

# SRA Grower Group Innovation Project Final Report

## Pachymetra awareness project for Condong Mill Area

|   |   |                       |                                 |
|---|---|-----------------------|---------------------------------|
| <b>SRA Project Code</b>                           | <b>2012/064 (2012/064)</b>  |                       |                                 |
| <b>Project Title</b>                              | Pachymetra Awareness Project for Condong Mill Area  |                       |                                 |
| <b>Group Name</b>                                 | NSW Canegrowers Association Tweed Executive   |                       |                                 |
| <b>Chief Investigator(s)</b>                      | Co-ordinators: Peter McGuire and Doug Irby  |                       |                                 |
| <b>Project Objectives</b>                         | <ol style="list-style-type: none"> <li>1. Use innovative approaches to motivate and demonstrate the potential benefits to improve Pachymetra management for farmers.</li> <li>2. Build capacity in growers to better manage Pachymetra on their farms.</li> <li>3. Increase farm, harvester and mill productivity by addressing Pachymetra in the Condong Mill Region.</li> </ol> |                       |                                 |
| <b>Milestone Number</b>                           | 6   |                       |                                 |
| <b>Milestone Due Date</b>                         | 1 <sup>st</sup> December, 2015  | <b>Date submitted</b> | 16 <sup>th</sup> February, 2016 |
| <b>Reason for delay (if relevant)</b>             | Prolonged illness of Doug Irby and the retirement of Peter McGuire  |                       |                                 |
| <b>Milestone Title</b>                            | Final Report  |                       |                                 |
| <b>Success in achieving the objectives</b>        | <input checked="" type="checkbox"/> Completely Achieved<br><input type="checkbox"/> Partially Achieved<br><input type="checkbox"/> Not Achieved   |                       |                                 |
| <b>SRA measures of success for key focus area</b> |   |                       |                                 |



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## Section 1: Executive Summary

Canegrowers in the Condong Mill Area were first made aware of the presence of *Pachymetra* root rot after it was identified in soil samples tested by BSES in 2005. Following this a small percentage of growers were having soils tested for the presence of *Pachymetra* but the majority of growers were not participating.

A soil test from Condong had the highest spore counts for *Pachymetra* ever recorded (in excess of 5 million spores per Kg of soil). Yield losses in this block were over 80%.

Stool tipping and poor ratoons are a feature of many peaty soils at Condong yet many farmers remained unaware of the damaging effects of *Pachymetra* because the problem occurs in the soil and roots and so is invisible.

Concerns were raised by the local productivity board that promotion of the *Pachymetra* problem at Condong has not had any impact on many farmers.

A meeting of local influential farmers, BSES and CPPB staff resolved to form a "Grower *Pachymetra* task force" to manage a project to improve the awareness of Condong growers to the benefits of managing *Pachymetra* on their cane farms.

Expressions of interest were called for by the task force in May 2012 for growers interested in participating in this trial. With limited responses to the EOI the project group approached growers who were known to have excessive levels of *Pachymetra*.

From this three sites were selected in different zones of the Condong Mill area;

1. Robert Hawken – Duranbah
2. Graham Martin – Dulguigan
3. Doug Irby – Mooball / Crabbes Creek

Samples were collected from all trial sites, preparations were carried out according to recommendations from soil tests and the trials were planted between 13<sup>th</sup> and 20<sup>th</sup> September, 2012.

A major flood event occurred in the Condong mill area during January 2013. Two of the demonstration sites (Martin & Irby) were severely affected by the flood and subsequent waterlogging that occurred until July 2013.

As a result of this the project was put back twelve months as farmer's focus shifted to 'flood recovery mode' and there was little interest in sampling fields for *Pachymetra*.

On 15<sup>th</sup> April, 2014 we held a successful *Pachymetra* Awareness Day consisting of a seminar on *Pachymetra* and a visit to the demonstration site on Robert Hawken's farm. The seminar was led by Dr Rob Magarey from SRA who spoke on the biology, impacts and control of *Pachymetra* and answered questions from the growers attending.

The information from the seminar was reinforced by a visit to Robert Hawken's demonstration site where growers were able to see the effects of *Pachymetra*.

Farmers attending the Awareness Day were provided with a "Pachy Soil Kit" to test one high risk block on their farm and provide a history of that block.

During the course of the project 65 soil samples from farmers were sent for *Pachymetra* assay. The average *Pachymetra* count for these samples was 57,193 spores per kg soil. The highest count was 663,000 spores/kg. The following table shows the breakdown of the farmer samples.

| Spores per kg soil | % of samples |
|--------------------|--------------|
| < 5,000            | 37%          |
| 5,000 – 25,000     | 21%          |
| 25,001 – 50,000    | 15%          |
| 50,001 – 100,000   | 13%          |
| > 100,000          | 13%          |

Mapping of these results has shown that *Pachymetra* is found in a number of areas in the Condong Mill area. Almost half of the area is made up of peaty soils which are the main soils effected by *Pachymetra*. 95% of the farms in this area contain some peaty soils.

With continued grower education it is hoped that this project will lead to:

Regular testing of high risk blocks

Greater use of recently released *Pachymetra* resistant varieties on affected soils.

An ongoing improvement in *Pachymetra* management resulting in longer ratoons and better yields.

Promotion of this project will also raise awareness of the issue within all cane growing areas.

## Section 2: Background

Canegrowers in the Condong Mill Area were first made aware of the presence of *Pachymetra* root rot after it was identified in soil samples tested by BSES in 2005. Following this a small percentage of growers were having soils tested for the presence of *Pachymetra* but the majority of growers were not participating.

Stool tipping and poor ratoons are a feature of many peaty soils at Condong yet many farmers remained unaware of the damaging effects of *Pachymetra* because the problem occurs in the soil and roots and so is invisible

A soil test from Condong had the highest spore counts for *Pachymetra* ever recorded (in excess of 5 million spores per Kg of soil). Yield losses in this block were over 80%.

The arrival of sugar cane smut disease had led many farmers to plant varieties that are smut resistant but susceptible to *Pachymetra*.

Survey work by BSES and the CPPB showed that the problem is widespread through the area.

Promotion by BSES and the CPPB of the *Pachymetra* problem at Condong has not had any impact on many growers.

## Section 3: Outputs and Achievement of Project Objectives

### Project Objectives:

1. Use innovative approaches to motivate and demonstrate the potential benefits to improve *Pachymetra* management for farmers.
2. Build capacity in growers to better manage *Pachymetra* on their farms.
3. Increase farm, harvester and mill productivity by addressing *Pachymetra* in the Condong Mill Region.

### Project Activities:

1. Form a Grower *Pachymetra* task force from local influential farmers.
2. Identify 3 suitable demonstration sites by testing 10 potential blocks.

3. Establish variety test strips on these sites using susceptible and resistant varieties to show how susceptible varieties on infected soils cause stool tipping and reduce yield. Recently released varieties will be included at these sites for local assessment.
4. Hold a Pachymetra Awareness Day using these sites and a seminar by Dr Rob Magarey (BSES Pachymetra expert).
5. Farmers attending will be given a “Pachy Soil Kit” to test one high risk block on their farm and provide a history of that block.
6. Soil nutrient analysis will be done on these samples to show if poor yields from the block are due to Pachymetra or soil fertility.
7. After awareness day ask for volunteers for 60 farmers to sample high risk blocks. If necessary target blocks through BSES staff, individual growers or productivity board.
8. Results from these tests will be mapped using Agdat or the mill’s GIS to show the distribution of Pachymetra at Condong.
9. The results will also be communicated by word of mouth using local, influential farmers and use of the Grower Group Services network.

Methodology:

Expressions of interest were called for in May 2012 for growers interested in participating in this trial. With limited responses to the EOI the project group approached growers who were known to have excessive levels of Pachymetra.

From this three sites were selected in different zones of the Condong Mill area;

1. Robert Hawken – Duranbah
2. Graham Martin – Dulguigan
3. Doug Irby – Mooball / Crabbes Creek

Samples were collected from all trial sites, preparations were carried out according to recommendations from soil tests and the trials were planted between 13<sup>th</sup> and 20<sup>th</sup> September, 2012.

Plans of the demonstration sites are shown below:

|  |                         |                          |                               |                         |                        |
|--|-------------------------|--------------------------|-------------------------------|-------------------------|------------------------|
| <p><b>Hawken Site</b></p> <p>rest of block<br/>Q211</p>  <p>Planting the trial at Robert Hawken's farm</p> | <p>6 rows<br/>KQ228</p> | <p>5.1 rows<br/>Q211</p> | <p>5.9 rows<br/>BN81-1394</p> | <p>6 rows<br/>KQ228</p> | <p>7 rows<br/>Q211</p> |
|  |                         |                          | <p>&lt; 30 m &gt;</p>         |                         |                        |

Farm No: 8121

Block:201

Date planted: 12-13/09/2012

Spore count: 106,000 spores /kg (July 2012)

Seed sources:

Q211 - R Hawken

KQ228 - R Hawken

BN81-1394 - mother plot



Nth

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

|                    |                 |                |                |                |
|--------------------|-----------------|----------------|----------------|----------------|
| <b>Martin Site</b> | 11 rows<br>Q208 | 8 rows<br>Q200 | 8 rows<br>Q203 | 8 rows<br>Q211 |
|--------------------|-----------------|----------------|----------------|----------------|

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main drain

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Farm No: 8050

Block: 211

Date planted: 17/09/2012

Spore count: 189,000 spores/kg (July 2012)

Seed sources: own farm



D Irby site

|  |                        |                          |                         |                        |
|--|------------------------|--------------------------|-------------------------|------------------------|
| <p>9 rows<br/>Rogan</p>  <p>Planting the trial at Doug Irby's.</p>  | <p>8 rows<br/>Q208</p> | <p>8 rows<br/>Pindar</p> | <p>18 rows<br/>Q208</p> | <p>7 rows<br/>Q190</p> |
|--|------------------------|--------------------------|-------------------------|------------------------|

Farm No

8074

Block

412

Date planted:

20/09/2012

Spore count:

130,800 spores/kg (Aug 2012)  
*previously 5,000,000*

Seed sources:

Pindar- J Harbison, rest - own farm



North

A major flood event occurred in the Condong mill area during January 2013. Two of the demonstration sites (Martin & Irby) were severely affected by the flood and subsequent waterlogging that occurred until July 2013.

As a result of this the project was put back twelve months as farmer's focus shifted to 'flood recovery mode' and there was little interest in sampling fields for Pachymetra.

## Results:

### **Pachymetra awareness day.**

On 15<sup>th</sup> April, 2014 we held a successful Pachymetra Awareness Day consisting of a seminar on Pachymetra and a visit to the demonstration site on Robert Hawken's farm. The seminar was led by Dr Rob Magarey from SRA who spoke on the biology, impacts and control of Pachymetra and answered questions from the growers attending.

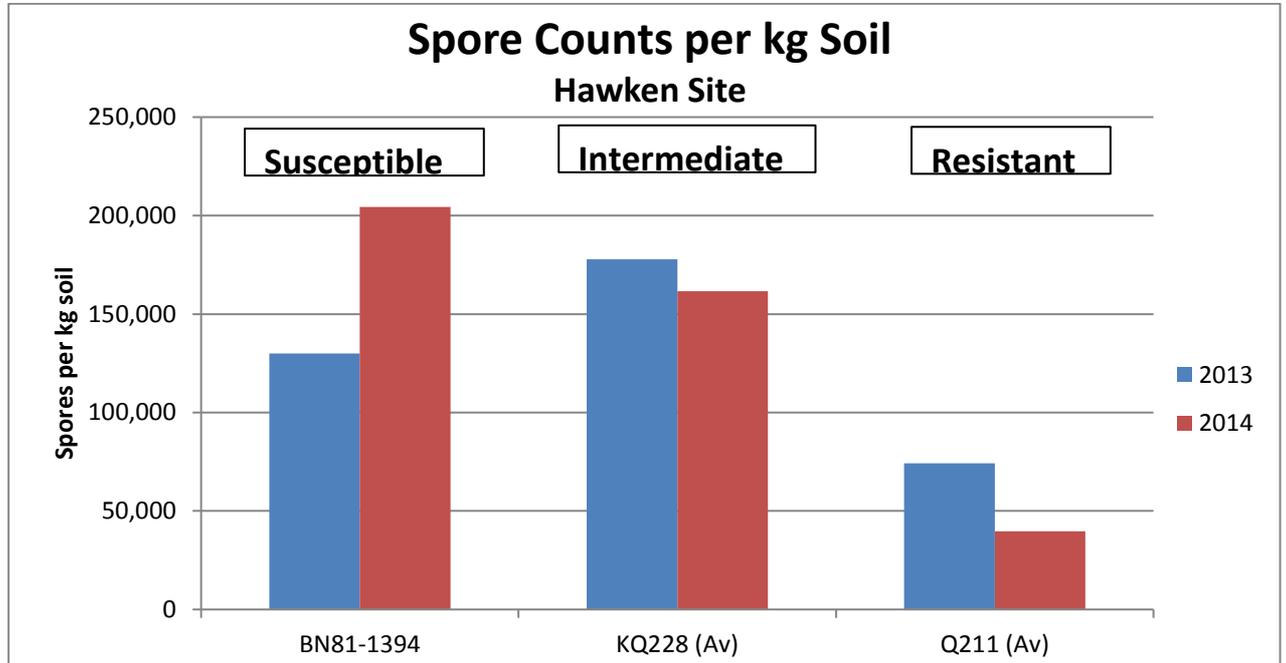
The information from the seminar was reinforced by a visit to Robert Hawken's demonstration site where growers were able to see the effects of Pachymetra.

During the 2014 season sampling was continued on all demonstration sites, following harvesting, with the results to be circulated to growers as part of a newsletter. The results of this sampling are as follows:

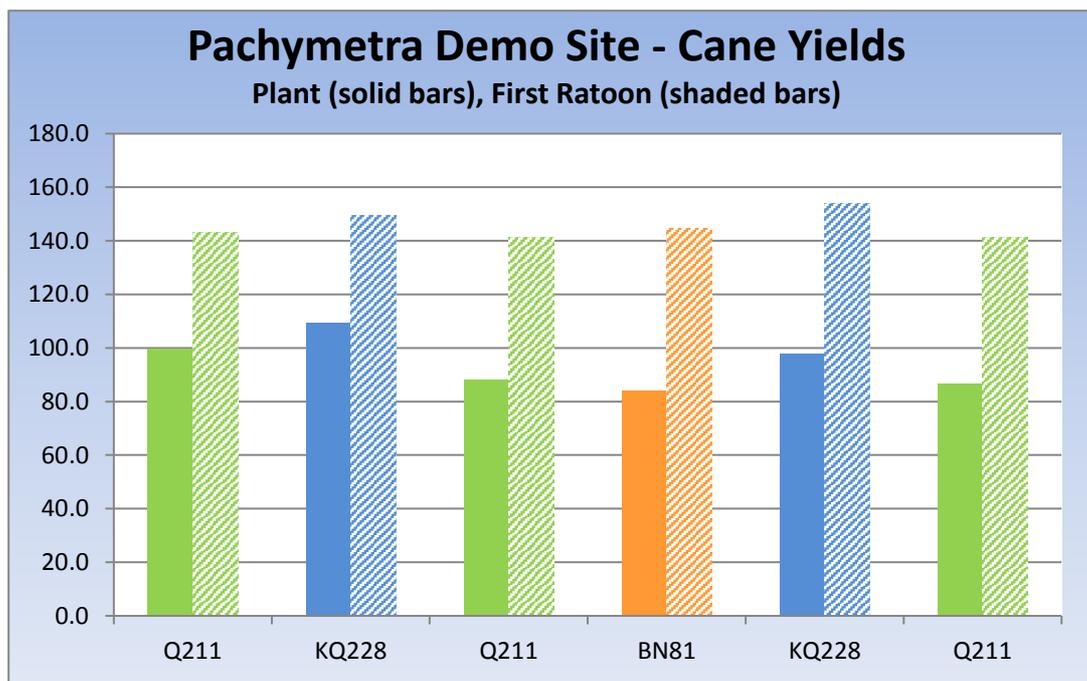
**HAWKEN SITE:**

Original spore count: 106,000 spores/kg (July 2012)

**Spore counts from 2013 & 2014:**



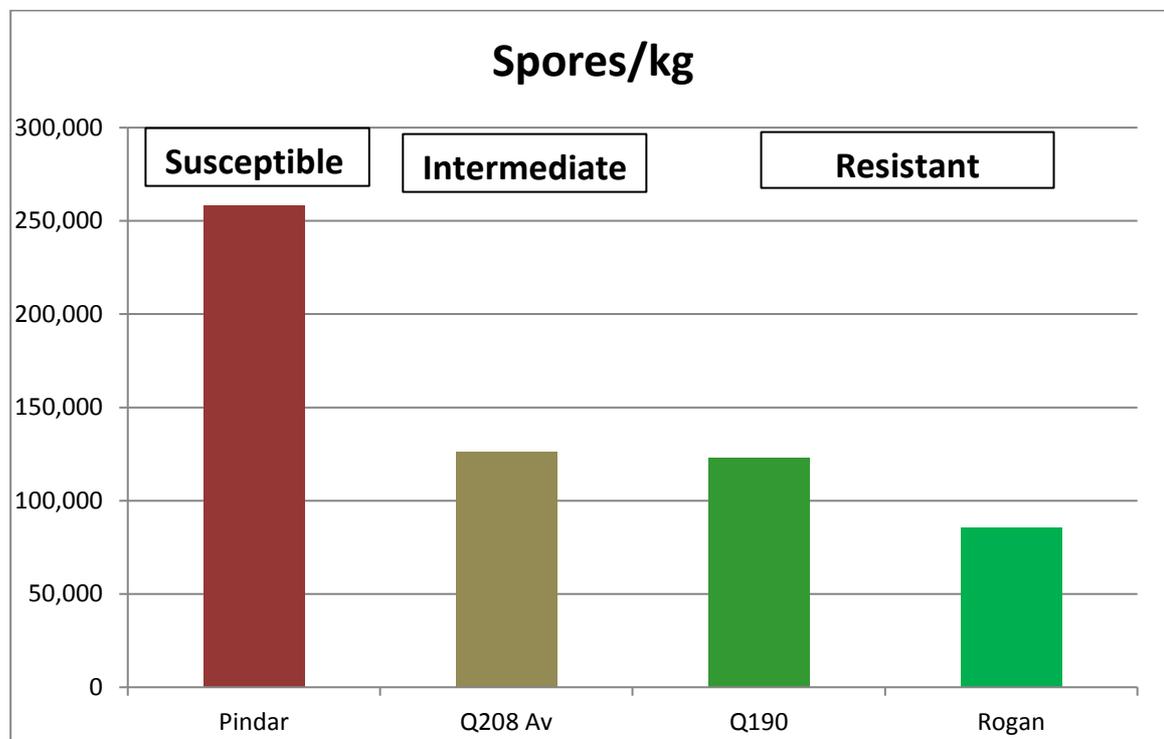
**2013 & 2014 yields:**



**IRBY SITE:**

Original spore count: 130,800 spores/kg (July 2012)

Spore counts from 2014:



Yields not measured at harvest due to extensive damage from flooding & waterlogging in January 2013.

**MARTIN SITE:**

Original spore count: 189,000 spores/kg (July 2012)

| Original Variety  | Spores/kg |
|-------------------|-----------|
| Q208 <sup>Ⓛ</sup> | 0         |
| Q200 <sup>Ⓛ</sup> | 2,279     |
| Q203 <sup>Ⓛ</sup> | 0         |
| Q211 <sup>Ⓛ</sup> | 0         |

**Comments:**

- Spore counts from recent sampling have reduced almost to zero but this seems atypical and too good to be true. Spore counts will be done again after the next harvest.
- Yields not measured at harvest due to extensive flood damage in January 2013.
- The Q200<sup>Ⓛ</sup> strip and part of the Q211<sup>Ⓛ</sup> strip was replanted due to the severe damage and stool death caused by the Jan 2013 flood.

### Sample High Risk Blocks

During the course of the project 65 soil samples from farmers were sent for Pachymetra assay. The average Pachymetra counts for these samples was 57,193 spores per kg soil. The highest count was 663,000 spores/kg. The following table shows the breakdown of the farmer samples.

| Spores per kg soil | % of samples |
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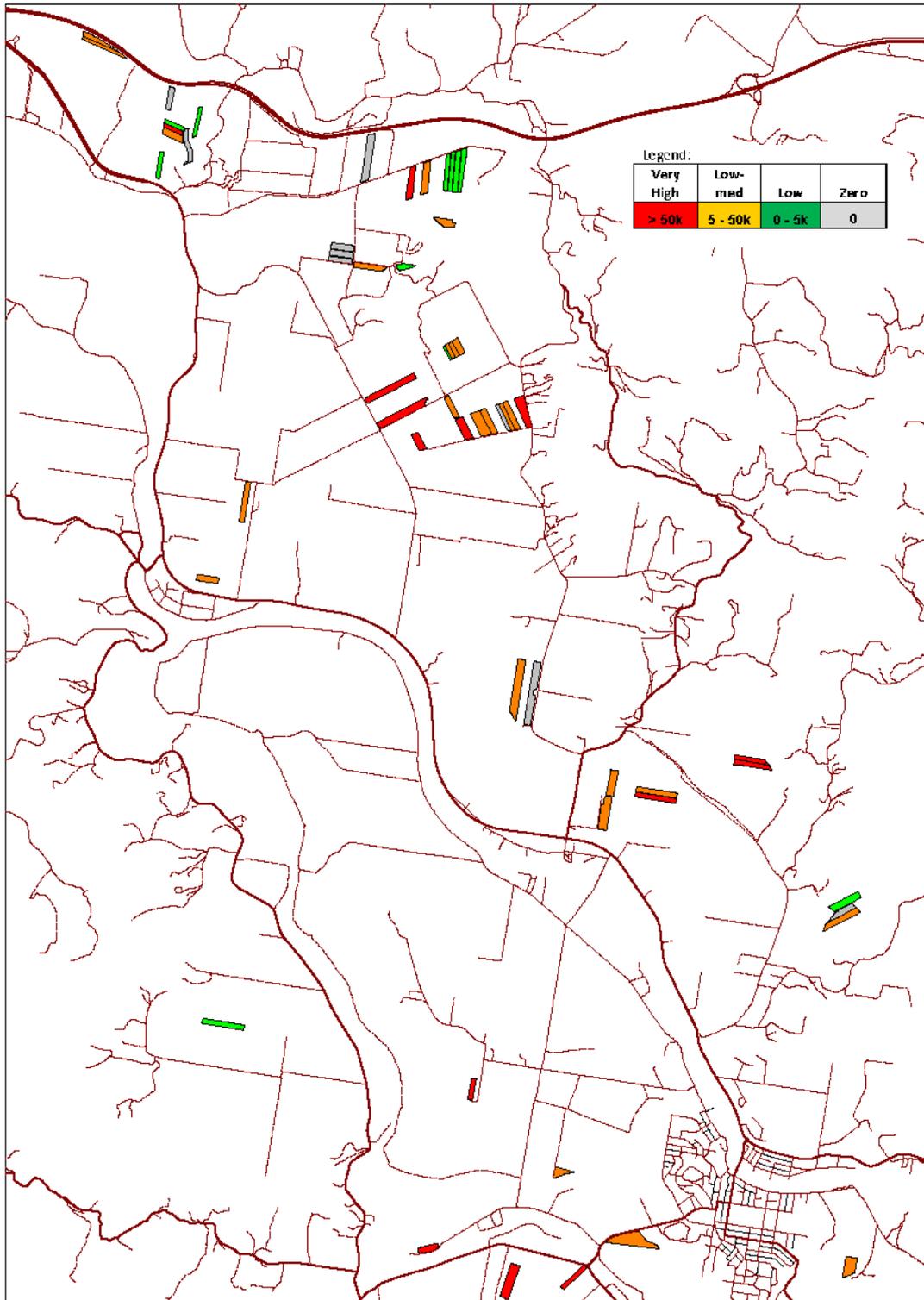
### Mapping Results

1. A total of 65 soil samples were tested for Pachymetra during the duration of the project. The results of these tests were then mapped during April 2015 and are shown on the following page.
2. At pre-season shed meetings held on 17<sup>th</sup> June, 2015 presentations were given to those growers attending by Peter McGuire. The presentations provided an outline of the project with emphasis on the results obtained from the trial sites in relation to productivity and the effect of growing intermediate and susceptible varieties in soils testing positive for Pachymetra.

#### Final:

As can be seen from the map highlighting the results of Pachymetra testing (following page) the organism has been found in very high numbers in several locations in the Condong mill area.

The plan now is to continue our education process to all growers with special attention to those who did not participate in the project and are located in the vicinity of properties showing very high result for Pachymetra. It is hoped that this project will kick start an ongoing improvement in Pachymetra management resulting in longer ratoons and better yields.



Map of results of Pachymetra soil tests done during the duration of the project.

## Section 4: Intellectual Property (IP) and Confidentiality

N/A

## Section 5: Industry Communication and Adoption of Outputs

The results of the project have been communicated/promoted in the sugar industry by way of:

A Pachymetra awareness day held 15<sup>th</sup> April, 2014. This day included a field tour to visit a demonstration site as well as a seminar held by Dr Rob Magarey and addresses by local farmers on their experiences with Pachymetra.

Word of mouth using local influential farmers

Use of Grower Group Services network

With continued communication and education it is hoped that the majority of growers will undertake a more active role in the management of Pachymetra on their farms and where necessary make greater use of recently released Pachymetra resistant varieties, resulting in longer ratoons and higher yields.

## Section 6: Environmental Impact

Environmental Benefits of this project include:

1. Improved uptake of applied fertilizer through better root systems.
2. Less stool tipping will result in less mud and problems associated with its disposal.
3. Reduced soil in cane supply will improve sugar quality and reduce unnecessary wear and tear on milling components.

## Section 7: Recommendations and Future Industry Needs

The task force that managed this project would like to stress to growers that Pachymetra is a threat to their productivity if it is present on their farms. They recommend that if you suspect that you may have Pachymetra, test for it and if it is present introduce a Pachymetra management plan to limit its effect.

## Section 8: Publications

N/A