

SUMMARY

Fiolita Prameswari Putri. 0810483034. THE INFLUENCE OF FERTILIZER N, P, K, AZOLLA (*Azolla pinnata*) AND PISTIA (*Pistia stratiotes*) ON THE GROWTH AND YIELD OF RICE (*Oryza sativa*). Prof. Dr. Ir. Husni Thamrin Sebayang, MS. as a main supervisor and Dr. Ir. Titin Sumarni, MS. as supervising companion.

Paddy (*Oryza sativa*), include in food commodities that produce rice and urgently needed in Indonesia as the main food. Rice productivity can reach 6-7 tons ha⁻¹ but production is only 4,9 ton ha⁻¹ (BPS, 2011). The cause that rice production is not optimal is unbalanced fertilization between inorganic fertilizer and organic fertilizer. Low organic matter content causes plants are less efficient in the use of inorganic fertilizers, causing lower crop production. The decline in soil organic matter content from season to season can not be replaced by inorganic fertilizer application. To improve soil conditions that have been damaged can be done by providing organic fertilizer that is giving a green manure. Azolla (*Azolla pinnata*) and pistia (*Pistia stratiotes*) can be used as green manure because it contains organic material and elements of N, P, K that is high enough. Applications azolla and pistia as green manure is expected to increase the soil organic matter which in turn will impact on increasing rice yield. The objectives of research are: 1) To study influence of green manure azolla (*Azolla pinnata*) and pistia (*Pistia stratiotes*) on the growth and yield of paddy (*Oryza sativa*). 2) To study the influence of green manure azolla (*Azolla pinnata*) and pistia (*Pistia stratiotes*) to reduce inorganic fertilizer. The proposed hypothesis are: 1) Addition of green manure treatment azolla (*Azolla pinnata*) and pistia (*Pistia stratiotes*) can increase crop growth and yield in rice (*Oryza sativa*) compared to treatment without giving a green manure. 2) Addition of green manure azolla (*Azolla pinnata*) and pistia (*Pistia stratiotes*) can reduce inorganic fertilizer in paddy (*Oryza sativa*).

The research was conducted in April 2012 to July 2012 in the village of Jatikerto, Kromengan District, Malang. The experiment was conducted using a randomized block design (RAK) non factorial with 3 replications, consists of: P1=100% inorganic fertilizer (urea 250 kg ha⁻¹, SP₃₆ 150 kg ha⁻¹, KCl 100 kg ha⁻¹). P2=100% inorganic fertilizer, azolla 0,5 tons ha⁻¹, pistia 0,5 tons ha⁻¹. P3=100% inorganic fertilizer, azolla 1 ton ha⁻¹, pistia 1 ton ha⁻¹. P4=100% inorganic fertilizer, azolla 1,5 tons ha⁻¹, pistia 1,5 tons ha⁻¹. P5=75% inorganic fertilizers (urea 187,5 kg ha⁻¹, SP₃₆ 112,5 kg ha⁻¹, KCl 75 kg ha⁻¹), azolla 0,5 tons ha⁻¹, pistia 0,5 tons ha⁻¹. P6=75% inorganic fertilizers, azolla 1 ton ha⁻¹, pistia 1 ton ha⁻¹. P7=75% inorganic fertilizers, azolla 1,5 tons ha⁻¹, pistia 1,5 tons ha⁻¹. P8=50% inorganic fertilizers (urea 125 kg ha⁻¹, SP₃₆ 75 kg ha⁻¹, KCl 50 kg ha⁻¹), azolla 0,5 tons ha⁻¹, pistia 0,5 tons ha⁻¹. P9=inorganic fertilizers 50%, azolla 1 ton ha⁻¹, pistia 1 ton ha⁻¹. P10=50% inorganic fertilizers, azolla 1,5 tons ha⁻¹, pistia 1,5 tons ha⁻¹. Preparation of experiment plot was made with the experimental plot size of 2,5 m x 3 m by 30 plots. Observations were made in non-destructive and destructive by taking two samples of plants for each treatment were carried out at the plant was 15, 30, 45, 60, 75, 90 day after planting (dap) and harvest. The observations made include the observation of growth and observation results. Observation on the component of growth

(plant length, number of seedlings, leaf area, total plant dry weight). Observations included yield components (number panicles per clump, number grains per clump, presentations grain content per clump (%), 1000 seeds weight, grain yield per hectare). Analysis of plant growth (leaf area index/ LAI, crop grow rate/ CGR). Observational data obtained were analyzed by using a variety of analysis (F test) at the level of 5%. To find the difference of treatment carried out testing with the Duncan's Multiple Range Test (DMRT) at the level of 5%.

The results showed that each treatment gave significant different on observation of plant height, number of seedlings, leaf area, total dry weight, LAI, CGR and yield components. Conclusions from the research are: 1) Treatment of 100% inorganic fertilizer (urea 250 kg ha⁻¹, SP₃₆ 150 kg ha⁻¹, KCl 100 kg ha⁻¹), azolla 1,5 tons ha⁻¹, pistia 1,5 ton ha⁻¹ gave a yield of 6,70 tons ha⁻¹ were not significantly different from treatment 100% inorganic fertilizer which gives a yield of 6,37 tons ha⁻¹. 2) Treatment of 75% inorganic fertilizer (urea 187,5 kg ha⁻¹, SP₃₆ 112,5 kg ha⁻¹, KCl 75 kg ha⁻¹), azolla 1,5 tons ha⁻¹, pistia 1,5 tons ha⁻¹ gave a yield of 6,33 tons ha⁻¹ and treatment of 75% inorganic fertilizer, azolla 1 ton ha⁻¹, pistia 1 ton ha⁻¹ gave a yield of 6,23 tons ha⁻¹. The two treatments were not significantly different from treatment of 100% inorganic fertilizer which gives a yield of 6,37 tons ha⁻¹ so that treatment of 75% of inorganic fertilizer, azolla 1,5 tons ha⁻¹, pistia 1,5 tons ha⁻¹ and fertilizer 75% inorganic, azolla 1 ton ha⁻¹, pistia 1 ton ha⁻¹ can reduce the adding for inorganic fertilizers. Suggestion based on the results is treatment of 100% inorganic fertilizer (urea 250 kg ha⁻¹, SP₃₆ 150 kg ha⁻¹, KCl 100 kg ha⁻¹) can be reduced by 75% inorganic fertilizer (urea 187,5 kg ha⁻¹, SP₃₆ 112,5 kg ha⁻¹, KCl 75 kg ha⁻¹), azolla 1,5 tons ha⁻¹, pistia 1,5 tons ha⁻¹ or 75% inorganic fertilizer, azolla 1 ton ha⁻¹, pistia 1 ton ha⁻¹. Needs to be done on the addition of azolla dan pistia as green manure to maintain and improve the organic matter content in the soil, which in turn can increase rice yield.

