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The Effects of Storage Methods on the Emergence, Growth, and Yield of *Cocoyam* [*Xanthosoma sagittifolium (L.*) Schotts]

Tajudeen Bamidele AKINRINOLA[1*], Hassan TIJANI-ENIOLA[2]

[1]Department of Crop and Horticultural Sciences, Faculty of Agriculture, University of Ibadan, Ibadan, NIGERIA
[2]Department of Agronomy, College of Agriculture, Ejigbo, Osun State University, Osogbo, Osun State, NIGERIA

[1]https://orcid.org/0000-0001-8761-3835, [2]https://orcid.org/0009-0006-8335-6038

*Corresponding author: tb.akinrinola@gmail.com

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ABSTRACT

Cocoyam (*Xanthosoma sagittifolium*), known as tannia, is cultivated for fresh leaves and cormels by resource-limited farmers in tropical regions. However, it is not fully utilised to enhance food security for the growing population. One of the key challenges in its production is the lack of sufficient planting material, largely due to limited information on effective storage methods that ensure adequate planting material for establishing the crop in the following season. This study aimed to evaluate weight loss and storage efficiency under common storage conditions and determine the field performances of the stored corms. Freshly harvested corms (T1), corms stored under shade (T2), corms stored in pits (T3) and corms stored on raised platforms (T4) were assessed for weight loss and storage efficacy. In a field experiment, the stored corms were planted and evaluated for emergence, growth and yield differences using a randomised complete block design with three replicates. Weight loss in storage and storage efficiency ranged from 11.42 (T3) to 35.62% (T4) and 60.0 (T4) to 84.0% (T2), respectively, with significant differences observed among the storage conditions. The T4 had a significantly lower emergence rate than other storage conditions. Across the observation periods, cocoyam height and stem diameter were similar for the storage conditions but lowest in T4. The cormel yield obtained from T1 was significantly higher than T4 but had 18.28 and 31.43% higher yields than the yields observed for T2 and T3, respectively. The corms stored under shade conditions were suggested for preserving tannia corms meant for planting.

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INTRODUCTION

Cocoyam [*Xanthosoma sagittifolium* (L.) Schott] known as tannia, is a tropical plant mostly cultivated for its spherical cormel, consumed as a source of starchy staples (Boakye et al., 2018). The cormels are used for food and are similar to potatoes in that they can be boiled, roasted, fried, baked, steamed and pounded into dumplings to be eaten with soup (Boakye et al., 2018). The cormel can also be used as a thickener for some traditional soups. The crop is perennial but cultivated annually (Amadi et al., 2012). Cocoyam is grown under a wide range of soil conditions. Cocoyam is a resilient crop that tolerates drought, resists pests and diseases, and requires minimal inputs, making it a low-cost alternative to other staple crops like yam in addressing food security challenges (Olatunji et al., 2015; Ifeanyi-Obi et al., 2017). Where dry weather is experienced for a long period, cocoyam can be left in the soil with little spoilage. However, it cannot be left for long in the soil during the wet season after maturity. The matured cormel will begin to sprout or rot, which reduces the food value and yield. Cocoyam is generally propagated through vegetative means from the large spherical swollen underground storage stem called a corm (de Chavez et al., 2019). Even though cormel can be used for propagation, this would reduce the availability of cormel for human consumption.

The availability of planting materials at the onset of rainfall has been one of the major challenges of cocoyam production expansion in Nigeria to meet the increasing demand for food (Amadi et al., 2012). The use of micro-propagation for the multiplication of tannia has been reported but is too expensive for resource-limited farmers (de Chavez et al., 2019), highlighting the need for more affordable and practical alternatives suited to rural farming conditions. The limited resources have also lowered the adoption rate of improved practices in cocoyam production (Olatunji et al., 2015). The preservation of corms for subsequent cultivation has not been a normal practice by farmers. Farmers practice collecting leftover corms from the old field, a larger percentage of which are most likely to have been scorched by sun heat. Also, the corms' deterioration rate is very high when not properly preserved. Thus reducing the number of corms available for production, let alone expansion. Consequently, the corm has to be stored safely using proper storage methods and conditions for the adequate supply of the planting material at the onset of rainfall for field establishment.

Storage losses are caused by environmental factors such as the storage method, type of storage structure, treatment during storage, duration, and storage purpose (Eze et al., 2015; Nwaigwe et al., 2015). Environmental factors affecting stored produce are mainly relative humidity, temperature, rainfall, air velocity, and exposure to direct sun. Also, biological factors that affect storage losses include moisture content, microorganisms, and rodents (Uritani, 1999). Some storage conditions available for storing other root and tuber crops could be adopted for corm storage (Nwaigwe et al., 2015). However, these efficient methods in maintaining the quality of the stored produce could be expensive for adoption by the resource-limited farmers engaged in cocoyam cultivation in Nigeria. Therefore, there is need to evaluated alternative, low-cost storage methods such as pit storage and shade storage that are more accessible, locally adaptable, and can be implemented by smallholder farmers with minimal resources. After harvest, root and tuber deterioration in storage is triggered by several interrelated factors that form complex interrelationships, which may result in the decline in stored corm quality for field establishment (Akinrinola and Tijani-Eniola, 2025).

One of the major factors that affect stored products is weight loss as a result of the respiration of the stored product and it is affected by the relative humidity of the environment. Weight loss in storage is generally higher when the relative humidity is low, while high relative humidity does not encourage weight loss. While previous studies have focused on optimizing storage conditions for cormels intended for consumption, little attention has been paid to evaluating traditional storage methods for corms intended as planting materials. This study addresses that gap by systematically comparing the effects of various low-cost storage techniques on cocoyam's emergence, growth, and yield performance of cocoyam under field conditions (Eze et al., 2015; Nwaigwe et al., 2015). Furthermore, there is limited information on evaluating stored corms for field establishment and performance. Hence, there is a need to proffer simple but suitable and efficient storage methods, especially for planting materials, to reduce spoilage, which can limit crop production. This study would uniquely contribute to understanding possible cost-effective, farmer-friendly storage techniques and their influence on the preservation and field performance of cocoyam planting materials, an area previously underexplored in West African agronomic contexts. Therefore, the study's objectives were to determine the efficient method of storing cocoyam planting material and assess the agronomic performances of the corms stored under different methods.

MATERIAL and METHOD

The study was carried out between January and April 2021 at the Ayepe research station of the Department of Agronomy, University of Ibadan, in the Isokan Local Government Area of Osun State, Nigeria, with the coordinates Latitude 7.288029ºN and Longitude 4.284788ºE. Figure 1 describes the prevailing environmental conditions at the location.

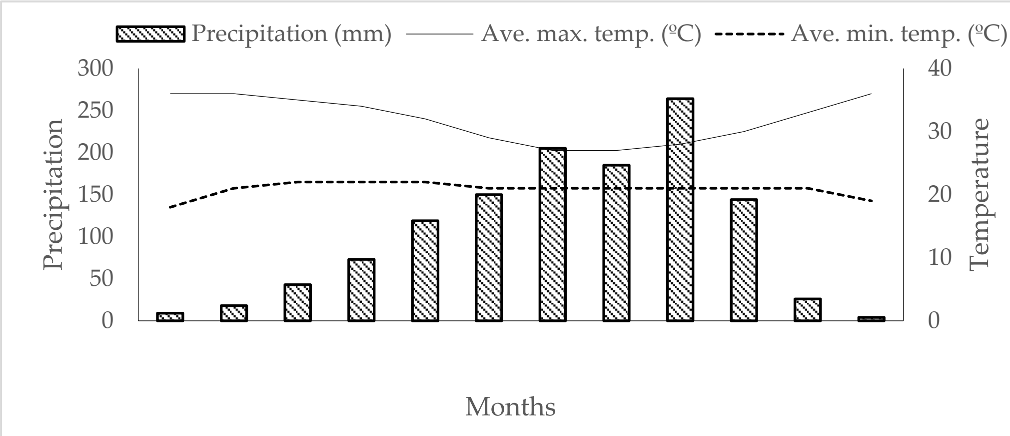

Figure 1. The precipitation and temperature recorded at the experimental location (Source: The weather network 2025)

Treatments and Experimental Design

The experiment involved evaluating different storage conditions, including freshly harvested corms (T1), corms stored under shade (T2), corms stored in pits (T3), and corms stored on raised platforms (T4). The storage and field experiments were carried out in a randomised complete block design with three replicates.

Storage

Freshly harvested cocoyam corms were collected from the experimental field (latitude 7.288029°N and longitude 4.284788°E) of the Department of Crop and Horticultural Sciences, University of Ibadan, Nigeria. Healthy, uninjured corms were selected, cleaned, and grouped for storage methods evaluation. Cocoyam corms of 150 - 200 g were collected from the bulk and were stored using different storage methods. Corms under shade were stored on the ground in the shade of mature cassia trees. Pits 1 m in length, 1 m in breadth, and 0.5 m deep were constructed, and corms were placed at the bottom of the pit and covered with palm fronds. Raised platforms were erected with bamboo sticks 1 m high above ground level, 2 m in length and 1 m in breadth. In all the different storage conditions, the corms were covered with palm fronds, except for the freshly harvested corms sourced from the old cocoyam field, which were allowed to stay on the field without harvesting.

Land Preparation

The vegetation [mainly *Chromolaena odorata (L.) R.M. King & H. Rob.]* was cleared manually, and the plant debris was removed from the plot and placed on the side of the field. The plots were marked out at 5 m x 5 m (25 m^2) per plot and 1 m between plots. Heaps were manually constructed at 1 m x 1 m apart.

Planting and Field Management

From the stored corms, 75 good corms (25 corms per replicate × 3 replicates = 75 per treatment) weighing 150 - 200 g each were selected as planting material from each storage method on 26 April 2021. Planting was done by planting one corm per heap. To prevent overcrowding, only one plant per heap was maintained by regularly removing any additional offshoots. Weeding operations on the field were carried out 4, 8 and 12 weeks after planting (WAP).

Data Collection

The weight of the corms was measured before and after storage to determine their weight loss during storage, as described in Equation 1 (Eze et al., 2015).

$$\text{Weight loss (\%)} = \frac{\text{Corm weight at storage} - \text{corm weight after storage}}{\text{Corm weight at storage}} \times 100 \quad (1)$$

The percentages of the good corms were also determined before and after storage to estimate the storage efficiency in Equation 2 (Eze et al., 2015).

$$\text{Storage Efficacy (\%)} = \frac{\text{Number of corms stored} - \text{Number of corms after storage}}{\text{number of corms stored}} \times 100 \quad (2)$$

The rate of corm emergence was determined at 2-week intervals till the 12th WAP. Plant height (by measuring the height of the tallest petiole of the leaves that stand erect from the underground corm using a ruler) and stem diameter (the base of the leaves petiole from the underground corm using a Vernier calliper) were measured starting from the 12th WAP and at monthly intervals for 7 months. At harvest, length and diameter per corm and cormel were measured. The weights of corms/ha, cormels/ha and the number of cormels/ha were estimated.

Data Analysis

The data collected were processed using descriptive statistics and analysis of variance. Means of significantly different treatments were separated using LSD at $p<0.05$.

RESULTS and DISCUSSION

Weight Loss under Different Storage Conditions

The significant variation in weight loss across storage methods may be attributed to differential exposure to environmental stresses, particularly temperature and relative humidity. Corms stored on raised platforms experienced the greatest weight loss, whereas those stored in pits had the least (Table 1). However, corms stored in pits likely experienced more stable microclimatic conditions, reducing respiration and transpiration rates that contribute to moisture loss. Lower metabolic activity under pit storage may have delayed dormancy break and microbial spoilage, thereby maintaining corm integrity better than raised platform storage, which was more prone to heat build-up and air circulation, accelerating desiccation and deterioration

(Uritani, 1999; More et al., 2019). These findings highlight the importance of selecting storage environments that minimize physiological stress on planting materials. More et al. (2019) reported that after harvest, tannia cormels undergo a period of dormancy and are likely to exhibit a low respiration rate. Consequently, weight loss is minimal compared to other root and tuber crops (More et al., 2019). However, the variation in weight in the different storage conditions implied that the stored corms were affected differently by the ambient storage conditions, which seemed to have imposed variation in the level at which the factors affecting weight loss in storage are altered. The weight reduction could decrease moisture content through transpiration from the stored produce (More et al., 2019). The weight loss is associated with the loss of moisture to the environment, leading to a decrease in the moisture content of the material, thus a loss in weight. Also, the stored condition would likely favour microbial activities differently, encouraging bio-deterioration of the stored produce (Uritani, 1999). Furthermore, reports have shown that weight loss in storage could be attributed to the increasing temperature that increases the respiration rate of the products in store (More et al., 2019). Weight loss in storage is largely attributed to respiratory metabolism and moisture evaporation, which are influenced by environmental conditions (Eze et al., 2015). According to Diaguna et al. (2022), respiration during storage depletes carbohydrate reserves, which not only leads to weight reduction but also affects sprouting and subsequent crop vigour (Finch-Savage et al., 2016). Moisture retention is crucial, as excessive desiccation delays sprouting and reduces emergence rates (Diaguna et al., 2022). These physiological responses must be considered when selecting appropriate storage conditions for vegetative planting materials. The interplay of these factors must have contributed to the final weight loss observed in the different storage conditions. Consequently, the ambient condition of the corms stored in pits is less affected by changes in temperature, which directly or indirectly affects the rate of respiration or conditions that may favour bio-deterioration of the stored produce. For the corms stored on raised platforms, however, despite being under shade, there is a high tendency of variation in the temperature of the storage platform.

Table 1. Weight loss and storage efficiency (%) of the corms stored under different conditions

Storage	**Weight loss**	**Storage efficacy**
Freshly harvested corms	-	-
Corms stored under shade	20.96	84.00
Corms stored in pits	11.42	73.60
Corms stored on raised platforms	35.62	60.00
LSD	4.267	5.51

Efficiency of Different Storage Conditions

The storage efficiency of the different storage methods was related to the number of corms stored vis-a-vis the number found after the storage period (Table 1). The efficiency of the different storage methods ranged from 60.0% (corms stored on raised platforms) to 84.0% (corms stored under shade) and differed significantly among the storage methods. The corms stored under shade had the highest number of good corms after storage, while those stored on raised platforms had the lowest. Behailu et al. (2023) and Akinrinola and Tijani-Eniola (2025) also reported similar observations on taro. Corm spoilage in storage is most often associated with pests, a rise in temperature, relative humidity, and rodent attacks, which induce or promote microbial activities on the stored produce. The trends observed for storage efficiency were similar to those for weight loss. The observation was probably due to the influence of similar factors. Reduction in the number of corms stored was occasioned by insect and rodent attacks, bio-degradation due to pathogenic bacteria and fungi, and an increase in temperature that increases transpiration and respiration of the stored materials. Unlike yam, mechanical damage resulting from skin damage in store is minimal in tannia due to the relatively tough skin (More et al., 2019; Opara and Pathare, 2023). The moisture evaporation rate from the corms stored on raised platforms is likely higher than the other storage conditions. This was due to consistent air movement around the platform, which tended to favour moisture loss that may lead to complete dryness of the corm. Also, despite the covering provided by the palm fronds, temperature variation is more likely to affect the storage condition than in the other storage methods. The corms stored under shade are more prone to rodent attacks. However, the condition is suspected to provide a reduction in the stored product compared to the corms stored in the pit. The corms stored in the pit respire and metabolise carbohydrates for sugar, water and heat. The heat generated within the storage condition may not be adequately dissipated, leading to the build-up of heat in the system. Consequently, the respiration rate increased, thereby resulting in the spoilage of the materials stored.

Influence of Corm Storage Methods on Cocoyam Emergence

Corm emergence varied significantly across storage methods (Figure 2). Corms stored in pits (T3) exhibited the fastest and most complete emergence, achieving full emergence earlier than the freshly harvested corms (T1) and shade-stored corms (T2). In contrast, corms stored on raised platforms (T4) consistently showed delayed and incomplete emergence, reaching full emergence only by 12 WAP, whereas other treatments had completed emergence by 10 WAP or earlier. Dormancy in corms is regulated by hormonal balances, particularly gibberellins and abscisic acid, which are influenced by temperature and relative humidity during storage (Diaguna et al., 2022). Effective storage aims to optimize environmental cues that break dormancy and trigger sprouting at planting time. Raised platform storage may have impeded this process by promoting desiccation, which is known to suppress sprouting activity (Uritani, 1999; More et al., 2019). According to the report by Eze et al. (2015), dormancy in tannia can last 2 - 3 months after storage. However, the environmental conditions have to be favourable enough to initiate the growth of the materials after planting (Wustman and Struik, 2007). The planting material needs suitable temperature and relative humidity levels to sprout root crops successfully. Although the soil type, soil moisture, temperatures in the study area, and the planting depth were similar, there was variation in the moisture contents of the corms used as planting materials. Consequently, no external factor should be an impediment to shoot emergence. The condition experienced by corms stored in pits encouraged earlier growth, resulting in earlier emergence compared to other methods. This may be attributed to minimal moisture loss and relatively stable environmental conditions in the pit. In practical terms, earlier emergence is critical for smallholder farmers as it can lead to earlier canopy closure, better competition with weeds, and improved overall yield. This aligns with findings by Anyaegbu et al. (2010), who reported better performance in maize with early emergence. Therefore, promoting pit storage as a viable low-cost method could help resource-constrained farmers establish their crops more reliably at the start of the rainy season. However, farmers may face challenges such as labor requirements for digging pits or managing rodent activity, which should be factored into extension recommendations. The environmental condition in the study area is tropical, which probably contributed to improving airflow that increases transpiration in a storage condition more than the others. Furthermore, the freshly harvested corms had a consistent emergence pattern compared to the other storage conditions. In storage, corms experience physiological weight loss through the reduction in moisture content or transpiration. However, before sprouting, the corm accumulates or absorbs moisture from the soil to initiate growth (Eze et al., 2015). The pit storage condition predisposes corms stored under this condition to earlier sprouting than the other conditions. Even though sprouting is not desirable in stored roots and tubers, it is sought after when the stored produce is reproductive propagules for early emergence and growth (Nwaigwe et al., 2015).

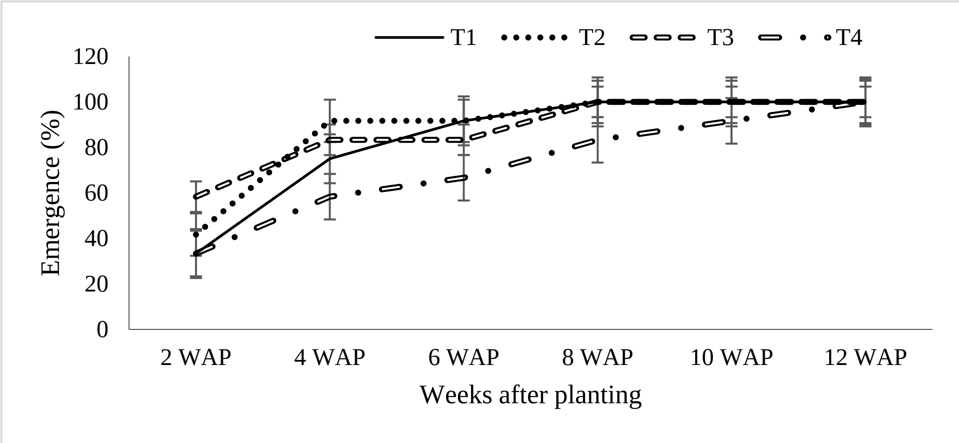

Figure 2. The emergence rates at 2-week intervals from planting up to 12 weeks after planting (WAP) as affected by storage methods. T1 = Freshly harvested corms, T2 = corms stored under shade, T3 = corms stored in pits, T4 = corms stored on raised platforms

Cocoyam Height as Affected by Corm Storage Methods

The height of cocoyam increased with an increase in the observation period after planting (Figure 2). The effect of corm storage methods on the height of cocoyam was not significant at the different periods of observation. However, the corms stored on raised platforms had the lowest values across the observation period, while the plants from corms stored under shade had the highest values 3 and 4 MAP (months after planting). The corms stored in pits gave the highest cocoyam height at 4 MAP till the 7th MAP. The growth of the sprouted corms after emergence differs in trends among storage conditions. This was substantiated by Wustman and Struik (2007) report that dormancy break does not relate to sprout growth under optimum temperature. The development of the corms after sprouting would rapidly initiate positive geotropic growth, which would offer good potential for phototropic shoot growth (Whalley and Finch-Savage, 2010; Finch-Savage and Basse, 2016). Therefore, plants with a delay in establishment are not likely to match those with early establishment. Crop vigour for upward growth is attributed to the ability of the plant to convert the carbohydrates stored in the corm to support improved height. The least corm vigour was observed in the corms stored on the raised platform, while the other corm was similar. The continued taller plants from the freshly harvested corm as planting material from 5 to 7 MAP could be attributed to the fast rate of establishment attained compared to the other treatments. The finding corroborated Anyaegbu et al. (2010) report on crop emergence and field performance in maize. The better performance from early emergence was attributed to the earlier acquisition of nutrients from the soil before the crops that emerged later. Thus, giving a higher competitive advantage than plants from the other storage conditions. Tsedalu et al. (2014) also reported that early emergence improved cocoyam competition for resources with weeds.

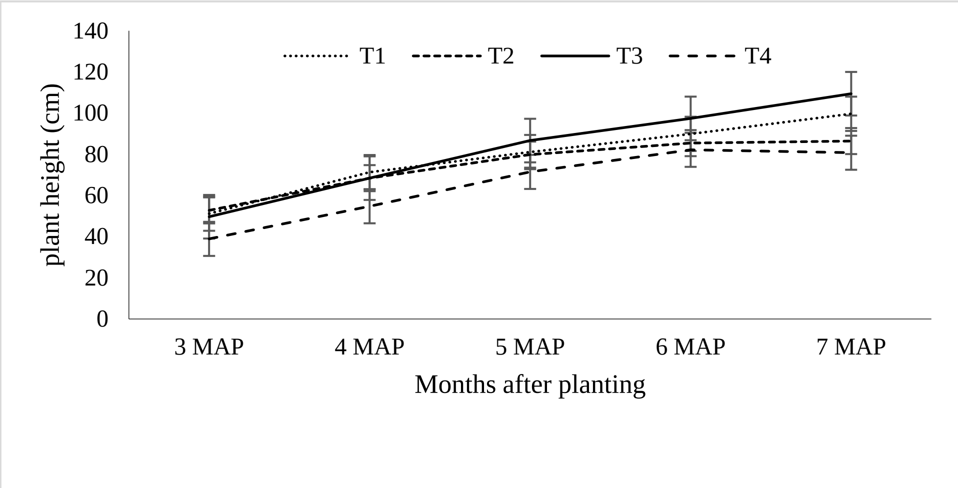

Figure 3. Average height of cocoyam (cm) over seven months as influenced by different corm storage methods. T1 = Freshly harvested corms, T2 = corms stored under shade, T3 = corms stored in pits, T4 = corms stored on raised platforms

Cocoyam Stem Diameter as Influenced by Corm Storage Methods

The stem diameter of cocoyam as affected by the storage condition of the planting material is shown in Figure 3. The stem diameter of cocoyam was not significantly affected by the method of corm storage across the period for which it was monitored. However, the lowest stem diameter values were observed in corms stored on the raised platform, while the corms stored under shade had the highest values at 3, 4 and 5 MAP, and corms stored in pits at 6 and 7 MAP. There was a reduction in stem diameter after 6 MAP, except for corms stored on a raised platform with stem diameter reduction at 5 MAP. The trends observed for the stem diameter were similar to those for the corm height. The consequent delay in the emergence of corms stored on raised platforms predisposes the crops to a time lag of nutrition after the other treatments (Anyaegbu et al., 2010). Also, the early drop in the growth curve for corms stored on raised platforms substantiated the lack of adequate nutrition, resulting in the early decline in growth compared to the other storage conditions. This is supported by Morgan and Connoll's (2013) finding that inadequate nutrition in plants resulted in the early senescence of plant leaves.

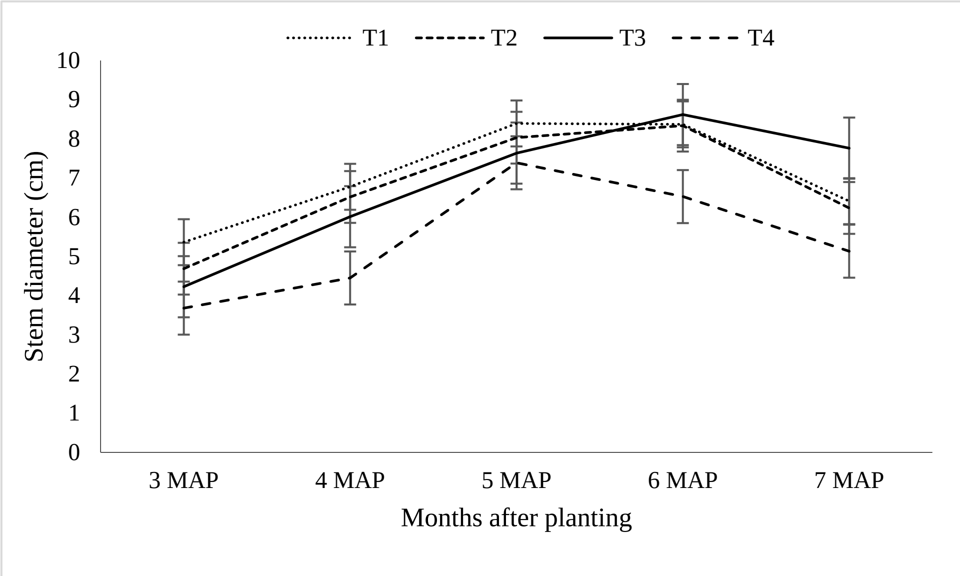

Figure 4. Average stem diameter (cm) of cocoyam across seven months as influenced by corm storage methods. T1 = Freshly harvested corms, T2 = corms stored under shade, T3 = corms stored in pits, T4 = corms stored on raised platforms

Cocoyam Corm and Cormel Yields as Affected by Corm Storage Methods

No significant variation was observed among the different storage methods concerning corm yield (Figure 4). However, the corms stored in the pit had 17.94, 22.27 and 24.53% corm yield than the stored corms under shade, freshly harvested corms and corms stored on raised platforms, respectively. This finding suggests that irrespective of the condition of corm storage used in the study, the yield obtained would not vary significantly. However, corms stored in the pit produced more cocoyam corms than the other methods.

The cormel yields varied significantly between the freshly harvested corms and corms stored on raised platforms. The cormel yield from the planting materials sourced from the freshly harvested corms had a significantly higher yield than those stored on the raised platform. The other storage methods were not significantly different from the yields observed from the freshly harvested corms. However, the yield from planting materials obtained from freshly harvested corms was 18.28, 31.43 and 39.81% higher than the yields observed for corms stored under shade, in pits and on raised platforms, respectively. The challenge of late corm emergence and attainment of complete emergence affected the cormels observed from the raised platform across the parameters, thus producing the least yield. According to Cornet et al. (2014), yam's delayed and erratic emergence leads to poor yield. The effect of early emergence and attainment of complete emergence on yield increase was associated with earlier tuberisation initiation in the growing season compared to those that emerge late. Although the freshly harvested corms (T1) recorded the highest cormel yield, this method presents practical challenges, particularly due to the high likelihood of spoilage when corms are left exposed in the field. Therefore, despite its agronomic performance, T1 may not be a viable storage option for resource-limited farmers.

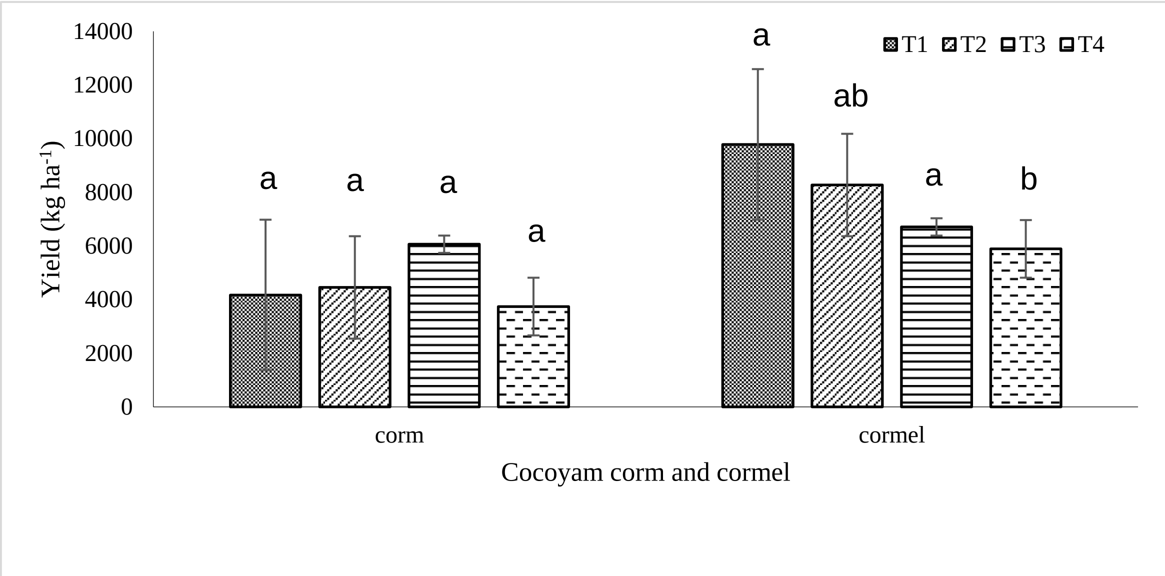

Figure 5. Effect of different corm storage methods on corm and cormel yields. T1 = Freshly harvested corms, T2 = corms stored under shade, T3 = corms stored in pits, T4 = corms stored on raised platforms

The Number of Cocoyam Cormel as Affected by Corm Storage Methods

The number of cocoyam cormels as influenced by the performance of corms stored under different methods is presented in Figure 5. The number of cormels from the yields observed was not significantly different. However, the number of cormels ranged from 55001.47 (corms stored in pits) to 107418.7 (freshly sourced planting materials at planting). The number of cormels from the freshly sourced planting materials was 16.21, 48.79 and 39.50% more than the number of cormels harvested from the corms stored under shade, in pits and on raised platforms, respectively. The poor general performance for the number of cormels observed for the corms from the raised platform could be the consequence of stresses in storage, the deterred emergence and poor growth variables. This result is supported by Tsedalu's (2014) report, that the number of cormels increases under appropriate growing conditions compared to suboptimal conditions. Therefore, the storage condition with the most limiting stress and growing condition performed better.

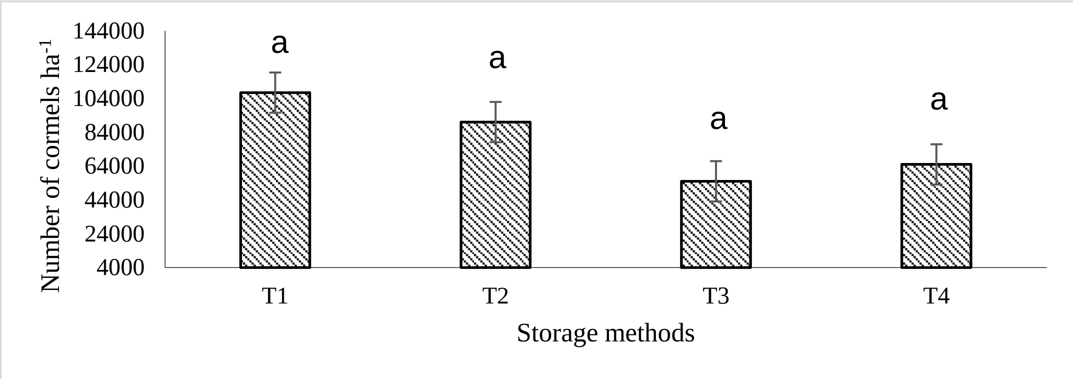

Figure 6. Total number of cocoyam cormels per hectare harvested from different corm storage treatments. T1 = Freshly harvested corms, T2 = corms stored under shade, T3 = corms stored in pits, T4 = corms stored on raised platforms

The Length and Diameters of Cocoyam Corms and Cormels as Affected by the Methods of Corm Storage

The lengths and diameters of corms and cormels indicated no significant variations (Table 2). However, the corm harvested from pits storage had the highest corm length and diameter values, while the materials from corms stored on raised platforms had the lowest values observed. The length and diameter of cormels harvested from materials established from corms stored in pits had the highest values (13 cm and 8.50 cm, respectively). The cormels harvested from the materials obtained from corms stored on raised platforms had the lowest cormel length and diameter. The length and diameter of the corms and cormels produced from the different storage conditions are a function of the ability of the crop to acquire sufficient nutrients from the soil to support the yield (Morgan and Connolly, 2013). Therefore, the length and diameter of corms and cormels stored in the pit had the highest values, while the lowest values were observed from the raised platform condition.

Table 2. The average length and diameters (cm) of cocoyam corms and cormels as affected by the methods of corm storage

Storage conditions	Average length/corm	Average diameter/corm	Average length/corm	Average diameter/corm
T1	12.00	7.95	13.42	4.77
T2	11.42	7.64	11.67	4.88
T3	13.00	8.50	12.17	4.79
T4	8.78	7.38	11.50	4.65
LSD	ns	ns	ns	ns

T1 = Freshly harvested corms, T2 = Corms stored under shade, T3 = Corms stored in pits, T4 = Corms stored on raised platforms

Pearson's Correlation Coefficient of Parameters

The Pearson correlation coefficient indicated a significant relationship between weight loss in storage and storage efficiency (Table 3). Corm emergence was negatively correlated to weight loss in storage across the observation period, with significance at 8 WAP and a high significance (p<0.01) at 10 WAP.

Table 3. Pearson's correlation coefficient of the parameters

	Weight loss	Storage efficacy	Emergence % (weeks after planting)					Cormel yield/ha
			2	4	6	8	10	
Storage efficacy	0.45*							
Emergence % 2 WAP	-0.20	0.16						
Emergence % 4 WAP	-0.35	0.01	0.66**					
Emergence % 6 WAP	-0.36	-0.10	0.31	0.71**				
Emergence % 8 WAP	-0.47*	-0.02	0.01	0.22	0.23			
Emergence % 10 WAP	-0.56**	0.13	-0.08	0.04	0.16	0.69**		
Cormel yield/ha	-0.30	-0.27	-0.03	0.19	0.22	0.43*	0.31	
Number of cormel/ha	-0.31	-0.34	-0.04	0.19	0.21	0.40	0.19	0.86**

*and ** = Significant at 0.05 and 0.01 probability levels, respectively

Similarly, weight loss was negatively correlated to cormel yield and the number of cormels/ha. The finding is supported by Tsedalu et al. (2014), who report that corm emergence has an inverse correlation with cocoyam performance. Impedance on emergence could facilitate poor crop growth and yield. The reason was attributed to the plant's ability to establish faster and limit the detrimental effects of weeds through competition for the limited available resources. Corm emergence at 2 WAP was significantly correlated to the emergence at 4 WAP. Similarly, emergence at 4 WAP had a high correlation with emergence at 6 WAP and emergence at 8 WAP also had a positively significant correlation with emergence at 10 WAP. The number of cormels/ha had a high (p<0.01) positive correlation with the cormel yield/ha. This result substantiated Paul and Bari's (2015) report that cormel yield and the number of cormels/ha are correlated.

CONCLUSION

The effects of different storage methods on the planting materials of cocoyam growth and yield revealed that weight loss in storage was highest in corms stored on the raised platform, while the least was observed in corms stored in pits. The storage efficiency of the different conditions was in the order of corms stored under shade > corms stored in pit > corms stored on raised platforms. The weight loss and storage efficiency for freshly harvested corm could not be estimated. This was because the materials were sourced at the time of planting. The corms stored on raised platforms had the lowest emergence rate relative to the other storage conditions, while the planting materials from corms obtained in the pit attained 100% emergence as early as possible. Cocoyam height and stem diameter were similar for the storage conditions but were the lowest in plants established from corms stored on the raised platform. While freshly harvested corms (T1) yielded the highest number of cormels, their practical viability is limited due to the potential for field losses. Thus, corms stored under shade (T2) offer a more balanced outcome in terms of both yield and postharvest handling efficiency. Storing corms under shade is recommended for preserving *Xanthosoma sagittifolium* planting materials.

Conflict of Interest

The authors have declared that there are no competing interests.

Authors Contribution

The authors contribute equally to the research

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