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CURE FOR PLANT HEART DISEASE

WA’s million hectare lupin crop could be decimated by exotic incursions, just as the industry is poised to launch into premium feed and human consumption markets that could drive grower returns to new heights.

The vegetative equivalent of heart disease, Fusarium wilt, which kills plants by cutting off nutrient supply from the roots, is one of the biggest obstacles to lupin production in Europe and Russia and could wipe out yields if it established in WA.

There are fears that if Fusarium took hold in WA, growers would desert lupins in even greater numbers than when anthracnose first emerged in 1996 and chopped the area sown by 200,000 hectares.

Mark Sweetingham, WA Department of Agriculture researcher and Pulse Program Leader with the Centre for Legumes in Mediterranean Agriculture (CLIMA), has been working on guarding the WA lupin industry from the Fusarium threat and said it was highly likely the disease would eventually arrive.

“In terms of the scale of damage Fusarium could do, the closest comparison for WA would be anthracnose and we couldn’t have made that comparison a few years ago because, like Fusarium, it didn’t exist here.

“It would be unwise to rely entirely on quarantine restrictions to keep Fusarium out indefinitely, as disease incursions still occur and it’s possible an endemic strain of Fusarium could evolve to infect lupin,” he said.

Recognising the possibility of Fusarium creeping into WA, the Grains Research and Development Corporation showed the foresight to support a project to breed for resistance to the disease.

Since its inception, CLIMA has developed and nurtured international germplasm and intellectual property trading agreements and it recently negotiated access to Fusarium resistant lines from Russia and Poland.

Providing the leverage to strike the deal were WA narrow leafed lupin varieties with resistance to anthracnose.
“Now that the Russians and Poles have bred resistance to Fusarium, it is enemy number two behind anthracnose and while WA has also taken a battering from anthracnose, our best varieties are much more resilient than their continental counterparts,” Dr Sweetingham explained.

“The Europeans can’t immediately grow our varieties, because they are not adapted to their conditions and get wiped out by Fusarium, but they are keen to use them as parents when breeding for anthracnose resistance, just as we are keen to use their Fusarium resistance.”

But while WA’s narrow leafed lupins are a source of anthracnose resistance, yellow and albus lupin varieties have been highly susceptible to the disease.

As part of the project, CLIMA will help Australian scientists work alongside breeding programs in Russia, Poland and Portugal to develop anthracnose resistance in these lupin species.

A wide range of yellow and albus lupin breeding lines and land-races will be screened in Poland, before elite lines are brought to WA for testing under local conditions.

WA’s yellow lupin industry is fulfilling only 0.5 per cent of its production potential, but if CLIMA was to develop resistant lines, the industry would grow rapidly as growers captured premiums for its higher protein levels.

With burgeoning technologies promising to open up new markets for lupin proteins and nutraceuticals and Europe’s increasing adoption of premium lupin kernel flour for pastry cooking, now would be a bad time for WA’s production potential to be limited by disease problems.

However, Dr Sweetingham remains optimistic that WA has the world’s best lupin breeding program and can develop safeguards before Fusarium even arrives.

“This, combined with exciting prospects for boosting yellow lupin’s viability, means WA should be in a position to exploit these growing opportunities,” he concluded.

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