

2. Factors influencing Aflatoxin production and contamination in Maize

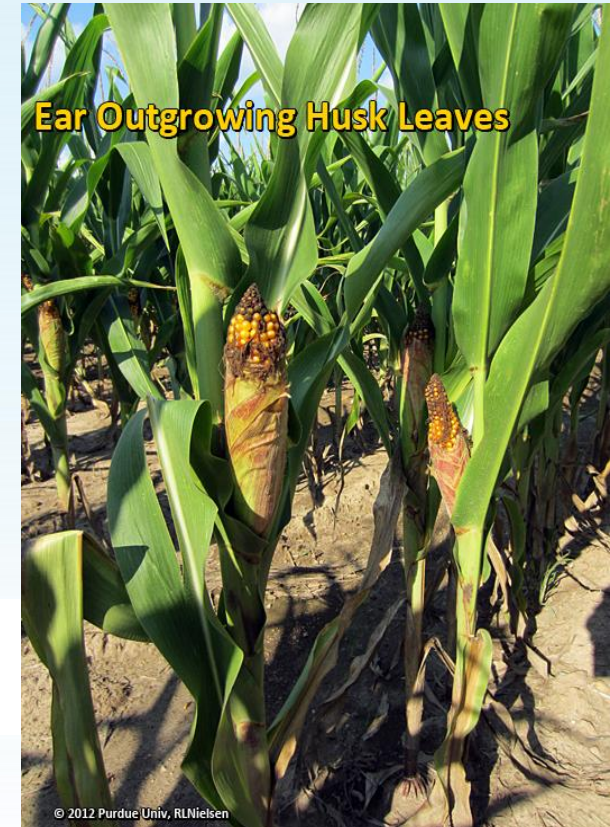
1. Pre-harvest factors

i) Resident Fungal

- The prevalence and severity of AFs in maize are heavily influenced by the composition of resident *Aspergillus* populations to the crop in the field

ii) Host plant susceptibility

- Some maize varieties are highly susceptible to the condition that favors *Aspergillus* and AF production
- Bad ear attributes (open-ear tips, loose husk coverage, not dropping at maturity) increase AF contamination in maize.

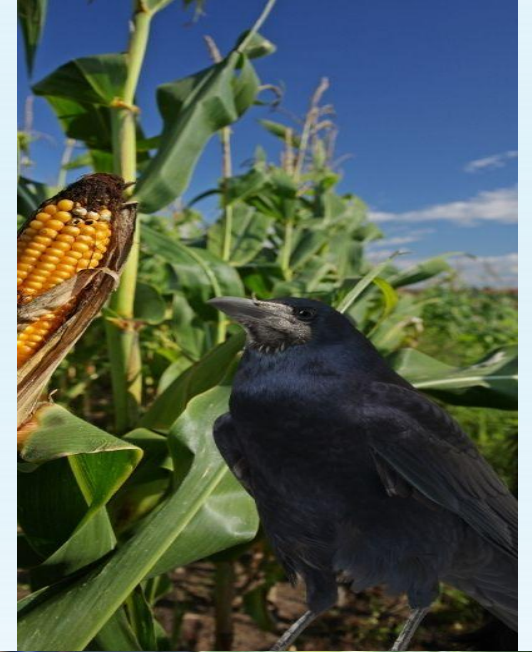


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iii) Environmental and biotic stresses

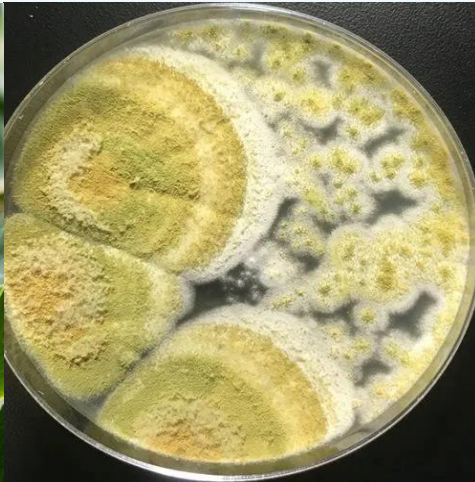
- The proliferation of *Aspergillus* and aflatoxin production is increased when the crop is stressed by biotic, edaphic, or climatic factors
- The damage of ears or kernels by birds and insects creates avenues for the entry of *Aspergillus*
- Maize is exposed to a moisture content (m.c) that is conducive to mold growth (17–19% m.c. = 0.80–0.90 water activity, aw)
- This condition can also allow *Aspergillus* and *Penicillium* to colonize the substrate.



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- The fungi *A. flavus* is widely distributed in nature and has been reported to occur on forages, cereal grains, food and feed products, and decaying vegetation in cultivated soils
- Maize is a good substrate for mycotoxins-producing fungi, especially those producing aflatoxins
- The fungus *A. flavus* can be recognized by a gray-green or yellow-green mold growing on corn kernels in the field or in storage
- Field infection of corn by *A. flavus* can result in aflatoxin production in the corn before harvest



Post-harvest Factors

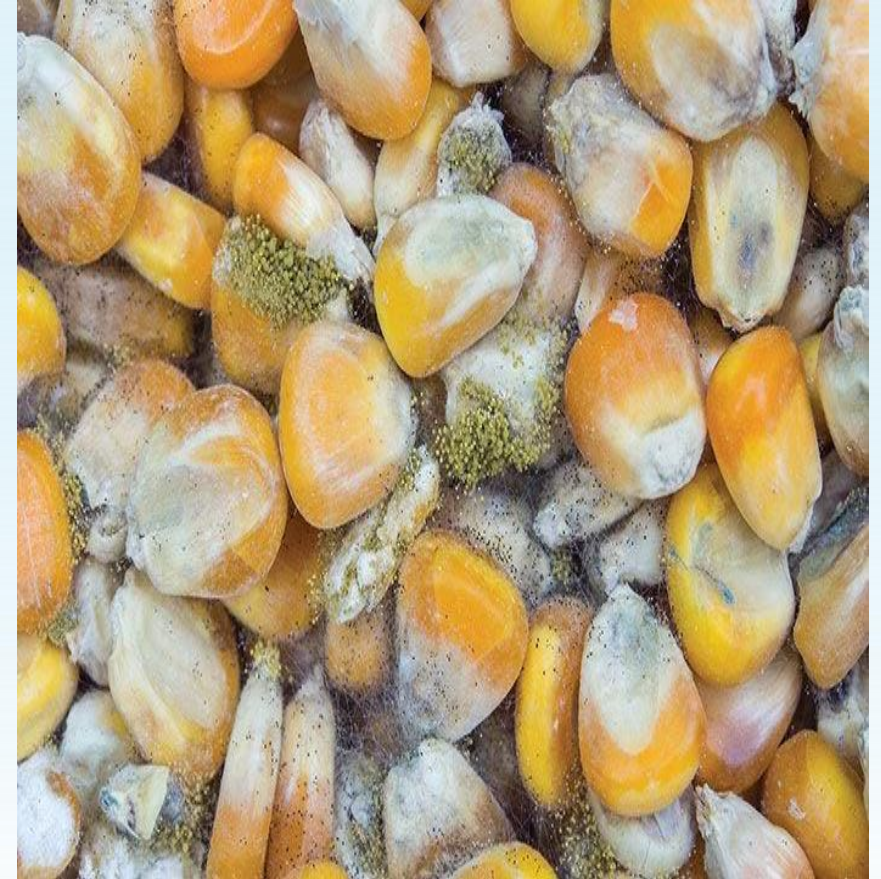


i) Moisture content

- *A. flavus* grows best on corn at 18.0 to 18.5% moisture
- Moisture content below 13% prevents the growth of *A. flavus*

ii) Temperature of the stored grain

- *A. flavus* grows best at high temperatures
- The fungus will grow slowly in grain between 40 and 50 degrees F but will grow rapidly in grain at 80 to 90 degrees



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iii) The physical condition of the grain going into storage

- Corn with cracks or breaks in the seed coats, broken kernels, or Other physical damage is more subject to invasion by *A. flavus*
- Corn contaminated with *A. flavus* going into storage will deteriorate at:
 - ✓ lower moisture content,
 - ✓ a lower temperature, and
 - ✓ in a shorter time
- Than grain that is free or almost free of *A. flavus*

