



Pest e-alerts



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Lodging in Winter Canola

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With excellent soil moisture this winter the winter canola crop in Oklahoma is looking really good. However lodging is being observed in localized spots or on scattered plants. There are two causes of lodging (plants falling over) that have been observed.

Winter decline syndrome - Winter decline syndrome is a gradual decline in the health and stand of winter canola that typically shows up in the spring as plants break winter dormancy. It is distinct from winterkill that occurs from the rapid death of plants soon after a low temperature event. Winterkill is a problem with non-adapted varieties and hybrids, plants that are too small or too big going into winter, and drought stress during overwintering. Symptoms of winter decline syndrome typically appear during bolting in the spring. Affected plants develop an internal deterioration of the crown near the soil line, often without external symptoms. The crown and stem base become swollen (Figure 1) and the taproot deteriorates and rots. The crown becomes soft and mushy and may be infested with seed corn maggots (Figure 2). Plants affected early are stunted, wilt, and die. Plants easily break at the soil line when pulled or exposed to high winds (Figure 3). Older affected plants that don't die early appear to flower normally but later lodge and die.



Figure 1: Swollen lower stems of winter canola from winter decline syndrome



Figure 2: Soft rot of canola stem from Winter decline syndrome



Figure 3: Lodging from winter decline syndrome

The exact cause of winter decline syndrome is not known but appears to be favored by high soil moisture during the winter, excessive plant growth in the fall, and high nitrogen applications in the fall. In my research plots evaluating resistance to blackleg, we take notes on the occurrence of winter decline syndrome and definitely see differences between varieties and hybrids. Locally adapted entries with good winter hardiness that remain prostrate going into winter have a lower incidence of the problem. Plants that get to big in the fall, are exposed to sudden low temperature drops before adequate cold acclimation, or are exposed to very low winter temperatures favor its development. One theory is that the freezing and thawing in wet soils causes injuries to the crown that allow entry by various microorganisms and maggots that rot the crowns and roots. While various plant pathogens have been isolated from affected plants, symptoms cannot be reproduced by inoculating plants with the microorganisms. To minimize the risk of winter decline syndrome, adapted varieties should be planted using seeding rates that do not produce an overly dense stands and fertilized in the fall with nitrogen rates that do not promote excessive fall growth.

Blackleg (*Leptosphaeria maculans*) - Blackleg is a widespread disease of canola in Oklahoma. It causes leaf spots (Figure 4) and cankers on the lower stem during ripening stages of crop development (Figure 5). While the disease commonly occurs, it is slow to develop and has not generally killed large numbers of plants prior to maturity. Generally cankers only extent partially into the stem and do no completely girdle the plant. This is likely because most varieties we grow have multi-gene or field resistance to the disease. One of the parents of the variety Wichita, one of the first varieties widely grown in the Southern Great Plains was 'Jet Neuf'. Jet Neuf carries the major blackleg resistance gene *Rlm4* that confers resistance to leaf spot. This major resistance gene is no longer effective in the southern Great Plains. However, Jet Neuf also has strong multi-gene resistance that was the primary management strategy for blackleg in Europe for many years. It appears that most varieties from the KSU Winter Canola breeding program and the conventional (non-round-up ready) European hybrids that we have been growing have this type of field resistance

Multi-gene resistance is only partially effective when conditions are very favorable for disease development. Spots of lodged plants from blackleg are showing up this year (Figure 6). This is likely due to the wet conditions experienced since planting last fall. In contrast to winter decline syndrome, stem bases generally do not swell from black leg and the decay is dry (Figure 7). Black pepper-like specks are visible on the surface of leaf spots and stem cankers caused by blackleg (Figure 5). Management of blackleg in winter canola should rely on crop rotation, separating new fields from old canola residue as far as possible, and planting the best resistant varieties or hybrids available.



Figure 4: Leaf Spot phase of blackleg



Figure 5: Lower stem canker from blackleg with Pepper-like fruiting bodies.



Figure 6: Lodged canola from blackleg



Figure 7: Dry decay of crowns from blackleg on Lodged plants.

Disease and Insect Diagnostic Laboratory

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