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cyp51 homologue recombinant *Mycosphaerella graminicola* strains differ in sensitivity to DMIs

The adaptation of *Mycosphaerella graminicola*, telomorph of the *Septoria* leaf spot of wheat, to 14 alpha demethylase inhibitors (ergosterol biosynthesis), DMI fungicides, is observed in field populations. This adaptation is referred as shift in sensitivity and associated to different mechanisms: the most investigated path is point mutations in the cyp 51 gene and different combinations of them. However, due to the big variations, also other mechanisms must be present, such as over expression and efflux. The high variability in each given cyp51 genotype can cover the basic effect mutations exert on sensitivity changes. Therefore, homologue recombinant strains have been generated in a cyp51 wild type *Mycosphaerella graminicola* strain rather than in yeast, which is not a suitable model for the ergosterol biosynthesis in plant pathogens. The results showed that the genetic background is crucial for displaying the sensitivity phenotype. The mutations at amino acid position 381, 381+379 and 524 of the cyp 51 gene alone had no effect on sensitivity. The mutations or deletions in the loop containing the positions 459 to 461 reduced the sensitivity to a certain extent compared to the wild type strains, however, additional mutations at positions 381 (and 379) and 524 were important for potentially field relevant reduction of the sensitivity towards DMI fungicides. The study revealed the impact of mutations alone or in combinations on the DMI sensitivity in *Mycosphaerella graminicola* without the effect of other mechanisms always present when comparing field isolates.

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Fungizidresistenz-Monitoring des Graufäuleerregers *Botrytis cinerea* zeigt Unterschiede zwischen Populationen von Erdbeeren und Weintrauben

Fungicide resistance monitoring on the plant pathogen Botrytis cinerea indicates differential behavior of populations collected from Strawberry or Grapes

Botrytis cinerea is a worldwide occurring plant pathogen with a wide host range including fruits, vegetables and ornamental flowers. Resistance development against fungicides has been reported for many years; therefore, an efficient grey mould disease management is necessary in order to maintain efficacy in the field. In 2011, Syngenta's resistance monitoring project included 241 samples received from nine different European countries. Fungicide resistance against the three compounds Fludioxonil, Cyprodinil and Boscalid (model for SDHI) was tested, which belong to different mode of action classes. In addition, the isolates were screened for the presence of SDHI resistance-related mutations in the *sdhB*, *sdhC* and *sdhD* coding sequences (mitochondrial complex II). We observed a simultaneous decrease in Cyprodinil and Fludioxonil sensitivity in strawberry isolates that likely indicates MDR (Multidrug resistance) development. We performed sequencing of the transcription factor Mrr1 in order to detect a potential correlation between the genotypes and phenotypes tested. Interestingly, Cyprodinil resistant isolates collected from grape did not show substantial decrease in the sensitivity towards Fludioxonil. Resistance frequency to SDHIs was significant both in grape and strawberry samples and could be ascribed to published mutations in the *sdhB* gene. However, strawberry-specific sequence polymorphisms leading to multiple amino acid changes in the *sdhC* coding sequence were identified that were shown to be responsible for differential behavior across SDHI subclasses.

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Zweijährige Untersuchungsergebnisse zum Auftreten der Paarungstypen und der Metalaxylresistenz von *Phytophthora infestans* in Deutschland

The distribution of mating types and resistance to Metalaxyl of Phytophthora infestans, based on two years of research in Germany

Phytophthora infestans tritt seit etwa 160 Jahren in den europäischen Anbaugeländen auf. Bis 1986 war in Deutschland lediglich das Auftreten eines Paarungstyps bekannt (Bezeichnung: A1). Die epidemische Ausbreitung erfolgte ausschließlich über die asexuelle Sporangienbildung. Seit der Einschleppung des Paarungstyps A2 Anfang der siebziger Jahre ist der Austausch von Genen zwischen den beiden Kreuzungspartnern möglich.