



Figure 1. Turnip yellows virus infection in a canola crop at Geraldton in 2024. Image: DPIRD.

Protecting WA Crops

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Turnip yellows virus emerges as leading threat to Australian canola in national grain crop survey

At a glance

- Between 2023 and 2025, surveys of grain and oilseed crops were conducted to assess virus incidence, resulting in the identification of 18 pathogenic plant viruses.
- Turnip yellows virus (TuYV) was the most important

virus found nationally, especially in canola, where it infected more than 80% of crops surveyed across Australia.

- Canola had the highest overall virus prevalence, with TuYV causing major economic damage, including severe outbreaks in Western Australia (WA) and New South Wales (NSW) that contributed to very large yield losses.
- TuYV continues to be a major concern across Australia in 2026 with outbreaks occurring across western and southern Australia.
- Cereal viruses have occurred at low incidences in recent seasons but remain a threat under conditions conducive to their respective vectors.
- Major pulse crops, such as chickpea, faba bean, lentil and narrow-leaf lupin, were infected with a diverse range of viruses, some of which caused serious damage to yield. Each virus requires its own management strategy which renders a serious challenge to virus management in pulse crops.

Viruses in grain crops pose a significant challenge for growers because management relies entirely on prevention. Once infection occurs there are no effective control options. These infections are also frequently misdiagnosed as other issues, such as nutrient deficiencies, herbicide damage or waterlogging. A better understanding of viruses, such as their incidence, host crops, and modes of transmission, will enable the development of more effective management strategies.

A national surveillance program, co-funded by the Grains Research and Development Corporation (GRDC) and conducted in collaboration with Department of Primary Industries and Regional Development Western Australia (DPIRD WA), Agriculture Victoria (AgVic), New South Wales Department of Primary Industries and Regional Development (NSW DPIRD), Department of Primary Industries Queensland (DPI QLD), Macquarie University, and South Australia Research and Development Institute (SARDI), has highlighted the widespread occurrence of key viruses in cereal, oilseed, and pulse crops.

Between 2023 and 2025, a survey of grain and oilseed crops assessed virus incidence. In total, 18 pathogenic plant viruses were identified, representing more than 49 distinct virus - host combinations.

The survey showed that virus incidence and diversity varied considerably by crop type and region. Canola had the highest incidence but was typically infected by a single virus, indicating low diversity. In contrast, pulses exhibited moderate incidence but were often infected with multiple viruses, reflecting high diversity. Cereals had the lowest incidence, with a moderate level of diversity (Figure 2).

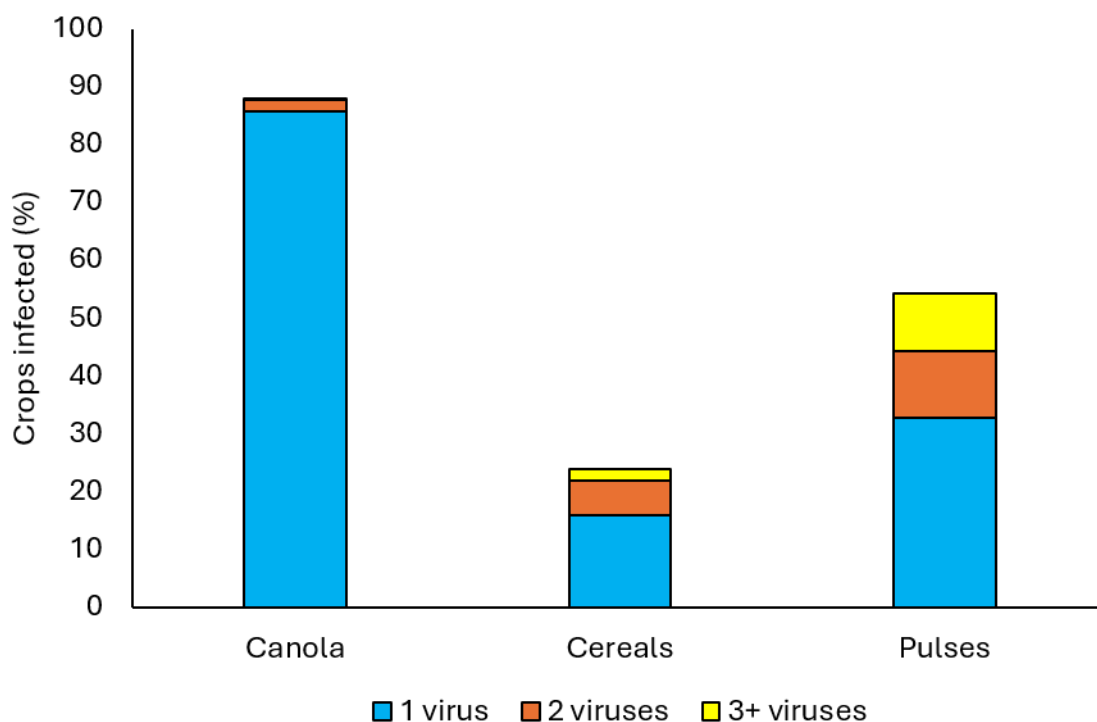


Figure 2. Virus prevalence in canola, cereals and pulses. Figure: DPIRD.

Canola viruses

Turnip yellows virus (TuYV) was the most common virus found in the survey and the main virus affecting canola. It was detected in 88% of canola crops, with an average infection

rate of 53% of plants. In WA, TuYV was found in 70% of crops at an infection rate of 19% of sampled plants.

During the survey period, the canola industry experienced several severe TuYV outbreaks in Geraldton (WA) and central and southern NSW in 2024, and in northern Victoria and NSW in 2025. The Geraldton 2024 outbreak accounts for an estimated \$31 million and the central and southern NSW event in the same year was estimated to be \$96 million in gross revenue forgone. However, there was also widespread virus spread across Australia that attracted less attention, likely causing smaller but still important losses. The 2026 season is following a similar trajectory with TuYV outbreaks in the Kwinana west, Esperance and Geraldton port zones.

The prevalence of TuYV is caused by widespread infestation of its extremely efficient vector, the green peach aphid (GPA), and the lack of control options to adequately suppress it. Recent research has shown that, due to evolution of insecticide resistance in GPA, neonicotinoid seed treatments fail to adequately control TuYV transmission in canola. Furthermore, there are currently no resistance ratings available for canola varieties, however most varieties are likely to be highly susceptible.

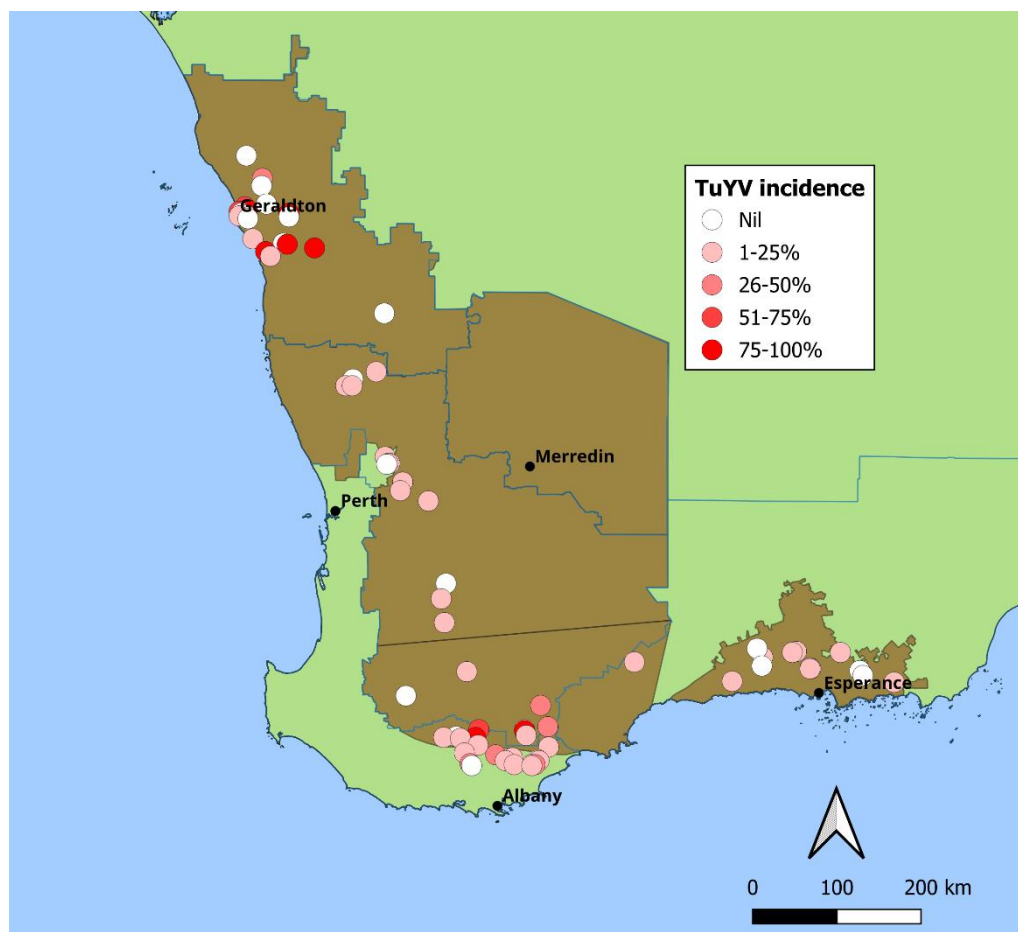


Figure 3. Turnip yellows virus incidence (% of plants infected in each crop) in Western Australia from 2023 to 2025. Image: DPIRD.

Cereal viruses

In contrast to canola, virus levels in cereals were very low across all regions. Fewer than 25% of wheat, barley, and oat crops had any virus present, and the average infection level

was under 3%, with only five crops with infection levels above 30%. Of the cereal species surveyed, virus infection was most prevalent in wheat, followed by barley and then oats.

There were clear regional differences, with 24–55% of cereal crops in the eastern states having at least one virus, compared to just 1% in Western Australia, highlighting the extremely low virus presence in WA cereals.

Barley yellow dwarf virus (BYDV), transmitted primarily by the oat aphid, and wheat streak mosaic virus, transmitted by the wheat curl mite, were detected in WA cereal crops but at very low prevalence and incidence.

BYDV, in particular, can cause widespread damage, and its low prevalence suggests current control strategies are working well, such as the use of neonicotinoid seed treatments and foliar applications of synthetic pyrethroids. In contrast to GPA, cereal aphids have not developed resistance to these insecticides.

Pulse viruses

Pulse crops showed the most variation in virus infection nationally, both between crops and within paddocks. About half of pulse crops had no virus detected, while the other half had one or more viruses present. Across the main pulse types, 14–43% of crops were infected with multiple viruses, with lentils showing the highest levels of mixed infection, including several crops infected with four to five viruses.

These mixed infections in pulse crops often involved very different types of viruses, which vary in how they spread (e.g. by seed and/or aphids), how they affect the crop, and how they need to be managed.

The viruses detected also varied by pulse species. Bean yellow mosaic virus (BYMV) was the predominant virus in faba bean, while cucumber mosaic virus (CMV) and persistently transmitted viruses such as TuYV and bean leafroll viruses (BLRV) were the most common viruses in lentil and narrow-leaf lupin. Alfalfa mosaic virus (AMV) was frequently detected, particularly in chickpea and lentil, and often occurred alongside other viruses.

Virus incidence and diversity was lower in WA compared to the other states. The survey found that 1 in 4 pulse crops were virus-infected in WA. The majority of these were TuYV-infected narrow-leaf lupin crops growing in close proximity to infected canola crops, and just 2% of crops surveyed were infected with 2 or more viruses. Research is currently being carried out to understand the impact of TuYV on narrow-leaf lupin, including its influence on CMV disease severity in mixed infection.

Many pulse viruses are seedborne, and their low presence suggests that current seed production pathways in WA are adequately reducing seed contamination. However, a recent outbreak of CMV in narrow-leaf lupin and lentils in the eastern states suggests that continued vigilance is required.

This survey is the first output of GRDC investment 'Effective virus management in grain crops'. It has provided a snapshot of virus prevalence across Australian grain growing regions which will enable research prioritisation. As supported by the survey results, TuYV in canola is receiving significant attention in the project with ongoing research focused on improving insecticide control of GPA and identifying durable host resistance in canola varieties.

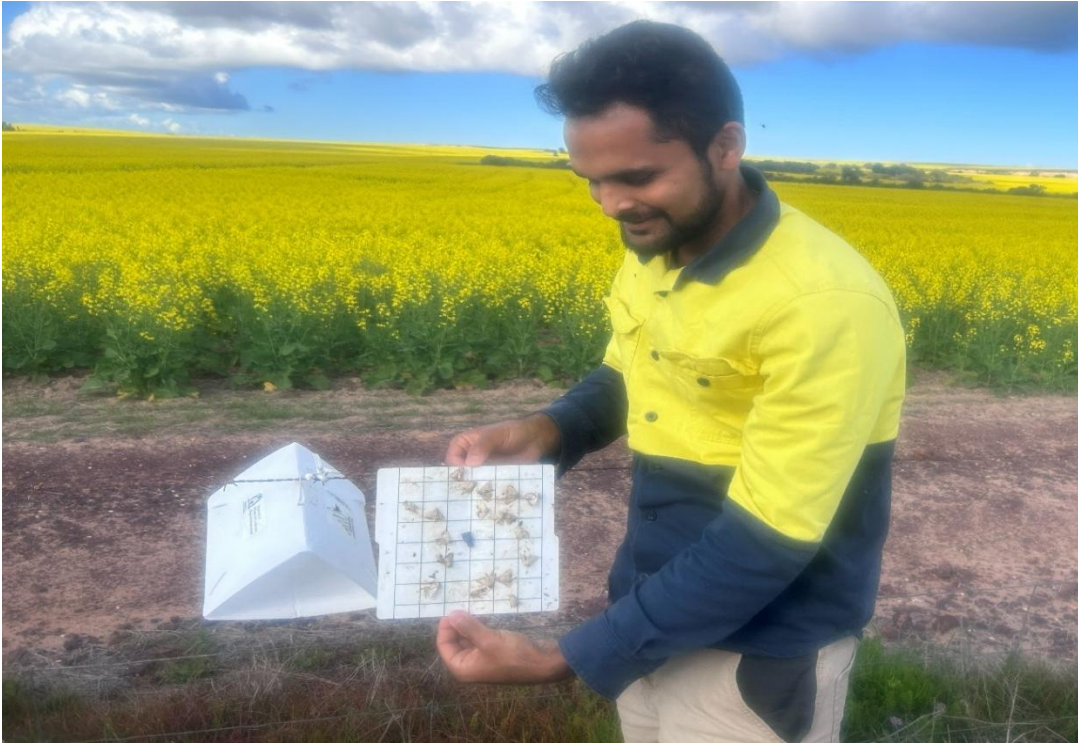
For more information on Turnip yellows virus refer to:

GRDC's [Manage turnip yellows virus in canola](#) factsheet

GRDC's Protecting canola seedlings from virus-bearing aphids may require more than a seed treatment factsheet

DPIRD's Take action to control turnip yellows virus in canola crops this season media release.

Meet Crop Protection team member - Surya Dhakal



Surya joined DPIRD as a field surveillance officer in the emergency response team in 2022 before relocating to Geraldton to take up a technical officer role in Crop Protection in 2023.

Raised on a family farm in Nepal, Surya developed an early passion for agriculture that led him to complete a Bachelor of Science in Agriculture at Tribhuvan University. After working for more than two years as an agricultural instructor, he moved to Australia to undertake a Master of Dryland Agriculture at Curtin University. During his Master's research on sclerotinia stem rot disease, Surya received a scholarship from the Soil Science Society to attend the 'Soil Judging Competition' in Adelaide in 2019.

At DPIRD, Surya's work focuses on disease and insect surveillance, plant pathology, and field-based research across Western Australia's grain-growing regions. His responsibilities include monitoring crop diseases and pests, supporting pathology laboratory activities, and contributing to field experiments. With a strong research background in sclerotinia stem rot, he enjoys helping growers and the grains industry better understand and manage crop health challenges.

Outside of work, Surya maintains a daily yoga practice, which has become an important part of his routine. In his spare time, he also enjoys playing soccer.

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