
 Book Reviews

Thompson, R. (ed.): *Vicia faba*, Physiology and Breeding. Series World Crop: Production, Utilization and Description, Vol. 4. The Hague: M. Nijhoff 1981. 358 pp., Hard bound Dfl 105.—.

Since the mid-seventies the interest in the field bean (*Vicia faba* L.) has markedly revived. A particular reason for this is the concurrence of farmers' economic concern (increasingly expensive N-fertilizer, problems with crop rotation) and an interest in macro-agricultural policy (a desire to raise the degree of self-supply in the EEC member-states with regard to the plant protein incorporated on a large scale in concentrated feed by the mixed feeds industry). The growing cost of concentrated feed has caused the farmer to increase the proportion of roughage in indoor-feeding. In this, maize silage has been used to a large extent, mainly as a source of starch. Field beans, which were harvested only on a small scale as a forage and silage crop in The Netherlands for some years, have earned again a fine reputation as a roughage that is rich in protein. It is now to be expected that field beans will occupy a modest place alongside maize in intensive cattle farming. One further reason is their ability, like it is with maize, to endure great amounts of semi-liquid manure without great difficulty.

It was mainly an agricultural-political consideration which, after the sudden exorbitant increase in price of soja at the beginning of the seventies, led the European Committee to stimulate research into field beans. With the exception of a few cases field bean research in West-Europe had been allowed to decline, or even stopped. An EEC Seed Legume Group was formed which met for the first time in Padua, Italy, in the spring of 1976. After further meetings in Dyon (France) and Stuttgart-Hohenheim (Germany) in 1977, the European Committee initiated the publication of a Proceedings, beginning in 1978 (Bari). The main topics of the Bari-conference were *Orobanche* and *Aphis fabae*, research on *Vicia faba* in Italy, reports on breeding work in *Vicia faba* and physiological studies and *Rhizobium*. In 1979 feeding value, processing and viruses were the main topics at the meeting of the work group in Cambridge.

The book under review contains the proceedings of the work group's meeting in Wageningen in 1980. Considering the need for improvement of yield stability, it was a good choice to take physiology and breeding for leading theme. The question about yield in field beans may perhaps be best phrased as follows: why does the field bean achieve its yield potential so seldom, reaching on an average barely half of what the crop should yield (in West-Germany at present about 3,000 kg/ha)? To help breeders choose the right approach to this problem, biologists should try to find out why the plants fail to come up to standard. This book offers some guidelines but also shows that the final words have not yet been said. That a good water supply is essential is by

itself nothing new. Further research will have to show if there are varietal differences in drought tolerance and if these can be utilized in breeding. The contribution of Thompson and Taylor clearly indicates the importance of an adequate supply of light for the crops to yield well. For yield stability the effects of genotype \times environment interaction are important. Le Guen and Berthelem reach the conclusion that the highest yielding varieties are also the most stable, which implies that breeding for yield as such also contributes towards a solution of the problem of yield stability.

A controversial point is also the question: which plant model offers the best safeguard against low yield? The determinate type continues to draw attention. This is based on the (as yet unproved) idea that the podless top causes unnecessary use of assimilates. One may ask whether it is not too early to totally accept Austin's suggestion of selecting determinate varieties having an increased number of tillers which develop synchronously with the main shoot. Further research must first prove that these plant types are the right answer to competition between vegetative and generative development resulting often in a grain yield level lower than possible.

A very interesting question is also: how far can the phenomenon of heterosis be used to bring the average yield to an acceptable level? Closely related to this is the question: which type of variety can best be aimed at? Since it becomes more and more clear that the F_1 -hybrids will not be among the possibilities, people are also thinking of 'synthetic varieties', which is a questionable term, because in most cases the minority of the seeds produced results from cross-fertilization and the components will not in all cases be tested for general combining ability. Moreover, for maximum heterosis one would have to combine genetically different components into a variety. This could come into conflict with the homogeneity required for registration. Further, Von Kittlitz suggests caution in the extensive use of synthetic populations because he could not show any indication of heterosis in plant yield under conditions of open pollination.

The last part of the proceedings is devoted to flowering, pollination and pod/seed set problems. Contrary to what the title of the book suggests, two contributions deal with the 'leafless' pea.

The proceedings mark a period in field bean research that is characterized by both a (renewed) recognition of a great number of problems in the cultivation and breeding of this crop and an admission that we know too little as yet for a proper solution. If the above arguments to re-introduce the field beans are taken seriously, physiological and breeding research must be given adequate time and space to find out which factors are decisive for a realization of the yield potential and how these factors can effect the development of new varieties.

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