



Cucumber mosaic virus in lupins

Cucumber mosaic virus (CMV) is a viral disease which infects all species of lupins, as well as many other broadleaf plant species. This includes a number of flower and vegetable crops, subterranean clover and many common weed species in our farming systems.

It is a sporadic problem in southern NSW that has been kept to a minimum by the widespread use of CMV tested seed. The prevalence of aphids during 2001 and 2002 means it is likely that CMV levels may be higher than usual.

Symptoms

Infected plants will be stunted and bunched, have few pods and remain green while other plants are haying off. See photo this page. They are more likely to occur around the edges of the paddock and where the crop is thin.

Spread

CMV is spread by many species of aphids from one lupin crop to another, from alternative hosts to lupin crop plants, and within a lupin crop from plant to plant. The virus is seed-borne in narrowleaf lupins and it is carried to the subsequent year's crop in infected seed.

Infected seed is often significantly smaller than healthy seeds in the same seed lot. Plants that grow from infected seed are often stunted and contribute little toward yield if healthy plants predominate. Invading aphids can then spread CMV from these plants to healthy ones.

Occurrence

All species of lupin can be infected with CMV but albus lupins are immune to seed transmission, so CMV is not a significant problem in them.

Although all narrowleaf varieties are susceptible to infection by CMV, some varieties have some resistance to the virus being carried over in the seed.

Wonga and Quilnock are moderately resistant (MR) to seed transmission while Jindalee, Gungurru and Merrit are moderately susceptible (MS).

CMV and livestock

CMV infected lupin grain can be safely fed to livestock. Take care where you feed out infected seed to avoid infection of subsequent crops. Monitor feed-out sites and control any volunteer lupin plants. As long as the seed remains viable CMV also remains viable in the seed.



Photo: Department of Agriculture, Western Australia

Cucumber mosaic virus (CMV) symptoms in narrowleaf lupin. The plant on the right has seed borne infection - the whole plant is affected. The plant on the left has been infected by aphid transmission so symptoms occur part way up the plant.

Reducing the CMV level in lupins

Lupins can be managed to reduce the level of CMV in subsequent crops using the following management practices.

- ♦ Use a seed source with a 'Not detected' seed test result.
- ♦ Grow a variety that has increased resistance to seed transmission of CMV (e.g. Wonga and Quilnock).
- ♦ Note the distribution of CMV infection in the crop. If it is mainly around the edge where aphids first invade, harvest the middle first for seed, then harvest the border area and sell or use for stockfeed.
- ♦ Grade seed heavily, removing 20% by weight. This removes small seeds carrying CMV. Seed should be retested following grading to confirm seed infection level.
- ♦ Sow at the start of the optimum sowing window and at a high seed rate, 45 to 50 plants per m². This allows healthy plants to out-compete stunted CMV infected plants. It also covers the stunted plants so the aphids are less likely to feed on them, reducing the risk of spread.
- ♦ Sow into cereal stubble to deter aphids.

CMV seed test

The seed test is the major tool used to manage CMV. Crops should be monitored for aphid activity through the season and checked at early maturity for CMV symptoms (see Symptoms and photo on page 1). If CMV symptoms or aphid activity are observed seed should be tested.

If the crop had no aphid activity, no observed symptoms of CMV and very low numbers of broadleaf weeds, seed testing for CMV will not be necessary.

Seed test results can be quite variable due to seed sampling error. Accuracy can be increased by taking more frequent sub-samples for each sample, and more test samples per seed lot. (International Seed Testing Association standard: 1 sample per 25 t, made up of 1 sub-sample for each 700 kg of seed).

The table below is a guide on interpreting your CMV seed test results.

The CMV seed test is available at the following laboratories.

Agrifood Technology, Werribee, Vic. Phone 03 9742 0555
AGWEST Plant Laboratories, Perth W.A. Phone 08 9368 3721

Interpretation of CMV seed test results			
Seed test result	Likely yield loss	Action	Management
Limit of detection <0.1%	Below this level yield loss unlikely	May be used for sowing	Normal best management
0.1 – 0.4 %	Some yield loss may occur	Seed may be used for sowing CMV levels may increase. Test seed of subsequent crops	<ul style="list-style-type: none"> • Sow on time • Target 45 plants/m² • No broadleaf weeds • Retain cereal stubble to deter aphids
0.5 – 0.9 %	Yield loss will occur. Level of loss will depend on aphid numbers and crop management	Not recommended to be used for sowing	Use alternative source of seed. If unavailable: <ul style="list-style-type: none"> • Grade seed heavily • Retest after grading
Above 1%	Significant yield loss likely to occur.	Don't sow seed	Deliver or use for stockfeed

Further information

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WA Department of Agriculture web site
www.agric.wa.gov.au

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DISCLAIMER

The information contained in this publication is based on knowledge and understanding at the time of writing in February 2003. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up-to-date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

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