TESIS

UJI KUALITAS BIOCHAR DAN *COMPOST TEA* TUMBUHAN LOTUS SERTA APLIKASINYA PADA BUDIDAYA BAYAM HIJAU (*Amaranthus* spp.) DI TANAH ASAL RAWA LEBAK

QUALITY EVALUATION OF BIOCHAR AND COMPOST TEA FROM LOTUS PLANTS AND ITS APPLICATION TO SPINACH (Amaranthus spp.) CULTIVATION ON LEBAK SWAMP SOIL

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PROGRAM STUDI ILMU TANAMAN
PROGRAM PASCASARJANA
FAKULTAS PERTANIAN
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2024

SUMMARY

TRI PUTRI NUR Quality Evaluation of Biochar and Compost Tea from Lotus Plants and Its Application to Spinach (*Amaranthus* Spp.) Cultivation on Lebak Swamp Soil. (Supervised by **NUNI GOFAR** and **SUSILAWATI**).

Lebak swamp is one of the potential areas for cultivating plants, but low soil fertility is one of the limiting factor in this area. Lotus, as a plant that is often found in the lowland swamp area, it has the potential to be developed into fertilizer, such as biochar and compost tea which can play a role in improving soil fertility and increasing the availability of nutrients in the soil. Spinach plants are popular among people because their high nutritional content and spinach can also be cultivated easily, however, spinach production in Indonesia has decreased in recent years due to efforts being made to increase green spinach production through fertilization. This research aims to analyze the quality and the best dosage of biochar and compost tea lotus which can reduce the use of NPK fertilizer, increase nutrient availability and the growth and production of green spinach cultivated on soil from lebak swamps. This research consists of two stages, the first is making and testing the quality of biochar and lotus compost tea, while the second stage of research is evaluating the dosage of biochar, lotus compost tea and its combination with NPK on soil chemical properties, growth and production of green spinach plants that planted on land of swampy origin. The production of lotus biochar and compost tea, as well as the cultivation of green spinach was carried out at Rumah Bayang Jl. Bukit Lama Polytechnic, Ilir Barat 1 District, Palembang, South Sumatra (3°00'15.4"S 104°43'44.5"E). The first stage of this research was carried out in August-September 2023, while the second stage was carried out in October 2023-March 2024. Lotus biochar was made using the drum method for 1-1.5 hours of burning at a temperature of 200°C. Testing the soaking composition in making lotus compost tea was designed using a Completely Randomized Design (CRD) with three treatment levels, namely soaking lotus compost and water at 1:5, 1:10, and 1:20 (w/v). Analysis of the pH and water content of lotus biochar was carried out in Soil Laboratory, Agriculture Faculty, Sriwijaya Univerity, SEM-EDS analysis of lotus biochar was carried out at the PT Cipta Mikro Material Laboratory. Biochar functional group analysis, humic concentration of lotus compost tea was carried out at the Integrated Chemistry Laboratory, UIN Raden Fatah, while analysis of the nutrient content of lotus compost tea was analyzed at the PT Bina Sawit Makmur Laboratory, Sampoerna Agro. The second stage of research was designed using a factorial randomized block design consisting of 3 factors. The first factor is the dose of lotus biochar: 0, 10, and 20tons ha^{-1}, the second factor is the dose of lotus compost tea: 0, 20, and 40mL $plant^{-1}$, and the third factor is the dose of NPK fertilizer: 0, 50, and 100%. Analysis of lowland swamp soil before planting was carried out at the Soil Department Laboratory, Faculty of Agriculture, Sriwijaya University, while analysis of soil after planting and plant tissue was carried out at BPSIP Bengkulu. The results of the research show that the lotus biochar produced has pH value and water content criteria that meet the criteria for biochar as a soil amendment and also meets the SNI 06-3730-1995 criteria regarding biochar requirements. The functional groups in lotus biochar consist of OH groups from carbonyl and phenol, C=C aromatic structures, C-H from lignin and holocellulose, and C-C functional groups from cellulose and hemicellulose. The results of SEM-EDS analysis of lotus biochar also showed that in various scanning and magnification results several elements were found in biochar such as C, O, Mg, Al, Si, P, Cl, K, Ca, Na, Fe, and S in atomic form. The porous structure of lotus biochar showed that the pores in lotus biochar look larger. The treatment of soaking lotus compost and water 1:5 (w/v) produces better quality and nutrient content for plants. This research also showed that treatment doses of biochar, lotus compost tea, NPK fertilizer, and their interactions had a significant effect on the chemical properties of the soil and the growth and production of green spinach plants. A dosage of 20tons ha^{-1} lotus biochar and 40mL $plant^{-1}$ lotus compost tea was able to make the use of NPK fertilizer more efficient by 50% in optimizing soil nutrient availability, growth, production and nutrient uptake of green spinach plants planted in lowland swamp soil. Therefore, the recommended dosage for cultivating green spinach planted in lowland swamps soil is a combination treatment of 20tons ha^{-1} lotus biochar + 40mL $plant^{-1}$ lotus compost tea + 50% recommended NPK.

Keywords: *biochar, compost tea, green spinach, lotus plant, swamp land*

RINGKASAN

TRI PUTRI NUR Uji Kualitas Biochar dan *Compost Tea* Tumbuhan Lotus serta Aplikasinya pada Budidaya Bayam Hijau (*Amaranthus* spp.) di Tanah asal Rawa Lebak. (Dibimbing oleh **NUNI GOFAR** dan **SUSILAWATI**).

Tanah rawa lebak merupakan salah satu lahan potensial untuk budidaya tanaman, namun kesuburan tanahnya yang rendah menjadi faktor pembatas pemanfaatan lahan tersebut. Lotus sebagai salah satu tumbuhan yang banyak ditemukan di kawasan rawa lebak berpotensi dikembangkan menjadi pupuk berupa biochar dan *compost tea* yang dapat berperan dalam memperbaiki kesuburan tanah serta meningkatkan ketersediaan hara di dalam tanah. Tanaman bayam banyak digemari masyarakat karena selain kandungan nutrisinya tinggi, bayam juga dapat dibudidayakan dengan mudah, namun produksi bayam di Indonesia mengalami penurunan beberapa tahun terakhir oleh karena dilakukan upaya untuk meningkatkan produksi bayam hijau melalui pemupukan. Penelitian ini bertujuan untuk menguji kualitas serta dosis *compost tea* dan biochar lotus terbaik yang dapat mengefisiensikan penggunaan pupuk NPK, meningkatkan ketersediaan hara serta pertumbuhan dan produksi bayam hijau yang dibudidayakan pada tanah asal rawa lebak. Penelitian ini terdiri atas dua tahap, yang pertama ialah pembuatan dan uji kualitas biochar maupun *compost tea* lotus, sedangkan penelitian tahap kedua ialah pengujian dosis biochar, *compost tea* lotus dan kombinasinya dengan NPK terhadap sifat kimia tanah, pertumbuhan serta produksi tanaman bayam hijau yang di tanam pada tanah asal rawa lebak. Pembuatan biochar dan *compost tea* lotus, serta budidaya bayam hijau dilaksanakan di Rumah Bayang Jl. Politeknik Bukit Lama, Kecamatan Ilir Barat 1, Palembang, Sumatera Selatan (3°00'15.4"S 104°43'44.5"E). Penelitian ini tahap pertama dilaksanakan pada Agustus-September 2023, sedangkan tahap kedua dilaksanakan pada Oktober 2023-Maret 2024. Biochar lotus dibuat dengan metode drum selama 1-1,5 jam pembakaran pada suhu 200°C. Pengujian komposisi perendaman dalam pembuatan *compost tea* lotus dirancangan menggunakan Rancangan Acak Lengkap (RAL) dengan tiga taraf perlakuan yaitu perendaman kompos lotus dan air 1:5 , 1:10, dan 1: 20 (b/v). Analisis pH dan kadar air biochar lotus dilakukan di Laboratorium Jurusan Tanah, Fakultas Pertanian Universitas Sriwijaya, analisis SEM-EDS biochar lotus dilakukan di Laboratorium PT Cipta Mikro Material. Analisis gugus fungsional biochar, konsentrasi humat *compost tea* lotus dilakukan di Laboratorium Kimia Terpadu, UIN Raden Fatah, sedangkan analisis kandungan hara *compost tea* lotus dianalisis di Laboratorium Pengujian PT Bina Sawit Makmur, Sampoerna Agro. Penelitian tahap kedua dirancang menggunakan Rancangan Acak Kelompok Faktorial yang terdiri atas 3 faktor. Faktor pertama ialah dosis biochar lotus : 0, 10, dan 20ton ha^{-1}, faktor kedua yaitu dosis *compost tea* lotus : 0, 20, dan 40mL $tanaman^{-1}$, dan faktor ketiga adalah dosis pupuk NPK : 0, 50, dan 100%. Analisis tanah rawa lebak sebelum tanam dilakukan di Laboratorium Jurusan Tanah, Fakultas Pertanian, Universitas Sriwijaya, sedangkan analisis tanah setelah tanam dan jaringan tanaman dilakukan di BPSIP Bengkulu. Hasil penelitian menunjukkan bahwa biochar lotus yang dihasilkan memiliki kriteria nilai pH dan kadar air yang telah memenuhi kriteria biochar sebagai bahan pembenah tanah selain itu telah memenuhi kriteria SNI 06-3730-1995 terkait persyaratan biochar. Gugus fungsional dalam biochar lotus terdiri atas gugus OH dari karbonil dan fenol, C=C struktur aromatik, C-H dari lignin dan holoselulosa, serta gugus fungsi C-C dari selulosa dan hemiselulosa. Hasil analisis SEM-EDS biochar lotus juga menunjukkan bahwa pada berbagai hasil *scanning* dan perbesaran ditemukan beberapa unsur dalam biochar seperti unsur C, O, Mg, Al, Si, P, Cl, K, Ca, Na, Fe, dan S dalam bentuk atom. Struktur keporian dari biochar lotus menunjukkan bahwa pori-pori pada biochar lotus terlihat lebih besar dan tidak begitu banyak. Perlakuan perendaman kompos lotus dan air 1:5 (b/v) menghasilkan kualitas dan kandungan hara yang lebih baik bagi tanaman. Penelitian ini juga menunjukkan bahwa perlakuan dosis biochar, *compost tea* lotus, pupuk NPK, serta interaksi perlakuan berpengaruh nyata terhadap sifat kimia tanah maupu pertumbuhan dan produksi tanaman bayam hijau. Dosis biochar lotus 20ton ha^{-1} dan *compost tea* lotus 40mL $tanaman^{-1}$ mampu mengefisiensikan penggunaan pupuk NPK sebesar 50% dalam mengoptimalkan ketersediaan hara tanah, pertumbuhan, produksi, serta serapan hara tanaman bayam hijau yang ditanam pada tanah asal rawa lebak. Oleh karena itu, dosis yang direkomendasikan bagi budidaya tanaman bayam hijau di tanah asal rawa lebak ialah kombinasi perlakuan biochar lotus 20ton ha^{-1} + *compost tea* lotus 40mL $tanaman^{-1}$ + 50% NPK rekomendasi.

Kata kunci : *biochar, compost tea, bayam hijau, tumbuhan lotus, rawa lebak*

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Diajukan Sebagai Syarat Untuk Mendapatkan Gelar Magister Sains (M.Si.) Pada
Program Studi Ilmu Tanaman Program Pascasarjana
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LEMBAR PENGESAHAN

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TESIS

Diajukan Sebagai Syarat Untuk Mendapatkan Gelar Magister Sains (M.Si.) Pada Program Studi Ilmu Tanaman Program Pascasarjana Fakultas Pertanian Universitas Sriwijaya

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Tesis dengan judul "Uji Kualitas Biochar dan *Compost Tea* Tumbuhan Lotus serta Aplikasinya pada Budidaya Bayam Hijau (*Amaranthus* spp.) di Tanah asal Rawa Lebak" oleh Tri Putri Nur telah dipertahankan di hadapan komisi Penguji Tesis Fakultas Pertanian Universitas Sriwijaya pada tanggal 16 April 2024 dan telah diperbaiki sesuai saran dan masukan tim penguji.

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PERNYATAAN INTEGRITAS

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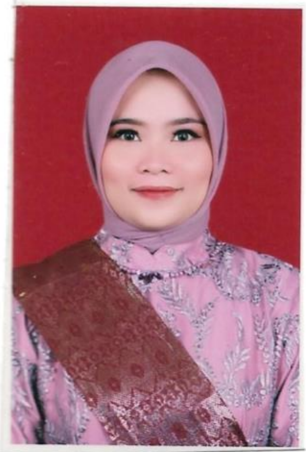
Menyatakan bahwa semua data dan informasi yang dimuat di dalam tesis ini merupakan hasil pengamatan saya sendiri dibawah supervisi dosen, kecuali yang disebutkan dengan jelas sumbernya. Apabila di kemudian hari ditemukan adanya unsur plagiasi dalam tesis ini, maka saya bersedia menerima sangsi akademik dari Universitas Sriwijaya.

Demikian pernyataan ini saya buat dalam keadaan sadar dan tidak mendapat paksaan dari pihak manapun.



Palembang, April 2024

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RIWAYAT HIDUP

Penulis bernama Tri Putri Nur, lahir pada tanggal 10 Juni 1999 di Kota Palopo, Sulawesi Selatan dan merupakan anak bungsu dari enam bersaudara dari pasangan bapak M. Tahir dan ibu Risnawati.

Penulis menempuh pendidikan di Taman Kanak-Kanak An-Nur, Jambi pada tahun 2004-2005. Kemudian penulis menamatkan pendidikan Sekolah Dasar di SDN 65 Bua pada tahun 2011, dan melanjutkan pendidikan menengah pertama di SMP Negeri 3 Palopo pada tahun 2011-2014. Penulis menempuh pendidikan menengah atas di SMA Negeri 3 Palopo pada tahun 2014-2017. Penulis menyelesaikan kuliah sarjana (S1) pada program studi Agroekoteknologi Fakultas Pertanian Universitas Sriwijaya dari tahun 2017-2021 dengan predikat Dengan Pujian. Pada tahun 2022 penulis mulai terdaftar sebagai mahasiswa dan aktif menempuh pendidikan di Program Pascasarjana Fakultas Pertanian Universitas Sriwijaya pada program studi Ilmu Tanaman.

Penulis pernah menjadi *awardee* program pertukaran pelajar, ASEAN International Mobility for Student (AIMS) oleh DIKTI di Thai Nguyen University of Agriculture and Forestry pada tahun 2019. Tahun 2021, penulis menjadi salah satu peserta Program Magang Mahasiswa Bersertifikat di Departemen Riset PT Pupuk Sriwijaya selama 6 bulan. Selama masa perkuliahan, penulis aktif dalam kegiatan akademik menjadi asisten dosen untuk asistensi mata kuliah Dasar-Dasar Ilmu Tanah dan Perancangan Percobaan. Penulis juga berpartisipasi aktif dalam penulisan artikel ilmiah untuk publikasi nasional dan internasional bereputasi. Ikut serta dalam seminar nasional dan internasional; yaitu, sebagai peserta dan *presenter* artikel pada The 1st International Conference Sains Tanah : Soil Science, Agriculture and Environment, Universitas Sebelas Maret, Indonesia tahun 2022 secara daring dan menjadi peserta sekaligus *presenter* artikel pada Seminar Nasional dan Kongres HITI ke-13, Bogor, Indonesia tahun 2023 secara luring. Selama menempuh pendidikan, penulis juga menerima hibah dari Program Penelitian Unggulan Profesi, Universitas Sriwijaya, Indonesia tahun 2023; yang diketuai oleh Prof. Dr. Ir. Nuni Gofar, M.S untuk pendanaan dalam perkuliahan, penelitian, dan publikasi.

KATA PENGANTAR

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Penulis menyadari tesis ini masih banyak terdapat kekurangan. Oleh karena itu, penulis menerima semua kritik dan saran yang bersifat membangun. Akhir kata, penulis berharap tesis ini dapat bermanfaat bagi pembaca dan dapat digunakan dengan sebaik-baiknya.

Palembang, April 2024

Tri Putri Nur

DAFTAR ISI

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DAFTAR LAMPIRAN

BAB 1
PENDAHULUAN

1.1. Latar Belakang

Rawa lebak merupakan lahan basah yang banyak dijumpai di Sumatera Selatan. Lahan rawa lebak tergolong sebagai lahan sub-optimal yang dapat dikelola untuk lahan budidaya tanaman (Arbi *et al.*, 2022). Lahan rawa lebak memiliki dua kondisi tanam yang berbeda (Wildayana & Armanto, 2018), dimana saat memasuki durasi tergenang cenderung dimanfaatkan untuk budidaya padi, sedangkan saat durasi kering untuk budidaya sayuran (Ali *et al*., 2014). Direktur Jenderal Prasarana dan Sarana Pertanian (PSP) di tahun 2023 menyebutkan bahwa potensi lahan rawa lebak Sumatera Selatan mencapai 1,35 juta ha, yang mana baru sebagian kecil yang telah dimanfaatkan untuk lahan pertanian. Tipe lahan rawa lebak yang banyak dimanfaatkan dalam budidaya tanaman ialah lebak dangkal atau pematang (Armanto *et al.*, 2017). Hasil analisis tanah asal rawa lebak pematang menunjukkan nilai pH berkisar 4,0-5,5 (sangat masam hingga masam), dengan kandungan P_2O_5, K_2O, dan P bray yang tergolong sangat rendah hingga sedang, serta nilai KTK yang tergolong sangat rendah hingga tinggi (Pujiharti, 2017). Pengembangan lahan rawa lebak menjadi lahan pertanian memiliki banyak faktor pembatas, hal ini disebabkan karena lahan rawa lebak tergolong lahan sub optimal yang secara alami memiliki kesuburan tanah dan produktivitas yang rendah (Susilawati *et al.*, 2020). Kesuburan tanah merupakan salah satu komponen penting dalam budidaya tanaman. Menurut Fitrah (2022), kesuburan tanah merupakan kemampuan tanah dalam menyediakan unsur hara dalam jumlah yang cukup, bentuk yang tersedia, dan seimbang untuk mendukung pertumbuhan dan produksi tanaman. Oleh karena itu diperlukan pengelolaan tanah yang sesuai guna memenuhi kebutuhan hara dan meningkatkan produktivitas tanaman yang dibudidayakan pada tanah rawa lebak.

Kesuburan tanah dipengaruhi oleh berbagai faktor baik fisik, kimia, maupun biologi tanah yang dapat menunjang pertumbuhan tanaman (Javed *et al*., 2022). Upaya pengelolaan kesuburan tanah baik secara kimia, biologi, dan fisika dapat dicapai melalui aplikasi pupuk maupun bahan pembenah tanah. Pemupukan salah satu alternatif dalam pengelolaan kesuburan lahan bagi pertumbuhan tanaman.

Penelitian Huda & Hidayati (2022), menunjukkan aplikasi pupuk NPK 300 kg ha^{-1} mampu mengoptimalkan pertumbuhan dan produksi bayam hijau dibanding perlakuan kontrol dan dosis pupuk yang lebih rendah. Seiring meningkatnya kebutuhan akan pupuk, mendorong pengembangan inovasi dalam bidang pengelolaan kesuburan tanah salah satunya penggunaan biochar sebagai bahan pembenah tanah. Penambahan biochar berpengaruh terhadap peningkatan pH tanah, ketersediaan Ca, Fe, K, Mg, Na, dan P di dalam tanah, serta berpengaruh nyata terhadap peningkatan pertumbuhan bayam hijau hingga tiga kali lipat dalam dua musim berbeda pada lahan terdegradasi dengan kesuburan rendah (Zemanová *et al*., 2017). Alternatif pengelolaan kesuburan lahan lainnya yang banyak digunakan ialah penggunaan *compost tea*. *Compost tea* salah satu jenis pupuk organik cair yang berasal dari ekstrak kompos padat dalam air dengan metode aerasi maupun non aerasi (Shaban *et al*., 2015). *Compost tea* memiliki pH berkisar 6-7, selain itu terdapat kandungan hara N, P, K, dan berbagai jenis fitohormon serta mikroba baik yang terlarut (El-Tahlawy, 2018).

Salah satu faktor pembatas dalam budidaya tanaman ialah hara yang tersedia bagi tanaman (Bechtold & Field, 2018), termasuk pada budidaya bayam hijau. Bayam hijau (*Amaranthus* spp.) merupakan salah satu sayuran yang memiliki nilai nutrisi dan potensi ekonomi yang tinggi, serta mudah untuk dibudidayakan. Bayam hijau memiliki kandungan komposisi mineral antara lain zat besi, magnesium, kalium, natrium, seng, mangan, tembaga, kalsium, dan fosfor (Gedi *et al.*, 2017; Roberts & Moreau, 2016)**.** Tidak hanya kandungan mineral, tanaman bayam hijau juga mengandung vitamin A dalam jumlah tinggi dan β-karoten, dengan konsentrasi asam folat, vitamin C, vitamin E, dan vitamin K yang lebih rendah (Murcia *et al*., 2020). Bayam hijau termasuk sayuran yang banyak digemari oleh masyarakat Indonesia, namun terjadi penurunan produksi bayam hijau beberapa tahun terakhir termasuk pada tahun 2021 sebesar 171.706 ton menjadi 170.821 ton di tahun 2022 (BPS, 2022). Alternatif yang dapat dilakukan dalam peningkatan produksi tanaman ialah perbaikan kesuburan tanah untuk menunjang produktivitas lahan dan tanaman (Havlin & Heiniger, 2020). Berdasarkan karakteristik serta keunggulan dari biochar dan *compost tea*, diharapkan menjadi input yang sesuai untuk memperbaiki kesuburan tanah bagi peningkatan pertumbuhan dan hasil tanaman bayam hijau yang dibudidayakan pada tanah asal rawa lebak, sehingga dapat mengurangi ketergantungan terhadap pupuk anorganik.

Bahan baku pembuatan biochar dan *compost tea* dapat memanfaatkan sumber daya alam yang potensial salah satunya yaitu tumbuhan lotus. Tumbuhan lotus (*Nulembo nucifera*) merupakan tumbuhan yang banyak ditemukan di lahan basah seperti di lahan rawa lebak termasuk di Kabupaten Ogan Ilir, Sumatera Selatan yang 35% kawasannya merupakan rawa berair (Ridhowati *et al.*, 2023). Penelitian Chen *et al*. (2014) menunjukkan bahwa ekstrak daun lotus dapat bersifat sebagai antibakteri yang mampu menghambat pertumbuhan patogen. Hasil analisis menunjukkan bahwa terdapat berbagai macam kandungan bioaktif serta flavonoid dalam daun lotus (Chen *et al.*, 2012), selain itu terdapat kandungan hara serta biomassa dari lotus berpotensi untuk dimanfaatkan sebagai bahan baku pembuatan pupuk (Liu *et al.*, 2023) maupun media tanam (Kanaga & Deivanayaki, 2017). Pengujian terkait penggunaan lotus sebagai bahan baku pembuatan biochar dan *compost tea* masih jarang dilakukan. Oleh karena itu, penelitian ini dilaksanakan untuk menguji potensi biochar dan *compost tea* dari tumbuhan lotus dalam meningkatkan kesuburan tanah dan mengurangi penggunaan pupuk anorganik serta meningkatkan pertumbuhan dan produksi tanaman bayam hijau yang ditanam pada pada tanah asal rawa lebak.

1.2. Rumusan Masalah

Perumusan masalah dalam penelitian ini antara lain :

1. Apakah karakteristik biochar dan *compost tea* yang dibuat dari tumbuhan lotus memenuhi kualitas sebagai bahan pembenah tanah?
2. Apakah aplikasi berbagai dosis biochar dan *compost tea* lotus yang dikombinasikan dengan pupuk NPK berpengaruh nyata dan memberikan hasil yang optimal terhadap beberapa sifat kimia tanah, serta pertumbuhan dan produksi tanaman bayam hijau yang ditanam pada tanah asal rawa lebak?
3. Adakah dosis biochar dan *compost tea* yang dapat mengefisiensikan penggunaan pupuk NPK anorganik dalam meningkatkan pertumbuhan dan produksi tanaman bayam hijau yang ditanam pada tanah asal rawa lebak?

1.3. Tujuan

Penelitian ini dilaksanakan bertujuan untuk :

1. Menganalisis beberapa karakter biochar dan *compost tea* tumbuhan lotus yang mendukung sebagai bahan pembenah tanah,
2. Mengevaluasi pengaruh dan menentukan dosis terbaik biochar dan *compost tea* dari tumbuhan lotus serta dosis pupuk NPK terhadap beberapa sifat kimia tanah, efisiensi pemupukan NPK anorganik serta pertumbuhan dan produksi tanaman bayam hijau pada tanah asal rawa lebak.

1.4. Hipotesis

Hipotesis dalam penelitian ini adalah:

1. Diduga ada metode pembuatan terbaik dalam pembuatan biochar dan *compost tea* tumbuhan lotus terhadap kualitas yang dihasilkan.
2. Diduga dosis biochar, *compost tea* tumbuhan lotus, dan NPK anorganik berpengaruh nyata terhadap beberapa sifat kimia tanah, pertumbuhan dan produksi tanaman bayam hijau yang ditanam pada tanah asal rawa lebak.
3. Diduga ada kombinasi terbaik dosis biochar, *compost tea* tumbuhan lotus, dan NPK anorganik dalam meningkatkan pertumbuhan dan produksi tanaman bayam hijau pada tanah asal rawa lebak.

1.5. Manfaat

Penelitian ini diharapkan dapat memberikan informasi dan pengetahuan terkait potensi pemanfaatan tumbuhan lotus sebagai pembenah tanah dan dapat mengefisienkan penggunaan pupuk anorganik dalam budidaya tanaman bayam hijau pada tanah asal rawa lebak. Penelitian ini juga diharapkan dapat memberikan informasi mengenai pengembangan teknologi pemupukan dalam peningkatan produktivitas lahan serta tanaman.

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