ABSTRACT

LULUK PRIHASTUTI EKOWAHYUNI. Analysis of Seed Vigor in Relation to Storability of Pepper (Capsicum annuum L.) seed and its Genetic Parameter Estimation. Supervised by: SURJONO HADI SUTJAHJO as the chairman, SRIANI SUJIPRIHATI (alm), MOHAMAD RAHMAD SUHARTANTO, MUHAMAD SYUKUR as the member of advisory committee.

The ability of seed to maintain seed quality during storage is called seed vigor. Selection method for testing seed vigor of pepper seeds is necessary to determine seed vigor in relation to seed storability during the process of marketing and distribution. Seeds were used were species genotype of IPB C9, which is the freshly harvested from pepper (Capsicum annuum L.) collection of the Genetics and Plant Breeding Division, Bogor Agricultural University (IPB). Vigor test methods are natural deterioration test at room temperature in controlled humidity (RH 90-95%) compared to 4 Accelerated Aging (AA) methods using hot water (60ºC), methanol 20%, ethanol 20% and temperature test at 40ºC. This first experiment aimed at accelerated aging methods for testing seed vigor in relation to seed storability of pepper seed. The best method was selected using analysis of variance, coeficient of variance, regression dan t student analysis. Based on these analysis, it was found that AA methods using methanol 20% and time periods of 0, 2, 4, 6 and 8 hours, is the best method to determine pepper seed vigor in relation to seed storability. The second experiment was designed to evaluate rapid ageing methods of methanol 20% for 0, 2, 4, 6 and 8 hours which is the first stage of the experiment results on some of the pepper seeds genotypes including hybrid, non hybrid, local, introduction, and great chili seeds produced in year 2009 and 2010. Seed used was non hybrid seed as much as 4 genotypes of production in 2009 and 4 genotype seed of production in 2010. Hybrid seeds used were 10 genotypes of production in 2009 and 8 genotypes of production in 2010. Data analysis used were analysis of the slope of the regression line which is the angle resulting from the comparison of the ordinate and the axis. Information obtained based on test results of the accelerated aging method by using methanol 20% for 0, 2, 4, 6 and 8 hours, that the shelf life of seed vigor in relation to storability of production in 2009 is better than from the production in 2010. Pepper seeds evaluated, the hybrid seeds, have same seed vigor in relation to seed storability with the non hybrid pepper seeds, as well as seed vigor in relation to seed storability between local vs introduction seeds, and the seed vigor in relation to seed storability of great chili vs chili pepper seeds. The third experiment was to achieve a method of selection in helping pepper breeding programs to produce high seeds vigor in relation to storability. Parents used was pepper seeds are high yielding varieties of pepper seed collections from research by IPB genetic and plant breeding division. There was no maternal effect on pepper seed vigor in relation to storability in power germinated, growth speed and electrical conductivity benchmarks, contrary there was maternal effect in length of radicle and length of hipocotyl benchmarks. Parents with high-affinity values were IPB C15 and crosses with particular value of high affinity and positive heterosis value was IPB C9 x IPB C10.

Keywords: seed vigor, controlled deterioration methods, accelerated aging method, genetic parameter seed vigor pepper.