



IAEA

Atoms for Peace: The First Half Century

1957-2007

Increasing productivity in barley crops and native varieties of grain, Peru

The challenge...

According to national statistics, some 49.6% of the population of Peru lives in poverty or extreme poverty. Three million of these individuals live in rural highland areas. Close to 70% of the national production of barley is used for human consumption in the highlands. Kiwicha, a native crop variety, is a highly nutritious staple food.

The project...

The project set out to increase the food supply and income of farmers in the Andean highlands of Peru through mutation breeding and the selection of improved barley and native crop varieties, such as Kiwicha. The project provided barley (*Hordeum vulgare*) and kiwicha (*Amaranthus caudatus*) mutant cultivars to the agricultural communities of the Andes.

The impact:

The improved crops are producing larger quantities of food. By strengthening the agricultural sector in the highlands area, the very high rates of unemployment are being addressed.

Quantifiable data...

- The use of a mutant barley cultivar and of seven other varieties developed through other methods has raised crop yields at the national level from 855 kg/ha in 1978 to 1283 in 2006.
- The project produced one mutant kiwicha cultivar with high yields in marginal conditions and good grain quality.
- Mixing barley and kiwicha has improved the protein content of food for poorer families.
- The project has contributed to the development of a small industry that manufactures food products in the highlands, such as barley flakes, pearl grains and flour.



A kiwicha plant, also known as amaranth.

Genetic Material	Yield (Kg/Ha)	Duncan proof	Origin
MSA 011	5,541	A	11
MSA 017	5,337	A	17
MSA 014	4,898	A	14
MSA 012	4,834	A	12
MSA 010	4,804	A	12
MSA 018	4,354	A B	18
MSA 013	4,331	A B	13
MSA 015	4,156	A B	15
MSA 016	4,147	A B	16
Selección Ancash	2,764	B	T

Table showing the yield (kg/ha) of kiwicha mutants in Peruvian conditions, developed through the induction mutation of a Selección Ancash cultivar that had been irradiated with gamma rays.