

INDUCED MUTATIONS IN APPLE AND SOUR CHERRY CULTIVARS*

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The project was started in 1968 and it was focussed originally on obtaining compact type mutants in apples with the help of gamma-ray treatment.

As compared to similar studies conducted elsewhere, lower doses of irradiation were applied. Dormant irradiated scions were topworked on mature apple trees. The details concerning the methods applied as well as the preliminary results obtained were published in 1973.

In spring 1973, the project was expanded and the following new lines of work were added:

- / I / gamma-ray treatment of sour cherry dormant scions aimed at developing compact type mutants.
- /II / chemical mutagen treatment of root cuttings of cherry and apple.
- /III/ the effect of bud position on the occurrence of mutations in apple.

As there was insufficient information on the reaction of sour cherry to gamma-ray treatment, a pilot experiment was conducted in which the treated scions were placed in a greenhouse for about six weeks to determine the mortality rate of the buds. The results of that experiment served as a basis for determining the dose which was applied to the scions, which, following the treatment, were grafted on nursery stock. The procedures applied, the results obtained so far and the difficulties encountered are discussed in detail.

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On a theoretical basis, one can expect that mutagene treatment of undifferentiated tissues, such as the ones occurring in roots followed by forcing differentiation of shoots might lead to obtaining homogenic mutants. To prove this hypothesis a series of experiments were conducted in 1973 and in 1974 using both the gamma-ray treatment and chemical mutagenes. Lack of information on a reaction of fruit tree roots to mutagene treatment raised several methodological questions. The experiments conducted so far were aimed primarily at solving some of those questions. Among others it was found that the root tissues are much more sensitive to mutagene treatment than the shoots of fruit trees. Also handling the roots prior to treatments presented some difficulties. The results obtained so far seem to indicate that the concept of the experiments was correct although there still are methodological questions to be answered. Further details, as previously mentioned, are discussed in the paper.

The 1973 results suggest that the position of a bud on apple shoot has no significant effect on the occurrence of the compact type mutants.