

INTISARI

Dampak rasio nitrogen berbasis amonium (NH_4^+) dan nitrat (NO_3^-) terhadap produktivitas kelapa sawit masih belum diketahui. Padahal nitrogen (N) merupakan unsur makro esensial utama. Tujuan penelitian ini adalah 1) mengetahui pengaruh rasio pemupukan N bersumber dari NH_4^+ dan NO_3^- terhadap aktivitas fisiologis dan produktivitas kelapa sawit di tanah mineral dan 2) menentukan rasio optimal pemupukan N bersumber dari NH_4^+ dan NO_3^- pada kelapa sawit di tanah mineral. Penelitian dilaksanakan di perkebunan PT. Langkat Nusantara Kepong, Kebun Tanjung Beringin, Kecamatan Hinai, Kabupaten Langkat, Sumatera Utara pada Januari hingga Desember 2022. Percobaan lapangan disusun menggunakan Rancangan Acak Kelompok Lengkap (RAKL) faktor tunggal dengan lima blok sebagai ulangan. Faktor yang diuji yaitu rasio pemupukan N berbasis NH_4^+ dan NO_3^- , terdiri dari lima taraf rasio yaitu $100\%\text{NH}_4^+ : 0\%\text{NO}_3^-$; $75\%\text{NH}_4^+ : 25\%\text{NO}_3^-$; $50\%\text{NH}_4^+ : 50\%\text{NO}_3^-$; $25\%\text{NH}_4^+ : 75\%\text{NO}_3^-$ dan $0\%\text{NH}_4^+ : 100\%\text{NO}_3^-$. Variabel yang diamati yaitu karakteristik cuaca mikro, kadar NH_4^+ dan NO_3^- tersedia tanah, kadar NPK daun, kadar klorofil (a, b, dan total), kadar gula (sukrosa, gula reduksi dan total) dan ANR, jumlah bunga betina, jumlah buah per tanaman, bobot TBS, produktivitas dan kadar minyak buah. Data yang diperoleh selanjutnya dianalisis varian (Anova) pada α 5 %, jika terdapat perbedaan nyata diuji lanjut dengan polynomial orthogonal. Hasil penelitian memberikan informasi bahwa rasio N- NH_4^+ dan N- NO_3^- pada pupuk N yang diberikan pada tanaman kelapa sawit tidak mempengaruhi secara nyata hampir semua variabel uji kecuali kandungan N- NH_4^+ dan N- NO_3^- tanah, kadar klorofil A dan ANR daun tanaman kelapa sawit. Namun demikian, terdapat kecenderungan hubungan kuadratik antara rasio N- $\text{NH}_4^+/\text{N-NO}_3^-$ dengan produktivitas tanaman kelapa sawit. Rasio N- $\text{NH}_4^+/\text{N-NO}_3^-$ yang cenderung optimal untuk memaksimalkan produktivitas tanaman kelapa sawit yaitu 66,93% $\text{NH}_4^+ : 33,07\% \text{NO}_3^-$. Pada rasio optimal tersebut didapatkan produktivitas maksimal sebesar 28,41 ton TBS/ha/tahun.

Kata kunci : amonium, nitrat, kelapa sawit, fisiologi dan produktivitas.

ABSTRACT

The impact of the ratio of ammonium (NH_4^+) and nitrate (NO_3^-) fertilization on oil palm productivity is still unknown. Whereas nitrogen (N) is the main essential macro element. The aims of this study were 1) to determine the effect of N fertilization ratios sourced from NH_4^+ and NO_3^- on the physiological activity and productivity of oil palm on mineral soils, and 2) to determine the optimal ratio of N fertilization sourced from NH_4^+ and NO_3^- in oil palms on mineral soils. The research was carried out on the plantation of PT. Langkat Nusantara Kepong, Tanjung Beringin Gardens, Hinai District, Langkat Regency, North Sumatra Province from January to December 2022. The field experiment was arranged using a single factor of Randomized Complete Block Design (RCBD) with five blocks as replications. The factor tested was the ratio of NH_4^+ and NO_3^- fertilizer consisting of five ratio levels, namely 100% NH_4^+ :0% NO_3^- ; 75% NH_4^+ :25% NO_3^- ; 50% NH_4^+ :50% NO_3^- ; 25% NH_4^+ :75% NO_3^- and 0% NH_4^+ :100% NO_3^- . Observation were done on several variables of micro climate, soil physical and chemical characters, crop physiology, yield components, and yield. Data were analyzed using analysis of variance (Anova) at α 5 %, if there were significant differences among treatments were tested using polynomial orthogonal. The results showed that ratio of NH_4^+ and NO_3^- fertilizer applied to oil palms did not significantly affect almost all tested variables except for soil N- NH_4^+ and N- NO_3^- content, chlorophyll A content and nitrate reductase activity (NRA) of oil palm. However, there was a tendency for a quadratic relationship between N- NH_4^+ /N- NO_3^- fertilizer and oil palms productivity. The optimal N- NH_4^+ /N- NO_3^- fertilizer to maximize oil palms productivity was 66.93% NH_4^+ : 33.07% N- NO_3^- . At this optimal ratio, a maximum productivity of 28.41 tons of FFB/ha/year was obtained.

Keywords: ammonium, nitrate, oil palm, physiology, and NRA.