# Book review

E. Drijfhout, 1978. Genetic interaction between *Phaseolus vulgaris* and bean common mosaic virus, with implications for strain identification and breeding for resistance. Agric. Res. Rep. (Versl. landbouwk. Onderz.) 872 (also: Doctoral thesis, Wageningen). VII + 98 pp, 14 figs, 41 tabs. Price Dfl 25.

So far, communication on strains of the widespread aphid-borne and seed-borne bean common mosaic virus and on results of breeding for resistance to the virus has been difficult. Earlier attempts by plant virologists at improving communication by international cooperation and by standardization of a range of differential bean cultivars failed because of lack of knowledge on the genetic make-up of differential cultivars and their purity.

The author's extensive knowledge of the genetics of common bean and his detailed research on the genetic interaction between bean and bean common mosaic virus has now led to an important breakthrough.

Testing of ca. 450 bean cultivars originating from 36 countries with 8 strains of the virus representing the total variation in pathogenicity resulted in the distinction of 11 resistance groups of bean. Subsequent testing of representative cultivars of these 11 groups with the 22 virus 'strains' described in the literature allowed the distinction of 10 pathogenicity groups and subgroups of the virus. Hence, the total number of known strains could be reduced to ten. For their identification a range of 11 differentials, each representing one resistance group, appeared sufficient.

Twelve differentials were intercrossed and their F1 and F2 tested with most of the virus strains for a genetical analysis of resistance in bean. Seven genes were distinguished: a necrosis gene I, already known from the literature, and responsible for the black-root syndrome five strain-specific resistance genes bc–1, bc–$1^2$, bc–2, bc–$2^2$ and bc–3, and a strain-unspecific gene bc–4, complementary to the strain-specific ones. Genes bc–1 and bc–$1^2$ were allelic, as were bc–2 and bc–$2^2$. The four strain-specific genes bc–1 to bc–$2^2$ had a gene-for-gene relationship with four pathogenicity genes, postulated to be present in the virus strains. Gene bc–3 had not been overcome by a corresponding pathogenicity gene. Two bean genotypes were developed with resistance to all known strains.

The gene-for-gene relationship described here is the best documented one described for a virus host-plant relationship so far.

Seeds of differential cultivars are now available for distribution. This standardized range of differentials will enable the reliable recognition of the known strains and will help in terminating the existing confusion. It will also increase predictability of the behaviour of cultivars when sown elsewhere.

These results make this publication in English (with Dutch summary) of great value to all interested in bean and virus genetics, strain identification and virus control.

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