



## CLIMA Media Release

### **RUST PROOFING AUSTRALIAN LUPIN**

As the world's lupin production capital, WA is familiar with the crop's limitations, including diseases that do not exist in Australia. Painful lessons have ensured that.

In 1996, as another seemingly untouchable million hectare lupin crop rose from the ground, a nasty fungal pathogen known as anthracnose landed in a new playground where it found a susceptible crop larger than any other in the world.

Anthracnose heaven was grower hell, as plantings plummeted in response to the disease's yield shrivelling impact.

The University of WA based Centre for Legumes in Mediterranean Agriculture (CLIMA) has been involved with much of the research into developing anthracnose resistance and now warns of yet another potential danger. Lupin rust, first discovered in Germany in 1927, could cut an anthracnose-type swathe through local crops.

CLIMA and Department of Agriculture researcher, Mark Sweetingham knows this because he recently tested local varieties for susceptibility to the disease.

“We set up a rust nursery at Rothamsted Research in the United Kingdom (UK) where the disease was endemic and tested incumbent WA varieties and promising lines. There was a chance WA lines may coincidentally have been rust resistant, but that was unlikely, given rust resistance had never been targeted by breeders.

“As we suspected, 12 Australian narrow-leafed lupin lines that we exposed to the disease proved highly susceptible, illustrating the threat the disease posed.”

Threatening prospects such as rust can quickly become destructive realities. In almost 100 years of fighting cereal rusts, WA scientists have learned not to underestimate these globe trotting diseases, which have traversed great distances to settle locally.

Even when wheat stripe rust arrived in WA, for example, the offending pathotype came not just from across the Nullarbor, but from overseas.

Although lupin rust has not been detected in lupin growing regions such as Russia or Poland, it has prevailed among wild populations throughout Morocco, Spain and Portugal, indicating the disease's liking for mediterranean conditions.

“It would be naïve to think an incursion might not occur at some point in the future, despite Australia’s rigorous biosecurity standards,” Dr Sweetingham observed.

“According to global infestation patterns, local environments could support the pathogen which, combined with susceptible varieties, could result in an epidemic causing significant yield loss.”

The news, however, is not all bad. During the Grain Research Committee supported trials, two narrow leafed lupin varieties displayed some resistance.

“Tallerack was resistant and so was the latest NSW variety, Jindalee, which gives the industry a fall back position if it suffers an incursion,” Dr Sweetingham explained.

“Although neither variety is popular in WA, UK trials showed that their resistance is controlled by a single recessive gene and so could be transferred into other varieties via simple crossing techniques.”

Further investigations have identified a microsatellite marker that could ultimately allow Australian researchers to test new progeny for rust resistance without carrying the cost of screening in off-shore disease nurseries.

Dr Sweetingham hopes to attract new funding to refine the marker to a simple PCR test for this purpose.

“Having found resistance sources, all we now need is to finalise this simple screening process to cheaply introduce rust resistance into future lines,” he concluded.

**ENDS**

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