



Researchers investigating virus outbreak in faba beans

A COMBINATION of a wet start to the year and the perfect breeding ground for aphids may have been responsible for unusually severe outbreaks of viruses in faba bean crops in northern New South Wales this season.

Joop van Leur, New South Wales Department of Primary Industries (NSW DPI) senior plant pathologist, said tests had confirmed high infections of Bean yellow mosaic virus (BYMV) throughout north-west NSW and particularly west of Moree with co-infections of Alfalfa mosaic virus (AMV) in some of the most severely impacted paddocks.

"We tested more than 1800 plants and it was clear the main culprit was BYMV. In several paddocks the effect of this virus was aggravated by co-infection of AMV," Joop said.

"In combination, these two viruses can have a lethal effect on faba bean plants, but fortunately this situation has been limited to a few very severely affected paddocks."

The Tamworth-based pathologist's research is supported by investment under the Grains Agronomy and Pathology Partnership (GAPP) between NSW DPI and the Grains Research and Development Corporation.

As part of this work Joop tested plant samples for multiple viruses, with BYMV detected in plants showing symptoms such as stunting and tip and stem necrosis.

Is it a new pathotype?

"But, these symptoms are not normally associated with BYMV so we are doing pathogenicity tests to determine if we are dealing with 'new', more severe pathotypes of this virus or a new virus, but this will take time to assess," Joop said.

"GRDC investment collaboration with colleagues in Queensland and Western Australia will also allow us to undertake molecular comparison of BYMV strains isolated this year with strains collected in previous seasons."

Joop's NSW DPI team is currently working to understand the reasons behind the frequency and severity of the virus induced symptoms observed in the region.

This work will be assisted by a GAPP investment focused on understanding aphid ecology in northern NSW and the role different aphids play in transmitting viral infections.

"Undoubtedly, the January-February rains played a major role because they triggered a massive germination of pasture legume seed which, very likely, was suppressed in the two earlier very dry years," Joop said.

"Both BYMV and AMV are understood to be seed transmitted in medic. Medics are also a preferred host for cowpea aphids.

"My hypothesis is that cowpea aphids multiplied on the freshly emerged medics in March and picked up the viruses and moved into faba bean crops in May.

"The virus infection patterns in the faba bean crops indicate



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Joop Van Leur says co-infection of BYMV and AMV can have a lethal effect on faba beans.

that after the early infection, secondary infection in the crops occurred by wingless, colonising aphids.

“We plan to investigate the role of pasture legumes in the virus epidemiology of crop legumes in more detail.”

He said other factors likely to have played a role included:

- Mild autumn temperatures allowing aphids to multiply in the crop and spread the virus;
- Lack of standing stubble and irregular emergence of older seed, which can result in higher aphid landing rates; and,
- Early sowing of faba bean.

Joop said it was, unfortunately, at this stage, impossible to predict epidemics of this nature and when they might reoccur in the future.

He said seed transmission of BYMV in faba bean seed had also been reported, yet his earlier research showed that this was very uncommon.

“We are currently testing faba bean seedlots, and growers and advisers are welcome to send us newly harvested seed for testing.”

Imidacloprid as a seed dressing

Joop said the situation this season was also likely to prompt growers to consider imidacloprid as a seed dressing in the future.

“Imidacloprid is a slow acting systemic insecticide that will not prevent the first crop infections by BYMV and AMV, as a quick probing by a viruliferous aphid is enough for a plant to get infected,” he said.

“It is likely imidacloprid will reduce aphid populations significantly during early plant growth and I have recommended it in the past for environments favourable for infection by persistently transmitted viruses like Bean leafroll virus (BLRV), transmission of which require longer periods of aphid infestation.

“But I would hesitate to advise widespread use of imidacloprid to control non-persistently transmitted viruses like BYMV and AMV.”

Joop said given the role aphids play in the transmission of viruses such as BYMV, it was critical that the industry understood more about aphid ecology.

Research to improve understanding of aphids across the northern region is part of work being undertaken by NSW DPI entomologist Zorica Duric as part of a GAPP research investment.

For more information

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The main disease detected in faba beans this season through NSW DPI testing has been Bean yellow mosaic virus.

Should I keep my existing crops or spray out and replant?

With an encouraging forecast for spring, some growers took advantage of soil water from rainfall received during July and planted sorghum and corn in areas of northern New South Wales and the central Darling Downs. For many, establishment has been mixed – with cooler-than-ideal soil temperatures, drying conditions post-planting, mice damage and late frost events all contributing.

Established crops are growing slowly due to these early setbacks and the lack of follow-up rainfall. Apart from some cold spells, September and early October were warmer than average and quite windy, adding to an already challenging start. Crops that are struggling to develop secondary roots will be at more risk of early season abiotic stress, such as nutritional deficiencies and attack from insect pests, including aphids, thrips and Rutherglen bug.

As winter crops – such as wheat, barley and chickpea – rapidly ripen and harvest begins, growers and agronomists need to keep a close watch on young summer crops, as insects will migrate from these winter crops in search of ‘greener pastures’.

A La Niña has now been officially declared, so when significant rainfall does eventuate, some growers may be faced with the difficult decision of keeping existing crops or spraying out and replanting. Several factors need to be evaluated to make this decision: for dryland corn and sorghum, plant population is important – however, as a contributor to final yield, it is actually a relatively minor element.

Of more importance is, in fact, the uniformity of plant spacing and the evenness of crop growth – an evenly spaced low population will often perform better than a higher population of unevenly spaced plants. Other considerations to replant will be expected yield, weed pressure, soil water profile, and the timing of year.

Trials conducted last season at the Pacific Seeds research farm evaluated the effect of increasing gaps (>50cm) in grain sorghum. We found significant yield penalty from ‘gappy’ establishments and a high ROI for replanting poorly established fields.

To see more of these results or to discuss your options for summer, please feel free to get in touch.

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