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Impact of Varied Intercrop Population Tested with Levels of Crop Growth and Yield Enhancers on Maize in the Tropical Rainforest Zone of Nigeria

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ABSTRACT

A field study was carried out to investigate the impact of varied intercrop populations tested with Levels of Crop growth and yield enhancers on maize in the tropical rainforest zone of Nigeria. Treatments consisted of three levels of organic manure (growth enhancers) and six varied intercrop populations. Factorial combinations of the treatments were fitted into a randomised complete block design (RCBD) with three replications and 72 plots. A 1.5 m path separated replicates, and a 1 m path separated each plot. The size of the experimental area was 63m x 32m (2016m2), the size of each replicate was 32 x 19 m (603m2), and the plot size for each bed was 4m x 4m (16m2), while the net plot from which data were collected was 2 x 2 m (4m2). The response from plants to treatments were evaluated from data collected from the net plot, for the following parameters; Plant height (cm), number of leaves (per plant), stem girth (cm), leaf area (LA), Leaf Area Index (LAI), number of days to 50% tasseling, total dry matter (g), cob length (cm), weight of grains/cob (g), number of grains /cob, total cob yield (t/ha) and total grain yield (t/ha). Means were compared using DNMRT at a 5% probability level. The results showed that both crop growth and yield enhancers, as well as varied intercrop populations, significantly affected maize performance. Correlation among vegetative and yield parameters was positive and significant.

Key words: Impact, Maize yield, Levels of growth enhancers, Varied intercrop population

INTRODUCTION

The organisation and management of the respective crops in a system are important to sustain their individual potentials. Intercropping research has shown that growing crops together in varied populations is likely to give individual crops a competitive advantage or disadvantage (Giller, 2001; Gbaraneh *et al.,* 2004; Kermah *et al.,* 2017). Intercropping is used to ensure food security by maximising yield and profit and using the same labour for different crop enterprises (Yusuf *et al*., 2008). According to Javanmard *et al*. (2009), intercropping can be more profitable because it combines multiple crops per unit area of land. Intercropping systems are less susceptible to weeds, pests, and diseases, and minimise erosion through water infiltration and plant population control (CTA, 1995). Land equivalent ratio (LER) and income equivalent ratio (IER) are measures used to assess the yield advantage of growing two or more crops as intercrops compared with sole cropping (Ogungbaigbe *et al*., 1990; Bilalis *et al*., 2005).

In developed countries, maize is a staple food and a source of industrial products such as corn oil, syrup, cornflour, sugar, brewers' grit, and alcohol (Dutt, 2005). Maize, which is also referred to as corn, is ranked with wheat and rice as one of the most important cereal crops in Nigeria. It is an energy supplement in livestock feed. Both humans and animals cherish maize for its nutritional value (Directorate of Information and Publications of Agriculture, 2006).

Growth enhancers (Poultry manure) are an excellent source of organic manure and play a vital role in supplying primary, secondary, and micronutrients, as well as improving soil fertility (Nweke *et al*., 2013). Loss of site productivity due to bush burning, intense cropping without nutrient supplementation, overgrazing, intense rainfall leading to leaching, and erosion of topsoil are important factors that lead to declining soil fertility in Nigeria (Okonkwo, 2016). This could be ameliorated by adopting cropping systems that can control soil surface erosion and enhance crop growth and yield; watermelon is an excellent cover crop with high nutritional value and compatible for intercropping

(Nkasi *et al.,* 2025). As well as sustaining productivity (Ogunbaigbe *et al*., 1990; Bilalis *et al*., 2010). Furthermore, cover crops like watermelon could help control some of the factors leading to declines in soil fertility (Ige *et al*., 2005; Nkasi *et al.,* 2021). Chemical fertilisers are becoming a major cost factor in crop production, and their cost has been increasing steadily; they also have potentially undesirable effects on the environment and humans, such as eutrophication, methemoglobinemia, cancer, and soil acidification. Poultry manure is a better alternative and a necessary option for soil fertility restoration in crop production and for protecting human health and the environment (Nwinyi and Odurukwe, 1988; Leng, 2006; Grey and William, 2006). Different levels of growth enhancers can affect crop performance and increase yield if applied correctly (Sharma, 2004). In view of the fact that several workers have reported yield advantages of intercropping over sole cropping (Ogindo and Walker, 2005; Akunlola and Ibironke, 2010; Undie *et al*., 2012), and the fact that there have been comparatively fewer comprehensive field studies on varied intercrop populations involving maize in the Nigerian rainforest ecological zone. This study was conceived to determine suitable intercrop populations and appropriate levels of growth enhancers that will increase maize yield in Nigeria's rainforest zone.

MATERIALS AND METHODS

Field research was conducted to evaluate the impact of varied intercrop populations, combined *with* levels of crop growth and yield enhancers, on maize in the tropical rainforest zone of Nigeria. The treatments consisted of six levels of Maize: Watermelon additive series intercrop populations (100%M:0%W, 0%M:100%W, 100%M:25%W, 100%M:50%W, 100%M:75%W and 100%M:100%W) combined with four rates of poultry manure (0, 5, 10 and 15 t/ha). Factorial combinations of the treatments were fitted into a randomised complete block design (RCBD) with three replications. The factorial combinations of treatments were fitted into a randomised complete block design (RCBD) with three replications and 72 plots. A 1.5 m path separated the replicates, while each plot was separated from the next by a 1 m path. The size of the experimental area was 63m x 32m (2016m^2), the size of each replicate was 32 x 19 m (603m^2), and the plot size for each bed was 4m x 4m (16m^2), while the net plot from which data were collected was 2 x 2 m (4m^2). Weeding was done manually with a hoe at 3, 6, and 9 weeks after planting. The response from plants to treatments were evaluated from data collected from the net plot, for the following parameters; Plant height (cm), number of leaves (per plant), stem girth (cm), leaf area (LA), Leaf Area Index (LAI), number of days to 50% tasselling, total dry matter (g), cob length (cm), weight of grains/cob (g), number of grains /cob, total cob yield (t/ha) and total grain yield (t/ha). Data were subjected to analysis of variance; Genstat package statistical software (version 8) was used; means were compared using Duncan's multiple range test at the 5% probability level (Bhattacharya *et al*., 2018).

RESULTS AND DISCUSSION

The crop growth and yield enhancers used for the study had a p^H of 6.8 and 6.6, Organic carbon of 32 and 48 g/kg, Available P of 1.85 and 1.96mg/kg, Nitrogen of 20.5 and 21.8 g/kg, and potassium amounts of 1.50 and 1.58 Cmol/kg, respectively, in 2022 and 2023 (Table 1).

Table 1: Data from Analysis of Crop Growth and Yield Enhancers (Poultry manure)

Properties	2022	2023
P^H	6.8	6.6
Organic Carbon(g/kg)	32	48
Available P. (mg/kg)	1.85	1.96
Nitrogen (g/kg)	20.5	21.8
Potassium (Cmol/kg)	1.50	1.58

Impact of Levels of Crop Growth and Yield Enhancers on Maize in the Rainforest Zone of Nigeria

Crop growth and yield enhancers (poultry manure) were found to have a pronounced effect on vegetative growth and yield characters of maize and watermelon intercrop (Tables 2-5). The positive linear response shown at the application rates up to 15t/ha of poultry manure could be attributed to its excellent role in the supply of plant nutrients, which significantly influenced increment in growth and yield parameters of plant height (cm), number of leaves/plant, leaf area (cm2), leaf area index, TDM (g), number of days to 50 number of cob/plant, and grain yield (t/ha) of maize. The significant increase in these parameters was due to the increase in poultry manure rates from 0, 5, 10, up to 15

t/ha, which resulted in improved crop performance. This is consistent with the findings of Enujike (2013) and Adeye *et al*. (2021), who reported a significant increase in maize performance with additional poultry manure added to the native fertility status.

Table 2: Maize Plant Height (cm) and Number of Leaves/plants as Impacted by Varied intercrop population and levels of crop growth and yield enhancers in Rainforest Zone of Nigeria in 2022 and 2023

Maize plant height (cm) and number of leaves/plants

	2022		2023	
	5 WAP	9WAP	5WAP	9WAP
Poultry manure (t/ha)				
0	102.90^{c}	161.80^{c}	105.31^{c}	167.29^{c}
5	103.09^{c}	163.10^{c}	109.45^{b}	191.04^{b}
10	112.26^{b}	176.43^{b}	110.64^{b}	194.38^{b}
15	118.62^{a}	232.61^{a}	121.20^{a}	245.67^{a}
SE±	1.97	3.72	2.55	4.15
Population density				
100%M:100%W	107.33^{c}	174.22^{a}	110.14^{d}	178.47^{d}
100%M:75%W	107.58^{c}	176.35^{a}	110.68^{d}	179.68^{d}
100%M:50%W	110.96^{b}	186.10^{a}	111.79^{c}	197.35^{c}
100%M:25%W	112.22^{a}	188.94^{a}	113.53^{b}	200.51^{b}
100%M:0%W	112.98^{a}	182.60^{a}	115.87^{a}	205.98^{a}
0%M:100%W	-	-	-	-
SE±	1.34	NS	1.90	2.41
Interactions				
0 t/haX100%M:100%W	100.53^{a}	145..81^{a}	102.88^{a}	150.49^{a}
0 t/ha X 100%M:75%W	101.23^{a}	155.52^{a}	106.37^{a}	159.75^{a}
0 t/ha X 100%M:50%W	102.83^{a}	163.11^{a}	103.37^{a}	169.80^{a}
0 t/ha X 100%M:25%W	105.67^{a}	171.43^{a}	105.13^{a}	175.54^{a}
0 t/ha X 100%M:0%W	106.20^{a}	172.80^{a}	108.83^{a}	180.96^{a}
0 t/ha X 0%M:100%W	-	-	-	-
5 t/haX100%M:100%W	107.00^{a}	162.44^{a}	109.50^{a}	166.81^{a}
5 t/ha X 100%M:75%W	104.87^{a}	169.72^{a}	105.51^{a}	172.51^{a}
5 t/ha X 100%M:50%W	108.63^{a}	172.83^{a}	107.27^{a}	173.37^{a}
5 t/ha X 100%M:25%W	111.53^{a}	174.51^{a}	108.50^{a}	175.32^{a}
5 t/ha X 100%M:0%W	108.43^{a}	175.71^{a}	112.77^{a}	187.25^{a}
5 t/ha X 0%M:100%W	-	-	-	-
10t/haX100%M:100W	110.10^{a}	180.09^{a}	110.43^{a}	185.30^{a}
10 t/ha X 100%M:75%W	110.07^{a}	187.27^{a}	112.20^{a}	190.45^{a}
10 t/ha X 100%M:50%W	112.80^{a}	190.33^{a}	116.14^{a}	193.19^{a}
10 t/ha X 100%M:25%W	114.23^{a}	180.55^{a}	115.00^{a}	195.80^{a}
10 t/ha X 100%M:0%W	114.58^{a}	192.61^{a}	116.20^{a}	197.18^{a}
10 t/ha X 0%M:100%W	-	-	-	-
15t/ha X100%M:100%W	115.70^{a}	207.83^{a}	117.77^{a}	241.28^{a}
15 t/ha X 100%M:75%W	116.13^{a}	220.72^{a}	118.80^{a}	242.00^{a}
15 t/ha X 100%M:50%W	119.57^{a}	241.61^{a}	121.53^{a}	253.06^{a}
15 t/ha X 100%M:25%W	120.23^{a}	245.19^{a}	124.27^{a}	255.40^{a}
15 t/ha X 100%M:0%W	121.47^{a}	247.40^{a}	123.63^{a}	258.53^{a}
15 t/ha 0%M:100%W	-	-	-	-
SE±	NS	NS	NS	NS

Means followed by the same letters within a column are not significantly different at 5% level using DNMRT; 100%M:100%W, 100%M:75%W, 100%M:50%W, 100%M:25%W, 100%M:0%W and 0%M:100%W for Additive Maize: Watermelon intercrop and NS for Not Significant.

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TABLE 3: Maize Stem girth (mm), total dry matter (g) and number of days to 50% tasselling as impacted by Varied intercrop population and levels of crop growth and yield enhancers in the Rainforest Zone of Nigeria in 2022 and 2023.

	Stem girth, TDM and number of days to 50% tasselling							
	2022		2023		TDM and number of days to 50% tasselling			
	5WAP	9WAP	5WAP	9WAP	2022	2023	2022	2023
Poultry manure (t/ha)								
0	17.51^{c}	19.62^{c}	17.36^{c}	20.33^{b}	144.50^{c}	143.46^{c}	48.56^{c}	47.93^{c}
5	18.58^{b}	20.12^{b}	18.50^{b}	20.63^{b}	179.82^{b}	186.38^{b}	46.50^{b}	47.13^{c}
10	18.93^{b}	20.52^{b}	18.94^{b}	21.32^{b}	182.92^{b}	186.65^{b}	46.34^{b}	46.93^{b}
15	20.72^{a}	23.39^{a}	20.48^{a}	25.15^{a}	202.42^{a}	206.56^{a}	43.74^{a}	42.98^{a}
SE±	0.59	0.46	0.52	1.34	4.75	2.15	1.25	1.85
Additive series intercrop								
100%M:100%W	18.87^{a}	20.20^{b}	18.00^{b}	21.20^{b}	158.72^{b}	158.07^{c}	47.15^{b}	47.61^{b}
100%M:75%W	18.92^{a}	20.63^{b}	18.21^{b}	21.01^{b}	160.25^{b}	173.19^{b}	47.12^{b}	46.57^{b}
100%M:50%W	19.21^{a}	20.82^{b}	18.32^{b}	21.72^{b}	172.48^{a}	173.77^{b}	45.21^{a}	46.49^{a}
100%M:25%W	19.45^{a}	21.09^{a}	19.24^{a}	22.51^{a}	176..26^{a}	178.30^{a}	45.24^{a}	45.42^{a}
100%M:0%W	19.84^{a}	21.84^{a}	19.39^{a}	22.90^{a}	178.75^{a}	179.23^{a}	45.22^{a}	45.14^{a}
0%M:100%W	-	-	-	-	-	-	-	-
SE±	NS	0.23	0.20	0.27	3.10	1.25	1.17	1.18
Interactions								
0 t/ha X 100%M:100%W	18.01^{a}	18.87^{a}	15.17^{ass}	19.69^{a}	140.60^{a}	131.67^{a}	48.95^{a}	49.38^{a}
0 t/ha X 100%M:75%W	18.85^{a}	19.53^{a}	16.70^{a}	19.87^{a}	142.29^{a}	142.51^{a}	48.12^{a}	47.97^{a}
0 t/ha X 100%M:50%W	18.74^{a}	19.51^{a}	17.13^{a}	20.47^{a}	143.59^{a}	145.06^{a}	49.20^{a}	48.70^{a}
0 t/ha X 100%M:25%W	18.87^{a}	19.73^{a}	19.01^{a}	20.39^{a}	149.61^{a}	148.88^{a}	47.29^{a}	46.89^{a}
0 t/ha X 100%M:0%W	18.94^{a}	20.40^{a}	18.75^{a}	21.25^{a}	146.15^{a}	149.26^{a}	48.56^{a}	47.38a
0 t/ha X 0%M:100%W	-	-	-	-	-	-	-	-
5 t/ha X 100%M:100%W	18.58^{a}	19.56^{a}	18.32^{a}	20.19^{a}	137.46^{a}	137.71^{a}	49.27^{a}	47.77^{a}
5 t/ha X 100%M:75%W	18.75^{a}	20.37^{a}	17.91^{a}	19.74^{a}	153.30^{a}	154.52^{a}	48.94^{a}	47.33^{a}
5 t/ha X 100%M:50%W	18.92^{a}	19.61^{a}	17.87^{a}	20.75^{a}	156.08^{a}	154.55^{a}	48.47^{a}	47.27^{a}
5 t/ha X 100%M:25%W	18.70^{a}	20.29^{a}	17.78^{a}	21.04^{a}	158.97^{a}	159.09^{a}	47.29^{a}	46.72^{a}
5 t/ha X 100%M:0%W	18.94^{a}	20.78^{a}	17.86^{a}	21.48^{a}	158.13^{a}	161.11^{a}	49.24^{a}	46.62^{a}
5 t/ha X 0%M:100%W	-	-	-	-	-	-	-	-
10t/ha X100%M:100%W	18.10^{a}	19.82^{a}	17.63^{a}	20.51^{a}	174.63^{a}	180.89^{a}	49.16^{a}	47.62a
10 t/ha X 100%M:75%W	20.26^{a}	19.87^{a}	18.24^{a}	20.48^{a}	181.67^{a}	184.44^{a}	48.25^{a}	47.34^{a}
10 t/ha X 100%M:50%W	19.14^{a}	21.21^{a}	18.07^{a}	20.75^{a}	182.53^{a}	185.12^{a}	48.82^{a}	47.32^{a}
10 t/ha X	19.51^{a}	20.49^{a}	19.31^{a}	22.40^{a}	187.32^{a}	191.08^{a}	47.01^{a}	46.23^{a}

100%M:25%W								
10 t/ha X 100%M:0%W	20.62[a]	21.22[a]	19.24[a]	22.48[a]	188.59[a]	191.65[a]	48.43[a]	46.17[a]
10 t/ha X 0%M:100%W	-	-	-	-	-	-	-	-
15 t/haX100%M:100%W	20.79[a]	22.55[a]	19.63[a]	24.34[a]	178.20[a]	181.99[a]	48.90[a]	45.67[a]
15 t/ha X 100%M:75%W	19.94[a]	22.68[a]	20.00[a]	23.96[a]	207.73[a]	211.29[a]	47.00[a]	43.65[a]
15 t/ha X 100%M:50%W	20.21[a]	22.96[a]	20.20[a]	24.91[a]	207.72[a]	210.36[a]	45.00[a]	43.33[a]
15 t/ha X 100%M:25%W	21.34[a]	23.86[a]	20.81[a]	26.20[a]	209.15[a]	214.14[a]	43.36[a]	41.85[a]
15 t/ha X 100%M:0%W	21.32[a]	24.95[a]	21.71[a]	26.42[a]	209.64[a]	214.90[a]	42.51[a]	40.40[a]
15 t/ha 0%M:100%W	-	-	-	-	-	-	-	-
SE±	NS	NS	NS	NS	NS	NS	NS	NS

Means followed by the same letters within a column are not significantly different at 5% level using DNMRT; 100%M:100%W, 100%M:75%W, 100%M:50%W, 100%M:25%W, 100%M:0%W and 0%M:100%W for Additive Maize: Watermelon intercrop. NS for Not Significant

Impact of Levels of Crop Growth and Yield Enhancers on Maize in the Rainforest Zone of Nigeria

Crop growth and yield enhancers (poultry manure) were found to have a pronounced effect on vegetative growth and yield characters of maize and watermelon intercrop (Tables 2-5). The positive linear response shown at the application rates up to 15t/ha of poultry manure could be attributed to its excellent role in the supply of plant nutrients, which significantly influenced increment in growth and yield parameters of plant height (cm), number of leaves/plants, leaf area (cm2), leaf area index, TDM (g), number of days to **50% tasselling**, number of cob/plant, and grain yield (t/ha) of maize. The significant increase in these parameters was due to increasing poultry manure rates from 0, 5, 10, to 15 t/ha, which improved crop performance. This is consistent with the findings of Enujike (2013) and Adeye et al. (2021), who reported a significant increase in maize performance with additional poultry manure added to the native fertility status.

Impact of Interaction of Varied intercrop population and levels of crop growth and yield enhancers in Rainforest Zone

Interactions between crop growth and yield enhancers, 15t/ha PM rate with varied intercrop population; 100%M:0%W (sole maize), 100%M:25%W and 100%M:50%W plant populations gave higher leaf area, number of cobs/plants, and grain yield t/ha. It also gave the longest main vine length, higher number of leaves/plants, number of branches/plants, wider leaf area, higher total dry matter, number of fruits/plants, heaviest weight of fruits/plant, widest fruit girth, higher sugar content of fruits and total fruit yield/ha for watermelon (Tables 2-5). The 100%M:25M combination with 15 t/ha PM rate gave the best performance in growth and yield of the maize and watermelon mixture.

Table 4: Maize Leaf area (cm2) as impacted by Varied intercrop population and levels of crop growth and yield enhancers in the Rainforest Zone of Nigeria in 2022 and 2023

	Leaf area (cm2)			
	2022		2023	
	5 WAP	9 WAP	5 WAP	9 WAP
Poultry manure (t/ha)				
0	571.6[c]	749.9[c]	560.2[c]	803.4[c]
5	575.6[c]	860.8[b]	627.6[b]	835.2[c]
10	629.0[b]	861.3[b]	630.1[b]	888.2[b]
15	832.8[a]	970.9[a]	883.5[a]	1047.5[a]
SE±	5.59	3.57	4.10	42.8

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Population density				
100%M:100%W	62.8[b]	758.2[b]	641.9[b]	777.6[a]
100%M:75%W	660.3[b]	761.8[b]	665.0[b]	852.2[a]
100%M:50%W	667.4[a]	862.8[a]	674.1[a]	901.8[a]
100%M:25%W	699.1[a]	869.7[a]	676.3[a]	932.5[a]
100%M:0%W	699.6[a]	891.1[a]	678.9[a]	1004.3[a]
0%M:100%W	-	-	-	-
SE±	5.85	4.37	5.72	NS
Interactions				
0 t/ha X 100%M:100%W	561.7	622.9[a]	554.4[a]	632.4[a]
0 t/ha X 100%M:75%W	563.7	669.0[a]	556.8[a]	739.1[a]
0 t/ha X 100%M:50%W	577.0	797.1[a]	557.6[a]	862.7[a]
0 t/ha X 100%M:25%W	591.3	798.0[a]	564.5[a]	875.0[a]
0 t/ha X 100%M:0%W	599.4	863.1[a]	568.4[a]	904.6[a]
0 t/ha X 0%M:100%W	-	-	-	-
5 t/ha X 100%M:100%W	607.0	678.9[a]	568.9[a]	702.6[a]
5 t/ha X 100%M:75%W	617.3	803.8[a]	600.8[a]	812.7[a]
5 t/ha X 100%M:50%W	620.4	805.6[a]	601.6[a]	856.4[a]
5 t/ha X 100%M:25%W	625.9	806.8[a]	606.8[a]	898.5[a]
5 t/ha X 100%M:0%W	652.7	809.0[a]	609.9[a]	906.2[a]
5 t/ha X 0%M:100%W	-	-	-	-
10 t/ha X 100%M:100%W	629.4	812.6[a]	623.5[a]	847.3[a]
10 t/ha X 100%M:75%W	641.3	847.5[a]	621.9[a]	879.2[a]
10 t/ha X 100%M:50%W	647.1	865.6[a]	628.7[a]	893.1[a]
10 t/ha X 100%M:25%W	650.5	885.8[a]	635.5[a]	908.3[a]
10 t/ha X 100%M:0%W	676.4	894.9[a]	640.8[a]	914.2[a]
10 t/ha X 0%M:100%W	-	-	-	-
15 t/ha X 100%M:100%W	801.1	918.5[a]	820.8[a]	928.3[a]
15 t/ha X 100%M:75%W	818.8	967.1[a]	880.5[a]	79.5[a]
15 t/ha X 100%M:50%W	825.0	982.9[a]	892.4[a]	995.3[a]
15 t/ha X 100%M:25%W	848.7	988.3[a]	898.2[a]	1001.8[a]
15 t/ha X 100%M:0%W	869.8	997.3[a]	924.5[a]	1002.1[a]
15 t/ha 0%M:100%W	-	-	-	
SE±	NS	NS	NS	NS

Means followed by the same letters within a column are not significantly different at 5% level using DNMRT; 100%M:100%W, 100%M:75%W, 100%M:50%W, 100%M:25%W, 100%M:0%W and 0%M:100%W for Additive Maize: Watermelon intercrop. NS for Not Significant

Table 5: Number of Maize Cobs/plant and Total Grain Yield (t/ha) as impacted by Varied intercrop population and levels of crop growth and yield enhancers in the Rainforest Zone of Nigeria in 2022 and 2023

	cobs/plan and total grain yield (t/ha)			
Treatment	2022	2023	2023	2023
Poultry manure (t/ha)				
0	2.72[c]	2.84[c]	3.95[c]	2.57[c]
5	3.19[b]	3.09[b]	5.63[b]	3.08[b]
10	3.75[b]	3.64[b]	5.62[b]	3.09[b]
15	4.49[a]	4.54[a]	7.01[a]	5.03[a]
SE±	0.60	0.57	0.05	0.040
Population density				
100%M:100%W	3.15[b]	3.10[b]	4.61[c]	3.45[c]
100%M:75%W	3.28[b]	3.18[b]	4.70[c]	3.45[c]
100%M:50%W	3.62[a]	3.80[a]	6.23[b]	4.21[b]
100%M:25%W	3.79[a]	3.85[a]	6.94[a]	4.86[a]
100%M:0%W	3.84[a]	3.90[a]	6.95[a]	4.87[a]
0%M:100%W	-	-	-	-
SE±	0.20	0.15	0.060	0.05

Interactions				
0 t/ha X 100%M:100%W	2.13[a]	2.57[f]	3.70[a]	2.27[e]
0 t/ha X 100%M:75%W	2.66[a]	2.89[e]	3.76[a]	2.95[g]
0 t/ha X 100%M:50%W	2.86[a]	2.92[e]	3.88[a]	2.96[g]
0 t/ha X 100%M:25%W	2.97[a]	2.97[e]	4.12[a]	2.98[g]
0 t/ha X 100%M:0%W	3.01[a]	2.99 [e]	4.20[a]	3.03[f]
0 t/ha X 0%M:100%W	-	-	-	-
5 t/ha X 100%M:100%W	2.83[a]	2.94[e]	4.22[a]	2.87[g]
5 t/ha X 100%M:75%W	3.08[a]	2.91[e]	4.44[a]	2.87[g]
5 t/ha X 100%M:50%W	3.43[a]	2.87[e]	4.64[a]	3.29[d]
5 t/ha X 100%M:25%W	3.56[a]	3.12[d]	4.92[a]	3.30[d]
5 t/ha X 100%M:0%W	3.57[a]	3.12[d]	491[a]	3.30[d]
5 t/ha X 0%M:100%W	-	-	-	-
10 t/ha X 100%M:100%W	3.48[a]	3.64[c]	4.96[a]	4.01[c]
10 t/ha X 100%M:75%W	3.28[a]	3.68[c]	5.17[a]	4.03[c]
10 t/ha X 100%M:50%W	3.82[a]	3.69[c]	5.74[a]	4.05[c]
10 t/ha X 100%M:25%W	4.05[a]	3.79[c]	5.86[a]	4.07[c]
10 t/ha X 100%M:0%W	4.11[a]	3.82[c]	5.87[a]	4.09[c]
10 t/ha X 0%M:100%W	-	-	-	-
15 t/ha X 100%M:100%W	3.77[a]	4.26[b]	5.91[a]	4.53[b]
15 t/ha X 100%M:75%W	4.10[a]	4.33[b]	5.93[a]	4.53[b]
15 t/ha X 100%M:50%W	4.77[a]	4.71[a]	5.98[a]	4.88[a]
15 t/ha X 100%M:25%W	4.80[a]	4.82[a]	6.05[a]	4.88[a]
15 t/ha X 100%M:0%W	4.98[a]	4.99[a]	6.43[a]	4.89[a]
15 t/ha 0%M:100%W	-	-	-	-
SE±	NS	0.20	NS	0.050

Means followed by the same letter(s) within a column are not significantly different at 5% level using DNMRT; 100%M:100%W, 100%M:75%W, 100%M:50%W, 100%M:25%W, 100%M:0%W and 0%M:100%W for Mixture of Maize: Watermelon. NS for Not Significant

CONCLUSION

The intercrop population with 100%M:25%W of maize and watermelon showed the best performance in growth and yield, respectively, compared to the other intercropped populations in both planting seasons.

RECOMMENDATION

Based on the study, it is recommended that the application of 15 t/ha of crop growth and yield enhancers to the 100%M:25%W maize and watermelon intercrop population be adopted to maximise yield in the studied area.

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