ROTHAMSTED RESEARCH

BBSRC
bioscience for the future

Resistance 2015

14th-16th September, 2015

Rothamsted Research, Harpenden, Hertfordshire, UK

HRAC

IRAC

FRAC
FUNGICIDE RESISTANCE ACTION COMMITTEE

Poster 7

Fungicide resistance profiles in *Botrytis cinerea* from strawberry fields in Spain.

Dolores Fernández-Ortuño*, Rocío Cerezo-Arrabal*, Manuel Chamorro[#], Juan A. Torés[Φ] and Antonio de Vicente*

[*]*Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora"-Universidad de Málaga-Consejo Superior de Investigaciones Científicas (IHSM-UMA-CSIC), Facultad de Ciencias, Dept. de Microbiología, 29071 Malaga, Spain.*
[#]*Instituto de Investigación y Formación Agraria y Pesquera (IFAPA), Consejería de Agricultura, Pesca y Desarrrollo Rural, Junta de Andalucía, 41012 Seville, Spain*
[Φ]*Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora"-Universidad de Málaga-Consejo Superior de Investigaciones Científicas (IHSM-UMA-CSIC), Estación Experimental "La Mayora", 29750 Algarrobo-Costa, Malaga, Spain.*

Email: dfernandez-ortuno@uma.es

Botrytis cinerea Pers., is one of the most economically important pre- and post-harvest pathogen of strawberry. The main strategy to control the disease involves the application of different classes of fungicides despite that *B. cinerea* is considered a high-risk pathogen for resistance development. We collected a total of 367 *B. cinerea* isolates from 14 strawberry fields in Huelva (Spain) during 2014 and 2015 and determined *in vitro* fungicide sensitivity to all classes of fungicides currently used for gray mold control in Spain. The overall resistance frequencies of 242 isolates collected in 2014 for pyraclostrobin, boscalid, cyprodinil, fenhexamid, iprodione, and fludioxonil were 79, 71, 38, 25, 17, and 0%, respectively. Frequencies of 125 isolates collected in 2015 were 65, 52, 31, 22, 7, and 4%, respectively. Resistant isolates were resistant to either one (10%), two (21%), three (37%), four (15%), five (1%), or six (0%) chemical classes of fungicides in 2014. In 2015, this distribution was 9, 22, 26, 9, 1, and 1%, respectively. The molecular basis of resistance for all chemical classes of fungicides, including point mutations in the corresponding target genes (*bos1, cytb, erg27*, and *sdhB*) and expression of the ABC transporter *artB*, are under investigation.

Poster 8

In vitro evolution of fungicide resistance in *Zymoseptoria tritici* to fluxapyroxad.

Omar Gutiérrez-Alonso[1,2], Hans J. Cools[1], Michael W. Shaw[3] and Bart A. Fraaije[1]

[1]*Biological Chemistry and Crop Protection, Rothamsted Research, UK*
[2]*CIR-Sureste, INIFAP, Mexico*
[3]*School of Agriculture, Policy and Development, University of Reading, UK*

E-mail: omar.gutierrez-alonso@rothamsted.ac.uk & bart.fraaije@rothamsted.ac.uk

Emergence of resistance mechanisms and their fixation in field populations of *Zymoseptoria tritici* represents a constant threat to Septoria leaf blotch control in wheat by fungicides. A new generation of carboxamide fungicides, inhibiting succinate dehydrogenase (SDHI), provides good Septoria control but previous studies have indicated that the risk of resistance development is high. The emergence and subsequent dynamics of genomic adaptive changes conferring resistance to the SDHI fluxapyroxad in *Z. tritici* was investigated *in vitro*. The sensitive isolate IPO323 was exposed to increasing concentrations of fluxapyroxad in replicate populations at three different starting concentrations with or without a short exposure to UV light at the start of the incubation. Target protein alteration was the most common resistance mechanism to fluxapyroxad and cross-resistance to both fluopyram and carboxin was often observed. There was successive replacement of fitter fluxapyroxad-resistant mutants carrying distinct amino acid substitutions in SdhB and SdhC during ten rounds of fluxapyroxad selection. However, in two of three populations not exposed to UV light only a single mutation arose, SdhB-H267Y, and reached high frequency without further replacement by other Sdh variants. In the remaining population not exposed to UV, a medium level of resistance developed and target-site changes were not detected.