

BLACK CHAFF AND FALSE BLACK CHAFF OF WHEAT



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Black chaff is a bacterial disease of wheat caused by the bacterium *Xanthomonas campestris* pv. *translucens*. Head symptoms consist of dark lines or patches on the glumes and dark spots (lesions) on the awns. These lesions often give the awns alternating green and brown areas — a “barber pole” effect that helps identify the disease. One or more black vertical “pencil” stripes are diagnostic for black chaff (Figure 1). Leaf symptoms do not always accompany head symptoms. If leaf infection occurs, dark, greasy, green (water soaked) longitudinal streaks develop on the leaves; this tissue soon dies and becomes tan to brown colored.

The black chaff bacteria can survive on crop refuse and seed. The bacterium is spread by splashing rain and sprinkler irrigation. Crop rotation may help somewhat, preferably in rotations with non-cereals. Barley and oats also are susceptible.

When black chaff infection occurs late in the season under dryland conditions, damage to the grain usually is minimal. Yield losses have been reported to be severe under sprinkler irrigation in other states.

Melanism (pseudo black chaff, false black chaff, or brown-necrosis) produces dark purple to black streaks or blotches on the glumes. The dark discoloration with melanism usually is more uniform black than in the case of black chaff. The awns and peduncle show no symptoms. A dark purple to purple-brown ring or collar forms at each joint, and often it is necessary to peel away the leaf sheath to see this

symptom. The purple rings at the joints are diagnostic for this genetic disorder (Figure 2).

Melanism traditionally has been associated with certain genes for stem rust resistance. The develop-

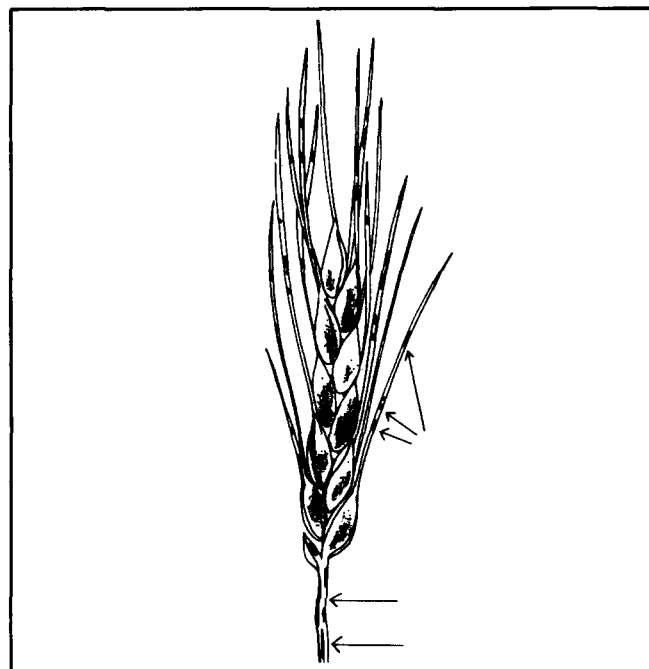


Figure 1. Black Chaff. Note diagnostic features on the awns and the peduncle (base of head — arrows).



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Figure 2. Melanism (false black chaff). Note darkening of glumes on the kernels. The dark collar (streaking) above the joint is diagnostic (arrow).

ment of the dark brown pigments, known as melanism, occurs when the environment is both hot and humid. Dry heat alone apparently does not induce melanism. Melanism caused yield losses in Crim, Conley, and Fortuna wheat varieties in the 1960's.

Melanism occasionally has been observed on Butte and Amidon hard red spring wheats following hot, humid weather. Symptoms usually have appeared late in the season as the crop approached maturity. Conditions favoring melanism often are also favorable for black chaff. Melanism has not been as severe as Butte or Amidon as it was on Crim, and melanism has not caused any observable yield losses in Butte or Amidon.

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