

### Variation in the Chinese adzuki bean germplasm

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A core germplasm of 231 adzuki beans (*Vigna angularis*) representing 3,946 Chinese accessions originating from north to south China, was grown at four locations in China in 1998. Traits recorded were plant height, flowering, maturity, grain yield and yield components. These traits varied in their correlation with latitude of origin of accessions according to the geographic location where evaluated.

This study applies three-mode pattern analysis methodology, the joint use of clustering and ordination techniques, to the data to effectively describe the response patterns across environments and across attributes in order to allocate accessions into relatively homogeneous groups so that the response patterns for groups of accessions provide a simplified description of the individual data. The aim is to identify and describe the underlying patterns in an efficient manner. These pattern analysis procedures are hypothesis-generating rather than hypothesis-testing techniques.

Pattern analysis of phenology, yield and yield components, and plant height data identified six accession groups with varying levels of cohesiveness. Greatest diversity occurred in the germplasm from the provinces of the lower Yellow river basin in mid-north China, with a geographic overlap of the accession origins in four of the groups. These differed in maturity, height and seed size. The other two groups came respectively from south China (Sichuan - Anhui) characterised by late maturity and small seed size, and from north China (Liaoning - Heilongjiang) characterised by earliness and short habit. Only the latter group matured at Heilongjiang before winter.

The multi-location screening provided genotype × environment characterisation of the accession groups, and a capability of predicting the most suitable groups for specific target environments and breeding objectives. This approach enables a more efficient and effective use of germplasm by plant breeders.