

RINGKASAN

Kedelai merupakan salah satu komoditas pangan yang memiliki peminat tinggi. Permasalahan utama dalam produksi kedelai adalah minimnya luas tanam dan rendahnya produktivitas kedelai. Salah satu usaha yang dapat dilakukan untuk mengatasi permasalahan tersebut dengan meningkatkan produktivitas kedelai melalui program perakitan varietas unggul. Tim peneliti Laboratorium Pemuliaan Tanaman dan Bioteknologi, Fakultas Pertanian, Universitas Jenderal Soedirman (UNSOED) melakukan persilangan kedelai Varietas Grobogan dan Genotipe asal Nigeria dengan harapan memperoleh varietas kedelai yang berdaya hasil tinggi, berbiji besar dan berumur genjah. Penelitian sebelumnya telah mencapai penanaman generasi kesatu (F_1), sehingga dalam penelitian ini dilakukan pengamatan pada generasi kedua (F_2). Penelitian ini bertujuan untuk : 1) mengidentifikasi pola pewarisan sifat agronomi pada F_2 hasil persilangan kedelai Varietas Grobogan \times Genotipe asal Nigeria, 2) mengetahui keragaman genetik sifat agronomi pada F_2 hasil persilangan kedelai Varietas Grobogan \times Genotipe asal Nigeria, 3) menentukan nilai heritabilitas arti luas pada sifat agronomi dari F_2 hasil persilangan kedelai Varietas Grobogan \times Genotipe asal Nigeria, 4) mengetahui penampilan agronomi populasi Grobogan, Nigeria dan F_2 hasil persilangan kedelai Varietas Grobogan \times Genotipe asal Nigeria, 5) menentukan sifat agronomi yang dapat dijadikan indikator seleksi untuk menghasilkan genotipe kedelai yang berdaya hasil tinggi.

Penelitian dilaksanakan di *screen house* dan Laboratorium Pemuliaan Tanaman dan Bioteknologi, Fakultas Pertanian, Universitas Jenderal Soedirman (UNSOED), Kelurahan Karangwangkal, Kecamatan Purwokerto Utara, Kabupaten Banyumas dan berlangsung pada Bulan Oktober 2018-April 2019. Rancangan yang digunakan adalah Rancangan Acak Kelompok dan *augmented design* dengan 3 blok. Data yang diperoleh dianalisis menggunakan uji *Chi-square*, analisis keragaman genetik, analisis heritabilitas arti luas, dan perhitungan rerata untuk setiap variabel pengamatan. Variabel pengamatan meliputi: tinggi tanaman, umur berbunga, umur panen, jumlah polong total, jumlah polong isi, jumlah biji total, bobot biji per tanaman, bobot 100 biji, bobot brangkasan kering, warna bunga, dan bentuk biji.

Hasil penelitian menunjukkan bahwa pewarisan sifat agronomi pada umur berbunga dan jumlah biji total populasi F_2 mengikuti nisbah (9 : 6 : 1); umur panen, jumlah polong isi, warna bunga dan bentuk biji mengikuti nisbah (3 : 1); jumlah polong total dan bobot brangkasan kering mengikuti nisbah (15 : 1); tinggi tanaman mengikuti nisbah (9:7), dan diduga dikendalikan oleh sedikit gen (*single-genik*); sedangkan bobot biji per tanaman dan bobot 100 biji mengikuti nisbah 1 : 4 : 6 : 4 : 1 dan diduga dikendalikan oleh banyak gen (*poligenik*). Jumlah polong total dan jumlah polong isi memiliki nilai keragaman genetik luas dan nilai heritabilitas tinggi. Penampilan tinggi tanaman, umur berbunga, umur panen, jumlah polong total, bobot 100 biji, dan bobot brangkasan kering populasi F_2 menunjukkan rerata di antara dua tetuanya, sedangkan jumlah polong isi, jumlah

biji total, dan bobot biji per tanaman menunjukkan rerata di atas kedua tetuanya. Jumlah polong total dan jumlah polong isi dapat dipertimbangkan sebagai indikator seleksi untuk menghasilkan genotipe kedelai berdaya hasil tinggi.

Kata kunci : Kedelai, Populasi F₂, Pola Pewarisan Sifat, Keragaman Genetik, Heritabilitas, Indikator Seleksi.

SUMMARY

Soybean is one of the food commodities with the high number of consumers. The main problems in soybean produce are the lack of soybean land and the low productivity of soybean. One of the ways to solve those problems is to increase soybean productivity by breeding the new superior variety. The reasearch team of Plant Breeding and Biotechnology Laboratory, Agriculture Faculty, Jenderal Soedirman University (UNSOED) conducted soybean crossing between Grobogan and Nigeria varieties and expected the new superior variety would have high productivity, large seed, and short age. Prior to this, the research had planted the first generation (F_1). The current research observed the second generation (F_2). This research aimed to : 1) identify the agronomic inheritance pattern of F_2 populations from Grobogan varieties crossed with Nigerian genotype hybridization, 2) determine genetic variance of agronomic traits of F_2 populations from Grobogan varieties crossed with Nigerian genotype hybridization, 3) determine the broad-sense heritability of F_2 population from Grobogan varieties crossed with Nigerian genotype hybridization, 4) determine the agronomic performances of Grobogan, Nigeria, and F_2 populations from Grobogan crossed with Nigerian genotype hybridization, 5) determine agronomic traits which can likely be used as selection indicators to get the soybean genotype which has high productivity.

The research was conducted at the screen house and Plant Breeding and Biotechnology Laboratory of Agriculture Faculty, Jenderal Soedirman University (UNSOED) in October 2018 to April 2019. The design used was Randomized Block Design and Augmented Design with 3 blocks. The data was analyzed using Chi-square test, genetic varians analysis, broad-sense heritability analysis, and average for each characters observation. The characters observed included plant height, flower age, harvest age, number of total pods, number of filled pods, number of total seeds, seed weight per plant, 100 seed weight, dry stover weight, color of flower, and shape of seed.

The result showed that the agronomic inheritance pattern of F_2 populations on the flower age and number of total seeds followed 9 : 6 : 1 ratio, the harvest age, number of filled pods, color of flower and shape seed followed 3 : 1 ratio, the number of total pods and dry stover weight followed 15 : 1 ratio, the plant height followed 9 : 7 ratio and indicating that the traits were controlled by many genes (poligenic), while the seed weight per plant and 100 seed weight followed 1 : 4 : 6 : 4 : 1 ratio and indicating that the traits were controlled by single genes (singlegenic). The number of total pods and number of filled pods had wide gentic varians value and high heritability value. The average performances of F_2 populations on plant height, flower age, harvest age, 100 seed weight, and dry stover weight were between the parents, while the number of total pods, number of filled pods, number of total seeds, and seed weight per plant an average of above the parents. The number of total pods and number of filled pods can likely

be used as selection indicators to get the soybean genotype which has high productivity.

Key words : *Soybean, F_2 Population, Inheritance Pattern, Genetic Varians, Heritability, Selection Indicator.*