MIMYCS, A framework for simulating maize kernels mycotoxin contamination in Europe

Results in Brief

Simulating mycotoxin development in maize

Scientists simulated the development of naturally occurring fungal toxins in maize in order to improve food safety in cereal crops.

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Maize is a vital crop for both human food and livestock feed but it can be seriously affected by mycotoxins. Contamination is the result of complex interactions between maize, insect pests and toxin-producing fungi (together known as the pathosystem).

Mycotoxin development is influenced by climate conditions and crop management regimes. Consequently, a warming climate could have a major impact on contamination levels. Since mycotoxins can present a risk to human health their maximum level in cereals are carefully regulated. This can have a significant impact on the global cereal market.

The 'MIMYCS, A framework for simulating maize kernels mycotoxin contamination in Europe' (MIMYCS) project developed a computer model to simulate the risk from the main toxins contaminating maize. The computer model was linked to existing models

as part of the crop growth and monitoring system of the European Commission's Joint Research Centre (JRC).

Existing models included a simulation of moisture content in maize kernels. Models of two insect pests, the European corn borer (Ostrinia nubilalis) and the Mediterranean corn borer (Sesamia nonagrioiodes), were also developed and included. In addition, researchers created a model that simulated fungi development, infection of the maize grain and mycotoxin production.

Project results will help inform European policymakers, enabling them to fix safe and realistic mycotoxin contamination limits and to assess the effect of climate change on the pathosystem. Furthermore, they will assist maize producers in controlling mycotoxin contamination through improved agro-management and improvements in grain safety.

Keywords

Mycotoxin, maize, pathosystem, climate change, food safety, cereal crop, grain safety

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Project Information

MIMYCS

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