

## Developmental attributes of fababeans for northern New South Wales

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Fababeans (*Vicia faba* L.) are being investigated for their suitability in northern N.S.W. Guidelines for sowing time and plant density have been established, but data on growth and development are lacking, and will be needed so that desirable ideotypes can be defined and strategies for improvement developed. This paper reports observations made on flowering and pod set of fababeans, their influence on grain yield, and the sensitivity of development to temperature.

### Methods

Work was carried out at Tamworth Agricultural Research Centre. A glasshouse trial involving 50 entries and sown mid-May was used to study relationships between flowering and pod set under short days. Field experiments comprising a preliminary yield trial with 30 entries of differing maturity, and two sowing time experiments with the cultivar Fiord, and Fiord plus three accessions were used to study relationships between grain yield and development and the influence of mean temperature on phase duration. Sowing times varied from May to August 1981 and May to June 1983. Phases studied were 'sowing to first flower' and 'first flower to first pod black'. Trials in 1981 were irrigated, and rainfall in 1983 was non-limiting.

### Results and Discussion

Flowering and pod set. - Early maturity lines originating from the Middle

East, Mediterranean and North Africa flowered from the 7th or 8th node onwards, and set first pods at these nodes or one higher. In late maturing genotypes such as those from northern Europe, the data diverged. Some lines produced first flowers at low nodes but failed to set pods until much higher nodes, while others produced both their first flowers, and pods at high node positions. In only the earliest material was the time of flowering deemed useful as a measure of maturity, with preference given to the time of first pod set.

Grain yield and timing of pod set. - Early maturing lines sown in the field during early May set pods in the middle of August. Grain yield in a trial with 30 entries declined on average by 12% per week that pod set was delayed after mid-August. This trend was reinforced in the two sowing time trials in which grain yield declined on average by 16% and 6% respectively for each week that pod set was delayed after mid-August.

Phenology and temperature. - The large effect of varying sowing time on the date of flowering and pod set of early cultivars such as Fiord could be assigned largely to temperature. The durations of the phases 'sowing to

first flower' and 'first flower to first pod black' were highly and negatively correlated linearly with the mean temperature of the phase ( $r$ 's = -0.83, and -0.95 respectively) over the range 10°C to 18°C. Slopes for each phase were similar and showed that duration was shortened by about 6 days per degree increase in mean temperature.

In conclusion, it is clear that large variation exists in maturity among fababean genotypes. This probably operates through control by photoperiod, but the development of early varieties may not be greatly influenced by photoperiod, temperature playing the major role. Delay in commencement of pod-filling because of late sowing or late genotypes shortens the pod-filling phase, reduces pod number, and forces pod-filling into a period when rust (*Uromyces viciae-fabae*) may become severe, and grain yield is therefore reduced.

