IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 8, Issue 9 Ver. II (Sep. 2015), PP 70-73
www.iosrjournals.org

Impact of Different Planting Media on the Development of Pineapple Seedlings in Delta South Ecological Zone, Nigeria

Ogboi Edward and Nmor Edith
Department of Agricultural Technology, Delta State Polytechnic, Ozoro

Abstract: *This research was conducted at Delta State Polytechnic research farm, between March and February 2014 to identify the impact of different planting media on the development of pineapple seedlings. The research was potted experiment arranged in a randomized complete block design with four treatments and four replication. These treatments were a. Soil b. Soil + organic manure c. Soil + organic manure (NPK fertilizer) d. Soil + organic manure + inorganic manure. The growth parameters observed were seedling height, leaf length, leaf width and numbers of leaf. The results showed that the media of soil + in organic manure and soil + organic + inorganic manure gave highest development of the pineapple seedlings as they gave the highest parameters in terms of plant height, leaf length, leaf width and leaf numbers. Therefore, soil + organic manure medium is suggested as useful medium for accelerating the development of pineapple seedling.*
Keywords: *Pineapple, seedling, plant, growth, medium accelerating.*

I. Introduction

Pineapple (Ananas cosmosus) is botanically classified as Ananas comosus and it belongs to the bromellaceae. Pineapple can be grown from a shoot of the plant crown of the fruit, that is juicy and fragrant. Pineapple can be grown from a shoot of the plant, crown of the fruit, slips that grown on the flower stalk and suckers that grow from underground roots. Therefore, it can be propagated vegetatively and generatively. Plant materials for vegetative propagation can be in the form of shoot, slip, crown and stem cutting. Different from vegetative propagation, the generative propagation tend to be intended for breeding purposes. Planting medium is not only as a growing place but also a source of nutrient for plant growth (Okechukwue, 2014).

Media composition used influences the quality of seeding (Wilson, 2013). Generally, media for fruit crop seedling are composed of soil, organic matter and inorganic matter. This soil is usually used as a basic medium because it is cheapest and easy to set.

Akanbi (2012) observed that better relationship exist between manure and rooting rather than conventional soil mix and less pre-dispose the seedlings to soil borne pests and diseases.

Several studies on growth media had been conducted on various fruit commodities by many researchers. The best growth of mangostem seedling was reached on soil mediu compare to other (Jawel, 2012). Lan 2 on seedling appeared the best growth on sand medium until 5 months old (susiloadi; 2008). Ratna (2010) working on banana proved that soil and sand medium was most suitable medium for shoot and leaf growth of banana. ulapaca kirkiana muell Arg. Planted on the medium comprising 75% forest soil and 25% sawdust produced the tallest seedling, larger root collar diameter and higher survival at 10 months after planting (Mhango, 2010). Baiyeri (2013) observed that the best seedling qualities of African breadfruit (Treculia Africana Decne) were obtained when grown in medium formulated with top soil + poultry manure + river sand – in 1.2.3 (v/v/v) ratios.

Valuable information on growth media on several crops in different astrological zones exist (Sosiloadi, 2008, Ratna, 2010, Jawel 2012; Mhango 2012, Esaiyeri, 2013) and their recommendations have improved the development of the crops studied. Therefore in attempt to generate facts on the best planting/growth medium for cultivation of pineapple in Delta south ecological zone formed the basis for this research work. Hence, the aim of this work was to identify the impact of different planting media on the development of pineapple seedling in Delta south ecological zone, Nigeria.

II. Materials And Methods

The research was conducted at Delta state Polytechnic, school agriculture research farm Ozoro between March 2013 and February, 2014. Pinapple seedlings from smooth cayenne were used in this research. The experiment or research consisting of four treatments with four replications was arranged in a randomized complete block design. These four treatments were as follows:

a. Soil
b. Soil + organic manure(poultry dropping) (1.1v/v)
c. Soil + inorganic manure (NPK 15.15.15)
d. Soil + organic manure + inorganic manure

Each treatment was composed of four seedlings. The seedlings, eight months after germination, were transplanted to polythene bag (45 x 45cm) filled with each medium tested. Observations were performed on seedling height, leaf length, leaf width, and leaves number. Height of seedling was measured from soil surface up to the highest leaf tip by straightening all leaves. Leaves number were measured on the longest and the widest leaf. Leaves number were represented by the accumulation of all leaves that were counted from transplanting date to the last observation.

The first observation was done one month after transplanting seedling to the treatment media and subsequent observations were done at three months intervals within twelve (12) months the research lasted. All data collected were subjected to analysis of variance and means were separated by least significant difference (LSD) at $P \leq 0.05$.

III. Results And Discussions

The trends of seedling height, leaf length, leaf numbers and leaf width were still linear until 12 months old (figure 1). These were due to the seedlings still in the phase of vegetative growth. This finding was in line phase of vegetative growth. This finding was in line with (Datocos, 2013) observation. In general, figure demonstrates that soil + organic manure + inorganic manure and soil + organic manure media give higher growth components compared to other media at three months after transplanting.

The significant effect of media on leaf length was shown at six months after transplanting (Table 1). Leaf length was lower in soil alone and soil + inorganic manure media. Higher growth rate of leaf length was reached on the growth media. Soil + organic manure and soil + organic manure + inorganic manure. This finding is in agreement with Mulder (2013) findings who observed that organic seed of low molecular weight in organic matter help to increase leaf length. In addition, water soluble humic substances from organic manure had positive effect on the development of plant (Mockeridge, 2010).

The media composition significantly effected seedling height (cm) (Table 2). In general significant differences were found in seedling height between media with organic manure and media without organic manure and media without organic manure. This was in agreement with Akanbi (2012). Seedlings transplanted on growth media with organic manure were generally higher than those transplanted on the media without organic manure. This observation agrees with Akanbi (2012) who observed that better relationship exist between organic manure and rooting.

This suggested that manure is necessary to become supplemented in the soil media. In order to quicken the height of seedling. Since the highest increment of height took place in media of soil + organic manure and soil + organic manure + inorganic manure. These media composition represented the most suitable for inducing the height of pineapple seedling.

The result in table (3) shows the width of pineapple seedling leaf within twelve months are it also indicated that the width of the leaf of pineapple seedlings was significantly affected. The width increases as the seedlings matured and the highest increment in width of the seedling leaf was observed in soil + organic manure and soil + organic manure + inorganic manure. This observation was in line with (Dileas, 2012) who observed increment tin width of seedling least of pineapple grown in soil + organic manure medium.

The numbers of leaf of pineapple seedlings as affected in different growth media are as shown in table (2). It indicates that soil + organic manure and soil + organic manure + inorganic manure significantly affected the numbers of leaf in pineapple seedlings. Highest numbers of leaf were observed in both media containing organic manure. This observation may be attributed to organic matter impact acting as auxin in stimulating growth in plant (Hiliter, 2008) and was in line with Waksman (2009) observation who established that organic manure application increases leaf numbers and growth capacity of plants. Ramy (2010) observed increment in pineapple height and leaf numbers when nourished with organic matter. He concludes that organic manure is a catalyst. Khristera (2009) stated that, humic acids from organic manure entering the plant at early stages of development are supplementary sources of polyphenol which function as respiratory catalyst. This usually results in an increase in the living activity of the plant, enzymes systems are intensified, cell division is accelerated, root systems show greater development, more numbers of leaf and ultimately the yield of dry matter.

IV. Conclusion And Recommendation

Pineapple seedlings performed better in growth media containing organic manure in all parameters observed in this research work. Arising from the result obtained from this work, it was observed that there were no significant differences between growth medium of soil + organic manure and growth medium of soil + organic manure + inorganic manure in leaf length, plant height, leaf width and leaf numbers. It is therefore recommended that soil + organic manure medium should be used to grow pineapple in Delta south ecological zone to save cost that would have been used to purchase inorganic manure (fertilizer).

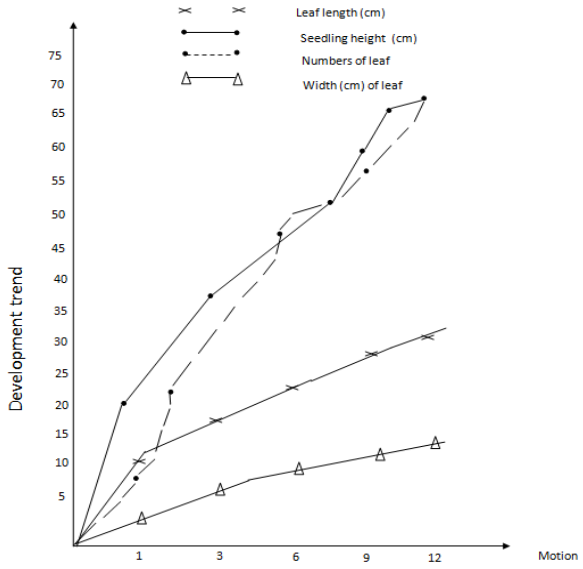

Figure 1: Trends of pineapple seedling development

Table 1: Effect of different planting media on the leaf length (cm) of pineapple at 1 through 12 months after transplanting.

Treatments	Leaf length (cm) at 1 through 12 months after transplanting				
	1	**3**	**6**	**9**	**12**
a. soil	10.25	14.3	18.2 c	22.5 a	26.01 c
b. soil + organic manure	11.63	14.9	26.2 a	30.7 a	35.06 a
c. soil + inorganic manure	11.62	14.6	22.3 b	26.04 b	30.02 b
d. soil + organic manure + inorganic manure	11.73	14.9	27.1 a	31.2 a	36.01 a
Average	11.06	19.5	22.25	27.6	31.7

Table 2: Effect of different planting media on the height (cm) of pineapple seedlings from 1 to 12 months after transplanting.

Treatments	Height (cm) of pineapple seedlings 1 through 12 months after transplanting				
	1	**3**	**6**	**9**	**12**
1. soil	24.2	29.1 b	37.1 c	46.2 c	53.6 c
2. soil + organic manure	25.02	45.07 a	60.02	69.03	75.05
3. soil + inorganic manure	24.9	30 b	41.3 b	53.3 b	59 b
4. soil + organic manure + inorganic manure	25.01	47.01 a	62.02 a	70.5 a	76.6 a
Average	24.7	37.7	50.01	59.6	65.9

Table 3: Effect of different planting media on the width (cm) of pineapple leaf between 1 and 12 months after transplanting.

Treatments	Leaf width (cm) 1 through 12 months after transplanting				
	1	**3**	**6**	**9**	**12**
1. soil	1.5	1.9	2.3 a	2.68 c	3.5 c
2. soil + organic manure	1.5	2.3	3.15 a	3.61 a	4.5 ab
3. soil + inorganic manure	1.5	2.1	2.9 b	3.23 b	4.01 b
4. soil + organic manure + inorganic manure	1.5	2.5	3.25 b	3.72 a	4.8 a
Average	1.5	2.2	2.9	3.31	4.2

Table 4: Effect of different planting media on the numbers of leaf of pineapple seedling, from 1 to 12 months after transplanting.

Treatments	Numbers of leaf of pineapple seedling at 1 through 12 months after transplanting				
	1	**3**	**6**	**9**	**12**
1. soil	10.0	11.0	16.0 c	26.0 c	36.0 c
2. soil + organic manure	10.0	30.0	62.0 a	74.0 a	84.0 a
3. soil + inorganic manure	10.0	25.0	51.0 b	62.0 b	73.0 b
4. soil + organic manure + inorganic manure	10.0	31.0	62.0 a	74.0 a	84.0 a
Average	10.0	24.2	47.7	59	69.2

References

[1]. Akanbi, J (2012). Soil organic matter and its role in crop development. Science 253, 3114-3118
[2]. Baiyeri, T.C (2013). The participation of humic acids and other organic substances in the nutrition of higher plants. Pochvovedenie 10, 68-71
[3]. Datocos, Z.I (2013). Environment and vegetative growth of plants. Agron J. 100:182-187
[4]. Dveas, J.C (2012). Pineapple development and growth media. Plant physiology, 201, 34-38
[5]. Hilitzer, S.K. (2008). The mechanisms and conditions of the physiological action of humic substances on the plant. Pochvovedenie, 12, 8-11.
[6]. Jawal, A. (2012). Impact of different growth media on the development of mango stem. Seedlings Agron J. 98: 28-32.
[7]. Khristera, L.A (2009). The role of humic acid in plant nutrition.
[8]. Mhango, S. (2010). Survival and growth of Upaca Kirkiana grown on different soil media. Plant physiology, 193, 250-255
[9]. Mockeridge, P.C (2010). The occurrence and nature of plant growth promoting substances in organic composts. Biochem J. 14. 432-435
[10]. Mulder, C (2013). Micro-organisms as geological agents. Solvent agron, 75. 103-108
[11]. Okechukwue, T (2014). Growth promoting substances, the nature of their effect and their practical applications. Soil sci, 294. 409-427
[12]. Ramy, T (2010). The quantitative composition of organic matter of soils. Pochovedenie, :28, 5-6.
[13]. Ratna, S (2010). Banana (musa sapientum) growth response to different growth media. Agronomy 201,:258-261
[14]. Susiloadi, P (2008). Influence of different plant growth material on the development of lanzon. Solvent agron. 58, 26-31.
[15]. Waksman, P. (2009). Humus, origin, chemical composition and importance in nature. London, Balliere, Tindall and cox, 293, pp
[16]. Wilson, C. (2013). Effects of stimulants on the growth of plants. J. Exp Bot. 87, 281-286