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RESEARCH ARTICLE

EFFECTS OF VERMICOMPOST, CHEMICAL FERTILIZER AND DIFFERENT BIOPESTICIDES ON THE AGRONOMIC CHARACTERISTICS, SENSORY QUALITY AND GRAIN PHYTOCHEMICAL CONTENTS OF CORN (ZEA MAYS)

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Abstract

This study was conducted to look for alternative measures to sustain the profitability of cultivating green corn by using different fertilizers and biopesticides. 2x5 factorial experiment in split-plot in Randomized Complete Block Design with four replication this was conducted at Brgy. Matikiw, Pakil Laguna fromDecember 2019 to March 2020. With the following treatments.A1 – vernicompost + urea and A2 – Chemical fertilizer, B1 – Control, B2 - Kakawate leaf extract (Gliricidiasepium), B3 - Makabuhay vine extract (Tinosporarumphii), B4 - Tagbak leave extract (Alipiniamalaccensis) and B5 - Acapulco leaf extract (Cassia alata).Result revealed that there was no interaction effect between biopesticide and fertilizer materials in growth and yield characteristics of corn plants. There is no interaction effect between biopesticide and different fertilizer materials on the growth characteristics in terms of number of days from sowing to emergence, silking to harvesting, weekly plant height and in all of parameter in yield components of green corn. The earliest emergence, earliest number of days from silking to harvesting, highest number of corn ear, highest biological yield, longest length were observed on the green corn with application of vermicompost + urea while earliest number of days from emergence to silking, tallest height, largest diameter, most number of corn kernels were observed on the green corn with application of farmers practice regardless of biopesticides. The study recommends further testing on the application of vermicompost + urea and acapulco, tagbak and kakawate leaf extracts at different levels of concentration is recommended.

Introduction:-

Corn (Zea mays L.) is one of the most important crops grown in the Philippines as staple food, livestock feed and raw materials for being used in food processing and other industries. It is one of the major crops grown in the country with over million Filipino farmers depending on corn as their main source of livelihood. And most farmers are interested to raise green corn because of the price and high demand in the market.

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Today, growing green corn requires a relatively shorter period ranging from 60 to 70 days from planting to harvesting to enable the farmers to have three to four cycles resulting to higher annual income among enterprising. Filipino farmers especially those living near commercial food centers. Sweet and glutinous corn are the most commonly grown variety for "green corn production" because of its short growing period and they are morenutritious and delicious compared with other varieties (Bacanto, 2004).

In addition in its early stage, the crop is vulnerable to numerous environmental conditions such as frost, flooding, and drought. Products such as herbicides or fungicides, applied to the crop early in the season may also impact overall growth.

Farmers have adopted the strategy of increasing crop yields by applying large amounts of chemical fertilizers and pesticides. This could be attainedtothe crops for optimum growth, development and production. However, the continues and over application of pesticides and inorganic fertilizers it may cause negative impacts includes infertility of the soil, resistance of insects to pesticide, and hazards to human health (Bulalin et al., 2016).

Application of plant extracts such as biopesticides with different fertilizer materials is one of the viable alternative approach to reduce inorganic fertilizers and insecticide utilization. On the other hand, it is necessary to address how to increase the yield rate of the crop while reducing the cost of production by using ecological strategies and practices.

Objectives of the Study:-

Generally, this study was conducted to evaluate the efficacy ofbio-pesticide on green corn with different fertilizer materials in terms of growth, yield, production income, sensory evaluation and grain phytochemical content.

Materials and Methods:-

Research Design

This study is an experimental research using 2x5 factorial experiment in split-plot in Randomized Complete Block Design (RCBD). The RCBD is the standard design for agricultural experiments. The field or orchard is divided into units to account for any variation in the field. Treatments are then assigned at random to the subjects in the blocks-once in each block.

Securing of Seeds, Fertilizers

The seeds of green corn variety (Sweet pearl F1 from east-west) and chemical fertilizer was secured from Agricultural Supply store at siniloan, market. The vermicompost was secured from College of Agriculture, Siniloan Campus, Siniloan, Laguna.

Land Preparation

The experimental area was prepared 3 weeks before planting to obtain soil tilt and allow ample time for the crop residues, weeds and weed seeds to rot or decompose. Plowing was done twice with the use of disk plow of a tractor followed by harrowing with an interval of one week or seven days to level the soil, break soil clods and remove weeds and other crop debris present in the area. A day before planting, furrows were prepared at 0.75 m spacing and about 0.08 m depth.

Laying-out the Experimental Area and Experimental Design

The prepared area was divided into four equal blocks, each block has a dimension of 12 meters x 14 meters. Each block was subdivided into ten equal plots measuring into 3 meters x 6 meters and with a spacing of 1meters between plots. The experimental treatments was randomly allocated following the randomization procedure for Randomized Complete Block Design (RCBD).

Experimental Treatments

The experimental treatments used the following treatments:
Factor A – Fertilizer materials
A1. Vermicompost 1000 kg/ha + Urea 32 kg/ha
A2. Chemical fertilizer – Urea (46-0-0) 32 kg/ha, complete (14-14-14) 50 kg/ha, Ammophos (16-20-0) 115 kg/ha.
Factor B - Biopesticides

B1. Control – Sprayed with water 1,108.3 lit./ha
B2. Kakawate leaf extract (Gliricidiasepium) 1,108.3 lit./ha
B3. Makabuhay vine extract (Tinosporarumphii) 1,108.3 lit./ha
B4. Tagbak leave extract (Alipiniamalaccensis) 1,108.3 lit./ha
B5. Acapulco leaf extract (Cassia alata) 1,108.3 lit./ha

Planting and Thinning
Three seeds were planted per hill in a furrow with a distance of 25centimeters between hills and 75 centimeters between rows. Thinning was done at 15 days after planting to maintain two healthy plants per hill.

Care and Management of the Crop
Cultivation and Weeding. Off-barring was done at 18 days after planting. Hilling- up was also done at 33 days after planting. Cultivation was done to loosen the root zone of the plants to initiate the entry of oxygen in the roots and to control the growth of weeds.

Insect pest management. Regular monitoring of the area was conducted, insects pest was observed on the plants starts from planting until harvesting. This were identified and recorded.

Harvesting
The corn ears were harvested when it reaches soft dough stage. The ears of the sample plants were harvested one by one, placed in plastic sack, and properly labeled.

Data Collection Procedure
Plant Height at 35 Days after Planting (DAP). The height of the 10 samples randomly selected will be measured from the base to the tip of the meristem by using a measuring meter stick.

Weight of corn per harvest areathe weight of the harvested corn ear per harvest area were determined with the use of digital weighing scale.

Length of Corn Ear (cm). The length of husked ear from the 10 representative plants was measured by using a foot ruler from end to end

Diameter of Ear (cm). The sample ear that was used in determining the length of husked ear was used to determine the diameter using a Vernier caliper.

Computed Yield per Hectare (kg). The yield per hectare was computed based on the yield obtained from the harvest area.

Insect pest identified,insects pest was observed on the plants starts from planting until harvesting. This were identified and recorded.

Sensory evaluation
The harvested corn kernel underwent sensory evaluation using the 5-point hedonic scale. Panel members consists of 30 untrained panelist

Grain phytochemical content
The grain samplesit was placed in the plastic bag obtain 300 grams fresh weight, labelled and brought to phytochemical analysis to determine the Alkaloids, Flavonoids, Glycosides, saponins, strerols, and tannins. The biopesticide samples were brought to the DOST- ITDI (Industrial Technology Development Institute) at Bicutan, Taguig for phyto chemical analysis.

Data Analysis
All the data gathered and analysed following the Analysis of Variance (ANOVA) for Randomized Complete Block Design to determine significant differences among treatment means. Significant results were subjected to further statistical analysis using Least Significant Differences (LSD). The collected data were analysed with the use of Statistical Tool for Agricultural Research (STAR) software.

Results and Discussion:-

Number of Days from emergence to 50% silking

The number of days from emergence to 50 percent silking of corn plant is presented in Table 1. Analysis of variance showed no significant effect on application of different fertilizer materials (P=0.8460), biopesticides (P=0.8660) and their interaction effect (P=0.1819) on the number of days from emergence to 50 percent silking of corn. Nevertheless, the treatment has different mean number, data showed that the earliest number of days from emergence to silking was observed on corn plant fertilized with farmers practice sprayed with makabuhay vine extract with a mean number of 42.45 days while the latest number of days was observed on fertilized with vermicompost + urea sprayed with makabuhay vine extract with the mean of 43.55 days.

The result conforms the study of Nascimento et., al (2004) which state that application of vermicompost with combination of others fertilizers increases soil organic matter, total nitrogen, phosphorus, potassium, sodium, calcium and magnesium concentration which favors plant development.

Table 1:- Number of days from emergence to 50% silking.

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	43.03	42.85	43.55	42.98	43.35	43.152
A2	43.18	43.25	42.45	43.45	43.23	43.112
Biopesticide means	43.105	43.05	43	43.215	43.29	

Note: Fertilizer means with the same letter are not significantly different by LSD Tests

Analysis of Variance

Sources of Variance	F value	P value
Block	0.36	0.7910^{ns}
Factor A	0.04	0.8460^{ns}
Factor B	0.31	0.8660^{ns}
Factor A x Factor B	1.70	0.1819^{ns}

CV(a)=1.73 CV(b)=1.15
**significant ns – not significant*

Number of Days from Silking to Harvesting

The number of days from silking to harvesting of corn plant was presented in Table 2. Analysis of variance showed that application with different fertilizer materials (P=0.3879) and different biopesticides (P=0.4115) did not affect significantly the number days from sowing to emergence and also no interaction effect was observed (P=0.7482). However, the treatment has different mean number, data showed that the earliest number of days from silking to harvesting was observed on fertilized with vermicompost + urea sprayed with kakawate leaf extract 22.15 days while the latest number of days was observed on fertilized with farmers practice sprayed with Acapulco leaf extract 22.88 days.The result conforms the study of Datta et., al (2004) who found that application of chemical fertilizers and compost can be effective in production of mustard with a good growth and yield.

Table 2:- Number of days from silking to harvesting.

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	22.63	22.15	22.60	22.38	22.48	22.448
A2	22.28	22.25	22.78	22.53	22.88	22.544
Biopesticide means	22.455	22.2	22.69	22.455	22.68	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	2.00	0.2912^{ns}
Factor A	1.01	0.3879^{ns}
Factor B	1.03	0.4115^{ns}
Factor A x Factor B	0.48	0.7482^{ns}

CV(a)=1.33 CV(b)=2.48
**significant ns – not significant*

Plant Height at 35 Days after Planting (DAP)

The weekly plant of corn plants is presented in table 3. Analysis of variance showed no significant interaction effect between fertilizer materials (P=0.1051) and biopesticide (P= 0.0708) on the final height of corn plants. Data showed that the tallest height of the corn was noted on fertilized with farmers practice sprayed with kakawate leaf extract 158.95 cm while the lowest height of the corn was noted on fertilized with farmers practice sprayed with makabuhay extract 143.75 cm.

Table 3:- Plant Height at 35 Days after Planting (DAP).

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	151.88	150.68	145.40	155.05	151.70	150.942
A2	145.85	158.95	143.75	147.15	145.07	148.154
Biopesticide means	148.865	154.815	144.575	151.1	148.385	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	9.59	0.0578^{ns}
Factor A	5.28	0.1051^{ns}
Factor B	2.48	0.0708^{ns}
Factor A x Factor B	1.92	0.1404^{ns}

CV(a)=2.56 CV(b)=4.52
**significant ns – not significant*

Weight of husked corn ear

The weight of husked corn earis presented in Table 4. Data showed that the highest economic yield of corn noted on fertilized with vermicompost + urea sprayed with water (control) 4.16 kg while the lowest yield noted also on fertilized with farmers practice sprayed with acapulco leaf extract 3.04 kg. The analysis of variance showed that application with different fertilizer materials (P=0.5909) and biopesticides (P=0.5220) did not affect significantly the economic yield of corn and also no interaction effect was observed (P=0.2121).

Table 4:- Weight of husked corn ear.

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	4.16	3.27	3.68	3.73	3.14	3.596
A2	3.10	3.97	3.21	3.52	3.04	3.368
Biopesticide means	3.63	3.62	3.445	3.625	3.09	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	2.81	0.2095^{ns}
Factor A	0.36	0.5909^{ns}
Factor B	0.83	0.5220^{ns}
Factor A x Factor B	1.58	0.2121^{ns}

CV(a)=34 CV(b)=20.70
**significant ns – not significant*

Weight of unhusked corn ear

Weight of husked corn earis presented in Table 5. Data showed that the highest biological yield of corn noted on fertilized with vermicompost + urea sprayed with tagbak leaf extract 5.53 kg while the lowest yield noted also on fertilized with vermicompost + urea sprayed with kakawate leaf extract 4.27 kg. The analysis of variance showed that application with different fertilizer materials (P=0.7028) and biopesticides (P=0.9325) did not affect significantly the biological yield of corn and also no interaction effect was observed (P=0.4299).

Table 5:- Weight of unhusked corn ear.

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	5.27	4.27	5.13	5.53	5.07	5.054
A2	4.73	5.41	4.54	4.96	4.77	4.882
Biopesticide means	5	4.84	4.835	5.245	4.92	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	7.63	0.0646^{ns}
Factor A	0.18	0.7028^{ns}
Factor B	0.21	0.9325^{ns}
Factor A x Factor B	0.99	0.4299^{ns}

CV(a)=26.08 CV(b)=21.21
**significant ns – not significant*

Length of corn ear (Unhusked)

The length of corn ear per plant with husk is presented in Table 6. Analysis of variance showed that application with different fertilizer materials (P=0.7713) and different biopesticides (P=0.1587) did not affect significantly the length of corn ear with husk and also no interaction effect was observed (P=0.5783). Nevertheless, the treatments had different mean number the longest length were noted on the treatment fertilized with vermicompost + urea sprayed with tagbak leaf extract with the mean of 25.18 cm while the shortest diameter noted on the treatment fertilized with farmers practice sprayed with water (control) with the mean of 24.28 cm.

Table 6:- Length of corn ear (Unhusked).

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	24.48	25.05	24.25	25.18	25.15	24.822
A2	24.28	24.65	24.80	24.80	25.03	24.712
Biopesticide means	24.38	24.85	24.525	24.99	25.09	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	4.55	0.1225^{ns}
Factor A	0.10	0.7713^{ns}
Factor B	1.82	0.1587^{ns}
Factor A x Factor B	0,73	0.5783^{ns}

CV(a)=4.42 CV(b)=2.58
**significant ns – not significant*

Length of corn ear (husked)

The length of corn ear per plant without husk is presented in Table 7. Analysis of variance showed that application with different fertilizer materials (P=0.3258) and different biopesticides (P=0.6459) did not affect significantly the length of corn ear without husk and no interaction effect was observed (P=0.2432) on the other hand there is a significant effects between block (P=0206) . Nevertheless, the treatments had different mean number the longest length were noted on the treatment fertilized with vermicompost + urea sprayed with water with the mean of 16.40 cm while the shortest diameter noted on the treatment fertilized with farmers practice sprayed with water kakawate leaf extract with the mean of 15.43 cm.

Table 7:- Length of corn ear (husked).

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	16.40	16.28	16.23	15.75	16.35	16.202
A2	15.80	15.43	16.43	16.35	16.23	16.048
Biopesticide means	16.1	15.855	16.33	16.05	16.29	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	17.75	0.0206*
Factor A	1.37	0.3258^{ns}
Factor B	0.63	0.6449^{ns}
Factor A x Factor B	1.47	0.2432^{ns}

CV(a)=2.59 CV(b)=4.25
**significant ns – not significant*

Diameter of corn ear (Unhusked)

The diameter with husk of corn ear per plant is presented in Table 8. Analysis of variance showed that application with different fertilizer materials (P=0.6203) and different biopesticides (P=0.0661) did not affect significantly the diameter of corn ear with husk and also no interaction effect was observed (P=0.6294). Nevertheless, the treatments had different mean number the largest diameter were noted on the treatment fertilized with vermicompost sprayed with tagbak leaf extract with the mean of 51.16 mm while the smallest diameter noted on the treatment fertilized with farmers practice sprayed with water (control) with the mean of 47.87 mm.

Table 8:- Diameter of corn ear (Unhusked).

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	49.50	50.38	49.84	51.16	49.84	50.144
A2	47.87	50.01	50.24	50.40	49.87	49.678
Biopesticide means	48.685	50.195	50.04	50.78	49.855	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	3.92	0.1457^{ns}
Factor A	0.30	0.6203^{ns}
Factor B	2.54	0.0661^{ns}
Factor A x Factor B	0.65	0.6294^{ns}

CV(a)=5.31 CV(b)=2.73
**significant ns – not significant*

Diameter of corn ear (husked)

The diameter without husk of corn ear per plant is presented in Table 9. Analysis of variance showed that application with different fertilizer materials (P=0.5202) and different biopesticides (P=0.6328) did not affect significantly the diameter of corn ear without husk and also no interaction effect was observed (P=0.7249). Nevertheless, the treatments had different mean number the largest diameter were noted on the treatment fertilized with farmers practice sprayed with kakawate leaf extract with the mean of 44.61 mm while the smallest diameter noted on the treatment fertilized with farmers practice sprayed with water (control) with the mean of 42.92 mm.

Table 9:- Diameter of corn ear (husked).

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	43.24	43.63	43.57	43.75	44.04	43.646
A2	42.92	44.61	43.38	43.07	43.34	43.464
Biopesticide means	43.08	44.12	43.475	43.41	43.69	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	15.09	0.0258^{ns}
Factor A	0.53	0.5202^{ns}
Factor B	0.65	0.6328^{ns}
Factor A x Factor B	0.52	0.7249^{ns}

CV(a)=1.83 CV(b)=3.11
**significant ns – not significant*

Number of corn ear per plant

Number of corn ear per plant is presented in Table 10. Data showed that the highest number of corn ear was noted on corn plants fertilized with vermicompost + urea sprayed with kakawate leaf extract and tagbak leaf extract 1.18 pieces while the lowest number of corn ear was observed on fertilized with vermicompost + urea, sprayed with water (Control) and fertilized with farmers practice sprayed with tagbak leaf extract 1.10 pieces. The analysis of variance showed that application with different fertilizer materials (P=0.8361) and biopesticides (P=0.9375) did not affect significantly the number of corn ear per plant and also no interaction effect was observed (P=0.5917).

The result conforms the study of Arancon et., al. (2003) who found that positive effects of vermicompost on the growth and yield in strawberry, especially increases number of fruit in the field condition.

Table 10:- Number of corn ear per plant.

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	1.10	1.18	1.10	1.18	1.13	1.138
A2	1.15	1.13	1.13	1.10	1.15	1.132
Biopesticide means	1.125	1.155	1.115	1.14	1.14	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	3.03	0.1932^{ns}
Factor A	0.05	0.8361^{ns}
Factor B	0.20	0.9375^{ns}
Factor A x Factor B	0.71	0.5917^{ns}

CV(a)=6.19 CV(b)=8.02
**significant ns – not significant*

Number of corn kernels

The average number of corn kernels is presented in Table 11. Analysis of variance showed that application with different fertilizer materials (P=0.9768) and different biopesticides (P=0.4674) did not affect significantly the number of corn kernel per cob and also no interaction effect was observed (P=0.8706). Nevertheless, the treatments had different mean number the most number of corn kernels were noted on the treatment fertilized with farmers practice sprayed with Acapulco leaf extract with the mean of 346.60 pieces while the least number of corn kernel noted on the treatment fertilized with farmers practice sprayed with waterkakawate leaf extract with the mean of 312.70 pieces. The result supports the study of Shah et., al (2009) who found out there was increase in the grain yield by combined application of organic and mineral fertilizers application.

Table 11:- Number of corn kernel.

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	330.43	317.60	336.15	346.05	327.05	331.456
A2	316.73	312.70	341.03	340.00	348.60	331.812
Biopesticide means	323.58	315.15	338.59	343.025	337.825	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	2.56	0.2299^{ns}
Factor A	0.00	0.9768^{ns}
Factor B	0.92	0.4674^{ns}
Factor A x Factor B	0.31	0.8706^{ns}

CV(a)=10.74 *CV(b)=10.44*
**significant* *ns – not significant*

Computed yield per hectare

The computed yield per hectare is presented in Table 12. Data showed that application of different fertilizer materials and its interaction with different biopesticide has no significant effect on the computed yield per hectare. However, no significant of fertilizer materials application and different biopesticide on the computed yield per hectare have been observed. Nevertheless, the treatments had different mean number the highest production were noted on fertilized with vermicompost + urea sprayed with tagbak leaf extract (A1B2) with the mean of 12,294.94 kg while the lowest production were noted on the treatment fertilized also withvermicompost + urea sprayed with kakawate leaf extract the mean of 9483.33 kg.

Table 12:- Computed yield per hectare .

Fertilizer Materials	Biopesticides					Fertilizer Materials Means
	B1	B2	B3	B4	B5	
A1	11705.56	9483.33	11400	12294.44	11266.67	11230
A2	10511.11	12016.67	10094.44	11016.67	10323.74	10792.53
Biopesticide means	11108.34	10750	10747.22	11655.56	10795.21	

Note: Fertilizer means with the same letter are not significantly different by LSD Test

Analysis of Variance

Sources of Variance	F value	P value
Block	8.08	0.0599^{ns}
Factor A	0.25	0.6524^{ns}
Factor B	0.21	0.9294^{ns}
Factor A x Factor B	0.96	0.4456^{ns}

CV(a)=25.21 *CV(b)=21.80*
**significant* *ns – not significant*

Insect identified

The insect identified based on the study was earworms, corn army worm, cutworms.

Sensory evaluation

Sensory characteristics of corn kernel that all treatment combinations are liked very much by the panel member

Phytochemical test result for corn kernel

Table 13 showed the phytochemical test result in the corn kernel conducted by DOST-ITDI. Based on the data presented in table 25, it was revealed that the treatment fertilized with vermicompost + urea sprayed with water (A1B1), vermicompost + urea sprayed with tagbak leaf extract (A1B4), chemical fertilizer sprayed with water (A2B1) and chemical fertilizer sprayed with makabuhay vine extract (A2B3) have moderate sterols phytochemical component. Treatment fertilized with vermicompost + urea sprayed with water (A1B1), vermicompost + urea sprayed with tagbak leaf extract (A1B4), vermicompost + urea sprayed with Acapulco leaf extract (A1B5), chemical

fertilizer sprayed with kakawate leaf extract (A2B2), chemical fertilizer sprayed with tagbak leaf extract (A2B4) and chemical fertilizer sprayed with acapulco leaf extract (A2B5) have moderate triterpenes phytochemical components. Treatment vermicompost + urea sprayed with kakawate leaf extract (A1B2), vermicompost + urea sprayed with acapulco leaf extract (A1B5) and chemical fertilizer sprayed with makabuhay vine extract have traces flavonoinds phytochemical components. Treatment vermicompost + urea sprayed with kakawate leaf extract (A1B2), vermicompost + urea sprayed with acapulco leaf extract (A1B5), chemical fertilizer sprayed with kakawate leaf extract (A2B2), chemical fertilizer sprayed with tagbak leaf extract (A2B4) and chemical fertilizer sprayed with Acapulco leaf extract (A2B5) have moderate alkaloids phytochemical components. Treatment vermicompost + urea sprayed water (A1B1), vermicompost + urea sprayed with makabuhay vine extract (A1B3), vermicompost + urea sprayed with tagbak leaf extract (A1B4) and chemical fertilizer sprayed with water (A2B1) have traces saponins phytochemical components. Treatment vermicompost + urea sprayed with water (A1B1), vermicompost + urea sprayed with kakawate leaf extract (A1B2), vermicompost + urea sprayed with makabuhay vine extract (A1B3), vermicompost + urea sprayed with tagbak leaf extract (A1B4) and chemical fertilizer sprayed with makabuhay vine extract (A2B3) have abundant glycosides phytochemical components. Treatment vermicompost + urea sprayed with water (A1B1), vermicompost + urea sprayed with tagbak leaf extract (A1B4), chemical fertilizer sprayed with water (A2B1), chemical fertilizer sprayed with makabuhay vine extract (A2B3) have moderate tannins phytochemical components.

According to Nawaz et al., 2018, corn seeds contains a number of bioactive phytochemical compounds including phenols, polyphenols, phenolic acids, flavonoids, flavone glycosides, anthocyanins, carotenoids, terpenoids, alkaloids, steroids, luteins,sterols, alkaloids, tannins, saponins,oils, vitamins, some sugars, and polysaccharides.

Table 13:- Phytochemical test result for corn kernel.

Phytochemicals	A1B1	A1B2	A1B3	A1B4	A1B5	A2B1	A2B2	A2B3	A2B4	A2B5
Sterols	++	+	+	++	+	++	+	++	+	+
Triterpenes	++	+	+	++	++	+	++	+	++	++
Flavonoids	-	+	-	-	+	-	-	+	-	-
Alkaloids	+	++	+	-	++	+	++	+	++	++
Saponins	+	-	+	+	-	+	-	-	-	-
Glycosides	+++	+++	+++	+++	++	+	++	+++	++	++
Tannins	++	-	-	++	+	++	+	++	+	+

Note:
(+) Traces, (++) moderate (+++) abundant (-) Absence

Conclusion, Limitations and Recommendations:-

The results of the study could be summarized as follows: 1. There were no significant differences found among treatments in terms of number of days from sowing to emergence, silking to harvesting, height of corn at maturity, number of corn ear per plant, number of kernels per corn ear, length and diameter of corn ear, weight of corn ear with and without husk per 4.5 m^3 harvest area and computed yield per hectare. 2. Different blocks showed significant effect on the length of corn ear without husk. 3. Sensory evaluation conducted shows that all treatment combinations are liked very much perceived by thirty panel members.

Based on the result of this study, it is therefore concluded that: 1. Biopesticide application and different fertilizer materials have significantly differences in growth characteristics of green corn plants. 2. There is no interaction effect between biopesticide and different fertilizer materials on the growth characteristics in terms of number of days from sowing to emergence, silking to harvesting, weekly plant height and in all of parameter in yield components of green corn. 3. The earliest emergence, earliest number of days from silking to harvesting, highest number of corn ear, highest biological yield, longest length were observed on the green corn with application of vermicompost + urea regardless of biopesticides.

Based on the results of the study, the following are recommended: 1. Application vermicompost + urea irrespective to biopesticide application on green corn production is recommended, 2. Utilization of other varieties of green corn production is also recommended and 3. experiment of similar nature under different season is likely recommended

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