ABSTRACT

The information on the growth and yield performances of MR 269 rice in combination with different fertilizer rates and different soil types is essential in order to identify the agronomic characteristics of this new rice variety when cultivated in Sarawak. Two pot culture experiments were conducted in order to evaluate the growth and yield performances of rice cultivated on two types of soils, Gley (GL) and Grey-white podzolic (GW) soils. In each experiment, a total of 80 pots were divided into four fertilizer treatments of T0 (Control), T1 ($N_{60}P_{28}K_{40}$), T2 ($N_{120}P_{56}K_{80}$), and T3 ($N_{240}P_{112}K_{160}$). Ten rice samples in each treatment were randomly selected and assessed for the growth and yield performances. Soil samples were collected and the study on the effects of different fertilizer rates to the soil properties were carried out through soil analysis before and after rice planting. The data for both rice and soil samples were analyzed using SPSS Statistic Version 22. The mean values were compared using one-way ANOVA and Tukey HSD was chosen as a post hoc test. In Experiment 1, for the soil analysis, it was found that the additional of fertilizer of different rates to GL soil had significant effects (P<0.05) on pH, EC, Exchangeable K, Exchangeable Al, Base Saturation, and Available P. The highest plant height was recorded in T3 with 97.9±2.4b cm during 110 DAT. The highest number of tillers was in T2 with 26±7.9b while the lowest was in T0 (9±0.8a). Rice yield components of reproductive tillers when cultivated in GL series was the highest in T2 (25±7.7b). The maximum grain yield obtained was in T3 (33.4±5.9b g). However, it was not significantly different from the recommended rates of fertilizer in T2 (27.5±3.6b g). Rice in T0 (0.46±5.1a) possessed the highest Grain Harvest Index (GHI) while the lowest was in T2 (0.30±0.04a). Meanwhile in Experiment 2, the soil analysis resulted that the significant effects (P<0.05) were in pH value, EC, Total N, C/N ratio, Exchangeable K, Exchangeable Al, and Available P. The highest plant height recorded during 110 DAT was in T3 (95.1±2.0b cm). The highest number

of tillers was in T2 (20±5.3b). As for the number of reproductive tillers, rice plant in T2 (20±5.1b) showed the highest number of reproductive tiller while the lowest was in T0 (6±2.1a). As for the grain yield, rice in T3 (38.4±3.1c g) recorded the greatest weight which however insignificantly different to T2 (27.6±10.5bc g). The maximum GHI was recorded in T0 (0.48±0.09b) while the lowest was in T2 (0.33±0.03a). Through the observations made in this pot culture study which provided only the preliminary data that gave the initial information, it can be concluded that the new rice variety, MR 269 was suitable to be cultivated in Sarawak soils of GL and GW using fertilizer rates of T2 ($N_{120}P_{56}K_{80}$) which was more economical and environmentally friendly than T3. Therefore, it is recommended that further on field trial of MR 269 rice to be carried out prior to large scale planting in Sarawak.

Keywords: MR 269 rice, pot culture experiment, gley soil, grey-white podzolic soil, fertilizer rates

Menilai Prestasi Pertumbuhan dan Hasil Padi Varieti MR 269 yang Ditanam pada Kadar Baja dan Jenis Tanah yang Berbeza di Sarawak

ABSTRAK

Maklumat mengenai pertumbuhan dan hasil prestasi padi MR 269 dengan kombinasi kadar baja dan jenis tanah yang berbeza adalah penting untuk mengenal pasti ciri-ciri agronomi padi baharu ini apabila ditanam di Sarawak. Dua eksperimen berskala kecil menggunakan pot telah dijalankan untuk menilai kadar pertumbuhan dan hasil padi yang ditanam pada dua jenis tanah, iaitu tanah Gley (GL) dan podzolik (GW). Untuk setiap eksperimen, sebanyak 80 pot yang dibahagikan kepada empat rawatan baja iaitu T0 (Kawalan), T1 ($N_{60}P_{28}K_{40}$), T2 ($N_{120}P_{56}K_{80}$), dan T3 ($N_{240}P_{112}K_{160}$) telah digunakan. Sepuluh sampel padi pada setiap rawatan telah dipilih secara rawak dan dinilai untuk kadar pertumbuhan dan hasil padi. Sampel tanah telah diambil dan kajian mengenai kesan kadar baja yang berbeza terhadap ciri-ciri tanah telah dijalankan melalui analisis tanah sebelum dan selepas penanaman padi. Data untuk kedua-dua sampel padi dan tanah telah dianalisis menggunakan SPSS Statistik Versi 22. Nilai min dibandingkan menggunakan One-way ANOVA dan Tukey HSD dipilih sebagai ujian post hoc. Dalam Eksperimen 1, untuk analisis tanah, didapati bahawa penambahan kadar baja yang berbeza pada tanah GL mempunyai kesan yang signifikan ($P<0.05$) pada pH, EC, kandungan K, Al, dan nilai P. Untuk prestasi pertumbuhan padi pula, ketinggian tertinggi dicatatkan pada sampel T3 dengan 97.9±2.4b cm semasa 110 Hari Lepas Tanam (HLT). Bilangan tertinggi batang padi pula ialah pada T2 (26±7.9b) manakala yang terendah adalah T0 (9±0.8a). Salah satu komponen hasil iaitu tangkai padi, mencatatkan jumlah yang tertinggi pada T2 (25±7.7b) apabila ditanam pada tanah GL. Hasil biji benih padi yang maksimum direkod pada T3 (33.4± 5.9b g). Walau bagaimanapun, bacaan yang diperolehi pada T3 adalah tidak signifikan dengan T2 (27.5±3.6b g), iaitu kadar baja yang disyorkan. Padi pada T0 (0.46 ± 5.1a) memiliki kadar

Indeks Tuaian (GHI) tertinggi manakala yang terendah adalah dicatatkan pada T2 (0.30±0.04a). Sementara itu, dalam Eksperimen 2, analisis tanah menunjukkan kesan yang signifikan (P<0.05) pada nilai pH, EC, jumlah nitrogen, nisbah C / N, kandungan K, kandungan Al, dan nilai P. Ketinggian tangkai tertinggi yang dicatatkan pada 110 HLT ialah pada T3 (95.1±2.0b cm). Batang padi terbanyak pula tercatat pada T2 (20±5.3b). Bagi bilangan tangkai padi pula, T2 (20±5.1b) menunjukkan bilangan tertinggi manakala yang terendah adalah pada T0 (6±2.1a). Bagi hasil biji benih padi, T3 (38.4±3.1c g) mencatatkan berat yang maksimum tetapi tidak signifikan dengan T2 (27.6±10.5bc g). GHI yang maksimum dicatatkan pada T0 (0.48±0.09b) manakala yang terendah adalah pada T2 (0.33±0.03a). Melalui pemerhatian yang dibuat dalam kajian ini, didapati bahawa variti padi baharu, MR 269 adalah sesuai untuk ditanam di tanah Sarawak yang terdiri daripada tanah GL dan GW menggunakan kadar baja T2 ($N_{120}P_{56}K_{80}$) yang lebih ekonomi dan mesra alam berbanding T3. Oleh itu, adalah dicadangkan bahawa kajian lanjutan padi MR 269 diteruskan di peringkat sawah sebelum penanaman berskala besar di Sarawak.

***Kata kunci**: Padi MR 269, eksperimen berskala kecil menggunakan pot, tanah gley, tanah podzolik, kadar baja*