

**EFFECT OF DETACHMENT TIME OF PINEAPPLE (*Ananas comosus L.*) CROWN ON ITS EARLY GROWTH**

**SALAMI A. E.**

**Department of Crop, Soil and Environmental Sciences**

**Ekiti State University, Ado-Ekiti, Nigeria**

**Email: [ayosalami@hotmail.com](mailto:ayosalami@hotmail.com)**

**ABSTRACT**

*A limiting factor to large scale production of pineapple is the scarcity of planting materials. The use of pineapple crown as a propagation material is common, but with no regard to length of time after detachment. A study was conducted in the late seasons of 2007 and 2008 at the Teaching and Research Farm Ekiti State University, Ado-Ekiti to determine the effect of detachment time on the performance of planted crown. In each if the year, twelve crowns each were collected on a weekly basis for three weeks, six of the crowns were placed in an open field while the others were placed underneath the shade for 1, 2 and 3 weeks storage time. The crowns were planted in a media consisting of top soil and rice husk on 1:1 volume basis. The 3x2 factorial experiment was replicated six times to give a total of 36 experimental units. Data were collected on number of leaves on a weekly basis for 8 weeks while root length and density was taken once at 8 weeks after planting (WAP). Result showed that there was significant difference ( $P<0.05$ ) in number of leaves among the storage time. The number of leaves produced reduced with longer time of storage. Storing crowns for two weeks after detachment reduced number of leaves by upto 17% while 115% reduction was observed for those stored for three weeks compared with those planted after one week of storage. Furthermore, shade enhanced number of leaves compared to those kept in the open field but the difference were not statistically significant. Root length and number of root were not significantly different ( $P>0.05$ ) between 1 and 2 weeks of storage for both shaded and exposed crowns, but those stored for 3 weeks was markedly affected particularly when stored in open field. These results are suggestive that pineapple crown stored for two weeks can be use for propagation but should preferably be stored underneath the shade.*

**Keywords:** Pineapple, crown, storage, detachment time.

**INTRODUCTION**

Pineapple (*Ananas comosus L.*) is a tropical or near tropical plant, which belongs to the family Bromeliaceae. The main body of the ripe pineapple fruit is oval or cylindrical and at its peak is the crown. In some unusual instance the pineapple fruit could have more than one crown (Samson, 1986). Pineapple is majorly propagated asexually using plant emerging from different parts of the plant. These growths are known as bulbs, crowns and auxiliary buds. The stump cutting (stalks from below the fruit) and crown are usually used for vegetable propagation even though the crown is more often used economically (Maxwell, 1984; Daves and Hassig, 1994).

In Nigeria, the crop is grown mostly in the rainforest zone where the rainfall ranges from 700-2000mm per annum with 4-5 months of dry season. With adequate water supply, the crop can grow in the drier parts of the country. Furthermore, though the crop can survive long day periods through its ability to retain water in the leaves, it is very sensitive to water deficit especially during the vegetative growth period (Morton 1987). The yield of pineapple has been

increased globally due to extensive research and the adoption of favourable practices that has enhanced yield. Despite the many improved practice and enhanced application to the pineapple plant commercial pineapple planting in Nigeria is still greatly inhibited by many factors, paramount amongst this inhibiting factor is the non-availability of adequate propagation materials for pineapple on a large scale. The lack of a well articulated government policy to support large scale pineapple plantation and its subsequent exploitation as foreign exchange earner via, exports also limits commercial propagation.

The use of crown as propagation material is a common practice by farmers, where a new pineapple farm is to be established sourcing of crown is done sometimes far from planting site necessitating transportation. Little regards is given to the length of time of detachment before planting of the crowns. This information will guide the farmer on the limit of their collection based on the time of detachment to enhance good sprouting and performance of crowns intended for use as planting material. The aim of this reaserch is therefore to determine the effect of detachment time of pineapple crown on the sprouting and early growth, the objectives were to determine the influence of time of storage on the performance of pineapple crown and the influence of shade on the performance of on the performance of pineapple crown

## **METHODOLOGY**

The research was conducted at the Teaching and Research Farm, Ekiti State University, Ado-Ekiti. The effect of detachment time of pineapple crown on its sprouting and early growth (*Ananas comosus* L.) different materials was determined. Twelve crown was collected each week for 3 weeks from a pineapple field after harvesting the fruits. Six of the crowns were kept in an open field and the other six underneath the shade. Storage was done at 3, 2 and 1 week at both open field and underneath the shade before planting was done. Thirty six bags were collected and each filled with 20 kg mixture of top soil and rice husk on 1:1 volume basis which serves as media for propagating the crown. The arrangement of the bags followed a completely randomized design format. Planting was done in mid July 2007 and 2008. Cultural practices such as watering of the plants were done regularly to ensure good establishment. Weeds were regularly removed to minimize competition for growth resources. Data were collection on a weekly basis for 8 weeks on the number of leaves while root length and number of root was obtained at the end of the 8<sup>th</sup> week. The data obtained were then subjected to analysis of variance and were separated by Duncan Multiple Range Test at 5% level of probability.

## **RESULTS AND DISCUSSION**

The analysis for both years indicated no significance for all the variables; therefore the result presented is an average of the two years. The number of sprouted leaves increases with age after planting from the second to eight weeks of observation. The length of time of storage significantly ( $P < 0.05$ ) affected the number of leaves produced. With those stored for three weeks having the least number of leaves followed by those stored for two weeks with those stored for a week having the highest number of leaves (Table 1). Storing the crowns for two weeks lead to a reduction in number of leaves produced by between 4.10% at 5 weeks after planting to 17.1% at 2 weeks after planting. However, storing for 3 weeks lead to reduction of 1.53 to 115% for 5 and 3 WAP, respectively. The long period of suspension of physiological, activities during storage may have been responsible for the lower number of leaves observed in crowns stored for 3 weeks compared with those stored for less period of time, level of desiccation can be a consequence of

length of storage with attendant effect on sprouting. Andre (1994) obtained a similar result with the vegetative propagation of *Colotera adorescens*.

Table 1. Effect of storage time (weeks) on the number of leaves.

Weeks after planting	Storage Time (weeks)		
	1	2	3
1	2.58a	5.50a	1.83a
2	5.75a	4.91a	2.75b
3	6.833a	6.000s	3.167b
4	7.583a	6.500a	3.583b
5	8.167a	7.083a	4.33b
6	8.67a	7.916a	5.167b
7	9.417a	8.33a	5.583b
8	10.000	9.417a	6.667b

Means with the same letter in each row are not significantly different by Duncan's Multiple Range Test (DMRT) at 5% level of probability.

The effect of methods of storage was presented in Table 2. Crowns stored underneath the shade have the highest number of leaves produced compared to those kept exposed field.

Table 2. Showing the type of storage or the number of leaves

Weeks after planting	No shade	Shade
1	2.33a	2.28a
2	4.11a	4.83a
3	4.94a	5.72a
4	5.61a	6.17a
5	6.28a	6.78a
6	6.94a	7.56a
7	7.00a	8.00a
8	8.50a	8.89a

Number of leaves increased with weeks after planting. Crowns placed in unshaded environment had reduced number of leaves by 0.05% at the first, 0.72% at 2 WAP, 0.78% 3 WAP when compared to the shaded crowns. Similar trend was also observed when the interaction between the two factors is considered. Number of leaves of crowns stored underneath the shade were better than those in unshaded fields also, longer storage time depressed number of leaves markedly (Table 3).

Table 4 presents the effects of storage time and storage method on the on the number of roots and Root length. The number of roots ranged from 7.25 to 30.6. The highest number of roots was observed when crown were stored for two weeks although the differences were not statistically significant ( $p > 0.05$ ) between exposed and shaded crowns. Root length ranged between 7.45.98 to 23.23 cm. There was a significant differences between crown stored in the two environments for 3 weeks storage time. The detrimental effect of direct exposure of crown propagules to sunshine was shown by the depressed growth performance. The use of shade has been found useful in enhancing early growth particularly in the nurseries for most horticultural crops (Opeke 2005).

Table 3. Effect of time of storage and type of storage of pineapple crown on the number of leaves

Time of storage	Type of storage	Weeks after planting							
		1	2	3	4	5	6	7	8
1	Exposed	2.17ab	4.83a	5.67b	6.33b	7.167ab	7.67bac	8.33b	9.167ab
	Shade	3.00a	6.67a	8.0a	8.83a	9.167a	9.67a	10.50a	10.83a
2	Exposed	2.83ab	4.83a	6.167ab	7.00ab	7.67ab	8.50ab	7.167ab	10.33a
	Shade	2.17ab	5.00a	5.86b	6.00b	6.00bc	7.33c	7.50bc	8.50abc
3	Exposed	2.00ab	2.67b	3.00c	3.50c	4.00d	4.67d	5.167d	6.00C
	Shade	1.67b	2.83b	3.33c	3.67c	4.167dc	5.67dc	6.00dc	7.33bc

Means with the some letter in each column are not significantly different by DMRT at 5% level of probability

Table 4. Effect of storage time on root length and number of roots of pineapple crown in exposed and shaded conditions.

Time of Storage	Root length (cm)	Number of roots
<b>Exposed</b>		
1	23.23a	23.50a
2	20.60a	27.00a
3	7.45b	7.25a
<b>Shaded</b>		
1	19.90a	23.17a
2	20.76a	30.60a
3	15.98a	25.00a

Means with the same letter in each column are not significantly different by Duncan's Multiple Range Test at 5% level of probability.

**CONCLUSION**

Result showed that there was significant difference ( $P < 0.05$ ) in number of leaves among the storage time. The number of leaves produced reduced with longer time of storage. Storing crowns for two weeks after detachment reduced number of leaves by upto 17% while 115% reduction was observed for those stored for three weeks compared with those planted after one week of storage. Furthermore, shade enhanced number of leaves compared to those kept in the open field but the difference were not statistically significant. Root length and number of root were not significantly different ( $P > 0.05$ ) between 1 and 2 weeks of storage for both shaded and exposed crowns, but those stored for 3 weeks was markedly affected particularly when stored in open field. These results are suggestive that pineapple crown stored for two weeks can be use for propagation but should preferably be stored underneath the shade.

**REFERENCES**

Andre E.F (1994) Vegetative propagation of *Colotera adorescens* L. *Agriforestry Systems* Vol. 9: 113-121

**Journal of Agriculture and Social Research, Vol. 13, No.2, 2013**

Daves T.D and Hassig B.E (1994) *Biology of Adventitious Root formation*. New York Plenum Press 25-34

Dawson T.D and King L.A. (1994) Propagation of some woody Australian Plant from cuttings; *Australian Journal of Experimental Agriculture*, 34(8):1225-1231

Maxwell (1984). The pineapple fruit, *Flonda fruit* 1984 Pp 12-14

Morton J (1987) *Propagation of Pineapple, fruits of warm climate*. Creative resources system Inc. 1987 Pp 18-28

Naiper D.R (2004) Fruits plants and its importance in consumption, *Journal of plant growth regulations* Vol. 8:1341-141

Opeke L. K. (2005) *Tropical Commodity Tree Crops*. 2<sup>nd</sup> edition, Spectrum books Ltd.Pp 503.

Samson D.A (1986). *The botany morphology 2nd physiology of pineapple tropical fruits 2nd edition*. Longman scientific on technical 19.