

# Markers Assisted Selection (MAS) for potato breeding

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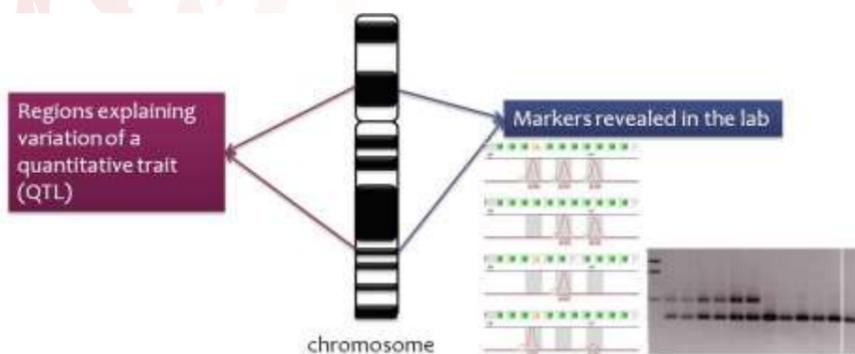
**Molecular markers have become a breeding tool**  
Since 2008, breeders of Bretagne Plants, Comité Nord and Grocep have used molecular markers in some of their breeding steps.

## Markers Assisted Selection ?

Gains	Needs
<ul style="list-style-type: none"> <li>• Replacement of difficult or costly phenotyping</li> <li>• Concentration of usual phenotyping on promising genotypes</li> <li>• Confirmation of some phenotyping</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable markers</li> <li>• Methods adapted to routine labs dealing with numerous genotypes</li> </ul>

## Molecular marker ?

A molecular marker is revealed in the lab. Thanks to the marker, the presence or the absence of a giving trait is revealed in the genome hybrid (ex: resistant or susceptible).



For most of the traits, several markers are needed because several genomic regions are involved (QTL, Quantitative Trait Locus).

## Main Steps

Choose of the genotypes and markers to test



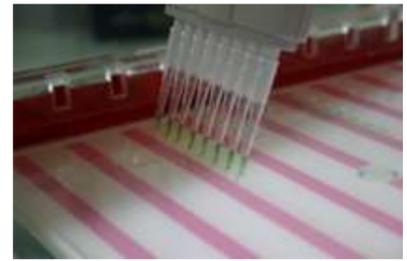
DNA extraction



Set up of the markers



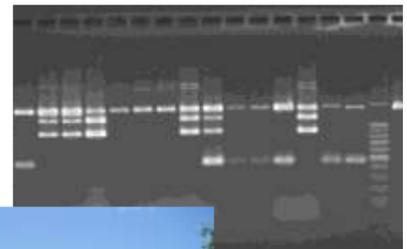
Analysis of the results



Selection on markers



Field phenotyping for other traits



## What are the main targets ?

Up to now, we have been using markers linked to resistance to several pathogens :

- nematods (*G. rostochiensis* et *G. pallida*).
- PVY

These resistances are mono or oligogenic ones.

Around 3500 tests have been processed in 2011 in professional labs.

## Prospects

Some mid term results are expected from the research program on late blight resistance.

A new project has just started on genitors collections of each breeding station. The aim is to place genetic diversity used by the breeders to the Inra collection.

## A strong collaboration with Inra

The research program aiming at the implement of molecular tools in breeders schemes is coming from a strong collaboration with Inra UMR IGEPP, Ploudaniel. This project started in 2003.

For several years, Inra has proposed improved genotypes, especially for pathogens resistances. Since 2009, molecular markers linked to resistance traits have also been proposed.

These genotypes and the markers associated, are generally the results of 20 years of research and selection.

The use of molecular tools will be reinforced in the plan action of Innoplant UMT.



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