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"Solidarity in a competing world — fair use of resources"

Quantitative Genetic Variation of Autofertility in Faba Bean (*Vicia faba* L.)

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Abstract

Faba bean, a grain legume, is an important crop which provides rich protein nutrition for human and animal. The reproductive mode of faba bean is a partially allogamous, which means both self- and cross-fertilisation occur. However, faba bean has a constraint in potential yield due to lack of autofertility combined with lack of pollinators. Autofertility is the ability of a plant to self-fertilise without pollinators and without manual stimulus of fertilisation. The purposes of the current experiment are to study the genetic variability of autofertility in-detail and to identify QTLs (Quantitative Trait Loci) which are responsible for this trait in faba bean. 189 homozygous lines of Göttingen winter faba bean population together with 11 control lines were used in the experiment. The study was carried out using tripped and un-tripped treatment in bee-isolation green foil house. Tripping was conducted as mechanical stimulus to assist fertilisation which in the experiment was manually conducted by hand. The trial was randomised by lattice design experiments with 2 replicates in three years of experiment. Rate of fertilisation and some reproductive characters were observed in the study. Genotyping was conducted using 1322 polymorfic markers of AFLP and SNP. The results showed that tripping significantly increased the rate of fertilisation. The genotypes were varied in some reproductive characters for tripped and un-tripped treatment. Large variation of rate of fertilisation which found in un-tripped treatment indicates that each genotype has its own ability in self-fertilisation. Several significant putative markers for QTL connected to reproductive characters were identified.

Keywords: Autofertility, faba bean

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