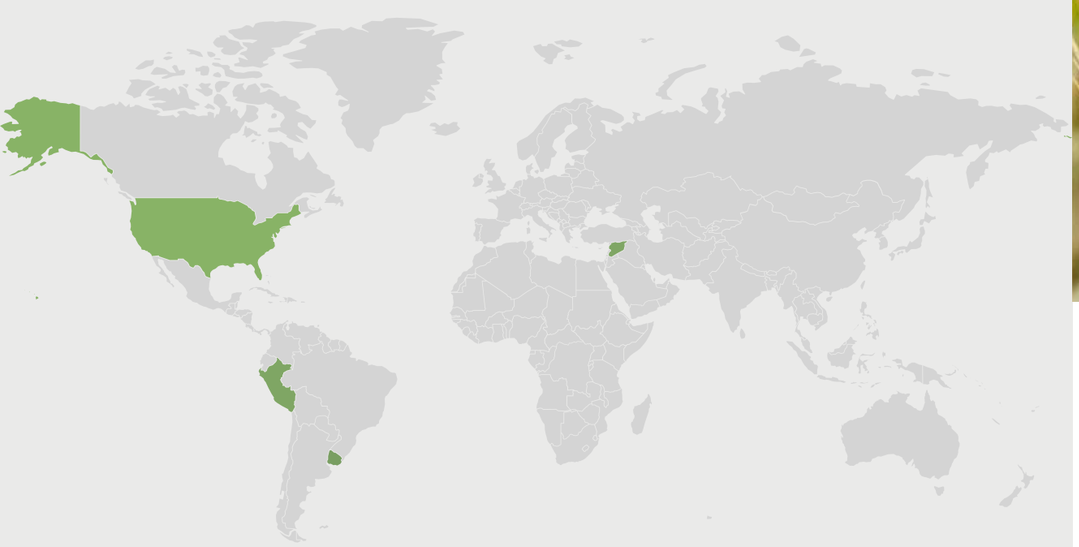
FAGRO - UDELAR, URUGUAY

Genetic resistance to diseases in barley

Identification and use of durable resistance to barley diseases in Latin America



Uruguay / Peru / Syria / United States

3
Improved varieties

2
Scientific Publications

15
Conference Presentations

Research and Development

The implemented initiative

The objective of the project was the development of disease-resistant and adapted barley germplasm using innovative genetic tools and the establishment of the necessary conditions for the future development of new germplasm with desired characteristics. The project used advanced tools such as high-productivity genomic characterization, linkage disequilibrium analysis, and assisted selection, in two "culture-disease" combinations. The chosen diseases were Yellow Rust (RA) caused by (Puccinia striiformis) and Blurred Spot (MB) caused by (Cochliobolus sativus), considered representative of health problems of the crop.

Genetic Resistance

The technological solution

The project allowed the incorporation of resistance already mapped to local adapted germplasm, through assisted selection. The source selected for MB was the BCD47 variety that presents a QTL (quantitative trait locus) of resistance on chromosome 1H and the adapted material the cultivars INIA Ceibo and INIA Aromo. Regarding RA, the source of resistance was the iBison 95-2 line, which has resistance QTLs on chromosomes 1H, 4H and 5H, using cultivars adapted to Peru as receptor parents. In addition, germplasm with pyramids of built-in resistance sources was developed. From the crosses between the MB resistant material (Ambev 293) and the adapted and susceptible cultivar (INIA Arrayán), F1 were obtained, which were later crossed with RC2F4 lines. Training and cooperation schemes were implemented among the participants, based on the use of genomic analysis tools in the routine process of genetic improvement.

MÁS INFO

Results

1. Germplasm was developed incorporating a previously detected QTL for MB.
2. Genetic resistance to MB, RA and RH was detected in regions of the genome that had not been previously identified.
3. A process of building pyramids of resistance began for MB
4. A network of collaboration and technical support was consolidated between project participants and other collaborators.
5. Highly qualified human resources were trained on the subject of the use of genomic tools in support of genetic improvement.

Main donors

Participating Organizations

FONTAGRO