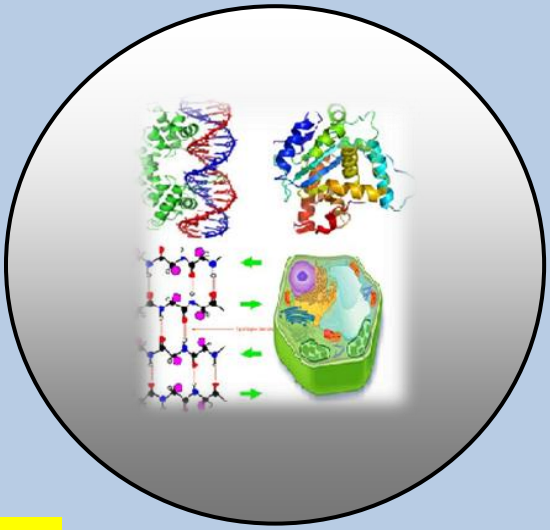

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RESEARCH PAPER

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ABSTRACT

Turmeric is an important spice cultivated particularly in South West Nigeria for its culinary, medicinal and industrial purposes. It is generally propagated by the rhizome which is the most useful part of the plant. The high level of utilization of the plant necessitated the search for an alternative propagule for propagation. Field trials were conducted during the 2009 and 2010 rainy seasons at the National Horticultural Research Institute, Ibadan, Nigeria to compare four different planting propagules namely fresh mother rhizome, cured mother rhizome, split mother rhizome and fingers in a Randomized complete block design. Vegetative growth was significantly higher on plants from fingers, followed by fresh mother rhizome, cured mother rhizome and split mother rhizome for both seasons. The highest yield of 20.4 t/ha and 25.6 t/ha were recorded with plants from fresh mother rhizome respectively for 2009 and 2010. Plant height was highest for fingers, followed by mother rhizome, cured mother rhizome and split mother rhizome for both seasons. Vegetatively, for both seasons, fingers performed better, although highest yield was obtained from the use of fresh mother rhizome, yield from fingers was still comparable. The use of fingers as alternative to the rhizome is hereby reported.
Keywords: Curcuma longa, Planting Materials, Vegetative Propagation and Yield.

INTRODUCTION

Turmeric (*Curcuma longa* L.) belongs to the family Zingiberaceae. It is an important spice cultivated in Nigeria for its medicinal properties and culinary and industrial purposes. Its underground orange rhizome is used as natural coloring agent in food, cosmetics and dye. Curcumin and volatile oils of turmeric have some medicinal properties to prevent tumor

formation, improve liver and kidney functions and biliary disorders(Hermann and martin,1991; Hossain *et al.* 2005).Curcuminoids in turmeric have anti-inflammatory, antimutagen, anticancer, antibacterial, antifungal, anti-oxidant, antiparasitic and detoxifying properties (Uechi *et al*.,2000; Hossain *et al.* 2005). Turmeric powder is highly valued as base material for curry production in confectionery industries for food seasoning and in the international market especially in United states of America, United Kingdom and Middle East as a functional food due to its health promoting properties.

The propagule type used affects the vigour of the plant, yield as well as the cost of production of turmeric (Manhas *et al.,* 2012)

Evaluation of the effect of different propagule type on growth and development of plants is very important for increasing yield in the plant species producing different sizes of seed (Singh and Singh, 2003; Stougaard 2002; Stougaard and Xue 2004 and Hossain *et al*. 2005).

The economic importance of the turmeric rhizome has necessitated the search for research information regarding alternative propagative materials. Furthermore turmeric yield has remained small in terms of size in the South Western Nigeria. This may be due to the type of rhizomes planted. There is therefore the need to find means of improving the yield using different types of rhizomes.

MATERIAL AND METHODS

Field experiments were conducted on the research field of National Horticultural Research Institute, Ibadan, Nigeria (3^0 50'E, 7^0 30'N, 168m above sea level) during the 2009 and 2010 rainy seasons.

Four different turmeric propagules were used in this study namely fresh mother rhizome, fingers, cured mother rhizome and split mother rhizome in a Randomized complete block design with three replications. The plot measured 2m x 2m and planting was done at a spacing of 30cm x 20cm with an application of 10 t/ha cured poultry manure as basal application. Weeding was manually done and harvesting was carried out after eight months of planting for both seasons. Data collected were subjected to statistical analysis using Analysis of variance (ANOVA) procedures and Least significant difference (LSD) were computed for significantly different means.

RESULTS

The plant height of turmeric planted with different turmeric propagules differed significantly for both seasons of 2009 and 2010. Plant heights of all treatments increased for both seasons from 6 WAP through 14 WAP (Table 1). Similar results were also obtained for Number of leaves (Table 2) and number of tillers (Table 3) in the two seasons considered.

Significant differences occurred among the yield of all the treatments considered for 2009 and 2010 planting seasons (Table 4). Fresh mother rhizome had the highest yield of 20.4t/ha in 2009 and 25.6t/ha in 2010, followed by fingers with a yield of 17.3t/ha in 2009 and 22.4t/ha in 2010, cured mother rhizome also with a yield of 14.8t/ha in 2009 and 19.9t/ha in 2010, split mother rhizome had the least yield of 10.4t/ha for 2009 and 15.6t/ha for 2010 (Table4).These values are similar and did not differ significantly. However, they differ significantly for cured mother rhizome and split mother rhizome for both seasons.

Table 1. Effect of different planting propagules on the Plant height (cm) of turmeric in 2009 and 2010 planting seasons.

			2009				2010			
Treatments	6	8	10	12	14WAP	6	8	10	12	14WAP
Split mother rhizome	8.6	12.7	19.2	22.1	22.8	9.2	13.4	20.6	24.6	25.1
Cured mother rhizome	10.0	12.7	21.2	24.2	25.5	11.5	14.7	22.3	26.8	27.5
Fresh mother rhizome	12.8	16.7	25.6	27.7	28.6	14.6	18.2	26.4	29.6	31.5
Fingers	14.3	18.3	27.2	29.9	32.4	15.9	19.4	28.3	31.1	34.7
LSD(0.05)	3.28	5.27	5.28	5.01	1.83	4.15	6.61	6.81	6.12	2.41

WAP= Weeks after Planting.

Table 2. Effect of different planting propagules on the number of leaves of turmeric in 2009 and 2010 planting seasons.

			2009					2010		
Treatments	6	8	10	12	14WAP	6	8	10	12	14WAP
Split mother rhizome	3.9	6.7	7.8	8.7	9.6	4.2	7.3	8.6	9.3	10.3
Cured mother rhizome	4.1	6.7	8.1	9.1	11.1	5.3	7.7	8.6	9.4	12.6
Fresh mother rhizome	5.0	7.7	8.3	9.3	12.9	5.5	8.2	9.1	9.6	13.4
Fingers	5.5	7.9	8.7	9.8	15.0	6.5	8.2	9.2	10.5	17.0
LSD(0.05)	0.88	1.01	0.39	0.42	2.94	0.96	1.35	0.42	0.48	3.02

WAP= Weeks after planting

Table 3. Effect of different planting propagules on the number of tillers in 2009 and 2010 planting seasons.

			2009					2010		
Treatments	6	8	10	12	14WAP	6	8	10	12	14WAP
Split mother rhizome	0	0.1	0.8	1.4	3.1	0	0.2	0.8	1.6	3.4
Cured mother rhizome	0	0.3	1.0	1.5	3.8	0	0.4	1.1	1.6	4.2
Fresh mother rhizome	0	0.5	1.3	1.7	4.3	0	0.7	1.5	1.8	4.6
Fingers	0	0.9	1.5	1.9	5.5	0	1.2	1.6	2.2	6.5
LSD(0.05)	0	0.48	0.61	0.31	1.05	0	0.62	0.84	0.51	1.24

WAP= Weeks after planting.

Table 4. Effect of different planting propagules on the yield (t/ha) of turmeric during 2009 and 2010 planting seasons.

	Turmeric Yield (t/ha)	
	2009	2010
Treatments		
Split mother rhizome	10.4	15.6
Cured mother rhizome	14.8	19.9
Fresh mother rhizome	20.4	25.6
Fingers	17.3	22.4
LSD (0.05)	7.15	7.75

DISCUSSION

Plant height was highest with fingers, followed by fresh mother rhizome, cured mother rhizome and split mother rhizome. This is in agreement with the findings of Hossain *et al*. (2005) that the height of plants in field experiments increased with the type of seed rhizomes. In this study, the differences in plant height were observed among the different planting materials used. Hossain *et al.* (2005) and Olojede *et al.* (2009) also claimed the number of leaves per plant and number of tillers increased with the seed type while (Manhas *et al.,* 2012) also reported that planting materials had significant effect on the production of tillers at all stages of production. The result obtained for the yield is also in accordance with the findings of Hossain *et al.* (2005) that the larger the type of seed rhizomes, the higher the turmeric yield. Olojede *et al., (*2009); Deshmukh *et al.* (2005) reported also that fresh mother rhizome gave the best performance for all the yield and yield parameters compared with fingers.

CONCLUSION

Fingers used as planting propagule performed vegetatively very well for both seasons considered. Although plants from it did not produce the highest yield, the yield it produced was still comparable to the highest produced from the fresh mother rhizome. This is an indication that the fingers can still be used as alternative planting material to the fresh mother rhizome.

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