Disease Alert – White Leaf Spot in Crucifer Seed Fields in the Willamette Valley

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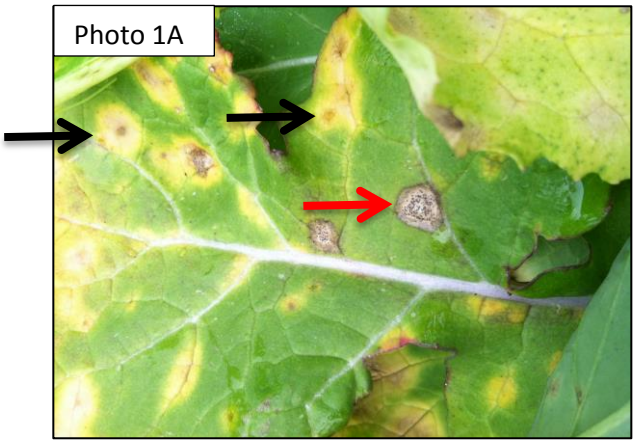
White Leaf Spot and Gray Stem in Crucifer Seed Crops in Western Oregon, 2014

Beginning late March 2014, I found several leaf spot diseases in fall-sown crucifer crops and weedy species in the Willamette Valley. A survey in OSU research fields of fall-sown canola during late October 2013 showed no leaf spots or seed/seedling diseases. However, white leaf spot and gray stem caused by the fungus *Pseudocercosporella capsellae* (sexual stage: *Mycosphaerella capsellae*) were observed during 2014 in canola research fields as well as in commercial seed fields of forage Brassicas and "field" turnip. White leaf spot was also detected in volunteer black mustard and forage fields. Susceptible hosts reportedly include species of *Brassica* (broccoli, cabbage, canola, cauliflower, Chinese cabbage, mustard, turnip, etc.) as well as radish and horseradish. Weedy types such as wild radish, wild mustard, and shepherd's purse are susceptible to white leaf spot and gray stem (1).

How the pathogen overwinters and reproduces in the Pacific Northwest is unknown at this time. In the UK, ascospores develop on infected *Brassica* or *Raphanus* residues during the autumn and can be wind-dispersed relatively long distances following rain or dew events. Beginning in late fall, the asexual spores (conidia) can develop and are spread relatively short distances by rain or splashing water, potentially causing pod infections the following spring; however, seed transmission is not thought to play a major role in disease spread. Temperatures of 50 to 60°F under moist conditions promote disease development.

This fungus can attack leaves, stems and pods. Tan, irregular or roundish spots develop on leaves, especially leaf tips and edges, later becoming ashy gray to white with a brownish margin and yellowish halo (Fig 1A). White conidia can be observed on the leaf spots. The leaf spots become dark brown as leaves senesce due to the initiation of the sexual stage. The center of older lesions may fall out, resulting in a shot hole appearance. Foliar lesions may coalesce when disease is severe, resulting in defoliation. Stem lesions are elongated and brown at first, turning ashy gray to white with a brownish margin (Fig 2A); the numerous tiny dark specks due to the formation of the pathogen's sexual stage. There is a distinct boundary between diseased and healthy tissue on the stem. Gray stem lesions are superficial; the pith is not severely infected. Pod infections start as small brown spots that expand and turn grayish-white with age and develop the numerous tiny dark specks indicative of the sexual stage.



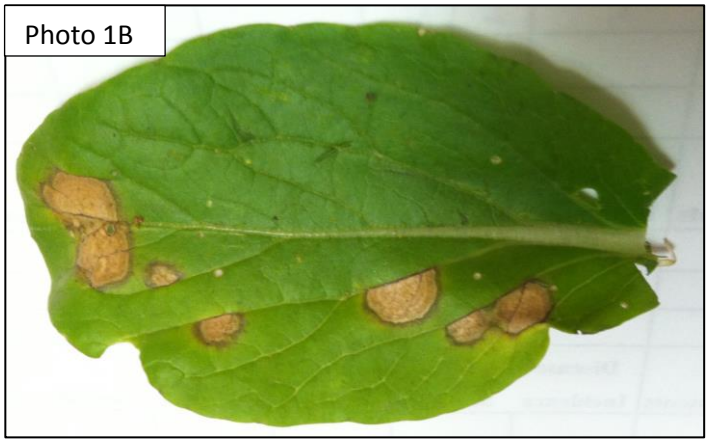


Photo 1A (above left) shows late stage white leaf spot (black arrows) and Phoma leaf spot (red arrow) on turnip; upper right (Photo 1B) is an earlier stage of white leaf spot.

Photo 2A (above left) shows gray stem of turnip; upper right (Photo 2B) is a close-up of white leaf spot showing white conidia.

Cultural controls:

- Eradicate susceptible weeds and volunteer *Brassica* and *Raphanus* plants.
- Remove plant debris or bury by deep-plowing. Flailing followed by a more shallow plowing may be sufficient depending on amount and size of plant debris and environmental conditions.
- Rotate out of crucifers for three years.
- Avoid planting in or adjacent to a field infected the previous season.
- Plant resistant cultivars; many genotypes of *Brassica napus* and *B. juncea* from China are resistant to this disease (2).

References

(1) Inman, A.J., and Fitt, B.D.L. 2007. White Leaf Spot. Pages 50-54 in: Compendium of Brassica Diseases, Rimmer, S.R., Shattuck, V.I., and Buchwaldt, L. (eds.), APS Press, St. Paul, MN. 117 pp.

(2) Gunasinghe, N., You, M.P., Banga, S.S., and Barbetti, M.J. 2014. High level resistance to *Pseudocercosporella capsellae* offers new opportunities to deploy host resistance to effectively manage white leaf spot disease across major cruciferous crops. European J. Plant Pathology 138:873-890.