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Application of Humic Acid and Mulch Doseon Corn (Zea mays L) Yield

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***Keywords*— Humic acid, mulching, corn growth, crop yield, Randomized Block Design.**

***Abstract*—*This research aims to determine whether there is an interaction between the use of humic acid and mulching on the growth and production of corn plants, the effect of humic acid on the growth and production of corn plants and the effect of the use of mulch or mulching on the growth and production of corn plants. This study used a Randomized Block Design (RAK) with 3 replications in Giripurno Village, Kawedanan District, Magetan Regency. The first factor studied was humic acid (A) consisting of 3 treatments, namely doses of 0 Kg / Hectare, 10 Kg / Hectare, 20 Kg / Hectare and the second factor was mulch (M) consisting of 3 treatments, namely without mulch, plastic mulch, straw mulch. The parameters observed included plant height, stem diameter, number of cobs, weight of wet cobs with husks, weight of wet corn cobs without husks, weight of 1000 grains, number of rows, number of seeds, dry weight without husks, weight of dry husked corn, number of leaves, leaf area. There is interaction with plants on the parameters of yield, namely the weight of wet cobs with husks, weight of 1000 grains, and number of rows because the nutrients in humic acid can provide benefits to the yield of corn plants. The absence of interaction on the parameters of plant height 53 HST, stem diameter, number of cobs, weight of wet cobs without husks, number of seeds, dry weight of whole cobs, weight of dry kernels, number of leaves, leaf area is caused by insufficient dosage and short sample observation time.*

I. INTRODUCTION

Corn (Zea mays L) is one of the important food crops that has high economic value and is popular with the community. Corn has soft textured seeds, making it very popular as a food and snack ingredient. In Indonesia, corn farming is one of the potential agricultural sectors. However, despite its great potential, corn productivity in the region is still not optimal.

Corn is placed in the following taxonomy: Kingdom: Plantae, Division: Spermatophyta, Subdivision: Angiospermae, Class: Monocotyledone, Order: Graminae, Family: Graminaceae, Genus: Zea, and Species: Zea maysL

Gajung has three types of roots: seminal roots, aerial roots, and adventitious roots. Seminal roots originate from the radicle and embryo; aerial roots originate from two or more nodes below the soil surface; and adventitious roots are also known as prop roots. Corn plant varieties, soil fertility, and groundwater conditions affect root development. The stems of corn plants are cylindrical with many segments and nodes and have no branches ranging between 150 and 250 cm and are

covered by alternating leaf sheaths from each node. Hybrid corn variety seeds aresuperior seeds.

Hybrid corn seeds have many advantages, such as disease resistance, faster harvest time, and better quality and quantity of production. Hybrid corn seeds can also produce twin corn cobs, which produce twice the yield. Because hybrid corn seeds do not have the superior properties of the parent, they can only be planted for one planting season.

Around 220 hectares of agricultural land planted with corn in Giripurno Village, according to field data. (Yoni, 2023), the intensification pattern of farmers in Giripurno Village on average cultivates existing agricultural land using chemical fertilizers and pesticides to increase agricultural yields. However, agriculture in Giripurno Village has never implemented soil cultivation using humic acid soil conditioners and mulching on corn plants.

To increase agricultural production, especially in the cultivation of food crops, mulch is one approach. Mulch is a material that covers the soil to prevent water loss throughevaporation and weed growth

Mulch protects the soil surface from erosion and rain exposure and maintains soil moisture, structure, and fertility. In addition, mulch inhibits weed growth. (Nadia, 2020). The use of mulch, which is a surface cover for beds or mounds, is very important because it provides benefits including reducing the rate of evaporation from the soil surface, which saves water use, reduces changes in soil temperature, and reduces the costs and energy required for weed control. In the use of mulching on agricultural land, synthetic mulch and natural mulch can be distinguished. Synthetic, for example, PE plastic mulch made from polyethylene.

Humic acid is a good material to complement inorganic fertilizers. It is very important to pay attention to the dosage of humic acid because it can affect the nutrient content and growth of corn plants. According to Firda's research (2016), humic acid contains 40-80% C elements, 2-4% N elements, 1-2% S elements, and 0-0.3% P elements. Based on research by Hermanto et al. (2013) Compared with other doses, the use of humic acid as a fertilizer supplement with a dose of 20 kg/ha showed a better response to plant growth, supported by increased nutrient availability and nutrient uptake.

Currently, humic acid has been used as a fertilizer supplement because it can increase plant growth and improve fertilizer utilization. Turan et al. (2011) reported that adding humic acid to fertilizer can increase corn plant growth in high-salt soil (soil-salinity condition).

Straw mulch has several advantages, such as lowering soil temperature and maintaining soil by reducing erosion, can stop weeds and increase organic matter in the soil for a certain period of time (Sadewa, 2019). In addition to the advantages, straw mulch also has disadvantages, namely the land looks dirty and messy, does not last long like plastic mulch.

Currently, the use of organic fertilizers or other nutrient supplements, such as humic acid, is very popular due to product safety reasons and the fact that they can also increase soil fertility. Humic acid is an organic substance with a complex molecular structure containing active groups (macromolecules or organic polymers).

The provision of humic acid produces extraordinary growth in corn plants. Humic acid has the ability to increase total N elements and plays an important role in vegetative growth, especially in increasing and increasing plant size. In addition to N, humic acid also has the ability to increase organic C and P available in the soil which are needed by plants for enzyme metabolism and tissue formation. Compared to other fertilizer doses, the use of humic acid as a fertilizer supplement with a dose of 20 kg/ha showed a better response to plant growth, supported by increased nutrient availability and nutrient uptake.

In addition to helping plant growth and production, mulch can provide organic matter after decomposition. (Nuraini, 2020). Mulch is of two types: organic and inorganic. The first is made from natural materials that are easily decomposed, such as rice straw. The second is made from synthetic materials that are difficult to decompose, such as black and silver plastic mulch. Aniekwe et al. (2015) explained that efficiency in utilizing plant space and regulating plant density will reduce plant competition, increase soil nutrient needs, provide shade, and increase the interaction of micro-organisms in the rhizosphere of the soil. even prevent weeds from growing, which can reduce yields.

By using silver plastic mulch, photosynthesis occurs thanks to the reflection of light. (Sembiring, 2013). During the vegetative phase, meeting nutrient and water needs can increase photosynthesis results, which allows for optimal cell growth and enlargement and an increase in the number of leaves.

II. RESEARCH METHODS

2.1 Research site

This research was conducted in the experimental field of Giripurno Village, Kawedanan District, Magetan Regency.With an altitude of 67 meters above sea level, this researchwill be conducted from April to July 2024.

2.2 Materials and tools

The materials used are BISI 2 variety corn seeds, Humic Acid, top soil. The tools used in this study include mulch, hoes, watering cans, stationery, and other equipment for planting corn.

2.3 Research implementation

This experimental study used a randomized block design (RAK) with two factors repeated three times.

1. The first treatment factor is Humic Acid.A0 = No Treatment

A1 = Humic Acid 10 kg / HectareA2 = Humic Acid 15 kg / Hectare

2. The second factor is the treatment of giving plastic mulch.

This study is an experimental study with a randomized block design (RAK)

M0 = No TreatmentM1 = Mulch Plastic

M2 = 20 Kg Straw Mulch with a thickness of 5 cm permound

Number of treatment combinations 3x3 = 9 combinations

A0M0 A1M0 A2M0 A0M1 A1M2 A2M1 A0M2 A2M2A1M1

2.3.1 Land preparation

The land preparation process begins by clearing the area of plant debris, grass, or shrubs growing around it. The soil is hoed and left to remain between 15 and

20 cm, after which, it is leveled, loosened, and cleaned of root debris from the soil. After that, install mulch and make a plan. Make a 2 x 2.5 meter plot andmake a hole for planting with a depth of only 2-3 cm. The planting hole is made using a wooden hoe. To regulate rainwater, drainage channels must be made around the plot. This will protect the land from rainwater during heavy rains.

2.3.2 Treatment

- Mulching at 0 days after planting

- Humic acid is given at 15 days after planting

2.3.3 Seed Planting

Seed planting is done by making holes in the mulch, making holes 2-3 cm deep and a planting distance of 40 x 40 cm. Two seeds are inserted per planting hole. After that,the hole is covered with loose soil around it.

2.3.4 Replanting

Replanting is done when the plants do not grow well, die due to pests or diseases, or their growth is abnormal. Afterthe plants are 6-15 days old, replanting can be done.

2.3.5 Thinning

The purpose of thinning is to reduce plant competition in absorbing nutrients in less fertile soil and prevent plants from lack of sunlight in fertile soil. Thinning is done when the plants are 1 week old after planting (dap). The numberof plants left after thinning is one plant per planting hole. The remaining plants grow best.

2.3.6 Fertilization

Fertilization using urea fertilizer with a dose of 20 kg/hectare treatment that has been given at 15 hst and no other fertilizers are added.

2.3.7 Plant Maintenance

Plant maintenance includes watering, weed control, pests, and diseases. The maintenance process is adjusted to field conditions. Watering is done twice a day: morning and evening.

Weeds are controlled manually, namely by cutting weeds that grow around the plants by hand. while pesticide spraying is used to control pests and diseases. Maintenanceis carried out at 7 days HST. The purpose of plant maintenance is to prevent vector contamination that can interfere with plant growth and increase plant growth rates.

2.3.8 Harvesting

Harvesting is carried out at the age of 105 hst. The rightime to harvest corn is when the hair is brown and the cobs are full. Because high temperatures will reduce the sugar content in the seeds, harvesting is done in the morningwhen the temperature is still low.

2.3.9 Data Analysis

a) Analysis of Variance

The data collected from the observation results of the effect of humic acid dosage and mulching were processed using the SPSS application. The F test was conducted to determine the effect of the dose treatment on humic acid and mulch on the growth parameters of corn plants for the observation parameters between treatments, namely by comparing F and sig values with the following provisions:

1. If the sig value> 0.05, it means that the treatment has no significant effect on the parameters tested.
2. If the sig value <0.05, it means that the treatment has a significant effect on the parameters tested.

b) Further Research Test

To determine the effect of each treatment, the observation data were then analyzed using analysis of variance at an error level of 5%. Further testing was conducted using the Duncan Test at an error level of 5% to determine whether there was a significant difference in the effect between treatments.

III. RESULTS

3.1 Discussion Parameters

Humic acid (A) and mulch (M) treatments were applied to the growth of corn plants during the vegetative and generative periods. Plant height, stem diameter, number of cobs, weight of wet cobs (with husks) and wet (without husks). weight of 1000 grains, number of rows, number of seeds, dry weight without husks, dry weight of husked corn, number of leaves, leaf area.

The results of the analysis of variance showed that there wasno interaction in all plant height parameters, but there was a significant difference in the provision of humic acid andmulch.

Table. 1: Plant height 44 HST

Treatment	Plant Height
MULCHING	
WITHOUT MUTCH	164,867 a
PLASTIC MULCH	164,733 a
STRAW MULCH	163,844 a
HUMIC ACID DOSAGE	
0 Kg/Ha	163,622 a
10 Kg/Ha	165,822 b
15 Kg/Ha	164,000 a

In table. 1, shows that the average height plant No Thereis interaction from giving sour humate and mulch However there is influence different real in giving sour humate with dose of 10 kg/Ha is 165.822 cm different real with doses of 0 kg/Ha and 15 kg/Ha. In general , giving mulch No show that combination maintenance other different

Table. 2: Plant height 53 HST

Treatment Height MULCHING	Plant
WITHOUT MUTCH	175,733 a
PLASTIC MULCH	176,622 a
STRAW MULCH	176,778 a
HUMIC ACID DOSAGE	
0 Kg/Ha	176,267 a
10 Kg/Ha	176,889 a
15 Kg/Ha	175,978 a

Table 2 shows that interaction from giving sour humate inplants is on average high No there is mulch , but dose sour humate 10 kg/ha compared with 0 kg/ha and 15 kg/ha no different . On average, the provision mulch No there is show that No there is real difference in combination treatment others . On average giving mulch No show that combination different treatments No own significant effect

Table. 3: Plant height 100 HST

Treatment	Plant Height
MULCHING	
WITHOUT MUTCH	174,789 a
PLASTIC MULCH	186,533 a
STRAW MULCH	194,944 a
HUMIC ACID DOSAGE	
0 Kg/Ha	183,533 a
10 Kg/Ha	184,844 a
15 Kg/Ha	187,889 a

Table 3 shows that the average height plant No There is interaction from giving sour humate and mulch However there is influence different real in giving mulch straw namely 194.944 cm, On average giving sour humate No show real difference in combination treatment other .

Table. 4: Stem diameter 44 HST

Treatment	Plant Height
MULCHING	
WITHOUT MUTCH	8,644 a
PLASTIC MULCH	8,733 a
STRAW MULCH	9,088 a
HUMIC ACID DOSAGE	
0 Kg/Ha	8,644 a
10 Kg/Ha	8,822 a
15 Kg/Ha	9,000 a

Table 4 shows that the average diameter of the stem No There is interaction from giving sour humate and mulch However , the dose sour humate 10 kg/Ha compared with

0 kg/Ha and 15 kg/Ha no different . On average, the provision mulch No there is show that combination different treatments The same very No different . On average, the provision mulch No show that combination different treatments The same very No different .

Table. 5: Stem diameter 53 HST

Treatment	Plant Height
MULCHING	
WITHOUT MUTCH	9,711 a
PLASTIC MULCH	9,733 a
STRAW MULCH	9,867 a
HUMIC ACID DOSAGE	
0 Kg/Ha	9,711 a
10 Kg/Ha	9,711 a
15 Kg/Ha	9,889 a

Table 5 shows that the average diameter of the stem No There is interaction from giving sour humate and mulch However dose sour humate 10 kg/ha and 15 kg/ha no comparable to the average giving mulch No there is show that No there is real difference in combination treatment others. In general, giving mulch No show that combinationmaintenance other different.

Table. 6: Stem diameter 100 HST

Treatment	Plant Height
MULCHING	
WITHOUT MUTCH	13,467 a
PLASTIC MULCH	13,644 a
STRAW MULCH	13,622 a
HUMIC ACID DOSAGE	
0 Kg/Ha	13,444 a
10 Kg/Ha	13,511 a
15 Kg/Ha	13,778 a

Table 6 shows that the average diameter of the stems of humic acid and mulch No interact One each other, and not There is proof existence significant difference in usage sour humate at the levels of 10 kg/ha, 0 kg/ha, and 15 kg/ha. On average, the application mulch No show that combination other treatments are different.

Table. 7: Amount Tuna 100 HST

Treatment	Plant Height
MULCHING	
WITHOUT MUTCH	1.5556 a
PLASTIC MULCH	1.5111 a
STRAW MULCH	1.4667 a
HUMIC ACID DOSAGE	
0 Kg/Ha	1.5555 a
10 Kg/Ha	1.4889 a
15 Kg/Ha	1.4667 a

Table 7 shows that the average humic acid with dose 10 kg/ha and mulch with doses of 0 kg/ha and 15 kg/ha do not impact on the number of cob . On average, the provision mulch No there is show that No there is real

difference in combination treatment others . On average giving mulch No show there is significant difference in treatment other.

According to results analysis variety , there is connection between dose sour humate and mulch to heavy cob wet with husk at age 100 HST observation average weight cob wet with cornhusk plant corn on sour humate and mulch presented in Figure 1.

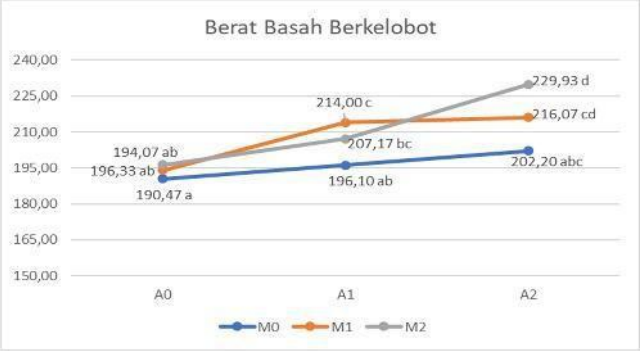

Fig.1 Interaction curve factor influence sour humate and mulch to heavy cob wet with 100 HST corn husks

In the picture on show that there is interaction of M0, M1 and M2, in the A2M2 treatment, namely addition sour humate as much as 15 kg/Ha and mulch with average weight value cob wet with cornhusk most namely 229.93, while the M0 and M1 treatments showed average weight value cob wet namely 202,200 and 216.07.

Table. 8: Weight of Tuna Wet Without Husk 100 HST

TREATMENT	WEIGHT OF WET COB WITHOUT HUSK
PLASTIC MULCH PROVISION	
WITHOUT MUTCH	185,711 a
PLASTIC MULCH	175,022 a
STRAW MULCH	178,467 a
HUMIC ACID DOSAGE	
0 Kg/Ha	174,022 a
10 Kg/Ha	178,178 a
15 Kg/Ha	187,000 a

Table 4.8 shows that No There is connection between giving sour humate and mulch and average weight of cobs wet without cornhusk However Dose sour humate 10 kg/ha and 15 kg/ha no different . On average, the provision mulch No there is show that No there is real difference in combination treatment others . On average Giving mulch show that combination maintenance other The same very No different.

Analysis results Variety show that there is interaction between dose sour humate and mulch to weight of 1000 grains average weight of 1000 grains corn on sour humateand mulch presented in Figure 2

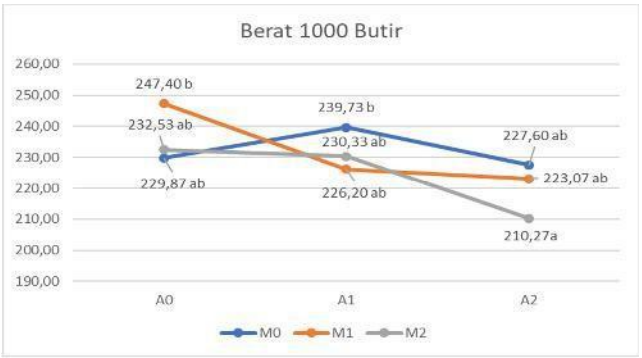

Figure 2 Interaction curve factor influence sour humate and mulch to weight 1000 grains

In the picture on show that there is interaction of M0, M1 and M2, in the A0M1 treatment , namely addition sour humate as much as 10 kg/Ha and mulch with average weight value of 1000 grains most namely 247.40 while the M0 and M2 treatments showed average weight value of 1000 grains thatis 239,733 and 232,533 . On the chart show decline Because a number of the actor who happened in the field like amount sparse seeds and also attack diseases and treatments A2M0,

A2M1, A2M2 are present size seed more corn small and lighter weight light from treatment A0M0, A0M1, A0M2 so weight 1000 grains at the time testing there is decreasing graph.

Analysis results Variety show that there is influence between dose sour humate and mulch to amount run away grain corn on sour humate and mulch presented in Figure 3

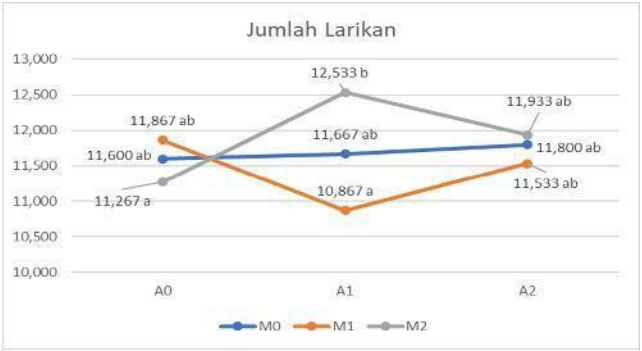

Fig.3 Influence curve factor sour humate and mulchto amount run away grain corn

In the picture on show that there is the influence of M0, M1 and M2, in the A1M2 treatment , namely addition sour humate as much as 10 kg/Ha and mulch with highest average value namely 12.533 while the M0 and M2 treatments showed average value of sum run away that is 11,667 and 11,933

Table. 9: Amount 100 seeds after planting

TREATMENT	WEIGHT OF WET COB WITHOUT HUSK
0 Kg/Ha	360,044 a
10 Kg/Ha	373,511 a
15 Kg/Ha	360,133 a

Table. 10: Dry Weight of Tuna Whole 100 HST

TREATMENT OF	DRY WEIGHT WHOLE TUNA
MULCHING	
WITHOUT MUTCH	167,778 a
PLASTIC MULCH	159,289 a
STRAW MULCH	166,778 a
HUMIC ACID DOSAGE	
0 Kg/Ha	160,844 a
10 Kg/Ha	161,600 a
15 Kg/Ha	170,667 a

Table 10 shows that the average number seed No There is interaction from giving sour humate and mulch However No there is difference real in giving sour humate with doses of 10 kg/ha, 0 kg/ha, and 15 kg/ha, respectively. There is no proof that There is significant difference in giving average mulchon combination treatment others. On average giving mulch No show that there is real difference in combination treatmentother.

Table 9 shows that the average number seed No There is interaction from giving sour humate and mulch However Nothere is difference real in giving sour humate at a rate of 10 kg/ha, as well as 0 kg/ha and 15 kg/ha, respectively. At an average application rate of mulch No there is show that No there is real difference in combination treatment others. On average giving mulch No show real difference in combination treatment other.

Table. 11: Dry Grain Weight

TREATMENT	DRY PEEL WEIGHT
MULCHING	
WITHOUT MUTCH	148,667 a
PLASTIC MULCH	141,800 a
STRAW MULCH	143,400 a
HUMIC ACID DOSAGE	
MULCHING	
WITHOUT MUTCH	371,333 a
PLASTIC MULCH	352,200 a
STRAW MULCH	370,333 a
HUMIC ACID DOSAGE	
0 Kg/Ha	360,044 a
10 Kg/Ha	373,511 a
15 Kg/Ha	360,133 a

Table 11 shows that the average weight snot dry No There is interaction from giving sour humate and mulch However No there is difference real in giving sour humate with dose 10 kg/Ha with doses of 0 kg/Ha and 15 kg/Ha. On average, the administration mulch No there is show that No there is real difference in combination treatment others. On average giving mulch No show that there is real difference in combination treatment other.

Table. 12: Number of Leaves (53 HST)

TREATMENT	NUMBER OF LEAVES
MULCHING	
WITHOUT MUTCH	10,733 a
PLASTIC MULCH	10,778 a
STRAW MULCH	10,600 a
HUMIC ACID DOSAGE	
0 Kg/Ha	10,622 a
10 Kg/Ha	10,844 a
15 Kg/Ha	10,644 a

Table 12 shows that the average number leaf No There is interaction from giving sour humate and mulch However Nothere is difference real in giving sour humate with dose 10 kg/Ha with doses of 0 kg/Ha and 15 kg/Ha. On average, the administration mulch No there is show that No there is real difference in combination treatment others. On average giving mulch show that No there is real difference in combination treatment other.

Table. 13: Number of Leaves (100 HST)

TREATMENT	NUMBER OF LEAVES
MULCHING	
WITHOUT MUTCH	10,733 a
PLASTIC MULCH	10,778 a
STRAW MULCH	10,600 a
HUMIC ACID DOSAGE	
0 Kg/Ha	10,622 a
10 Kg/Ha	10,844 a
15 Kg/Ha	10,644 a

Table 13 shows that the average number leaf No There is interaction from giving sour humate and mulch However Nothere is difference real in giving sour humate with dose 10 kg/Ha with doses of 0 kg/Ha and 15 kg/Ha. On average, the administration mulch No there is show that No there is real difference in combination treatment others. On average giving mulch No show that there is real difference in combination treatment other.

Table. 14: Leaf Area (53 HST)

TREATMENT	LEAF AREA
MULCHING	
WITHOUT MUTCH	624,575 a
PLASTIC MULCH	615,241 a
STRAW MULCH	670,716 a
HUMIC ACID DOSAGE	
0 Kg/Ha	623,863 a
10 Kg/Ha	651,544 a
15 Kg/Ha	635,152 a

Table 14 shows that the average number leaf No There is interaction from giving sour humate and mulch However Nothere is difference real in giving sour humate with dose 10 kg/Ha with doses of 0 kg/Ha and 15 kg/Ha. On average, the administration mulch No there is show that No there is real difference in combination treatment others. On average giving mulch No show that there is real difference in combination treatment other.

Table. 15: Leaf Area (100 HST)

TREATMENT	LEAF AREA
MULCHING	
WITHOUT MUTCH	627,402 a
PLASTIC MULCH	632,040 a
STRAW MULCH	692,393 a
HUMIC ACID DOSAGE	
0 Kg/Ha	639.348 a
10 Kg/Ha	663,148 a
15 Kg/Ha	652,337 a

Table 15 Show that the average area leaf no There is interaction from giving sour humate and mulch However there is difference real in giving mulch straw, On average treatment sour humate with dose 0 kg/Ha with doses of 10 kg/Ha and 15 kg/Ha are not show that there is real difference in combination treatment dose sour humate.

3.2 Discussion

In application treatment dose sour humate (A) and mulch

(M) are present interaction to plants on yield parameters that is heavy cob wet husked , weighing 1000 grains , and the number of run away Because nutrients in acid humate capable to give benefit to results plant corn.

Humic acid capable provide nutrients and mulch to plant when own sufficient nutrient content , especially nitrogen

(N) which content the nutrient N (Nitrogen) functions as compiler amino acids (proteins), acids nucleic , nucleotide as well as chlorophyll , content sour humate namely C, H, N, O, S and P as well other elements such as Na, K, Mg, Mn, Fe.

Humic acid contains 0.6 – 1.1% S; 0.2 – 3.7% P; 5.6% and Fe oxide ; 0.05 – 0.15% Na; 0.6% potassium

sulfate , magnesium and some small manganese (Nasution, 2020), This will make plant grow optimally , reinforced by Azzamy (2015) that nutrient content and levels fertility influence growth and level fertility plant depends on ability plant For absorb nutrients in the soil . Giving Mulch is also useful as deterrent growth annoying weeds absorption nutrients in plants corn. According to Murrinie (2010) said that at the beginning growth plant Not yet There is competition between plants and weeds. However, control weeds in the period this is the most effective Because give plant chance For grow and dominate the areas they have For grow .

Absence interaction at high parameters 53 HST plants , stem diameter , number tuna , heavy cob wet without husk , amount seeds , weight dry cob intact , heavy snot dry , amount leaves , wide leaf caused by giving under dosage and timing observation sample only A little as well as distance planting too much meeting cause amount overpopulation as well as giving sour humate done at the time Afternoon day so that level evaporation land increase and the elements contained therein evaporate more Lots than absorbed by plants . Because of the plants lack nutrients, growth obstructed. (Revelation Aprilyanto, Medha Baskara, 2016)

This matter allegedly Because sour humate is material organic which has little (3% N, 0.20% P, 10.00% K) content nutrients and provision of A little so that No Enough For fulfil need plant nutrients corn . In line with study (Agustian, 2014) who stated that Because amount sour the humate given is very small , the effect Possible No seen or Possible only increase in a way small-scale .

In addition, it is suspected Because task sour humate For increase growth plant need a relatively long time , at least three year . This is in accordance with opinion Shaila et al., (2019) stated that that level acidic nutrients humate low and need time longer , at least three year , for produce available nutrients For plants and ready absorbed . As a result , the reaction plant to giving sour humate not enough from fertilizer inorganic .

Result of observation there is interaction on observation parameters heavy cob wet with cornhusk show that there is interactions in the A2M2 treatment , namely addition sour humate as much as 15 kg/Ha and mulch straw with heavy cob wet with cornhusk most namely 229.93 g , while the M0 and M1 treatments showed average weight value cob wet namely 202.200 g and 216.07 g.

There is interaction on observation parameters results weight 1000 grains there is interaction of M0, M1 and M2, in the A0M1 treatment, namely addition sour humate as much as 10 kg/Ha and mulch plastic with average weight value of 1000 grains most namely 247.40 g , while the M0 and M2 treatments showed average weight value of 1000 grains namely 239.733 g and 232.533 g. The graph in Figure 2 shows decline Because due to seed experience whipping weather rainfall Fluctuating rain cause damage to the embryo and reduction quality seeds , lower viability , and make seed corn more moist that can cause water level drops drastic , shrinking morphology seeds and reduce Power stand seeds (Rahmawati, 2011).

According to Wen Chen, Xin Li a, Ping Zhao & Deng, (2024) For reduce competition in population , regulation density plant allow canopy and roots plant utilise environment completely . Because the plants excessive compete with nutrients, water, radiation sun , and space growth , quantity and weight seed plant will decreased . (Purwanti, Eny Wahyuning et al., 2022) . Too the meeting distance plant will hinder growth plants , but If too rare , population plant will reduce . (Hayati et al., 2010)

Observation result growth show there is influence in application dose sour humate on observation parameters tall plant age 44 HST with results influence different real Compared to with dose 0 kg/ha and 15 kg/ha, dose sour humate 10 kg/ha reached 165.822 cm.

At high observation parameters, the age of 100 HST plants with results influence different real in giving mulch straw which is 194.944 cm real different with maintenance without and with mulch plastic.

Result parameters amount run away show that there is interaction of M0, M1 and M2, in the A1M2 treatmen , namely addition sour humate as much as 10 kg/Ha and mulch with highest average value namely 12.533 while theM0 and M2 treatments showed average value of sum run away namely 11,667 and 11,933.

On growth parameters wide 100 HST leaves Show that the average area leaf No There is interaction from giving sour humate However there is difference real in giving mulch straw with mark area 692,393 cm 2 , on average treatment sour humate with dose 0 kg/Ha with doses of 10 kg/Ha and 15 kg/Ha are not show that combination maintenance dose sour humate different (Kartika, 2018) .

Nutrients will easy absorbed by plants For used in the metabolic process , causing reactions produced by plants (Parawansa, 2024) . Humic acid own composition elements C 40-80%, N 2%, S 1-2%, and P 0-0.3%. Humic acid contain more Lots H, C, N and S elements . Acid O element levels humate more A little compared to sour fat (Elismar Pereira de Oliveira et al., 2024)

Application mulch Plastic and Mulch organic show that No There is significant difference in the observation

parameters growth tall plants at 53 HST, stem diameter, number of tuna, heavy wet without husk, amount seeds, weight dry cob intact, heavy snot dry, amount leaves, wide leaf .

According to Dani (2018) Mulch plastic and organic, such as mulch straw, mulch bitter, and mulch plastic black and silver , can used . Based on opinion The Umbrella (2019) Lack use mulch organic among others not can used Again for planting season next and not always available throughout season, can cause growth mushrooms in condition humidity high and only can found around locationagriculture

With giving mulch organic and at the time phase plant weather No support during study found pest attack plant that is grasshopper, caterpillar grayak and grasshoppers. Pests controlled in a way chemical with pesticide as material active Cypermethrin, Profenofos, and Deltamethrin. Disease plants, such as bulai, controlled in a way Mechanic with to pull out affected plants and with use material active Propineb 70%, fungicide chemical applied For protect healthy plants.

In addition, production mulch plastic black in condition climate hot can cause temperature high around the root zone. If the root zone temperature is above average, growth plant will hampered in a way significant Other investigations also revealed that use mulch plastic increasedisease and attack pests on some plant.

Mulch plastic polyethylene also causes waterlogging , erosion land , and the reduction capacity retain water (Asroh et al., 2015) . In addition , according to The Grace of Allah (2023) use mulch plastic colored will impact on microbiota land and will to abolish function experience ecosystem land that has an impact direct and indirect directto health land .

With technique mulching and acid humate per plant hope hisFor increase growth,results production and quality corn the first “BISI 2” hybrid . However after applied results harvest No in accordance with what is expected.

IV. CONCLUSION

Based on the results of the research that has been done,the following conclusions can be drawn:

1. There is an interaction with plants on theparameters of the results, namely the weight of wet cobs with husks, the weight of 1000 grains, and the number of rows because the nutrients in humic acid can provide benefits to the yield of corn plants.
2. There is no interaction on the parameters of plant height 53 HST, stem diameter, number of cobs,weight of wet cobs without husks, number of seeds, dry weight of whole cobs, dry kernel weight, number of leaves, leaf area due to the provision of insufficient doses and the time of sampleobservation is only a little

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