

Genetic resistance traits and how to protect them | Ask the Industry

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Remy has been a popular variety but has come under pressure in recent times.

Many growers rely on vegetable varieties with resistance traits to manage certain pests and diseases. Syngenta Technical Sales Specialist for South Australia, Peter March, explains the complexities of maintaining these traits and the value of taking an integrated approach to manage pests and diseases.

It's always rewarding when a company like Syngenta can bring a new vegetable variety to market. A lot of time, effort and money is invested into these new releases. Often, they come with in-built resistance traits to help in the fight against significant pests or diseases.

The uptake of a new variety can be particularly swift when incidence and severity of a disease or pest is high, or the resistance of a previous industry standard is inherently weak or has broken down. Too many vegetable varieties that have contained a host of favourable traits for appearance, growth and taste have been discarded over the years because they have succumbed to pest or disease pressure. Australian examples are many.

'Clovis' was a leading greenhouse capsicum variety in South Australia for close to two decades until Tomato spot wilt virus (TSWV) appeared. It necessitated the introduction of TSWV varietal resistance (intermediate) through 'Remy'. An ongoing struggle ever since to control TSWV has brought with it

heavy thrip pressure and that in itself has created significant management issues in terms of vector control.



Tomato mosaic virus (ToMV) in capsicums is another example, and growers have become heavily reliant on resistance through varieties like 'Bloodshot', 'Infrared' and 'Biela' to manage this disease. Then there is downy mildew in lettuce and spinach, where continuous mutations of this fungal pathogen have necessitated a huge breeding effort be put into varietal resistance to keep up with this ever-evolving disease challenge.

This approach desperately needs to change, and more balanced management implemented to reduce sole reliance on varietal resistance.

The Tomato yellow leaf curl virus (TYLCV) outbreak in Queensland in the late-2000s, particularly in Bundaberg and then in Bowen is an example of how a virus outbreak can change the market dynamics. Growers were forced to change to resistant varieties that did not necessarily perform the same agronomically or have the same fruit quality. It's only now, eight years on that varieties such as 'Rifle' are meeting the standards that once were.

As an industry we need to do a better job of taking a long-term view and protecting the genetic integrity of available varieties. While genetic resistance provides a means by which growers can manage the impact of a pest or disease, experience has shown what happens with an over reliance on these traits.

Key lessons learnt

Heavy reliance on in-built genetic resistance places those genes under huge pressure because there is just so much naturally occurring biological diversity out there, and pests and diseases are continuously evolving.

No variety should be regarded as having 100 percent resistance, its resistance status can be broken down. So while genetic resistance is part of the solution, I stress, it is only part of the solution.

An integrated approach, using all available tools to manage pests and diseases, will support resistance longevity. This means;

- Monitoring to determine pest or disease incidence and pressure. Identification is vital, as incorrect diagnosis can lead to the wrong control measures being used.
- Utilisation of the best possible insecticides to control vectors that carry or transmit pathogens and fungicides to protect the crop ahead of disease outbreak.
- Control weeds and other virus hosts and destroy old crops.
- Apply the most IPM compatible crop protection products at the right time and rate.
- Utilise beneficial species and predators to feed on vector populations.
- Best practice farm hygiene.

One final note: New technology has given breeders the ability to add resistance to existing varieties. However, growers should understand that this can change the performance of the variety, even though it is basically the same as the original - with the resistance added. Growers will need to adapt to the needs of the updated variety.

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