RESPONSE OF CAYENNE PEPPER (SOMBO) GROWTH TO SIMULATED DRY SPELL OF DIFFERENT MAGNITUDES IN ABEOKUTA.

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ABSTRACT

The experiment was conducted in a screen house at Federal University of Agriculture, Abeokuta (FUNAAB) behind College of Environmental Resources Management (COLERM) to study the effect of simulated dry spell on growth of cayenne pepper (Capsicum Frutescens) in Abeokuta. The variety which were transplanted on September 13, 2019 was subjected under different dry spell for a period of ten (10) weeks for the purpose of this experiment, dry spell used were of different magnitude viz FLD – flooding; W3D– water after 3 days interval; W5D – water after 5 days interval; W7D – water after 7 days interval; and W10D – water after 10 days interval. The agronomic parameters monitored on a regular basis were plant height, number of leaves and leaf area, other parameters observed within the screen house environment were the soil and air temperature, relative humidity, and light intensity. The experimental design used for this experiment was the Completely Randomized Design (CRD), in which subjects are randomly assigned to treatments. At the final week of the experiment, the plants height were 36.00cm in W3D, 28.73cm in FLD, 26.07cm in W7D, 25.00cm in W5D, and 25.00cm in W10D,showing that cayenne pepper performed better under 3 days dry spell relative to plant height, during the growing period of week 1 to week 10, under FLD condition; the leaf area reduced from 24.98cm to 20.70cm, In W3D; the leaf area also reduced from 24.71cm to 14.60cm, In W5D; the leaf area shows increase from 7.13cm to 23.08cm, In W7D, the leaf area increased from 9.38cm to 15.40cm, and in W10D; the leaf area also increased from 9.87cm to 19.41cm. This implies that cayenne pepper thrives best in terms of leaf area under the water regime of W5D. the number of leaves mean highest values was 261.00 in W3D, followed by 154.00 in FLD, followed by 116.00 in W7D, followed by 104.00 in W5D, and least of 67.00 in W10D, it can be deduced comparing with the LSD values that dry spell shows a very significant effect on the soil temperature from 1WAT to 10WAT, it can also be put forward that considering fruit diameter, fruit length, fruit weight and number of fruits, the plant subjected to W3D thrives best. The W3D treatment showed the best result in terms of plants height, number of leaves and yield characteristics while W5D treatment shows better result in terms of leaf area only. This study confirms that dry spell have major impacts on cayenne pepper growth. The results showed that there was significant difference under the different water regimes; Performance was best observed under water after 3 days intervals (W3D) compared to FLD, W5D, W7D, W10D. So therefore, Water after 3 days intervals (W3D) is a very good water management option for the production of cayenne pepper in environment.

Keywords:

WAT - weeks after transplanting;

LSD - least significant differences;

FLD - flooding;

W3D - wet after 3 days;

W5D - wet after 5 days;

W7D - wet after 7 days;

W10D - wet after 10 days;

INTRODUCTION

Background information.

Water availability is the major constraint to crop production in different parts of the world (Panigrahi *et al*., 2013). The current increase in population worldwide along with urbanization and industrialization has reduced land coverage and water availability for agricultural practices. This had resulted in to scarcity in agricultural products particularly food and forestry products (Ayeni *et al*., 2015). Therefore, it is necessary to adopt efficient water management strategies.

Pepper (*Capsicum* sp) is an economically important crop belonging to the family Solanaceae (kumar 2011). It originated from South and Central America where it is still under cultivation (Pickersgill, 1997). The major centre of diversity is Brazil where representatives at all cited levels are found (Costa *et al.,* 2009). Peppers are considered the first spice to have been used by human beings and there is archaeological evidence of pepper and other fossil foods from as early as 6000 years ago (Hill *et al*., 2013). The genus *Capsicum* has five domesticated species (*C. annuum, C. frutescens, C. chinense, C. pubescens and C. baccatum*) of which *C. annuum* is the most widely cultivated species worldwide (Andrews, 1984).

Even though pepper is very popular in all the agro-ecological zones of Nigeria, very little has been achieved in the improvement of the indigenous cultivars probably because of the limited information on the genetic diversity within the species. It has been observed that farmers select and give out seeds of elite genotypes to their colleagues which are later cultivated under different local names. These materials are named based on several criteria, such as the origin of the genotype, pungency, uses, size and shape of fruits. This phenomenon has resulted in the treatment of some genotypes as different cultivars in different localities. For this reason, estimation of the genetic diversity among cultivated genotypes has become the

fundamental requirement of the crop industry, purposely, for identification and crop improvement (Tam *et al*., 2005)

Expert experience over the last few years has shown the need to embark on agricultural production with effective technology for better economic prosperity of any nation (OECD, 2001;UNDP, 2012) The present high cost of foodstuff in Nigeria is because of failed agricultural practices over the years (Okuneye, 2002; Obayelu, 2010; Olukunle, 2013). If Nigeria has to be rated among the economically powerful countries in the world, our agricultural productivity has to measure up to those countries that are presently rated as economic giant of the world. Hence, the agricultural sector of our economy will need a new and effective technology with ideas that will continually improve the productivity, profitability and sustainability of our country major farming practices (Sanusi, 2010; Plumecocq *et al*., 2018). Therefore, among these technologies and ideas is the greenhouse technology, soilless farming, irrigation, specific crops nutrient and water requirements, etc.

Cayenne pepper is a vegetable fruit very popular with the public in Indonesia. Chillies contain many essential oils that gives a spicy flavor and heat. The spicy flavor caused by the content capsaicin ($C_{18}H_{17}NO_3$) is very high. Pepper fruit contains a lot of Vitamin A and C. Problems crop irrigation chili among other things that still rely on rain-fed. So the efficiency of irrigation based on crop water needs to be considered to increase the national production of cayenne pepper. The water needs of plants vary, depending on the type of plant and its growth phase. In the dry season, the plants often get water stress (water stress) due to insufficient supply of water in the root zone and evapotranspiration rate that exceeds the rate of absorption of water by plants (Levitt, J. 2008).

In contrast to the rainy season, plants often suffer water saturated conditions. The purpose of this research is to know the effect of water stress on growth of cayenne pepper.

PROBLEM STATEMENT

In view of the erratic nature of rainfall and unpredictable weather condition, there is need for consistent or continuous work on identifying the vegetable variety with resistance to drought. This is done with the mind of ensuring food sustainability in Nigeria.

JUSTIFICATION OF STUDY

In Nigeria, one of the major setbacks in vegetable production is scarcity of water during the dry season and the incapacity of farmers to determine the accurate amount of water required during the growing season. It is in the light of this that the study conducted delved into the determination of the response of pepper plant to simulated dry spells as weather phenomenon remains unpredictable in many areas of Nigeria.

OBJECTIVES OF STUDY

The broad objective of this study is to assess the effects of simulated dry spell magnitude on growth of cayenne pepper in Abeokuta, Ogun state using Federal University of Agriculture, Abeokuta as a case study.

Specific objectives

The specific objectives of the study were to:

- Monitor the micro-climatic condition within the screen house environment.
- Assess the response of the agronomic parameters of capsicum specie to simulated dry spell magnitude.

MATERIALS AND METHODS

The experiment was conducted in a screen house at Federal University of Agriculture, Abeokuta (FUNAAB) behind College of Environmental Resources Management (COLERM) and the area is located between Latitude $7^{o}2^{1}23^{11}$N and Longitude $3^{o}4^{1}03^{11}$ E. (Figure 1).

The study area is characterized by a tropical climate with distinct wet and dry seasons. The wet season is associated relatively with the prevalence of the moist maritime southerly monsoon from Atlantic Ocean and the dry season by the continental North Easterly harmattan winds from the Sahara Desert. The area is located within a region characterized by bimodal rainfall pattern (April to July being the wettest months, followed by August to October). The annual rainfall ranges between 1400 and 1500mm in Abeokuta ant its environs. Isolated and scanty rains usually start in mid-March and steadily increase to reach the peak values in July followed by a short break in August. The dry season is normally from October to March and often characterized by hot days.

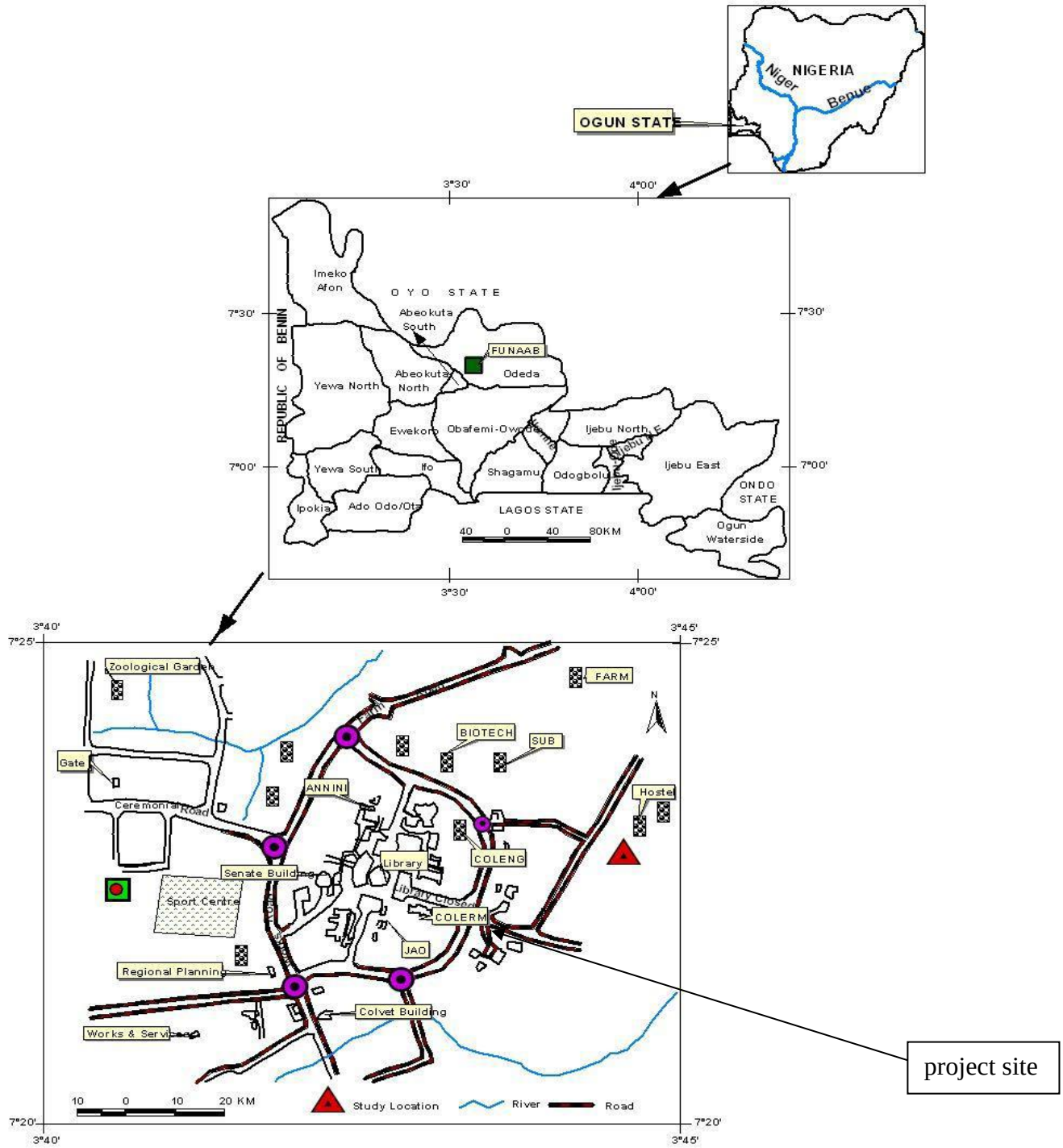

Figure 1: Location of experimental site within Federal University of Agriculture, Abeokuta within Odeda local government area in Ogun State, southwest Nigeria.

Experimental Procedures

Fifteen (15) transparent plastic buckets (5litres each), were purchased for the purpose of this experiment. Each of these buckets was perforated using soldering iron to enable the infiltration of water through the soil, out of the bucket. The Top soils that were filled into each buckets were obtained from the fadama experimental site behind marble hostel, FUNAAB. These top soils were excavated from the ground by the use of shovel, then filtered by the use of a sieve to obtain fine top soils that have little or no clump of soil particles before been transferred to the perforated buckets. The perforated buckets containing topsoil were wetted with water to field capacity and were left for a day before the desired variety of cayenne pepper was introduced. The perforated buckets containing the top soils were then labelled based on the treatments they underwent, and the varieties of pepper introduced into them.

The size of screen house was 12m length, 4.1 m width and 2.2 m height.

Experimental Design and Pot Layout

The experimental design that was used is the Completely Randomised Design (CRD) with three replications. The Completely Randomised Block Design is the most commonly used design because it minimizes error to a large extent. It is used when we have more than one factor. Plastic pots containing 3kg of the moistened soil samples were prepared for treatments.

Table 1: Experimental layout

REP 1	REP 2	REP 3
FLD	W5D	W10D
W3D	W10D	FLD
W5D	FLD	W7D
W7D	W3D	W5D
W10D	W7D	W3D

Where;

FLD – flooding;

W3D – without water for 3 days;

W5D -- without water for 5 days;

W7D – without water for 7 days;

W10D — without water for 10 days

Data collection and analysis

Two sets of data were collected, the agronomic data and meteorological data. The agronomic data were number of leaves, plant height, leaf area, leaf length and leaf breath, collected using standard procedures. The meteorological data involved daily observations of relative humidity (%) and temperature (^{0}C) with the aid of the soil thermometers for readings.

Data collected were subjected to analysis of variance (ANOVA) to evaluate the effects of simulated dry spell on growth of the pepper variety and treatment means were separated using Least Significance Difference (LSD).

RESULT AND DISCUSSION.

Meteorological data collected

The meteorological data collected during the growing season are recorded below, the temperatures was highest at 10WAT with 41.6^{0}C and lowest at 2WAT with 30.3^{o}C which was possible as the growing season started at wet season and towards the dry season in Abeokuta area while the relative humidity shows alike trend and decrease accordingly as the dry season approaches from 71% at 1WAT to 47% at 10WAT. This was September where the project started was a wet season tending towards a dry season around November/ December when the project was terminated.

Weeks	T(˚C)	RH(%)
1	32	71
2	30.3	79
3	33.3	72
4	32.2	70
5	38	62
6	33.7	62
7	33.8	73
8	37.7	60
9	35.4	56
10	41.6	47

TABLE 2; METEOROLOGICAL DATA

Where T- Temperature RH- relative humidity.

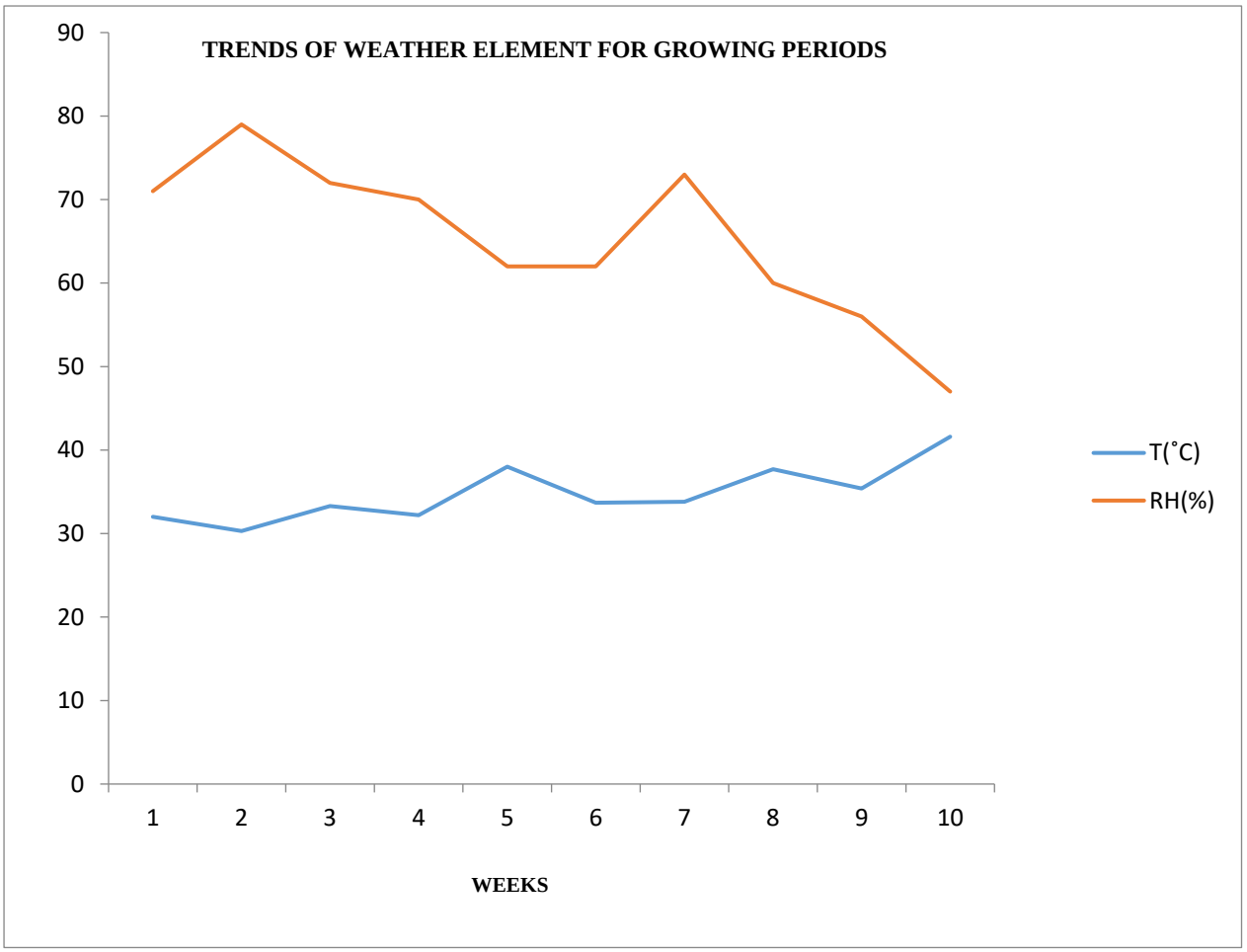

Figure 2: trends of temperature and relative humidity during the growing season

Plants height of cayenne pepper.

The observations recorded in the table 3 shows the plants height of cayenne pepper from one (1) WAT to ten (10) WAT. The plant heights shows significant difference at all sample occasion, the plant height at 1WAT has mean values ranging from 31.83cm in W3D, 25.03cm in FLD, 17.53cm in W7D, 14.37cm in W10D,and 11.87cm in W5D. Equally, the plant height at 4 WAT has mean value ranging from 35.43cm in W3D, 27.40cm in FLD, 20.27cm in W7D, 20.27cm in W10D, and 18.13cm in W5D. Furthermore, at 7WAT, the mean values are 35.80cm as the highest in W3D, followed by 28.57cm in FLD, followed by 24.07 in W7D, followed by 24.07cm in W10D, and lowest in W5D as 22.10cm.Also, the plant height at 10WAT has mean values ranging from highest to lowest as 36.00cm in W3D, 28.73cm in FLD, 26.07cm in W7D, 25.00cm in W5D, and 25.00cm in W10D.

Following the table below, it can however be deduced comparing with the LSD values that dry spells shows a very significant effect on the plants height from 1WAT to 10WAT, on the other hand, at 10WAT; the plants height were 36.00cm in W3D, 28.73cm in FLD, 26.07cm in W7D, 25.00cm in W5D, and 25.00cm in W10D, this implies that cayenne pepper thrives best in terms of plant height under the water regime of W3D and least improvement in W10D.

Sara *et al.*, (2017) reported that medium irrigation treatment (70% F.C.) produced the highest yield because increasing soil water content led to increasing plant height, number of branches and total leaf area resulting in an increase in the number of fruits and total fruit yield.

TABLE 3. EFFECTS OF WATER REGIMES ON PLANT HEIGHTS OF CAYENNE PEPPER IN ABEOKUTA, OGUN STATE.

	WAT									
TREATMENT	1	2	3	4	5	6	7	8	9	10
FLD	25.07±1.07	26.3±1.01	26.67±1.23	27.40±1.82	28.07±2.31	28.43±2.66	28.57±2.55	28.73±2.55	28.73±2.55	28.73±2.55
W3D	31.83±2.31	34.07±3.96	35.23±4.81	35.43±4.83	35.70±4.83	35.77±5.05	35.80±5.03	35.77±5.04	35.90±4.94	36.00±4.89
W5D	11.87±0.19	12.57±0.50	20.43±1.00	18.13±1.34	19.30±0.57	21.50±1.06	22.10±1.46	24.47±2.45	24.83±2.68	25.00±2.84
W7D	17.53±2.90	18.83±3.24	18.07±3.37	20.27±2.52	21.67±1.79	22.67±1.42	24.07±1.35	24.67±1.30	24.93±1.28	26.07±1.16
W10D	14.37±1.93	16.20±1.40	18.07±1.83	20.27±1.73	21.67±1.33	22.67±1.09	24.07±0.52	24.67±0.33	24.93±0.07	25.00±0.21
LSD(0.05)	6.09**	7.65**	8.97**	8.67**	8.51**	8.56**	8.53**	8.88**	8.88**	8.90**

Keys

WAT – weeks after transplanting; LSD – least significant differences; FLD – flooding; W3D – wet after 3 days; W5D -- wet after 5 days; W7D –wet after 7 days; W10D—wet after 10 days.

Leaf area of Cayenne pepper

The observations recorded in the table below shows the leaf area of cayenne pepper from 1WAT to 10WAT. The leaf area shows significant difference at all sample occasion, the leaf area at 1WAT has mean values ranging from 24.98cm in FLD, 24.71cm in W3D, 9.87cm in W10D, 9.38cm in W7D,and 7.13cm in W5D. Equally, the leaf area at 4WAT has mean value ranging from 29.57cm in W3D, 22.31cm in W7D, 21.91cm in FLD, 21.13cm in W5D, and 17.31cm in W10D. Furthermore, at 7WAT, the mean values are 28.25cm as the highest in W3D, followed by 26.72cm in W5D, followed by 23.86 in FLD, followed by 16.55cm in W10D, and lowest in W7D as 11.94cm. Also, the leaf area at 10WAT has mean values ranging from 23.08cm in W5D, 20.70cm in FLD, 19.41cm in W10D, 15.40cm in W7D, and 14.60cm in W3D.

Following the table below, it can however be deduced comparing with the LSD values that dry spells shows a very significant effect on the leaf area from 1WAT to 4WAT and a significant effect on leaf area from 5WAT to 10WAT. On the other hand, across the growing period of week 1 to week 10, under FLD condition; the leaf area reduced from 24.98cm to 20.70cm, In W3D; the leaf area also reduced from 24.71cm to 14.60cm, In W5D; the leaf area shows increase from 7.13cm to 23.08cm, In W7D, the leaf area increased from 9.38cm to 15.40cm, and in W10D; the leaf area also increased from 9.87cm to 19.41cm. This implies that cayenne pepper thrives best in terms of leaf area under the water regime of W5D.

Drought conditions led to excess salts premature in older leaves consequently leaf senescence occurred and photosynthetic leaf area of a plant resultantly decreased (Yang *et al.,* 2008).

TABLE 4. EFFECT OF DRY SPELL ON LEAF AREA OF CAYENNE PEPPER IN ABEOKUTA, OGUN STATE.

	WAT									
TREATMENT	1	2	3	4	5	6	7	8	9	10
FLD	24.98±4.18	24.39±6.44	25.47±5.88	21.91±1.98	22.70±8.00	23.94±8.24	23.86±7.33	22.54±7.77	21.48±10.2	20.70±9.62
W3D	24.71±3.85	24.87±5.41	29.30±4.37	29.57±3.65	30.33±3.53	30.12±6.53	28.25±5.56	20.93±4.86	11.11±4.49	14.60±1.10
W5D	7.13±1.65	15.33±5.66	17.61±5.50	21.13±4.55	25.73±2.91	26.21±4.53	26.72±3.55	25.98±6.25	23.30±10.00	23.08±7.45
W7D	9.38±3.14	12.32±2.22	14.41±2.41	22.31±2.59	24.41±4.40	18.74±1.62	11.94±1.41	15.40±2.33	13.16±1.87	15.40±2.33
W10D	9.87±2.15	11.21±3.67	14.67±3.99	17.31±4.64	23.67±4.81	21.66±7.67	16.55±7.81	19.41±6.0 0	14.93±2.60	19.41±6.00
LSD(0.05)	10.20**	15.52*	14.49**	11.31**	15.88*	18.05*	17.84*	18.05*	21.57*	19.51*

Keys

WAT – weeks after transplanting; LSD – least significant differences; FLD – flooding; W3D – wet after 3 days; W5D -- wet after 5 days; W7D –wet after 7 days; W10D—wet after 10 days.

Number of leaves of Cayenne pepper.

The observations recorded in the table 5 below shows the number of leaves of cayenne pepper from 1WAT to 10WAT. The number of leaves shows significant difference at all sample occasion, the number of leaves at 1WAT has mean values ranging as 38.33 in W3D, 29.00 in FLD, 21.67 in W5D, 18.67 in W7D, and 11.67 in W10D. Equally, the number of leaves at 4WAT has mean value ranges as 168.33 in W3D, 77.00 in FLD, 70.67 in W7D, 38.00 in W5D, and 32.00 in W10D. Furthermore, at 7WAT, the mean values are 238.33 as the highest in W3D, followed by 119.67 in FLD, followed by 96.33 in W7D, followed by 90.00 in W5D, and lowest in W10D as 59.00 .Also, the number of leaves at 10WAT has mean values ranges as 261.00 in W3D, 154.67 in FLD, 116.00 in W7D, 104.00 in W5D, and 67.00 in W10D.

Following the table below, it can however be deduced comparing with the LSD values that dry spell shows a very significant effect on the number of leaves except from week one(1),week seven(7) and week eight(8) after transplanting which are of significant effect. On the other hand, at 10WAT; the number of leaves mean values were 261.00 in W3D, followed by 154.00 in FLD, followed by 116.00 in W7D, followed by 104.00 in W5D, and least of 67.00 in W10D, this implies that cayenne pepper thrives best in terms of number of leaves under the water regime of W3D and least improvement as number of leaves is concerned in W10D.

Many other investigators reported that, water stress affected negatively on vegetative growth characters of plants such as *Capsicum annuum* (Ali *et al.,* 2014), *Coriandrum sativum* (Farhood *et al.,* 2016), *Zinnia elegans* (Zahra *et al.,* 2016) and *Origanum vulgare* (Farzad *et al.,* 2016).

TABLE 5. EFFECT OF DRY SPELL ON NUMBER OF LEAVES OF CAYENNE PEPPER IN ABEOKUTA, OGUN STATE.

	WAT									
TREATMENT	1	2	3	4	5	6	7	8	9	10
FLD	29.00±11.0	45.0±17.16	65.67±33.67	77.00±31.01	84.33±32.9	109.00±43.19	119.67±50.2	123.67±53.3	150.3±34.9	154.67±31.47
W3D	38.33±7.54	76.67±14.1	124.67±23.13	168.33±36.33	193.0±33.1	222.67±43.35	238.33±55.3	225.0±57.65	259.7±54.7	261.00±45.08
W5D	21.67±10.0	15.33±3.17	18.33±4.67	38.00±10.79	52.67±15.7	76.00±32.05	90.00±45.18	111.0±64.05	107.7±57.3	104.00±51.86
W7D	18.67±7.69	26.33±5.78	45.00±11.79	70.67±13.00	94.67±16.8	105.32±4.78	96.33±19.43	125.67±26.6	117.7 ±25.5	116.00±26.73
W10D	11.67±4.26	14.33±4.67	21.67±7.13	32.00±8.02	39.00±8.73	43.67±8.51	59.00±14.84	79.67±20.35	70.67±15.2	67.00±11.84
LSD(0.05)	26.53*	33.31**	61.10**	72.28**	74.32**	104.11**	127.68*	150.36*	128.9**	114.19**

Keys

WAT – weeks after transplanting; LSD – least significant differences; FLD – flooding; W3D – wet after 3 days; W5D -- wet after 5 days; W7D – wet after 7 days; W10D — wet after 10 days.

Soil temperature of Cayenne pepper.

The observations recorded in the table 6 shows the soil temperature in degree celsius of cayenne pepper from 1WAT to 10WAT. The soil temperature shows significant difference at all sample occasion, the soil temperature at 1WAT has mean values ranges as 26.4 in W7D, 26.30 in FLD, 26.30 in W10D, 26.20 in W5D, and 26.00 in W3D. Equally, the soil temperature at 4WAT has mean value ranges as 31.47 in W10D, 31.23 in W3D, 30.87 in W7D, 30.77 in FLD, and 30.60 in W5D. Furthermore, at 7WAT, the mean values were 28.13 as the highest in W7D, followed by 28.00 in W10D, followed by 27.40 in FLD, followed by 27.07 in W5D, and lowest in W3D as 26.47cm. Also, the soil temperature at 10WAT has mean values ranging from as 35.43 in W5D, 35.33 in W7D, 34.33 in W10D, 34.13 in W3D, to 31.80 in FLD.

Following the table below, it can be deduced comparing with the LSD values that dry spell shows a very significant effect on the soil temperature from 1WAT to 10WAT, on the other hand, at 10WAT; the table shows the soil temperature data recorded for the growing seasons, it was differed considerably at various stages of the crop growth. The values for temperature and relative humidity in the screen house were related to the main phases of vegetative growth and reproductive development of pepper. The trend of temperature decreases and increases respectively but still within the range of optimum temperature required for normal growth of pepper.

Tiryaki and Andrews, (2001) reported that germination and seedling establishment phase of plants growth is especially sensitive to temperatures

TABLE 6. EFFECT OF DRY SPELL ON SOIL TEMPERATURE OF CAYENNE PEPPER IN ABEOKUTA, OGUN STATE.

	WAT									
TREATMENT	1	2	3	4	5	6	7	8	9	10
FLD	26.30±0.35	31.10±0.38	31.47±0.19	30.77±0.33	30.27±0.50	30.20±050	27.40±0.15	26.70±0.20	31.13±0.32	31.80±0.32
W3D	26.00±0.20	30.67±0.30	31.50±0.21	31.23±0.37	29.90±0.15	30.13±0.46	26.47±0.03	26.57±0.12	31.27±0.20	34.13±0.74
W5D	26.20±0.06	30.90±0.32	31.30±0.12	30.60±0.55	29.67±0.44	31.20±0.56	27.07±0.35	26.63±0.20	31.13±0.20	35.43±0.34
W7D	26.40±0.17	31.23±0.47	31.67±0.30	30.87±0.12	30.17±0.17	31.76±0.46	28.13±0.23	26.73±0.21	34.57±1.10	35.33±0.15
W10D	26.30±0.06	31.90±0.50	32.43±0.09	31.47±0.58	30.30±0.23	33.00±0.87	28.00±0.33	27.00±0.33	33.57±0.48	34.33±0.21
LSD(0.05)	0.6**	1.26**	0.61**	1.34**	0.77**	1.86**	0.79**	0.58**	1.79**	1.29**

Keys

WAT – weeks after transplanting; LSD – least significant differences; FLD – flooding; W3D – wet after 3 days; W5D -- wet after 5 days; W7D – wet after 7 days; W10D — wet after 10 days.

Yield characteristics of Cayenne pepper

Table 7 comprises of the fruit diameters, fruit lengths, fruit weight and number of fruit which are the yield data recorded after harvesting of the fruit, the parameters were differed considerably. There was significantly difference in fruit diameter, fruit length and number of fruits in all samples of the fruit harvested. The significant differences in fruit diameter, fruit length and number of fruits also ranged from different water regime while W10D has no fruit at all. The highest fruit diameter was recorded in W3D with 2.90cm wide, followed by 2.30cm in W5D, 0.97 in W7D, and 0.93 in FLD. The highest fruit length was recorded in W3D with 5.90cm long, W5D with 4.23cm long, FLD with 2.10cm long and W7D with 1.80cm long. It also follows that there was no significant difference between the fruits for the various water regimes. Water regimes has a very significant effect on number of fruits as W3D shows a very positive response with mean value of 12.67 fruits, W5D has 3.00 fruits mean values and FLD and W7D has the same mean value of 2.00 fruits.

Also from the table below it can be put forward that considering fruit diameter, fruit length, fruit weight and number of fruits, the plant subjected to W3D thrives best.

The water deficit during the period between flowering and fruit development reduced final fruit production (Jaimez *et al.*, 2000;).

TABLE 7. EFFECT OF DRY SPELL ON FRUIT DIAMETER,FRUIT LENGHT,FRUIT WEIGHT, AND NUMBER OF FRUITS OF CAYENNE PEPPER IN ABEOKUTA, OGUN STATE.

TREATMENTS	FD	FL	FW	NF
FLD	0.93±0.93	2.10±2.10	0.77±0.77	2.00±2.00
W3D	2.90±0.20	5.90±0.36	2.47±0.31	12.67±1.20
W5D	2.30±1.30	4.23±2.19	2.23±1.59	3.00±1.53
W7D	0.97±0.97	1.80±1.80	0.62±0.62	2.00±2.00
W10D	0	0	0	0
LSD(0.05)	2.65*	4.99*	2.67ns	4.84**

Keys

WAT – weeks after transplanting; LSD – least significant differences; FLD – flooding; W3D – wet after 3 days; W5D -- wet after 5 days; W7D –wet after 7 days; W10D—wet after 10 days

CONCLUSION AND RECOMMENDATION.

CONCLUSION

This study confirms that cayenne pepper responds to varying degree of dry spells. From this study,3 days without water (W3D) showed the best results in terms plants height, number of leaves, yield characteristics(fruit diameter, fruit length, fruit weight, and number of fruits) from FLD,W5D,W7D and W10D, leaf area result is best under W5D to FLD, W3D, W7D, W10D. While flooding (FLD) and wet after 5 days (W5D) showed a better result from W7D, while the least results were recorded under the continuous drying treatment at W10D. The research also confirmed that under different water management regimes, wetting after 3 days (W3D) favours plant height, number of leaves, leaf area, leaf breadth, and leaf length more than FLD, W5D, W7D and W10D.

Recommendations

Further research should be carried out on other plants to ascertain the effect of water management regimes on them. Likewise, more varieties of cayenne pepper should be subjected to researches like this.

However it is very important that other comparative experimental field studies be conducted in different environments or regions with different soil types, topography and climatic conditions within the country to validate these results**.**

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APPENDICES

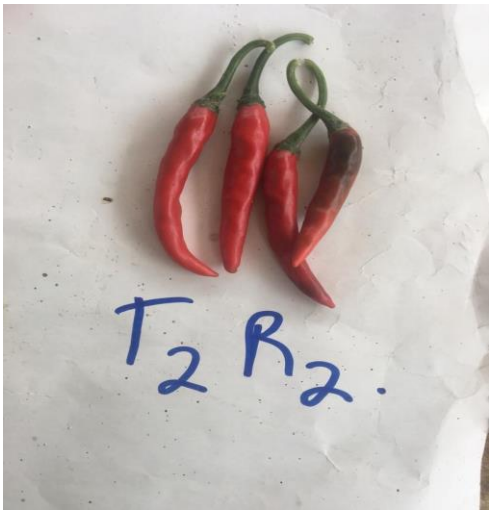

FIG. 3; W3D at REPLICATE 2

FIG. 4; SCREEN HOUSE

FIG. 5; EXPEIMENT PLOT

FIG 6; POT LAYOUT

FIG 7; FLD TREATMENT YIELD

FIG 8; W5D POT