UPPER CANOPY BLACKLEG FUNGICIDE APPLICATION

STEVE MARCROFT

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

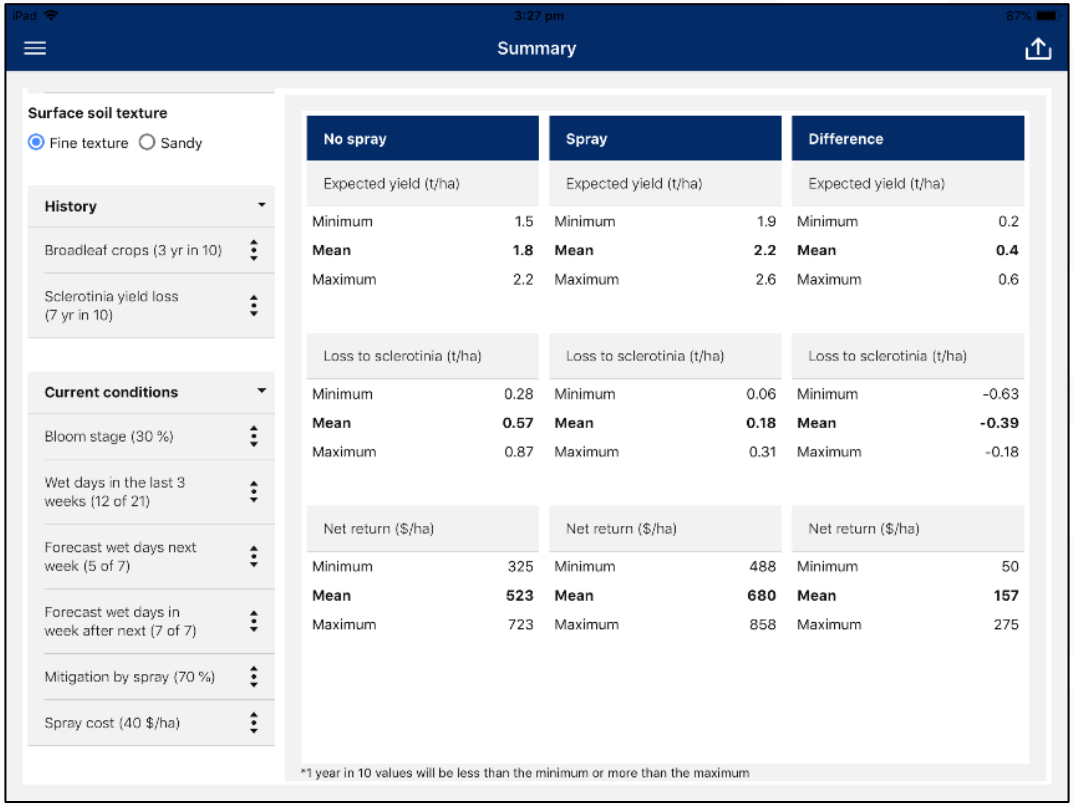
FUNGICIDE DECISION MAKING

- Large growth in 30% bloom fungicide application.
- Agronomists are generally uncertain on how to decide to apply fungicide.
- Yield responses vary – zero to 20% return.
    - Some agronomists will apply every year.
    - Some agronomists will never apply
    - Most will apply if blackleg is observed

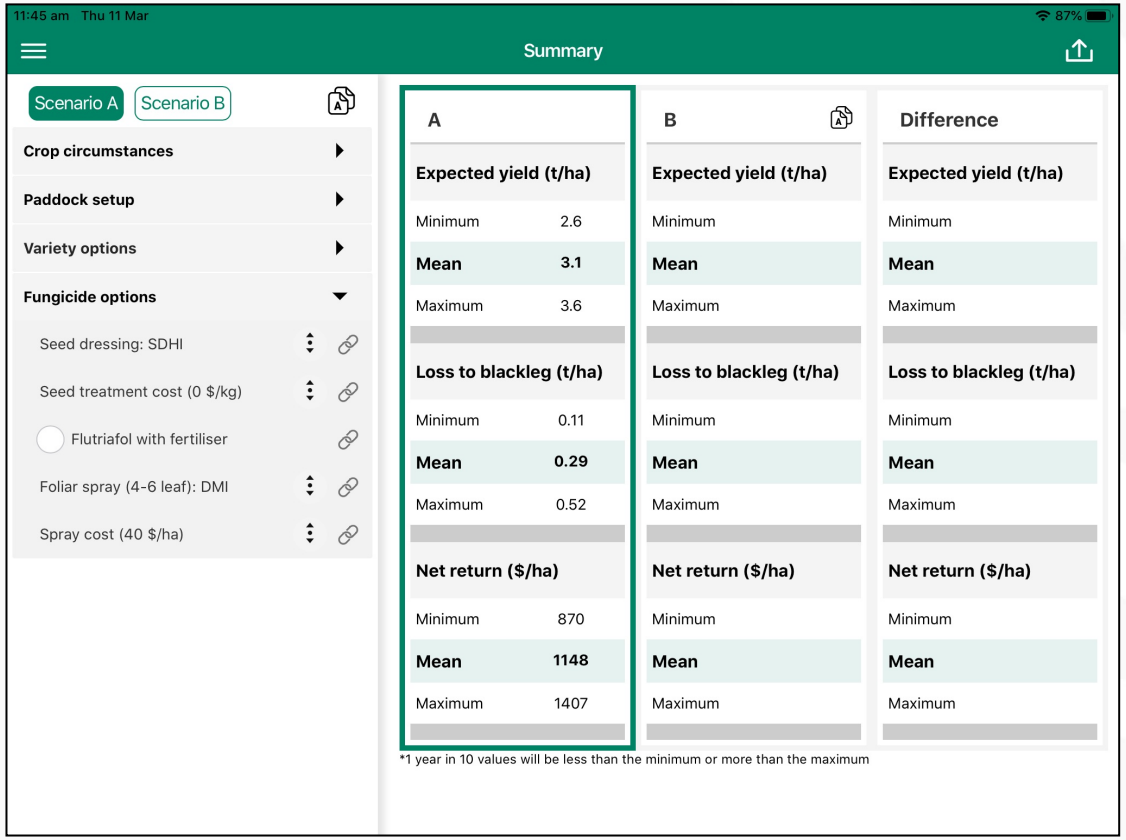
All agronomists are scared of ether costing their client money from lost yield or increased expense.

How can the canola industry help?

SclerotiniaCM



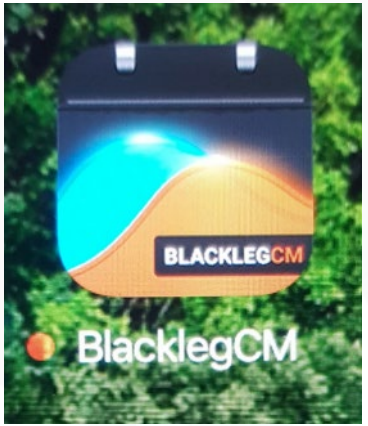
BlacklegCM


11:45 am Thu 11 Mar
87%
Summary
Scenario A
Scenario B
Crop circumstances
Paddock setup
Variety options
Fungicide options
Seed dressing: SDHI
Seed treatment cost (0 $/kg)
Flutriafol with fertiliser
Foliar spray (4-6 leaf): DMI
Spray cost (40 $/ha)
A
B
Difference
Expected yield (t/ha)
Minimum 2.6
Mean 3.1
Maximum 3.6
Loss to blackleg (t/ha)
Minimum 0.11
Mean 0.29
Maximum 0.52
Net return ($/ha)
Minimum 870
Mean 1148
Maximum 1407
*1 year in 10 values will be less than the minimum or more than the maximum

BLACKLEG CM APP

Seed treatments and 8-10 leaf fungicide prediction was accurate.

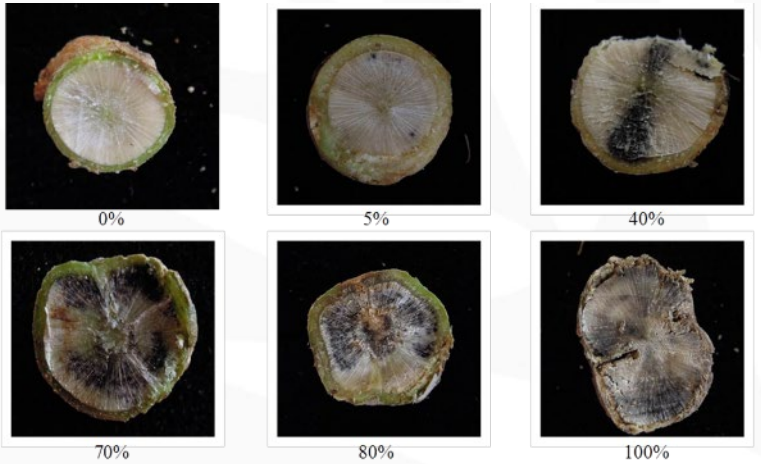
NSW	Full control yield	UT		SDHI ST		SDHI ST + 8-10L	
		Actual	Predicted	Actual	Predicted	Actual	Predicted
Cootamundra	2.82	2.38	2.10	2.61	2.50	2.45	2.80
Lockhart	2.78	2.50	2.20	2.35	2.50	2.74	2.60
Wagga Wagga	2.27	1.49	1.70	1.94	2.00	2.10	2.10
SA							
Cummins Landmark	3.09	2.56	2.20	2.87	2.70	2.79	2.80
Vic							
Hamilton	3.34	2.65	2.40	3.08	3.00	3.48	3.20
Horsham	3.47	2.91	2.70	3.16	3.10	3.36	3.20
Kaniva	2.81	2.47	2.20	2.70	2.50	2.98	2.60
Lake Bolac	3.19	2.09	2.30	2.45	2.80	2.63	2.90
WA							
Gibson	3.38	2.68	2.30	2.92	2.90	2.99	3.10
Kojonup	3.43	3.18	2.70	3.61	3.10	3.69	3.20
Williams	3.49	3.18	2.70	3.54	3.10	3.43	3.20
Grand Total	**3.10**	**2.55**	**2.32**	**2.84**	**2.75**	**2.97**	**2.88**



CROWN CANKER SEVERITY FUNGICIDE RESPONSE IS PREDICTABLE

2020 11 sites, ATR Mako MR rating, Group A
Crown canker severity

11 sites	UT	Seed trt	Seed trt + 8-10 leaf
NSW			
Cootamundra	3.5	0.3	0.2
Lockhart	10.8	2.7	0.2
Wagga Wagga	12.7	3.3	0.3
SA			
Cummins	2.3	2.5	0.0
Vic			
Hamilton	13.7	7.2	6.2
Horsham	12.6	4.2	0.2
Kaniva	11.4	2.4	0.0
Lake Bolac	8.7	3.0	0.1
WA			
WA	13.2	12.1	2.7
Gibson	4.3	2.4	1.3
Kojonup	7.2	5.3	0.2
Williams	28.2	28.3	6.5
	10.7	**6.1**	**1.5**



UCI SEVERITY
FUNGICIDE RESPONSE IS PREDICTABLE

Upper canopy blackleg pith incidence. ATR Mako -MR Group A

Sites	UT	Seed Trt + 30% bloom	Full control
NSW			
Cootamundra	16.0	4.7	1.3
Lockhart	6.0	6.3	7.7
Wagga Wagga	34.7	12.0	9.3
SA			
Cummins	22.3	14.0	3.0
Vic			
Hamilton	15.5	5.7	0.7
Horsham	8.3	2.7	0.0
Kaniva	8.3	3.3	2.0
Lake Bolac	17.0	3.3	3.0
WA			
Gibson	6.0	1.3	1.0
Kojonup	1.3	1.0	0.0
Williams	12.0	3.0	1.7
Grand Total	**13.3**	**5.2**	**2.7**

Fungicides nearly always reduce blackleg severity but don't always result in a yield increase.

Site	ATR-Mako SDHI + 8-10L	ATR-Mako SDHI 30% bloom
Cootamundra	94	106
Cummins Landmark	97	100
Gibson	102	115
Hamilton	113	111
Horsham	106	102
Kaniva	111	108
Kojonup	102	97
Lake Bolac	107	113
Lockhart	116	114
Wagga Wagga	108	96
Williams	97	90
	105	**105**

ATR-Mako.
Green = 5% increase above seed treatment.

THERE ARE NO UPPER CANOPY MANAGEMENT GUIDES

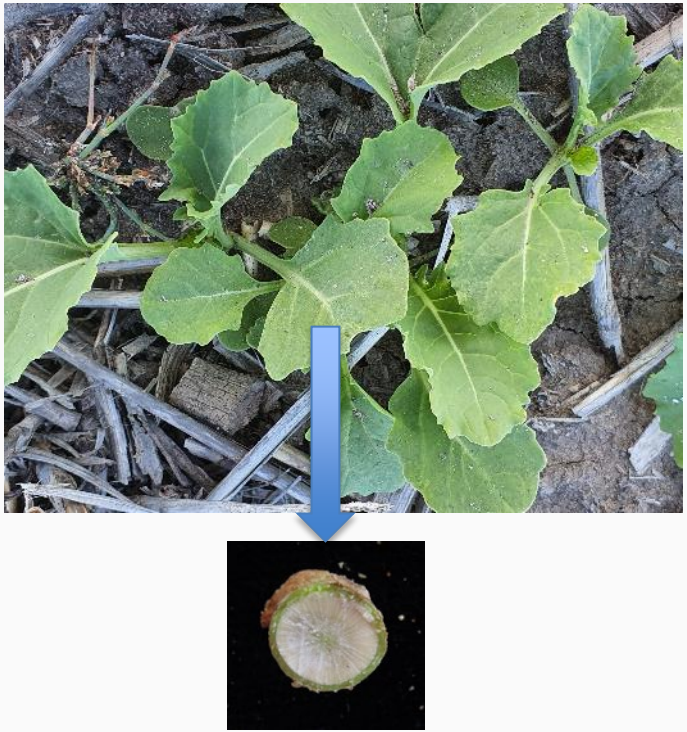
- We are working with DPIRD to build a UCI-CM App
- But we are still on a large learning curve.

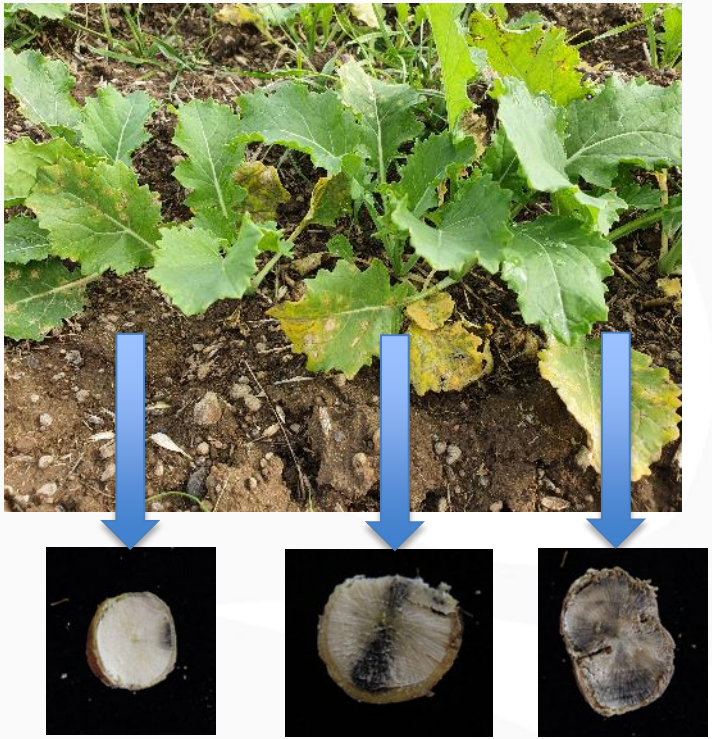
OTHER DISEASES ARE CONTROLLED BY BLACKLEG FUNGICIDES

PHYSICAL DAMAGE

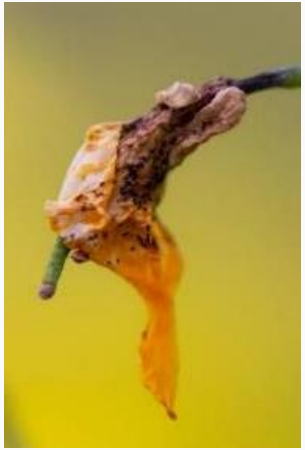
Damage allows an entry point for blackleg

SCOUTING CROWN CANKER – BLACKLEG RATING





SCOUTING FOR UCI




TARGET DATE OF FIRST FLOWER

Example; Early flowering crop gets the fungicide yield response.

EFFECT OF TIME BETWEEN INFECTION AND HARVEST DATE. THERMAL DEGREE DAYS

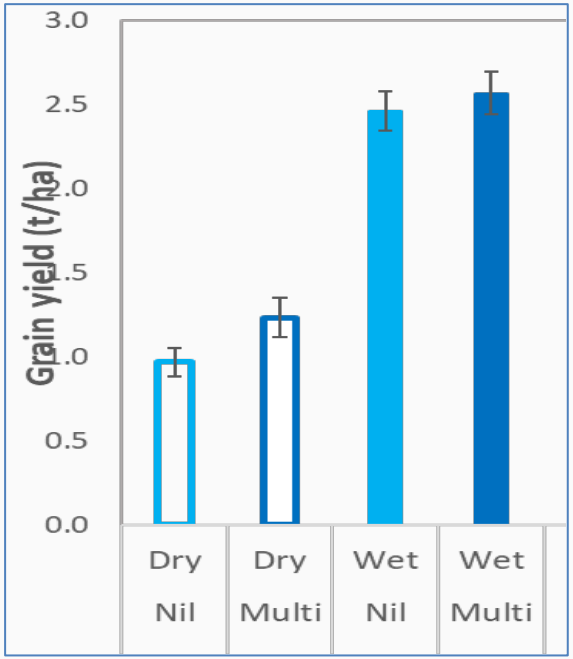
Short period between 1st flower and harvest

Medium period between 1st flower and harvest

Long period between 1st flower and harvest

Example; Long maturity crop gets a fungicide yield response.

SPRING - BLACKLEG EFFECT ON YIELD



Example; two identical crop have same level of disease.

Crop 1 – cool moist spring no yield loss.
Crop 2- hot dry spring yield loss.

Crop 1 gets fungicide response, crop 2 no fungicide response.

S. Sprague CSIRO

UCI GENETIC RESISTANCE

Resistance group	Blackleg rating	Isolate 1 lesion(mm)	Isolate 2 lesion(mm)	Isolate 3 lesion(mm)	Average (mm)
Group A	MR	35.6	21.0	39.4	32.0
Group A	MS	54.5	76.5	69.4	66.8
Group B	R	28.3	14.2	11.2	17.9
Group B	MS-S	29.2	184.7	60.8	91.6
Group C	MR	72.0	47.5	87.9	69.1
Group C	MS	4.1	119.4	88.8	70.7

Example;
Group A MR – no fungicide yield response.

Group A MS – fungicide yield response.

UPPER CANOPY FUNGICIDE YIELD RESPONSE DEPENDS ON:

Canola intensity in region, environment, distance to stubble, stubble management, seasonal conditions.

UCI specific issues

- Cultivar - Major Gene Resistance (regional response).
- Cultivar - Quantitative Resistance ????? (regional response?).
- Date of 1st flower (regionally specific).
- Time between infection to harvest (Thermal degree days).
- Seasonal rainfall and temperature, timing of rainfall.
- Other unknown unknowns.
- Interactions between all of the above.

What do agronomists need?

- UCI Blackleg App / management guide.
- Cultivar (rating + resistance group) by region knowledge dump.
- Cultivar UCI blackleg rating?????
- Cultivar UCI blackleg rating by fungicide yield response knowledge.
- Thermal degree days knowledge – regionally specific.
- Regionally based seasonal updates at 30% bloom.
- Routine method for scouting / monitoring yield loss.

App prototype drivers
Factors for UCI model
1. Cultivar – risk categories
2. Leaf lesions present – yes / no
3. Leaf lesions severity at stem elongation – risk categories
4. Region – drop down menu
5. Date of flower commencement – date by regions – 3 risk categories
6. Flower infection – 3 categories
7. Hail damage, split stems
8. Target harvest date
9. Spray timing 20%, 30%, 50%

SCOUTING

-CHECK FOR DARKENED BRANCHES / BLACK PITH

Grains Research and Development Corporation (GRDC)
A Level 4, East Building, 4 National Circuit, Barton, ACT 2600
Australia
P PO Box 5367 Kingston, ACT 2604 Australia
T +61 2 6166 4500
F +61 2 6166 4599
www.grdc.com.au
@thegrdc