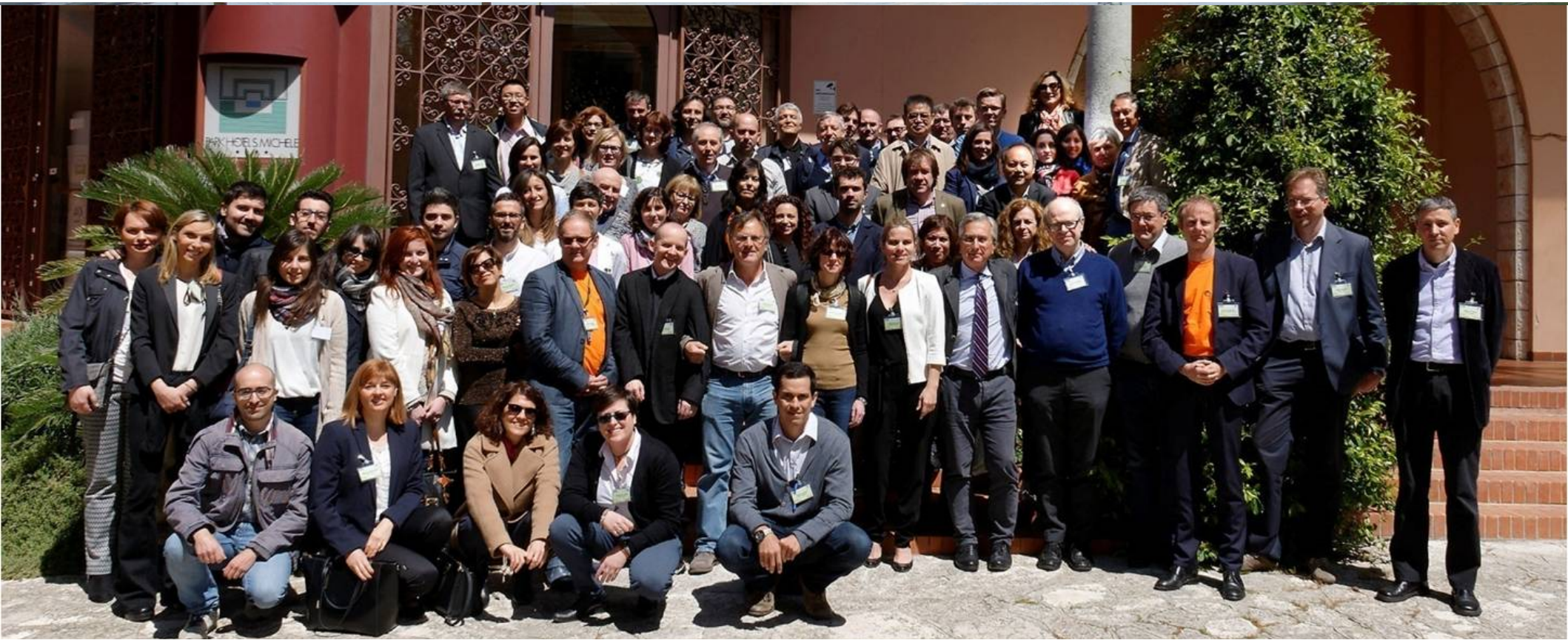
Mycokey

Integrated and innovative key actions for mycotoxin management in the food and feed chain

Lay summaries

Knowledge transfer to stakeholders



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Molecular basis of resistance to FUSARIUM EAR ROT IN MAIZE

ISSUE

The increased incidence of mycotoxin contamination in maize due to the impact of climate change is considered an emerging menace for food security and safety. A large number of fungi can attack and invade developing maize ears and kernels, causing numerous diseases classified as ear rots.

Fusarium verticillioides is the main causal agent of Fusarium ear rot (FER). The interest in this fungus has arisen from the accumulation of the mycotoxin fumonisin in pre-harvest infected plants or in stored grains.

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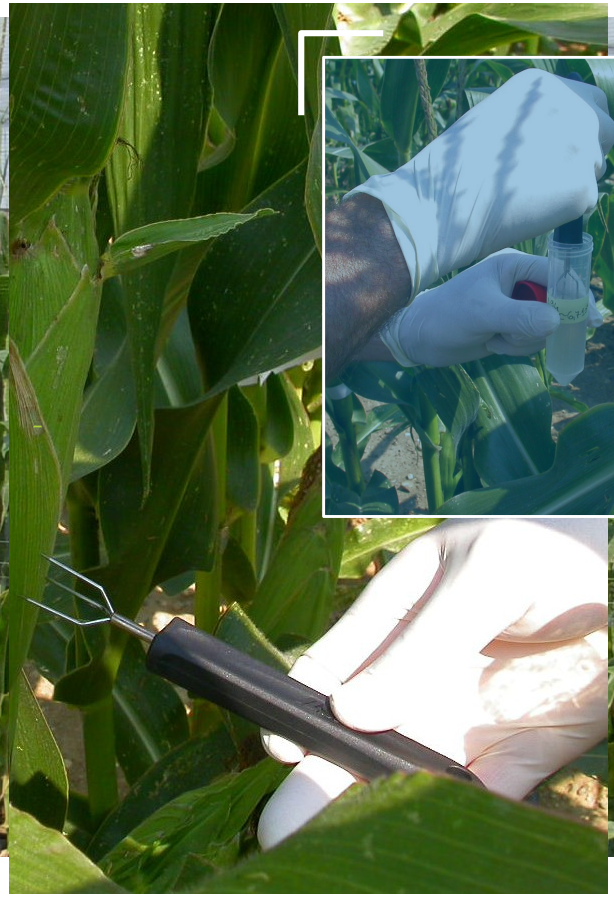
APPROACH

One approach to reduce fumonisin in maize grain is to identify germplasm with increased resistance to fungal infection and lower levels of accumulated toxins. Accurate, quick tools for phenotyping FER and fumonisin contamination can be potentially employed for large-scale selection of resistant genotypes. Therefore, a deeper knowledge of the genetic basis underlying these two traits through omics approaches is necessary to speed up progress in breeding for resistance.



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Molecular basis of resistance to

FUSARIUM EAR ROT IN MAIZE

OUTCOMES

The molecular tools developed in the last years will allow to expedite the achievement of inbred lines and hybrids more resistant to FER and fumonisin contamination by smart and cost-effective breeding strategies.

Wide phenotypic variation for resistance to FER was observed in 749 elite inbred lines of maize and 12 lines were selected as the most promising genotypes. The resistance relies on polygenic traits (QTL).

Lanubile A, Maschietto V, Borrelli VM, Stagnati L, Logrieco A, Marocco A, 2017. Frontiers in Plant Science.
DOI: 10.3389/fpls.2017.01774.

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