Contribution ID: **284** Type: **Poster**

PBG Test Text

TEST Text. Whether spontaneous or induced, mutations generally are a result of large-scale deletions, inversions or translocations of chromosomes, or from point mutations (a type of mutation that causes a single change, insertion or deletion of the genetic material) in the DNA. Physical mutagens most often result in chromosome changes and larger DNA deletions while mutagenic chemicals typically cause point mutations. The degree of mutation also depends on the tissue and the time and dosage of exposure. DNA mutations are generally of the most interest to breeders. However, mutations that alter chromosome structure to increase the number of recombination events (the production of offspring with combinations of traits that differ from those found in either parent) and break undesirable linkages are also extremely valuable.
Physical mutagens, mostly ionizing radiation, can increase the natural mutation rate by 1,000 to 1 million fold, and have been widely used to induce heritable genetic changes. More than 70 per cent of induced and released mutant crop varieties have been developed using physical mutagens. Since the 1960s, gamma rays have become the most commonly used mutagenic agent in plant mutation breeding.
Seeds or other plant propagules (such as pollen, spores or stem cuttings) are typically treated for seconds or minutes with a cobalt-60 source, or are irradiated in X-ray machines. Whole plants or seedlings can also be irradiated, either in a gamma greenhouse or a gamma field. This process is called chronic irradiation. If the resulting mutations are not repaired by the cell's own repair mechanism, a heritable mutation has been generated.

Plant breeding can enrich the nutritional properties of edible crops, and among the tools available to plant breeders, induced mutation (using radiation) is highly efficient in altering the genetic constitution of plants.

please see additional comments

Country or International Organization

TEST

Author: Prof. SPENCER LOPES, Maria Madeleine (IAEA consultant)

Co-author: Ms ALLAF, Katayoun (Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, NAFA)

Presenter: Prof. SPENCER LOPES, Maria Madeleine (IAEA consultant)

Track Classification: Contribution and impact of mutant varieties on food security