radiation techniques improve rice

Rice is the staple diet for roughly half of mankind. Higher yields and better grain quality, therefore, are of global importance.
Plant breeders have demonstrated in recent years that by improving the genetic component, and appropriate application of good agronomic techniques, yields can be multiplied.
The genetic potential with regard to other important characters like early ripening, nutritional value, milling and cooking quality, disease resistance, etc. is still to be exploited.

New strains of rice recently developed by radiation treatment of seeds show promise of higher yield and earlier ripening than the best available rice varieties. Further trials are at present being conducted in Asia.

Induced mutations are an important complementary and often unique approach to further improvement of rice varieties.

(1) They are capable of conferring specific improvements to varieties without otherwise significantly affecting their performance, and the time required for such specific improvement is shorter than if hybridization were used.
(2) They represent the only possible method of creating a character which is not found in the natural population and their use is often the easiest and quickest method if the desired character is part of an undesirable genotype.
(3) They offer a method of breaking tight linkages, producing translocations for gene transfer, and are an invaluable tool for genetical and cytological studies of the rice crop.

Rice breeders in many countries, particularly in Asia, have been collaborating since 1965 in a coordinated research programme sponsored by the Food and Agriculture Organization of the United Nations (FAO) and the IAEA, under the auspices of the International Rice Commission, selecting superior types from among mutations induced by radiation. (See IAEA Technical Reports Series No. 131).

A large number of improved strains has already been developed and was tested in the Philippines, Sri Lanka, India, Pakistan and Bangla Desh. Three of these have been found so good that they have been released to farmers. At least five other improved varieties are expected to be released this year. The aim of the breeders was primarily to shorten plant height to make the stem stronger, to reduce the time required to grow the crop, and to increase yield.

A high-yielding rice mutant line, MI 273 (m) being checked by a field technician in Sri Lanka.

Scientists at the International Rice Research Institute in the Philippines point out that further testing must still be carried out at several sites in order to discover whether strains which show promise are truly superior to their 'parents' in terms of their yield performance, also under different environmental conditions.

In 1966, the first radiation-induced mutant variety of rice, Rei Mei, was developed in Japan. It has become one of the highest yielding varieties of rice in that country.

The IAEA's work on the breeding of rice mutants is centred at its laboratory at Seibersdorf in Austria, which is made available to the joint FAO/IAEA division. Extensive use is also made of research contracts, and international symposiums and working groups held to co-ordinate their work.