MAR 12 Pathogen of the month – March 2012

Rhizoctonia carotae Rader 1948

Fig. Symptoms of crater rot of carrot (*ref.* http://smfarm.cfans.umn.edu/carrotrootproblems6.htm; *http://www.omafra.gov.on.ca/english/crops/facts/98-001.htm#Crater*)

Disease: Crater rot of carrot (*Daucus carota*); Causal agent: *Rhizoctonia carotae*
Classification: K: Fungi, D: Basidiomycota, C: Agaricomycetes, F: Ceratobasidiaceae

Crater rot is a fungal disease of carrot caused by *Rhizoctonia carotae*. The disease initiates in field conditions but the major damage to carrot appears in storage conditions where cool temperatures favour fungal growth. The disease is easily spread to new locations through infested carrots and packing materials. Significant crop damage is reported in a number of carrot growing counties. Currently, Australia is free of this disease but it is a potential biosecurity threat to the Australian carrot industry.

Biology and Ecology: The disease initiates in field by infecting a primary carrot root however symptoms are usually not visible until white cottony mycelial growth on the surface of carrot becomes visible in storage. This distinct symptom initiates as small horizontal canker-like lesions mostly on the crown and upper roots. Small pits soon develop beneath the lesions and gradually enlarge into sunken brown craters lined with a white flocculent mycelium. Symptoms may easily be confused with *Fusarium* dry rot of carrot.

The pathogen can survive for a long time as sclerotia in field soil and in wooden packing materials. Under favourable conditions new infections start from sclerotia. Fungal development in storage is favoured by high humidity with low temperature.

Distribution: The disease has been reported from USA, Denmark, Norway, Sweden, Russia, UK and recently from Turkey (Kurt *et al.* 2005). Oceania countries are still free of this fungus.

Host Range: In addition to carrot, crater rot fungus also attacks celery, swedes, cabbage and beet.

Disease Impact: *R. carotae* is generally considered to be a minor pathogen but it can cause severe disease outbreaks. Losses of 50-70% have been reported in storage from Denmark, Turkey and some areas in the USA (Punja, 1987). Crater rot is a damaging storage disease of carrot and related vegetable crops grown in Australia. Therefore this exotic disease poses potential economic impacts to susceptible vegetable industries in terms of both production and marketing.

Disease Management: Cultural practices and chemical spraying are equally important to managing crater rot disease. There is no evidence of varietal resistance. On farms with a previous history of the disease, control with fungicide is advisable. Damage during harvest should be avoided, and soil and leaf debris should not be left adhering to the roots. Good hygiene is required, with thorough cleaning of storage bins and stores.

Further Reading: Kurt *et al.* (2005) *Plant Pathology* 251; Jensen (1971) *Acta Horticulturae* 125-129; Punja (1987) *Canadian Journal of Plant Pathology* 24-31.

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