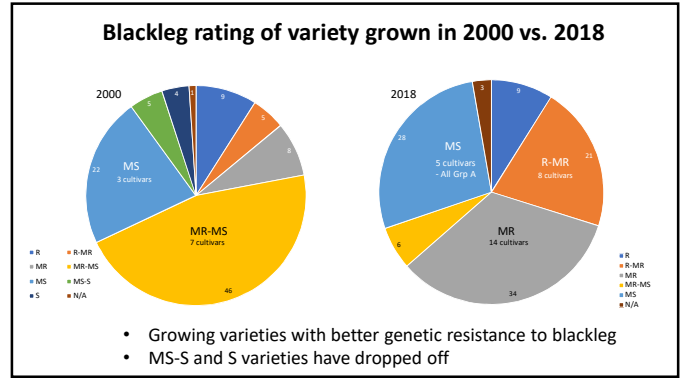
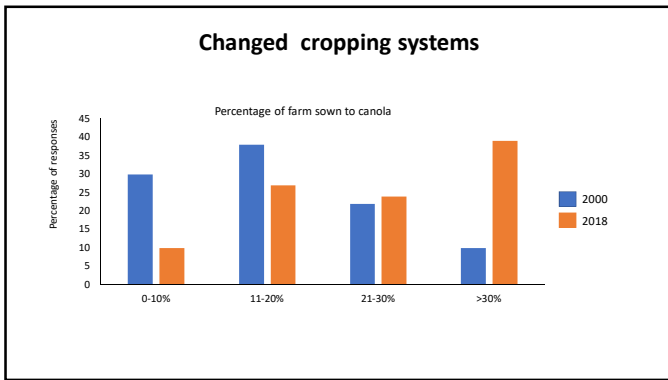


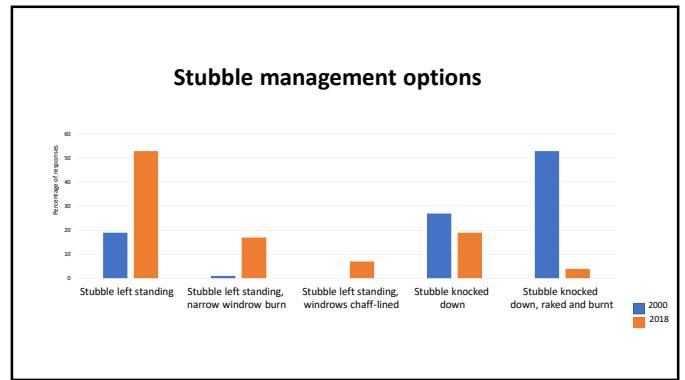
1



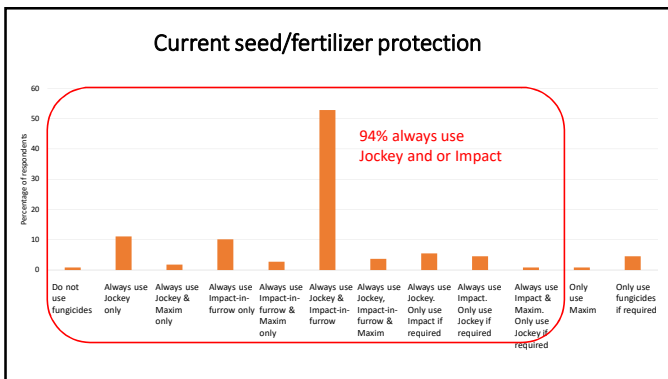
2



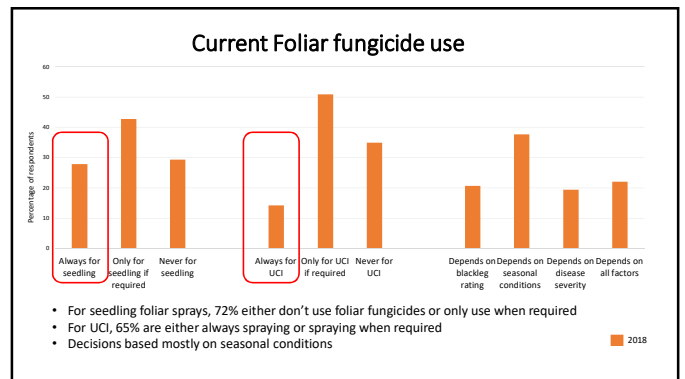
3



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## Current - Recommendations seedling -

**Jockey and/or flutriafol + foliar at 4-6 to 10 leaf growth stage for high disease situations.**

*23 experiments (2013 to 2016) - different blackleg ratings x different environments (regions/years). 95 interactions tested.*

- Jockey compared to Jockey + Prosaro
  - o Sites that had significantly reduced crown canker with fungicide application
    - o Blackleg rating significantly reduced canker in 23/23 sites
    - o Fungicide significant reduced canker in 22/23 sites
  - o Sites that had significant increased yield with fungicide application
    - o Fungicide application significantly increased yield in 5/23 sites (high rainfall, lower blackleg rating).
- Fungicide use communicated via BlacklegCM



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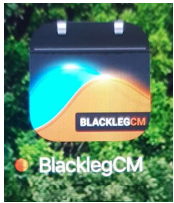
## New fungicide use 2018 data

| Site       | 4-6 leaf | 30% bloom | Pod control | Treatment | Leaf lesions (#) | Infected flowers (%) | Pod infection (%) | Crown canker (%) | Seed weight (g) | % yield increase | p-value |
|------------|----------|-----------|-------------|-----------|------------------|----------------------|-------------------|------------------|-----------------|------------------|---------|
| Lake Bolac | No       | No        | No          | Bare      | 0.7              | 6.2                  | 1.5               | 40               | 89              |                  |         |
|            | Yes      | Yes       | Yes         | Fungicide | 0.0              | 0.8                  | 0.2               | 3                | 108             | 122              | 0.017   |
| Cavendish  | No       | No        | No          | Bare      | 19.3             | 9.0                  | 6.3               | 45               | 114             |                  |         |
|            | Yes      | Yes       | Yes         | Fungicide | 23.7             | 4.5                  | 0.2               | 6                | 132             | 116              | 0.026   |
| Kaniva     | No       | No        | No          | Bare      | 10.7             | 5.0                  | 22.2              | 17               | 102             |                  |         |
|            | Yes      | Yes       | Yes         | Fungicide | 14.3             | 2.5                  | 0.7               | 3                | 137             | 134              | 0.031   |
| Bordertown | No       | No        | No          | Bare      | 3.3              | 8.8                  | 23.7              | 15               | 106             |                  |         |
|            | Yes      | Yes       | Yes         | Fungicide | 3.7              | 4.7                  | 0.3               | 8                | 148             | 140              | 0.027   |

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## New BlacklegCM UCI app being developed

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## Future Seed Treatments -????

- Seed companies will use SDHI
  - No seed safety issues.
  - No seed longevity issues.
  - Better efficacy compared to Jockey.
  - Will increase the probability of good crop establishment (what seed companies get judged on).
  - Therefore expect a complete switch from DMI to SDHI seed treatments?????
- 90% of seed SDHI treated??
- 75% of DMI fertiliser treated??

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## Future foliar fungicide use for crown canker


- Options
  - Prosaro (DMI) off patent = cheaper.
  - Miravis (SDHI)
  - Aviator (SDHI + DMI)
  - Veritas (QoI + DMI)
- Used at 4-6 leaf or 8-10 leaf / 20-50% bloom.
- More likely to be used depending on seasonal conditions eg 2016.
- Likely aim for blackleg UCI and sclero control.
- BlacklegCM upgraded for seedling and UCI.
- Pods?? Still unprotected (can be large yield loss).

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## Fungicide resistance mangt in 2019

- What advice do we provide to industry?

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## Fungicide resistance management

**Crop(s):** Wheat

**Pest(s):** Septoria, Yellow spot, Powdery mildew

**Resistance Management Strategy for:** Group 3 (DMI); Group 7 (SDHI); Group 11 + 3 (Quinone outside Inhibitor + DMI) – Treat as a Group 11; and Group 11 + 4 (Quinone outside Inhibitor + PAA) – Treat as a Group 11

1. Fungicides should be used as protectant treatments – where no more than 5% leaf area infection evident anywhere in the canopy. In high risk disease environments, integrated management approaches should be used to reduce fungicide resistance risk including the removal of stubble, control of green bridge volunteers and the use of tolerant and resistant varieties.
2. DO NOT apply more than two applications per growing season of Group 11 or 7 containing products. This includes in-furrow or seed treatments that have activity on foliar diseases. Combinations of in-furrow and seed treatment are counted as one application.
3. DO NOT apply consecutive applications of Group 11 containing products. This includes in-furrow i.e. If a Group 11 + 4 fungicide has been used in-furrow at planting, the first foliar fungicide spray must not contain a Group 11 fungicide
4. If a solo Group 7 seed treatment has been used with foliar activity (as determined by label claims), the first foliar fungicide applied should not contain a Group 7 fungicide.
5. If a solo Group 7 fungicide is being applied as a foliar spray it must be mixed with an effective, registered mixing partner.
6. DO NOT apply more than three applications containing Group 3 fungicides per growing season. This total of three applications includes DMI's applied as Group 11 + 3 co-formulations and in-furrow or seed treatments that have activity on foliar diseases. Combinations of in-furrow and seed treatment are counted as one application.
7. Minimise use of Group 3 fungicides which are known to have compromised resistance status.

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## Cereal fungicide resistance management (Grant Hollaway)

- Cases of fungicide resistance have been identified in some Victorian cereal pathogens. To minimise the development of resistance to fungicides it is important to:
  - use integrated disease control, that combines variety (avoid susceptible varieties) and paddock selection (avoid infected stubble) with green bridge control;
  - not apply the same fungicide active to a crop more than once per season;
  - use fungicide mixtures where possible;
  - avoid unnecessary fungicide use; and
  - follow label directions for use and adhere to MRLs.

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## Fungicide application scenarios

**2 applications of a chemistry in a season**

| Seed     | Saltro or Ileva (SDHI)   | Flutriafol (DMI)   | SDHI-Flutriafol (DMI)  | SDHI-Flutriafol (DMI)                                    | Saltro or Ileva (SDHI)                                   |
|----------|--|--|--|--|--|
| Seedling | Prosaro (DMI)<br>Aviator (DMI+SDHI)<br>Miravis (SDHI)<br>Veritas (DMI+Qol) | Prosaro (DMI)<br>Aviator (DMI+SDHI)<br>Miravis (SDHI)<br>Veritas (DMI+Qol) | Prosaro (DMI)<br>Aviator (DMI+SDHI)<br>Miravis (SDHI)<br>Veritas (DMI+Qol) | No seedling application                                  | No seedling application                                  |
| UCI      | Prosaro (DMI)<br>Veritas (DMI+Qol)   | No options   | No options   | Prosaro (DMI)<br>Aviator (DMI+SDHI)<br>Veritas (DMI+Qol) | Prosaro (DMI)<br>Aviator (DMI+SDHI)<br>Veritas (DMI+Qol) |

**1 applications of a chemistry in a season**

| Seed     | Saltro or Ileva (SDHI)             | Flutriafol (DMI) | SDHI-Flutriafol | Saltro or Ileva (SDHI)             | Flutriafol (DMI)        |
|----------|------------------------------------|------------------|-----------------|------------------------------------|-------------------------|
| Seedling | Prosaro (DMI)<br>Veritas (DMI+Qol) | Miravis (SDHI)   | No options      | No seedling application            | No seedling application |
| UCI      | no options                         | No options       | No options      | Prosaro (DMI)<br>Veritas (DMI+Qol) | No options              |

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## Fungicide resistance management, cont.

- Use good genetic resistance
- Use recommended cultural practices
- SDHI seed treatments.
  - Is there still need for Impact-in furrow (DMI)??
  - Reduced need for seedling foliar fungicide??
- Only using fungicides where warranted. They are not needed in most situations.
- Avoid repeated active of same fungicide group???
- Keep fungicides for severe events (2016) and UCI (no genetic resistance).

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## Future work?

- Need to monitor populations for tolerance to fungicide and cross tolerances. Monitor different fungicide use patterns. Does farming system contribute to resistance??
- Need to test fungicides use patterns in the lab. Generate stubbles and monitor subsequent tolerance frequencies of blackleg populations.
- Test yield losses due to fungicide resistance.
- Test all the scenarios listed in previous slide.

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## Discussion

- Need consistent messaging from all industry.
- Do we need a stewardship plan??
- Do we use the cereal CropLife/Holaway recommends as a start??
- We can improve advice as we get more data over the next few years. Work with new GRDC tenderer.
- Registration for UCI control??
- Industry need advice for 2019 season.