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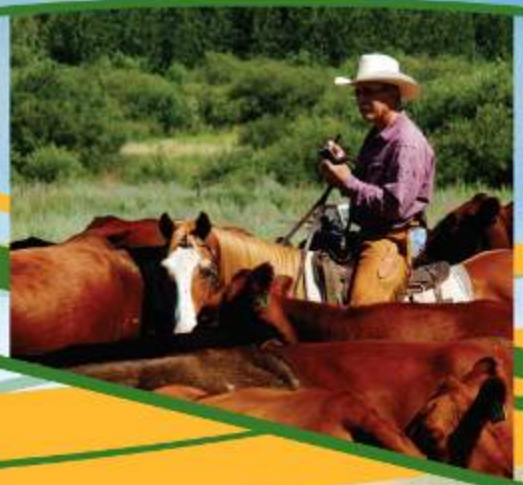
Fungicide Applications



Considerations for Economic Thresholds

Brent Flaten

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Thanks to:

- Randy Kutcher, U of S

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Benefit to using fungicide depends on:

- the cost of product and application, and
- the increased revenue as a result of the expected yield and or quality increase

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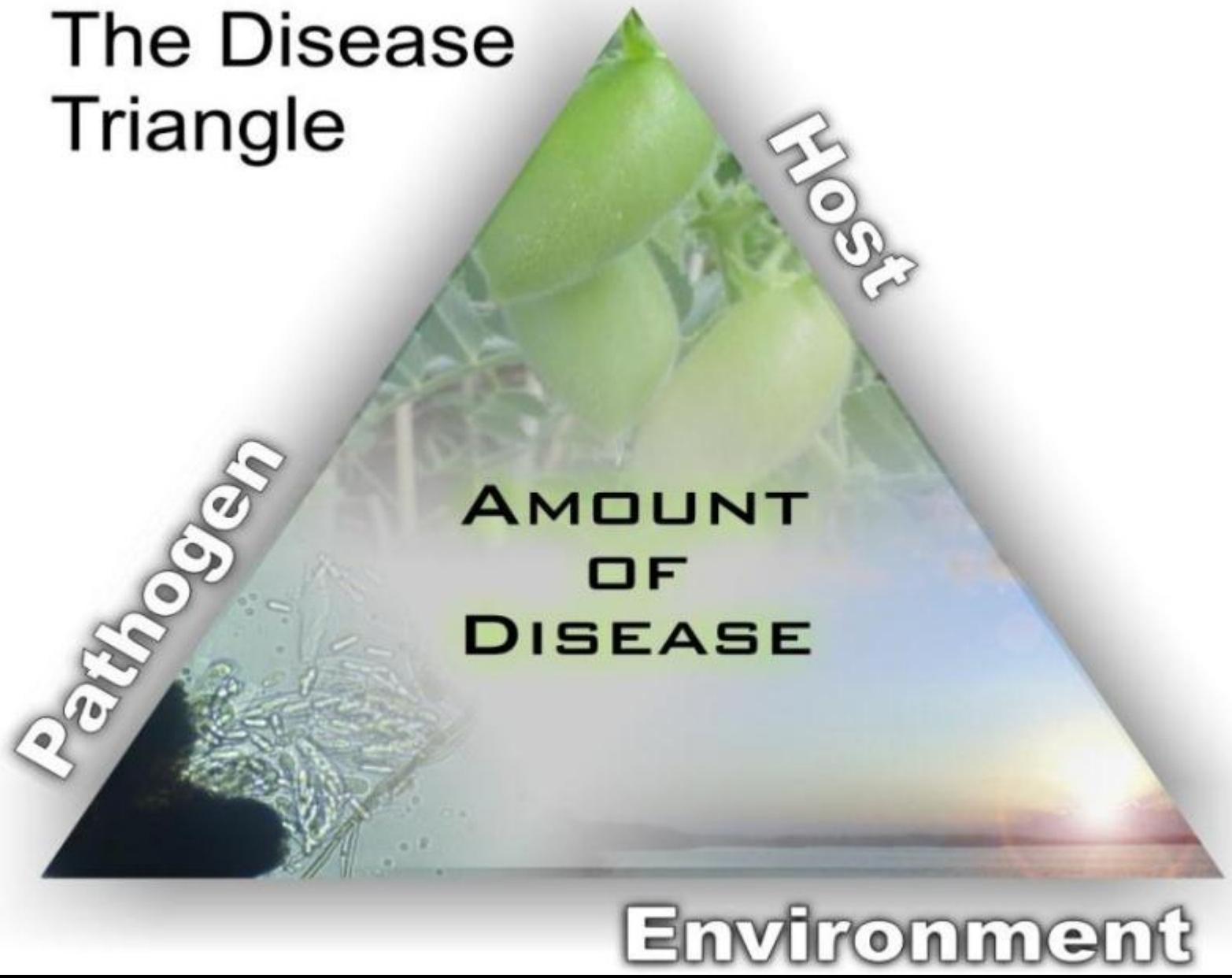
Benefit depends on the risk (of disease):

- environment,
- management practices:
  - variety choice,
  - seeding date,
  - time of fungicide application,
  - rotation,
  - seeding rate,
  - row spacing,
  - fertility…..

The Disease Triangle

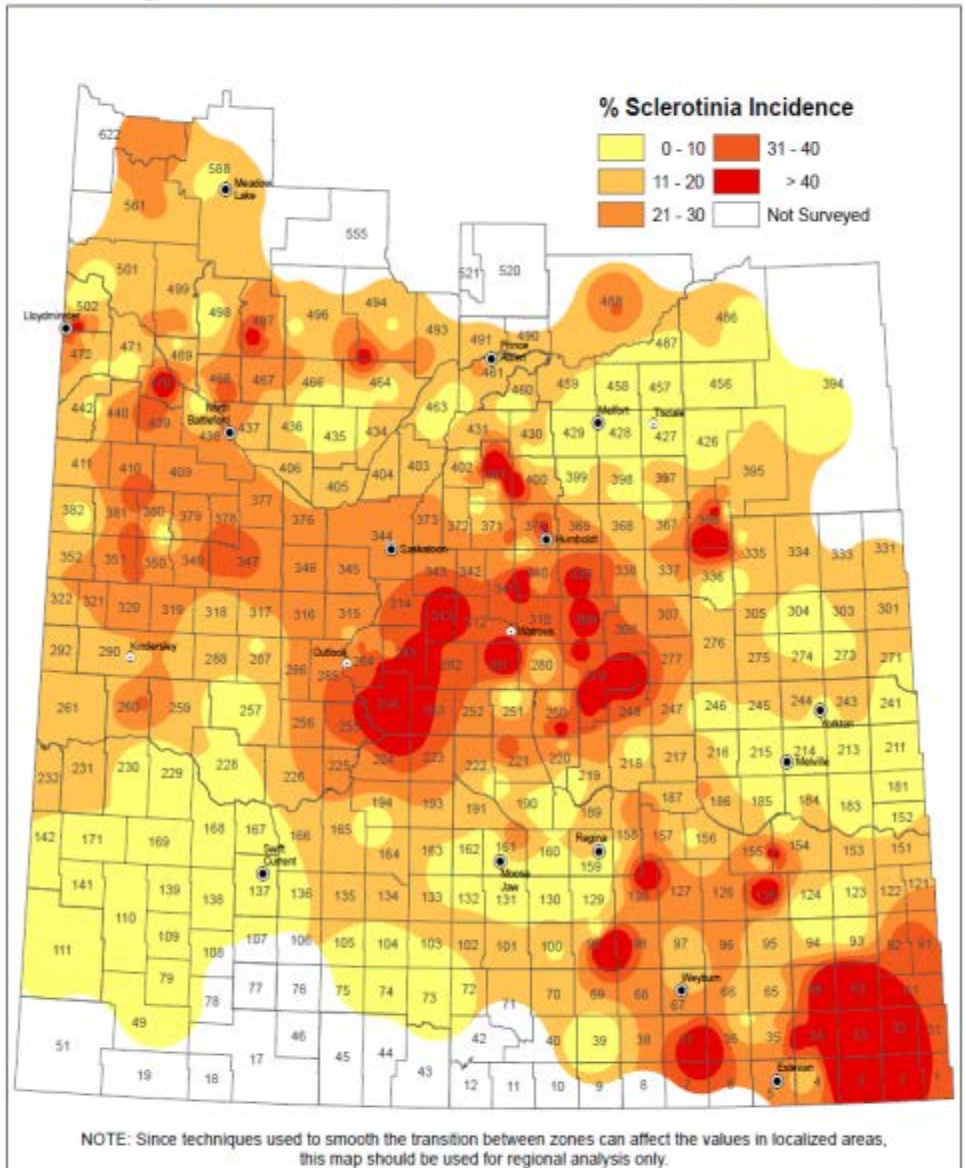


Sclerotinia

Sclerotinia (White mould): Lentils

And most broadleaf crops and weeds

Average Percent Sclerotinia Incidence in Canola - 2012



NOTE: Since techniques used to smooth the transition between zones can affect the values in localized areas, this map should be used for regional analysis only.

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0 25 50 100 150 200

Kilometers

Projection: UTM Zone 13 Datum: NAD83

Data Source:
Canola Survey Data - Crops Branch
Collaboration with: Agriculture and Agri-Food Canada
IDW interpolation (power 2.5, fixed radius 300 km)
Prepared by: Geomatics Services Date: November 20, 2012

Spraying for Sclerotinia – early bloom Canola

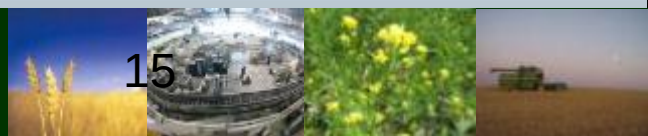
	Possible Answers	Risk Points	Example
Number of years since last host crop	> 6 yrs	0	
	3 – 6 yrs	5	
	1 – 2 yrs	10	10
Disease incidence in last host crop	None	0	
	Low (1-10%)	5	
	Moderate (11-30%)	10	10
	High (31-100%)	15	
Crop Density	Low	0	
	Normal	5	5
	High	10	Total = 25

Spraying for Sclerotinia - Canola

	Possible Answers	Risk Points	Example
Rain in last 2 weeks	<10mm (0.4")	0	
	10-30 mm (0.4-1.2")	5	5
	>30mm (1.2")	10	
Weather forecast	High pressure	0	
	Variable	10	10
	Low pressure	15	
Apothecial Development	None found	0	
	Low numbers	10	10
	High numbers	15	

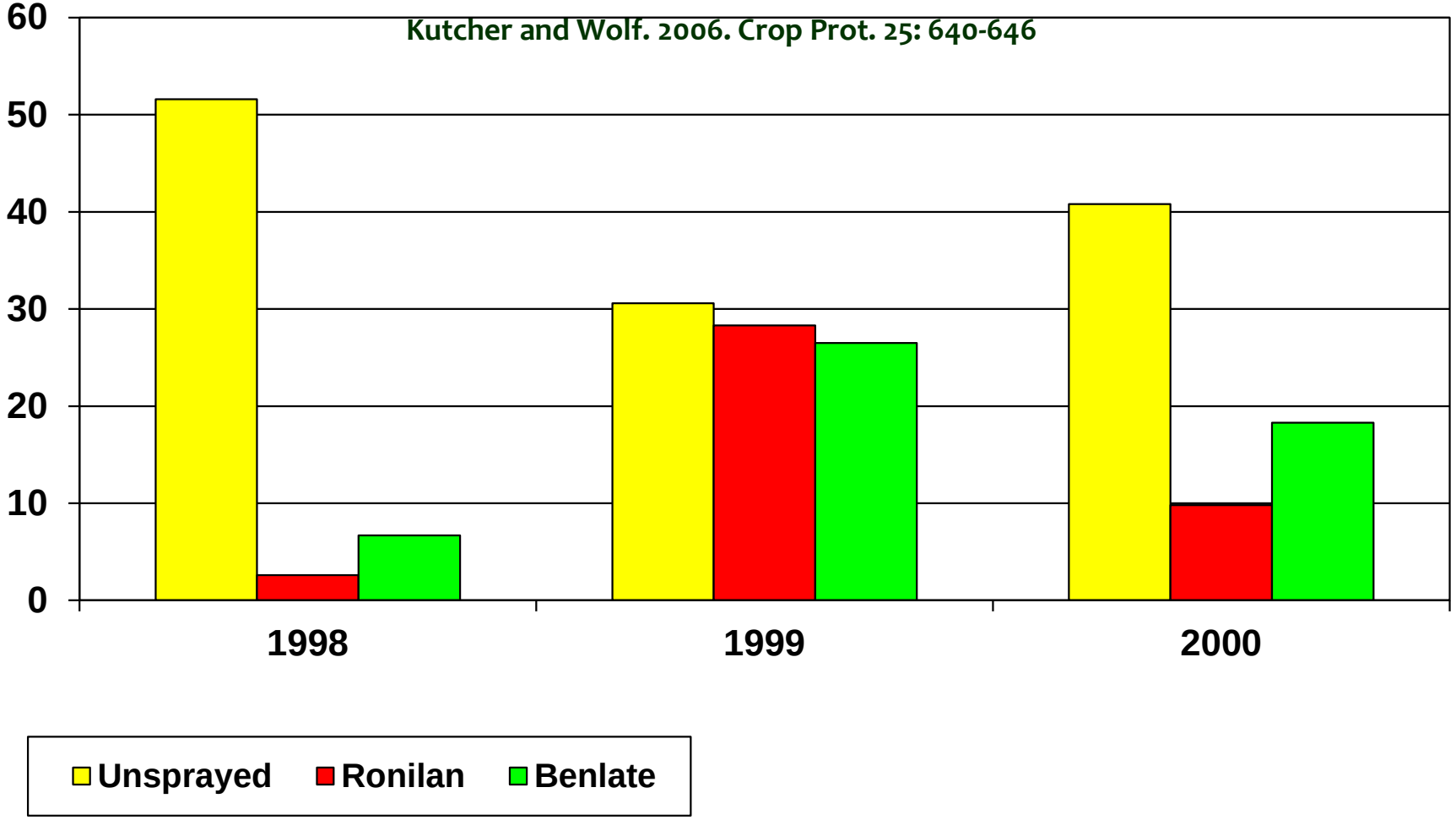
> 40 good chance fungicide a good option

Total = 25+25=50



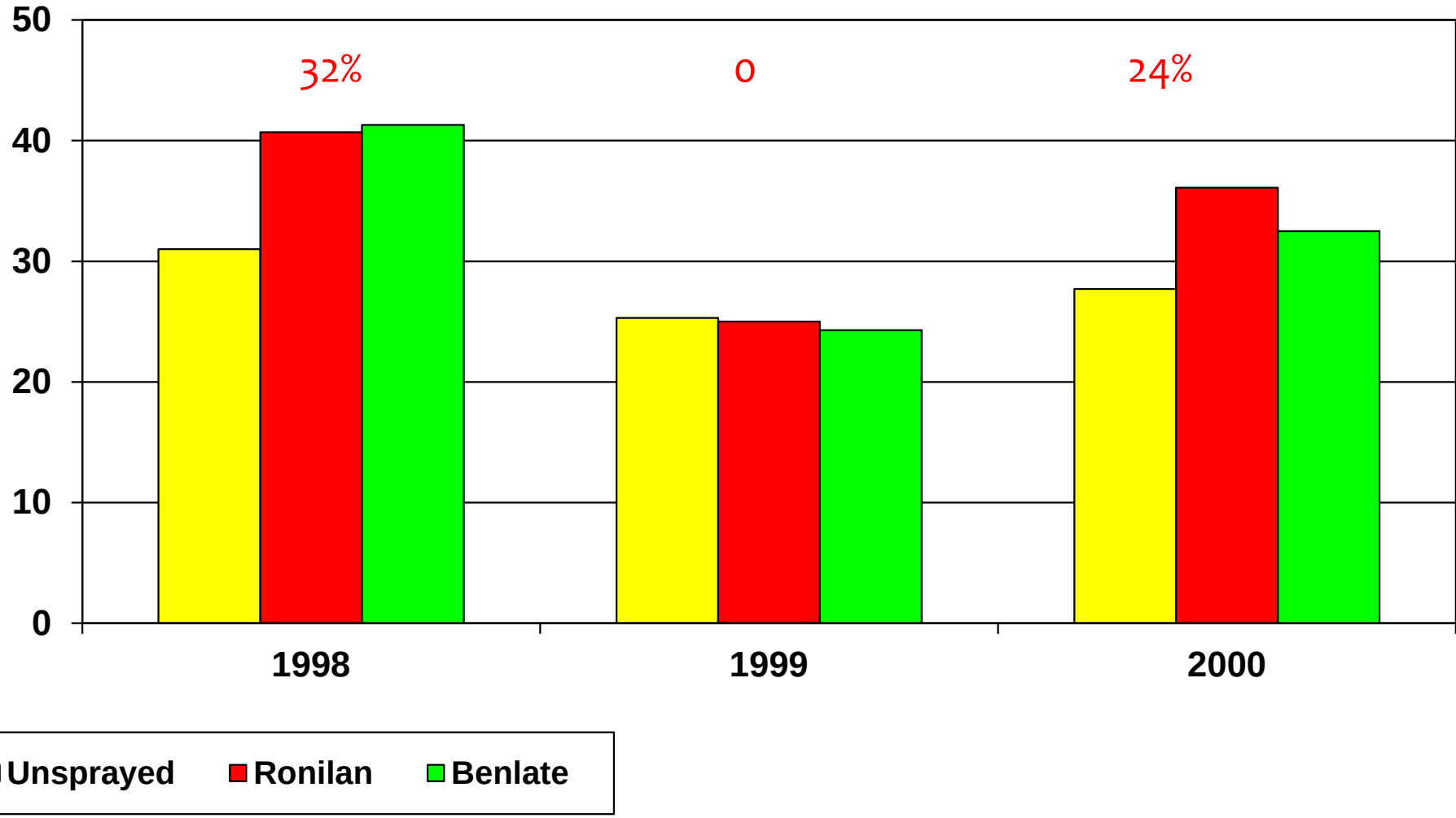
ENVIRONMENTAL EFFECTS

Stem Rot Incidence (%) on canola at AAFC, Melfort



ENVIRONMENTAL EFFECT

Yield (bu/ac) of canola at Melfort



Old fashion assessment /Contans

Canola Disease Survey: Blackleg

- Blackleg basal canker was present in 32% of SK canola crops, with a mean incidence across all crops of 3.7%.

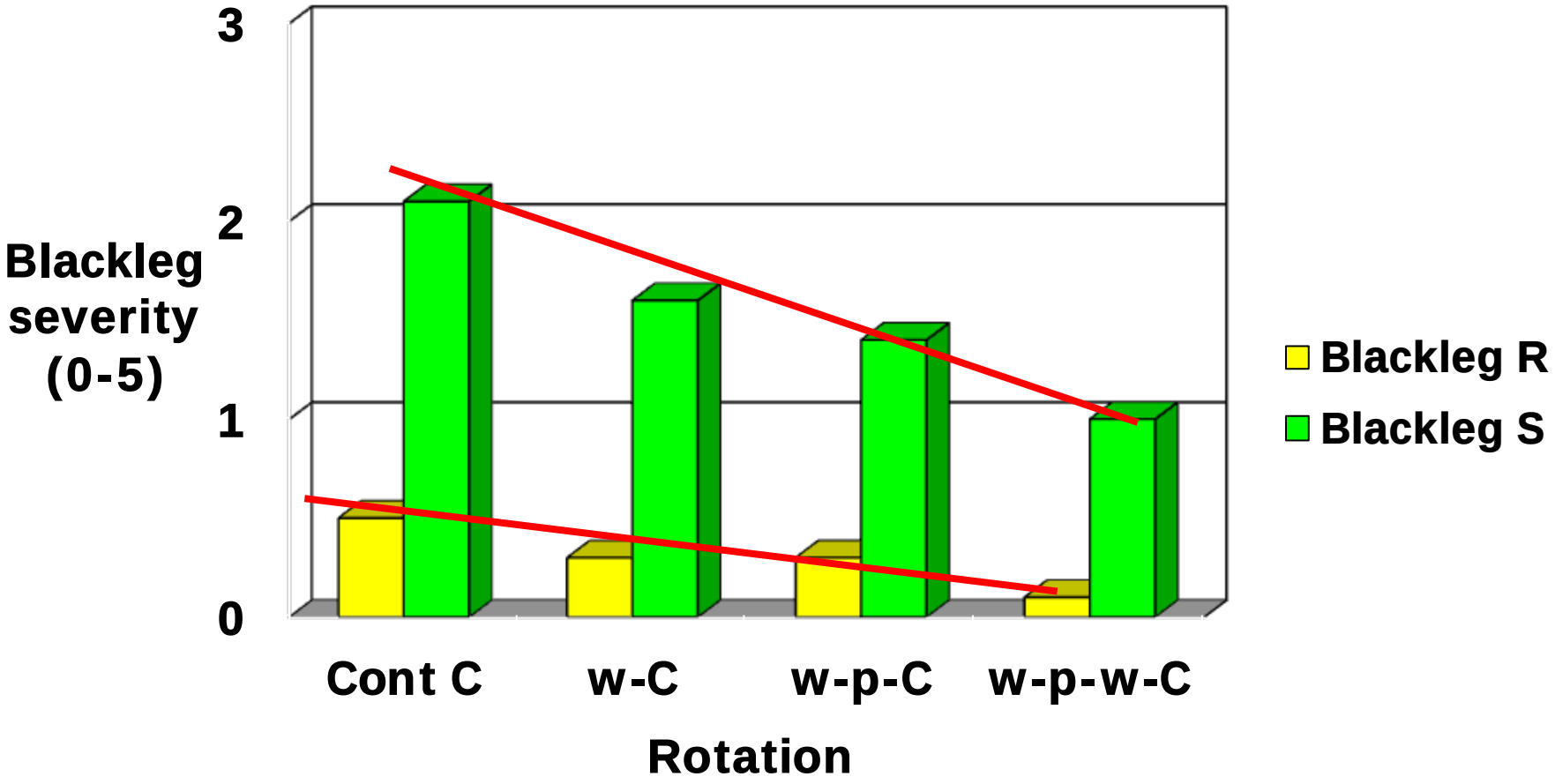
Blackleg “Resistance” Ratings

- Resistant: 0-30%*
- Moderately Resistant: 30-49%
- Moderately Susceptible: 50-69%
- Susceptible: 70-89%
- Highly Susceptible: 90-100%

*** averages**

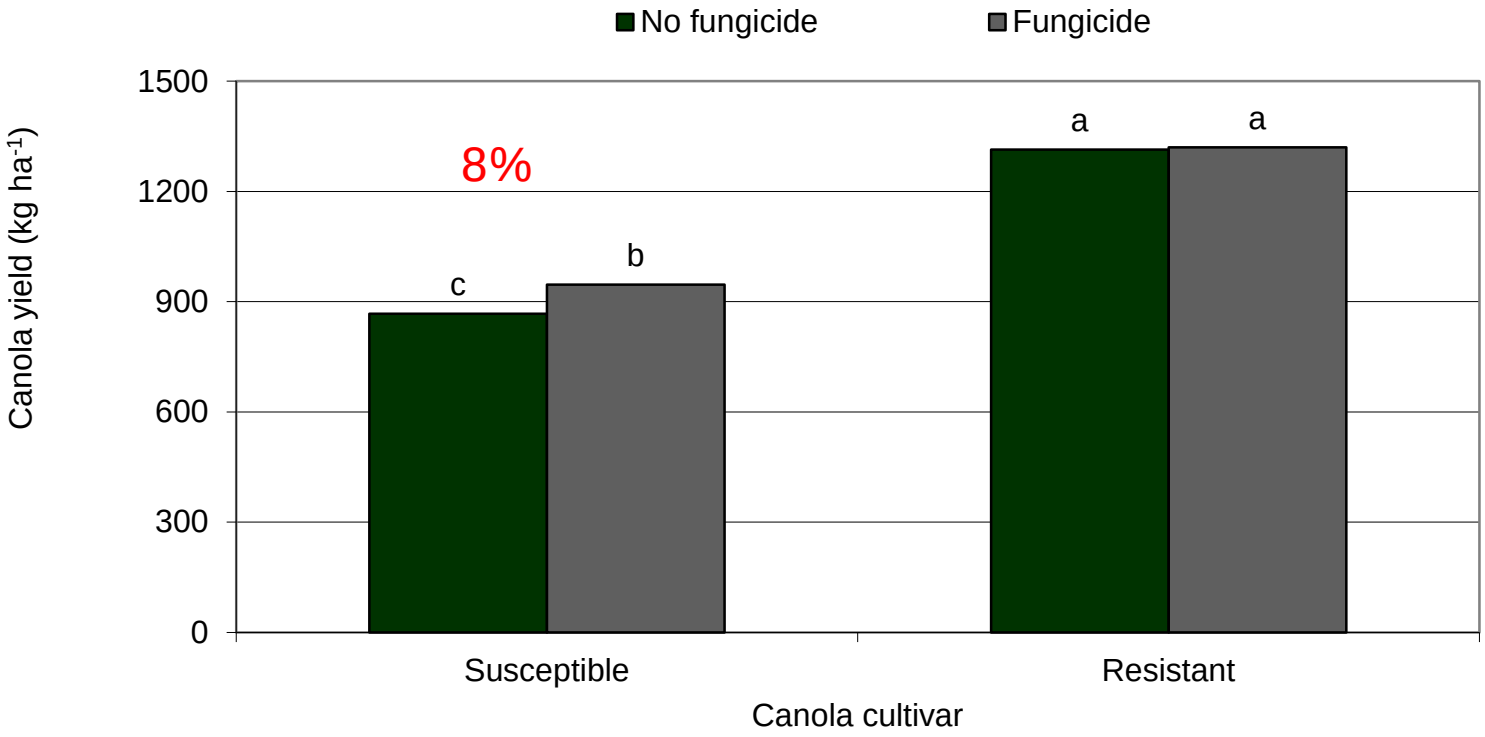
Influence of rotation length on severity of blackleg of canola

[14 site-years - Scott and Melfort, 2000-06]



VARIETAL EFFECTS

Fungicide (blackleg timing) on canola yield (kg/ha)



Mean of 9 site-years of data 1999-2003, Melfort and Scott, SK

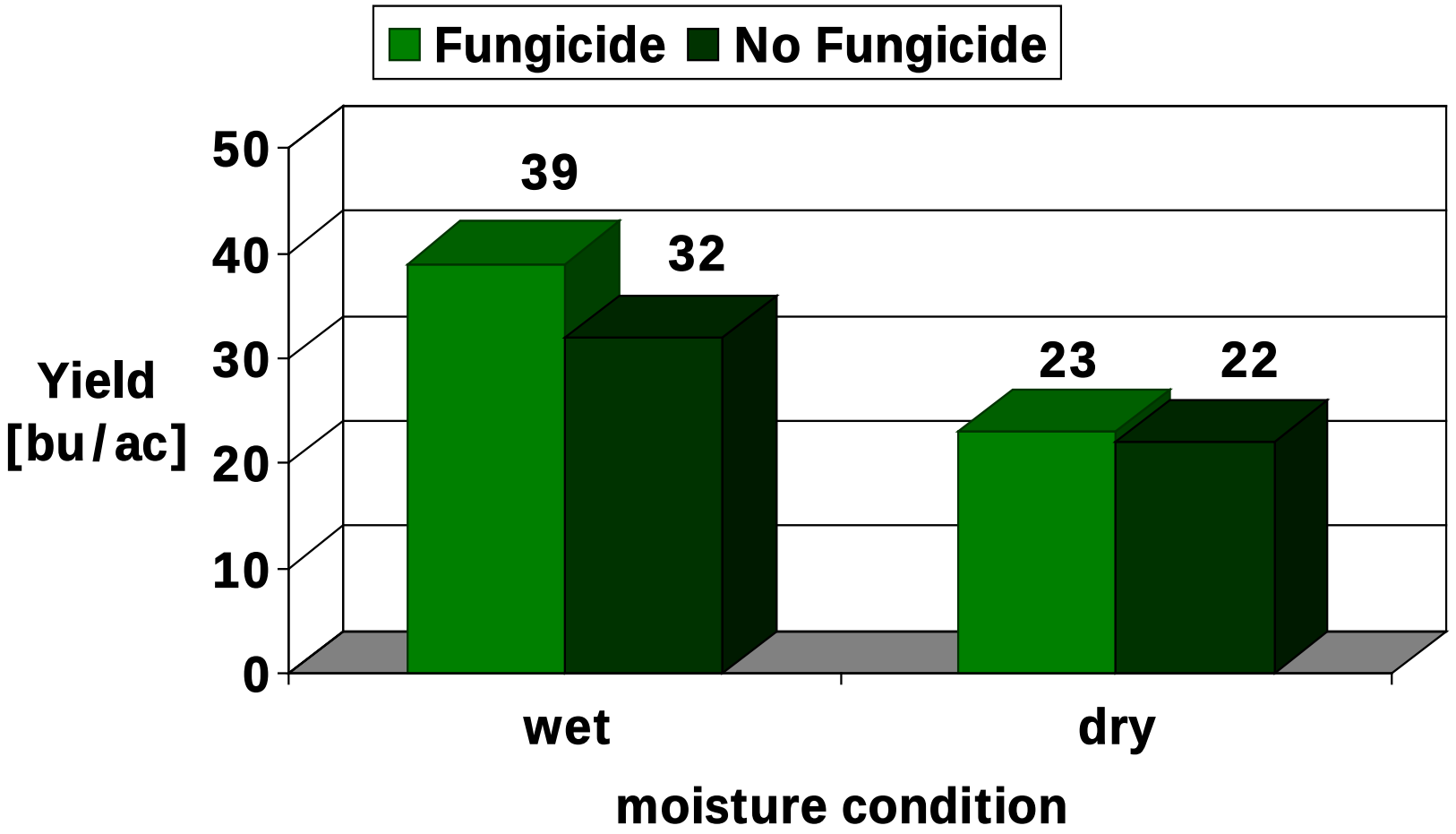
Mycosphaerella Blight / Ascochyta Blight

Foot rot / root rot

- Foot rot (Ascochyta)
- Root rot (Fusarium, Rhizoctonia, Pythium or Aphanomyces)
  - Severe epidemics under cool, wet conditions
  - 30 to 50% yield losses have been reported
  - Some can infect at any stage

ENVIRONMENTAL EFFECTS

Moisture conditions and pea yield response to fungicide: [normal/wet – 00, 04, 05, 06; dry 01, 02, 03]



Pea - wet feet

Photo courtesy of SCIC

Excess Water

- A relative rating of crop tolerance to excess water (in decreasing order):

Cereal crops: oats > wheat > barley

Oilseed crops: canola > sunflower > flax

Pulse crops: fababeans > soybeans >>> peas > lentils

?

Courtesy of SCIC

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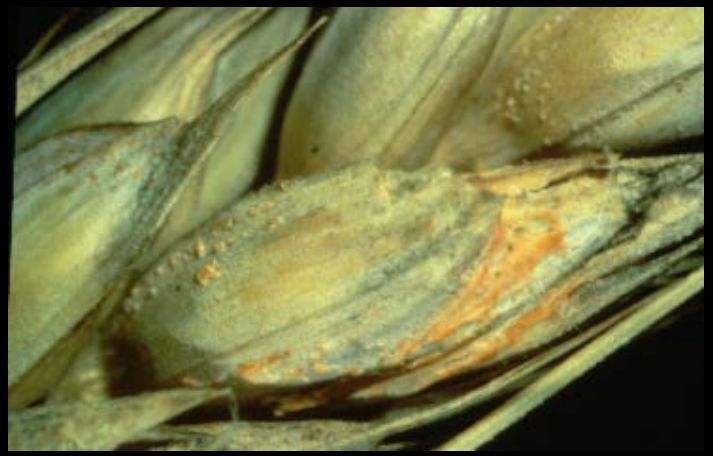
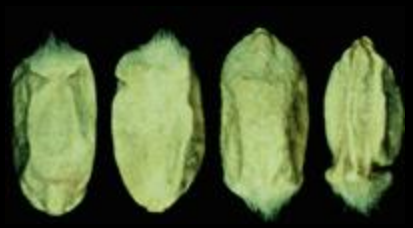
White Heads

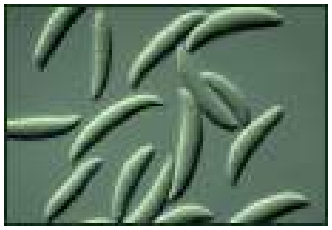
- Root rot – pull easily from soil
- Wheat stem maggot / Wheat stem sawfly
- Barley yellow dwarf / Aster Yellows
- FHB – can affect whole stem in extreme cases
- Herbicide damage (late apps)
- Heat stress / Loss of flag leaf

Fusarium Head Blight





FHB infection process in wheat:



Inoculum Increase

4-7 days prior to head emergence. Wet conditions favour spore production.

Head Emergence

Infection

3-6 days after emergence when flowering begins. Requires humid, warm conditions. (at 25°C, infection within 24 hrs)

Symptoms

7-14 days after emergence. Fungi colonizes head and mycotoxin is produced, depends on humid warm conditions. New infections.

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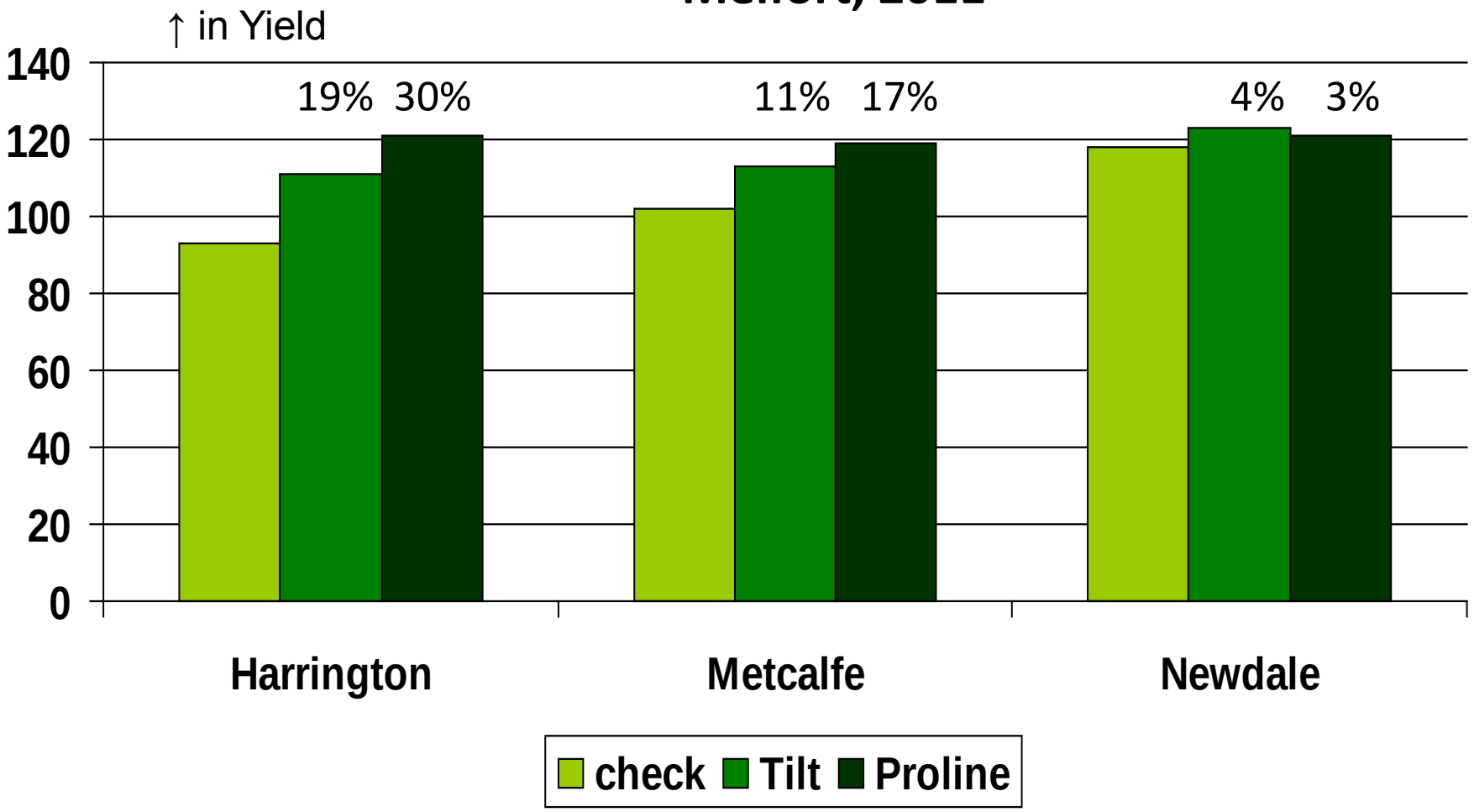
FHB

- What to do for 2013?
  - Plant seed with <5% and/or use seed treatment
  - Resistant varieties
  - Rotation – avoid cereal stubble or near infected fields
  - Fungicide application at heading if conditions warrant

Wheat

Variety x Fungicide Trial

Yield (bushels/acre) of barley
Melfort, 2011



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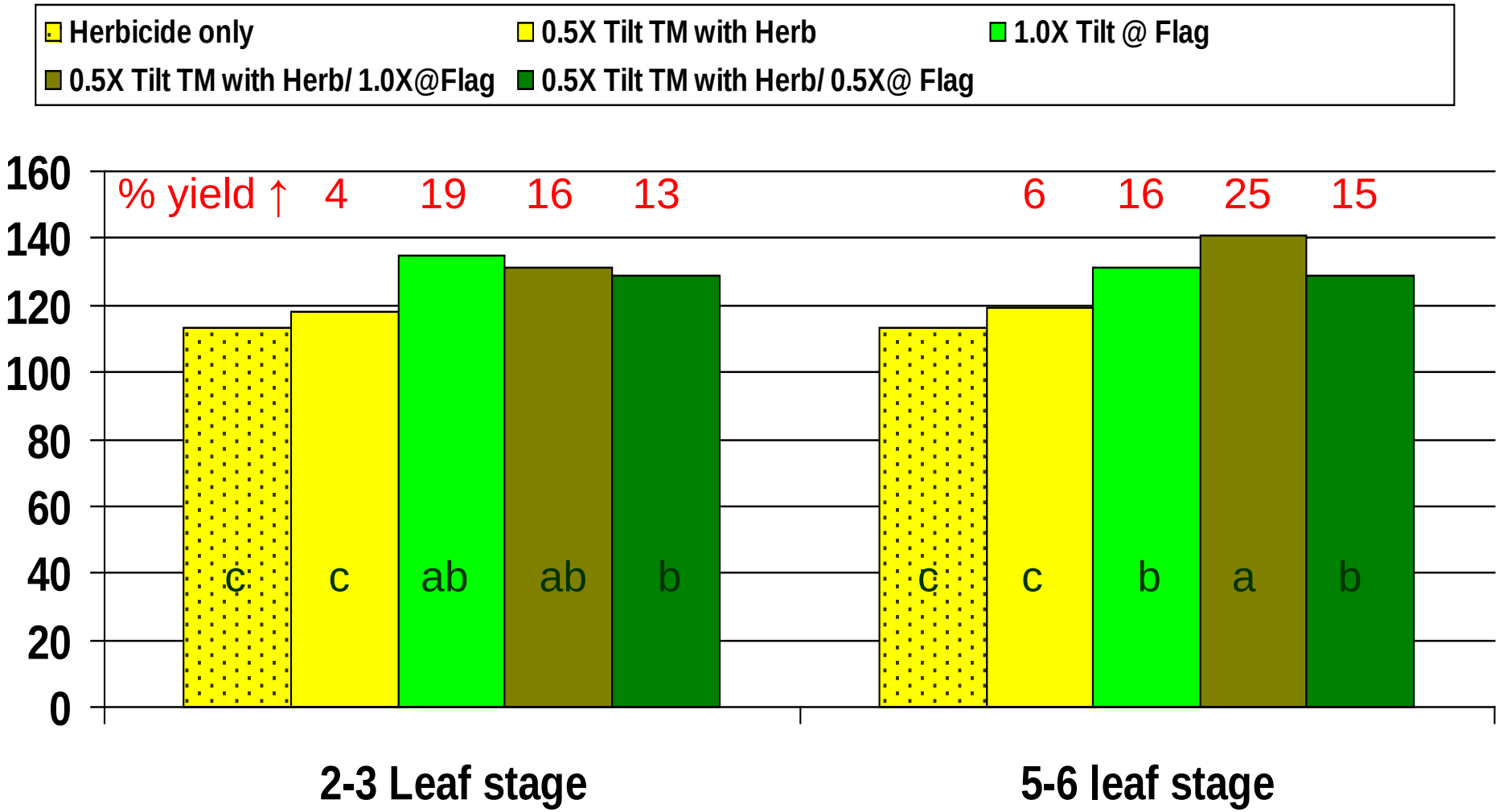
Timing is important

- Cereal Leaf Spots (tan spot, spot blotch net blotch, stagnospora, septoria)
  - Wheat – protect top 2 leaves (flag and penultimate)
  - Barley – protect top 3 leaves
- FHB
  - Wheat – 7-10 days window - early flowering
  - Barley –just before or at head emergence

Yield (bu/ac) of barley treated at the seedling and/or flag leaf stage with fungicide (propiconazole) and herbicide (Axial/Frontline); Metcalfe barley at Melfort, 2010



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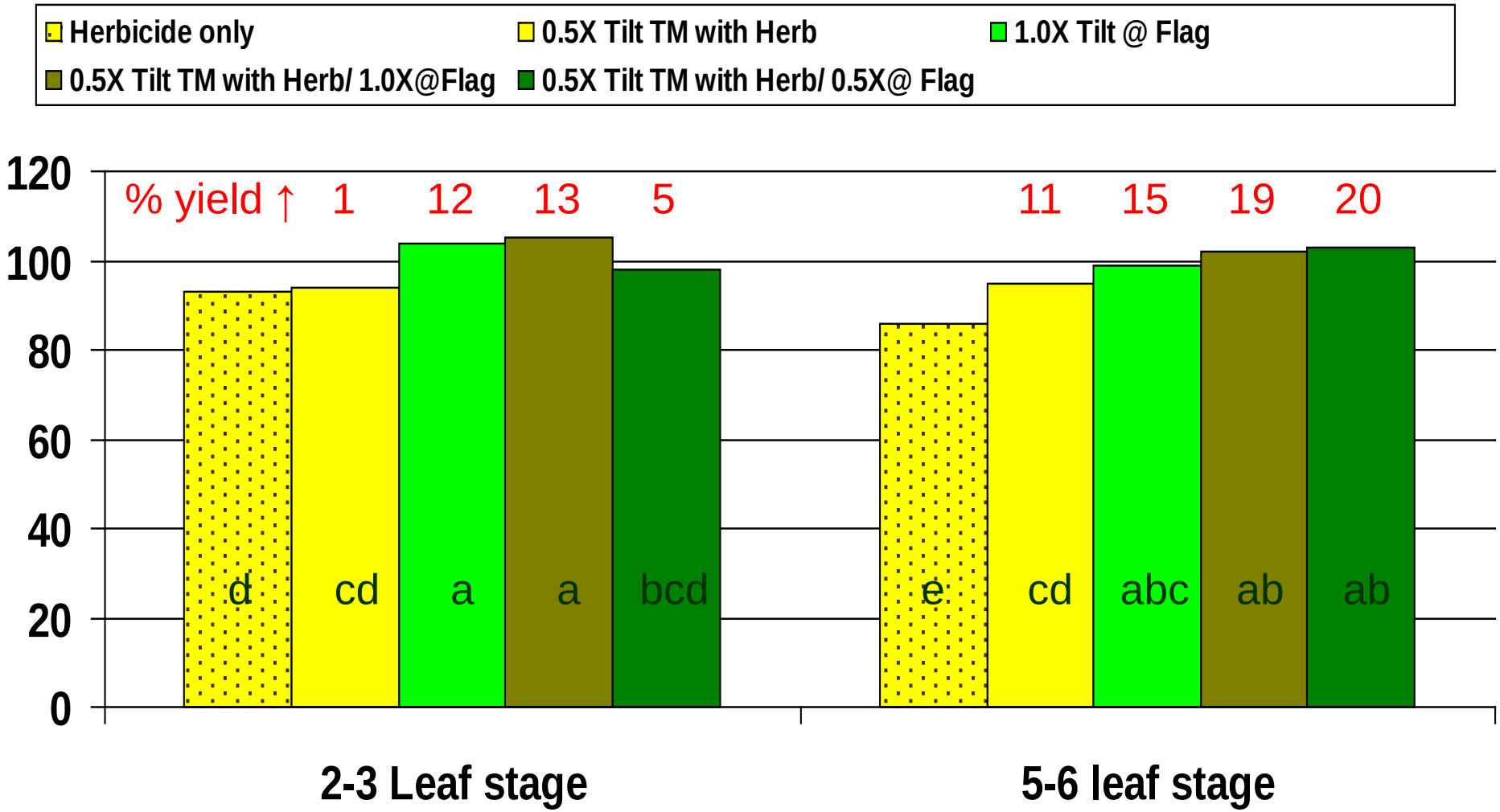

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Thank You!

Questions????