

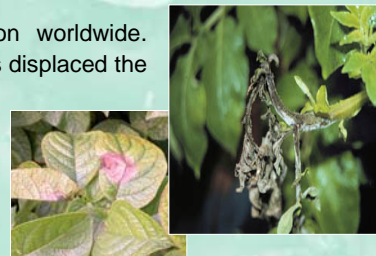
THE IMPORTANCE OF COMPETITION AND HOST PLANT RESISTANCE ON SELECTION OF *PHYTOPHTHORA INFESTANS* POPULATIONS IN MICHIGAN AND NORTHERN IRELAND

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The late blight pseudofungus *Phytophthora infestans* continues to threaten potato production worldwide. Populations in Europe and the US have become widely divergent since highly aggressive genotypes displaced the 'old' panglobal US1 clonal lineage in the 1970's.

Competitive abilities and subsequent selection of representative isolates of *P. infestans* from N. Ireland and the US were investigated by inoculation onto potato cultivars with varying foliar resistance.



Six representative groups containing multiple isolates were chosen from N.Ireland and the US based on phenotypic and genotypic differences. Isolates were distinguished by mating type, Glucose-6-phosphate isomerase (*Gpi*) and Peptidase (*Pep*) allozyme genotyping, mitochondrial haplotype and sensitivity to the fungicide metalaxyl.

Isolates chosen to represent the population of N.Ireland.			
	Metalaxyl	<i>Pep</i> genotype	Haplotype
1	R	100/100	Ila
2	S	100/100	Ila
3	R	100/100	la
4	S	100/100	la
5	R	96/100	la
6	R	83/100	la

Isolates chosen to represent the population of the US.			
	Mating Type	<i>Gpi</i> genotype	Name
1	A1	86/100	US-1
2	A1	100/100	US-6
3	A2	100/111/122	US-8
4	A2	111/111/122	US-10
5	A1	100/100/111	US-11
6	A2	100/122	US-14

Field trials were planted in the early summer of 2003 and 2004 in both NI and Michigan State. Atlantic and Stirling were included in both trials as common varieties. Pike and Jacqueline-Lee were planted in the US, and Sante and Milagro in the NI trial.

All six isolate groups were inoculated onto surrounding spreader rows of susceptible cultivars and allowed to spread onto adjacent test cultivars.

Single-lesions were removed from each cultivar at 1% infection for isolation. These isolates were then characterized and assigned to their respective groupings.

Cultivars	Resistance Ratings*
Atlantic	3,3 (NIAB rating)
Stirling	8,7 (NIAB rating)
Sante	7,6 (NIAB rating)
Pike	6,7 (breeder's estimate)
Milagro	8,6 (breeder's estimate)
Jaqueline Lee	8,4 (breeder's estimate)

* for foliage, tuber blight, (1-9 scale; 9 = maximum resistance)

Results and Conclusions

The US-8 genotype was by far the most common with few other genotypes being detected in either year.

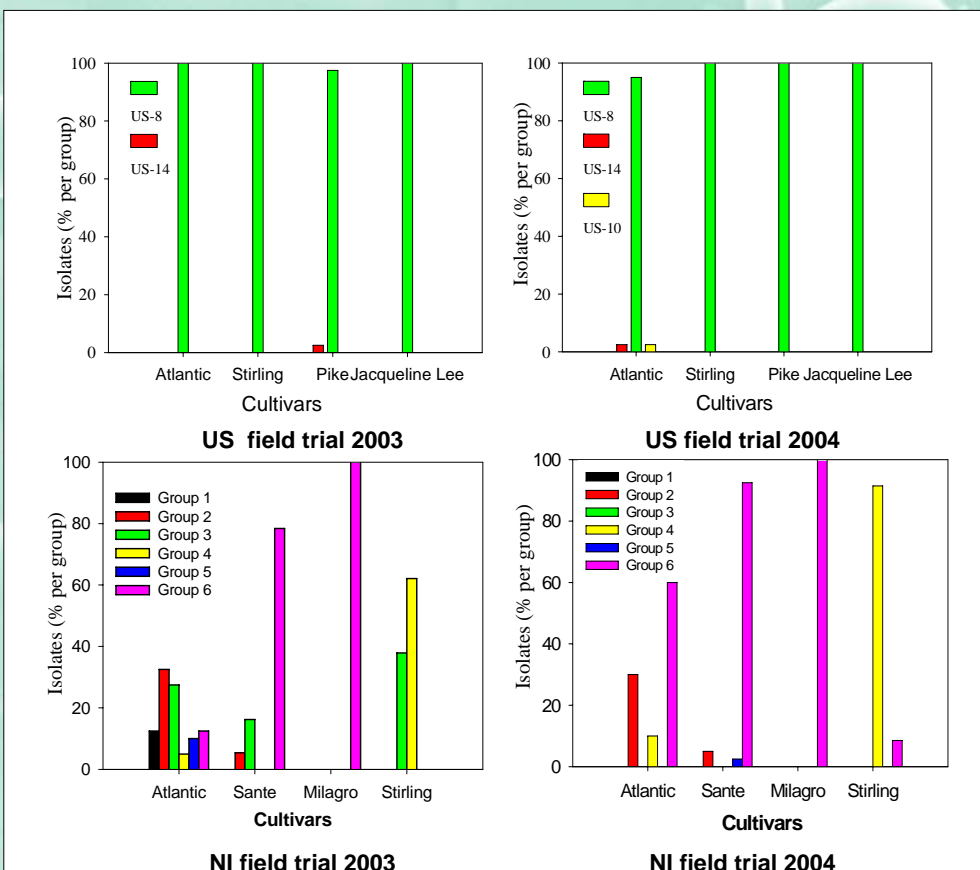
It is likely that the US-8 isolate out-competed all others through higher aggressiveness independently of any isolate x cultivar interaction.

In both NI field trials the distribution of infection by the six isolate groups differed significantly between cultivars.

Strong selection was observed within the more resistant Stirling and Milagro cultivars.

This was particularly evident within Milagro where only *Pep* 83/100 genotype isolates (a rare genotype in the NI population) were recovered.

These findings illustrate the importance of the host in population selection and of exposing new cultivars to a wide range of genotypes in the field before marketing as blight-resistant.



Acknowledgements

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