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INTISARI

PENGARUH RORAK TERHADAP KARAKTER MORFOLOGIS AKAR, FISIOLOGIS TAJUK, DAN HASIL TIGA KLON KAKAO (*Theobroma cacao* L.)

Canggih Nailil Maghfiroh
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Kakao berasal dari daerah tropis yang banyak dibudidayakan di Afrika Barat, Asia tenggara, dan amerika latin. Indonesia merupakan salah satu negara di asia tenggara yang terbesar diikuti oleh papua nugini dan amerika latin. Rorak diberikan pada lahan untuk berbagai keperluan yaitu menampung bahan organik, menampung sedimen aliran permukaan, mencegah erosi, dan mempertahankan ketersediaan unsur hara. Klon merupakan salah satu faktor internal yang sangat berpengaruh terhadap hasil kakao. Klon unggul yang direkomendasikan adalah klon RCC70, RCC71, dan KKM 22 memiliki produktivitas tinggi dan tahan hama dan penyakit. Rorak berdampak pada pemotongan akar yang juga perlu untuk dikaji lebih lanjut. Penelitian tentang penggunaan rorak pada tanaman kakao terkait dengan aktivitas fisiologis relatif terbatas. Penelitian bertujuan untuk mengetahui a) mendeteksi keberadaan akar dengan penggambaran resistivitas, b) aktivitas fisiologis tajuk kakao klon RCC 70, RCC 71, dan KKM 22, jika kawasan lahan diberi rorak. Penelitian dyilaksanakan di perkebunan kakao milik PT. Pagilaran di Unit Produksi Segayung Utara, Kecamatan Tulis, Kabupaten Batang, Jawa Tengah. Penelitian dilaksanakan pada Agustus 2018 – Juni 2019. Percobaan lapangan disusun dalam Rancangan Acak Kelompok Lengkap (RAKL) faktorial dua faktor dengan tiga blok sebagai ulangan. Faktor pertama, penggunaan rorak di areal kebun kakao, terdiri dari dua perlakuan : rorak dan tanpa rorak. Faktor kedua, klon kakao yang terdiri dari klon RCC 70, RCC 71, dan KKM 22. Perlakuan di masing-masing blok menggunakan tiga tegakan kakao sebagai sampel, jumlah tegakan yang digunakan 56 tanaman. Hasil penelitian menunjukkan bahwa enggunaan rorak secara nyata mampu meningkatkan konsentrasi N total tanah, P tersedia tanah, K tersedia tanah, porositas, c-organik, KPK, kejenuhan basa, kadar N jaringan, kadar P jaringan, kadar K jaringan. bobot segar akar total, bobot kering akar total, bobot kering biji, klorofil a, lebar bukaan stomata, transpirasi, kandungan H_2O daun, kandungan CO_2 daun, dan laju fotosintesis. Penggunaan rorak secara nyata mengakibatkan perbaikan pada sebagian besar karakter tanah, morfologis akar, dan fisiologis tajuk tanaman kakao, namun demikian perbaikan tersebut belum terekspresi pada komponen hasil dan hasil tanaman kakao yang diindikasikan oleh variabel bobot segar buah, diameter buah, panjang buah, bobot basah biji, jumlah biji, bobot 100 biji, dan *beant count.* Kesimpulan pada poin a dan b berlaku sama pada ketiga klon kakao yang diuji yaitu RCC 70, RCC 71, dan KKM 22.

Kata Kunci : Kakao, Akar, Rorak, Fisiologis Tajuk, Klon RCC 70, Klon RCC 71, Klon KKM 22

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ABSTRACT

THE EFFECT OF THE DEAD-END TRENCH ON ROOT MORPHOLOGICAL CHARACTERS, LEAVES PHYSIOLOGY, AND THE YIELD OF THREE COCOA CLONES (*Theobroma cacao* L.)

Cacao originates from tropical regions which are widely cultivated in West Africa, Southeast Asia and Latin America. Indonesia is one of the largest countries in Southeast Asia, followed by Papua New Guinea and Latin America. The dead-end trench is given to the land for various purposes, soil organic matter sequestration, preventing surface runoff sediment, preventing erosion, and maintaining nutrient availability. Clone is one of the internal factors which is very influential on cocoa yield. The superior clones recommended by coffee and cocoa research center (Puslitkoka) as the superior cocoa clones are clones RCC70, RCC71, and KKM 22 which have high productivity and are resistant to pests and diseases. The dead-end trench has an impact on root cutting which also needs to be studied further. Research on the use of the dead-end trench in cocoa plants related to physiological activity is relatively limited. The study aims to determine a) detecting the presence of roots by depicting resistivity, b) physiological activity of cocoa canopy clones RCC 70, RCC 71, and KKM 22, if the area was given the dead-end trench. The study was conducted at a cocoa plantation owned by PT. Pagilaran in North Segayung Production Unit, Tulis Subdistrict, Batang Regency, Central Java. The study was conducted in August 2018 - June 2019. Field experiments were arranged in a factorial Completely Randomized Completely Randomized Design (RCBD) with three blocks as replications. The first factor, the use of the dead-end trench in the cocoa plantation area, consists of two treatments: the dead-end trench and without the dead-end trench. The second factor, cocoa clones consisting of RCC 70, RCC 71, and KKM 22 clones. The treatment in each block used three cocoa stands as samples, the number of stands used by 56 plants. The results showed that the use of the dead-end trench was significantly able to increase total N concentration of soil, P available soil, K available soil, porosity, c-organic, CEC (Cation Exchange Capacity), base saturation, tissue N levels, tissue P levels, tissue K levels. fresh root total weight, total root dry weight, seed dry weight, chlorophyll a, stomatal enclosure width, transpiration, leaf H_2O content, CO_2 leaf content, and photosynthesis rate. Application of the dead-end trench significantly results in improvements in most soil, morphological, and physiological characteristics of the canopy of cocoa plants, however such improvements had not been expressed in yield components and yield of cocoa plants as indicated by variables of fresh fruit weight, fruit diameter, fruit length, wet weight seeds, number of seeds, weight of 100 seeds, and beant count. The conclusions in points a and b apply equally to the three tested cocoa clones, namely RCC 70, RCC 71, and KKM 22.

Keywords: Cocoa, Root, The dead-end trench, Leaves Physiology, RCC 70 clone, RCC 71 clone, KKM 22 clone