



## Tackling soilborne diseases in onion production

Soilborne diseases are a widespread, unseen killer in Australian onion production. Reducing root function, soilborne diseases result in yield loss, poor bulb quality, and the need for increased inputs to achieve acceptable bulb production.

Correct identification and effective management of soilborne diseases can play a pivotal role in combatting the effects of root diseases in onion crops, improving bulb quality and yields.

That's according to South Australian onion grower Jason Daniell, owner of Burdett Harvest, who is implementing change on-farm after attending a recent Soilborne Disease Master Class, funded by Hort Innovation and delivered through the Soil Wealth and Integrated Crop Protection project.

"The onion industry needs to be more aware of soilborne diseases and the management strategies available. To achieve this, you firstly need to understand and identify the risk you're facing on-farm, and then educate yourself on the management strategies for that particular disease," Mr Daniell said.



Operating since 2005, Mr Daniell grows 35 hectares of Redwing onions per year, producing around 2,500 tonnes of the popular variety. Following planting in September, harvest occurs in mid to late February and onions are supplied to packing houses around the Murray Bridge region.

### ABOUT BURDETT HARVEST:

- Operating since 2005
- Located in Burdett, South Australia
- Grows 35 hectares of Redwing onions and 90 hectares of Certified Seed Potatoes
- Plant onions in September and harvest mid to late February/March
- Cover crops including rye grass, vetch, forage brassicas and clover on four-year rotation.

Mr Daniell said the biggest soilborne disease affecting the Redwing variety grown at Burdett Harvest is Pink Root.

"Pink Root infects the roots of the onion plant, causing them to turn reddish-purple and disintegrate, leaves

can turn yellow or brown starting at tips and eventually die, and the bulbs from infected plants are usually undersized," Mr Daniell said.



“We’ve just finished carrying out our annual PREDICTA® DNA-based soil testing on all 15 irrigation pivot sites on-farm, helping us to understand exactly what we’re dealing with and to assist with implementing the correct disease management strategies at each individual pivot site.

“Following the Soilborne Disease Masterclass in September 2018, and at the beginning of the broadacre cropping season, we implemented multiple management trials on-farm.

“We’re using a range of cover crops, including rye grass, vetch, forage brassicas and clover on a four-year rotation with onions, with the aim of reducing the incidence of soilborne diseases in the soil.

“Furthermore, we’ve implemented soil fumigation using Chloropicrin, and a soil biologicals program as well as a control site on one irrigation pivot.

While there are multiple trials occurring on-farm, Mr Daniell is still in the process of identifying the best approach for managing Pink Root.

“Although we haven’t seen any results on farm yet, we’ve made significant progress in implementing a range of trials and we’ll be critiquing these management strategies following results from the PREDICTA® DNA-based soil testing,” Mr Daniell said.

“It will take around four years before we determine a definitive approach to the best management of Pink Root in the environmental conditions present at Burdett Harvest.

“I recognise it’s not going to be an easy or quick process. Moving forward, we’re committed to researching and trialling alternative soilborne management strategies until we find what works, with the aim to improve the quality and yields of our onions in the future.”

## Soilborne diseases in onion production:

- **Pink Root** (caused by *Setophoma terrestris* and *Fusarium spp.*)
- **Fusarium basal rot** (*Fusarium oxysporum* and *F. oxysporum f sp. cepae*)
- **Onion stunt** (caused by *Rhizoctonia spp.* particularly *R. solani AG8*)
- **Nematodes** (*Pratylenchus spp.* and *Meloidogyne spp.*)

Barbara Hall, Senior Research Scientist at the Primary Industries and Regions SA’s Research Division, the South Australian Research and Development Institute (SARDI), believes growers often aren’t aware of the level of impact soilborne diseases have on onion production, as impacts

can be slight and occur gradually, making them unrecognisable.

“Above ground symptoms of root disease can vary from obvious patches of severely stunted onions (e.g. onion stunt) to widespread less noticeable symptoms that nonetheless reduce size and yield of bulbs (e.g. root lesion nematodes, pink root),” Mrs Hall said.



“Understanding the symptoms of soilborne diseases is critical for onion growers as it’s often difficult to identify the diseases impacting on production, and if left unrecognised, the impacts can become quite significant.

“Growers should take a whole system approach when managing soilborne diseases as management effectively starts before the crop is planted.

“Firstly, identify the issue you’re facing and educate yourself on the best management guidelines for that disease, and start implementing controls early.”

Mrs Hall encourages growers to utilise the PREDICTA® DNA-based soil testing service for onions.

“By using the testing service, growers can ensure the strategies to manage soilborne diseases are suitable and effective, it will confirm if they have diseases in their soils and it will define their decision to plant in specific areas.”

To access a best practice guide for managing onion stunt, please visit:

<https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/vn13003---best-practice-guide-for-onion-stunt.pdf>

## **PREDICTA® DNA-based soil testing service:**

- Developed by researchers from Primary Industries and Regions SA Research Division at SARDI, the test assesses the risk of *Rhizoctonia solani* AG8, which causes onion stunt, as well as the risks for root lesion and root knot nematode
- Currently the PREDICTA® tests for onion pathogens are offered through SARDI as a customised test. Please contact Michael Rettke from SARDI on 0401 122 124 or [michael.rettke@sa.gov.au](mailto:michael.rettke@sa.gov.au).