



State of Breeding Research in the "Göttingen winter bean population" (*Vicia faba* L.)



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Göttingen winter bean population

Based on 11 components (German, French and English)

started in 1989, natural selection since then

Intensive research work since 1997

Out-crossing rate

Experiments on out-crossing were conducted in 1999 and 2000.

Hilum color was used as morphological marker (cf. photo).

The method used by Fyfe and Bailey (1951) was applied to estimate C (cf. eq. 1)

$$C = 4r_N^H + 2h_N^R - 1 \quad C = \text{Out-crossing in \% [eq. 1]}$$

$$q = 1 - \frac{h_N^R}{C} \quad q = \text{Frequency of recessive marker allele [eq. 2]}$$

r_N^H = Frequency of the homozygous recessive plants in the offspring of heterozygous mothers

h_N^R = Frequency of the heterozygous plants in the offspring of the homozygous recessive mothers

Jackknife (Wier, 1990) was used to estimate the Standard error of the means.



Degree of out-crossing in 1999 and 2000

Locations	years	N*	Out-crossing rate
Göttingen	1999	247	62.4%±7.4%
Hohenlieth	2000	118	53.88%±0.08%
Göttingen	2000	139	61.55%±0.04%
Oberer Lindenhof	2000	37	66.02%±0.16%

*Number of individuals tested for degree of out-crossing

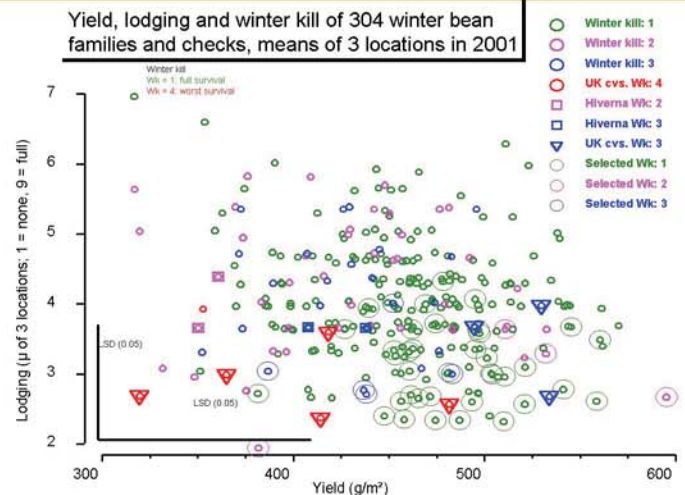
Population performance

In 2001 yield trials were conducted at three locations (Hohenlieth, Göttingen and Oberer Lindenhof), N=304.

English cultivars were used as checks.

English checks were less winter hardy compared to the better part of the "Göttingen winter bean population" (cf. Figure)

Yield, lodging and winter kill of 304 winter bean families and checks, means of 3 locations in 2001



Conclusions

Out-crossing rate of the population is relatively high compared to the summer beans at Göttingen (56 % in 1989 and 50.3 in 1990, Link et al. 1994).

These results are firmly in favour of developing synthetic and hybrid cultivars from the available material. Research is continued.

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