MAY 13 Pathogen of the month – May 2013

Pythium sulcatum R.G. Pratt & J.E. Mitch.

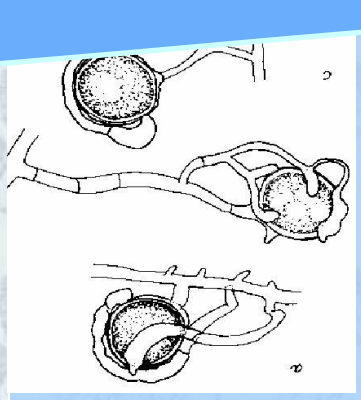

Fig. Oospores of *Pythium sulcatum,* symptoms of cavity spot on mature carrot, root dieback on seedlings, and forking resulting from seedling damage.

Disease: Cavity spot of carrots (*Daucus carota*); Causal agent: *Pythium sulcatum*
Classification: K: Chromista, D: Oomycota, C: Oomycetes, O: Pythiales, F: Pythiaceae

Cavity spot is a widespread field disease of carrots. The spots are sunken, circular to elliptical lesions usually less than 10 mm across, and sometimes surrounded by a pale halo. The spots develop rapidly on roots that are close to harvest; severely affected carrots are unmarketable. This disease is mainly caused by *P. sulcatum* in Australia, but other *Pythium* spp. such *P. violae* are more important overseas.

Biology and Ecology: *Pythium* spp. survive in soil from many years as thick walled oospores. They produce zoospores in wet soil, so that disease severity can increase rapidly in wet weather.

P. sulcatum survives mainly as oospores; most isolates do not produce zoospores as abundantly as other species. It can be isolated from carrot plants at all stages of development, but symptoms of cavity spot usually appear only when plants are close to maturity.

P. sulcatum, P. violae and other *Pythium* spp. also cause diseases such as damping off, leading to low plant numbers, and tap-root dieback, resulting in stumpy and forked carrots. These are most severe in wet soil.

Distribution: Cavity spot is a common disease of carrots worldwide. In Australia It is particularly damaging in Western Australia, Victoria and Queensland. *P. sulcatum* occurs in all carrot growing areas in Australia, but *P. violae* only occurs on carrots in South Australia and along the River Murray in Victoria.

Host Range: *P. sulcatum* is unusual in that its host range is limited to members of the family Apiaceae, it can survive for at least 2 years between carrot crops. *P. violae* can infect a much wider range of plants, which include many crops such as wheat, lucerne and broccoli.

Disease Impact: Carrots are an important crop in Australia where they are grown for the domestic and export markets. Cavity spot is common in crops that are grown with either no or limited rotation.

Disease Management: Rotation with a non-host will reduce the build up of inoculum in soil. In areas where *P. sulcatum* causes cavity spot, do not rotate with other members of the Apiaceae (celery, parsnip).

Carrot varieties show a wide tolerance to cavity spot, Stefano is one of the most tolerant varieties.

Liming acid soil to pH of 7.2 or higher reduces the incidence and severity of cavity spot.

Metalaxyl reduces the incidence of cavity spot when used at or shortly after seeding, however if used too frequently it can loose its effectiveness because of enhanced microbial breakdown.

Further Reading: Davison & McKay (2003) Australasian Plant Pathology 32: 339-346; Davison *et al.* (2003) Australasian Plant Pathology 32: 455-464.

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