Generation Mean Analysis of Seed Yield and Pod Per Plant in Azuki Bean Growing on Highland Areas

Weerapun Kunkaew[1*], Suthat Julsrigival[2], Chuckree Senthong[2] and Dumnern Karladee[2]

[1]Royal Project Foundation, 65 Suthep Road, Chiang Mai 50200, Thailand.
[2]Department of Agronomy, Faculty of Agriculture, Chiang Mai University, Chiang Mai 50200, Thailand.

**Corresponding author. E-mail: weerapun@hotmail.com*

ABSRACT

Six basic generations, P_1, P_2, F_1, F_2, BC_1 and BC_2 of one azuki bean cross, Hondawase × Akatsukidainagon, were planted at two locations on the highland area of Chiang Mai province for two consecutive growing seasons. The objective of the study was to evaluate the gene action as influenced by environmental variations on seed yield per plant and number of pods per plant of azuki bean by using the generation mean analysis. Results of the study indicated that there were additive gene effect, dominance gene effect and interaction of both genes effects of these studied traits with environment. This study suggested that seed yield per plant and number of pods per plant were important agronomic characters which highly responded to environmental variations, thus, optimum environmental factors especially low temperature on highland areas should be selected for testing gene action in azuki bean.

Key words: Azuki bean, Gene action, Generation mean analysis, Highland

INTRODUCTION

Gene action of each quantitative trait such as seed yield and its yield components can be evaluated by generation mean analysis. Several models have been developed for analysis of generation mean which described by Anderson and Kempthorne (1954), Hayman (1958) and Gamble (1962). Procedures used to estimate mean and variance of quantitative traits were proposed by using six basic generations which included parents (P_1 and P_2), F_1, F_2 and first two backcrosses (BC_1 and BC_2). Additive (d) and dominance (h) are parameters of gene actions for additive-dominance model. Genotype and environment interaction of generation mean analysis was presented by Mather and Jinks (1982). Some important crops had been reported on generation mean analysis for evaluation of genetic effects of genes controlling quantitative traits such as mungbean (Chaitieng et al., 2003), peanut (Jogloy et al., 1999), wheat (Mullaney et al., 1982; Snijders, 1990), cotton (Quisenberry, 1975; Dani and Kohel, 1989), maize (Landi et al., 1990), tomato (Scott and Jones, 1990) and common bean (Checa et al., 2006). The objective of