

Beating the mycotoxin menace

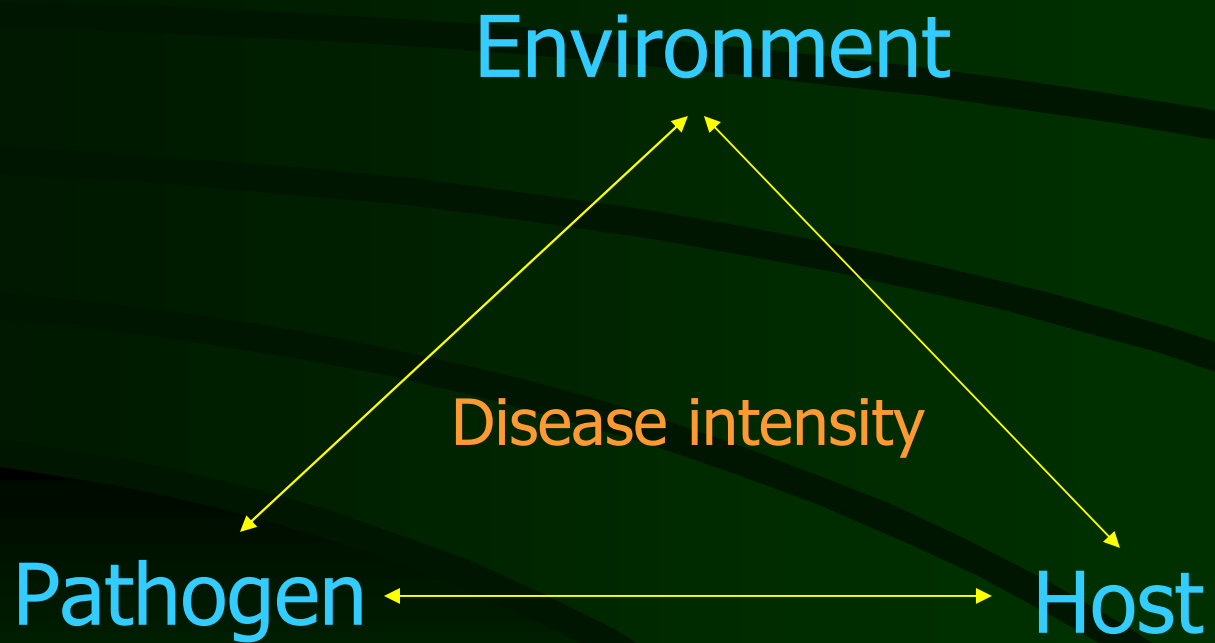


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Back to basics

- Disease triangle
- Epidemiology
- Control Strategies
- Farming systems

Disease Triangle



Epidemiology

- Plant disease epidemiologists strive to understand the cause and effects of disease and develop strategies to intervene in situations where crop losses may occur.

Control Strategies

- Avoidance and exclusion
- Chemical
- Biological
- Sanitation
- Resistance (Ian Small)
- Integration

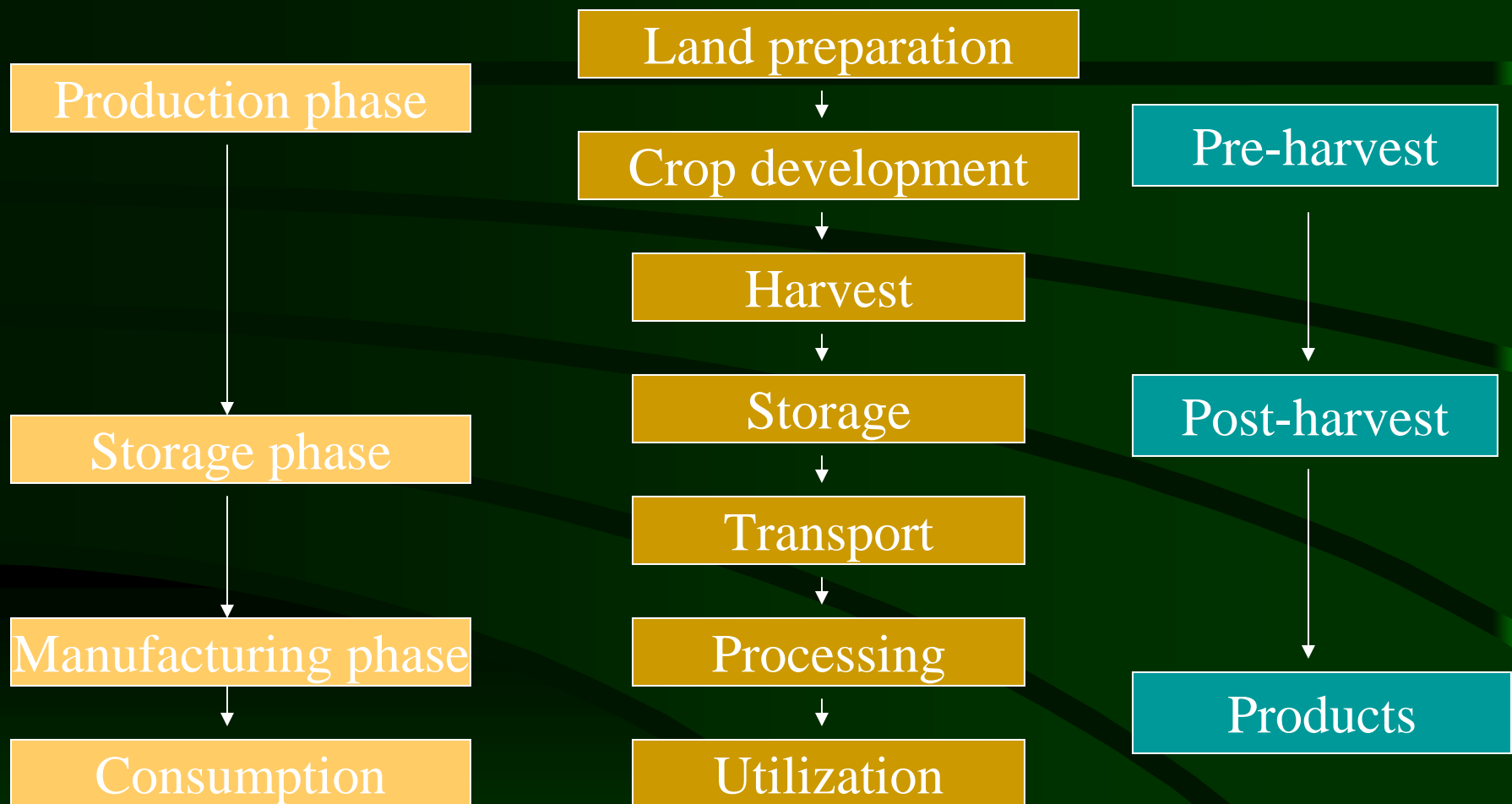
Farming systems

- Large-scale commercial
- Small-scale commercial
- Subsistence

Reduction of mycotoxins

- Farm-to-Fork approach
- Identify Critical Control Points
 - Production phase
 - Storage phase
 - Manufacturing phase
 - Consumer phase

Process flow diagram



Production Phase

- Avoidance and exclusion
- Chemical
- Biological
- Sanitation
- Resistance (Ian Small)

Need to understand

- Ear rot and mycotoxin interactions (Aneen)
- Within species variation (Aneen)
- Pathogen x host interactions
- Environment effect on host pathogen interaction (Belinda and Mudzuli)
- Detection and quantification of disease and mycotoxins (Belinda)

Avoidance and exclusion

- Comprehensive surveys (Edson)
 - Plant in low risk areas
 - Plant at low risk times
- Ensure seed is pathogen free

Chemical Control

- How, when, what and where do we apply?
- Decision making tools – models similar to DONCAST (Belinda and Mudzuli)
- Systemic Acquired Resistance (Ian Small)

Biological Control

- Within species interactions (Aneen)
- Between species interactions
- Exclusive competitors used with success on aflatoxins in USA
 - Non-toxic strains (Aneen)
 - Other species ?

Sanitation

- Crop rotation
- Tillage systems
- Infested stubble reduction
- Working with ARC-CA group (Brad)

Other management factors

- Plant nutrition
- Insect control (Edson Ncube)
- Plant densities
- Stress conditions

Storage phase

- Good storage practices
- Legislation/regulation and quality assurance
- Rapid, cheap detection and diagnostic technologies
- Minimise insect damage

Manufacturing phase

- Good manufacturing practice
- Sourcing – prediction model
(Belinda and Mudzuli)
- Legislation, regulation and quality assurance

Consumption

- Quality assurance (self regulation)
- Daily intake levels
- Feed additives
- Experimentation with food additives
- Routine screening
- Product contamination
- Objective, responsible consumer education

Conclusion

- Database of mycotoxins in SA maize
- Prioritization of mycotoxin risks
- Research must aim to solve priorities
- Integrate mycotoxin management from “farm-to-fork” using HACCP
- Integration of existing and new knowledge
- Optimal use of capacity (cooperation and multidisciplinary approach)
- Solve own problems