Mycotoxins and Cereals Production

The farming reality

Mike Hambly
DON, ZON, T2-HT2: Monitoring activity

- Farmer + industry funded monitoring results on DON, ZON and T2-HT2 for a decade, sharing results with UK Competent Authorities

- UK pilot 2013/14 to allow electronic transfer of data among farmers, traders and first processors - Voluntary cost effective tracking of all 600,000 commercial movements.
**T2-HT2: Improved understanding of pathogen**

*F. langsethiiae* in cereals and the subsequent contamination of cereals with HT-2+T-2.

**Figure 17.** Postulated life-cycle of *F. langsethiiae* in cereals based on a three-year field survey, artificial inoculations and the generalised life-cycle of *Fusarium* species.
Better risk assessment: Modelling and Data
Plant breeding and fusarium infection

Resistance to initial penetration
Resistance to spread of infection

Some success with identifying and describing resistance genes...
But must be no negative effect on crop

Wheat and Barley work now underway:
researchers begin pre-breeding of useful resistance mechanisms

Passive resistance may be possible
Current technology has an impact but may fail to keep pace with climate change.

New breeding and crop protection developments will be required to meet future targets, this will require time and regulatory approval.
Managing risk

⇒ Farmers and first processors must be allowed technology to limit the development of fusarium disease and subsequent mycotoxin formation in field.

⇒ Strong legislative pressure on existing crop protection products used by farmers to protect against fusarium formation is perceived as unhelpful and increases risks in growing crops for human consumption.
Mycotoxin control on farm
Potential for reducing mycotoxin risks in EU grain

2013

Monitoring, screening, data sharing and analysis of natural contaminants

Validation of risk assessment models, automation of meteorological data, efforts to incorporate T2-HT2

2016

Pre-Breeding results potentially available for wheat, barley breeders

Improved understanding of Langsethiae pathogen

2021

2027

Resistant commercial cultivars potentially available to farmers
Policy actions and mycotoxin risk in EU grain

Within remit of DG SANCO:

2013

- Roll out of ‘Bee Guidance’ safety provisions from neonicotinoids to other actives

2014

- Definition of Endocrine Disruptors: Threat to triazole fungicides active against fusarium
- Lack of cultivation approvals for biotech events preventing innovation, investors exiting EU

2016

- Economics of crop production weakened by limited access to technology + greater use of fewer products
- Reduced protection from fusarium and other mycotoxin producing fungi may lead to pressure for EU regulation

2018?

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Managing risk

- Fusarium mycotoxins like T2-HT2 and others could be managed even better if we had sufficient knowledge, but not eliminated by farmers.

- We are developing an expert approach as our understanding of pathogens improves.
Better communication of risks should be developed for use with secondary processors and retailers:

Explaining inbuilt safety margins, difficulties with existing analysis techniques
Support for agriculture needed from EU institutions

- Develop tools for farmers to mitigate the development of mycotoxins at field level (need 3 to 5 years, and more);

- Plant breeding and biotech event approval oriented to fusarium and insect resistance;

- Provide functional framework for existing and new crop protection products
Farming sector: Build confidence with European consumers
Thank you

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