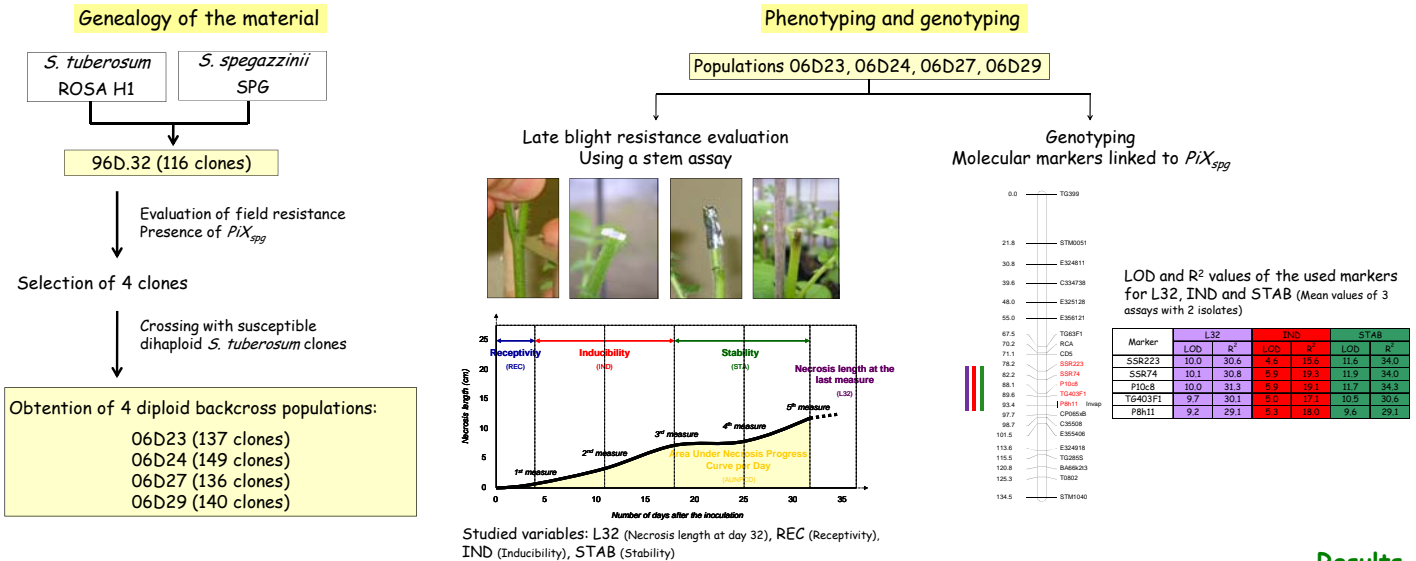


As most of the R-genes identified in *Solanum* wild species have been overcome by *Phytophthora infestans*, the UMR APBV team aims at identifying and studying quantitative traits loci (QTL) involved in late blight resistance.

A segregating population (96D32) obtained by crossing a susceptible dihaploid *S. tuberosum* clone (Rosa H1) with a resistant clone belonging to the wild potato relative *S. spegazzinii* has been studied for late blight resistance using a stem assay. A major QTL originating from the wild species has been identified. Using genetic map developed by Caromel (2004), this QTL has been mapped to chromosome X and is named  $PiX_{spg}$ . It explains between 30 to 40% of the phenotypic variation according to the stem resistance component. A fine mapping of  $PiX_{spg}$  has been carried out, leading to the development of two SSR markers (SSR223 and SSR74) and three CAPS markers (P10c8, TG403F1 and P8h11) that are closely linked to the QTL (Quéleñec *et al.*, 2009). The usefulness of these markers is evaluated in a marker-assisted selection program.

## Materials and Methods



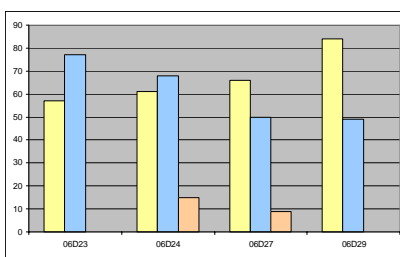
## Results

TG403F1: Monomorphic in the 4 populations

P10c8: Linked to the susceptible allele → Not useful in backcross populations

P8h11: Polymorphic in 06D24 and 06D27 populations

SSR223 and SSR74: Polymorphic in the 4 populations



Segregation of the molecular markers in the backcross populations

06D23 and 06D29: Segregation of SSR74

06D24 and 06D27: Segregation of SSR74 and P8h11

Legend for marker segregation:

- Yellow: Number of clones having the markers linked to  $PiX_{spg}$
- Blue: Number of clones without the markers linked to  $PiX_{spg}$
- Orange: Number of recombinants

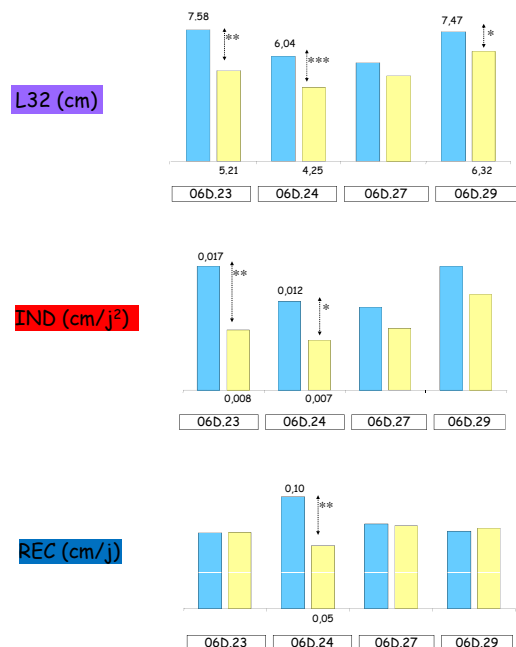
In populations 06D23 and 06D24, the clones having the markers linked to  $PiX_{spg}$  have significantly lower values of L32 and IND. In population 06D29, this is observed only for L32. In population 06D27, no significant correlation is observed.

In population 06D24, the presence of the markers is associated with lower REC values whereas no QTL for REC was detected in the 96D32 population.

## Conclusions and Perspectives

In 3 out of the 4 studied populations, the molecular markers linked to  $PiX_{spg}$  appear to be useful to predict the late blight stem resistance of the clones. The usefulness of these markers will be also evaluated for marker-assisted selection at the tetraploid level.

However, as the presence of  $PiX_{spg}$  is not always correlated with stem resistance, it is likely that other genomic regions and/or epistatic interactions are involved in the expression of this trait.



Correlation between the phenotypic evaluation and the presence or not of the markers linked to  $PiX_{spg}$

←\*\*\* Significant difference (\*\*\*: p<0.001, \*\*: p<0.01, \*: p<0.05)

## References

Caromel (2004) Thesis  
Quéleñec *et al.* (2009) BioExploit Meeting (Poster)