



The Yellow Crop

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4

PIP COURTNEY, PRESENTER: It's that time of year when the canola crop is flowering, putting on a stunning golden display. But in many parts of the country, the distinct yellow crop is anything but vibrant.

A virus, which until now no-one has taken much notice of, has infected thousands of hectares, in what some scientists say is the world's worst outbreak. Lauren Waldhuter reports.

LAUREN WALDHUTER, REPORTER: Lush green paddocks are presently a common sight around SA. Many of the state's grain growers are on track for a bumper crop.



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Near Eudunda, about an hour's drive north of Adelaide, fifth-generation farmer Patrick Neale certainly likes the view from his tractor.

PATRICK NEALE, WILLOUGHBY HILLS, NGAPALA, SA: Yes, I'm pretty optimistic about most of our crops. Our cereal crops, they look really good. The rest of our beans and little patch of lentils we've got, they look pretty good. We've still got a reasonable way to go in our season. We still need some good rains in September and October for us to get a good season, but we've definitely got potential.

LAUREN WALDHUTER: But that potential doesn't extend to his canola crop, which has been attacked by a virus many had barely heard of.

So, Patrick, what should this crop look like now?

PATRICK NEALE: Well, this crop should be fully canopied over and we should be struggling to walk through it without getting water on our boots. It's just lost all of its leaf area and you can see that the virus is affecting this leaf here.

LAUREN WALDHUTER: The virus is called beet western yellows and it blocks tissues in the plant which transport nutrients.

PATRICK NEALE: You can see that it's pretty sick and the plant's going to struggle because that leaf isn't able to photosynthesise. Some of these fresher leaves here, they've recovered and they've grown back since it's been infected by the virus, but because this plant is so small, you wouldn't have much hope for any grain yielding in this patch.

LAUREN WALDHUTER: To get a clearer picture of how big the infected patch is, Patrick has just the tool for his own bird's-eye view. About a third of his canola has been wiped out and he isn't holding out a lot of hope for the rest.

PATRICK NEALE: In a season like this, we'd hope for about two tonne to the hectare, but at this stage, yes, they're looking like they'll struggle to go a tonne to the hectare. Last year, canola was probably our most profitable crop on our property, whereas this year it's probably going to be our least profitable. It's definitely a big blow. It's the biggest crop loss we've ever had in my time in farming.

LAUREN WALDHUTER: The Lower North Region of SA where Patrick farms is being described as the epicentre of the virus. It's destroyed or damaged crops across a huge area - from SA's west coast to the Victorian Mallee and Wagga Wagga in NSW.

When you first saw these images, what did advice did you give Patrick, initially?

MICK FAULKNER, AGRONOMIST: I probably swore, just saying, "Look, we're in a lot of trouble." I've never seen a virus have that sort of impact on such a wide area. We normally associate virus with minor to moderate yield loss and we don't have whole paddocks affected. We tend to have patches of paddocks.

LAUREN WALDHUTER: The outbreak has baffled agronomists like Mick Faulkner.

Initially, he thought aphids were feeding on the plants, but the damage was so severe, it soon became obvious something else was at play.

MICK FAULKNER: I think we were all blindsided, we were all taken just so much by surprise. We were disempowered too, I think. We - as consultants, you put a lot of time, I think, into keeping up with current knowledge and this was something we hadn't experienced before.

LAUREN WALDHUTER: In search of answers, Mick and his colleagues began collecting samples and sending them to scientists. They, too, didn't suspect a virus was to blame.

JENNY DAVIDSON, SARDI: But just to discount virus, we took some samples and sent them through to Horsham, the people over there who do the virus testing and every single sample came back 100 per cent infected. And that was the point we realised we had a major problem with virus in the canola crops.

LAUREN WALDHUTER: That virus turned out to be the obscure beet western yellows.

While scientists are focusing a lot of attention on it right now, in the past they've had their hands full with other traditionally more destructive canola diseases. They knew about this virus; it just hadn't left much of a mark other than on small patches of canola in WA and the odd pulse plant. That is, until now.

JENNY DAVIDSON: I've never seen beet western yellows virus infect canola crops to this large extent. I've never seen any virus do it like this at all.

LAUREN WALDHUTER: And what about globally? Has there been a case like this anywhere in the world to your knowledge?

JENNY DAVIDSON: To my knowledge, no. I have been doing a lot of reading of the scientific literature and certainly in Europe and UK they're aware that beet western yellows virus is potentially a problem. But they're estimating that it's more a 10 per cent yield loss across their crops throughout that region. But they don't talk about complete crop losses at all.

LAUREN WALDHUTER: The virus doesn't spread by itself and that's where these green peach aphids do come in. When they feed on one infected plant and then bite another, there's a 97 per cent chance they'll pass the virus on. And there's been a buffet of infected plants this year, as the virus lives in broadleaf weeds. An unusually wet summer followed by a warm autumn has ensured there are plenty of those.

The conditions were right for the virus, right for the aphids and right for farmers to plant canola early and

that's where it all went wrong.

JENNY DAVIDSON: By early June, they're up and away and they're at that sort of four-leaf stage and it was at that stage that all the aphids started flying because they had these wonderfully warm conditions and they had all the canola crops to fly into and infect, so the aphids were very, very happy.

LAUREN WALDHUTER: While scientists have been busy analysing more than 500 plant samples from across the country, it's the vectors, not the virus, that they say needs the most attention.

JENNY DAVIDSON: The virus, yes, there are certainly some holes in understanding how it operates, but if we want to manage this problem, it's really around the green peach aphid - how it moves, why it moves, when it moves and how do we best control it.

LAUREN WALDHUTER: And that's where Melbourne entomologist Dr Paul Umina comes in. He's been studying these common agricultural pests for four years. He says aphids mainly reproduce asexually, so any resistance to insecticides is passed down from one generation to the next and that makes it increasingly difficult to control any viruses they carry.

PAUL UMINA, UNIVERSITY OF MELBOURNE: Globally, they are one of the most prevalent insects going around that actually have developed resistance to more chemical classes than almost any other insect. So there's certainly a need to continue to understand the resistance in this species, but also to hopefully, working with industry and working with agricultural chemical companies, to actually introduce new insecticides so that we actually have more options available to growers.

LAUREN WALDHUTER: As researchers work on ways to tackle the virus in the future, growers are hoping to salvage what they can from this season. I'm on another infected property near Patrick Neale's place. The farmer who owns it says he'll get something from that paddock, but this paddock was so badly affected, he got rid of the canola and resowed it with barley.

Like Patrick Neale, third-generation farmer Andrew Bruce thought he was on the right track when he sprayed for aphids early on in the season. But the chemicals didn't stop the insects invading his canola and beet western yellows virus wasn't far behind.

ANDREW BRUCE, SULBY FARM, RIVERTON, SA: Within about three to four weeks, the crop had gone from looking reasonable, quite a good crop, to basically gone. We don't know how well it's going to put up and how well it will seed, how much of the plant we've lost - it's just a waiting game.

LAUREN WALDHUTER: In the meantime, he's preparing for round two, with many expecting the aphids to return any time now, after their winter nap. So far, he hasn't spotted much to be concerned about. In fact, quite the opposite. Traps set up alongside his crops have caught mainly helpful rather than harmful bugs.

ANDREW BRUCE: At this stage, we're getting a lot of predators to the green peach aphid, which is good because, I mean, the natural control is the best control.

PAUL UMINA: In Spring, in south-eastern Australia, and also, I guess, in WA, some of the main beneficial insects that are quite prevalent and also provide a very good control of aphid populations include things like ladybirds, hover flies, lacewings and very small parasitic wasps as well, which are known to be very effective in reducing aphid populations.

LAUREN WALDHUTER: If the aphids do make a comeback this spring, it's not the canola Andrew's worried about. The damage has already been done to that crop. It's the pulses in the paddock across the road. And even though he knows spraying won't protect his beans from any bugs that are insecticide-resistant, it's still better than doing nothing.

ANDREW BRUCE: We know that if we get this virus in them, we've got a yield loss of perhaps 30-odd per cent. So then it's a double whammy from our canola to our beans. So we've got a fair area of our program that is - could be affected.

LAUREN WALDHUTER: As for the future of the crop that's already born the brunt of the surprise attack, the golden fields may not deliver the goods for many growers this season, but farmers aren't about to abandon canola. They'll just be more cautious and better prepared next time.

ANDREW BRUCE: We'll continue to grow canola. We may spread our risk a little bit. But at this stage, we don't have another break-crop which is effective and as profitable as our canola is.



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