

Differences in the self- and cross-fertilization ratio of raspberry cultivars

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Red raspberry, *Rubus idaeus* L., cultivars are self-fertile. However, wild *Rubus idaeus*, like most other Rosaceae crops as apples or cherries, is self-sterile. Rosaceae self-sterility system is a gametophytically controlled self-incompatibility, with an RNase SI mechanism.

In this study, 20 seedlings from open pollinated mother plants were genotyped with up to 17 SSR markers via capillary electrophoresis to compare the extent of self- and cross-fertilization of 16 raspberry cultivars. The marker profile of the progeny was compared to that of the mother cultivars to determine self- and cross-fertilization in these 320 samples.

There is a range of self- and cross-fertilization in the 16 cultivars assessed, from all progeny self-fertilized in 'Dorman Red' to none of the progeny self-fertilized in 'Rumla'.

Allele mismatches occurred with five markers in the cultivar 'Preußen', where both alleles between progenies and mother cultivar were different. As the samples used for positive controls were taken from the testing station of the Federal Plant Variety Office in Wurzen, not from the original field where the fruit was

collected from, a cultivar mix-up or somaclonal variation could have occurred.

These results coincide with a previous study, where six raspberry cultivars of up to six different origins were tested for trueness-to-type by DNA fingerprinting with 16 SSR markers. Nine out of 33 samples turned out not to be true-to-type, which, although a small sample size, still raises awareness of a problem in raspberry trade that could be of a bigger extent than previously assumed.

The two cultivars at the two extremes of the spectrum were hand pollinated to study seed set with self- and cross-fertilization. Seed set of 'Rumla' is significantly higher in cross-pollinated fruit, while with 'Dorman Red', seed set is significantly higher in self-pollinated fruit.

This study delivers new information about the natural propensity of self-fertilization in 16 raspberry cultivars; self-fertilization is tolerated differently from cultivar to cultivar. This can be an important information for growers, as raspberry production increasingly takes place in protected growing.