



Looking for the variety name thanks to its DNA

Marhadour¹, S., Laversin², N., Méar¹, A., Pavy³, V., Perramant⁴, M., Dargier⁵, C., Le Hingrat⁶, Y.

Determine the variety name, all the plant cycle long

This method helps to reinforce the seed production scheme, to guaranty the identity of the varieties and to protect breeders' rights. A procedure based on 5 markers had been initially set up (Moisan-Thiéry, Marhadour et al, 2005). Since then, additional markers have been implemented. A database containing genetic profiles of more than 500 varieties has been built. We are currently building an application which will permit real time update and consultation of the database.

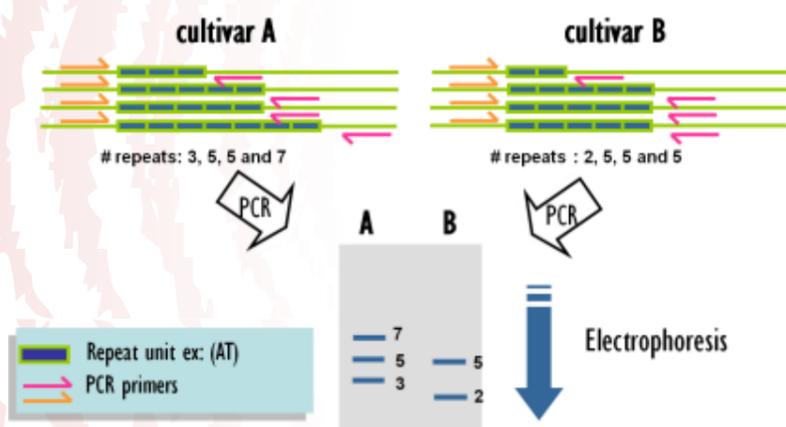
A network of partners

Partners are French professional labs involved in seed testing and breeding (Bretagne Plants, Comité Nord, FN3PT), a public research lab (Inra UMR IGEPP), a Swiss lab (Agroscope ACW Changins) and GNIS-SOC.



Microsatellites markers principle

Small sequences named microsatellites exist in the potato genome. Amplified and revealed in the lab, they produce a "bar code" specific to each variety.



Ring tests validated the procedure

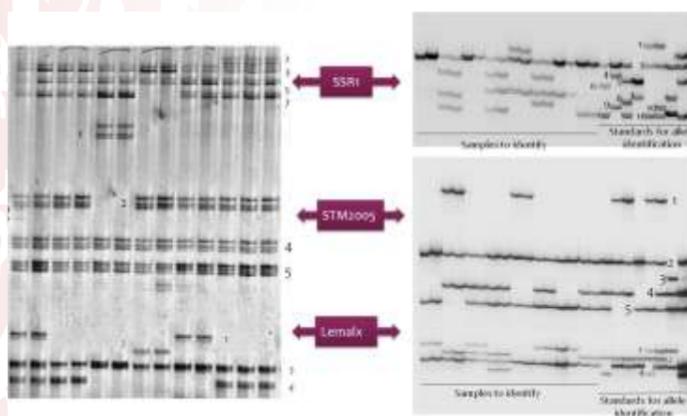
Several ring tests have been organized since 2003 by GNIS-SOC. Number of labs involved has gradually increased. Results of the last test exhibited the importance to get a common database updated regularly (Marhadour et al 2011).

Years	Number of Labs	Number of Samples to identify	Results
2003	2	30	28/30*
2004	2	20	20/20
2005	4	10	10/10
2006	4	15	15/15**
2007	4	5	5/5
2011	6	8	8/8 for 3 labs 7/8 for 2 labs*** 6/8 for 1 lab***

*2 variety not registered
**In 3 labs
*** no mis identification but unidentified varieties

Different systems can be used to reveal the markers

Profiles revealed using silver nitrate staining (left) and LI-COR® sequencing system (right) for 7 markers (SSR1, STM2005 and Lemalx). Work is also currently done to evaluate transferability of the markers on capillary sequencing system.



Picture M. Perramant

Picture A. Méar

Preparation of the samples for DNA extraction



IdeAle: a common database, which can be interrogated in real time through the internet

Number of profiles in the database has gradually increased. An application permitting the real time update and consulting of the profiles by the users has become necessary.

Thanks to a grant of the French Department of Agriculture, FN3PT is the coordinator of a project aiming at the construction of a multi users database. The application named IdeAle is being built by the informatics service of the FN3PT in collaboration with the project partners.

We have chosen a client-server tool linked to a web interface because this structure permit the real time access to the most update data. The application program manages private and public data.

Expectable evolutions in the mode of markers revelation (sequencing) is also handled by the application.

¹ FN3PT INRA UMR 1349 IGEPP, Keraiber 29260 Ploudaniel France
² Comité Nord, Station « La Pigache », Avenue F. Mitterrand, 62217 Beaurains, France
³ Station de recherche du Comité Nord, 76110 Bretteville du Grand Caux, France
⁴ Bretagne Plants, Roudouhir, 29460 Hanvec, France
⁵ FN3PT Service informatique, rue du Louvre, 75001 Paris, France
⁶ FN3PT, Roudouhir, 29460 Hanvec, France

References

Moisan-Thiéry, M., S. Marhadour, M.C. Kerlan, N. Dessenne, M. Perramant, T. Gokelaere, and Y. Le Hingrat. 2005. Potato cultivar identification using simple sequence repeat markers (SSR). *Potato Research* 48:191-200.
Marhadour, S., E. Droz, et al. (2011). Potato variety identification using SSR in France and Switzerland. *EAPR 2011, the 18th Triennial Conference of the European Association For Potato Research, Oulu, Finland.*