



# IAEA

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## ***Breeding salt-tolerant rice, Pakistan***

### ***The challenge...***

Rice is an important cereal crop in Pakistan, forming part of the local staple diet. As an export crop, it earns the country some \$42 million annually. However, rice cultivation is constrained by salinity. About 2.7 million hectares of cultivated agricultural land are affected by this problem, and the area is increasing at a rate of 3% per year. Plant breeders have released a rice variety that withstands high salinity levels, but the severity of the problem demands more intense efforts on rice breeding, emphasizing salinity tolerance. Moreover, because rice farming normally follows wheat cultivation, the development of early-maturing rice is also necessary. The new varieties should also be resistant to disease and insect pests.



### ***The project...***

The project aims to induce mutations in semi-dwarf non-aromatic rice varieties to achieve salt tolerance, high grain yield, good grain quality, early maturity and resistance to insect pest and disease. Mutation techniques have the advantage of being able to develop improved germplasm with the desired traits in a shorter time period, as compared with cross-breeding. Radiation-induced mutations will therefore play a valuable role in developing salt-tolerant rice varieties with early maturity for wheat-rice cropping systems. Nuclear techniques, synergized with improved screening techniques for salt tolerance, can help realize the project's goals.



### ***The impact...***

The project has yielded seven salt tolerant mutants. These will help to enhance food security in Pakistan, and will sustain and possibly increase rice production in saline areas. The new mutants are expected to have a beneficial effect on the economy by improving the competitiveness of local rice which is exported to other countries. The farming sector will also gain from improved crop productivity of rice-rice and rice-wheat cropping systems.

*PAK5042: Induced mutation to improve salt tolerance in non-aromatic rice varieties.*

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