RINGKASAN

Padi merupakan tanaman penghasil bahan makanan pokok sebagian besar masyarakat di Indonesia, yaitu beras. Peningkatan produktivitas padi dapat dilakukan salah satunya dengan cara pemupukan. Pupuk nitrogen dalam bentuk urea sudah menjadi kebutuhan pokok bagi petani padi karena dianggap meningkatkan produktivitas sehingga pemborosan dalam pemakaian urea di petani tidak dapat dihindari. Penggunaan pupuk urea secara berlebihan akan menimbulkan berbagai masalah seperti memberikan dampak lingkungan yang negatif. Upaya tersebut dapat diperbaiki dengan pemberian pupuk NPK *SR* yang dirakit dengan berbagai diameter zeolit alam yang mempunyai efesiensi N yang tinggi sekaligus berupa kompos dengan harapan menunjukkan respon pada pertumbuhan padi sawah serta sifat kimia tanah dan air. Selaras dengan hal tersebut, penelitian ini bertujuan untuk mengetahui pengaruh pemberian pupuk NPK *SR* dengan variasi diameter zeolit dan takaran kompos terhadap pertumbuhan tanaman padi sawah serta sifat kimia air dan tanah.

Penelitian telah dilaksanakan di Laboratorium Tanah dan Sumber Daya Lahan, Laboratorium Agronomi dan Hortikultura, dan kebun percobaan *screen house* A5 Fakulas Pertanian Universitas Jenderal Soedirman, Purwokerto. Penelitian ini berlangsung selama 5 bulan. Penelitian ini dilakukan dengan rancangan acak kelompok lengkap (RAKL) yang terdiri dari dua faktor dengan tiga ulangan. Faktor pertama adalah pemberian pupuk NPK *SR* dengan variasi diameter zeolit yang terdiri atas enam jenis, yaitu: P0 (tanpa pemberian pupuk NPK *SR* dan zeolit), P1 (pupuk NPK *SR* diameter zeolit 30 mesh), P2 (pupuk NPK *SR* diameter zeolit 35 mesh), P3 (pupuk NPK *SR* diameter zeolit 60 mesh), P4 (pupuk NPK *SR* diameter zeolit 100 mesh) dan P5 (pupuk NPK *SR* diameter zeolit 140 mesh). Faktor kedua adalah perlakuan takaran kompos yang terdiri atas tiga taraf, yaitu: K0 (kompos setara 0 t/ha), K1 (kompos setara 20 t/ha), dan K2 (kompos setara 40 t/ha). Variabel pengamatan penelitian ini meliputi: tinggi tanaman, jumlah anakan, bobot akar segar, bobot tajuk segar, bobot tanaman segar, bobot akar kering, bobot tajuk kering, bobot tanaman kering, pH H_2O tanah, pH KCl, DHL tanah, pH H_2O air, DHL air, dan TDS.

Hasil penelitian ini menunjukkan bahwa: pemberian pupuk NPK *SR* dengan variasi diameter zeolit dapat meningkatkan pertumbuhan tanaman padi sawah dan berpengaruh terhadap pH H_2O tanah. Takaran kompos dapat meningkatkan semua variabel pertumbuhan tanaman dan sifat kimia tanah tetapi tidak memberikan pengaruh terhadap sifat kimia air kecuali pH H_2O air. Interaksi antara pemberian pupuk NPK *SR* dengan variasi diameter zeolit dan takaran kompos tidak berpengaruh terhadap semua variabel pengamatan kecuali jumlah anakan. Jumlah anakan tertinggi diperoleh melalui pemberian kompos dosis 20 t/ha dan pupuk NPK *SR* dengan zeolit berdiameter 30 mesh; sedangkan pada pemberian kompos dosis 40 t/ha, jumlah anakan tertinggi diperoleh melalui pemberian pupuk NPK *SR* dengan zeolit berdiameter 35 mesh.

SUMMARY

Rice is a staple food crop for most people in Indonesia. One of the ways to increase rice productivity is by fertilization. Nitrogen fertilizer in the form of urea has become a basic need for rice farmers because it is considered to increase productivity so that waste in the use of urea in farmers cannot be avoided. Excessive use of urea fertilizer will cause various problems such as giving a negative environmental impact. This effort can be improved by giving NPK SR fertilizer which is assembled with various diameters of natural zeolite which has high N efficiency as well as compost in the hope of showing a response to the growth of lowland rice as well as the chemical properties of soil and water. In line with this, this study aims to determine the effect of application of NPK SR fertilizer with variations in zeolite diameter and compost dosage on the growth of lowland rice plants as well as the chemical properties of water and soil.

The research has been carried out at the Laboratory of Soil and Land Resources, Laboratory of Agronomy and Horticulture, and the experimental garden of screen house A5, Faculty of Agriculture, Jenderal Soedirman University, Purwokerto. This research lasted for 5 months. This study was conducted with randomized completely block design (RCBD) consisting of two factors with three replications. The first factor was the application of NPK SR fertilizer with variations in the diameter of zeolite which consisted of six types, namely: P0 (without NPK SR fertilizer and zeolite), P1 (NPK SR fertilizer zeolite 30 mesh diameter), P2 (NPK SR fertilizer zeolite 35 mesh diameter), P3 (NPK SR fertilizer zeolite 60 mesh diameter), P4 (NPK SR fertilizer zeolite 100 mesh diameter), and P5 (NPK SR fertilizer zeolite 140 mesh diameter). The second factor is the compost dose treatment which consists of three levels, namely: K0 (compost equivalent to 0 t/ha), K1 (compost equivalent to 20 t/ha), and K2 (compost equivalent to 40 t/ha). The variables observed in this study included: plant height, number of tillers, fresh root weight, fresh crown weight, fresh plant weight, dry root weight, dry crown weight, dry plant weight, soil pH H_2O, pH KCl, soil electrical conductivity, water pH H_2O, water electrical conductivity and total dissolved solid.

The results of this study indicate that: the application of NPK SR fertilizer with zeolite diameter variations could increase the growth of lowland rice plants and affect the soil pH H_2O. Doses of compost can increase all variables of plant growth and chemical properties of the soil but has no effect on the chemical properties of water except pH H_2O of water. The interaction between the application of NPK SR fertilizer with variations in zeolite diameter and compost doses did not affect all observed variables except the number of tillers. The highest number of tillers was obtained by giving compost at a dose of 20 t/ha and NPK SR fertilizer with 30 mesh diameter zeolite; while at a dose of 40 t/ha compost, the highest number of tillers was obtained through the application of NPK SR fertilizer with 35 mesh diameter zeolite.