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National Vegetable Industry Centre Newsletter

Iris Yellow Spot Virus Found In Riverina Onions

Tony Napier and Andrew Watson, I&I NSW

Onions (*Allium cepa* L.) are an important crop for the Riverina as about 600 ha are grown each year for the fresh market. Seed onions are also an important local crop plus there are some small areas of garlic. These crops can all be affected by *Iris Yellow Spot Virus* (IYSV) which was first reported in Australia in 2003. In the Riverina, IYSV has been found on seed onions on several occasions but until recently have not seen on bulb onions. Last season IYSV was found in a late sown crop of bulb onions which could not be harvested due to the effect of the disease on bulb size and quality.

IYSV is a Tospovirus which is transmitted from plant to plant by onion thrips. Onion thrips acquire the virus while feeding on an infected host while still a juvenile and then are able to transmit the virus to other plants as they move around the crop. Once a juvenile thrips has fed on an infected plant and acquired the disease it can continue to spread the virus to new plants for the remainder of its lifetime. The disease has a potential to spread rapidly with large numbers of infected onion thrips. The virus cannot be transmitted by other common thrips species such as Western flower thrips or Tomato thrips.

Iris Yellow Spot Virus typically doesn't kill plants; however, the virus reduces plant vigour and bulb size. The virus weakens plants, making them more susceptible to other diseases, pests and environmental stresses. The severity of the disease depends on the plant's overall health at the time of infection therefore healthy plants may show few symptoms and maintain decent growth. Plants under environmental or cultural stress may show severe symptoms resulting in significant economic losses.

Leaf symptoms of Iris Yellow Spot Virus

Disease symptoms include straw coloured and diamond-shaped lesions on the leaves and stalks of onion plants. Some lesions have distinct green centres with yellow or tan borders; other lesions appear as concentric rings of alternating green and yellow/tan tissue. The symptoms can be confused with herbicide damage or downy mildew. Infected plants may be scattered about or spread throughout an entire field. Seed crops can be more adversely affected than bulb crops. Seed stalks may bend over at a lesion with the leaves and flower bearing stalks withering, potentially causing total crop failure because flower heads do not develop. It should also be noted that the virus is not seed-borne and cannot be transmitted to the next generation through the seed.

Once plants are infected with IYSV, there is no cure. Maintaining good cultural management practices will help to reduce stress on the plants, thus lessening the disease's effect. Good management practices include maintaining good fertility and adequate water. Thrips management is critical as they are the vector for the disease. Particularly important is reducing surrounding weeds that may be a source of thrips and of the virus. Although no cultivars are known to be resistant to the virus, research has shown that cultivars vary in their susceptibility to both the virus and the thrips vector. For further information, contact the District Horticulturist at Yanco Agricultural Institute on (02) 6951 2611.

NSW GOVERNMENT Industry & Investment

Information Boost For Cambodian Vegetable Growers

David Troldahl, I&I NSW

Cambodian vegetable growers in the Sydney basin are set to benefit from new publications that have been produced specifically for vegetable growers from non- English speaking backgrounds.

Researchers and extension staff from Industry and Investment NSW are working with vegetable growers from a non-English speaking backgrounds operating in the Sydney basin. The work is the Australian component of the Australian Centre for International Agricultural Research (ACIAR) project "Strengthening the Cambodian and Australian vegetable industries through adoption of improved production and postharvest practices".

In January this year a meeting was held with the non-English speaking background growers in the Sydney Basin to understand the gaps in education and to produce a suite of materials suitable for extension to those groups. The focus for this project is the Sydney based Cambodian growers with possible overlaps with materials produced for vegetable growers in Cambodia. As well as addressing some of the needs of the Chinese speaking growers.

The main request from the Cambodian growers in Sydney was for a pest, disease and disorder identification guide and if feasible include a growing guide. This has led to work on developing a Guide for Fruiting Solanaceous crops (Tomatoes, Capsicums and Eggplants) encompassing pest, disease and disorders as well as a chapter on crop management.

The growers interviewed were keen for "plain English" and translated factsheets relevant to the crops that they are growing. A follow up meeting in Sydney in September discussed the format of the Guide for Fruiting Solanaceous and future factsheets that would be most useful to these growers.

Folders containing several translated factsheets were distributed to the growers including translated factsheets on tomato yellow leaf curl virus; and on tomato spotted wilt virus and western flower thrips. Other newly translated spray application record sheets and calibration techniques were also included in the folders so that the growers can more easily comply with legislation when spraying their vegetable crops.

Cambodian vegetable growers from Sydney Basin looking at the newly translated publications folder

The translated factsheets were considered by the growers as a very useful resource and they are looking forward to other information as the project continues. As more resources are translated the Sydney growers will have access to a wider range of information to help them with the management of their crops. The resources will also allow the growers as a group to be more informed on management strategies for pests and diseases that impact on their day to day running of their farms.

The next set of translated factsheets will be posted directly to the growers for them to add to their folders and continue to build this very useful resource. For more information on the ACIAR project for strengthening the Cambodian and Australian vegetable industries, contact David Troldahl at Yanco Agricultural Institute on (02) 6951 2546

Early Season Capsicum Variety Trial

Stephen Wade, I&I NSW, Bathurst

The search for capsicum varieties better suited to Australian conditions remains an industry priority. To assess their suitability for processing, an early season capsicum variety trial (see Table 1) was planted near Cowra as part of a series of capsicum variety trials conducted over the 2009/10 growing season.

Table 1. Early season capsicum trial varieties.

Variety	Seed Company	Growth Habit	Fruit Size	Fruit Shape	Skin Colour
Denison	Terranova Seeds	vigorous	large	blocky	green to red
Hugo	Lefroy Valley	semi-compact	large	blocky	green to red
35-141	Rijk Zwaan	compact	large	blocky	green to red

The trial was transplanted on the 5th November, 2009. It was located on a brown, silt loam soil on the Lachlan River floodplain. The capsicums were transplanted onto 0.76 m wide rows, with 0.3 m spacings between plants. The transplants were established with sprinklers and then watered by furrow irrigation. Normal commercial practices were followed over the growing season. The trial was harvested 84 and 107 days after transplanting on the 27th January and 19th February, 2010. The capsicums were measured for fruit weight, size, skin thickness and soluble solids.

No statistical differences were found between the varieties for any of the trial crop yields or fruit traits (see Tables 2 & 3). The trial showed that with two pickings an average processing fruit yield of 22.7 t/ha could be harvested from an early sown capsicum crop.

For further information on the early season capsicum variety trial, please contact Stephen Wade, District Horticulturist (Vegetables), Bathurst Primary Industries Centre, on (02) 6330 1216.

Hugo capsicums (Lefroy Valley).

Table 2. Early season capsicum variety trial crop yields.

Variety	Total Yield (t/ha)	Processing Fruit (t/ha)	Small Fruit (t/ha)	Medium Fruit (t/ha)	Large Fruit (t/ha)
Hugo	57.6 a	24.9 a	10.1 a	14.8 a	0.0 a
35-141	46.5 a	23.3 a	10.8 a	12.5 a	0.0 a
Denison	41.8 a	19.8 a	7.1 a	7.8 a	5.0 a
Average	48.6	22.7	9.3	11.7	1.7

Total Yield – yield of all fruit ≥ 50 g weight.
Processing Fruit – yield of green, 140-330 g fruit.
Small Fruit – yield of green, 140-200 g fruit.
Medium Fruit – yield of green, 200-300 g fruit.
Large Fruit – yield of green, 300-330 g fruit.
a – *least significant difference rank (P > 95%).*

Table 3. Early season capsicum variety trial fruit traits.

Variety	Fruit Weight (g)	Fruit Length (mm)	Fruit Width (mm)	Fruit Wall (mm)	Fruit Brix (°B)
Hugo	199 a	93 a	86 a	6.5 a	3.8 a
35-141	199 a	86 a	89 a	6.3 a	3.7 a
Denison	211 a	93 a	87 a	6.8 a	3.7 a
Average	203	90	87	6.5	3.7

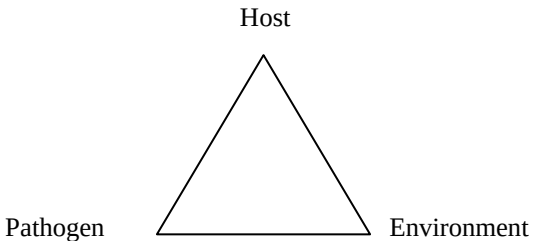
Fruit Weight – average weight of processing fruit.
Fruit Length – average length of processing fruit.
Fruit Width – average width of processing fruit.
Fruit Wall – average skin thickness of processing fruit.
Fruit Brix – average soluble solids of processing fruit.
a – *least significant difference rank (P > 95%).*

Detecting Soil Borne Pathogens Through Soil DNA Testing.

Andrew Watson, I&I NSW, Yanco

Soil-borne diseases can be troublesome for a range of crops. The fungi involved are often one or a combination of the soil borne fungi including *Rhizoctonia*, *Pythium*, *Fusarium*, *Thielaviopsis*, *Aphanomyces* and *Phytophthora*. The diseases associated with these fungi include damping off (death of plants before or after emergence), root rot, stem rot causing plant death and/or yield loss. The detection of these fungi in soils is difficult and usually not found until the crop is planted and conditions are favourable for disease. Disease incidence with either foliar or soil-borne pathogens is often related to the disease triangle where there is an interaction between the host, pathogen and environment. All three can be partially controlled; resistance to diseases can be achieved in the host through breeding, the environment can be controlled by growing in greenhouses and the pathogen can be controlled through fungicide application. However, all these factors are dependent on the type of crop grown and its requirements.

In broadacre farming, there is the opportunity to test for diseases that may be present in soil before planting. For example there is currently a soil test that can indicate the presence of DNA of take-all, *Rhizoctonia* and crown rot (*Fusarium*) and nematodes in wheat. These tests are only useful if the detection is an accurate one, if the host is susceptible and the weather conditions and other environmental factors play a role to induce disease. What is also important is if the detection related to subsequent disease expression.



In a recent study in the development of a DNA test, a comparison was made between its detection and disease observed. The results are expressed in the graph (Fig. 1). The test development was undertaken by the South Australian Research and Development Institute. The disease examined was *Aphanomyces*, a soil borne disease of beans, symptoms of which were observed after growing beans in 42 different bean soils.

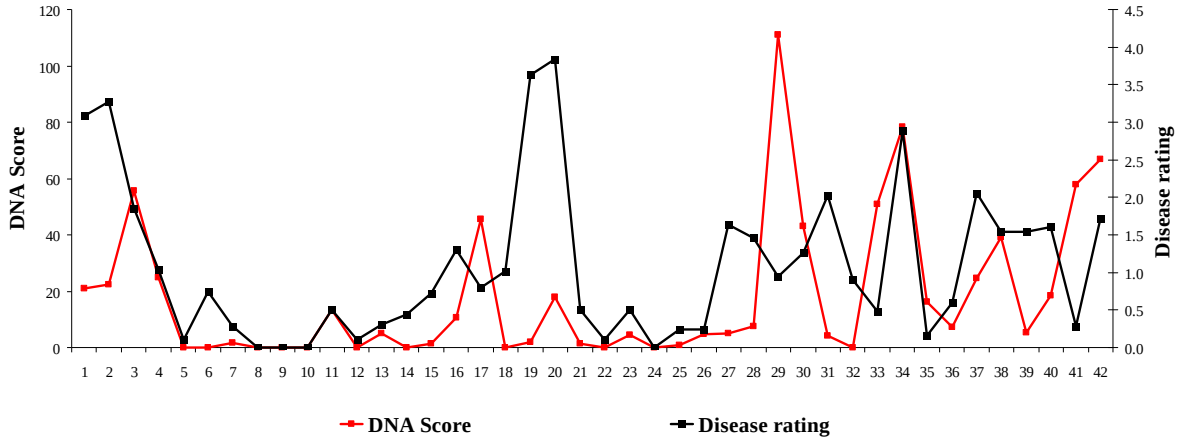


Figure 1. The red line indicating the amount of DNA found in each soil sample and the black line a visual disease rating. Units of measurements are different for both so a comparison of numbers is not relevant, but the trends in the graphs need to be similar for the test to be worthwhile.

Aphanomyces builds up in soil infecting bean roots and stems affecting yield. The advantage of its detection in soil gives an idea of the possible disease that may occur when conditions are right for disease expression. Soil DNA tests give a guide to disease levels and can be useful in the decision making process. The aim is to develop this test for grower use.

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