

Guide to head diseases of wheat and barley in Montana

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Fusarium head blight (scab) of wheat and barley (*Fusarium* spp.)

Symptoms: Partial bleaching of the head; brown stems on very susceptible varieties; if moist, pink/orange fungal mycelia

Risk Factors: Continuous wheat or barley production, moist conditions at flowering, previous history of scab

Management: Crop rotation, cut irrigation 10 days before flowering and through the flowering period, resistant varieties, fungicides applied at or before flowering



Common bunt (stinking smut, covered smut) of wheat (*Tilletia tritici* or *T. laevis*)

Symptoms: Grain kernels replaced with brown masses of spores known as smut balls; fishy smell

Risk Factors: Contaminated seed, often from previous crop

Management: Resistant cultivars, fungicide seed treatment, new seed source



Dwarf bunt (TCK) of winter wheat (*Tilletia controversa* Kuhn)

Symptoms: Grain kernels replaced with brown masses of spores known as smut balls; fishy smell; plants and heads are stunted/dwarfed

Risk Factors: Contaminated seed, often from previous crop

Management: Resistant cultivars, systemic fungicide seed treatment, new seed source



Loose smut of wheat and barley (*Ustilago tritici*)

Symptoms: Grain kernels replaced with green-brown masses of spores covered by a thin membrane; spores disperse within days of head emergence

Risk Factors: Contaminated seed, often from previous crop

Management: Resistant cultivars, systemic fungicide seed treatment, new seed source



Ergot of wheat and barley (*Claviceps purpurea*)

Symptoms: Grain kernels replaced with solid purple-black mass of fungal hyphae called a sclerotia; if wet after flowering honeydew (sticky mass of fungal conidia) can be observed on infected heads

Risk Factors: Contaminated seed, often from previous crop

Management: Crop rotation to non-grass crop; tillage to bury sclerotia; clean seed

Caution: Ergot is toxic to humans and animals (ergotism)



Black chaff of wheat and barley (*Xanthomas* spp.)

Symptoms: Red/brown/black streaks on glumes; watersoaked spots on leaves and/or glumes

Risk Factors: Contaminated seed, often from previous crops; can also be on residue or soilborne

Management: Crop rotation to non-grass crop, tillage to bury residue, clean seed



Melanism (abiotic)

Symptoms: Red/brown/black streaks on glumes; no spots on leaves, although stems or nodes may also be dark

Risk Factors: Stress (particularly heat stress), variety (genetics)

Management: Variety selection

Black point (kernel smudge) (various fungi)

Symptoms: Glumes, other tissues covered with black, sooty-appearing mold; diseased kernels are discolored, weathered, black at seed ends, embryos often shriveled and brown to black in color

Risk Factors: Warm, moist weather during maturation, delayed harvest

Management: None practical, avoid moisture during crop storage



Sooty mold (primarily *Alternaria*, but other fungi can be involved)

Symptoms: Glumes, other tissues covered with black, sooty-appearing mold; diseased kernels are discolored, weathered, black at seed ends, embryos often shriveled and brown to black in color

Risk Factors: Warm, moist weather during maturation, delayed harvest

Management: None practical, avoid moisture during crop storage

