



Farmnote

Cavity spot disease of carrots

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Summary

In Western Australia cavity spot disease of carrots is caused by the soil borne fungus *Pythium sulcatum*. Cavity spots are small elliptical lesions (usually less than 10 mm across) often surrounded by a yellow halo. Infection can take place anywhere along the carrot root and lesions start as pinhead-size spots. In most cases visible symptoms develop in the month before harvest maturity and develop rapidly if conditions are favourable.

Cavity spot reduces the quality of carrots so that they become unacceptable for the local and export fresh markets.

Cavity spot has resulted in severe losses and has been difficult to control.

An extensive survey of commercial carrot crops showed that cavity spot was:

- more prevalent in late summer and autumn harvested carrot crops;
- more serious on soils with a pH less than 7 than on soils with a higher pH;
- not reduced by the soil fumigant metham sodium;
- more severe in carrots following another carrot crop.

Control

Cavity spot can be minimised by using an integrated control program based on tolerant varieties, rotation, liming, scheduling harvesting, and metalaxyl application.

Grow carrots when cavity spot is least likely to occur. Avoid



Figure 1. Cavity spot disease of carrots



Figure 2. Severe cavity spot on overmature carrots



Figure 3. Close up: Severe cavity spot symptoms.

growing carrots for summer and autumn harvest in areas where previous crops have been affected by cavity spot.

Stefano and Navarre are highly tolerant to cavity spot. Crusader and Nandor are moderately tolerant. All of these are more cavity spot tolerant than Ivor (Top Pak) and produce similar quality and yields in research trials. Avoid planting Ivor, Murdoch, Primo and Ricardo on sites where cavity spot is a known problem.

Rotate carrots with unrelated plants such as broccoli, lettuce and onions, to prevent the build up of disease. Plants related to carrots, such as parsnips and celery are hosts of *Pythium sulcatum*.

Liming acid soil to increase soil pH reduces the incidence and severity of cavity spot. The amount of lime to apply depends on soil type and soil pH. The target pH for suppression of cavity spot is 7.2 or higher (measured in calcium chloride). The pH of 7.2 in calcium chloride equals about pH 8 measured in water. As an example - on a yellow Karrakatta sand of pH 5.6 (calcium chloride), 8 t/ha of limesand reduced cavity spot incidence from 65 per cent to 32 per cent. The pH 18 months after incorporating the lime was 7.2. The long term effect of lime on cavity spot is unknown.

The amount of lime to apply also depends on the future cropping program. For instance, potatoes prefer lower soil pH than carrots; liming may affect the yield and quality of the crop. In addition, liming may induce deficiencies of trace elements such as zinc, manganese and iron. Growers are advised to test soil before adding lime. Contact Development Officers of Agriculture Western Australia or horticultural consultants for advice on liming soil.

Harvest carrots as soon as they reach marketable size, since over-mature carrots develop more cavity spot (compare [Figure 1](#) and [Figure 2](#)). On sites with a history of cavity spot, monitor disease development over the life of the crop. In the month before the normal harvest date, sample and wash carrots regularly to monitor disease levels. This will help you make decisions on when to harvest.

Metalaxyl (Ridomil Gold 25G®) is registered for use on carrots for *Pythium* control. It reduces the incidence of cavity spot when applied at, or shortly after seeding. If metalaxyl is used too frequently, however, it can lose its effectiveness because of an increase in its rate of breakdown in soil. In order to reduce the

likelihood of enhanced microbial degradation developing, metalaxyl should not be used more often than once a year.

Metham sodium application before cropping has failed to control cavity spot in Western Australia.

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