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Sorghum (*Sorghum vulgare*, L.) Diseases

Head mold (*Fusarium* spp, *Alternaria* spp., *Helminthosporium* spp. *Curvularia* spp.)

Mold affecting sorghum grains (left and center pictures) and heads with severe mold infection (left side on the picture at the right) and healthy heads (right side on the picture at the right).

Head mold is produced by a variety of fungi among which *Fusarium* spp, *Alternaria* spp., *Helminthosporium* spp. *Curvularia* spp. being the most important ones. Only some of these fungi are pathogens with capacity to infect developing seed and produce significant damage, others are saprophytes and they only invade the seed coat (pericarp) and dead floral tissue. Grain mold pathogens have been associated with losses of grain mass, density, and germination, and some produce mycotoxins that are harmful for human and animal health and productivity. Grain mold infection occurs any time from flowering to grain filling and harvest. It is believed that early infection occurs on the external parts of a flower such as glumes, lemma, and palea and continues with infection of the grain near the base or pedicel disrupting the translocation of assimilates from the plant to the grain. The saprophytic fungi cause only superficial damage to the seed but, due to moldy appearance, the market value is affected. Toxins developed by the fungi are diverse and include aflatoxin, a naturally occurring carcinogen. These toxins can cause fertility and birth defects in swine, reduced weight gains in poultry and turkey, and increased disease susceptibility in humans and animals. *Fusarium graminearum*, which produces stem and ear rot in corn and head scab on wheat, can also produce head mold on sorghum. In this case the fungus produces toxic metabolites that damage the internal stem tissue and allow other *Fusarium* spp. to invade the head. Head and grain mold is favored by humid conditions during grain filling, in particular by air humidity of 95% and over 95% relative humidity. Injury by head bugs and worms feeding on the grains favor fungal infection as they provide a ready site for entry of the fungi. Mold color varies from white or pink when it is induced by *Fusarium* spp. to black when caused by other fungi.

Management of grain mold includes several options from which the most important ones are adjustment of planting date so that grain filling occurs during the driest part of the growing season, use of resistant varieties, and timely harvest. Harvest should be made as soon as the black layer at the base of the grain is formed. However, at this time seed has around 18-20% moisture and it can develop post-harvest mold if it is not delivered to the buying stations or dried on farm. Chemical control of the grain mold appears to be impractical and uneconomical, however timely chemical control of the bugs and worms that can create good infection conditions for the fungi is important.

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