

## RINGKASAN

Pengembangan budidaya tanaman kelapa sawit (*Elaeis guineensis* Jacq) sangat erat kaitannya dengan ketersediaan bibit yang berkualitas, untuk mendapatkan bibit yang berkualitas dipengaruhi faktor genetik dan lingkungan. Faktor lingkungan yang mempengaruhi pertumbuhan bibit tanaman kelapa sawit salah satunya adalah kualitas medium tanam sebagai media perkembangan akar dan penyedia unsur hara bagi pertumbuhan dan perkembangan bibit.

Penelitian ini bertujuan untuk mengetahui efektivitas aplikasi biochar tempurung kelapa pada media tanam sub soil terhadap pertumbuhan bibit kelapa sawit (*E. guineensis* Jacq) di *Main Nursery*. Untuk mengetahui pengaruh pemberian pupuk majemuk terhadap pertumbuhan bibit kelapa sawit (*E. guineensis* Jacq) di *Main Nursery*. Untuk mengetahui interaksi biochar tempurung kelapa dan pupuk majemuk terhadap pertumbuhan bibit kelapa sawit (*E. guineensis* Jacq) di *Main Nursery*. Penelitian ini dilaksanakan di lahan percobaan Fakultas Pertanian Universitas Islam Sumatra Utara, yang terletak di Jln. Karya Wisata, Gedung Johor, Kecamatan Medan Johor, Kota Medan, dengan ketinggian tempat sekitar 35 mdpl. Penelitian ini berlangsung mulai bulan November 2024 hingga Maret 2025. Penelitian ini menggunakan metode percobaan Rancangan Acak Kelompok (RAK) faktorial yang terdiri dari 2 faktor. Faktor pertama adalah biochar terdiri dari 3 taraf perlakuan dan faktor kedua adalah pupuk majemuk terdiri dari 3 taraf perlakuan. Dari kedua perlakuan ini diperoleh 9 kombinasi perlakuan, setiap perlakuan diulang 3 kali. Faktor pertama Pemberian biochar tempurung kelapa yang diaplikasikan pada media tanam dalam polybag ukuran 35 cm x 40 cm dengan persen volume ada 3 taraf, yaitu : B<sub>0</sub> : 100% tanah sub soil (10 kg tanah sub soil = 25 cm) (Kontrol), B<sub>1</sub> : 80% tanah sub soil + 20% Biochar tempurung kelapa ( 20 cm tanah sub soil + 5 cm Biochar tempurung kelapa = 25 cm), B<sub>2</sub> : 60% tanah sub soil + 40% Biochar tempurung kelapa (15 cm tanah sub soil + 10 cm Biochar tempurung kelapa = 25 cm). Biochar tempurung kelapa dicampur rata dengan tanah kemudian dimasukkan lagi di dalam polybag. Faktor 2 Pemberian pupuk majemuk NPK 12:12:17:2 dengan 3 taraf yang ditetapkan berdasarkan presentase standar pemupukan PPKS untuk pembibitan, yaitu M<sub>0</sub> : Tanpa pupuk majemuk (Kontrol), M<sub>1</sub> : 7,5 g/polybag, M<sub>2</sub> : 15 g/polybag. Parameter yang diamati adalah tinggi tanaman, diameter batang, jumlah daun, dan luas daun.

Hasil penelitian menunjukkan bahwa pemberian biochar tempurung kelapa hanya berpengaruh terhadap jumlah daun, tetapi tidak berpengaruh terhadap pertumbuhan tinggi tanaman, diameter batang dan luas daun bibit kelapa sawit di *Main Nursery*. Perlakuan terbaik terdapat pada B<sub>2</sub> (60% tanah sub soil + 40% Biochar tempurung kelapa). Perlakuan B<sub>2</sub> dikatakan perlakuan terbaik karena menghasilkan pertumbuhan yang lebih baik daripada perlakuan lainnya, mulai dari parameter seperti tinggi tanaman, diameter batang, jumlah daun, dan luas daun. Pemberian pupuk majemuk berpengaruh terhadap semua parameter yang diamati antara lain seperti tinggi tanaman, diameter batang, jumlah daun, dan luas daun bibit kelapa sawit di *Main-Nursery*. Perlakuan terbaik terdapat pada M<sub>2</sub> (Pupuk Majemuk NPK 12-12-17-2 15 g/polybag). Perlakuan M<sub>2</sub> dikatakan perlakuan terbaik karena perlakuan M<sub>2</sub> rata-rata menghasilkan pertumbuhan yang lebih baik daripada perlakuan lainnya. Interaksi dari kedua perlakuan biochar tempurung kelapa dan pupuk majemuk berpengaruh terhadap diameter batang dan jumlah daun. Interaksi

perlakuan terbaik terdapat pada B<sub>2</sub>M<sub>2</sub> (60% tanah sub soil + 40% Biochar tempurung kelapa+ Pupuk Majemuk NPK 12-12-17-2 15 g/polybag). Interaksi perlakuan B<sub>2</sub>M<sub>2</sub> dikatakan terbaik karena menghasilkan pertumbuhan bibit kelapa sawit yang lebih baik daripada interaksi perlakuan lainnya.

***Kata kunci*** : *media tanam, bibit kelapa sawit, biochar tempurung kelapa, pupuk majemuk*

## SUMMARY

The development of oil palm (*Elaeis guineensis* Jacq) cultivation is closely related to the availability of quality seedlings, to get quality seedlings influenced by genetic and environmental factors. One of the environmental factors that affect the growth of oil palm seedlings is the quality of the planting medium as a medium for root development and nutrient providers for seedling growth and development.

This study aims to determine the effectiveness of coconut shell biochar application on sub soil planting media on the growth of oil palm seedlings (*E. guineensis* Jacq) in the Main Nursery. To determine the effect of compound fertilizer on the growth of oil palm seedlings (*E. guineensis* Jacq) in the Main Nursery. To determine the interaction of coconut shell biochar and compound fertilizer on the growth of oil palm seedlings (*E. guineensis* Jacq) in the Main Nursery. This research was conducted at the experimental field of the Faculty of Agriculture, Islamic University of North Sumatra, located at Jln. Karya Wisata, Gedung Johor, Medan Johor District, Medan City, with an altitude of about 35 meters above sea level. This research took place from November 2024 to March 2025. This study used a factorial Randomized Group Design (RAK) experimental method consisting of 2 factors. The first factor is biochar consisting of 3 levels of treatment and the second factor is compound fertilizer consisting of 3 levels of treatment. From these two treatments, 9 treatment combinations were obtained, each treatment was repeated 3 times. The first factor is the provision of coconut shell biochar applied to planting media in polybags measuring 35 cm x 40 cm with a volume percent of 3 levels, namely: B<sub>0</sub> : 100% sub soil (10 kg sub soil = 25 cm) (Control), B<sub>1</sub>: 80% sub soil + 20% coconut shell biochar (20 cm sub soil + 5 cm coconut shell biochar = 25 cm), B<sub>2</sub>: 60% sub soil + 40% coconut shell biochar (15 cm sub soil + 10 cm coconut shell biochar = 25 cm). Coconut shell biochar was mixed well with the soil and then put back in the polybag. Factor 2 Application of NPK 12:12:17:2 compound fertilizer with 3 levels determined based on the percentage of PPKS fertilization standards for nurseries, namely M<sub>0</sub>: Without compound fertilizer (Control), M<sub>1</sub>: 7.5 g/polybag, M<sub>2</sub>: 15 g/polybag. The parameters observed were plant height, stem diameter, number of leaves, and leaf area.

The results showed that the provision of coconut shell biochar only affected the number of leaves, but had no effect on the growth of plant height, stem diameter and leaf area of oil palm seedlings in the Main Nursery. The best treatment was B<sub>2</sub> (60% sub soil + 40% coconut shell biochar). B<sub>2</sub> treatment is said to be the best treatment because it produces better growth than other treatments, starting from parameters such as plant height, stem diameter, number of leaves, and leaf area. The provision of compound fertilizer affects all parameters observed, such as plant height, stem diameter, number of leaves, and leaf area of oil palm seedlings in the Main-Nursery. The best treatment was M<sub>2</sub> (NPK 12-12-17-2 Compound Fertilizer 15 g/polybag). The M<sub>2</sub> treatment is said to be the best treatment because the M<sub>2</sub> treatment on average produces better growth than other treatments. The interaction of the two treatments of coconut shell biochar and compound fertilizer affected the stem diameter and number of leaves. The best treatment interaction was B<sub>2</sub>M<sub>2</sub> (60% sub soil + 40% coconut shell biochar + NPK 12-12-17-2 compound fertilizer 15

g/polybag). B<sub>2</sub>M<sub>2</sub> treatment interaction is said to be the best because it produces better growth of oil palm seedlings than other treatment interactions.

***Key word*** : *planting media, oil palm seedlings, coconut shell biochar, compound fertilizer*