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SCANDINAVIAN MUTATION RESEARCH DURING THE LAST NINETY YEARS –A HISTORICAL REVIEW

In 1928, the Swedish geneticists Hermann Nilsson-Ehle and Åke Gustafsson started on their idea for the first experiments with induced mutations using a diploid barley crop. They started with X-rays and UV irradiation. Soon after the first chlorophyll mutations were obtained and followed by the first 'vital'mutations 'Erectoides' . Several other valuable mutations were considered as early maturity, high yielding, lodging resistance and characters for barley architecture. The experiments expanded with other different types of irradiation, followed by chemical mutagenesis starting with mustard gas and concluding with the inorganic sodium azide. The research brought a wealth of observations of general biological importance, irradiation problems, difference in the mutation spectrum and directing mutagenesis. This research was non-commercial even if some mutants have become of important agronomic value. Its peaks of activities were during the fifties, sixties and seventies, and barley was the main experimental crop. About 12000 different morphological and physiological mutants with a very broad biodiversity were brought together and are incorporated in the Nordic Gene Bank. Several important mutant groups have been analysed in more detail genetically, with regard to mutagen specificity and gene cloning. They are: 1. Early maturity mutants (Praematurum), 2. Six-rowed and intermedium mutants, 3. Mutants affecting surface wax coating (Eceriferum), 4. Mutants affecting rachis spike density (Erectoides), they will be presented in more detail. Since the work with induction of mutations began, it was evident that mutations should regularly be included in breeding programs of crop plants. In Sweden direct X-ray induced macro mutants have been released as cultivars, several ones are used in combination breeding and successfully released as cultivars. The importance for breeding will be discussed in more detail.

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