RINGKASAN

Biochar merupakan senyawa organik berkarbon tinggi hasil proses *pyrolisis* yang resisten terhadap pelapukan sehingga mampu berfungsi sebagai amelioran organik yang efektif untuk memperbaiki kesuburan tanah. Fosfor (P) mempunyai peranan sangat penting bagi tanaman jagung dalam proses respirasi, pemindahan dan penggunaan energi, pembelahan sel, pertumbuhan jaringan meristem, serta pembentukan bagian-bagian generatif seperti bunga dan buah. Penggunaan biochar limbah tongkol jagung dan pupuk P di tanah ultisol merupakan salah satu upaya dalam memperbaiki tanah masam yang ada di Indonesia.

Penelitian ini dilaksanakan pada bulan Februari sampai Oktober 2021 di *screenhouse* Balai Benih Tanaman Pangan Bojongsari, Laboratorium Ilmu Tanah, Laboratorium Agonomi dan Hortikultura dan Laboratorium Agroekologi Fakultas Pertanian Universitas Jenderal Soedirman. Rancangan percobaan yang digunakan yaitu Rancangan Acak Kelompok Lengkap (RAKL) faktorial dengan 2 faktor. Faktor pertama adalah biochar limbah tongkol jagung, yaitu B0= 0 ton/ha, B1= 5 ton/ha, dan B2= 10 ton/ha. Faktor kedua adalah dosis pupuk P, yaitu P1= 100kg/ha, P2= 200 kg/ha, P3= 300 kg/ha. Masing-masing faktor dikombinasikan dan didapat 9 kombinasi perlakuan. Perlakuan diulang sebanyak 3 kali sehingga diperoleh 27 satuan percobaan. Variabel yang diamati yaitu tinggi tanaman, jumlah daun, diameter batang, klorofil daun, bobot segar tanaman, bobot kering tanaman, panjang tongkol, bobot tongkol, diameter tongkol, jumlah baris per tongkol, jumlah biji per tongkol, P total, dan P tersedia. Data yang diperoleh dari hasil penelitian dianalisis menggunakan sidik ragam pada taraf kepercayaan 95%. Jika berpengaruh nyata dilanjutkan dengan uji *Duncan's Multiple Range Test* (DMRT) taraf kepercayaan 95%.

Hasil penelitian menunjukkan bahwa pengaplikasian biochar limbah tongkol jagung 10 ton/ha memberikan hasil terbaik pada variabel jumlah daun, bobot tanaman segar, P total dan P tersedia. Sedangkan untuk aplikasi biochar limbah tongkol jagung sebesar 5 ton/ha memberikan hasil terbaik pada variabel diameter batang. Aplikasi dosis pupuk P 300 kg/ha memberikan hasil terbaik pada variabel tinggi tanaman, jumlah daun, diameter batang, bobot tanaman segar, P total dan P tersedia.

Kata kunci: biochar limbah tongkol jagung, SP 36, ultisol, jagung, pertumbuhan, hasil

SUMMARY

Biochar is a high carbon organic compound resulting from the pyrolysis process that is resistant to weathering so that it can function as an effective organic ameliorant to improve soil fertility. Phosphorus (P) has a very important role for corn plants in the process of respiration, transfer and use of energy, cell division, meristem tissue growth, and the formation of generative parts such as flowers and fruit. The use of biochar elements in corncob waste and phosphate in ultisol soils has an effort to improve acid soils in Indonesia.

This research was carried out from February to October 2021 at the screenhouse of the Center for Food Crops and Horticulture (BBTPH) Rice and Palawija Seed Gardens, Bojongsari Village, Soil Science Laboratory, Horticulture and Agonomy Laboratory and Agroecology Laboratory, Faculty of Agriculture, Jenderal Soedirman University. The experimental design used was a factorial Completely Randomized Block Design (RAKL) with 2 factors. The first factor is corncob waste biochar, namely B0 = 0 ton/ha, B1= 5 ton/ha, and B2= 10 ton/ha. The second factor is the dose of P fertilizer, namely P1 = 100 kg/ha, P2 = 200 kg/ha, P3 = 300 kg/ha. Each factor was combined and obtained 9 treatment combinations. The treatment was repeated 3 times to obtain 27 experimental units. The variables observed were plant height, number of leaves, stem diameter, leaf chlorophyll, plant fresh weight, dry weight of plant, length of ear, weight of ear, diameter of ear, number of rows per ear, number of seeds per ear, total P, and available P. The data obtained from the research results were analyzed using variance at the 95% confidence level. If it has a significant effect, it is continued with Duncan's Multiple Range Test (DMRT) with a 95% confidence level.

The results showed that the application of corncob waste biochar 10 tons/ha gave the best results on the number of leaves, fresh plant weight, total P and available P variables. Meanwhile, the application of corncob waste biochar at 5 tons/ha gave the best results on the variable stem diameter. Application of fertilizer P 300 kg/ha gave the best results on the variables of plant height, number of leaves, stem diameter, fresh plant weight, total P and available P.

Keywords: corncob waste biochar, SP 36, ultisol, corn, growth, yield