



# nuclear science for Food Security

For decades the IAEA, in partnership with FAO, has assisted its Member States in producing more, better and safer food. In plant breeding and genetics, its expertise is helping achieve enhanced agricultural output using nuclear technology around the world.

The pictures that follow show some of the crops developed through nuclear technologies. They help provide much needed food as well as millions of dollars in economic benefits for farmers and consumers, especially in developing countries.



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Canada's Linola mutant series of linseed contains reduced levels of linolenic and raised levels of linoleic acid making it similar to traditional sunflower oil and therefore suitable for human consumption. Linola accounts for about 10% of all flax/linseed grown in Canada, a major flax producer.

Turkey's chickpea mutant was successfully released with enhanced yield potential, higher seed protein, early maturity and resistance to blight.

In Egypt, three mutant varieties of high-yielding, disease and insect resistant sesame are bringing higher economic returns than standard varieties.

The USA's grapefruit variety 'Rio Star', with its characteristic bright red coloured flesh, now accounts for 75% of the highly lucrative US grapefruit production.

Pasta, Italy's favourite food, is made with mutant varieties of durum wheat and contributes tens of millions of dollars each year to farmers' incomes.

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# FOODS



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In China, up to 2005, a total of 638 mutant varieties of 42 plant species were released, covering nine million hectares of planting area. Increased cereal production brings economic benefits of roughly \$420 million a year.



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In Peru's high Andes, stronger, healthier varieties of barley grow at altitudes of up to 5000 meters, producing harvests of some 1200 kilograms a hectare. This is an increase of 50% against earlier levels, which translates to roughly \$9 million a year.

Ghana's Cassava variety 'Tek Bankye', with improved cooking quality, was released to wide acclaim. Trials are underway to produce higher-yielding, disease resistant cassava, with improved starch content.

India's mutant groundnut series 'TAG' has early maturity, high pod growth and greatly improved harvest rates. Total domestic seed sales amount to 132 000 tons and cover 6.5 million hectares.

In Pakistan, a mutant producing better quality and higher yielding crops quadrupled cotton production within 10 years of release (1983-1992), and now accounts for 70% of all cotton grown in the Punjab. Economic contribution: \$20 million a year.