

Agronomic traits correlative analysis between interspecific and intraspecific soybean crosses

Qi Yang & Jinling Wang

Northeast Agricultural University

People Republic of China

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Abstract

Two semicultivated (*G.gracilis*) and four cultivated (*G.max*) cultivars were used to make 15 crosses and the resulting F1 and F2 progenies were evaluated for morphological yield and quality characters. The relationship among agronomic characters between intraspecific and interspecific soybean crosses was analyzed. The objective of this study was to compare the difference among agronomic characters between intraspecific and interspecific soybean crosses. Plants derived from crosses involving *G.gracilis* were taller more vigorous had greater seed and pod number /plant lower seed-stem ratio and smaller 100-seed weight than those from intraspecific crosses. In interspecific crosses taller and more vigorous plants had close association with lower seed-stem ratio. The correlations of 100-seeds weight with the duration of developing stage were in the opposite direction to those with seed and pod number/plant. The correlation of protein content with developing stage were in the opposite direction to that of oil content. It is suggested that it was difficulty to select plants both higher in protein and in oil content derived from interspecific crosses.

Introduction

Soybean breeding still depends on a relatively narrow bases of genetic resource because of soybean genetic improvement have been mainly made between adapted varieties and lines. Delannay (1983) studied the pedigree of 158 soybean cultivars which coming from U.S.A. and Canada. He found that 10 introduced germplasm provided 80% soybean genetic contribution in the North of American while only 7 cultivars gave the same genetic

contribution to the South of soybean cultivars. In addition soybean cultivars in North American originated from only 6 cultivars among which 5 from Northeast of China 1 from Japan. Hromoto (1986) reported that only 11 varieties provided 89% soybean genetic contribution to Brazil soybean varieties. Zhang (1985) reported that 10 varieties provided 65%-75% genetic contribution to 200 soybean cultivars pedigree. Zhang (1985) reported that soybean varieties in Heilongjiang province originated from a few ancestors varieties 'Man Ching Jin' 'Zhi Hua 4' and et al. Moreover 59.3% varieties from 'Man Chan Jin'. In addition two varieties 'Huang Bao Zhu' and 'Bai Mei' provided 66.23% cytoplasm of soybean varieties. In ShangDong province 66% varieties came from variety 'Qi Hung 1' (Li et al. 1987). It is obviously that the soybean varieties genetic bases were narrow almost all over the world.

Wild soybean is of great interest as a potential genetic resource to increase the genetic diversity of soybean varieties (Wang et al. 1982). In order for soybean breeders to make the most effective use of wild or semi-wild soybean germplasm it is important to understand the relationship among agronomic traits. However little is done about comparison the relationship between the interspecific and intraspecific soybean crosses. The primary objective of the research reported here were to ascertain the correlation among agronomic traits between intraspecific and interspecific soybean crosses.

Materials and Methods

15 crosses were made between two semicultivated, two early released indeterminate and two currently released semideterminate soybean varieties. The six parents were planted at the same year. Approximately 31 seeds and 155 seeds from each F1 and F2 crosses were planted in 1 and 5 rows plot 3 m long with three replication respectively. Individual plants developing stage in F2 population were taken notes by visual examination according to Fehr and Caviness (1977). A total of 60 and 350 F1 and F2 plants from each cross were sampled for testing morphological characters yield traits oil content and protein content respectively.