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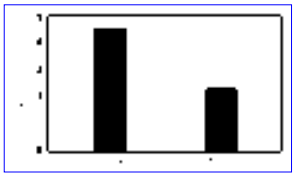

Figure 1. Effect of seedling damage by redlegged earth mite on grain yield of yellow lupin cv. Motiv.

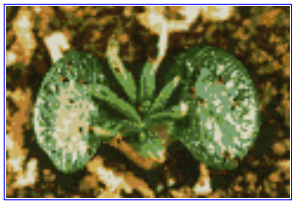

Figure 2. RLEM feeding on leaf surfaces leaving silvery patches.

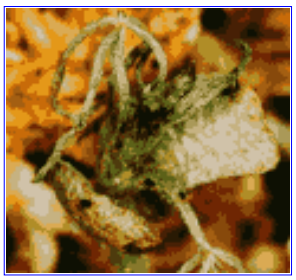

Figure 3. Severely damaged lupin plant.

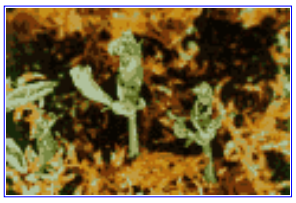

Figure 4. Field pea plants damaged by RLEM.

Farmnote

Redlegged earth mite control in pulses

By Anyou Liu, Centre for Legumes in Mediterranean Agriculture, and Phil Michael, Senior Entomologist, Agriculture Western Australia, Albany

Redlegged earth mite (RLEM)

Redlegged earth mite (*Halotydeus destructor*) first arrived in Western Australia in 1917, and is believed to have been brought by cargo ships from South Africa. It spread quickly to other Australian States, reaching the limit of its distribution which approximately coincides with areas having a Mediterranean climate. These areas usually have a cool and humid winter (rainfall from May to October is more than 205mm), and a dry and hot summer (rainfall from December to March is less than 225 mm). The maximum temperature of the hottest month is less than 33ºC. This covers most of the areas recommended for cool season pulses.

RLEM is only active during winter months and spends the summer in the form of diapause eggs in the dead bodies of the female. It has been reported attacking a wide range of crops during winter, resulting in substantial economic losses. Under controlled conditions on yellow lupin, up to a 48 per cent yield reduction has been recorded due to damage at the seedling stage (Figure 1). Severe reduction in plant growth has also been observed under field conditions.

Although RLEM attacks adult plants, the major damage is to the young seedlings. It sucks plant juices from the epidermal cells of the cotyledons and/or true leaves, leaving a typically silvery patch in the damaged area (Figure 2). Heavy damage will lead to dehydration of the leaves, dead growth tips, reduced formation of nodules, or even dead plants (Figure 3 and Figure 4). Complete loss of a crop has been reported in experimental trials.

Susceptibility of different pulses to RLEM

Different crops vary in their susceptibility to RLEM. With the growing interest in pulses in Australia, more species have been introduced to grow under Australian conditions, most of which face the risk of RLEM attack.

Screening has been conducted to compare the relative susceptibility of cool season pulses to RLEM. The results indicate that field pea, one of the major pulse crops, is highly susceptible, together with common vetch and yellow lupin (Table 1). Faba bean, narrow-leafed lupin and lentil are moderately to RLEM in these screenings, while chickpea and albus lupins are highly resistant.

Table 1. Susceptibility ranking of different pulse species to RLEM

Species		Susceptibility ranking
Common name	Scientific name	
Field pea	Pisum sativum	Susceptible
Yellow lupin	Lupinus luteus	Susceptible
Common vetch	Vicia sativa	Susceptible
Faba bean	Vicia faba	Medium
Narrow-leafed lupin	Lupinus angustifolius	Medium
Lentil	Lens culinaris	Medium
Ochrus chickling	Lathyrus ochrus	Medium
Narbon bean	Vicia narbonensis	Medium
Atlas lupin	Lupinus atlanticus	Medium to Resistant
Chickpea	Cicer arietinum	Resistant
Albus lupin	Lupinus albus	Resistant
Sandplain lupin	Lupinus cosentinii	Resistant
Hairy vetch	Lupinus pilosus	Resistant
Purple vetch	Vicia benghalensis	Resistant
Bitter vetch	Vicia ervillia	Resistant
Dwarf chickling	Lathyrus cicera	Resistant
Common chickling	Lathyrus sativus	Resistant

Control

Priority for controlling RLEM should be based on a crop's relative susceptibility to the pest. The more susceptible it is, the higher the priority should be given to mite control.

Field situations most prone to mite attack include crops established on old pasture paddocks and near pasture crops. Plant debris or weeds (especially capeweed) also encourage a large mite infestation.

The most dangerous period is during the first couple of weeks after crop emergence. As most pulse plants are quite erect (unlike pasture species) they can tolerate some mite attack when they have passed the seedling stage.

In high risk situations, such as sites prone to mite attack or when highly susceptible crops are planted, preventative spraying is recommended. This could include bare ground spraying before emergence, seed dressing, and barrier spraying around crops. After crop emergence, close monitoring of mite attack is required and prompt action taken if mite populations reach damaging levels.

Chemicals are still the most effective weapon to control the mite. Omethoate and dimethoate are effective organophosphate type chemicals, which can be used both as sprays and as seed dressings. Endosulphan and bifenthrin can be applied to the bare ground before emergence. The synthetic pyrethroid group

of chemicals (such as Karate® and Talstar®) is relatively new and is generally quite effective in controlling RLEM. But the group is not effective in controlling lucerne flea. For detailed recommendations on the use of different chemicals and the labels of the relative products.

Besides direct spraying, other methods have also been proven effective in reducing mite populations. Reducing the diapause egg production through timely spraying in the spring of the year before cropping, heavy spring grazing of pastures by livestock, and reducing weed problems could all effectively suppress potential mite populations. Controlling mites in surrounding pastures will reduce the potential for RLEM to migrate into crops.

Further development

Work has started to look for and utilise plant resistance available in the susceptible crops, such as field pea and yellow lupin. Resistant lines have been identified. The mechanisms of the resistance will be studied to make sure they are not in conflict with grain quality requirements. Understanding the resistance mechanisms could also help to develop simple and quick screening methods. Plant crosses have been made to elucidate the inheritance of the resistance; this could help breeding programs to develop resistant cultivars. Hopefully, with resistant cultivars available in the future, chemical spraying requirements will be greatly reduced.

Acknowledgments

This Farmnote is based in part on the results of a project funded by Grains Research and Development Corporation. We thank Dr. James Ridsdill-Smith for valuable comments.

Further reading

- Ridsdill-Smith, J. and Pavri, C. 1998, Spring spraying for redlegged earth mites, *Australian Grain* (Oct-Nov): i-iv.

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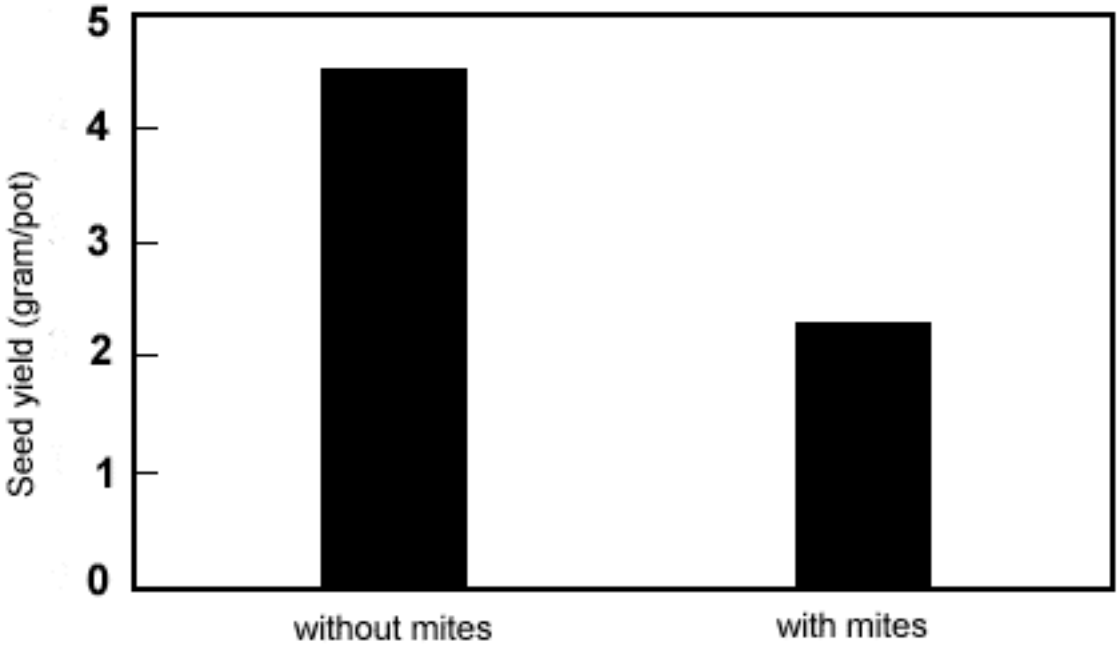

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