

B.Sc. thesis project

Topic: Genetic variation among selfed offspring of a set of 12 faba bean (*Vicia faba* L.) individuals

Faba bean is a **partially allogamous** crop. It naturally both self- and cross-fertilizes in population. When an individual self-fertilizes, for all its heterozygous loci, its offspring will be $\frac{1}{4}$ homozygous for the one allele, $\frac{1}{4}$ homozygous for the other allele, and $\frac{1}{2}$ heterozygous due to segregation. When a gene responsible for genetic variation of a trait is heterozygous in the parent, it brings **phenotypic variation** among the selfed progeny for this specific trait.



The Göttingen Winter Bean Population is a faba bean population, created in 1989 from 11 founder lines. We recently propagated through selfing **12 individuals** from that population. We work with **30 offspring** from each of the 12 individuals, thus **a total of 360 individual plants**.

Each offspring was sown in pot in mid-February 2024 in foil house and will be kept there to prevent the risk of frost, until mid-April. Then, the pots will be sunk into the soil in the field following a **randomized complete block design (RCBD)**.

The student (you) take care and maintain the plants by e.g. binding them to bamboo sticks as stakes, and you phenotype each plant individually by assessing **plant height, beginning of flowering, thousand grain weight and yield**.

Eventually, these phenotypic variance of these genotypes and their traits will be analysed; we will use this to calculate means and variances of the 12 progenies for each trait to check their correlation with the proportion of heterozygosity in the initial parents and further test standard hypotheses about heterozygosity and segregation, important parameters for modern plant breeding.

The project will be supervised by M.Sc. Henri Laugel and apl. Prof. Wolfgang Link.