

Punyavee Dechkrong 2006: Identification of DNA Markers Linked to Genes Controlling Field Weathering Resistance in Soybean Cross CM60 x GC10848 by Bulk Segregant Analysis. Master of Science (Agriculture), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Prapa Sripichitt, Ph.D. 118 pages.
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Identification of DNA markers linked to genes controlling field weathering resistance in soybean using bulk segregant analysis was conducted by crossing between susceptible variety CM60 and resistant variety GC10848 to produce F_1 hybrid seeds. Thirty-three F_1 plants were grown in the greenhouse and their hybridity was determined using SSR marker. The results showed that all the F_1 plants were true hybrids. The F_1 hybrid plants were selfed to produce F_2 seeds. The 135 F_2 progenies were grown in the greenhouse. Leaves were collected from the 2 weeks old F_2 progenies for DNA extraction. At physiological maturity, seeds were harvested from each F_2 progeny for incubator weathering test and electrical conductivity (EC) test. The remaining seeds were harvested at harvest maturity for determining the percentage of seed coat. It was found that the germination of seeds after incubator weathering varied from 0 to 76 %. The electrical conductivity of the leakage from seeds distributed from 23.05 to 317.00 $\mu\text{S}/\text{cm}/\text{g}$ seed. The percentage of seed coat extended from 7.04 to 19.98 %. By considering the germination percentage, EC value and seed coat percentage, the F_2 progenies were divided into 2 groups; the field weathering resistant group which comprised 14 plants and field weathering susceptible group which composed of 17 plants. The DNA extracted from resistant and susceptible F_2 plants were pooled for polymorphism detection using RAPD and AFLP markers. The results revealed that 33 of the 200 RAPD primers amplified polymorphic bands between parental varieties CM60 and GC10848. The polymorphic markers obtained were used to detect the polymorphism between bulked resistant and susceptible DNA pools, however, no difference could be found between both DNA pools. Using AFLP marker, 53 of 82 primer combinations could amplify 2,846 DNA bands from which 209 bands showed polymorphism between parental varieties. Nevertheless, no specific band for field weathering resistance between the two bulks were observed or DNA marker linked to genes controlling field weathering resistance in soybean was not identified.

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