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Evaluation of Three Varieties of Wheat (*Triticum aestivum* L.) on Yield and Yield Components in Jalingo Metropolis, Northern Guinea Savanna Ecological Zone of Taraba State, Nigeria

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Abstract
A field experiment was conducted in the dry seasons of 2017 and 2018 to evaluate the performance of three wheat (*Triticum aestivum* L.) varieties on yield and yield components in the Jalingo metropolis, northern Guinea savanna ecological zone of Taraba state, Nigeria. The experiment was laid out in a Randomized Complete Block Design (RCBD). The three wheat varieties used in the experiment were Cettia, Lifen and Reyna-28. They were sourced from the Lake Chad Research Institute (LCRI), Maiduguri, Nigeria. The treatments were replicated three times. The plot size was 3 m x 2 m (6 m^2). The seeds were sown by dibbling at a row spacing of 30 cm x 25 cm on the 15th of November each year. All the required agronomic practices were carried out. Data were collected on the number of spikes per m^{-2}, number of spikelets per spike, number of grains per spike, weight of 1000 grains, biomass yield, grain yield, straw yield and harvest index. All the data collected were subjected to Analysis of Variance (ANOVA) appropriate to randomized complete block design and means were separated using the Least Significant Difference (LSD) procedure. The results revealed that there were significant differences ($P \leq 0.05$) among the varieties in wheat yield and yield components. Reyna-28 produced the highest number of spikes m^{-2}, number of spikelets $spike^{-1}$, number of grains $spike^{-1}$, weight of 1000 grains, grain yield per hectare, biomass yield per hectare and harvest index while Linfen recorded the highest value of straw yield per hectare. In conclusion, Reyna-28 proved to be the best wheat variety for higher grain yield and most of the other traits tested. Therefore, Reyna-28 is recommended for irrigated wheat production in the study area.
Keywords: wheat (Triticum aestivum L.) varieties, yield and yield attributes and harvest index

Introduction

Wheat (*Triticum aestivum* L.) is an important staple crop around the world. Its importance has risen even more due to frequently experienced food shortages and its role in world trade. Wheat ranks first among the cereal crops, accounting for 30% of all cereal food worldwide and a major food for over one-third of the world population providing about 20% of the total food calories directly or indirectly for the human race (Ali and Teymur, 2013). In Nigeria, wheat is mainly cultivated under irrigation conditions in the northern part of the country where suitable low temperatures (<25^0 C) exist during the cold harmattan period from November to March (LCRI, 2015). There is an increase in domestic demand for baked and pasta products in the country with a national requirement of about 4.0 million metric tonnes annually (LCRI, 2015). However, local production is only 2.2% of its national requirement while the remaining is imported (LCRI, 2015; Falaki and Mohammed, 2011). The selection of improved and high-yielding wheat genotypes with a wide range of adaptation to soil and environmental conditions in the northern Guinea savanna ecological zone is essential to increase grain yield (Muhammad *et al*., 2014 Muhammad *et al*., 2009). Grain yield is generally the first factor to be considered when choosing a wheat variety, but farmers also compare varieties for agronomic factors such as establishment, lodging, disease resistance, maturity and weather hardiness (Kirk Anne, 2017). Many differences exist among wheat varieties, therefore it is important to assess them and also identify the characteristics that are most important for their productivity in a particular area (University of Georgia, 2013). Several crop traits directly contribute to grain yield hence they may be important when choosing from a crop variety to grow and the ecological zone where this plant can be grown. Other traits are associated with grain quality and they affect the economic values of the harvested produce, hence they are to be considered by farmers when choosing from the crop variety to grow. The choice of appropriate variety plays a significant role in maximizing yield under good management and optimum input conditions. Proper production technology cannot be contemplated in the absence of the right variety. Under irrigated conditions, appropriate plant height, duration, disease resistance, fertilizer responsiveness, lodging and heat tolerance during the grain-filling period as well as shattering tolerance are some of the important traits for wheat varieties to be cultivated.

Methodology

Study Area

This research was conducted in the 2017 and 2018 dry seasons at the Irrigation Research Farm of the Department of Crop Science, Taraba State College of Agriculture, Jalingo, Nigeria located at latitude 8^0 55′0″ N and longitude 11^0 19′25″ E with an altitude of 1600.23 m above sea level in Southern Guinea Savanna ecological zone. Jalingo metropolis is characterized by two (2) seasons, wet and dry seasons (Oruonye and Bashir, 2011). The wet season which lasts for six (6) months usually begins around April and ends in October with a break coming up sometime in July (Garba *et al*., 2022). The rains are at their peaks usually between August and September. However, the break is not fixed as it sometimes extends into August (Nasidi and Bello, 2020). About 60% of the rain in the study area falls between July and September. The dry season is characterized by the prevalence of the northeast trade winds popularly known as the harmattan wind which begins in November and ends in March. Jalingo has a mean rainfall of about 1,200mm and an annual temperature of 29^0 C with the highest temperature experienced in March (Garba *et al*., 2022). Relative humidity ranges between 60-70% during the wet season to about 35-45% in the dry season (Oruonye and Bashir, 2011). The study area is drained by River Lamurde, which is fed by the smaller stream; Mayo-Gwoi (Garba *et al*., 2022). Their content is emptied into the Benue river system at Tau village, dotted with ox-bow lakes that have been formed as a result of the depositional activities of the two aforementioned rivers (Oruonye and Bashir, 2011; Garba *et al*., 2022). The soil of the study area is sandy clay in some parts and sandy loam in others. According to Garba *et al*., (2022), the sandy clay is moderately poorly drained while the sandy loam on the other hand is well drained. The soil favours the cultivation of groundnut, while the sandy loam supports the cultivation of yam, maize, and guinea corn (Nasidi and Bello, 2020; Garba *et al*., 2022). The study area is dominated by grassland (Guinea savanna) in the northern part of the State. Northern Guinea Savanna is characterized by short grasses interspersed with short trees, though urbanization has taken its toll on the original vegetation. Local tree species include *Daniella oliveri*, *Vitellaria paradoxa* and *Acacia spp* (Meer *et al*., 2022). The *Eucalyptus tereticornis*, *Azadirachta indica*, and *Gmelina arborea* tree species have been domesticated (Nasidi and Bello, 2020; Garba *et al*., 2022).

Field Layout, Data Collection and Analysis

The field research was conducted in the 2017 and 2018 dry seasons at the Irrigation Research Farm of the Department of Crop Science, Taraba State College of Agriculture, Jalingo located in the Northern Savanna ecological zone of the State. The study site was cleared, ploughed, harrowed and levelled to achieve the required tilt for small grains. The experiment was laid out in RCBD with three wheat varieties (Cettia, Reyna-28 and Linfen). Wheat seeds obtained from Lake Chad Research Institute, Maiduguri were treated with Apron star at the rate of 10 g to 10 kg of seeds and sown by dibbling at row spacing of 30 cm x 25 cm on the 15th of November each year. Due to the texture of the soil (silt-clay) and the period (dry season), water was applied to the field at 7-day intervals commencing at sowing and irrigation continued until the grain filling reached the hard stage. Post-emergence application of Bentazone at 1.5 kg ai ha^{-1} (2.5 L ai ha^{-1}) was applied at 4 weeks after sowing as recommended (LCRI, 2015). Data were collected on the number of spikes m^{-2}, number of spikelets $spike^{-1}$, number of grains $spike^{-1}$, the weight of 1000 grain weight, biomass yield, grain yield, straw yield and harvest index. The crop was harvested at physiological maturity at an area of 1 m^2 of each plot, sundried and threshed to obtain the grains. All the data collected were subjected to Analysis of Variance (ANOVA) appropriate to RCBD and means were separated using Least Significance Difference (LSD) at a 5% level of significance as described by Gomez and Gomez (1984). The statistical analysis was performed using Genstat Discovery Version 4.0.

Results and Discussion

The results of the effects of varieties on the number of spikes m^{-2}, number of spikelets $spike^{-1}$, number of grains $spike^{-1}$ and weight of 1000 grains weight for the 2017 and 2018 dry seasons and the combined results over the yearsare presented in Table 1.

Number of Spikes m^{-2}

The results show that there were significant differences ($P \leq 0.05$) between the varieties in the number of spikes m^{-2} in both individual seasons and in the combined results. From the combined result, Reyna-28 gave the highest values of 293.29 followed by Linfen with the mean value of 243.29 while Cettia gave the lowest mean value of 237.50 spikes m^{-2}. **This could be ascribed to differences in the varieties to utilize the fertilizer as well as partition their photosynthates to the reproductive portions of the plants. The ability of plant cultivars to utilize available nutrients and optimally partition their photosynthates to the economic region of the plants has been recognized by Ndon and Ndaeyo (2001). These findings are in agreement with the report of Bavar** *et al*. (2016) that the effects of cultivar were significant on several **spike m^{-2}.**

Number of Spikelets $Spike^{-1}$

The effect of varieties on the number of spikelets per spike was highly significant ($P \leq 0.01$) in both seasons and combined results. From the combined results, Reyna-28 had the highest value of 18.79 spikelets $spike^{-1}$ which was statistically similar to that of Linfen (18.47) while the lowest value of 17.67 was obtained from Cettia. This indicates that the Reyna-28 variety had a higher ability to produce more spikelets $spike^{-1}$. The observation is similar to that which was obtained by Sultan (2012)) and Bello and Singh, (2013) who reported differences among varieties in the number of spikelets per spike.

Number of Grains Spike^{-1}

There was a highly significant (P≤0.01) effect of wheat varieties on the number of grains per spike in both seasons and the combined result. The maximum number of 56.07, 52.34 and 54.21 grains spike^{-1} for 2017, and 2018 and the combined results were obtained from Reyna-28 followed by Cettia while Linfen recorded the lowest number of grains spike^{-1}. The very low number of grains spike^{-1} in variety Linfen which has longer days to maturity was due to the nature of the Northern Savanna ecological zone characterized by unfavourable climatic conditions (heat stress) during heading, flowering and pollination (end of January to early February) which resulted to a greater percentage of empty spikelets. This could also be connected to the genetic variations among the varieties. Sohail *et al*. (2014) reported that each cultivar expressed a specific response to environmental conditions. They further stated that the genetic potential for cultivars' tolerance to environmental stress plays an important role in improving wheat productivity. The result agrees with the findings of Ali *et al*. (2000) who observed the significant differences among cultivars in terms of the number of grains spike^{-1}.

Weight of 1000 Grain

There were highly significant (P<0.01) differences among the wheat varieties on weight of 1000 grains in 2017, and 2018 and the combined result over the two years. From the combined result, the highest and the lowest mean values of 37.52 and 32.12 g of 1000 grains were recorded by Reyna-28 and Linfen, respectively. This observation is apparently due to their genetic makeup. This shows that Reyna-28 had heavier grains than the other varieties. It had better grain filling compared to the others. Elsewhere, Bello and Singh (2013) also worked on three varieties of wheat and observed that the three varieties were different in weight of the grains. Similar results were observed by Woyema *et al*. (2012) who worked with seven cultivars of wheat and found that there were significant differences among the cultivars in terms of 1000 grain weight. In line with these findings, Khurram *et al*. (2013) and Abdelkhalek *et al.* (2015) observed significant differences in the weight of 1000 grains among the wheat varieties they worked with. This shows that wheat varieties have differences in grain weight.

Biomass Yield

The results of the effects of varieties on biomass yield, grain yield, straw yield and harvest index for the 2017 and 2018 dry seasons and the combined results over the yearsare presented in Table 2. The results showed highly significant (P<0.01) differences among the varieties on biomass yield in the 2017 and 2018 seasons and the combined results. The combined varietal effect on biomass yield over the years shows that the highest and the lowest amounts of 11349 and 9426 kg of biomass were from Reyna-28 and Cettia, respectively. These varieties had different potentials for dry matter accumulation which is essential to dry matter allocation to the economic part of the plants. Rahim *et al*. (2010) and Alemu and Tesfay (2016) also reported differences among wheat varieties in biological yield.

Grain Yield

There were highly significant (P<0.01) differences among the wheat varieties on in both seasons and combined results on grain yield. Reyna-28 had the highest grain yield of 4173.10 kg ha^{-1} in the 2017 season and a mean grain yield of 3722.7 kg ha^{-1} in the two seasons. This was followed by Cettia which had the mean grain yield value of 3272.3 kg ha^{-1} for the two seasons. The lowest values of grain yield were obtained from Linfen with a mean grain yield of 2627.2 kg ha^{-1} for the two seasons. The responses of wheat varieties concerning the yield could be due to their varied genetic potentials and adaptation to the soil and climatic conditions which manifested in the differences in the yield components earlier reported. It could therefore be attributed to a greater number of grains spike^{-1} and 1000-grain weight obtained from Reyna-28 as compared to the other two varieties. This result confirms the report of LCRI (2015) that out of the three varieties studied, Reyna-28 has a higher grain yield. This affirmed the report of Degewione *et al.* (2013) that the significant varietal effect obtained on grain yield and other traits reveals the existence of sufficient genetic variability among the wheat varieties. Low yield in 2018 was a result of the corresponding low production of the yield components in 2018 due to higher temperature associated with the year as reported in the meteorological data (Table 3). This impacted heat stress on the crop leading to a greater significant reduction in all the traits, especially the grain yield. This confirms the report of FAO, United Nations (2019) which reported lower world wheat production of 734 million metric tons in 2018-2019 as compared to 771 MMT in 2017-2018 due to diverging weather conditions.

Straw Yield

There was a highly significant (P<0.01) varietal effect on straw yield where Linfen exhibited superior performance in straw yield over the other varieties in both years and the combined result over the years with the mean values of 7788 kg ha^{-1}. This is due to its higher number of tillers plant^{-1} and lower grain yield produced. These results are those of (LCRI, 2015) which reported that Linfen has profuse tillering ability. The numerous tillers were not effective as they could not produce grains. The result of this research confirms the findings of Maqsood *et al*. (2014) who reported differences among varieties of straw. The superior performance of this variety over the others is due to their genetic makeup.

Harvest Index

There were highly significant (P<0.01) variations among the varieties in the harvest index in both years and the combined result over the two years. Variety

Reyna-28 exhibited superior performance in harvest index over Cettia and Linfen with the mean value of 32.09 from the combined result. This may be attributed to its genetic make-up which is expressed in its ability to produce higher grain yield than the others. Higher grain yields are an indication of a higher potential for allocation of dry matter produced to the grains. These findings are comparable with those of Tamang *et al*. (2017) after they studied four soft red winter wheat genotypes where they reported differences among the harvest index of the genotypes. Noureldin *et al*. (2013) in Belete *et al*. (2018) stated that the significant differences in harvest index among varieties they worked with were due to their genetic variations.

Conclusion

Significant differences were recorded between the varieties in the number of spikes m^{-2} in both individual seasons. Reyna-28 had higher yield potentials than Cettia and Linfen under the climatic conditions of the northern Guinea Savanna ecological zone and could be recommended for production by farmers across the northern Guinea Savanna ecological zone. The results showed that wheat can be produced in the study area. Therefore, while farmers are thinking of the crop to produce in the dry season, they could also consider wheat and the ecological zone. The low temperature during the dry season in the study area is good enough for wheat production. Therefore, the dry season and northern Guinea savanna ecological zone are recommended for sustainable for wheat production.

References

Abdelkhalek, A. A., Darwesh, R. K., Mona, H and El-Mansoury, A. M. (2015). Response of Some Wheat Varieties to Irrigation and Nitrogen Fertilization Using Ammonia Gas in North Nile, Delta region. *Annals of Agricultural Science*, 60(2): 245-256.

Alemu, A. and Tesfay, B. (2016): Response of Some Resistant Barley Varieties to Russian Wheat Aphid (*Diuraphis noxia*) Damage under Different Nitrogen Fertilizer Rates in Tigray, Northern Ethiopia. *Journal of the Drylands*, 6(1): 469 – 477.

Ali, A., Choudry, M. A., Malik, M. A., Ahmad, R. and Saifullah, C. (2000). Effect of Various Doses of Nitrogen on the Growth and Yield of Two Wheat Cultivars. *Pakistan Journal of Biological Sciences,* 3(6): 1004-1005.

Ali, N. and Teymur, K. (2013). Response of Wheat to Mineral Nitrogen Fertilizer and Biofertilizer (*Azotobacter* sp. and *Azospirillum* sp.) Inoculation under Different Levels of Weed Interference. *Ekologija*, 59(2): 85–94.

Bavar, M., Heidari S. A. H. and Noormohamadi, G. H. (2016). The Effects of Different Levels of Nitrogen on Yield and Yield Components of Rainfed Wheat in Two Regions of North Khorasan. *Open Journal of Ecology*, 6: 443-451.

Belete, F., Dechassa, N., Molla, A. and Tana, T. (2018). Effect of Nitrogen Fertilizer Rates on Grain Yield and Nitrogen Uptake and Use Efficiency of Bread Wheat (*Triticum estivum* L.) Varieties on the *Ve. rtisols* of Central Highlands of Ethiopia. *Agriculture and Food Security*, 7(78): 1- 41.

Bello, M. S. and Singh, A. (2013). Yield and Yield Components of Bread Wheat as Influenced by Water Stress, Sowing Date and Cultivar in Sokoto, Sudan Savannah, Nigeria. *American Journal of Plant Sciences*, 4: 122-130.

Degewione, A., Dejene, T. and Sharif, M. (2013). Genetic variability and traits association in bread wheat (*Triticum aestivum* L.) genotypes. *Int. J. Agric. Sci*., 1: 19-29.

Falaki1, A. M. and Mohammed, I. B. (2011). Performance of Some Durum Wheat Varieties at Kadawa, Kano State of Nigeria. *Bayero Journal of Pure and Applied Sciences,* 4(1): 48 – 51.

FAO (Food and Agriculture Organization of the United Nations), (2019). *Crop Prospect and Food Situation.* Quarterly Global Report. FAO. 1st March, #1, 2019: 1-39.

Garba, A. H., Bwadi, E. B., Nicodemus, B. J., Albert, K. R., Iguisi E. O. and Folorunsho J. O. (2022). Flood vulnerability assessment using GIS/AHP in Jalingo metropolis. Taraba State, Nigeria. *Journal of Geography and Earth Sciences*, 10(1): 16-43.

Gomez, K. A. and Gomez, A. A. (1984). *Statistical Procedures for Agricultural Research*. 2nd Edition, John Wiley and Sons, New York: P 680.

Kamla, D., Alok, S. and Verma, R. S. (2017). Comparative Analysis of Changes in Leaf Area Index in Different Wheat Genotypes Exposed to High-Temperature Stress by Late Sown Condition. *Journal of Applied and Natural Science*, 9(4): 2410-2413.

Khurram, S., Ayub, K. and Iffat, N. (2013). Response of Wheat Varieties to Different Nitrogen Levels under Agro-Climatic Conditions of Mansehra. *Science, Technology and Development*, 32(2): 99-103.

Kirk, A. (2017). Tips for Winter Wheat Seeding. Available at www.seedmb.ca. Accessed on May 25, 2022.

Lake Chad Research Institute. (2015). *Extension Guide on the Production of Wheat*. Federal Ministry of Agriculture and Rural Development. Pp 1- 4.

Maqsood, M., Shehzad, M. A., Ramzan, Y. and Sattar, A (2014). Effect of Nitrogen Nutrition on Growth, Yield and Radiation Use Efficiency of Different Wheat (*Triticum aestivum* L.) Cultivars. *Pakistan. Journal of Agricultural Science*, 51(2): 441-448.

Meer, B. B., Tella, I., Saka, M. G., Nyiputen, I., Gbande, S. and Chapman, H. (2019). Sustainability, population and structure of woody species composition of Taraba State forests. *Asian Journal of Research in Agriculture and Forestry,* 2(4): 1-13.

Muhammad, T., Asghar A., Muhammad, A. N., Akhtar, H and Farhan, K. (2009). Effect of Different Sowing Dates on Growth and Yield of Wheat (Triticum aestivum L.) Varieties in District Jhang, Pakistan. *Pakistan Journal of Life and Social Science,* 7(1): 66-69.

Muhammad, Y. Suleiman, A. I. A., Khalid, A. O. and Salih, A. I. S. (2014). The Effect of Nitrogen Application Rates and Timings of First Irrigation on Wheat Growth and Yield. *International Journal of Agriculture Innovations and Research.* 2(4): 2319-1473.

Nasidi, N. A. and Bello, H. G. (2020). Muri Emirate under British Colonial Domination and the Changing Role of Modibbe in the Spread of Islam. *Lapai Journal of Humanities*. 11(2): 1152-168.

Ndon, B. A. and Ndaeyo, N. U. (2001). Evaluation of Some Cowpea (*Vigna unguiculata* (L) in Bread Wheat (*Triticum aestivum* L.) Genotypes. *International Research Journal of Agricultural Sciences* 1(2):19-29.

Noureldin, N. A., Saudy, H. S., Ashmawy, F. and Saed, H. M. (2013). Grain Yield Response of Bread Wheat Cultivars as Influenced by Nitrogen Levels. *Annals of Agricultural Science*, 58: 147-142.

Oruonye, E. and Bashir, A. (2011). *The Geography of Taraba State, Nigeria*. LAP LAMBERT Academic Publishing GnBH and Co. KG and licensors. Pp 1-264.

Rahim, N., Amir, M., Reza, S. and Ehsan N. (2010). Response of Bread Wheat to Nitrogen Application in Calcareous Soils of Western Iran. *American-Eurasian Journal of Agriculture and Environmental Science*, 9 (1): 79-85.

Sohail, M., Hussain, I., Din, R.U., Tanveer, S. K., Qamar, M. and Abass, S. H. (2014). Physico-Agronomy Traits Evaluation of Wheat Genotypes for Adaptability Under Rainfed Conditions. *Sarhad Journal of Agriculture*, 30 (2): 151 -159.

Sultan, B. (2012). Global Warming Threatens Agricultural Productivity in Africa and South Assia. *Environmental Research Letters*. 7(4): Pp 041001.

Tamang, G. B., Brasier, K. G., Thomason, W. E., Griffey, A. C. and Fukao, T. (2017). Differential Responses of Grain yield, Grain Protein, and their AssociatedTraits to Nitrogen Supply in Soft Red Winter Wheat. *Journal of Plant Nutrition and Soil Science.*180: 316–325.

University of Georgia (2013). Wheat Production Guide. College of Agricultural and Walp) Cultivars Adaptable to Acid Soils of Llyo, Southern Nigeria, *Global Journal of Pure and Applied Science,* 7(3): 437-441.

Woyema, A., Bultosa, G. and Taa, A. (2012). Effect of Different Nitrogen Fertilizer Rates on Yield and Yield Related Traits for 7 Durum Wheat (*Triticum turgidum* L. Var Durum) Cultivars Grown at Sinana, Growth Eastern Ethiopia. *Journal of Cereal Sci*., 44: 101-112.

Table 1: Effects of Wheat Varieties on Number of Spike m^{-2}, Number of Spikelets $Spike^{-1}$, Number of grains $Spike^{-1}$ and Weight of 1000 Grains During 2017 2018 Dry Seasons and Combined Result of the Two Years in Jalingo

Variety	Number of Spike m^{-2}			Number of Spikelets $Spike^{-1}$			Number of grains $Spike^{-1}$			Weight of 1000 Grains (g)		
	2017	2018	Combined	2017	2018	Combined	2017	2018	combined	2017	2018	Combined
Reyna-28	360.81	225.52	293.17	19.49	18.35	18.79	56.07	52.34	54.21	42.02	32.95	37.52
Cettia	297.67	177.33	237.50	18.46	16.89	17.67	48.74	45.16	46.95	35.68	29.67	32.68
Linfen	305.95	180.62	243.29	18.60	18.10	18.47	19.75	19.36	19.56	32.60	31.64	32.12
Pof F	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
LSD	0.861	0.491	0.485	0.266	0.278	0.188	0.581	0.880	0.516	0.218	0.145	0.128

Table 2: Effects of Wheat Varieties on Biomass Yield (kg ha^{-1}), Grain Yield (kg ha^{-1}), Straw Yield (kg ha^{-1}) and Harvest Index During and 2018 Dry Seasons and Combined Result of the Two Years in Jalingo Metropolis of Northern Guinea Savanna Ecological Zone , Taraba State

Variety	Biomass Yield (kg ha^{-1})			Grain Yield (kg ha^{-1})			Straw Yield (kg ha^{-1})			Harvest Index		
	2017	**2018**	**Combined**	**2017**	**2018**	**Combined**	**2017**	**2018**	**combined**	**2017**	**2018**	**Combined**
Reyna-28	12589	10110	11349	4173.10	3272.3	3722.7	8430.0	6337.5	7636	32.90	31.38	32.09
Cettia	10900	7951	9426	3122.20	2132.1	2627.2	7782.0	5819.0	6800	29.02	26.72	27.87
Linfen	11770	8987	10379	2819.40	2361.9	2590.7	895’3	6625.6	7788	23.98	25.71	24.8
Pof F	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
LSD	4.895	21.99	11.02	27.60	40.19	23.84	13.96	28.22	15.40	0.194	0.367	0.203

Table 3: Monthly Average Weather Data for Experimental Site for 2017 and 2018 Dry Seasons

Month	2017			2018		
	Min Temp (^0C)	Max Temp (^0C)	R.H. (%)	Min Temp (^0C)	Max Temp (^0C)	R.H. (%)
November	19.50	33.30	43	20.70	35.20	60
December	19.40	34.70	27	21.60	35.40	36
January	19.70	35.10	31	22.80	37.00	32
February	21.70	36.50	31	24.10	37.60	35
March	25.90	38.80	51	24.50	39.30	55

Source: Department of General Studies, Taraba State College of Agriculture Jalingo, 2017 to 2018

Key: RH = Relative humidity