

P 25: Breeding for downy mildew resistance in basil

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Abstract

Basil downy mildew is a recent, host specific disease. It appeared in all regions where basil is grown as a crop. Every year, complete crops loss occurred for some growers. Because this disease is spreading fast and has a strong destructive power, Iteipmai, in collaboration with several public and private research entities and growers, initiated the MILAROM project. This project uses a multifactorial approach to develop complementary solutions for field and greenhouse growers: improved agricultural practice, prediction modelling of disease epidemic, conventional and alternative phytosanitary products and breeding for resistant varieties.

Concerning the breeding aspects, a marker assisted backcrossing scheme has been applied. Resistance genes, identified within a collection of genetic resources of the *Ocimum* genus, were introgressed into a susceptible commercial variety and agronomy is improved by recurrent crosses. In order to run this breeding program, several methods had to be developed by iteipmai and its partners: crossing method, inoculum production, artificial inoculation, high-throughput screening method for disease resistance, molecular markers.

This project was started in 2010 and is still in progress in 2016. The progeny evaluation for downy mildew resistance indicates that several resistance genes, identified in twelve different sources, were successfully introgressed into the breeding material. The original donors of those resistances cannot be fully traced because open pollination was used at the beginning of the program. However, their inheritance in the progeny of crosses performed with the susceptible donors is showing that they probably are different from one source to another. Identified as dominant, some of those resistances are showing a non monogenic pattern.

The breeding work is still in progress and will lead to the creation of a synthetic variety composed of near isogenic lines of the commercial variety introgressed with the different resistance genes. This variety construction has been chosen in order to ensure the sustainability of its resistance. It should be available on the market in 2020.