

## GROWTH AND YIELD OF EGGPLANT (*Solanum melongena* L.) ON VARIOUS COMBINATIONS OF N-SOURCE AND NUMBER OF MAIN BRANCH

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### ABSTRACT

This research was conducted to increase production of eggplants through combination of N-source and number of main branch has done on the field of andosol in Poncokusumo - Malang, 600 m asl, pH 5.4, from August to December 2013. The experiment used a Randomized Complete Block Design with 2 factors and 3 replications. Factor 1 was proportion of inorganic - organic N fertilizer (138 kg N ha<sup>-1</sup>): 100% Urea, 75% Urea + 25% goat manure, 50% Urea + 50% goat manure, and 25% Urea + 75% goat manure. Factor 2 was number of main branches: 1, 2 and 3 main branches. Results showed that there was no interaction effect between treatment combinations of organic-inorganic sources of N and the number of main branches to all observed variables. Treatment using the combination of 75% Urea + 25% goat manure increased the plant growth and gave the highest fruit yield (49.20 t ha<sup>-1</sup>) in comparison with combination using other fertilizers and 100% Urea. The lowest was derived from the application of 100% Urea, 35.61 t ha<sup>-1</sup>. Cultivation of eggplant with 3 main branches has resulted better growth and fruit yield than 1 and 2 main branches, 50.85, 47.91 and 30.79 t ha<sup>-1</sup>, respectively.

Keywords: eggplant, goat manure, main branch  
urea

### INTRODUCTION

The increasing demand of eggplants has gone along with the rapid growth of population. This is due to the increasing awareness toward the benefit of vegetables in fulfilling the nutrient of the family (Jumini and Marliah, 2009). According to Sowinska and Krygier (2013), eggplants contain low calorie and high nutrient. Gandhi and

Sundari (2012) described that eggplant can also be utilized as medicine to reduce cholesterol in blood and it is suitable as diet to regulate hypertension. Owing to high nutrient content of the eggplant, it is presumed that the demand of eggplant will increase, so that the production should be increased as well (Sowinska and Krygier, 2013).

Eggplant production for the last 3 years has decreased. In 2013, the national production of eggplants reduced 509,380 ton from 519,481 ton in 2011 (Directorate General of Horticulture, 2014). One of the main causes of such reduction is the decreasing fertility of the soil and organic matters in the soil (Ullah *et al.*, 2008). According to Waseem *et al.* (2013), the use of inorganic fertilizer in long-term has reduced physical, chemical, and biological traits, as well as organic matters in the soil, and of course, they will affect efficiency of nutrients absorption. Excessive application of inorganic fertilizers would contaminate environment and the food yield that may harm human health (Jagatheeswari, 2013). Therefore, some efforts are required to fulfill a part of nutrients and improve the physical, chemical, and biological traits of the soil through the application of organic fertilizers.

The demand of nutrients for the eggplant could not be fulfilled completely through the application of organic fertilizers. Sutanto (2002) described that the only application of organic fertilizer might reduce the production, whereas the use of chemical fertilizers without organic fertilizers could damage the environment. Efforts to increase vegetable production will keep relying on the use of outer input, including organic and chemical fertilizers. These fertilizers are used to fulfill the required nutrients, particularly for the superior varieties, which are responsive to fertilizer (Suwandi, 2009).

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Eggplant is highly responsive to N fertilizer. Both deficient and excessive N will reduce the potential production of eggplants. In order to produce 1 ton fresh eggplants, it requires 3 – 3.5 kg of Nitrogen (Sharma and Brar, 2008). Nafiu *et al.* (2011) described that eggplant has longer potential harvesting time and reside in the soil for longer time, so that sufficient N fertilizer is required during the growth.

One of the successes in managing the combination of organic and inorganic fertilizers is determined by proportion of the two-combined nutrients. More farmers have combined organic and inorganic nutrients, but the yield of production is below the potential production due to the insufficient additional nutrients, low quality of organic matters and inappropriate combination, as well as inefficient (Palm *et al.*, 1997). Therefore, in order to fulfill the demand of N nutrient for the plants through combination of N inorganic and organic fertilizers, proportion of N from Urea and animal manure should be found out.

Efficient nutrient absorption by the eggplant can be increased by regulating number of the main branches. Regulating number of the branch can be done by removing wild shoots and remain the main branches, which are going to be maintained. Maintenance of the main branches is done to regulate equilibrium between sources and sink to increase the eggplant production (Raden *et al.*, 2009). According to Wartapa *et al.* (2009), regulating number of branch is a way to arrange number of leaf and leaf area that can increase photosynthetic efficiency and assimilate. Maintenance of the main branch could improve the environmental condition, such as temperature, humidity, light, air/wind circulation, so that photosynthetic activities would be better.

Based on the description above, further research is required to study the effect of combination inorganic – organic N source and maintenance in number of the main branch that could increase the growth and yield of the eggplant by keep preserving the environment.

## MATERIALS AND METHODS

The research was conducted at the field of andosol in Poncokusumo – Malang, 600 m asl, pH 5.4, from August until December 2013. Materials of the research are tray as the seedbed and strong green variety of eggplant seed. The

applicable fertilizers include goat manure, inorganic fertilizers (Urea, SP-36 and KCl). Controlling weeds, pests and diseases used herbicide ( roundup), insecticide (Furadan, Curacron, Marshal), fungicide (Antracol and Agrept). Stake and connecting bamboo are used to support the plant.

The research used a randomized complete block design by 2 factors and 3 replications. Factor 1 was proportion of N fertilizer of both inorganic and organic ( $138 \text{ kg N ha}^{-1}$ ) that comprised of 4 levels: 100% Urea, 75% Urea + 25% goat manure, 50% Urea + 50% goat manure, and 25% Urea + 75% goat manure. Factor 2 was number of the main branches that comprised of 3 levels: 1, 2, and 3 main branches.

Eggplant was planted in spacing of 70 x 40 cm at the experimental plots 2.8 m x 5.2 m. SP-36 and KCl were applied as ground fertilizers in which each of them was given by dosage of  $278 \text{ kg ha}^{-1}$  ( $100 \text{ kg ha}^{-1} \text{ P}_2\text{O}_5$ ) and  $168 \text{ kg ha}^{-1}$  ( $100 \text{ kg K}_2\text{O}$ ), which were applied at 7 DAP. Dosage of Urea was  $300 \text{ kg}$  ( $138 \text{ kg N}$ ) and be applied three times during the growth at 7, 28, and 49 DAP for about 1/3 dosage each. The application of goat manure was given during ground making by a given dosage in accordance with each treatment, and sown evenly to the entire soil surface, and then harrowed completely. Number of the main branches was taken care by removing wild shoots starting from 21 DAP, by the branches rate that were taken care in accordance with each treatment.

The taking care of the crops includes embroidering (replace the dead seedlings with the new ones), *penyiwilan*, installing stakes, tying up the crop to the stake, and controlling pests and diseases. Weeds control can be done manually. Irrigation during pre-planting was done once a week, and then once in 2 weeks during the generative phase. Pest and disease control was done in accordance with intensity of the pest and disease infection.

The crops were observed destructively, 4 times, started from 14 to 56 DAP by the observational interval of 14 days once. The observation includes dry weight of the crop, leaf area, and analysis of the crop growth (Leaf Area Index, Crops Growth Rate, and Net Assimilation Rate). Observation on harvest includes number of fruits, weight per fruit, fruit weight per plant, and per ha. The collected data was analyzed using analysis of variance. If the result shows a

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significant difference among the observed treatments, it will be followed by SSD (the Smallest Significant Difference) test at the level 5%.

## RESULTS AND DISCUSSION

There was no interaction effect between treatment combinations of organic-inorganic sources of N and the number of main branches to all observed variables. The presentation of data was conducted separately for each factor.

### Crop Growth

Diverse treatments of N fertilizer have significant effect on the crop growth started from

28 DAP. Table 1 and 2 show that at 14 DAP, various applications of fertilizer have insignificant difference on leaf area and dry weight of the eggplant. At 14 DAP, the crops have still in adaptive phase after transplanting, therefore they have not required more nutrients. That is why all treatments by the application of N fertilizer have insignificant difference effect on leaf formation and dry weight of the crop. Sanchez (1992) described that during initial growth, the plant requires little nutrients, and therefore the available nutrients in the soil are sufficient to support optimal growth and development of the crop.

Table 1. Leaf area of eggplant (cm<sup>2</sup>) on treatment of N-source and number of main branches

Treatments	Leaf area (cm <sup>2</sup> )			
	14 DAP	28 DAP	42 DAP	56 DAP
<b>N-source (138 kg N ha<sup>-1</sup>):</b>				
- 100 % Urea	159.11	1415.00 b	4443.83 bc	7843.33 a
- 75 % Urea + 25 % goat manure	161.56	1578.34 c	4542.72 c	8489.13 c
- 50 % Urea + 50 % goat manure	157.03	1301.29 ab	4370.51 ab	8307.86 bc
- 25% Urea + 75% goat manure)	155.35	1236.22 a	4292.75 a	8132.44 ab
LSD 5%	ns	144.95	150.27	341.72
<b>Number of main branches:</b>				
- 1 main branch plant <sup>-1</sup>	157.50	1365.17	4182.99 a	7674.47 a
- 2 main branches plant <sup>-1</sup>	158.27	1379.46	4452.33 b	8069.51 b
- 3 main branches plant <sup>-1</sup>	159.02	1403.52	4602.05 c	8835.59 c
LSD 5%	ns	ns	130.01	295.94

Remarks: Numbers followed by different letter at each column are significantly different at P=0.05. ns=not significant

Table 2. Plant dry weight (g) on treatment of N-source and number of main branches

Treatments	Dry weight (g)			
	14 DAP	28 DAP	42 DAP	56 DAP
<b>N-source (138 kg N ha<sup>-1</sup>):</b>				
- 100 % Urea	1.83	14.87 bc	65.65 bc	203.20 a
- 75 % Urea + 25 % goat manure	1.85	15.87 c	68.50 c	230.95 c
- 50 % Urea + 50 % goat manure	1.79	14.01 b	63.64 ab	215.95 b
- 25% Urea + 75% goat manure)	1.77	12.76 a	60.40 a	211.92 ab
LSD 5%	ns	1.02	3.65	10.83
<b>Number of main branches:</b>				
- 1 main branch plant <sup>-1</sup>	1.80	14.08	56.34 a	190.98 a
- 2 main branches plant <sup>-1</sup>	1.81	14.36	65.11 b	215.04 b
- 3 main branches plant <sup>-1</sup>	1.82	14.69	72.20 c	240.47 c
LSD 5%	ns	ns	3.16	9.38

Remarks: Numbers followed by different letter at each column are significantly different at P=0.05. ns=not significant

Reducing the application of 25% Urea and replacing it with stable manure will produce wider leaf area in comparison with other treatment. Table 1 shows that the application of 75% Urea and 25% stable manure will produce wider leaf area than the application other fertilizers at 28 to 56 DAP, even the application of 100% Urea showed insignificant difference at 42 DAP. This was due to the plant has gained sufficient N since the initial growth. The availability of Urea has been able to fulfill immediately the demand of N, while the application of stable manure has been able to improve physical, chemical, and biological traits, so that it could increase N absorption by the plants. The fulfillment of sufficient N has increased ability of the plant to form leaf. The increasing number of leaves will increase the leaf area as well. Ridho and Yuliana (2007) described that more leaves will increase the photosynthetic process and produce more photosynthates, and of course, it will increase the plant growth as well.

The combination of inorganic and organic N sources has produced wider leaf area in comparison with the application of 100% Urea. This is due to different nutrient release of inorganic and organic that could supplement one another. Meanwhile, the combination of Urea 75% + 25% stable manure ( $K_1$ ) and Urea 50% + 50% stable manure ( $K_2$ ) have produced wider leaf area. When N level in Urea started to reduce, the eggplant could utilize the available N from the stable manure. Both of them have supplemented one another due to the nutrient in Urea is fast release, while the nutrient in stable manure is slow release. Through decomposition process, the organic matter could improve the soil features, so that it could increase efficient nutrient absorption by the plant. According to Agbo *et al.* (2012), nutrient of the inorganic fertilizer could relatively faster in improving soil productivity, but it is easily removed through washing, evaporation, and nitrification, and of course, it could create pollution. The application of stable manure could provide nutrient and improve soil structure, but has slow release.

The combination of Urea 75% + 25% stable manure ( $K_1$ ) has produced higher dry weight than the application of other treatments. Table 2 shows that at 28 and 42 DAP, the eggplant was given the application of 75% Urea + 25% stable manure ( $K_1$ ) and resulted higher

dry weight and it had insignificant difference with the application of 100% Urea ( $K_0$ ). At 56 DAP, the combination of Urea 75% + 25% stable manure ( $K_1$ ) has produced the highest dry weight in comparison with other treatments. This is due to the applied combination of 75% Urea + 25% stable manure produce wider leaf area than other treatments. The increasing leaf surface will increase the area for photosynthesis, so that the formation of photosynthates will increase as well. The photosynthate products were translocated to form organs of the plant, so that the wider the leaf area, the higher dry weight of the plant is produced.

Reducing 75% Urea and replacing it with stable manure by the same dosage will produce lower dry weight of the plant in comparison with reduction of other fertilizers. Table 2 shows that the application of 25% Urea and 75% stable manure ( $K_3$ ) produces lower dry weight than the combination of other fertilizers. This is due to the nutrient in stable manure is slow release, so that when the plant requires the nutrient, the available nutrient is insufficient. 25% proportion of Urea has caused N in Urea would not be able to fulfill the required N for the eggplant. Such no synchronization of N has produced few leaves. Palm *et al.* (1997) described, inappropriate proportion of inorganic-organic fertilizers has caused the growth and the yield below the potential growth and yield of the plant.

Maintenance 3 main branches have produced the highest dry weight and leaf area at 42 and 56 DAP. Maintenance 3 main branches ( $C_3$ ) have increased the formation of secondary and tertiary branches, and then increase the formation of leaves. The increasing number of leaves has caused the increasing leaf area, which means that the photosynthetic site has increased as well (Table 1). The increasing photosynthetic site has increased the light interception area, which increase the photosynthetic activities. Better photosynthesis will form more photo-synthates, which will increase the accumulation of photosynthates. Taiz and Zeiger (2002) stated that the increasing number of leaves have increased the ability of plant to produce photosynthates, so that the formation of vegetative organs will be better, due to the leaves function as photosynthetic organs that converse the light energy into chemical energy. Table 2 shows that the maintenance 3 main branches has resulted the highest dry

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weight of eggplant in comparison with the maintenance 1 and 2 main branches.

Reducing 25% Urea and replacing it with stable manure has resulted higher leaf area index. Table 3 shows that leaf area on 75% Urea and 25% stable manure ( $K_1$ ) has resulted higher leaf area in comparison with other treatments. It means that reduction 25% Urea and replaces it with stable manure by the same dosage will be able to provide N better than the application of 100% Urea or other fertilizer combinations. During the early growth, the eggplant gets sufficient N from Urea, and along with the time passing by, the plant could use N from the available stable manure. It forms more leaves and wider leaf area, and of course, it will increase leaf area index. Optimal leaf area index shows that radiant interception by the plant will be more effective, due to the light that could not be intercepted by the leaf layer below it. The higher interception is, the higher photosynthetic process and photosynthate products, which are allocated to form the increased dry matters as well. This is due to light is one of determinant key in metabolism of the plant (Lakitan, 1996).

Arranging number of the main branches could increase leaf area index of the eggplant. Table 3 shows that number of the main branches have significant effect on the eggplant in which taking care of 3 main branches would result higher leaf area index in comparison with maintenance 1 and 2 branches. Maintaining more main branches will increase number of

leaves. The increasing number of leaves will extend leaf area, so that leaf area index will increase as well. High leaf area index could increase light interception due to the light that cannot be intercepted by leaves at the top part, will be intercepted by the leaf layer below it. According to Raden *et al.* (2009), the arrangement number of the main branches will affect on percentage of much intercepted-light. The condition has offered some opportunities to leaves in the canopy to be used for photosynthetic process.

Reducing Urea to be 75% and replacing it with the stable manure has resulted lower growth rate in comparison with the reducing of other fertilizers. It shows no synchronization of nutrients on the combinations. Reducing Urea to be 75% has caused the eggplant has experienced deficient N since early growth. Proportion 25% Urea has not been able to fulfill the demand of N, while nutrient of stable manure has not been utilized completely by the plant due to slow release. N deficiency inhibits the formation of some organs, such as leaf, so that it will result low leaf area and leaf area index as well. According to Cerny *et al.* (2012), N deficiency will cause lower and narrower leaf formation. Narrower surface of leaf area will restrict the photosynthetic area, so that it will result less photosynthate. Lower photosynthate has caused less dry matters, and of course, it will inhibit the growth rate.

Table 3. Leaf area index of eggplant on treatment of N-source and number of main branches

Treatments	Leaf area index			
	14 DAP	28 DAP	42 DAP	56 DAP
<b>N-source (138 kg N ha<sup>-1</sup>):</b>				
- 100 % Urea	0.057	0.505 b	1.59 bc	2.80 a
- 75 % Urea + 25 % goat manure	0.058	0.564 c	1.62 c	3.03 c
- 50 % Urea + 50 % goat manure	0.056	0.465 ab	1.56 ab	2.97 bc
- 25% Urea + 75% goat manure)	0.056	0.442 a	1.53 a	2.90 ab
LSD 5%	ns	0.05	0.05	0.12
<b>Number of main branches:</b>				
- 1 main branch plant <sup>-1</sup>	0.056	0.488	1.49 a	2.74 a
- 2 main branches plant <sup>-1</sup>	0.057	0.493	1.59 b	2.88 b
- 3 main branches plant <sup>-1</sup>	0.057	0.501	1.64 c	3.16 c
LSD 5%	ns	Ns	0.05	0.11

Remarks: Numbers followed by different letter at each column are significantly different at P=0.05. ns=not significant

Arranging number of the main branches has significant effect on the growth rate. Table 4 shows that the fewer number of the main branches, the lower growth rate of the plant is. Eggplant that has 1 main branch, however, shows lower growth rate than the plant that has 3 main branches. Taking care of 1 main branch has reduced the formation of secondary and tertiary branches; therefore it will reduce the formation of leaf. The reducing numbers of leaves and leaf area have reduced the light interception by the plant. Such reduction has caused lower photosynthetic rate, so that the photosynthetic product has declined and reduce ability of the plant produce dry matters. The formation of lower dry matter has inhibited the growth rate of the plant. Wartapa *et al.* (2009) stated that fewer number of leaf, however, will reduce the resulted assimilates.

Diverse combinations of N sources has resulted higher net assimilation rate in comparison with the application of 100% Urea. Table 5 shows that diverse treatments of fertilization have insignificant effect on net assimilation rate started from 14 to 42 DAP. It shows that the ability per leaf area, in producing dry weight, has insignificant difference among the fertilizer application treatments. At 42 to 56 DAP, the eggplant that has been applied by diverse combinations of N sources produces higher net assimilation rate than the plant, which has just been given by 100% Urea. At 42 DAP, most of the nutrients contained in the stable manure (goat manure) have been loosen so that they can be utilized by the plant, as well as through organic decomposition process, which lead to the improvement of physical, chemical, and biological features of the soil. According to Gulshan *et al.* (2013), the application of stable manure has not only provided nutrients, but also improving the physical, chemical, and biological features of the soil, so that it could increase efficient absorption of the nutrients. Improvement on the soil features and the available nutrients have produced higher net assimilation rate for the eggplant, which has been applied by diverse combination of N source, in comparison with the application of 100% Urea.

Taking care of the main branches has significant effect on net assimilation rate of the plant. Table 5 shows that at the beginning, at 28

to 42 DAP, the arrangement of 3 main branches has higher net assimilation rate than 1 and 2 main branches, but at 42 to 56 DAP, it shows insignificant difference with 2 main branches arrangement. This is due to at the early growth, the leaf area index ranges 1.49 to 1.64, so that the leaves have not covered completely one another and each leaf could capture the light for photosynthetic process. Along with the time passing by, at 42 to 56 DAP, the eggplant with 3 main branches has resulted indifferent net assimilation rate with the 2 main branches. However, even the maintenance of 2 main branches has lower leaf area and leaf area index, but due to the leaves position that are not sheltered one another as on 3 main branches, the net assimilation rate between both of them is indifferent. Wartapa *et al.* (2009) stated that the overlapping position of leaves has inhibited light penetration and the photosynthetic process, so that the formation of assimilate would not be maximum.

#### **Yield of Eggplant**

The application of 75% Urea and 25% stable manure has produced the highest yield of eggplants. It shows that the combination has the highest synchronization in comparison with other combinations. Proportion of 75% Urea has fulfilled the demand of N since early growth; therefore, the highest yield of eggplant can be achieved. Eggplant is highly responsive to N fertilizer, and deficient N will inhibit the growth and result low production. The reduced proportion of 25% Urea and replacing it with stable manure could increase efficiency of N absorption because it could reduce the risk of N loss. During the initial growth, the plant has gained sufficient N from Urea due to N has not been available from the stable manure, but when N has been available in stable manure, the eggplant could utilize N from Urea and stable manure. The improvement of soil features as a result of the stable manure application has also increased the efficient N absorption by the plant. This result conforms to the research by Ullah *et al.* (2008) that the reduced dosage of inorganic fertilizer and replaced with the organic fertilizer by the same dosage, has resulted higher weight per hectare in comparison with the application of 100% Urea.

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Table 4. Crops growth rate of eggplant ( $\text{g m}^{-2} \text{d}^{-1}$ ) on treatment of N-source and number of main branches

Treatments	Crops growth rate ( $\text{g m}^{-2} \text{d}^{-1}$ )		
	14-28 DAP	28-42 DAP	42-56 DAP
<b>N-source (138 kg N ha<sup>-1</sup>):</b>			
- 100 % Urea	3.33 bc	12.81 ab	35.23 a
- 75 % Urea + 25 % goat manure	3.58 c	13.43 b	41.44 c
- 50 % Urea + 50 % goat manure	3.12 b	12.66 a	38.85 bc
- 25% Urea + 75% goat manure)	2.80 a	12.15 a	38.65 b
LSD 5%	0.26	0.74	2.65
<b>Number of main branches:</b>			
- 1 main branch plant <sup>-1</sup>	3.13	10.78 a	34.35 a
- 2 main branches plant <sup>-1</sup>	3.20	12.84 b	38.35 b
- 3 main branches plant <sup>-1</sup>	3.28	14.67 c	42.93 c
LSD 5%	Ns	0.64	2.29

Remarks: Numbers followed by different letter at each column are significantly different at  $P=0.05$ . ns=not significant

The eggplant, which has been applied by 100% Urea, has resulted lower weight per plant and per hectare. Fertilization using 100% Urea has resulted low efficient N absorption. This is due to N in Urea is fast release and immediately available for the plant, so that it is easily removed through washing, evaporation, and nitrification before it could be utilized by the plant. Deficient N during the generative phase will inhibit the formation and enlargement of the eggplant, and it will lead to low production. According to Gardner *et al.* (1991), investment of the assimilation result in the plant growth during the vegetative period will determine productivity in the next development level.

Higher formation and enlargement of eggplant was found by the application of 75% Urea and 25% stable manure. Table 6 shows reduced Urea into 50% and replace it with stable manure by the same dosage ( $K_1$  and  $K_2$ ) have resulted higher number of eggplant per plant, while the reduced 25% Urea has resulted the highest weight. Higher numbers of eggplant as well as the weight were found by the application of those treatments, because the eggplants have obtained sufficient N, so that the plant can grow well. Better growth of the plant has produced high photosynthate, in which a part of the photosynthate products has been used for formation and enlargement of the eggplant.

According to Ridho and Yuliana (2007), the amount of the formed photosynthates will increase the weight and number of the eggplant.

Taking care of 2 and 3 main branches has resulted higher weight of the eggplant. One of the objectives is synchronizing between sources and sink. According to Raden *et al.* (2009) controlling number of the main branch could increase number of the productive branch, in which more productive branches will increase number of the eggplants. By arranging number of the main branch, the photosynthetic product can be directed to produce more in order to form the eggplant. Reducing the main branches could increase the intercepted light to the leaves, which will increase the photosynthetic rate. The eggplant that has 2 main branches has resulted indifferent weight per plant and per hectare as the plant that has 3 main branches, 47.91 and 58.85  $\text{t ha}^{-1}$ , respectively. However, even the maintenance of 3 main branches has resulted more eggplants, but the weight of eggplant per plant that maintains 2 branches has the highest weight per eggplant. Higher weight per eggplant causes the weight of eggplant per plant and per hectare has indifferent result with the weight of eggplant per plant and per hectare that is indifferent with the eggplant, which has 3 main branches.

Table 5. Net assimilation rate of eggplant on treatment of N-source and number of main branches

Treatments	Net assimilation rate (g m <sup>-2</sup> d <sup>-1</sup> )		
	14-28 DAP	28-42 DAP	42-56 DAP
<b>N-source (138 kg N ha<sup>-1</sup>):</b>			
- 100 % Urea	16.26	13.55	16.46 a
- 75 % Urea + 25 % goat manure	16.32	13.41	18.37 b
- 50 % Urea + 50 % goat manure	16.18	13.95	17.73 b
- 25% Urea + 75% goat manure)	15.06	13.83	17.97 b
LSD 5%	Ns	ns	1.12
<b>Number of main branches:</b>			
- 1 main branch plant <sup>-1</sup>	15.76	12.02 a	16.71 a
- 2 main branches plant <sup>-1</sup>	15.92	13.73 b	17.64 ab
- 3 main branches plant <sup>-1</sup>	16.18	15.30 c	18.54 b
LSD 5%	ns	0.97	0.97

Remarks: Numbers followed by different letter at each column are significantly different at P=0.05. ns=not significant

Table 6. Fruit number and fruit weight of eggplant on treatment of N-source and number of main branches

Treatments	Fruit number plant <sup>-1</sup>	Fruit weight		
		g fruit <sup>-1</sup>	kg plant <sup>-1</sup>	t ha <sup>-1</sup>
<b>N-source (138 kg N ha<sup>-1</sup>):</b>				
- 100 % Urea	7.95 a	258.97 a	2.04 a	35.61 a
- 75 % Urea + 25 % goat manure	9.13 c	299.11 c	2.73 c	49.20 c
- 50 % Urea + 50 % goat manure	8.83 bc	279.73 b	2.43 b	44.76 b
- 25% Urea + 75% goat manure)	8.33 ab	278.79 b	2.30 b	43.16 b
LSD 5%	0.71	225.67	0.22	4.12
<b>Number of main branches:</b>				
- 1 main branch plant <sup>-1</sup>	6.23 a	273.48 a	1.70 a	30.79 a
- 2 main branches plant <sup>-1</sup>	8.57 b	306.22 b	2.63 b	47.91 b
- 3 main branches plant <sup>-1</sup>	10.87 c	257.76 a	2.80 b	50.85 b
LSD 5%	0.62	195.43	0.19	3.57

Remarks: Numbers followed by different letter at each column are significantly different at P=0.05.

## CONCLUSION AND SUGGESTION

### CONCLUSION

Combination of 75% Urea and 25% stable manure has resulted higher growth in comparison with combination of other fertilizers and 100% Urea. Taking care of 3 main branches resulted better growth in comparison with 1 and 2 main branches.

Combination of 75% Urea and 25% stable manure (goat manure) resulted the highest weight of eggplant per plant and per hectare, 49.20 t ha<sup>-1</sup>, while the lowest has been resulted

from the application of 100% Urea, 35.61 t ha<sup>-1</sup>. Taking care of 2 and 3 main branches resulted higher weight of eggplant, 47.91 t ha<sup>-1</sup> and 50.85 t ha<sup>-1</sup>, respectively.

### SUGGESTION

Whereas the reduction of 25% Urea and replace it with stable manure (goat manure), as well as taking care of 2 and 3 main branches that produce the highest yield of eggplant per hectare, therefore the application of 75% Urea and 25% stable manure, as well as the



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maintenance of 2 and 3 main branches have been done to increase the production.

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