

The effect of late blight population changes on on host resistance ratings

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Surveys of the composition of UK populations of *P. infestans* have revealed considerable changes in recent years, with a genotype designated as 13_A2 becoming dominant.

Anecdotal reports have also suggested that the historic late blight ratings for many existing potato varieties currently considered as having some resistance are not valid when these varieties have been challenged by isolates of genotype 13_A2.

Trials data from several sources has been combined in order to establish the reaction of these varieties to genotype 13_A2.

Materials and Methods

Data was made available from the following trials:
 • SCRI, 2008 & 2009
 • SÁrvári Research Trust at Llanbedrogch 2008 & 2009, Henfaes, 2009
 • SAC, 2008
 • SAsA, 2008 & 2009

Varieties and clones tested included commonly grown varieties, those undergoing Independent Variety Trialling and breeding and genetic resource material.



In general, a method similar to the agreed European protocol (www.eucablight.org) was used to assess host resistance and common reference varieties were included in all trials.

All trials were inoculated using an isolate of the 13_A2 genotype of *P. infestans*. In the SCRI and SAsA trials artificially inoculated glasshouse-grown plants of cv. King Edward were placed at 1-2m intervals along infector drills of King Edward.

The percentage area of foliage of each test plant affected by late blight was assessed on at least four occasions during the epidemic. Scores were averaged and a 1-9 score calculated. An over-years and -trials analysis was conducted by Biomathematics and Statistics Scotland (BioSS) for varieties that were tested in at least two trials.

Results

There is evidence that some published foliar resistance ratings are inaccurate and these ratings fall into 2 categories:

Trials that have been conducted across Europe using a range of isolates including 13_A2 indicate that the original tests for some varieties may have over-estimated their degree of resistance. This discrepancy in ratings is therefore not related to the change in the *P. infestans* population.

In addition, some varieties that were originally determined to be resistant were found to be considerably more susceptible when challenged by 13_A2. An example is given in Figures 1. & 2, where the reaction of var. Stirling moves from an original published rating of 7 to a current rating of 4 when tested with 13_A2. Similar changes can be seen with, for example, Lady Balfour, Galeatica and Romano (Fig 3)

Fig 1. Foliage late blight resistance ratings for var. Stirling as assessed in various trials 2004-2009. Nc = National List rating. Trials from 2007 onwards were assessed using isolates of 13_A2

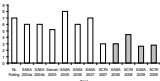
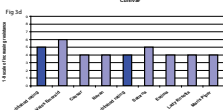
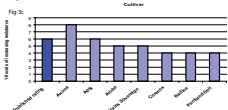
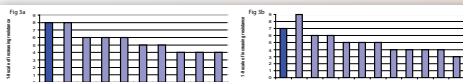


Fig 2. Late blight symptoms on variety Stirling inoculated with isolates of 13_A2 and other genotypes



Variety Resistance Ratings

Results of trials conducted at the various sites using genotype 13_A2 are summarised in Fig3.

Each graph shows the rating from these tests compared with the previously published resistance rating for that group of varieties i.e. Fig 3a. shows the rating of varieties previously described as scoring 8 on the 1-9 scale etc.

In Fig 3d. varieties previously rated as either 5 or 4 are shown on the same graph.



Conclusions and future work

The published resistance ratings of some, but not all, cultivars appear to differ, markedly in some cases, from their reaction to the 13_A2 genotype which dominates the GB *P. infestans* population.

Sarpomira and Axona are amongst the most resistant varieties tested. Sarpomira was tested in all the trials whereas Axona was tested only in Wales. The varieties Toluca and Bionica were also very resistant with only hypersensitive lesions developing on the foliage.

Work to assess the current variety resistance ratings using isolates of the most common genotypes of *P. infestans* (including 13_A2 and 6_A1) will continue and changes in resistance ratings will be communicated to the industry.

Further information on protocols for late blight host resistance testing and results of trials conducted across Europe over several years can also be found via the Eucablight website: www.eucablight.org

