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National Vegetable Industry Centre Newsletter

Aphanomyces management in beans

Andrew Watson – NSW DPI

Bean production in NSW is mainly located along the north coast. A research project looking at managing root and stem diseases in beans commenced about 18 months ago at Yanco Agricultural Institute (YAI). One outcome of the project has been the isolation of *Aphanomyces* from infected plants. This is a tricky fungus for researchers to work with as it is very difficult to isolate in the laboratory. The *Aphanomyces* that has been found in the bean growing areas of the NSW north coast is similar to the *Aphanomyces* that attacks pea crops.

Aphanomyces has been found to attack the bean plant when conditions are favourable (i.e. very moist soil). This initial attack appears to predispose the plant to further attack by other fungi including *Fusarium* and/or *Pythium*. It is this disease complex that is so devastating and capable of destroying entire bean crops. A paddock that has been infected with *Aphanomyces* can be unsuitable for bean production for many years. Rotating out of beans for a number of years is currently recommended to help reduce the chance of infection occurring. Even with long paddock spells and crop rotations, growers are still struggling with crop losses due to this disease. The problem is so bad some growers are considering leaving the industry or moving their operations to another growing area.

The beans pictured here show a range of symptoms that are commonly found. The plant on the far left has no symptoms, with increasing levels of symptoms as you move to the right. These symptoms were reproduced in the glasshouse using grower soil.

Two control options have been investigated at YAI as part of the research project. The first trial involved evaluating new and existing seed dressings in pot trials. Results were clear with two of the older chemistries, thiram and captan, giving the best protection against *Aphanomyces*. These two common seed dressings were used at high rates and gave much better protection than some of the newer generation seed dressings. A soil drench trial was also undertaken in pot trials which involved applying the fungicides as a drench to the soil before sowing. The fungicides were sprayed in a furrow so it would be mixed in around the seed line. The results for this trial are similar to the seed dressing trial with the older fungicides of thiram and captan performing the best. For more information on the HAL funded bean project, contact Andrew Watson, Research Pathologist at Yanco on 02 6951 2647.

Currant Lettuce Aphid detected in Sydney

Dr Sandra McDougall – NSW DPI

Currant Lettuce Aphid (CLA) was found for the first time in NSW on hydroponic lettuce in the Camden district in early February, 2006 by NSW DPI staff as part of the state wide surveillance program. Since then it has been found in other parts of the Sydney basin. These inspections have been required to maintain the NSW state freedom from CLA for market access to other CLA-free states and to regulate entry of lettuce from Tasmania and Melbourne metro areas where CLA is now found. Since the first positive detection a major effort was launched to survey as many lettuce crops as possible to see how widespread CLA is in the Sydney basin. Although many lettuce crops of untreated susceptible varieties were found to be free of CLA, further detections of CLA have been made within the Sydney basin. Another positive detection of CLA has been made just north of the Sydney Basin at Mangrove Mountain (the Central Coast). Surveys of lettuce in the Central West, Cooma and Hay have not detected CLA.

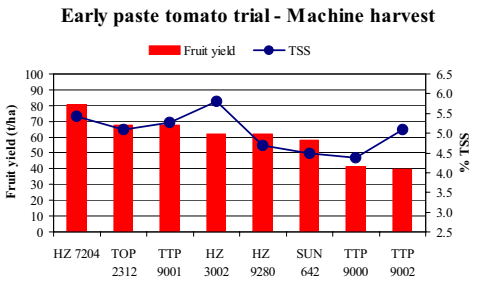
Growers in the Sydney Basin who wish to ship lettuce to SA, WA or QLD will need to meet the market access requirements Victorian growers currently operate under. Contact your local NSW DPI office or Regulatory Officer for more information. Lettuce aphid management strategies and permits are available from http://www.agric.nsw.gov.au/reader/pe-insect/currant-lettuce-aphid

NSW processing tomato variety trials update

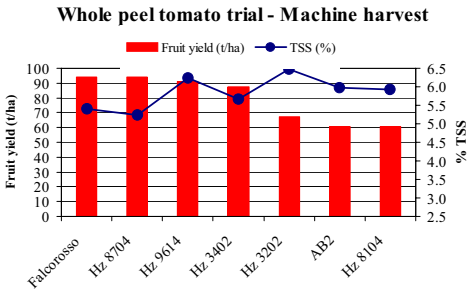
Tony Napier – NSW DPI

During the 2005/06 season, the Australian processing tomato industry continued its cultivar evaluation program to screen new varieties. There are two main levels of assessment for variety selection. The first level of assessment is as small observation plots where each variety was visually assessed for suitability. The final level of assessment is as full row plots which are harvested by machine. These larger plots are usually the full length of a paddock. These plots are measured for yield by mechanical harvest with samples taken at maturity for quality testing.

The "early paste" machine harvest trial was sown on the 8th September 2005 and harvested on the 28th February 2006. This trial was sown near Griffith in a crop of Heinz 9280. The trial contained 8 varieties for evaluation, each sown on 296m of bed. The highest yielding variety was Hz 7204 with 80.7 t/ha. Hz 7204 was also the variety with the highest yield of Total Soluble Solids (TSS) with 4.4 t/ha. The variety with the highest percentage of TSS was Hz 3002 with 5.8%.



The "whole peel" machine harvest trial was sown on the 12th October 2005 and harvested on the 16th February 2006. This trial was sown at Barooga in a crop of Heinz 8704. This trial contained 7 varieties for evaluation, each sown on 200m of bed. The highest yielding varieties were Falcorosso and Hz 8704 with 94.3 t/ha. The variety with the highest percentage of TSS was Hz 3202 with 6.5% whilst the variety with the highest yield of TSS was HZ 9614 with 5.7 t/ha.



The "mid paste" machine harvest trial was sown on the 18th November 2005 and due for harvest in early April. The trial was sown at Jerilderie in a crop of Hz 8704. This trial contains 7 varieties for evaluation, each sown on 240m of bed. Results will be available after harvest. For more information contact Tony Napier, District Horticulturist at Yanco on 02 6951 2796.

Varietal evaluation in focus

Mark Hickey – NSW DPI

An eminent potato researcher, Dr Eric Allen from Cambridge University Farms in the UK recently addressed a gathering of vegetable industry managers, consultants and researchers at Yanco. Dr Allen is well known for his work in potato evaluation, based on his publication in the standard industry text "The Potato Crop", but is also involved with a range of other annual horticultural and field crops.

Dr Allen's visit was part of a Horticulture Australia Ltd initiative to study varietal evaluation programs throughout Australia. Dr Allen's work in potatoes has clearly indicated the potential that exists to increase the effectiveness and efficiency of varietal evaluation efforts through the use of different approaches to the characterisation and field evaluation of varieties and genotypes. His success in this is illustrated by his activities with Frito Lay (Pepsico) where he is active throughout the Americas and Europe. This visit was an opportunity for Australian researchers to learn from his many years of experience, and consider an alternative approach to varietal evaluation and selection.

Eric Allen (centre) and project coordinator Jeff Peterson visit a potato grower at Koo Wee Rup, Victoria, as part of the workshop program.

Of particular interest to the Yanco research team was the emphasis placed on canopy vigour in potatoes and how that relates to productivity and cultivar performance. Factors that influence canopy size, such as disease or pest damage, nutritional problems or irrigation practice need to be managed consistently across various trial sites before realistic comparisons can be made about suitable varieties for particular regions.

Apart from the workshop at Yanco in mid March, Dr Allen also visited several potato growing districts and conducted workshops at Sydney University, and with the various state agencies at Knoxfield in Victoria, Gatton in Queensland and northern Tasmania.

Diurnal activity of thrips in onions

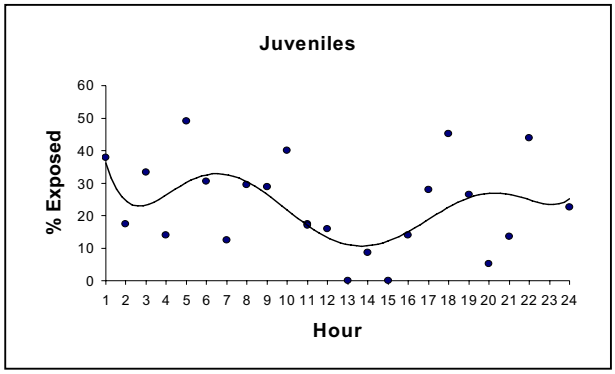
Tony Napier – NSW DPI

Onion thrips (*Thrips tabaci*) are tiny insects that feed on onions during the crops vegetative stage of growth. Onion thrips feed by piercing and rasping the leaf surface with their mouthparts to release the liquids from the plant cells. The damage is indicated by the appearance of silvery patches or streaks on the leaves. In severe situations, where there is lots of thrips damage, the plant's ability to photosynthesise and to maintain water balance is greatly reduced. In badly damaged plants, maturity is quicker and bulb size is reduced.

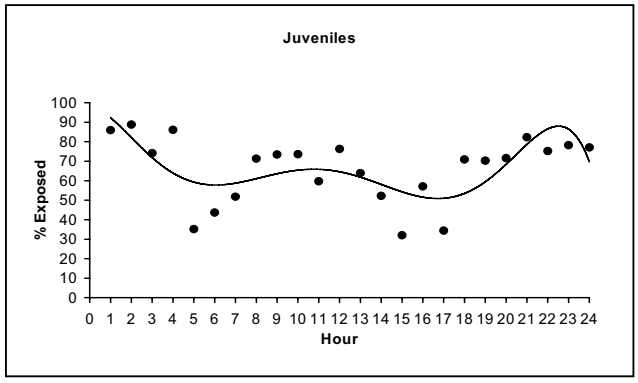
Onions have long, thin and erect leaves (tightly bound at the base). Juvenile thrips tend to live and feed most of the time in the lower inner leaf folds of onions where it is difficult to reach with insecticides. Adult thrips are a bit more active and can be found moving over the entire plant.

Researchers at Yanco were unsure of the diurnal activity (movement over a 24hr period) of onion thrips. If there was a period of the day when both the juvenile and adult thrips migrated to higher and more exposed parts of the onion plant, then this would be the best time to make an insecticide application. For this reason two trials were established during the last onion season to monitor the movement of thrips on onion plants over a 24hr period. On the 6th of October and the 14th of November 2005 an onion crop was inspected on an hourly basis for a full 24 hour period. Individual plants were counted for thrips numbers and their location over the plant.

Graph 1 - Diurnal activity – 6 October 2005



Graph 2 - Diurnal activity – 14 November 2005



The two graphs above show the percentage of juvenile thrips counted on the upper leaves. On the first sampling date, when thrips numbers were low, it appeared that the juvenile thrips reduced their movement away from the protection of the lower leaves during the middle of the day. On the second sampling date, when thrips numbers were much higher, it is difficult to see any trend. The results from this study did not show anything conclusive and it is difficult to make any recommendations on what is the best time of day to make an insecticide application based on the diurnal activity of thrips. For further information on any trials in the national onion thrips project, contact Dr Jianhua Mo at Yanco Agricultural Institute on 02 6951 2537

Aspergillus causes havoc in Riverina onion crops

Mark Hickey – NSW DPI

January 2006 will be remembered as one of the hottest months on record. With average temperatures up to 3^0 C above long term average, the conditions were ideal for *Aspergillus niger,* otherwise known as Aspergillus black mould, which continues to be one of the most devastating onion diseases in the Riverina.

Hot days and warm nights experienced during the main harvest period for onions in the Riverina greatly increases the risk of black mould. In recent years, January has been relatively mild, so crops were able to be harvested and sold before the worst of the weather hit later in January. However in the 2005/06 season, the relentless heat which started around Christmas continued right through and even crops being moved into sheds at night had very high core temperatures, creating conditions which are ideal for development of the disease.

Riverina growers have managed the disease better in recent times, avoiding use of high rates of nitrogen fertiliser and late irrigations. However, this year even in

relatively firm bulbs with good skin coverage, *aspergillus* infections were severe. The disease was commonly seen occurring around the neck of the onion, then spreading to other parts of the bulb. The white onion pictured above has symptoms that can easily be seen under the outer skin. Varieties with dark skin colour were generally worst affected.

NSW DPI has estimated that up to 15% of the Riverina onion crop was lost due to *aspergillus*. Most of the losses occurred in the shed, after the crop had been harvested, adding to the value of the dumped crop. *Aspergillus* is a post-harvest disease, symptoms of which typically are not apparent until onions have been stored in sheds for a period of time. In the worst cases, shipments of onions were rejected at the markets, adding to the extent of the losses.

Aspergillus needs temperatures above 32^0 C and high humidity or free moisture to thrive. Forced air curing using fans and covers to direct airflow through the bin stacks has proven to be useful in reducing the risk of *Aspergillus* development in harvested bulbs. Aspergillus thrives on moisture trapped under outer skins, and the curing helps to dry out that moisture, preventing the fungus from growing. Storing onions in coolrooms will also help prevent the disease, but is more expensive than forced air curing.

Forced air curing system

NSW DPI worked with local industry in the late 1990's to develop low cost curing methods for bulb onions. Several curing fan systems (as seen in the photo) were installed, but the major problem was handling large quantities and the fan arrangements did not necessarily suit the larger operations. The vegetable team at Yanco will be investigating alternative control techniques for *Aspergillus* over the coming months, and small scale trials could be set up depending on the level of industry support. For further information please contact Mark Hickey at Yanco on 02 6951 2523 or Andrew Watson on 02 6951 2647.

Pumpkin variety trial

Tony Napier – NSW DPI

During the previous few years, when irrigation allocations for MIA farmers were at very low levels, interest in pumpkin production appeared to heighten. There was an increase in enquires about growing pumpkins at Yanco Agricultural Institute, however this did not translate into any real increase on the amount sown with approximately 800ha of pumpkins still grown annually in the MIA.

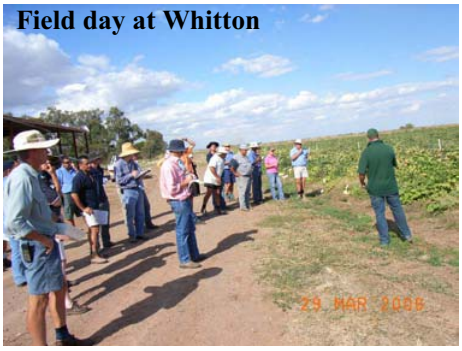
With the increasing interest in pumpkins, NSW DPI decided to establish a pumpkin variety trial in the local area. The variety trial was established to compare and evaluate the major varieties currently grown in the MIA. Three types of pumpkins, greys, butternuts and Japs, were all sown for evaluation. The trial is focusing on yield and fruit size but also hopes to measure some quality aspects including brix, seed cavity size and storage life.

The trial was sown in a commercial crop of Japs on the 22nd November 2005 at Roy Schrippa's property near Whitton. The trial included all the major varieties currently grown in the MIA. Some varieties have already ripened in the trial with harvest expected to be completed by the end of April. The older open pollinated types are still the most popular types in the MIA with some newer hybrid varieties quickly gaining popularity with improved yields and better suitability for processing.

The average yield of early pumpkin crops in the MIA has been reasonable this year, while the mid and later crops appear to be down about 10 to 20%. Most of the later crops have been adversely affected by the severe heat encountered during the season.

A field day was held on the 29th March 2006 to give any interested people a chance to see the varieties before harvest. Attending the field day were most seed company representatives to answer any questions and promote their new varieties. For further information on the pumpkin trial, contact Tony Napier, District Horticulturist at Yanco Agricultural Institute on 02 6951 2796.

Field day at Whitton



Editorial contact: Tony Napier, NSW Department of Primary Industries, Ph 02 6951 2611, Fax 02 6951 2692
Email – tony.napier@dpi.nsw.gov.au Web address www.agric.nsw.gov.au/reader/vegetables