

Estimation of Heterosis and Combining Ability in Azukibean under Highland Growing Conditions in Thailand[†]

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ABSTRACT

*Four varieties of azukibean (*Vigna angularis*) were used in a diallel cross without reciprocals to study heterotic performance and combining ability for seed yield and yield components in F1 hybrids at two altitudes (700 m and 1,200 m above sea level) in northern Thailand during the August to December 2003 growing season. Heterotic effects and combining abilities differed between altitudes. F1 hybrids exhibited both negative and positive heterotic effects on seed yield per plant over their mid-parents and better parents which, averaged over the two test sites, were -0.6 to 31.8 percent and -10.7 to 20.5 percent, respectively. Analysis of data for component traits indicated the importance of both additive and non-additive gene effects for number of branches per plant, seed size and seed yield per plant. The only statistically significant interaction with test site involved specific combining ability for seed yield per plant.*

Key words: Azukibean, Heterosis, General combining ability, Specific combining ability, Highland growing conditions

INTRODUCTION

Azukibean (*Vigna angularis* [Willd.] Ohwi and Ohashi) is a new legume crop which was introduced recently from Japan by Royal Project Foundation for farmers to grow on the highlands in northern Thailand. The crop has a very good potential for these areas since the climatic conditions, especially low temperature during the growing season, are similar to those of its place of origin. Research work on cultural practices of azukibean in highland areas was reported by Smutkupt et al., (2004), and on yield stability by Kunkaew et al., (2004), but genetic study of this crop is still quite scarce. As a preliminary breeding program of azukibean, this study is aimed to estimate the heterosis and combining ability of traits of this crop for obtaining the genetic information on the inheritance of traits, to serve as a guideline for improving the well-adapted varieties for highland areas in Thailand.

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