Resistance 'mite' be a problem

PestFax Editor and 2007 Grains Research and Development Corporation (GRDC) Seed of Light winner, Peter Mangano of the Department of Agriculture and Food WA (DAFWA), warns growers that redlegged earth mite (RLEM) populations on two WA properties at Esperance and Cranbrook have major resistance to widely used synthetic pyrethroid insecticides.

Toxicology bioassays by the Centre for Environmental Stress and Adaptation Research at the University of Melbourne showed high levels of resistance to bifenthrin and alpha-cypermethrin.

A resistance factor of more than 240,000 fold against bifenthrin and almost 60,000 fold against alpha-cypermethrin, when compared with susceptible mites, was found in RLEM populations on the property in the Esperance area.

"This alarming discovery highlights our current dependence on insecticides and the need for sustainable long term pest management, using integrated pest management (IPM)," Peter said.

He indicated that, fortunately, organophosphates, such as dimethoate and omethoate, were still effective against the mites.

Peter is a member of the GRDC-funded National Invertebrate Pest Initiative (NIPI), which enables entomologists around Australia to advance IPM adoption.

RLEM, or *Halotydeus destructor*, is one of the most important and widely distributed pests in broadacre farming systems in southern Australia.

"The mites can be particularly destructive at the establishment phase of crops and pastures, causing severely reduced plant density or total seedling mortality, necessitating reseeding in some cases," he said.

"In years with a late break of season, or with late sown crops and pastures, seedlings may emerge in the presence of large populations of mites.

"Canola seedlings are particularly at risk, while lupins and other pulses are more tolerant and cereals and grasses can tolerate considerable damage," he said.

DAFWA entomologist, Svetlana Micic says the risk of RLEM resistance occurring can be reduced by following some simple IPM guidelines.

The GRDC funded National Invertebrate Pest Initiative advises growers adopt an integrated pest management approach to prevent resistance developing in redlegged earth mites, shown here on a lupin seedling.

"If a RLEM susceptible crop, such as canola, is following pasture then grazing to two tonnes per hectare of dry weight will control RLEM as effectively as chemicals," she said.

Svetlana indicated that trials have shown that crops following pasture have higher RLEM numbers than those following a cereal.

"Growers should be aware of varying pest risks following paddock rotations. Planting susceptible RLEM crops following cereals, rather than pasture, will reduce the need to control RLEM with chemicals," she said.

If insecticides do need to be applied to control RLEM, insecticide groups should be rotated to minimise the risks of selecting for resistance to a particular chemical group.

Growers and agronomists who discover mites surviving registered rates of insecticide are encouraged to contact local department entomologists so mites can be tested for resistance levels.

Growers interested in receiving PestFax can subscribe by sending their details to PestFax@agric.wa.gov.au

Contact Peter Mangano, Ph: 08 9368 3753 or Svetlana Micic, Ph: 08 9892 8591. ■

One soil may benefit another

AT A GLANCE

- GRDC-funded PhD student researching mechanisms for disease-suppression.
- Rhizoctonia-suppressive soils from Avon analysed and compared with soils from other dryland areas.

A PhD student funded by the Grains Research and Development Corporation (GRDC) is analysing soils from dryland farming systems in order to answer questions about the soil biota.

The University of Adelaide's Sjaan Davey is focusing her research on soils that are disease-suppressive for Rhizoctonia root rot.

"Rhizoctonia root rot is caused by the fungus *Rhizoctonia solani*," Sjaan said. "It can have a devastating impact on crops in dryland areas, but very little is known about the disease."

"Research has shown that disease-suppressive soil from Avon, in South Australia's mid-North, is able to host Rhizoctonia,

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The University of Adelaide's Sjaan Davey is focusing her research on soils that are disease-suppressive for Rhizoctonia root rot.

◁vii...ONE SOIL

but the disease symptoms aren't showing in the crop. Research by Roget and Wiseman in 1995 showed the Avon soil became suppressive to soil-borne diseases after 10 years of retaining crop residues."

Sjaan is now conducting experiments to see if the Rhizoctonia-suppressive soil biota present in the Avon soil can be found in soils from South Australia's Eyre Peninsula, where Rhizoctonia is an important management issue for grain growers.

"We are seeing if the beneficial characteristics of the Avon soil can be found on Eyre Peninsula," Sjaan said. "It would be hugely beneficial to Eyre Peninsula growers if the disease was suppressed over there too."

DNA testing

Sjaan is working in conjunction with the South Australian Research and Development Institute (SARDI) root disease testing unit. There they are using DNA testing to measure populations of beneficial micro-organisms in the Eyre Peninsula soils.

Although Sjaan is still in the early stages of her research, she said early results have provided lots of new information about the Rhizoctonia-suppressive soil biota.

"This research will be applicable to dryland farming systems right across the southern region," she said. "These areas are afflicted by Rhizoctonia every year.

"The fact that Avon suppressive rhizobiota were not transferable to Eyre Peninsula soils poses many questions. For example, what exactly is hindering the development of biological disease-suppression within these soils?

"My results so far highlight how little is known about the complex interactions between the physical soil abiotic matrix and the soil biology, despite the importance of such interactions. My research will now focus on answering these questions."

Sjaan's PhD is supported by growers and the Australian Government through the GRDC, with further funding support from the South Australian Grain Industry Trust (SAGIT) and the Eyre Peninsula Farming Systems project.

Check for Cape Tulip control

Landholders in southern and Western Australia are advised that the coming month is the time to check for Cape Tulip development.

Nancye Gannaway from the WA Department of Agriculture and Food's Small Landholder Information Service (SLIS) said the good breaking rain was expected to result in flourishing crops of the toxic weed.

"The SLIS suggests digging up several plants of Cape Tulip in mid July and inspecting the corms for development. Control should begin before the corms begin to harden," Nancye said.

"Treatment is necessary when the old corm looks shrivelled and large fleshy roots are emerging from the base of the plant," Nancye said.

Cape Tulip is a member of the iris family, and was introduced to Australia as a garden plant, but it is now a widespread weed in the south west of Western Australia, Victoria and New South Wales.

One leaf and two leaf cape tulip are declared and are prohibited from import. Nancye said they contained toxic chemicals which could affect the heart, and could be lethal for livestock.

"The plant remains toxic even when dry, so contaminated hay can also be a problem," Nancye said.

"Cape Tulip can be difficult and expensive to eradicate, so checking corms for development is a good first defence," she said.

"Digging up infestations is an ineffective control strategy when there are large numbers of plants. This strategy tends to spread the bulbs and landholders will find that herbicides will be more effective."

Further information on control is available in DAFWA's Farmnote 213, Control of Cape Tulip in Pasture and also Farmnote 100 Cape Tulips. ■

Cape Tulip flower.

Inspect the corms for development.

Cape Tulip – pretty but lethal for stock.