

Seed Projects in Peru

Strengthening the seed sector –
improving food security

SEEDING
THE FUTURE
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KWS





KWS Seed Projects in Peru

Peru is a diverse country.

A tropical climate prevails in the Eastern rain forests (“Selva”) while there is a dry desert climate in the West and in the coastal regions (“Costa”). The central Andes (“Sierra”) and the Andean plateau (“Altiplano”) are moderate to cold zones. This diversity is reflected in the country’s agriculture as well. Peruvian small farmers in all parts of the country cultivate a multitude of corn and quinoa varieties. This biodiversity is at risk, however, due to increasingly extreme climate events and the migration of young people to the cities, leading to the loss of traditional knowledge about the cultivation, use and preservation of crops. The result: a chronic shortage of food especially in remote regions. A total of eight million Peruvians live below the poverty line – almost 30 percent of the total Peruvian population of 30 million.

The KWS Initiative “Capacity Development”

With the Capacity Development initiative, KWS SAAT SE supports the training primarily of young plant breeders in Peru and Ethiopia. The program focuses on the development and seed multiplication of locally adapted varieties. In Peru, focus crops are corn and quinoa, while in Ethiopia they are barley and wheat.

The initiative also contributes to the sustainable conservation and use of the existing diversity of genetic resources, thus implementing the International Treaty on Plant Genetic Resources for Food and Agriculture.

Project goal: Improving food security

The initiative consists of three projects, completely financed by KWS

In the long term they are to help improve the food security of Peruvian small farmers, e.g. by means of:

- Improved conservation, characterization, documentation and sustainable use of genetic diversity
- Support of the development of new, locally adapted corn and quinoa varieties
- Training of young Peruvian scientists in relevant technologies

Efficient management of corn resources

In cooperation with the National Agricultural University La Molina (UNALM, Lima) and the University of Hohenheim (Stuttgart), KWS is working to improve the management of corn genetic resources in the UNALM gene bank.

The available corn seed samples from the Peruvian Costa, Selva, Sierra, and Altiplano regions are being characterized in field trials and genotyped in Hohenheim. For this purpose, a UNALM scientist is being trained in Hohenheim in genetic diversity analysis and the identification of duplicates.

All passport and characterization data is digitized and collected in a Web catalog. This project will improve gene bank efficiency and contribute to the more sustainable use of conserved corn resources.

Strengthening national corn breeding programs

Another project compares different selection methods in local, open-pollinated corn populations.

The goal is to illustrate the effects on selection success. For this project, KWS cooperates with the corn breeding program of the National Institute of Agricultural Innovation (INIA, Cusco).

Another experiment is aimed at enhancing the adaptation of corn to acidic soils. Both trials are designed to strengthen national corn breeding programs and to deliver new, improved corn varieties for widely distributed locations with acidic soils.



New breeding strategies for quinoa

Quinoa is a very nutritious annual grain crop that was domesticated in the Andes about 4,000 years ago.

The goal of this project is to develop strategies for improved breeding. To that end, genetic variations and the gains from selection in crosses of different parental quinoa materials are studied. At the same time, the project works to preserve the genetic resources of quinoa and to make it usable for sustainable agriculture.

Project partners include the National University of the Altiplano (UNAP, Puno) and the University of Hohenheim (UH). Peruvian students are involved in the project, providing them with important hands-on experience.



Initial achievements

Support for conservation, documentation and use of Peruvian corn genetic resources at the National Agricultural University – La Molina (UNALM)

- Characterization in terms of agronomic properties of 1,781 corn seed samples from different ecological zones of Peru
- Genotypic characterization using modern genotyping-by-sequencing (GbS) techniques
- Establishment of a database
- Training of a scientist in database creation, GbS techniques and data analysis at the University of Hohenheim

Strengthening the corn improvement program at the National Institute for Agricultural Innovation (INIA)

- Training in various methods of population improvement, comparison of expected and realized gains from selection (field trials still underway)
- Studies of acid soil tolerance in newly bred corn populations and local varieties; superior populations identified for Selva sites

Enhancing the quinoa breeding program at the National University of the Altiplano (UNAP)

- Genetic diversity study of twelve quinoa varieties using almost fifty thousand molecular markers
- Creation of new genetic variation from single and double crosses
- Development of 6 new populations as well as the identification of genome regions for various traits planned for 2015/16

Project partners and cooperations

Peruvian partners

- National Agricultural University – La Molina (UNALM), Lima, Peru
- National Institute of Agricultural Innovation (INIA), Cusco, Peru
- National University of the Altiplano (UNAP), Puno, Peru



Quinoa field nearby Puno

German partners

- University of Hohenheim, Stuttgart, Germany, Crop Biodiversity and Breeding Informatics
- German-Peruvian Chamber of Commerce, Lima, Peru



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