Effect of Time of Planting on the Growth and Yield of Five Varieties of Cucumber (*Cucumis sativus L.*)

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Abstract: A field experiment was conducted during the wet season of 2006 at the Teaching and Research Farm of the Ambrose Alli University, Ekpoma (Lat. 6º 45' North and Long. 6º 08' E) and 460 meters above sea level to evaluate five varieties of cucumber (Marketmore 76, Ashley, Palmetto, Marketer and Beith Alpha) and determine the appropriate time during the wet season for planting. Planting was done in the month of April, May and June. The results of the study revealed significant differences ($P< 0.05$) among the varieties in terms of vine length, number of branches, leaf area, number of fruit, per plant and total fruit weight per hectare. The highest fruit, yield per hectare was obtained in the April planting and the Ashley variety consistently had higher yields than the other varieties.
[Ehiokhilen Kevin Eifediyi and Samson U. Remison. Effect of Time of Planting on the Growth and Yield of Five Varieties of Cucumber (*Cucumis sativus L.*). Report and Opinion 2010;2(11):6-13]. (ISSN: 1553-9873).

Key words: Cucumber, five varieties, time of planting and yield.

1. Introduction

Cucumber is a major vegetable crop worldwide and develops rapidly, with a shorter time from planting to harvest than for most crops (Wehner and Guner, 2004). The crop is the fourth most important vegetable crop after tomato, cabbage and onion in Asia (Tatlioglu, 1993); the second most important vegetable crop after tomato in Western Europe (Phu, 1997) and is the fourth most cultivated vegetable in the world after tomatoes, brassicas and onions (Wehner, 2007). In tropical Africa, the crop has not been ranked because of limited use.

Cucumber is grown widely in different parts of the world. It is an all year round out door vegetable in the tropics and an important greenhouse vegetable especially in Northern Europe and North America (Mingbao, 1991). Phu (1998) stated that cucumber could be cultivated in the field during the summer and winter in greenhouses using artificial heating. Jizhe (1993) opined that cucumber is a typical vegetable of warm temperate and cool tropical areas that can be cultivated at any time of the year.

At present, cucumber is cultivated as a field crop in most areas of the world under frost free conditions and also an important greenhouse crop in Northern Europe (George, 1990), the United States (Thompson and Kelly, 1957), and China (Jizhe, 1993). Nu (1998) stated that cucumber is a warm season crop which can be cultivated at any time but has little or no tolerance to frost and that growth and development are favoured by temperatures above 20^0C. In Nigeria, cucumber can be cultivated at anytime of the year. During the raining season, the crop is grown under rainfed conditions and during the dry season using irrigation facilities; as a result the crop can be seen in most vegetable markets in Nigeria throughout the year.

Many varieties of cucumber exist with varying shapes, skin colour and carotene content (Simon,1992) .The variation in the performance of cucumber varieties has been widely documented by many scholars (Manyvong, 1997; Ajisefinanni, 2004), which could be as a result of environmental factors or genetic composition.

This study was carried out to evaluate five varieties of cucumber and determine the appropriate time during the wet season for planting.

2. Materials and Methods

The experiment was conducted at the Teaching and Research farm of Ambrose Alli University, Ekpoma on Lat. 6^0 45^1 N and Long. 6^0 08^1 E in a forest - savanna transition zone of Edo State, Nigeria. The area is characterized by a bimodal rainfall pattern which starts in late March and ends in late July while the short rainy season extends from September to late October after a dry spell in August and the rainfall data is presented in Table 1. The soil order is an ultisol and the site is classified locally as kulfo series (Moss, 1957).

The site was left fallow for three years after it was cropped to maize, yam and cassava for two years prior to the establishment of the experiment. A composite soil sample was collected from 0-30 cm depth prior to planting to determine the pH and the nutrient status of the soil. Soil pH was analyzed by 1:2 in H_2O, total N content was determined by Kjeldahl method (Bremner, 1965); available

phosphorus was analyzed using the modified method of Walkley and Black (Nelson and Sommers, 1982) . The NPK fertilizer was bought from the Edo State Ministry of Agriculture and Natural Resources. Chemical analysis of the soil is presented in Table 2.

Table 1. Rainfall data taken during the experimental period

Months	No of raining days	Rainfall (mm)
January	2	5.30
February	2	9.20
March	6	96.90
April	5	112.00
May	13	234.10
June	15	292.70
July	19	449.90
August	15	348.10
September	25	554.20
October	19	42.20
November	1	2.20
December	0	0
Total	122	2145.30

Source EADP Ministry of Agriculture and Natural Resources Irrua Edo State.

The experimental site was cleared of existing vegetation and packing of the debris was carried out before it was marked into plots. Tilling of the soil was carried out by using hoes. Planting was done on 1st of April, 1st of May and 1st of June 2006 at a spacing of 75 cm x 75 cm. Two seeds were sown per hole which were later thinned down to one plant per stand three weeks after planting giving a plant population of 17,778 plants per hectare. The three inner rows were considered the net plot and five plants from the net plot were tagged from which the growth and yield parameters were recorded.

Fertilizer was applied at three weeks after planting at the rate of 200 kg/ha^{-1} using the side band method. The field was weeded manually using a hoe. A total of three weedings were carried out for adequate weed control at 3, 5 and 7 weeks after planting. The crops were sprayed three times with lamdacyahalothrin as Karate (insecticide) and benomyl (benlate) fungicide at the rates of 2 litres and 1.5kg/ha respectively at 4, 6 and 8 WAP to protect the plants against insect pests and fungal diseases. Harvesting of the cucumber fruits commenced at six weeks after planting when the fruits had turned deep green in colour. Harvesting was done by handpicking the mature fruits twice weekly.

The parameters recorded were vine length, number of leaves, number of branches, leaf area, yield and yield components. Cucumber vine length was measured by using a flexible tape rule. Number of leaves and number of branches were assessed by visual count of the green leaves and branches and the leaf area was assessed by the dry weight method of Bloodworth and Rhoads, At every harvest, the fruit girth was assessed by using a vernier calliper, the fruit length was measured by using a flexible tape before the fruits were weighed using a 10kg scale. The cumulative weights of the entire harvests (10 times) were summed up for data analysis.

Table 2. Chemical properties of the soil at the experimental site

Properties	Value
pH (in 2: 1 H_2O)	6.13
Organic matter content (g/kg)	36.50
Organic carbon (g//kg)	21.20
Nitrogen (%)	0. 12
Exchangeable Ca (cmol/kg)	5.36
Exchangeable Mg (cmol/kg)	1.04
Available P (mg/kg)	10.30
Exchangeable K (cmol/kg)	0.15

Results

Vegetative traits

The mean vine length of five cucumber varieties planted in April and assessed at 4, 6 and 8 WAP are shown in Table 3. The mean vine length at 4 WAP ranged from 19.09 to 25.99cm. Ashley and Palmetto varieties had the longest vine length, which was significantly different from the other varieties ($P<0.05$). At 6 WAP, the mean vine length ranged from 144.57 to 179.94cm. Ashley variety produced the longest vines followed by the Palmetto variety. At 8 WAP, the mean vine length ranged from 231.39 to 264.22cm. The longest mean vine length was produced by the Ashley variety, which was significantly similar to the Palmetto variety but significantly different from the other varieties ($P<0.05$).

The mean number of branches at 4WAP ranged from 1.01 to 1.25. (Table 3). The highest number of branches was recorded by the Ashley variety and the lowest by Marketmore 76. The differences between the treatment means were not significant. At 6 WAP, the mean number of branches ranged from 5.84 to

14.40; the highest number of branches was recorded by Ashley variety and the lowest by Marketmore 76 variety (Table 4). The differences between the treatment means were significant (P<0.05). At 8 WAP, the mean number of branches ranged from 14.08 to 16.60, the highest number of branches was produced by the Ashley variety and the lowest was by the Super marketer. The difference between the varieties were significant (P<0.05).

The mean number of leaves assessed at 4,6 and 8 WAP are presented in Table 3. The mean number of leaves per plant at 4 WAP ranged from 6.26 to 6.96. The highest number of leaves was produced by the Ashley variety and the least by the Marketmore 76 (Table 3). Data on the mean number of leaves per plant at 6 WAP ranged from 43.36 to 58.02. The highest number of leaves was produced by the Ashley variety and the least by the Beith Alpha variety and the differences between the varieties were significant (P< 0.05).The mean number of leaves at 8 WAP ranged from 47.84 to 62.49 and the Ashley variety produced the highest number of leaves which was significantly different from the other varieties (P<0.05).

The mean leaf area per plant of five cucumber varieties assessed at 4, 6 and 8 WAP are shown in (Table 3). The mean leaf area at 4 WAP ranged from 892.40 to 992.52 cm^2. The highest mean leaf area was observed in the Beith Alpha variety and the lowest mean leaf area was observed in the Marketmore 76. The differences between the varieties were significant (P<0.05). The mean leaf area at 6 WAP, ranged from 2971.38 to 4099.23 cm^2. The Ashley variety had the highest leaf area which was significantly different (P<0.05) from the other varieties. At the 8 WAP sampling period, the mean leaf area ranged from 3434..58 to 4284.52 cm^2. The highest leaf area was observed in the Ashley variety and the lowest was recorded in the Beith Alpha and the differences between the treatment means were significant (P<0.05).

The mean vine length of five cucumber varieties planted in May 2006 is shown in Table 4. The mean vine length at 4 WAP ranged from 23.99 to 28.86cm. The longest vine was observed in the Ashley variety with the Palmetto variety having similar value while the least vine was observed in the Marketmore 76 variety. The differences between the treatment means were significant (P<0.05). At 6 WAP, the vine length ranged from 144.99 – 168.45cm. The longest vine was observed in the Ashley variety, and the Beith Alpha the lowest. There was a significant difference in their treatment means (P<0.05). The vine length at 8 WAP ranged from 217.43 to 244.02cm. The Ashley variety produced the longest vine and the Beith Ashley, the lowest. The differences between the treatment means was significant (P<0.05).

The mean number of branches of five cucumber varieties is presented in Table 4. There were significant differences (P<0.05) across the three sampling periods of 4, 6 and 8 WAP. At 4 WAP, the mean number of branches ranged from 1.23 to 1.43. The highest number of branches was observed in the Ashley variety with the Palmetto variety having similar values. The Beith Alpha and Marketmore 76 varieties had the least number of branches. The number of branches at 6 WAP ranged from 7.32 to 13.23. The highest number of branches was recorded in the Ashley variety with the Palmetto variety having a similar value. Although the Marketmore 76 variety had the least value, it was similar to the other varieties. At 8 WAP, the number of branches ranged from 10.23 to 14.76. The Ashley variety produced the highest number with the Palmetto variety having a similar value and the Beith Alpha variety, the lowest.

The mean number of leaves of five cucumber varieties at 4, 6 and 8 WAP are shown in Table 4.The mean number of leaves at 4 WAP ranged from 7.75 to 8.22. The highest number of leaves was produced by the Ashley variety and the Marketmore 76, the lowest. The difference between the treatment means was not significant. At 6 WAP, the mean number of leaves ranged from 33.61 to 42.87. The highest number of leaves was produced by the Super marketer variety with Palmetto and Ashley having similar values and Marketmore 76 variety, the lowest. There were significant differences between the treatment means (P<0.05). At 8 WAP sampling period, the mean number of leaves ranged from 39.44 to 48.87. The highest number of leaves was produced by the Super marketer variety with the Palmetto and Ashley varieties having similar values and the Marketmore 76 variety, the lowest. There were significant differences between the treatment means (P<0.05).

The mean leaf area of five cucumber varieties at 4, 6, and 8 WAP are shown in Table 4. At 4 WAP, the mean leaf area per plant ranged from 881.91 to 993.24 cm^2. The highest leaf area was observed in the Ashley variety and the Super marketer, the lowest. There was no significant difference between the treatment means. At 6 WAP, the mean leaf area ranged from 3015.56 to 4227.93cm^2. The highest mean leaf area was observed in the Ashley variety, and the Beith Alpha, the lowest. The differences between the treatment means were significant (P<0.05). At 8 WAP, the mean leaf area ranged from 3759.57 to 4879.70 cm^2. The Ashley variety produced the highest mean leaf area and the Beith Alpha, the lowest. The differences between the

treatment means were significant (P<0.05).

The mean vine length of five cucumber varieties planted in June and evaluated at 4, 6 and 8 WAP are shown in Table 5. The mean vine length at 4 WAP ranged from 20.26 to 25.23cm. The Super marketer variety produced the longest vine and the Marketmore 76 variety, the shortest. There were significant differences between the treatment means (P<0.05). At 6 WAP, the mean vine length ranged from 150.82 to 11.03cm. The longest vine was observed in the Super marketer and the Beith Alpha the shortest. There was no significant difference between the treatment means. At 8WAP, the mean vine length ranged from 232.10 to 259.33cm. The longest vine was recorded in the Palmetto variety and the Beith Alpha variety, the lowest; there were significant differences between the treatment means (P<0.05).

The mean number of leaves per plant of cucumber at 4, 6 and 8 WAP is shown in Table 5. There were significant differences between the treatment means at (P<0.05) across the three sampling periods of 4, 6, and 8 WAP. At 4 WAP, the mean number of leaves ranged from 5.24 to 6.13. The highest number of leaves was observed in the Super marketer while the Beith Alpha, the lowest. At 6 WAP, the mean number of leaves ranged from 39.44 to 52.07. The highest number of leaves was recorded in the Palmetto variety and the Beith Alpha, the lowest. At 8 WAP, the mean number of leaves ranged from 45.39 to 56.20. The highest number of leaves was observed in the Palmetto variety and the Beith Alpha, the lowest.

The mean number of branches per plant of five cucumber varieties at 4, 6, and 8 WAP are shown in Table 5. There were significant differences between the treatment means across the three sampling periods of 4, 6 and 8 WAP (P<0.05). At 4 WAP, the mean number of branches ranged from 0.89 to 1.29. The highest number of branches was recorded in the Palmetto variety and the Beith Alpha and Marketmore 76 varieties, the lowest. At 6WAP, the number of branches ranged from 6.22 to 10.14, the highest number of branches was observed in the Super marketer variety and the Marketmore 76 variety, the lowest. At 8 WAP, the mean number of branches ranged from 7.86 to 10.80. The highest number of branches was observed in the Super marketer variety and the Marketmore 76, the lowest.

The mean leaf area per plant (cm^2) of five cucumber varieties of cucumber assessed at 4, 6 and 8 WAP are shown in Table 5. The mean leaf area at 4 WAP ranged from 966.14 to 955.63cm^2. The highest mean leaf area was observed in the Ashley variety with the Palmetto and Super marketer having similar values. The Marketmore 76 variety had the lowest mean. There were significant differences between their means (P<0.05). The mean leaf area of five cucumber varieties at 6 WAP ranged from 3536.84 to 3757.49 cm^2. The highest leaf area was observed in the Ashley variety and the Marketmore 76 variety, the lowest but there was no significant difference between the treatment means. At 8 WAP, the mean leaf area ranged from 3603.86 to 3961.34cm^2. The highest leaf area was observed in the Palmetto variety and the Beith Alpha variety, the lowest but there was no significant difference between the means.

Yield and yield components.

The fruit girth of five cucumber varieties planted in April are shown in Table 6. The fruit girth ranged from 5.50 to 6.40cm; the highest was observed in the Beith Alpha variety and the Super marketer variety, the lowest. The differences between the varieties were significant (P<0.05).

The fruit length of five cucumber varieties are shown in Table 6. The fruit length ranged from 19.04 to 20.51cm, the longest fruit was observed in the Marketmore 76 variety and the Ashley variety, the shortest but there were however no significant differences between the varieties .

Fruit number per plant of five varieties of cucumber are shown in Table 6.The fruit number per plant ranged from 6.16 to 9.53 and the Ashley variety produced the highest number of fruit per plant and the Marketmore 76, the lowest. There were significant differences between the varieties (P<0.05).

The fruit weight per plant and total yield per hectare of five cucumber varieties are presented in Table 6. The fruit weight per plant ranged from 1.17 to 2.33kg .The Ashley variety produced the highest weight per plant while the Marketmore 76, the lowest but there was no significant difference between the varieties. The total yield of cucumber per hectare ranged from 20,906.85 to 41,098.03kg. The highest yield was observed in the Ashley variety and the Marketmore 76 variety, the lowest but there was no significant difference between the varieties.

The fruit girth, fruit length, fruit weight per plant and yield per hectare of five cucumber varieties planted in May 2006 are shown in Table 7. The fruit girth of five varieties of cucumber ranged from 5.06 to 5.65cm. The Ashley variety had fruits with the widest girth and the Beith Alpha the shortest. The fruit length of five cucumber varieties ranged from 14.64 to 16.59cm. The Ashley variety had the longest fruit while the Beith Alpha, the shortest. There were significant differences between the varieties (P<0.05). The number of fruits per plant of five

cucumber varieties are shown in (Table 6). The number of fruit per plant of five cucumber varieties ranged from 5.60 to 8.50; the highest number of fruits per plant was observed in the Ashley variety and the Beith Alpha, the lowest. The differences between the varieties was significant (P<0.05).

The fruit weight per plant and fruit yield per hectare of five cucumber varieties are shown in Table 7. The fruit weight per plant ranged from 1.29 to 2.37kg; the Ashley variety produced the highest fruit weight per plant and the Marketmore 76 variety, the lowest; though there was no significant difference between the varieties. The yield per hectare of five cucumber varieties ranged from 23,431.54 to 29984.31kg; the Ashley variety produced the highest fruit weight per hectare and the Marketmore 76, the lowest. There were significant differences between the varieties (P<0.05).

The yield components of five cucumber varieties planted in June 2006 are shown in Table 8.The fruit number per plant of five varieties of cucumber ranged from 3.84 to 6.66; the highest number of fruits per plant was observed in the Ashley variety and the Marketmore 76, the lowest but there was no significant difference between the varieties.

The mean fruit girth and fruit length of five cucumber varieties are shown in Table 8. The fruit girth ranged from 4.40 to 4.90cm; the widest girth was recorded in the Beith Alpha variety and the Marketmore 76 variety, the shortest but there was no significant difference between the varieties. The fruit length ranged from 15.74 to 17.19cm. The longest fruit was observed in the Palmetto variety and the Ashley variety, the shortest but there was no significant difference between the varieties.

The mean fruit weight per plant and total yield of five varieties of cucumber per hectare are shown in Table 8. The fruit weight per plant ranged from 1.00 to 1.68kg; the Ashley variety produced the highest fruit weight per plant and the Marketmore 76, the lowest. The differences between the varieties were significant (P<0.05). The total yield per hectare ranged from 18,212.70 to 29,892.08kg; the highest total yield per hectare was observed in the Ashley variety and the Marketmore 76 variety, the lowest. There were significant differences between the varieties (P<0.05).

Planting dates and yield of cucumber varieties

The effects of planting dates on the five varieties of cucumber are shown in Table 9. The mean yield of five varieties of cucumber for the three months of April, May and June 2006 were significantly different (P<0.05) and ranged from 20,850.71 - 33,658.14kg/ha. The Ashley variety produced the highest yield per hectare, and the Marketmore, the lowest. Time of planting also significantly (P< 0.05) affected yield; but there was no varieties and planting dates interaction Planting in April produced the highest yield, and the June planting, the lowest..

4 Discussion

The results of this study showed that there were significant differences among varieties in some vegetative characters, namely. Vine length, number of branches, leaf area, number of leaves and yield characters such as number of fruits per plant, fruit weight per plant and total yield per hectare.

In all cases, Ashley and Palmetto varieties were superior to Marketmore 76, Super marketer and Beith Alpha varieties in both the vegetative characters at 8WAP and yield characters. The Ashley variety had differential yield characters – number of fruits per plant, weight of fruit plant and total yield per hectare which were significantly different from the other varieties. These differential growth and yield characters of cucumber have been reported by researchers in different parts of the world. (Sarwar, 1975; Koterowa et al., 1977; Buitelaar, 1978; Haben, 1980; Ramirez *et al*., 1988; Widders and Price, 1989; Uruk,1998). The differences in vegetative and yield characters can be attributed to genetic composition of the varieties used; the Ashley variety may have been quicker in adapting to the environment than the other varieties or the vegetative characters of the Ashley variety may have been more active than the other varieties and therefore had a strong source to sink relationship which resulted in high yields experienced in the variety. The number of fruits per plant was higher than what was reported by Phu (1998) and by Jizhe (1993) in Thailand.

The yields obtained in this varietal studies was higher than what Manyvong (1998) and Phu (1997) reported in Thailand but lower than the yield obtained by Mingbao (1993).

From the result of this study, it was found that cucumber can be planted at any time during the rainy season because of the consistent high yields recorded in the varietal trials which were carried out in different months of April, May and June in 2006. This is in consonance with the findings of Mas (1983) who stated that cucumber can be planted at any time of the year provided during the growing period, there is ample moisture and the soil is fertile. The results also agree with the findings of Thoa (1998) who observed that cucumber can be planted at anytime of the year and that even in temperate regions, during the winter the crop can be grown under greenhouse conditions using artificial lighting systems.

The high yield which was consistently recorded by the Ashley variety throughout the three months of study could be attributed to the genetic composition and its ability to quickly adapt to this environment. This was in agreement with the findings of Staub and Bacher (2004) who posited that cucumber yield is influenced by genetic and environmental factors, and as such is variable depending upon growing season and region.

The high yield experienced during the April planting over the May and June plantings could be attributed to moderate rainfall at the flowering and fruiting stage of the crop which began in the middle of May. High rainfall during flowering and fruiting can lead to bees inactivity with subsequent flower abortion with resultant low yield which may have resulted in the yields experienced during the July planting. This is in agreement with the finding of Papadopoulos (1994), who stated that high moisture tend to discourage the activity of bees and resultant high relative humidity which influence water condensing on the plant leaves which may result in the development of pests and diseases.

Table 3. Vegetative traits of five varieties of cucumber planted in April 2006

	Vine length (cm) WAP			Number of branches/ plant WAP			Number of leaves/plant WAP			Leaf area (cm^2/plant) WAP		
Varieties	**4**	**6**	**8**	**4**	**6**	**8**	**4**	**6**	**8**	**4**	**6**	**8**
Market more 76	22.34^{b}	148.57^{c}	237.86^{c}	1.01	5.84^{a}	14.08^{a}	6.26^{b}	47.30^{b}	53.25^{b}	892.40^{b}	3260.61^{b}	3982.42^{ab}
Ashley	25.99^{a}	174.94^{a}	264.22^{a}	1.25	14.40^{a}	16.60^{a}	6.96^{a}	58.02^{a}	62.49^{a}	979.15^{a}	4099.23^{a}	4284.52^{a}
Palmetto	25.36^{a}	165.54^{a}	250.27^{ab}	1.19	12.00^{b}	15.44^{a}	6.81^{a}	47.95^{b}	53.00^{b}	972.36^{b}	3351.63^{b}	3813.46^{bc}
Super marketer	20.99^{bc}	150.18^{c}	236.13^{b}	1.11	10.08^{c}	13.28^{b}	6.51^{b}	49.33^{b}	53.33^{b}	920.22^{ab}	3235.44^{b}	3443.40^{c}
Beith Alpha	19.09^{c}	152.19^{c}	231.39^{b}	1.07	9.72^{c}	14.08^{a}	6.43^{b}	43.36^{b}	47.84^{b}	992.56^{a}	2971.38^{b}	3404.58^{c}
Significance	*	*	*	NS	*	*	*	*	*	*	*	*

Table 4. Vegetative traits of five varieties of cucumber planted in May 2006

	Vine length (cm) WAP			No of branches/plant WAP			No of leaves/plant WAP			Leaf area cm^2/plant WAP		
Varieties	**4**	**6**	**8**	**4**	**6**	**8**	**4**	**6**	**8**	**4**	**6**	**8**
Market more 76	23.99^{c}	148.42^{b}	223.63^{ab}	1.23^{c}	7.32^{b}	10.44^{b}	7.75	33.61^{c}	39.44^{b}	906.32	3226.28^{c}	4022.52^{bc}
Ashley	28.86^{a}	168.45^{a}	244.02^{a}	1.43^{a}	13.23^{a}	14.76^{a}	8.22	40.72^{ab}	45.75^{ab}	993.24	4227.93^{c}	4879.70^{a}
Palmetto	28.78^{a}	155.45^{b}	232.71^{ab}	1.38^{ab}	12.36^{a}	13.14^{a}	8.14	42.77^{a}	47.20^{a}	963.61	3761.28^{b}	4349.76^{b}
Super marketer	26.21^{b}	150.26^{b}	225.89b^{c}	1.34^{b}	8.16^{b}	10.74^{b}	7.98	42.87^{a}	48.87^{a}	881.91	3264.43^{c}	4035.76^{bc}
Beith Alpha	26.13^{b}	144.99^{b}	217.43^{d}	1.23^{c}	8.76^{b}	10.23^{b}	7.76	35.73^{bc}	40.18^{b}	902.17	3015.56^{c}	3759.57^{d}
Significance	*	*	*	*	*	*	NS	*	*	NS	*	*

WAP = Weeks after planting

- Means followed by the same letter(s) within a treatment group are not significantly different at 5% level of significance using the Duncan Multiple Range Test (DMRT)

  NS Not significant

  * Significant at 5%

Table 5. Vegetative traits of five varieties of cucumber planted in June 2006.

	Vine length (cm) WAP			No of branches/plant WAP			No of leaves/plant WAP			Leaf area (cm^2)/plant WAP		
Varieties	**4**	**6**	**8**	**4**	**6**	**8**	**4**	**6**	**8**	**4**	**6**	**8**
Market more 76	20.26^{a}	158.17	233.93^{c}	0.89^{a}	6.22c	7.86^{d}	5.24^{b}	41.06^{b}	63.33^{b}	866.14^{b}	3536.84	3877.78
Ashley	24.01^{ab}	153.24	251.50^{ab}	1.03^{b}	9.24^{ab}	10.26^{b}	5.60^{b}	43.31^{b}	50.37^{b}	995.03^{a}	3757.49	3924.05
Palmetto	23.05^{b}	153.80	259.33^{a}	1.07^{b}	9.28^{b}	10.00b	4.47^{bc}	25.07^{a}	56.20^{a}	891.22^{a}	3746.75	3961.34
Super marketer	25.23^{a}	161.03	238.14^{bc}	1.25^{a}	10.14^{a}	10.80^{a}	6.14^{a}	40.75	47.78^{b}	891.54^{a}	3668.41	3603.86
Beith Alpha	21.15^{c}	150.82	238.10	0.89^{b}	8.64^{b}	9.22^{c}	5.27^{bc}	39.44^{b}	45.39	890.43^{b}	3635.63	3831.62
Significance	*	NS	*	*	*	*	*	*	*	*	NS	NS

* Significant at 5%

NS Not significant

Means followed by the same letter(s) within a treatment group are not significantly different at 5% level of significance using the Duncan Multiple Range Test (DMRT)

Table 6. Yield and yield components of five cucumber varieties planted in April 2006.

Varieties	No. of fruits/plant	Fruit length (cm)	Fruit girth (cm)	Wt of fruits/plant (kg)	Yield (kg/ha)
Market more 76	6.16[c]	20.99	5.57[b]	1.17	20,906.85
Ashley	9.53[a]	19.04	5.93[ab]	2.33	41098.03
Palmetto	8.59[b]	20.40	5.96[ab]	2.50	36565.93
Super marketer	6.57[c]	20.51	5.50[b]	1.59	28242.65
Beith Alpha	6.46[c]	19.62	6.40[a]	1.46	25917.35
Significance	*	NS	*	NS	NS

Means followed by the same letter(s) within a treatment group are not significantly different at 5% of significance using the (DMRT) Duncan Multiple Range Test
NS – Not Significant.

Table 7. Yield and yield components of five cucumber varieties planted in May 2006.

Varieties	No. of fruits/plant	Fruit length (cm)	Fruit girth (cm)	Wt of fruits/plant (kg)	Yield (kg/ha)
Market more 76	5.76[c]	14.64[b]	5.04	1.29	23431.54[b]
Ashley	8.50[a]	16.59[a]	5.65	2.37	29984.31[a]
Palmetto	7.48[a]	15.59[ab]	5.34	1.89	27940.31a
Super marketer	6.89[bc]	16.50[a]	5.46	1.41	24968.17[b]
Beith Alpha	5.60[c]	14.93[b]	4.90	1.38	24547.16[b]
Significance	*	*	NS	NS	*

*Means followed by the same letter(s) within a treatment group are not significantly different at 5% of significance using the Duncan Multiple Range Test (DMRT).
NS – Not Significant

Table 8. Yield and yield components of five cucumber varieties planted in June 2006.

Varieties	No. of fruits/plant	Fruit length (cm)	Fruit girth (cm)	Wt of fruits/plant (kg)	Yield (kg/ha)
Market more 76	3.84	15.76	4.40	1.00c	18213.70[c]
Ashley	6.66	15.74	4.77	1.68a	29892.08[a]
Palmetto	6.14	17.19	4.71	1.46b	26306.83[a]
Super marketer	5.19	15.74	4.78	1.39b	24783.46[b]
Beith Alpha	5.43	15.86	4.90	1.37b	24374.81[b]
Significance	NS	NS	NS	*	*

Table 9. Effect of planting dates on yield of five varieties of cucumber.

Varieties	April	May	June	Mean
Marke more 76	20906.85	23431.54	18213.54	20850.70
Ashley	41098.03	29984.31	29892.08	33658.14
Palmetto	36565.93	27940.31	26306.83	30371.02
Super marketer	28242.65	24968.17	24783.46	25998.09
Beith Alpha	25917.35	24547.61	24374.81	24946.59
Mean	30546.16	26174.39	24714.18	

LSD (P<0.05) Varieties 5739.23
Planting dates 4445.59
Varieties x Planting dates interaction Ns
NS – Not Significant.

Conclusion

From the result of this study, it was observed that cucumber performs best in a forest savanna zone when planted early at the beginning of the wet season in April and Ashley variety is recommende for the area.

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9/9/2010