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Growth and Yield of Maize (*Zea mays L.*) as Influenced by Seed Energizers

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Abstract

Pre-treatment of seeds before sowing has been reported to improve seedling vigour and also increase crop yields of seeds placed under pyramids. Field trials were conducted during the early cropping and late cropping seasons of 2023 at Abeokuta, Nigeria to evaluate the influence of seed energizing technique on growth and yield of Maize (*Zea mays L.*). The trial was laid out in a randomized complete block design with a split- plot arrangement, involving a 3 x 3 factorial combination replicated three times. Seed lots of maize were stored in three seed energizing devices built as tetrahedron, hexahedron and dodecahedron for one, two and three weeks. The seeds were planted and evaluated over two seasons. Observations were made on growth and yield parameters. Results showed that seed energizing devices significantly ($p \leq 0.05$) affect the performance of maize. Maize performed best for seeds kept in dodecahedron for two weeks compared with the control. Seed energizing devices and duration of seed placement significantly affected ($p \leq 0.05$) weight of cobs, weight of seeds in the cobs, ear length, number of rows/ears, number of grains / row and grain weight/plant. Dodecahedron device gave the best dry matter yield at 60 Days after Planting followed by tetrahedron and least for hexahedron.

Introduction

The energy field within pyramids has become a popular field of study in recent decades. Flanagan (1971) maintained that the five angles of the pyramid project a beam of radiation towards the center which he called the "fire in the middle". He called this amplified life- giving force "biocosmic energy". Science has not yet understood the specifics of this energy.

Flanagan (1973) further showed that pyramids with the exact relative dimensions of Egyptian pyramids act as an effective resonator of randomly polarized micro wave signals which can be converted into electrical energy. He demonstrated that while most of the energy is focused within and beneath the pyramid, some also diffuse from the five points.

He indicated that many people who have stood on top of the Great pyramid have described sensing a subtle energy field or electrical charge around them.

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Flanagan who then investigated pyramid effects on plants, water, animals, and people was particularly enthusiastic about the pyramid's ability to preserve food. He observed that foods and beverages stayed fresh longer and acquired enhanced flavour. Some fruits can be preserved indefinitely by pyramid dehydration.

Schull and Petit (1975) stated that the Great pyramid enshrined and preserved timeless knowledge which is still challenging scientists today. They said that it is "an instrument for human growth". As we delve into its history and learn more about the ancient wisdom it embodies, we learn more about human capacity and evolution. We are only beginning to understand the advanced scientific and metaphysical knowledge which ancient civilizations and the Great pyramid convey to us across the millennia.

There are indeed many questions still waiting for answers. For instance, how and with what instrument or techniques was the Great pyramid in Egypt built? It is widely believed that the Great pyramid enshrined and preserved timeless knowledge that modern science is yet to unlock its secret.

Research in the USA, Russia and Ukraine have shown that seeds placed inside pyramid prototypes showed better vigor, growth and yield. Adetiloye (1985) studied the evolutionary sequence of five regular geometric shapes (tetrahedron, hexahedron, octahedron, icosahedron and the dodecahedron) and opined that if the asymmetrical forms of the great pyramid can have the above beneficial effects, more regular symmetries should exhibit similar if not better effects than the Egyptian prototypes.

Maize is a subsistence cereal crop grown widely throughout the world in a range of agroecological environments. It is one of the important grains in Nigeria, not only on the basis of the number of farmers that engage in its cultivation, but also in its economic valueIt started as a . Maize is highly yielding, easy to process, readily digested and costs less than other cereals. It is also a versatile crop, allowing it to grow across a range of agro ecological zones (IITA,2001). All parts of the crop can be used for food and non-food products. It is used as livestock feed and as a raw material for industrial products. It is an important source of carbohydrate and if eaten in the immature state, provides useful quantities of Vitamin A and C. Maize thrives best in a warm climate and is now grown in most of the countries that have suitable climatic conditions (Olaniyi and Adewale).

According to lzang and Tenong (2019), various agricultural programmes have been introduced in the past. For example, the National Accelerated Food Production Project in Nigeria was targeted towards providing small scale farmers with high-yielding varieties of seeds, tractors, fertilizers, insecticides and other farming equipment at subsidized prices. The recent Anchor Borrower's Programme was also designed to reduce poverty by strengthening and expanding agriculture. Izand and Tenong (2019) further reported that despite the enormous investment in agriculture, the agricultural revolutions failed and food supply continued to increase at arithmetic progression in contrast to geometric progression of population growth.

The objective of the study was to contribute to the immediate need to increase crop yields using seeds with superior yield advantages as a result of energizing the seeds prior to planting.

Materials and Methods

Location

Field experiments were conducted at the Teaching and Research Farm of Federal University of Agriculture, Abeokuta, Ogun State (70 15'N, 3^0 25'E) in the early season and late season of 2023. The meteorological observation of the location is presented in Table 1.

Table 1: Federal University of Agriculture, Abeokuta Meteorological observations in 2023

Month	Rainfall (mm)	Temperature (°C) Min.	Max.	Relative Humidity (%)	Sunshine Hours
January	39.8	21.6	36.0	51.6	5.9
February	23.5	23.9	35.4	57.5	5.5
March	78.1	24.6	34.9	63.2	5.1
April	82.4	23.2	31.4	64.1	5.8
May	128.2	23.5	32.1	71.1	5.7
June	53.7	23.3	31.0	71.0	5.3
July	202.6	22.3	28.7	76.2	3.0
August	35.2	21.1	28.6	71.7	3.1
September	136.0	22.4	28.9	69.7	4.3
October	94.4	23.1	31.7	67.2	5.0
November	15.6	23.5	33.1	60.0	6.5
December	16.5	22.4	33.0	58.5	6.2
Mean	**75.5**	**22.9**	**32.1**	**65.2**	**5.1**

Experimental Design

Each trial was planted in a Randomized Complete Block Design with a split-plot arrangement involving a 3 x 3 factorial with three replicates and covering three different geometric shapes and three durations of placement of seed lots in the different geometric shapes. The pictorial representation of the Energizers is shown in Fig.1

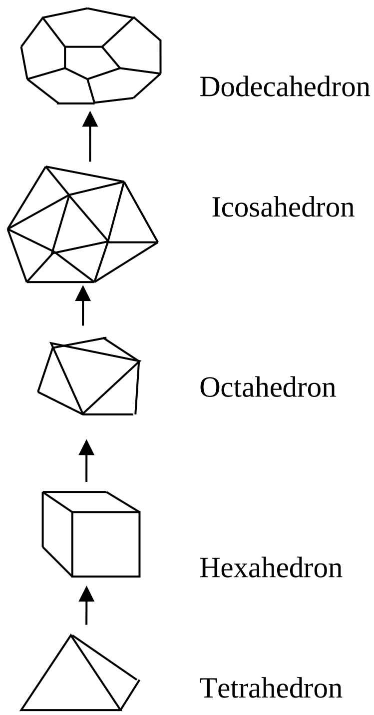

Fig. 1: The five regular geometric solids.
(Adetiloye, 1985, 1996)

Planting

Maize (*Zea mays* L.) seeds variety SAMMAZ 37 (QPM) were obtained from the International Institute of Tropical Agriculture, Ibadan. The seeds were evaluated after placement inside different energizing devices for one, two and three weeks for growth and yield evaluation The energizers were constructed as polyhedrons with a cardboard. The dodecahedron had 12 flat faces, each face being a pentagon; the hexahedron had 6 flat faces, each face being a square and the tetrahedron had 4 flat faces, each being a triangle. These were similar to those discovered by Adetiloye (1996).

Each plot size measured 15 m^2. The seeds were planted at 2 seeds per hole at 75 cm x 50 cm spacing and thinned to 1 per stand at 2 weeks after planting (WAP). Planting was done on the field during the early cropping season on April 21 and on July 30 in the late season.

Hoe weeding was done at 2 weeks after planting (WAP), 5WAP and 8WAP while NPK (15-15-15) Fertilizer was applied at 60 kg per hectare at 4 weeks after planting.

Data Collection

Data was collected on growth parameters such as emergence (%) counted at 7 days after planting (DAP), plant height (cm) at 60 DAP, stem girth (cm) at 60 DAP, number of leaves counted at 60 DAP, fresh matter yield at 60 DAP, dry matter yield at 60 DAP, and yield components such as seed yield/m^2, ear length, number of rows per ear, number of grains per row, ear weight per plant, grain weight per plant, cob weight per plant, shelling ratio, harvest index and hundred-seed weight.

Data Analysis

Data collected were subjected to Analysis of Variance (ANOVA) using Genstat Release Version 12.1. Significant Differences among treatment means were identified using the Least Significant Difference (LSD) test at 5% probability level.

Results and Discussion

Maize growth and yield in the early season

Data presented in Table 2 showed a significant difference ($p \leq 0.05$) between control seeds stored in the energizing devices prior to planting. Seeds stored in the dodecahedron prior to planting gave 9.6% more emergence, 13.3% higher in plant height, 17.8% bigger in stem girth, 8.3% higher in number of leaves, 33.3% higher in shoot fresh weight and 29.8% higher in shoot dry weight than control seeds. Seeds stored for two weeks prior to planting gave 6.0% more emergence, 7.3% higher in plant height, 15.6% bigger in stem girth, 8.3% higher in number of leaves, 25.7% higher in shoot fresh weight and 28.5% higher in shoot dry weight than control seeds. There is no significant interaction between the energy devices and the duration of seed placement in the devices.

Table 2: Effect of duration of maize seed placement in different energizing devices on growth parameters in the early cropping season.

	Emergence %	% Diff.	Plant height (cm)	% Diff.	Stem girth (cm)	% Diff.	Number of leaves	% Diff.	Shoot fresh weight per plant (g)	% Diff.	Shoot dry weight per plant (g)	% Diff.
Device												
Tetrahedron	95.3	7.9	153.3	6.8	5.0	11.1	13.0	8.3	251.2	21.0	55.1	25.5
Hexahedron	88.5	0.6	146.3	2.0	4.6	2.2	12.3	2.5	229.2	10.4	48.4	10.3
Dodecahedron	96.8	9.6	162.6	13.3	5.3	17.8	13.0	8.3	276.7	33.3	57.0	29.8
LSD (0.05)	0.95		0.58		0.47		ns		25.64		2.25	
Duration of seed placement												
One week	92.6	4.9	153.2	6.8	5.0	11.1	12.7	5.8	251.9	21.3	54.5	24.2
Two weeks	93.6	6.0	154.0	7.3	5.2	15.6	13.0	8.3	260.9	25.7	56.4	28.5
Three weeks	94.5	7.0	155.0	8.0	4.7	4.5	12.7	5.8	244.3	17.7	49.5	12.8
LSD (0.05)	0.84		0.45		ns		ns		9.45		1.39	
Shape x Time	ns		ns		ns		ns		ns		ns	
Control	88.3		143.5		4.5		12.0		207.6		43.9	

LSD (0.05): Least significant difference at $P \leq 0.05$, % Diff.: Percentage difference over control plants

Table 3: Effect of duration of maize seed placement in different energizing devices on yield and yield parameters in the early cropping season.

	Ear length (cm)	% D	Number of rows/ears	% D	Number of grains/ row	% D	Ear wt per plant (g)	% D	Grain wt per plant (g)	% D	Cob wt per plant	% D	Seed yield/m^2	% D	HI	% D	SP	% D	100-grain weight (g)	% D
Device																				
Tetrahedron	18.3	4.6	12.7	5.8	46.7	11.2	161.7	18.0	127.6	20.0	32.1	1.9	683.8	21.2	0.43	2.4	79.6	3.0	26.6	-11.9
Hexahedron	17.7	1.2	12.3	2.5	43.0	2.4	142.1	3.7	110.0	3.5	31.7	0.6	582.5	3.2	0.43	2.4	77.8	0.7	30.0	-0.7
Dodecahedron	19.7	12.6	13.7	14.2	49.7	18.3	176.1	28.5	138.6	30.4	34.4	9.2	757.6	34.3	0.41	-2.4	79.7	3.1	21.4	-29.1
LSD (0.05)	1.24		1.02		3.01		14.01		1.32		1.70		19.00		0.01		2.11		1.64	
Time																				
One week	18.6	6.3	13.3	10.8	43.3	3.1	158.0	15.3	126.4	18.9	32.7	3.8	675.0	19.6	0.42	0.0	78.9	2.1	26.1	-13.6
Two weeks	19.6	12.0	14.7	22.5	45.7	8.8	176.7	28.9	127.9	20.3	33.3	5.7	689.2	22.1	0.43	2.4	79.4	2.7	25.0	-17.2
Three weeks	17.4	-0.6	12.0	0.0	46.3	10.2	145.2	5.9	121.9	14.7	32.2	2.2	659.6	16.9	0.42	0.0	78.1	1.1	27.6	-8.6
LSD (0.05)	0.63		0.77		ns		9.21		2.46		0.97		15.39		0.01		ns		0.93	
Shape X Time	ns		ns		ns		ns		ns		ns		ns		ns		ns		ns	
Control	17.5		12.0		42.0		137.1		106.3		31.5		564.3		0.42		77.3		30.2	

LSD (0.05): Least significant difference at $P \leq 0.05$, % D: Percentage difference over control plants, SP: shelling percentage, HI: Harvest index.

The results presented in Table 3 showed that seeds stored in the dodecahedron prior to planting gave 12.6% higher in ear length, 14.2% higher in number of rows per ear, 18.3% higher in number of grains per row, 28.5% higher in ear weight per plant, 30.4% higher in grain weight per plant, 9.2% higher in cob weight per plant, 34.3% higher in seed yield, 2.4% lower in harvest index, 3.1% higher in shelling ratio and 29.1% lower in100-grain weight than control seeds. Seeds stored for two weeks gave 12.0% higher in ear length, 22.5% higher in number of rows per ear, 8.8% higher in number of grains per row, 28.9% higher in ear weight per plant, 20.3% higher in grain weight per plant, 5.7% higher in cob weight per plant, 22.1% higher in seed yield, 2.4% higher in harvest index, 2.7% higher in shelling ratio and 17.2% lower in100-grain weight than control. There is no significant interaction between the energy devices and the duration of seed placement in the devices.

Maize growth and yield in the late season

The results on growth parameters presented in Table 4 showed a significant difference ($p \leq 0.05$) between control seeds stored in the energizing devices prior to planting. Seeds stored in the dodecahedron prior to planting gave 13.6% higher in emergence, 13.3% higher in plant height, 18.0% bigger in stem girth, 9.1% higher in number of leaves, 28.7% higher in shoot fresh weight and 27.1% higher in shoot dry weight than control seeds. Seeds stored for two weeks prior to planting gave 6.3% higher in emergence, 7.7% higher in e plant height, 15.4% bigger in stem girth, 6.4% higher in number of leaves, 25.1% higher in shoot fresh weight and 21.9% higher in shoot dry weight than control seeds. There is no significant interaction between the energy devices and the duration of seed placement in the devices.

Data collected on yield parameters in Table 5 showed that seeds stored in the dodecahedron prior to planting gave 12.1% higher in ear length, 16.7% higher in number of rows per ear, 18.3% higher in number of grains per row, 28.8% higher in ear weight per plant, 26.2% higher in grain weight per plant, 9.7% higher in cob weight per plant, 34.5% higher in seed yield, 4.8% lower in harvest index, 3.1% higher in shelling ratio and 30.1% lower in 100-grain weight than control seeds. Seeds stored for two weeks gave 12.1% higher in ear length, 16.7% higher in number of rows per ear, 17.4% higher in number of grains per row, 24.9% higher in ear weight per plant, 20.7% higher in grain weight per plant, 5.5% higher in cob weight per plant, 22.8% higher in seed yield, 2.4% higher in harvest index, 3.0% higher in shelling ratio and 19.6% lower in 100-grain weight than control. There is no significant interaction between the energy devices and the duration of seed placement in the devices.

Emergence, stem girth, number of leaves, plant height, shoot fresh weight and shoot dry weight were all higher in seeds kept in the energizing devices prior to planting than the control seeds. Seeds kept in the hexahedron had fewer emergences but higher in plant height, stem girth, number of leaves, shoot fresh weight and shoot dry weight because the maize seeds were able to better utilize the energies from the hexahedron device. This agrees with Wilcock (2002) who posited that every object having certain geometry will simultaneously generate left and right torsion fields of a certain configurations depending on the geometry of the objects. The yield was higher in the dodecahedron and tetrahedron than the hexahedron because the hexahedron was not able to generate as much useful energy as the dodecahedron and tetrahedron energizing devices.

Table 4: Effect of duration of maize seed placement in different energizing devices on growth parameters in the late cropping season.

	Emergence %	% Diff.	Plant height (cm)	% Diff.	Stem girth (cm)	% Diff.	Number of leaves	% Diff.	Shoot fresh weight per plant (g)	% Diff.	Shoot dry weight per plant (g)	% Diff.
Device												
Tetrahedron	89.3	4.8	128.3	6.7	4.3	10.3	11.7	6.4	230.7	21.0	49.5	21.9
Hexahedron	85.5	0.4	123.5	2.7	4.0	2.6	11.2	1.8	211.2	10.8	44.4	9.4
Dodecahedron	96.8	13.6	136.3	13.3	4.6	18.0	12.0	9.1	245.3	28.7	51.6	27.1
LSD (0.05)	0.71		0.37		0.42		0.53		12.65		1.44	
Duration of seed placement												
One week	89.6	5.2	128.5	6.8	4.3	10.3	11.7	6.4	227.6	19.4	48.7	20.0
Two weeks	90.6	6.3	129.5	7.7	4.5	15.4	11.7	6.4	238.4	25.1	49.5	21.9
Three weeks	91.5	7.4	130.2	8.2	4.2	7.7	11.3	2.7	221.3	16.1	47.2	16.3
LSD (0.05)	1.13		0.38		ns		ns		9.31		1.22	
Shape x Time	ns		ns		ns		ns		ns		ns	
Control	85.2		120.3		3.9		11.0		190.6		40.6	

LSD (0.05): Least significant difference at P ≤ 0.05, % Diff.: Percentage difference over control plant, ns: ??

Table 5: Effect of duration of maize seed placement in different energizing devices on yield and yield parameters in the late cropping season.

	Ear length (cm)	% D	Number of rows/ears	% D	Number of grains/rows	% D	Ear wt per plant (g)	% D	Grain wt per plant (g)	% D	Cob wt per plant	% D	Seed yield/m^2	% D	HI	%D	SP	% D	100-grain weight (g)	% D
Device																				
Tetrahedron	18.1	4.0	13.0	8.3	47.7	13.6	150.6	18.0	114.5	18.4	31.6	1.9	631.8	22.6	0.43	2.4	78.3	3.3	25.0	-15.5
Hexahedron	17.7	1.7	12.4	3.3	43.0	2.4	132.7	4.0	97.5	0.8	31.2	0.7	540.7	5.0	0.43	2.4	76.3	0.7	28.3	-4.4
Dodecahedron	19.5	12.1	14.0	16.7	49.7	18.3	164.4	28.8	122.0	26.2	34.0	9.7	692.7	34.5	0.40	-4.8	78.7	3.8	20.7	-30.1
LSD (0.05)	1.40		1.07		4.06		23.50		1.19		1.26		19.64		0.01		0.29		1.96	
Time																				
One week	18.7	7.5	13.0	8.3	46.7	11.2	148.4	16.3	111.6	15.4	32.0	3.2	622.1	20.8	0.42	0.0	77.7	2.5	25.1	-15.2
Two weeks	19.5	12.1	14.0	16.7	49.3	17.4	159.3	24.9	116.7	20.7	32.7	5.5	632.5	22.8	0.43	2.4	78.1	3.0	23.8	-19.6
Three weeks	17.0	-2.3	12.0	0.0	44.3	5.5	139.9	9.6	105.6	9.21	31.5	1.6	610.6	18.5	0.42	0.0	77.4	2.1	25.2	-4.9
LSD (0.05)	1.01		0.64		ns		7.65		0.94		0.97		ns		0.01		0.48		0.87	
Shape X Time	ns		ns		ns		ns		1.59		ns		ns		Ns		ns		ns	
Control	17.4		12.0		42.0		127.6		96.7		31.0		515.2		0.42		75.8		29.6	

LSD (0.05): Least significant difference at P ≤ 0.05, % D: Percentage difference over control plants, SP: shelling percentage, HI: Harvest index, ns: non-significant

Maize seeds kept in the energizing devices performed best when the seeds were energized for two weeks. This is because the energy received from the energizing devices were too much for the seeds beyond two weeks and further energy imbibition caused negative reactions in the maize plant and this led to reduced grain yield when the seeds were energized for more than two weeks. This may be an area that needs more study as measurement of the amount of energy inside the energizers becomes possible.

Badru-Apraku *et al.* (2006) reported that the savanna of West and Central Africa has one of the greatest potentials for the production of maize because of relatively, higher incident of solar radiation and lower incident of pests and diseases during the cropping season. Agbogidi *et al.* (2006) has noted that maize yield is a function of a number of factors and processes such as light intercepted by the canopy, metabolic efficiency of the plant, translocation efficiency of photosynthesis from the source (leaves) to economic parts and sink capacity. It therefore follows that the photosynthetic capacity of the plant determines overall productivity and the extent of development of each yield character and is dependent on the interrelationship between the various yield components. The heightened energy field in the energizers allowed the seeds to absorb useful energy that created a special reaction in the living cells, resulting in larger blooms, leaves and thus photosynthetic action (Laigaard, 2012). This study agrees with Golod (2012) who reported 25.8% increase in plant height, 17.4% increase in root depth and 31.4% increase in wheat yield in a pyramid experiment in Russia. Also, Patel (2015) reported 22.1% increase in plant growth rate, 15.6% increase in fruit size and 28.5% increase in tomato yield.

Conclusion and Recommendation

The percentage increases in yield for plants from seeds kept in tetrahedron and dodecahedron were more in the late cropping season. This suggests that crops planted with energized seeds adapted more to drier environments. The energizing devices performed than the control. However, the more symmetrical hexahedron performed less than the asymmetrical tetrahedron. This is because the hexahedron is the worst type of human habitation as nobody builds square homes. The dodecahedron shape is recommended for maize when seeds are energized for two weeks.

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