QoI Working Group

FRAC
FUNGICIDE RESISTANCE ACTION COMMITTEE

Mutations associated with QoI-resistance (Updated 11-Oct-2005)

Two amino acid substitutions have been detected in the cytochrome b gene in plant pathogens that govern resistance to Qo Inhibitors:

- Change from glycine to alanine at position 143 (G143A)
- Change from phenylalanine to leucine at position 129 (F129L)

Both G143A and F129L are based on single nucleotide polymorphisms in the cytochrome b gene; the selection process is qualitative (single step).

Based on current knowledge, resistance factors (RF = ED50* [resistant strain] / ED50 [sensitive wild-type strain]) associated with G143A and F129L are different. RF's caused by F129L usually range between 5 -15, and in a very few cases up to 50, whilst resistance factors related to G143A are in most cases greater than 100 and usually greater than several hundreds. Isolates carrying G143A express high (complete) resistance. Isolates with F129L express moderate (partial) resistance. QoIs applied at manufacturers' recommended rates are shown to provide effective control of diseases with the F129L mutation. In contrast, a severe loss in disease control is always seen in populations where G143A predominates and QoIs are used alone.

G143A has been shown to be responsible for QoI resistance in more pathogen species than F129L (17 out of 23 plant pathogens carry G143A). F129L has been detected in 3 out of 23 plant pathogens, and 3 out of 23 pathogens possessing both mutations.

*ED50 (Effective dose 50): Effective dose with 50% response (inhibition)

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