RINGKASAN

Peningkatan produksi kedelai dapat dilakukan melalui pengoptimalan luas lahan yang ada dengan penambahan populasi tanaman per satuan luas. Kajian fisiologis terkait bentuk daun erat hubungannya dengan penerimaan cahaya matahari dalam proses fotosintesis. Tujuan penelitian ini yaitu untuk: 1) mengetahui pengaruh populasi tanaman terhadap karakter fisiologis, pertumbuhan, dan hasil tanaman kedelai, 2) mengetahui pengaruh perbedaan bentuk daun terhadap karakter fisiologis, pertumbuhan, dan hasil tanaman kedelai, serta 3) mengetahui pengaruh interaksi perbedaan bentuk daun dan populasi tanaman kedelai terhadap karakter fisiologis, pertumbuhan, dan hasil tanaman kedelai.

Penelitian dilaksanakan pada bulan Februari 2019 sampai Juli 2019 di kebun percobaan dan Laboratorium Agronomi dan Hortikultura, Fakultas Pertanian, Universitas Jenderal Soedirman. Penelitian menggunakan Rancangan Acak Kelompok Lengkap (RAKL) Faktorial 4 x 3, terdiri dari 2 faktor perlakuan yaitu populasi tanaman kedelai sebagai faktor I, terdiri dari 4 taraf jenis yaitu P_1 = populasi 333.333 tanaman/ha, P_2 = populasi 250.000 tanaman/ha, P_3 = populasi 166.666 tanaman/ha, dan P_4 = populasi 125.000 tanaman/ha. Faktor II yaitu bentuk daun kedelai terdiri dari 3 taraf yaitu B_1 = bentuk daun lanceolate, B_2 = bentuk daun oval, B_3 = bentuk daun agak bulat. Variabel yang diamati meliputi luas daun total, indeks luas daun, kehijauan daun, lebar bukaan stomata, kerapatan stomata, jumlah daun trifoliat, tinggi tanaman, jumlah buku, jumlah cabang, laju asimilasi bersih, laju pertumbuhan tanaman, bobot kering tanaman, bobot kering akar, jumlah polong isi, jumlah polong hampa, bobot 100 biji, dan bobot biji per hektar.

Hasil penelitian menunjukkan bahwa populasi tanaman 125.000 tanaman per hektar menghasilkan nilai luas daun total 7 mst, jumlah daun 6 dan 8 mst, jumlah buku, jumlah cabang, bobot kering tanaman 5 dan 7 mst, laju asimilasi bersih 1 dan 2, bobot kering akar 5 dan 7 mst, jumlah polong isi yang paling tinggi dibanding populasi lainnya. Populasi 250.000 tanaman per hektar menghasilkan bobot biji per hektar paling banyak, yaitu 2,65 ton/ha. Bentuk daun tanaman kedelai lanceolate menghasilkan nilai luas daun total 3 mst, indeks luas daun 3 mst, jumlah daun 2 dan 6 mst, jumlah cabang, bobot kering tanaman 3 dan 5 mst, laju pertumbuhan tanaman 1, bobot kering akar 3 mst, jumlah polong hampa, dan bobot 100 biji paling tinggi dibanding bentuk daun lainnya. Bentuk daun oval dan agak bulat menghasilkan bobot biji per hektar paling tinggi, yaitu masing-masing 2,41 dan 2,31 ton/ha. Luas daun 5 mst dan bobot kering tanaman 5 mst tertinggi terdapat pada bentuk daun lanceolate dengan populasi 125.000. Indeks luas daun 5 mst dan laju pertumbuhan tanaman 1 (3-5 mst) tertinggi terdapat pada bentuk daun lanceolate dengan populasi 333.333 tanaman per hektar. Laju asimilasi bersih 2 (5-7 mst) tertinggi terdapat pada bentuk daun oval dengan populasi 125.000 tanaman per hektar.

SUMMARY

The efforts to increase soybean production can be through optimizing the existing land area by increasing plant population per unit area. Physiological studies related to the shape of the leaves are closely related to the interception of sunlight for photosynthesis process. The purpose of this study were to: 1) determine the effect of plant population on physiological characters, growth, and yields of soybean plants, 2) determine the effect of leaf shapes on physiological characters, growth, and yields of soybean plants, and 3) determine the interaction effect of leaf shape and plant population on the physiological characters, growth, and yields of soybean plants.

The study was conducted from February until July 2019 at The Experimental Farm and The Agronomy and Horticulture Laboratory, Faculty of Agriculture, Jenderal Soedirman University. The research was arranged by using randomized completely block design with 3 replications. The first factors was the level population of soybean plants, consisted of P_1= 333.333 plants/ha, P_2= 250.000 plants/ha, P_3= 166.666 plants/ha, and P_4= 125.000 plants/ha. The second factors was the leaf shape of soybean plants, consisted of B_1= lanceolate, B_2= oval, B_3= slightly round. The observed variables were leaf area, leaf area index, leaf greenness, opening stomata width, stomata density, number of trifoliate leaves, plant height, number of nodes, number of branches, net assimilation rate, plant growth rate, root dry weight, plant dry weight, number of filled pods, number of empty pods, 100 seeds weight, and yields per hectares.

The results showed that the populations 125.000 plants/ha produce the highest number of leaf area at 7 Weeks After Sowing (WAS), number of trifoliate leaves at 6 and 8 WAS, number of nodes, number of branches, plant dry weight at 5 and 7 WAS, net assimilation rate at 3-5 WAS and 5-7 WAS, root dry weight at 5 and 7 WAS, and number of filled pods compared with the other populations. The population 250.000 plants/ha produce the highest yields compared the others plant populations, reached 2,65 tons/ha. The lanceolate leaf shape produce the highest number of leaf area at 3 WAS, leaf area index at 3 WAS, number of trifoliate leaves at 2 and 6 WAS, number of branches, plant dry weight at 3 and 5 WAS, plant growth rate at 3-5 WAS, root dry weight at 3 WAS, number of empty pods, and 100 seeds weight compared the others leaf shape. The oval and slightly round leaf shape produce the highest yields compared the others leaf shape, reached 2,41 tons/ha for oval leaf shape and 2,31 tons/ha for slightly round shape. The highest leaf area at 5 WAS and plant dry weight at 5 WAS found in lanceolate leaf shape with populations 125.000 plants/ha. The highest leaf area index 5 WAS and plant growth rate at 3-5 WAS found in lanceolate leaf shape with populations 333.333 plants/ha. The highest net assimilation rate at 5-7 WAS found in oval leaf shape with populations 125.000 plants/h