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Application of mutagenesis in important varieties and evaluation of new clones

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Abstract: The objectives of the Geisenheim mutation breeding programme is to enlarge the spectrum of genetic variation for selection of improved clones in a limited number of characteristics. 1- year-old grafted vines were treated with X-rays and fast neutrons during dormancy just before bud burst. Rootstocks and base of the grafted vines were shielded. Among varieties irradiated with 2-6 kR were the following: White Riesling clone 239-25 Gm, White Riesling clone 110-18 Gm, Müller-Thurgau clone 6-8 Gm, Ruländer (Pinot gris) clone 2 Gm, Blauer Spätburgunder (Pinot noir) clone 20 Gm and Silvaner, Gewürztraminer, Chardonnay and Trollinger (most Geisenheim clones). Grafted and rooted vines were found to tolerate higher doses of radiation than unrooted cuttings. In M_1V_2 many chimeric and non-chimeric variant shoots could be observed.

Stable periclinal chimeras were obtained in White Riesling and Trollinger after irradiation. Out of irradiated Ruländer, mutants of Weisser Burgunder (Pinot blanc) type were selected. In another experiment using 1500 rad of fast neutrons, mutants with the characteristics of Blauer Spätburgunder (Pinot noir) were found. Within progenies of irradiated Blauer Spätburgunder early ripening types with dark skin berries were discovered. After microvinification some of them were scored to produce better wines. Some new mutant clones under evaluation show interesting properties with regard to stem rot, berry botrytis, yield and quality. The best new mutant clones of White Riesling, Müller-Thurgau and Pinot noir are already in propagation for further evaluation.