UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Plant Pathology Fact Sheet PPFS-AG-R-01

Winter Decline Syndrome of Canola

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Background

Interest in producing canola in Kentucky has greatly increased in recent years. Many farming operations wish to diversify their production systems with different row crops that require little to no additional equipment or infrastructure costs; canola is such a crop. Additionally, newer canola cultivars have improved agronomic traits, including winter hardiness. Lastly, more stable markets in Kentucky have greatly increased the profitability of canola.

During the last canola "boom" in Kentucky during the late 1980s, a serious concern was the rapid decline of stands during late winter and early spring. The problem was so severe in some fields that near complete crop failure occurred. For lack of a better term, this malady was called winter decline syndrome. Winter decline syndrome was one of the main reasons for waning canola production in Kentucky during the 1990s and first decade of the 2000s.

At present, it is unknown if newer canola cultivars—with reported improved winter hardiness and survival—will be less subject to winter decline syndrome or not. Therefore, it behooves canola producers to be familiar with winter decline syndrome, its symptoms, and its possible cause.

Symptoms

Affected plants develop moderate to extensive crown and root deterioration (Figure 1). Severely affected plants often die prior to or following bolting in the spring. Less severely affected plants may appear to be normal, but eventually lodge due to stem weakening in the crown area (Figure 2).

Figure 1. Canola with extensive crown deterioration typical of winter decline syndrome.

Possible Cause

The exact cause of winter decline syndrome is unknown. The current thinking is that physical factors (e.g., cold injury) cause initial plant damage. This, in turn, is followed by the invasion of damaged plants by various secondary organisms, including common soil-borne fungi and bacteria, and insect maggots (*Delia* spp.). Physical damage (the supposed primary cause of the problem) occurs most frequently in poorly drained soils. Waterlogging of soil may directly damage roots or it may affect winter survival by reducing plant vigor.

There also appears to be some relationship between winter decline syndrome and insufficiently cold-

FIGURE 2. LODGING OF CANOLA PLANTS AFFECTED WITH WINTER DECLINE SYNDROME.

hardened plants, or plants that break dormancy too early in the spring. This accounts for the occurrence of winter decline syndrome in some fields that are relatively well-drained. Whatever the mechanism, initial plant damage provides substantial numbers of ports-of-entry for secondary organisms, such as *Rhizoctonia* spp. These organisms cause further damage which results in plant decline and often death.

Management

The best defense against winter decline syndrome is to plant adapted canola cultivars in well-drained soils. It is also essential to follow management practices that promote adequate, but not excessive, growth in fall. Excessive growth in fall can result from planting too early and/or applying excess nitrogen. Excessive growth can also result when excessively high seeding rates, plant populations, or in no-till systems that may promote long and narrow stems. In recent years, canola breeders have worked to develop canola cultivars that are less responsive to sporadic warming periods common in Kentucky in winter months. These cultivars may be less prone to plant stress and possibly winter decline syndrome. However, research will be needed before definitive recommendations can be made relative to selection of currently available canola cultivars and avoidance of winter decline syndrome.

More Information

The University of Kentucky publications listed below are available at county Extension offices, as well as on the Internet.

- Canola (University of Kentucky, 2012)
http://www.uky.edu/Ag/CCD/introsheets/canola.pdf

- Crop Profile for Canola in Kentucky (University of Kentucky, 2010)
http://www.ipmcenters.org/cropprofiles/docs/KYcanola.pdf

- Canola Growers' Manual (U.S. Canola Association, 2008)
http://www.uscanola.com/site/files/956/102387/363729/502632/Canola_Grower_Manual_FINAL_reduce.pdf

- Factors Involved in Winter Survival of Canola in Kansas (Kansas State University, 2014)
https://webapp.agron.ksu.edu/agr_social/eu_article.throck?article_id=148

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