Ear and Stalk Rots

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Ear Mold Concerns

• Mycotoxins

• Yield loss

• Price dockage

• Feed quality
Mycotoxins

• Compounds produced by fungi that accumulate in grains

• Heat stable

• Can be toxic to humans and/or livestock
Is this corn contaminated with mycotoxins?
Gibberella ear rot
Gibberella Ear Rot
• Vomitoxin
  – Also known as deoxynivalenol or DON

• FDA Advisory Limits
  – 1 ppm  Human Food
  – 5 ppm  Swine, <20% of diet
  – 10 ppm Cattle and chickens, < 50% of diet
  – 5 ppm  All other animals, <40% of diet
Zearalenone

• **Swine**
  – Prepubertal gilts: Hyperestrogenism, prolapse
  – Sexually mature gilts: Anestrus, pseudopregnancy
  – Bred sows: Early embryonic death, small litters
  – Juvenile boars: Reduced libido, small testicles
  – Mature boars: No effect

• **Cattle**
  – Virgin heifers: Reduced conception
  – Dairy cows: Reduced conception
Fusarium ear rot life cycle

Infection occurs through silks, kernel wounds (birds, insects) or systemically through roots.

Infected ear

Fungi survives in debris in soil or on soil surface.

Disease cycle

Fungus also commonly seedborne.

Macroconidia, microconidia are soilborne and airborne.
Fusarium ear rot
Fumonisin: FDA Advisory

- Food: 2-4 ppm
- Horses: 5 ppm, <20% of diet
- Swine: 20 ppm, <50% of diet
- Ruminants: 30 - 60 ppm, <50% of diet
- Poultry: 100 ppm, <50% of diet
Diplodia ear rot
Diplodia ear rot life cycle
Diplodia ear rot
Diplodia ear rot
Diplodia Facts

• It can survive on corn residue for at least 17 months (e.g. Nov 2014 to April 2016)

• It’s favored by rainy weather at silking plus 2-3 weeks after

• The real economic loss comes from discounts due to Total Damaged Kernels (TDK’s) and Broken Corn and Foreign Material (BCFM)

• Hybrid resistance varies
Storing Diplodia infected grain

- Dry to ≤ 14% moisture
- Cool to 50°F as quickly as possible
- Cool to 30°F for long term storage
- Empty bins before the following summer
Aspergillus ear rot
Aspergillus ear rot
Aspergillus ear rot

- Fungus survives in soil and corn debris
- Drought, heat stress and insect damage to ears favor development
- There is no strong disease resistance
Aflatoxin

- FDA Action Limits
  - 0.5 ppb Milk
  - 20 ppb Human Food and interstate trade
  - 100 ppb Breeding cattle and swine
  - 100 ppb Poultry
  - 200 to 300 ppb Swine and finishing cattle
Other ear rots

Nigrospora ear rot

Penicillium ear rot

Trichoderma ear rot
Stalk Rots

- Fusarium stalk rot
- Charcoal Rot
- Anthracnose stalk rot
- Diplodia Stalk rot
General symptoms
Fusarium stalk rot

- Fungus can penetrate stalks at base of leaf sheaths and progress to lower internodes.
- View of split stalk.
- Fungus also commonly seedborne.
- Infection occurs directly or through wounds from hail or insects.
- Fungi survive in debris in soil or on soil surface.
- Macroconidia and microconidia are soilborne and airborne.
Fusarium/Gibberella Stalk Rot
Charcoal Rot
Anthracnose stalk rot
Anthracnose top dieback
Diplodia stalk rot
Conditions favoring stalk rot

- Fusarium – wet early, dry mid-season, wet late
- Charcoal rot – hot and droughty mid- to late-season
- Anthracnose – wet mid- to late-season
- Diplodia – wet mid season
Stalk rot management

• Choose hybrids with good root, stalk and stay-green characteristics

• Maintain healthy leaves

• Provide adequate nitrogen

• Harvest early to avoid lodging
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