

SUMMARY

ABDULLAH MUJAHID. 0810483001. The Test of Nanotechnology Fertilizer on Red Spinach (*Alternanthera amoena* Voss.) Cultivation. Supervised by Dr.Ir. Nurul Aini, MS. and Prof.Dr.Ir. Sudiarso, MS.

There was two basic reasons of this study being conducted. First is the sensitivity to the development of nanoscience and nanotechnology that grow quite rapid in almost all developing countries, but not in Indonesia. Nanotechnology is expected to improve the efficiency of fertilizers and water used in agricultural production system. The use of nano-sized fertilizer (10^{-9} μm) has several advantages such as more reactive, directly reach the target because of its size, and only needed in small amounts. So that the input in a agricultural production systems can be reduced, but food production can be increased much better. Second is the potential development of vegetable crops especially red spinach, which has the advantage of its nutritional and economic value other than any types of spinach. The last data from Indonesia Central Bureau of Statistics (2015) showed that up to 2014, Indonesian spinach production dropped about 43,000 tons since 2009. Based on that fact, the purpose of this research are: (1) To determine the effect of nano-tech fertilizer application on the growth and yield of red spinach cultivation, and (2) To determine the most efficient concentration of nano-tech fertilizer in affecting the growth and crop yields of red spinach. This research was conducted at the Green House belongs to Green World Farm, Cemorokandang, Kedungkandang sub-district, Malang. The results analysis was conducted in the Laboratory of Plant Physiology and Environmental Resources Laboratory, Faculty of Agriculture, University of Brawijaya.

The study began in September to November 2013. This study used a completely randomized design (CRD) with 7 treatments and 4 replications so that there are 28 units of the experiment. Each experimental unit with 15 polybag each consisting of 1 plant, so there are 420 plants used as samples in this study. As for the treatment of concentrations used in this study are; M0: Without the application of fertilizers, M1: 1 mLpupuk/Lair, M2: 5 mLpupuk/Lair, M3: 10 mLpupuk/Lair, M4: 15 mLpupuk/Lair, M5: 20 mLpupuk/Lair, and M6: 25 mLpupuk/Lair. Bravo Nature nano fertilizer application in the experiments carried out on two phases, in the development stages (11 DAP) and in the middle phase (21 DAP). For each treatment, the stock solution made by mixing Bravo Nature nano fertilizer with 5 liters of water. Application of fertilizers in all phases carried out by spraying to the leaves of red spinach. As for the observation variable is the growth and crop yield of red spinach with destructive and non-destructive ways, performed every 5 days at 15 DAP, 20 DAP, 25 DAP and 30 DAP. Non-destructive observation includes observations of plant growth variables such as plant height and red spinach total leaves. Destructive observation in this study include; Leaf Area Index (LAI), Relative Growth Rate (RGR), Net Assimilation Rate (NAR), Leaf Area Ratio (LAR), Red Spinach Fresh Weights and Dry Weights, the analysis of the nitrogen (N) content on red spinach leaves and economic calculations. The data were analyzed using GENSTAT ver.16 application. If there is significant

effect on treatment, then the analysis continued using a Least Significant Difference (LSD) test at 5% tolerance to detect a difference between treatments.

Based on result data taken from this research, it can be conclude twi things, first is that the application of nanotechnology fertilizers give a significant difference effect on some growth variables including plant height, total leaves, leaf area index, dry weight, relative growth rate (RGR), leaf area ratio (LAR) and nitrogen (N) content on red spinach leaves. But do not have a significant impact on red spinach fresh weight and the net assimilaition rate (NAR). And the second conclusion is based on the results presented in contingency table, it was concluded that the most efficient concentration of Bravo Nature's nanotechnology fertilizer in affecting the growth and crop yield of red spinach was treatment M3 with a concentration of 10 ml/L in terms of harvesting process should be done at 25 DAP. If the time exceeds, the yield product would be difficult to be absorbed by the market.

