Crop Updates 2011 - Pests and Diseases

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Pest and Diseases
Agribusiness Crop Updates 2011

Grains biosecurity – everyone’s business

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Key Messages

• Grain biosecurity is a whole-of-grain-industry responsibility.
• Grain biosecurity practices in the grains industry can be readily incorporated into daily farm management.
• Vigilance and reporting of anything unusual is vital.
• Assistance is available to growers wishing to be better informed about the latest grains biosecurity information.

Aims and Background

The Grains Farm Biosecurity Program is designed to raise awareness of the importance of farm biosecurity and priority pest threats to the grains industry.

Biosecurity is about the protection of livelihoods, lifestyles and the natural environment, which could be harmed by the introduction of new and exotic pests. As such biosecurity is a national priority, implemented off-shore, at the border and on-farm. Biosecurity is essential for your farm business.

Freedom from these exotic pests is a vital part of the future profitability and sustainability of Australia’s plant industries. Biosecurity allows us to preserve existing trade opportunities as well as to provide evidence to support new market negotiations.

Farm biosecurity

Farm biosecurity is a set of management practices and activities that are carried out on-farm to protect a property from the entry and spread of pests. Farm biosecurity is essential for your business and is your responsibility and that of every person visiting or working on your property.

Growers can play a key role in protecting themselves and the Australian grains industry from exotic pests by implementing effective farm biosecurity. If a new pest becomes established on your farm, it will affect your business through increased farm costs (e.g. changing of rotations, additional chemical controls, and other management treatments and strategies that need to be put in place), reduced productivity (yield and/or quality) or loss of markets.

Regional biosecurity

To strengthen the biosecurity measures that you undertake on your property, consider starting biosecurity meetings and activities to promote biosecurity at the regional level. Through this collaborative approach, biosecurity threats to all properties in your region can be minimised.

Potential sources of biosecurity threats may be neighbouring farms (whether producing grain, livestock or undertaking other activities), native vegetation, and garden and roadside plantings.

Implementation of farm biosecurity underpins regional biosecurity, which in turn underpins national biosecurity. Promotion of biosecurity at the regional level is enhanced through understanding the region, the source and nature of potential threats, and having knowledge of the expertise and resources available to the region. This is supported by a commitment from everyone to implement biosecurity measures, carry out surveillance and report suspect pests.

If farm measures are supported by community based measures, a regional framework for biosecurity can be coordinated and is achievable.

Biosecurity in Practice

Here are six simple, routine farm practices you can do to reduce the threat of new pests entering and establishing on your property. Each practice should be embedded in your farm’s everyday management as they make good business sense by reducing the risk of spreading any pest. Don’t put your livelihood at risk by neglecting farm biosecurity.
1. **Be aware of biosecurity threats**
   Make sure you, your farm workers and contractors are familiar with the most important grains pest threats. Carry out a biosecurity induction session on your farm to explain hygiene practices for people, equipment and vehicles.

2. **Ensure seed is pest free, and preferably certified**
   Ensure all seed and other farm inputs are fully tested, pest-free and preferably certified. Keep records of your farm inputs.

3. **Keep it clean**
   Practising good sanitation and hygiene will help prevent the entry and movement of pests onto your property. Workers, visitors, vehicles and equipment can spread pests, so make sure they are decontaminated before they enter and leave your farm. Have a designated visitors area and provide vehicle and personnel disinfecting facilities.

4. **Check your crop**
   Monitor your crop frequently. Knowing the usual appearance of your crop will help you recognise new or unusual events and pests. Keep written and photographic records of all unusual observations. Constant vigilance is vital for early detection of any exotic plant pest threat.

5. **Abide by the law**
   Support and be aware of laws and regulations established to protect the grains industry, Australian agriculture, and your region.

6. **Report anything unusual**
   If you suspect a new pest – report it immediately.

**Pest Response Deed (EPPRD) and the Grains Industry**

The EPPRD is a formal, legally binding document between Plant Health Australia (PHA), Australian and state/territory governments, and plant industry signatories. Under the EPPRD, the grains industry has a responsibility to report suspect pests. The earlier a new pest is detected, the greater the chance an eradication response will be mounted and the more likely it will be successful.

Within an approved response plan, grower reimbursement payments (Owner Reimbursement Costs; ORCs) are included for direct costs incurred as a result of eradication of a pest incursion.

**Conclusion**

As a grain grower you have an important role to play in protecting your farm and the entire grains industry from biosecurity threats.

Early detection and immediate reporting increase the chance of an effective and efficient eradication.

More information on how to secure your farm and secure your future can be found online at: www.farmbiosecurity.com.au a joint initiative of Plant Health Australia and Animal Health Australia.

Specific information relating to the grains industry can be found on the Plant Health Australia website: www.planthaustralia.com.au.

**Key Words**

Grains biosecurity, exotic pest, Plant Health Australia

**Acknowledgments**

Greater detail on the topic of Grains Biosecurity can be found in the ‘Farm Biosecurity Manual for the Grains Industry’ published by Plant Health Australia. Copies are available from the Grains Industry Biosecurity Officer Jeff Russell Centre for Cropping Systems, DAFWA Northam, email jeff.russell@agric.wa.gov.au

**Project No.:** PHA 189
Control of insect and mite pests in grains — insecticide resistance and integrated pest management (IPM)

Paul Umina\(^1\), Svetlana Micic\(^2\) and Laura Fagan\(^3\)

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Key Messages

- Growers are likely to face significant challenges in the future due to insecticide resistance in redlegged earth mites (RLEM) and other crop pests.
- More strategic and integrated approaches to insect pest management are needed.
- Insecticide sprays are effective at controlling crop pests, but do not always provide yield benefits.

Background and Aims

Pest species within the grains industry pose a serious threat as farming practices change. To avoid costs associated with crop failure and increases in pesticide usage, potential pest species must be identified and their basic biology determined so effective control strategies can be devised. During the past decade, a large amount of research has been carried out on a number of important pests, such as blue oat mites (BOM) and the redlegged earth mite (RLEM). This has led to important breakthroughs in the way we now control these mites.

Underpinning an integrated pest management (IPM) approach is correct identification and monitoring of both pest and beneficial insects. Misidentification of pests can cost growers money through ineffective control strategies and pesticide applications. Monitoring of pest and beneficial numbers is also critical for making informed control decisions.

Earth mites and insecticide resistance

RLEM is a major invertebrate pest, particularly to establishing crops and pastures. Mite feeding significantly reduces seedling survival and development and will often lead to entire paddocks needing to be re-sown. For decades, RLEM have been controlled relatively effectively with broad-spectrum pesticides. However, during 2006 chemical resistance was discovered in RLEM populations in Western Australia. Extremely high levels of resistance to several synthetic pyrethroids (> 200,000 fold in the case of bifenthrin) were detected using laboratory bioassays, and this has translated to significant yield losses in the field (Umina, 2007).

This resistance has been shown to have a genetic basis, persisting among mite populations after several generations of culturing away from the paddock. This means it can be passed on to offspring and will persist in the field indefinitely. Further surveys of RLEM have found this resistance to be more widespread than first thought. We have carried out field surveys since 2007 in order to map the spread and distribution of insecticide resistance in WA and other States. Resistance was tested from 115 paddocks across 85 properties in WA between 2007–2010. Twenty-eight individual paddocks were found to contain mites with resistance to the synthetic pyrethroid bifenthrin. These paddocks are spread across 19 separate properties. Although resistance ratios were not determined in each case, the percentage survival at the discriminating doses examined indicates the level of resistance for each of these populations is very high. At this stage, resistance has not been detected outside of WA.

In total, resistance has now been demonstrated for five synthetic pyrethroids, all of which are currently registered to control RLEM in Australia. This means growers should not alternate between the different synthetic pyrethroids when faced with resistant RLEM. Careful consideration of chemical rotations between different chemical classes is critical. It is encouraging that resistance to organophosphate chemicals has not been detected, although there is evidence of genetic tolerance in some populations of RLEM.

Concerns surrounding other crop establishment pests and chemical use also exist. High levels of tolerance to several organophosphates and/or synthetic pyrethroids have been found in BOM, the lucerne flea and in two emerging mite pests, *Balaustium* and *Bryobia* mites (Arthur et al. 2008, Micic et al. 2008, Roberts et al. 2009). This shows that current pesticide usage is unlikely to be a sustainable practice and also helps explain the increasing number of reports of these species persisting in the field after multiple chemical applications. Smarter chemical use is critical and a more strategic and integrated approach to pest management is needed.
IPM Trials

IPM is an accepted approach to sustainably and cost-effectively manage invertebrate pests. IPM coordinates the use of pest biology, environmental information and available technology to prevent unacceptable levels of pest damage by the most economical means, while posing the least possible risk to people and the environment. Although growers have adopted IPM in the cotton industry and for several horticultural commodities, there has been relatively little uptake in broadacre farming systems throughout Australia, which tend to rely heavily on broad-spectrum insecticides for the control of insect pests (Horne et al. 2008).

A recently-funded Grains Research and Development Corporation (GRDC)-project Developing and Promoting Integrated Pest Management in Australian Grains aims to examine alternative approaches to insect pest management in grain crops across Australia.

During winter 2010, five on-farm trials were established to address the uptake of IPM in broadacre farming; two in WA, and one each in South Australia, Victoria and New South Wales. Canola was sown across all trial sites during 2010 and wheat will be assessed during 2011.

At each of the trial locations, a series of 12 plots (each > 50 m x 50 m in size) were assigned to one of three pest management approaches: (1) No insecticide input (control); (2) strategic (or IPM) approach: insecticides applied only when needed, following accurate monitoring of pest and beneficial invertebrates combined with assessments of plant damage. When insecticides needed the most selective or ‘soft’ chemical option is chosen; and (3) conventional: insecticides applied according to typical grower practice in this region.

Invertebrates were assessed using a combination of methods including vacuum sampling, pitfall traps, direct visual searches, sweep netting and extracting invertebrates from soil core samples. In addition, plant numbers, yields and harvest index, and the level of pest-feeding damage to plants were measured at various stages throughout the season.

A number of the invertebrate samples collected are still being sorted or analysed in each state (including WA), so the results discussed here must be considered preliminary only.

In the Victorian trial, the strategic treatment incorporated an insecticide seed dressing, while the conventional treatments received two separate foliar sprays; a bare-earth of bifenthrin, and a post-emergent application of omethoate. At seven, 14 and 28 days after crop emergence, there was a significant reduction in plant numbers in the control compared with the strategic plots (see Figure 1). There was no significant difference between the conventional and strategic plots. As a result of excellent spring rainfall, canola plants across all plots grew well throughout the latter part of the season, and numbers of typical ‘spring pests’ (for example, aphids, diamondback moth, native budworm) were quite low across the site.

Figure 1. Average numbers of canola plants per square metre in plots at the Victorian trial at 7, 14, 28 and 42 days after crop emergence.

Error bars indicate standard error of the mean. Different letters above bars indicate significantly different means at each sampling date (at the $P < 0.05$ level, Tukey’s-b post hoc test).
The control plots (0.43) had higher harvest index values \((P < 0.05; \text{LSD} = 0.03)\) compared with the other two treatments. This indicates the canola plants in the controls produced more seed per total plant biomass. It is likely that this is due to lower competition due to lower plant densities in the Controls compared with the other treatments as a result of early season pest feeding damage. As a result (and due to issues with rainfall at harvest), there were no significant differences in yield estimates across the three treatments, although the controls did yield the least.

At the Victorian site, the conventional treatment sprays cost $11/ha and the strategic treatment had a total cost of $1.35/ha, indicating conventional practice may not be the most economical approach for pest management. Preliminary results suggest similar findings at a number of the national trial sites. This indicates routine monitoring, accurate identification of pest and beneficial species and the strategic use of chemicals should be considered by growers and their advisors. During the 2011 trials, the cost of monitoring and time taken to identify invertebrates will be incorporated into our assessments. These components of IPM are likely to be an ongoing challenge in broadacre cropping, particularly for larger farms, and will need to be investigated thoroughly.

**Key Words**

Resistance, crop insects, Integrated Pest Management (IPM), redlegged earth mites (RLEM)

**Acknowledgements**

Grower Groups and growers involved in both the IPM trials and for allowing collections of RLEM in our resistance work. Stuart McColl and Samantha Strano for direct involvement and Darryl Hardie who is project leader on the IPM project.

**GRDC Projects:** UWA00134; UM00033; UM00043

**Paper reviewed by:** Sally Peltzer

**References**


Effect of cropping rotations on pest mites of broadacre agriculture

Svetlana Micic, Mark Seymour, Tony Dore and Pam Burgess
Department of Agriculture and Food, WA

Key Messages

• Canola is the crop most sensitive to mite damage in the seedling stage. Crop rotation can affect mite numbers and affect the risk of damage from mites.
• Pasture has the highest mite pest pressures but it is possible to use canola as a break crop after pasture if mites have been controlled in the pasture phase and insecticidal seed dressings are used.
• Crops planted after cereals will have decreased pest pressures from earth mites but may have higher pest densities of Balaustium mite. Balaustium preferentially feed on grasses and cereals, but plant death is rare and cereals outgrow damage. The mites survive into the following year and may pose a risk for canola or lupins.

Background and Aim

This trial examined the effect of cropping rotations especially break crops, on pests and beneficial invertebrates in broadacre cropping as a means to decrease reliance on chemical applications and also to look at the long-term impacts of cropping rotations on pests. Of the many pest species assessed, we chose pest mites to focus on in this paper.

There are many new challenges arising in broadacre cropping for the control of mite pests. Redlegged earth mites (Halotydeus destructor) have developed resistance to commonly-used synthetic pyrethroids and are proving difficult to control in field on bare ground before seedling emergence. By contrast, blue oat mites (Penthaleus spp.), which resemble redlegged earth mites and have the same distribution, are readily controlled by commonly-used synthetic pyrethroids with no evidence of resistance to date. Together these mites are referred to as earth mites. Balaustium mite (Balaustium medicagoense) also has the same distribution as the earth mites and are exposed to the same chemical controls. However, Balaustium mites are more tolerant of synthetic pyrethroids than blue oat mites or non-resistant redlegged earth mites. Thus control of Balaustium mite and earth mites can at times be difficult.

This project aimed to determine pest numbers under crop residues under different cropping rotations.

Method

A trial was carried out at Esperance Downs Research Station (385527.19mE 6281242.9mN zone: 51) in which rotations of canola, wheat, barley, lupins and pasture were assessed for pest populations and plant damage. The trial design was a strip plot design with four replicates. No insecticides were applied on the trial, except for a fipronil (Cosmos®) seed dressing applied to canola.

In year 1, within an existing pasture paddock, crops were seeded and pasture remained uncropped in strips 20 m x 100 m. Strips were harvested to allow all crop residue remained in each strip.

In year 2, the same combination of crops and pasture were seeded perpendicular to the year one plots. This formed a 5-by-5 crop matrix x crop residue giving 25 plots with different cropping sequences. Each second-year plot was 20 m x 20 m.

Populations of pest and beneficial invertebrates were monitored each year by suction sampling of 5 m of row x 6 rows, in the 10 m x 10 m centre of each plot at 14, 28 and 60 days post seeding.

Also each year, plant densities and damage by invertebrates was assessed at 14 and 28 days post seeding. This was done by counting plants in 1 m x 2 crop rows at five separate points within the 10 m x 10 m square centre of each plot. Also for each plant any invertebrate damage, such as chewing and/or sucking damage was separately scored only at the cotyledon stage for lupins and canola and on the first two leaves of cereal. The damage was scored using a scale of 0–5, with a score of 0 being nil damage, score of 3 being 50 % of leave area damaged and 5 being 100% of leaf area damaged.
Results and Discussion

Pastures sustain higher densities of pest mites

In Year 1, pastures had more Balaustium mite, blue oat mite and redlegged earth mites than other crops (see Figure 1). Of these pest mites, blue oat mites and redlegged earth mites are considered to be more damaging to crops than Balaustium mite and are collectively known as earth mites. Even though numbers of all mite pests were low over the entire trial area, significantly more Balaustium mite ($P >0.001$) and earth mites ($P = 0.009$) were found in pasture than in other crops.

![Figure 1. Average number of mites from all sample dates in different crops during year 1. Letters represent significantly different treatments.](image-url)

Seed dressings decrease pest mites

During the following year, even though the number of pest mites on crops was not significantly different, the same trend was observed of pastures sustaining higher numbers of mite pests (see Tables 1 and 2). We expected that crops seeded after pasture would have higher numbers of mites. In the case of canola after pasture, lower numbers of mites were found than expected and this was also observed for canola after lupins, barley and wheat. This is most likely due to the effects of the fipronil seed dressing applied to the canola seed, leading to mortality of mites and lower pest mite numbers after plant emergence.

Table 1. Average number of Balaustium mites per square metre (sum of all sample dates during year 2)

<table>
<thead>
<tr>
<th>Crop in Year 2</th>
<th>Crop in Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Barley</td>
</tr>
<tr>
<td>Barley</td>
<td>30</td>
</tr>
<tr>
<td>Canola</td>
<td>5</td>
</tr>
<tr>
<td>Lupins</td>
<td>14</td>
</tr>
<tr>
<td>Pasture</td>
<td>93</td>
</tr>
<tr>
<td>Wheat</td>
<td>50</td>
</tr>
</tbody>
</table>
Table 2. Average number of earth mites per square metre (sum of all sample dates during year 2)

<table>
<thead>
<tr>
<th>Crop in Year 2</th>
<th>Barley</th>
<th>Canola</th>
<th>Lupins</th>
<th>Pasture</th>
<th>Wheat</th>
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</thead>
<tbody>
<tr>
<td>Barley</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Canola</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Lupins</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Pasture</td>
<td>42</td>
<td>106</td>
<td>224</td>
<td>255</td>
<td>86</td>
</tr>
<tr>
<td>Wheat</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

Cereals affect mites differently
More Balaustium mites were found in cereals than were found in other crop types. This trend was observed during the first year (see Figure 1) and in the second year of the trial (see Table 1). However, lower numbers of earth mites were found in all crops seeded following wheat (Table 2).

Low numbers of mites do not cause economic damage
Seedling crops sustained little mite damage. Of all of the crops tested, lupins sustained the most damage during Year 2. This is surprising as canola is usually the most susceptible to invertebrate damage, however, a combination of low mite pressures and the effect of seed dressings in suppressing mite numbers is the likely cause. Damage was not recorded on pasture species.

Table 3. Average mite damage score on seedling crops during Year 2

<table>
<thead>
<tr>
<th>Crop in Year 2</th>
<th>Barley</th>
<th>Canola</th>
<th>Lupins</th>
<th>Pasture</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Canola</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Lupins</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Wheat</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

Discussion
Planting canola pasture is possible if mite numbers from the previous pasture crop are low and seed dressings are used. Canola planted after cereals will have decreased pest mite pressures from earth mites, but may have increased pressures from Balaustium mite populations. Cereals tend to outgrow mite damage, so high Balaustium mite numbers may only damage cereals that are stressed and not able to out grow damage.

Many of the weeds that occur in crop are considered to be part of the plant compositions of pastures. So if there is a good germination of weeds before crop germination then there is potential for high numbers of mites such as Balaustium mite and earth mites to occur and cause damage to emerging crops.

Key Words
Rotation, crop, Balaustium mite, earth mites

Acknowledgments
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Project No.: DAW00177
Paper reviewed by: Michael Grimm
Common bunt resistance in Western Australian wheat varieties

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Key Messages

- Most Western Australian wheat varieties do not have adequate resistance to common bunt of wheat.
- Of the 40 varieties tested Blade, Wyalkatchem, Tammarin Rock, EGA Eagle Rock and Fortune were moderately resistant (MR) while varieties Zippy, GBA Sapphire and Calingiri were moderately resistant to moderately susceptible (MR–MS).
- Of the remaining varieties, eight were moderately susceptible (MS), eight moderately susceptible to susceptible (MS–S) and 16 susceptible (S). These ratings are based on two years of data.
- Continued use of seed dressing fungicides for controlling common bunt is highly advisable.
- A one-year rotation is mandatory where common bunt has been diagnosed and resorting to a MR variety in the year after rotation should limit the disease adequately.

Background and Aims

Common bunt caused by *Tilletia laevis* and/or *Tilletia tritici* is a serious disease of wheat. Other hosts include triticale, barley, rye and several grasses. Despite advances in control measures the disease continues to be a threat to wheat producers, especially in areas where seed treatment is not practiced. In Western Australia common bunt outbreaks are reported infrequently in crops where seed treatment has not been applied, is not applied every year, or where it is applied inadequately. The disease causes losses by reducing yield and by imparting a foul, fishy odour to the grain. Grain with bunt is usually unfit for milling. Australia has stringent receival standards and a nil tolerance for common bunt in all grades of wheat.

Disease cycle

Common bunt is normally a seed-borne disease, although it can survive in the soil for at least a year during excessively dry summers. Wheat seed becomes contaminated with bunt spores when a diseased field is harvested. When the contaminated seed is planted the next season, the spores germinate and the fungus invades the coleoptile of the developing seedling before emergence. The fungus then grows asymptptomatically within plant, establishes itself within the developing kernels and displaces the tissues within the kernels with spores.

Symptoms

Infected plants are shorter than unaffected plants. Heads of diseased plants are generally darker green and have a more open appearance due to the expanding of the bunted kernels that causes a spreading of the glumes. Diseased kernels are filled with a soft, black, pasty mass of bunt spores. One of the most common signs of the disease is the fishy odour associated with the spores.

Gene-for-gene relationship

The two causal fungi commonly exhibit genetic recombination leading to a great deal of variability in virulence. Well-defined pathogenic races have been found among the bunt population, and the classic gene-for-gene relationship is present between the fungus and host. However, it is difficult to keep track of all the different pathogenic races because of their constantly changing dynamics. This fact also makes breeding for resistance very challenging. Studies carried out by Andrews and Ballinger (1987) have indicated that without chemical seed treatments, susceptible cultivars may have unacceptable levels of bunt one year after seeding and the disease may reach epidemic proportions during the second year. Moderately-resistant (MR) cultivars can have unacceptable levels of bunt by the second year.

Several resistance genes have been identified worldwide but little is known about the incidence of resistance genes in Australian wheat varieties.

The present study was initiated to establish the resistance spectrum of current WA wheat varieties and their potential to limit the occurrence of the disease.
Method

Experimental design

Forty wheat varieties, including resistant control Fortune, and susceptible controls H46 and Magenta were assayed during 2009 and 2010. The experiment was planted as a randomised block design with four replicates. Each replicate plot comprised of 25 plants planted as single seeds in plastic tubes (5 cm × 5 cm wide; 12 cm high) containing a standard potting mix. Four plots (= 100 tubes) were placed in a wire crate so there were a total of 10 crates per block.

Inoculation and disease assessment

Before seeding, bunt inoculum was prepared by macerating bunt infected seed in a blender for one minute. Spores were then separated from seed debris by screening through 710 μm and 355 μm sieves, retaining the sieved fraction. Seed of each line was shaken with the sieved spores at 0.01 g/g seed. Inoculated seed was sown at a depth of 3 cm in the plastic tubes, placed in an appropriate crate and incubated at 15ºC in a growth room for seven days. The crates were then transferred to the field at Medina Research Station ensuring the base of the plastic tubes was embedded in the soil. The tubes were retained in the crates all season. Disease incidence (% plants and % tillers with bunt infection) was assessed at maturity.

Results

![Graph showing disease incidence in wheat varieties](image)

Figure 1. Percentage disease incidence in wheat varieties inoculated with common bunt spores at seeding during 2009. MR = moderately resistant, MR–MS = moderately resistant to moderately susceptible, MS = moderately susceptible, MS–S = moderately susceptible to susceptible, S = susceptible.

Percentage disease incidence followed a similar trend both during 2009 and 2010. However, disease was better established during 2009 and results of that year are presented. Varieties Blade, Wyalkatchem, Tammarin Rock, EGA Eagle Rock and Fortune were moderately resistant (MR) while varieties Zippy, GBA Sapphire and Calingiri were moderately resistant to moderately susceptible (MR–MS). Of the remaining varieties, eight were moderately susceptible (MS), eight moderately susceptible to susceptible (MS–S) and 16 susceptible (S).
Discussion

Most WA varieties do not have adequate resistance to common bunt of wheat. Continued use of seed dressing fungicides for controlling common bunt is highly advisable. A one-year rotation is mandatory where common bunt has been diagnosed and resorting to a MR variety in the year after rotation should limit the disease adequately.

Key Words
Resistence, common bunt, *Tilletia laevis*, *Tilletia tritici*, wheat varieties

Acknowledgments

Thanks to Max Donelan and Brooke Anderton for assisting with planting and field assessments.

Paper reviewed by: Geoff Thomas

Reference