



An online database to improve management of DNA profiles dedicated to cultivar identification of seed potatoes in France

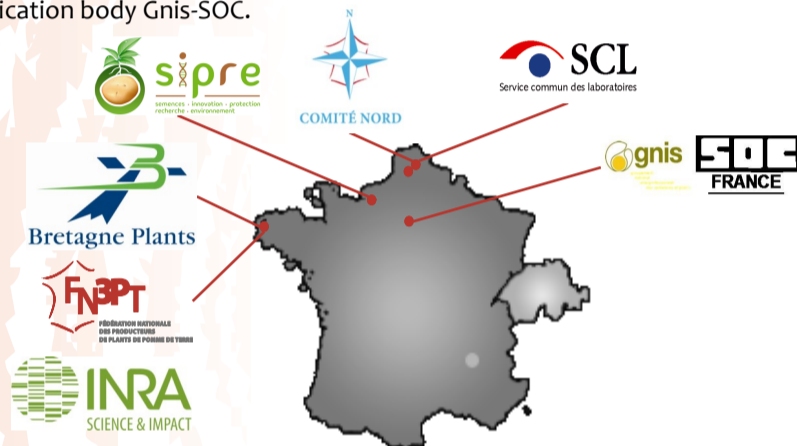
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Context and objectives

A set of SSR markers is routinely used in 5 French labs for identification of potato cultivars grown for seed production. Between 2008-2012, we developed an internet platform named IdeAle. The main objective was to improve information exchanges about the profiles between the labs. By analyzing part of the Inra worldwide varieties collection, we could implement additional alleles to our system. We also tested the portability of the markers between different analysis systems.

Partners of the project

Partners are French professional labs involved in seed testing and breeding (Bretagne Plants, Comité Nord, FN3PT), the lab in charge of the official control on ware potato and selling point (SCL), a public research lab (Inra UMR IGEPP) and French certification body Gnis-SOC.



An additional tool for the control of seed potato production

We are using the kit of markers to strengthen the seed potato production scheme. Visual inspections are nevertheless needed in order to discard potential mutants which can not be detected using the markers. A national (conformity) field is planted every year to check the conformity of prebasic material.



Application and database content

An application linked to a web interface was set up allowing the real time access to the most updated data. Its access is restricted to the partners. The application manages private and public data between partners of the project.

Technical evolutions are needed concerning the analysis system. The application has been shaped to manage a possible change in the technics provided that correspondence of alleles between the systems have been informed.

Content of the common database (07/06/2013):

Number of profiles	973 varieties 374 hybrids 22 wild species
Analysis systems	Acrylamide + silver staining LI-COR® infrared DNA analyzer ABI PRISM® genetic analyzer
Number of markers	7 markers of the kit 23 markers used by Inra team to describe its collection of worldwide varieties (Esnault et al. 2010)

The kit of microsatellites in use

The 7 markers of the kit are presented in the following table. All these markers are also used by E. Droz Agroscope ACW Changins, Switzerland (Personal communication). Markers stm5136, stm2005 and SSR1 are common to the kit published by Reid et al (2007).

The numbers of alleles observed result from the analysis of the complete dataset except for stgbss and stm5136 (762 and 647 genotypes respectively).

SSR name	Chromosome	Repeat motif	Number of alleles	Size range (pb)	Reference
SSR1	VIII	(TCAC)	17	200-230	Kawchuk et al 1996
stm2005	X	(CTGTTG)	8	150-200	Milbourne et al (1998)
Lemalx	V	(ATT) _n	5	120-140	Milbourne et al (1998)
stm1097	VII*	(CGTTT) _n	9	230-280	Milbourne et al (1998)
stm2020	I	(TAA) _n	12	160-200	Milbourne et al (1998)
stgbss	VIII	(TCT) _n	13	around 120	Ghislain et al (2004)
stm5136	I	(AGA) _n	13	210-250	https://research.cip.cgiar.org/

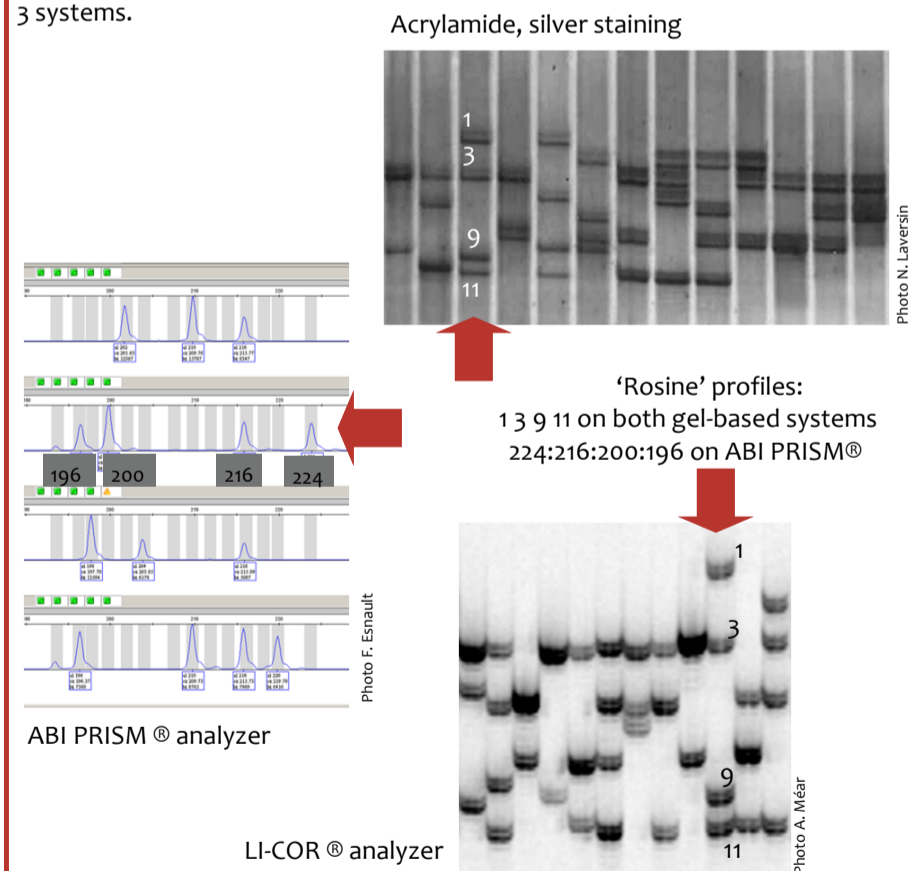
* modified from Moisan-Thiéry, M., S. Marhadour, et al. (2005)

10 additional alleles have been detected by analyzing 350 genotypes of the Inra worldwide varieties collection. This set of genotypes was complementary to the genotypes already profiled in the labs of the potato seed growers for 166 genotypes.

Different systems have been tested to reveal these profiles

The method currently in use in the labs of Bretagne Plants, Comité Nord and SCL is an acrylamide gel electrophoresis followed by silver staining. Despite the multiplexing of PCR, the throughput of the method is becoming a limiting factor.

We tested the portability of the 7 markers on LI-COR® analyzer and ABI PRISM® genetic analyzer. Here we illustrate results obtained using SSR1 marker with the 3 systems.



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Acknowledgements

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