INTISARI

Gambut merupakan salah satu pilihan dalam pengembangan dan peningkatan budidaya pertanian di Indonesia dewasa ini. Pengelolaan gambut tidak mudah karena mengandung persoalan yang rumit baik fisika, kimia, biologi, dan hidrologi. Kendala sifat fisika antara lain pengeringan yang berlebihan mengakibatkan terjadinya kekeringan yang tidak dapat balik (*irreversible drying)*, pembasahan yang berlebihan mengakibatkan terbentuknya asam asam organic. Selanjutnya adalah rendahnya berat volume (0,1 – 0,2 g cm^{-3}) yang menyebabkan daya tumpu tanah rendah sehingga mudah mengalami subsiden. Secara kimiawi, tanah gambut umumnya bereaksi masam (pH 3,0-4,5). Kandungan basa (Ca, Mg, K dan Na) dan kejenuhan basa rendah. Kandungan N total termasuk tinggi, namun umumnya tidak tersedia bagi tanaman karena rasio C/N tinggi. Kandungan unsur mikro, khususnya Cu, Bo dan Zn, sangat rendah, namun kandungan besi (Fe) cukup tinggi .

Penelitian ini terdiri dari 5 tahapan, yaitu : (1). Penentuan Metode Preparasi sebelum Analisa Kimia tanah gambut, yaitu dengan metode Kering Angin Gojok (KAG), metode Asli Lindi (AL) dan metode Asli Gojok (AG) menggunakan Centrifuge dengan 800 rpm selama 10 menit (2). Persiapan Pembuatan Biochar dan Karakteristiknya. Biochar yang digunakan adalah Biochar dari sekam padi, batok, tankos dan gambut Bengkalis yang dipirolisis selama 3, 4 dan 5 jam dengan suhu pirolisis 350^{o}C. (3). Percobaan Pengaruh Pemberian Biochar Terpilih (4 macam) dengan dosis yang berbeda untuk Meningkatkan Daya Simpan Hara Tanah Gambut terhadap pelindian N, P dan K, (4). Percobaan Rumah Kaca : Percobaan Pengaruh Pemberian Biochar Terpilih (4 macam) dan Pupuk NPK dengan dosis biochar yang berbeda terhadap Hasil jagung di tanah Gambut, Pontianak, (5). Pengaruh Pemberian Biochar, Kapur dan Pupuk NPK Terhadap hasil jagung di lahan gambut**.**

Dari hasil percobaan didapat hasil bahwa (1). Metode preparasi Asli Lindi (AL), baik untuk preparasi tanah gambut sebelum melakukan analisa kimia tanah di Laboratorium dan hasil analisinya tetap dikonversi dengan faktor koreksi BV (x 0,1) sebagai interpretasi nilai Kering Mutlak, sehingga hasil analisis laboratorium, interpretasinya lebih mencerminkan kondisi di lapangan. (2). a). Biochar Batok (Tempurung Kelapa) dan Tankos (Tandan Sawit Kosong) memiliki gugus fungsional > Sekam (Sekam padi), karena keberadaan lignin yang tinggi. Biochar batok dan tankos dengan waktu pirolisis 3, 4, dan 5 jam dipilih untuk analisis sifat fisik dan kimia biochar. b). Biochar Batok dengan lama pirolisis 4 jam memiliki pori pori lebih kokoh, teratur, dan luas permukaan pori < biochar Batok yang dipirolisis 5 jam, dan Tankos yang dipirolisis 3 jam dan 4 jam. Karakterisasi kimia biochar Batok yang dipirolisis 4 jam memberikan hasil tertinggi terhadap pH H_2O, Mg, K, Na, Ca dan KPK dibanding biochar lainnya. (3). a). biochar Batok yang dipirolisis 4 jam dengan dosis 12 t ha^{-1}, pada tanah gambut dapat meningkatkan Mg, K tersedia dan Kejenuhan Basa dan memberikan nilai tertinggi terhadap pH H_2O, N total, Ca tersedia. b). Biochar Batok yang dipirolisis 4 jam dengan dosis 12 t ha^{-1}, memberikan konsentrasi N,P,K dan DHL paling kecil pada air lindian, diikuti Batok yang dipirolisis 5 jam, Tangkos yang dipirolisis 3 jam dan 4 jam. c). Tanpa biochar, unsur hara banyak terdapat pada air lindian. (4) Perlakuan Batok yang dipirolisis 4 jam dengan dosis 12 t ha^{-1}, memberikan nilai tertinggi terhadap pH H_2O, DHL, Ca, Mg, K, Na dan KPK pasca inkubasi selama 2 minggu, demikian pula terhadap serapan NPK dan hasil jagung. (5). Pemberian biochar Batok yang dipirolisis 4 jam, dolomite hingga 50%, dan pupuk NPK hingga 75%, dapat meningkatkan

C organik, K tersedia, serapan N, P, K tanaman, dan tinggi tanaman, serta hasil jagung pada lahan gambut.

Dari percobaan yang telah dilakukan dapat disimpulkan bahwa pemberian Biochar Batok yang dipirolisis selama 4 jam dengan dosis 12 t ha-1 dapat membantu meningkatkan daya sangga gambut Ombrogen terhadap kehilangan hara N,P dan K, selain itu dapat memberikan nilai tertinggi terhadap pH H_2O, DHL, Ca, Mg, K, Na dan KPK pasca inkubasi selama 2 minggu, demikian pula terhadap serapan NPK dan hasil jagung, pada percobaan Rumah Kaca. Pada Percobaan di lahan gambut, pemberian biochar Batok yang dipirolisis 4 jam, pemberian dolomit hingga 50% dari rekomendasi pengaouran tanaman jagung, dan pupuk NPK hingga 75% dari rekomendasi pemupukan tanaman jagung, dapat meningkatkan C organik, K tersedia, serapan N, P, K tanaman, dan tinggi tanaman, serta hasil jagung.

Kata Kunci : Asli Lindi, Biochar Batok, Daya Sangga, Dolomit, Gambut Ombrogen

ABSTRACT

Peatland is one of the options for agricultural development and improvement in Indonesia recently. Peatland management is not an easy task, contain constraints of the combination of physical, chemical, biological, and hydrological aspects. Physical constraints include: if excessive drying will resulting in irreversible drying, and excessive wetting resulting in the formation of soluble organic acids. The low volume weight (0.1 - 0.2 $g.cm^{-3}$) in declining water content may cause self -fractions arrangement and subsidized. Chemically, peat soils generally acid ranging pH 3.0 - 4.5. Basic cations such as Ca, Mg, K, and Na is low as well as low base saturation. The total N content is high but is not generally available for plants because of the high C/N ratio. The content of microelements, especially Cu, Bo, and Zn, is very low, but the iron content (Fe) varies from low to quite high.

So far, the peat soils analyses still follow the method for mineral soils and also expressed in dry weight based. The first stage has been done for an arrangement of peat samples preparation for laboratory analyses, a pathway of extractions, and later on how to express the results of peat as, plus analytical that can be adjusted to the field conditions. Created biochar and its application as amelioration agents for improvement of peat quality are also to be done in the next stage experiments in the glasshouse and in the field with corn as planting plant.

This research consists of 5 stages, namely: (1). Determination of preparation method before chemical analysis of peat soil, that is by the method of air dry method and shake (KAG), and field moisture condition and shake methods using centrifuge with 800 rpm for 10 minutes (AG), field moisture condition and leaching methods (AL). (2). Biochar construction and its characterization by FTIR. Row materials for biochar are rice husk, coconut shell, and empty palm bunches. Duration for pyrolysis is 3, 4 and 5 hours at 350^{o}C. (3). Lysimeter experiment: the effect of selected given biochar (4 types) with different doses to improve peat nutrient retention against leaching of N, P and K. (4). Greenhouse experiments: The growth and yield of corn in peat samples from Pontianak treated with four selected biochar with different doses have been used combined with NPK Fertilizer. (5).The field experiment to see the effect of giving Biochar, Dolomite and NPK Fertilizer to corn yield on peatlands of Pontianak.

From the experiment obtained results showed that (1). The original method of preparation of Lindi (AL), both for peat soil preparation before the soil chemical analysis in the laboratory and the results of its analysis is still converted by correction factor BV (x 0,1) as an interpretation of oven dry weight value, so the result of laboratory analysis, in the field. (2). a). Due to the presence of high lignin in biochar from coconut shell and empty palm bunch shows higher functional groups compare to biochar created from rice husk. Biochar shells and tanks with pyrolysis time of 3, 4, and 5 hours were selected for analysis of physical and chemical properties of biochar. b). Biochar Batok with 4 hours duration pyrolysis has a stronger pore, regular pores, and pore surface area of < biochar Batok which is in pyrolysis 5 hours, and Tanks is in pyrolysis 3 hours and 4 hours. Chemical characterization of biochar Batok with the 4-hour pyrolysis gave the highest results of pH of H_2O, Mg, K, Na, Ca and CEC compared to other biochar. (3). a). Biochar Batok with the 4-hour pyrolysis with 12 t ha-1 rate can increase Ca, Mg, K availability and base saturation as well as providing the highest value of pH H_2O, N total. b). Biochar Batok in pyrolysis 4 hours with a dose of 12 t ha^{-1}, giving the smallest concentration of N, P, K and EC in leached water, followed by 5 hours in pyrolysis of Batok, Tanks in pyrolysis 3 hours and 4 hours. c). Without biochar, many nutrients are

present in leached water. (4) Treatment of Batok 4 hour pyrolysis in doses of 12 t ha-1 gives the highest value of pH H_2O, EC, Ca, Mg, K, Na and CEC after incubation for 2 weeks, as well as to NPK absorption and corn yield . (5). Giving Biochar Batok 4 hour pyrolysis, dolomite up to 50% from recommendation, and fertilizer up to 75% from recommendation, can increase organic C, K available, N, P, K plant uptake and plant height, and maize yield on peatlands.

The experiments it can be concluded that the biochar created from Batok with duration of 4 hours pyrolysis and given rate of 12 t ha^{-1} able to increase Ombrogen's peat retention against N, P and K losses, and in addition to providing the highest value of pH H_2O, EC, Ca, Mg, K, Na and CEC after incubation for 2 weeks, as well as for NPK absorption and corn yield, on Green House experiment. In experiments on peatland, 4 hour of biochar Batok, dolomite giving up to 50% of the recommendation of maize cultivation, and NPK fertilizer up to 75% of the recommendation of maize cultivation, can increase organic C, K available, N, P, K plant, and plant height, and corn yield.

Keywords: Natural Lindi method, Biochar Batok, Buffering Capacity, Dolomite, Ombrogen Peat