



Information paper

Susceptibility of potato cultivars and breeding lines to powdery scab in New Zealand: updated results from field evaluations

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Robert Lamberts

Powdery scab

Breeding for resistance to powdery scab



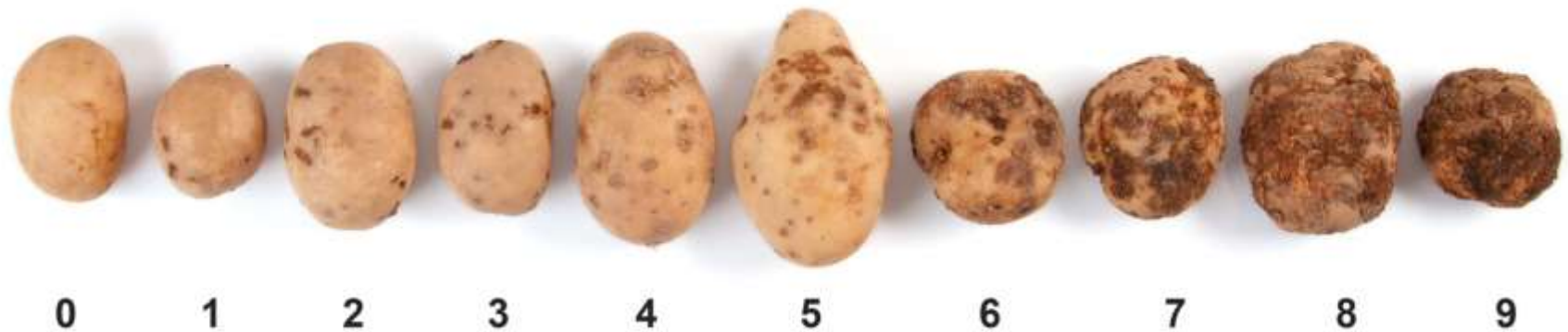
Russell Genet
Mark Paget





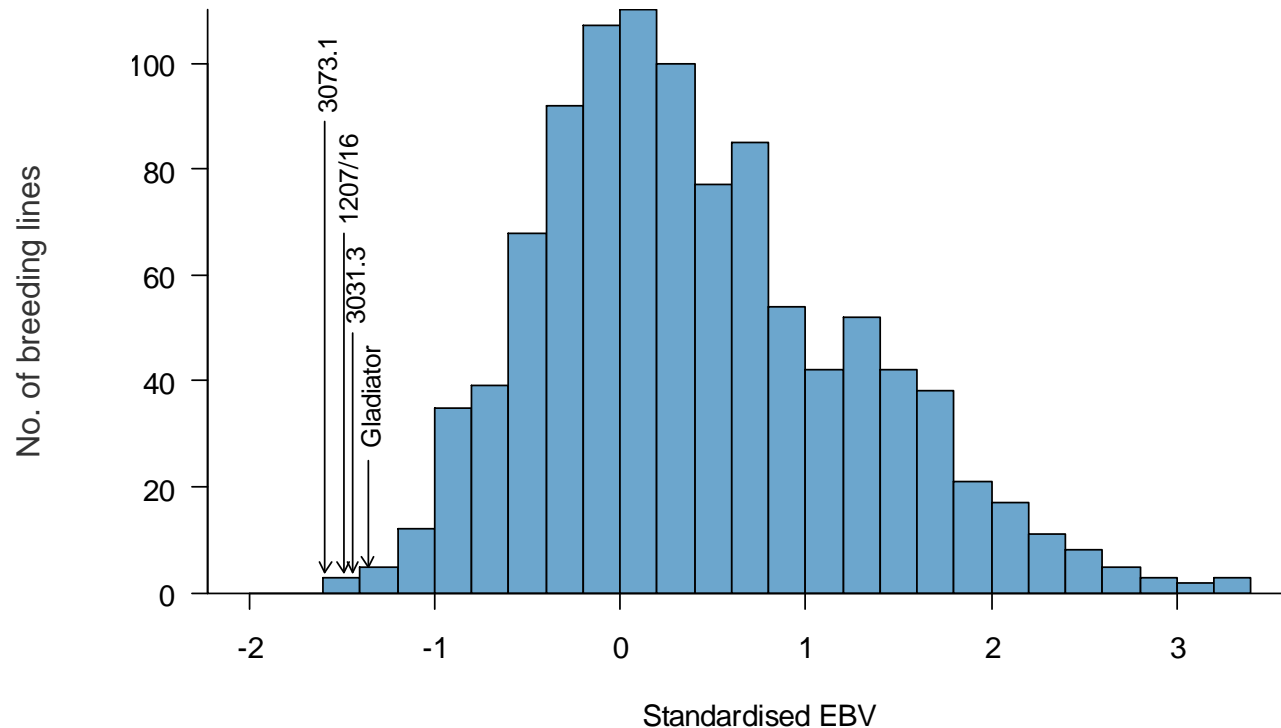
Field evaluations, 1991/92 to 2013/14

Breeding lines planted in screening trials and inoculated with *S. subterranea*. At harvest, tubers are assessed for powdery scab severity on a 0 to 9 scale



**Linear mixed ‘individual plant’ model used for analysis
Takes account of the pedigree (relationships) present
between all breeding lines tested, making best use of
available data from all years (trials)**

Empirical breeding values (EBVs), a measure of genetic worth, are obtained for each breeding line and used to aid selection



Distribution of EBVs of tested breeding lines for resistance to powdery scab

- **EBVs range from resistant (-ve EBVs) to susceptible (+ve EBVs)**

Empirical breeding values (EBVs) for cultivars that have previously been used as parents in the PFR potato breeding programme

Cultivar name	EBV
GLADIATOR	-1.66
FIANNA	-1.10
MOONLIGHT	-0.43
NADINE	-0.37
DESIREE	0.08
MARIS PIPER	0.40
ATLANTIC	0.70
AGRIA	1.08
KENNEBEC	1.42
SHEPODY	1.64
MACRUSSET	2.88

increasing susceptibility

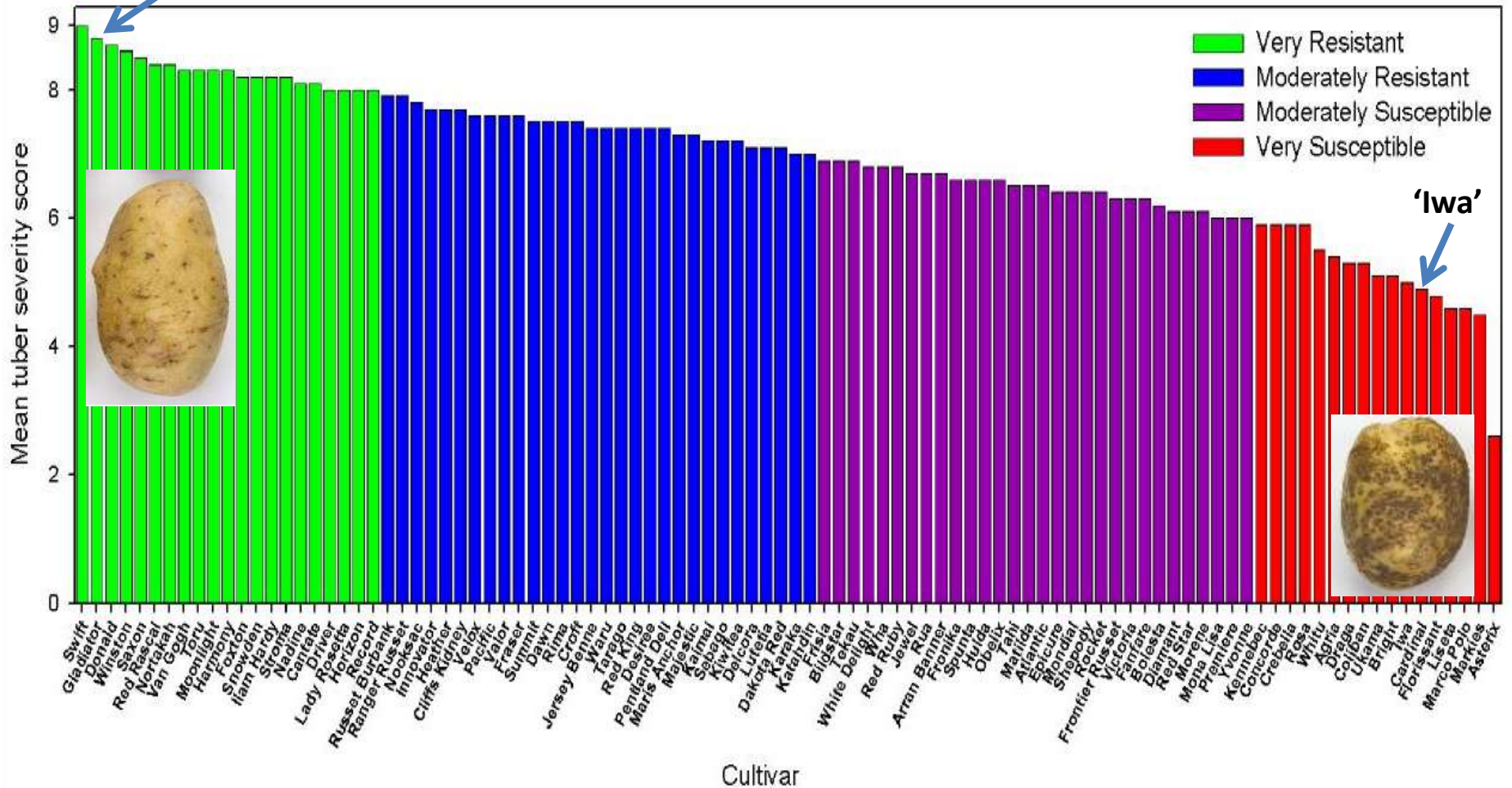


- Parents have been used in the past that are highly susceptible to powdery scab
- Routine genetic evaluation identifies susceptible genotypes, and their use as parents is avoided

Paget et al. (2014)
Euphytica 197: 369-385

Potato cultivar susceptibility to powdery scab

'Gladiator'



***Spongospora* has three phases on potato plants**

- **root cell infections**
- **root hyperplasia**
- **tuber powdery scab**

