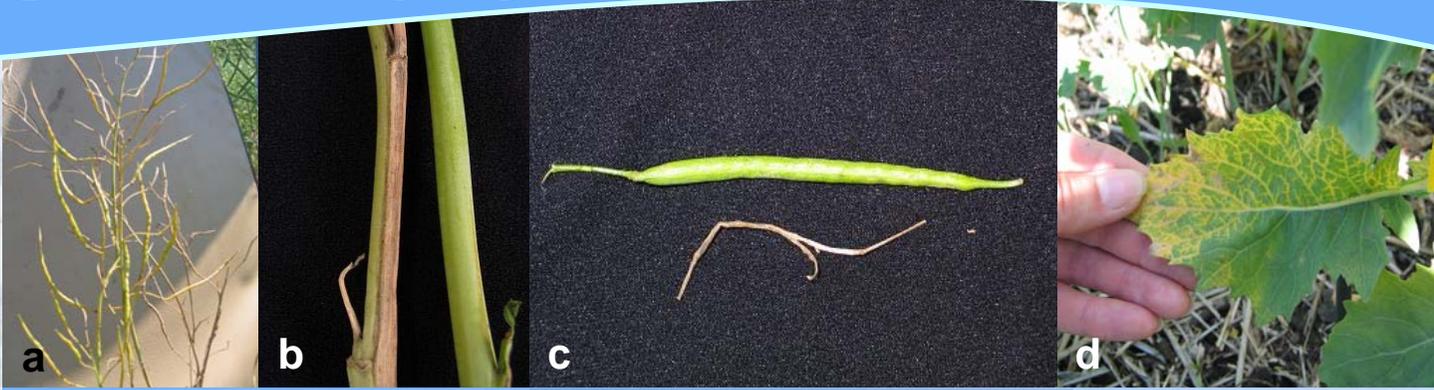


# Fusarium oxysporum Schlecht. f. sp. conglutinans (Wollenw.) Snyder & H. N. Hansen



**Fig. 1.** Canola plant showing signs of wilting (a); Healthy stem (right) and reddish brown unilateral streaks (left) on canola stem (b); Healthy (top) and shrivelled pods (bottom) due to Fusarium wilt (c); Veinal chlorosis due to Fusarium wilt (d); Photo credits:Ralph Lange, Alberta Research Council, Vegreville, Canada.

**Disease:** Fusarium wilt

**Classification:** K: Eumycota, D: Ascomycota, C: Sordariomycetes, O: Hypocreales, F: Nectriaceae.

Fusarium wilt is a serious biosecurity threat to Australia's canola industry. It is caused by *Fusarium oxysporum* f.sp. *conglutinans* race 1. This fungus causes disease in canola and other cruciferous hosts, particularly vegetable Brassicas. It has also led to severe disease of canola crops in Canada.

**The Pathogen:** The pathogen causing wilt of canola was first reported from Russia in 1996 and was identified as *Fusarium oxysporum* f. sp. *conglutinans*, race 1. Three years later a new disease of canola called Fusarium wilt was reported by Lange *et al.* (2000) in Alberta, Canada. Originally two species of *Fusarium*, *F. avenaceum* and *F. oxysporum* were isolated from diseased plants, however, the disease was later confirmed to be caused by *F. oxysporum*, f. sp. *conglutinans* race 1.

*Fusarium oxysporum* f. sp. *conglutinans* specifically attacks Brassica species and is morphologically indistinguishable from other *F. oxysporum* strains. Sporodochia and macroconidia are abundant on CLA (Carnation leaf agar). Macroconidia are short to medium in length and usually 3-septate. Microconidia usually 0-septate, oval or reniform and are formed in false heads. Chlamydospores are formed abundantly on agar.

**Distribution:** Fusarium wilt of canola is reported from Canada, Russia and Argentina. The pathogen causing Fusarium wilt, *Fusarium oxysporum* f.sp. *conglutinans* race 1, is known to

widely occur in many countries. This pathogen was also reported from Queensland, Australia in 1961 causing 'Yellows disease' on cabbages.

**Host Range:** The pathogen causing canola wilt mainly affects canola and mustard. It is also known to cause 'Fusarium Yellows' on a range of other crucifers in particular vegetable Brassicas.

**Impact:** Fusarium wilt can reduce yield by up to 30%, however, in worst cases complete yield loss can occur (Lange *et al.*, 2007). The symptoms of the disease include poor seed set, premature senescence and premature shattering of siliques. Sometimes, symptoms may be present on one side of the stem, or affecting only one or a few branches, while other plant parts appear normal. Vascular discoloration of the main stem is the key diagnostic symptom.

**Detection and control:** Diagnosis is based upon fungal morphological characters on Special Minimal Medium (SNA). Control options are limited and use of resistant varieties is the best option. Crop rotation and good weed control is vital to minimise the inoculum levels.

**Further Reading:** Lange *et al.* (2000) A new Fusarium wilt of canola in Alberta, Canada in 1999. Presented at the Canadian Phytopathological Society's AGM, Victoria B.C.; Lange *et al.* (2007) *Commun. Agric. App. Biol. Sci.* 72: 723-734..

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