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SEPTEMBER 2009

PRIMEFACT 616

SECOND EDITION

Powdery mildew – a new disease of carrots

Andrew Watson

Plant Pathologist, Plant Health Sciences, Yanco Agricultural Institute

Powdery mildew has been found on a carrot crops in three states of Australia. The first finding of the disease was in the Murrumbidgee Irrigation Area (MIA) of New South Wales in 2007. It has subsequently been found in Tasmania and South Australia in 2008. While the organism causing the disease is commonly found in parsnip crops, powdery mildew has not previously been recorded on carrots in Australia.

Cause

The causal agent is *Erysiphe heraclei*, the same fungus that affects parsnips and other members of the Apiaceae family. Preliminary information has indicated that this form of *E. heraclei* does not infect parsnip or parsley, indicating that it may be specific to carrots.

Symptoms

The disease affects foliage, stems and umbels. Patches of white, fluffy fungus appear on the lower leaves first, and then spread to the terminal growth. The fungus often covers entire leaves with its masses of white mycelium and powdery spores. Infected foliage becomes brittle, and may eventually turn brown, shrivel, and die. Diseased pedicels may turn brown, causing the florets to die prematurely. Severe infection can result in loss of foliage, causing lower yields and in seed crops poor seed quality.

Research Project

There is currently a project funded by Horticulture Australia, "Investigations and developing integrated

management strategies for carrot powdery mildew". The project is due to finish in 2011.

The project is based in the three states that have recorded the disease i.e.. New South Wales, Tasmania and South Australia. The collaborators in Tasmania include Hoong Pung (Peracto Pty Ltd.) and in South Australia, Barbara Hall (Sardi).

This project is looking at the spread of powdery mildew on carrots and best methods of managing the disease using fungicides, varietal resistance (where available) and softer alternatives.

Fungicide options.

Fungicide trials in New South Wales and Tasmania have shown that applications of sulphur successfully controls the disease as do Amistar and Folicur. The latter products have a permit for powdery mildew control. Sulphur has a general vegetable registration. However alternative products need to be investigated as resistance to fungicides can develop especially to products such as Amistar. Therefore a complete control package needs to consider fungicide options and timing.

These products don't reduce disease levels to nothing, but they do reduce disease levels as



Severely infected carrots (Photo H. Pung).

compared to those plots not receiving any treatment.

In 2009 powdery mildew was not seen on carrots in some properties in the Murrumbidgee Irrigation Area. In the trial site disease, developed rapidly in February.

Yield Loss

Powdery mildew did not show yield loss in carrot trials when fungicide treated plots were compared to untreated plots. However in glasshouse trials, yield was reduced by 20% when fungicide treated carrots were compared to carrots left without powdery mildew control.

It was considered that yield loss did occur in fresh market carrots where the carrots are lifted out of the ground by the leaves with some carrots being left in the ground. This was due to the leaves being weakened by powdery mildew. Processing crops where the carrots are lifted from below the ground did not have the same problem.

Control

To assist control of the disease, growers should consider:

- monitoring young crops regularly. Powdery mildew is very difficult to see on leaves early. Once it is seen infecting many leaves control is not as successful.
- limiting the movement of machinery and chippers from infected paddocks to non-infected properties or carrot crops. Powdery mildew can be easily spread, and preventative action can help limit the spread of the disease throughout the district.
- maintain proper crop nutrition to optimise leaf development.

Emergency use permits

Permits are available to NSW, Tasmanian and SA growers for two fungicides that can be used to control powdery mildew: Amistar 250SC (Permit 10197) and Folicur 430SC (Permit 10198). These permits expire in September 2009. More information is available at www.apvma.gov.au

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ISSN 1832-6668

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Job number 9554 PUB09/102