

ABSTRAK

Penelitian bertujuan untuk 1) mengetahui pengaruh kalium terhadap aktivitas fisiologis dan pertumbuhan bibit kelapa sawit tercekam kekeringan, dan 2) menentukan dosis kalium yang optimal untuk meningkatkan ketahanan bibit kelapa sawit terhadap cekaman kekeringan berdasarkan pada indikator aktivitas fisiologis dan pertumbuhan. Penelitian dilaksanakan di Kecamatan Prambanan, Kabupaten Sleman pada September 2017 – September 2018. Percobaan lapangan disusun menggunakan Rancangan Acak Kelompok Lengkap (RAKL) faktorial dua faktor dengan tiga blok sebagai ulangan. Faktor pertama adalah dosis kalium yang terdiri dari lima aras yaitu 0,00; 8,50; 17,02; 25,53; dan 34,03 gram kalium/bibit. Pupuk kalium yang digunakan adalah kalium klorida (KCl) dengan kandungan K sebesar 60%. Faktor kedua adalah cekaman kekeringan, terdiri dari tiga aras kekeringan yaitu kontrol (kapasitas lapangan), cekaman kekeringan moderat, dan cekaman kekeringan berat. Metode kekeringan menggunakan prinsip *fraction of transpirable soil water* (FTSW). Data yang dikoleksi mencakup beberapa variabel fisika dan kimia media tanam, iklim mikro di lokasi penelitian, aktivitas fisiologis, dan pertumbuhan bibit kelapa sawit. Data yang diperoleh selanjutnya dianalisis varian (ANOVA) dengan tingkat kepercayaan 95%, dan jika terdapat beda nyata antar perlakuan dilakukan uji lanjut menggunakan DMRT. Dosis kalium yang optimal untuk meningkatkan tingkat ketahanan bibit kelapa sawit terhadap cekaman kekeringan ditentukan dengan analisis regresi. Hasil penelitian memberikan informasi bahwa peningkatan dosis K pada bibit kelapa sawit tercekam kekeringan menyebabkan kenaikan kerapatan stomata permukaan daun, kandungan dan serapan K tajuk, kandungan dan serapan K akar, potensial air daun, kandungan klorofil, dan laju fotosintesis. Berdasarkan variabel berat kering tanaman, pemberian dosis K sampai dengan 19,68 g/bibit selalu diikuti oleh peningkatan berat kering total bibit kelapa sawit tercekam kekeringan sehingga tingkat ketahanan bibit kelapa sawit terhadap cekaman kekeringan bisa meningkat.

Kata kunci: kalium, kelapa sawit, kekeringan, fisiologis.

ABSTRACT

The present study aimed at: 1) determining the effects of potassium on physiological activities and growth of oil palm seedlings gripped by drought, and 2) determining the optimal potassium dose to increase the resistance of oil palm seedlings to drought stress based on indicators of its physiological activities and growth. It was conducted at Prambanan Subdistrict, Sleman Regency in September 2017 – September 2018. Field experiments were carried out using a two-factor factorial CGRD (Complete Group Randomized Design) with three blocks as replications. The first factor was potassium dose consisting of five levels, i.e. 0.00; 8.50; 17.02; 25.53; and 34.03 grams of potassium per seed. Potassium fertilizer used in the present study was potassium chloride (also known as KCL) with a potassium content of 60%. The second one was drought stress, consisting of three levels, i.e. control (field capacity), moderate drought stress, and severe drought stress. Drought method used the principle of fraction of FTSW (Transpirable Soil Water). The collected data included several physical and chemical variables of the planting media, micro-climate in the research area, physiological activities, and the growth of oil palm seedlings. The data were then analyzed for variance using ANOVA with a confidence level of 95%, and if there were significant differences among treatments, further testing using DMRT (Duncan's Multiple Range Test) would be carried out. The optimal dosage of potassium to increase the level of resistance of oil palm seedlings to drought stress was determined by regression analysis. The results revealed information that an increase in potassium dose in oil palm seedlings gripped by drought had caused an increase in the density of leaf surface stomata, shoot content and potassium uptake, potassium content and roots uptake, leaf water potential, chlorophyll content, and photosynthesis rate. Based on plant dry weight variables, potassium dosage up to 19.68 grams per seed was always followed by an increase in total dry weight of oil palm seedlings gripped by drought so that the resistance level of oil palm seedlings to drought stress could increase.

Keywords: potassium, palm oil, drought, physiology.