

Combining Ability Analysis of Yield and Yield Components in Azukibean under Highland Conditions of Northern Thailand

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ABSTRACT

*Four varieties of azukibean (*Vigna angularis*) were manipulated in a half-diallel mating design to analyse and estimate combining ability for seed yield and yield components in F1 hybrid crosses at three different altitudes of highland area (1,300 m, 1,200 m and 700 m above sea level) in the north of Thailand during August to December 2005 growing season. Significant across-site effect on general combining ability and its interaction with location effect were statistically evident for yield components such as 100-seed weight and number of pods per plant, indicating that the additive genetic effects were important to the inheritance of these traits and the expression of additive genes was influenced greatly by environments. In addition, specific combining ability effect was statistically evident for seed yield per plant, number of seeds per pod and number of pods per plant, suggesting that non-additive gene effects played the significant roles in the inheritance of these traits but the expression of non-additive genes was slightly influenced by the environments.*

Key words : Azukibean, DIALLEL-SAS program, General combining ability (g.c.a.), Specific combining ability (s.c.a.)

INTRODUCTION

The Royal Project Foundation introduced one famous azukibean (*Vigna angularis* [Willd] Ohwi and Ohashi) variety named “Erimo” from Japan for farmers to grow as a cash crop on the highland area in the northern part of Thailand since 1997. It has been reported that this promising azukibean variety is able to grow commercially under highland growing conditions but variations of grain yields which ranged from lowly- to highly-acceptable level were always obtained by the farmers. This unstable yield performance could probably be due to its narrow genetic base that resulted in expressing adaptive traits of growth and development within a specific range of highland environments. These observations were supported by yield trial results as reported by Julsrigival et al., (2004) and yield stability evaluation by Kunkaew et al., (2004). In order to develop a wider genetic base and create better adaptability for azukibean varieties for highland growing area in Thailand,