

Meeting the challenges of food security with induced mutation breeding of crops in ARASIA States Parties

The challenge...

Wheat and barley are among the most important crops for food security and sufficiency in the ARASIA (Co-operative Agreement for Arab States in Asia for Research, Development and Training related to Nuclear Science and Technology) region. However, despite advances in increasing crop yields, several biotic (disease and pest) and abiotic (drought) factors are limiting productivity. New varieties of wheat and barley with higher and more stable yield potentials, superior quality and multiple resistance to disease and insects are needed. The ARASIA countries have recognized the prime importance of developing improved varieties of food crops through the application of mutation techniques.

Using mutation induction to create useful new germplasm and to develop new cultivars is a profitable approach to produce these weather resistant crops. If desired traits are to be enhanced and mutant varieties with high yield, quality and stress tolerance are to be developed, while taking climate change into consideration, various valuable mutant germplasms must be generated, identified and used.

The project...

An IAEA technical cooperation project aimed at improving regional partnerships in the field of mutation induction to enhance the breeding of wheat and barley. Eight training courses (116 participants), nine fellowships and nine scientific visits were arranged, contributing to capacity development in:

- Survey, storage, multiplication and distribution of high potential wheat and barely plant material;
- Implementation of the Standard Material Transfer Agreement;
- Mutation induction and breeding;
- In vitro techniques.

The impact...

- A high level of farmer participation in this project (337 farmers).
- New germplasm for promising and advanced mutant lines/cultivars have been developed for the production of improved varieties or as pre-breeding material: 275 Durum wheat lines, 60 Bread wheat lines and 119 Barley lines.
- Lebanon, Oman and Saudi Arabia have also fostered national breeding programmes.
- Increased capacity development in mutation induction and breeding.
- Improved knowledge and skills for future endeavours to enhance crop productivity and food security in the region.



*Farmers participating in the selection of barley mutants in Kawkban, Yemen.
(Photo: Mr. Abdulwahed Saif).*



Smallholder farmer selecting mutant lines to be advanced for national yield trials and possible release as a variety.