Fusarium head blight in wheat

Crop Opportunity Update
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Dekker Centre, North Battleford

Randy Kutcher, Gurcharn Brar, Gursahib Singh
Plant Pathologists
Crop Development Centre, U of S
randy.kutcher@usask.ca

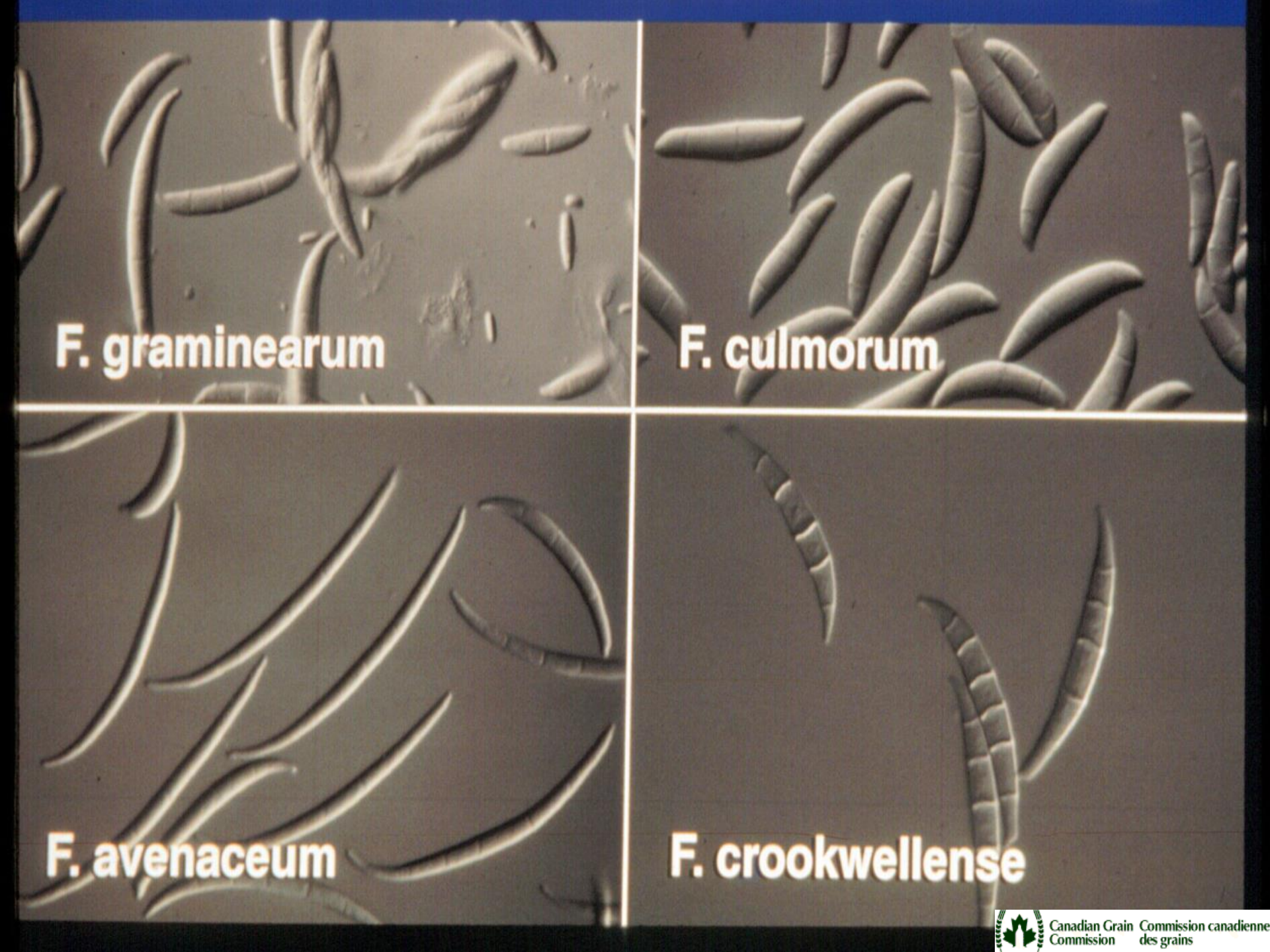
What is Fusarium Head Blight (FHB)?

- An infectious disease of cereals, corn, grasses and some other crops
- Also called scab or tombstone on cereal grains
- Occurs worldwide and from coast to coast in Canada

What is Fusarium Head Blight (FHB)?

- Caused by species of the plant pathogenic fungus *Fusarium*
- *Fusarium* species can also cause seed decay, seedling blight, and stem and root rot
- *Fusarium graminearum* is the most important cause of FHB in Western Canada

Saskatchewan Ministry of Agriculture



FHB symptoms, wheat

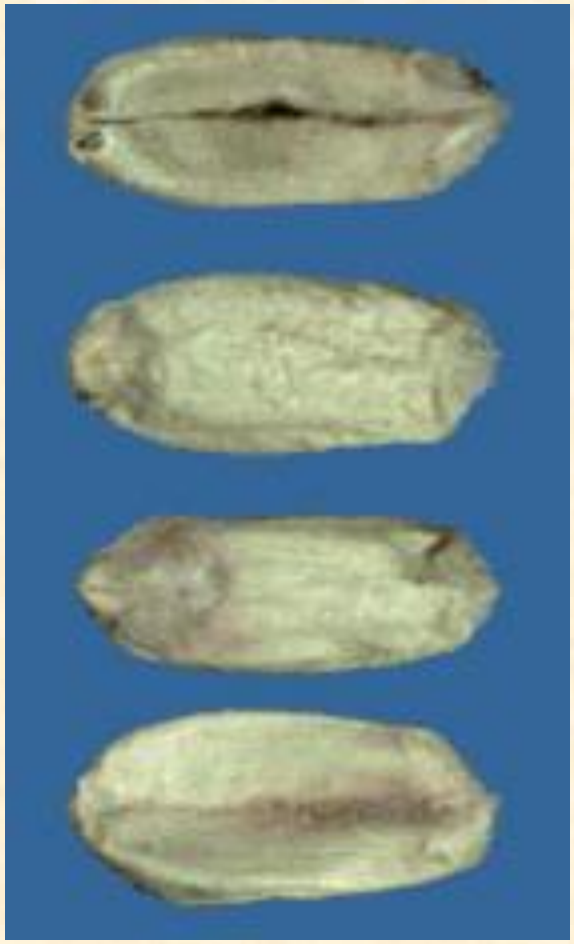
Diseases of Field Crops in Canada

Western Committee on Plant Disease Control

- bleaching of whole head or individual spikelets
- may be salmon pink - orange spore masses on the spikelet and glumes.

FHB symptoms, wheat

- tombstone / scab
- shrivelled, light-weight kernels, chalky white colour
- the earlier in the life-cycle infection occurs the greater the effect



Canadian Grain Commission
www.grainscanada.gc.ca

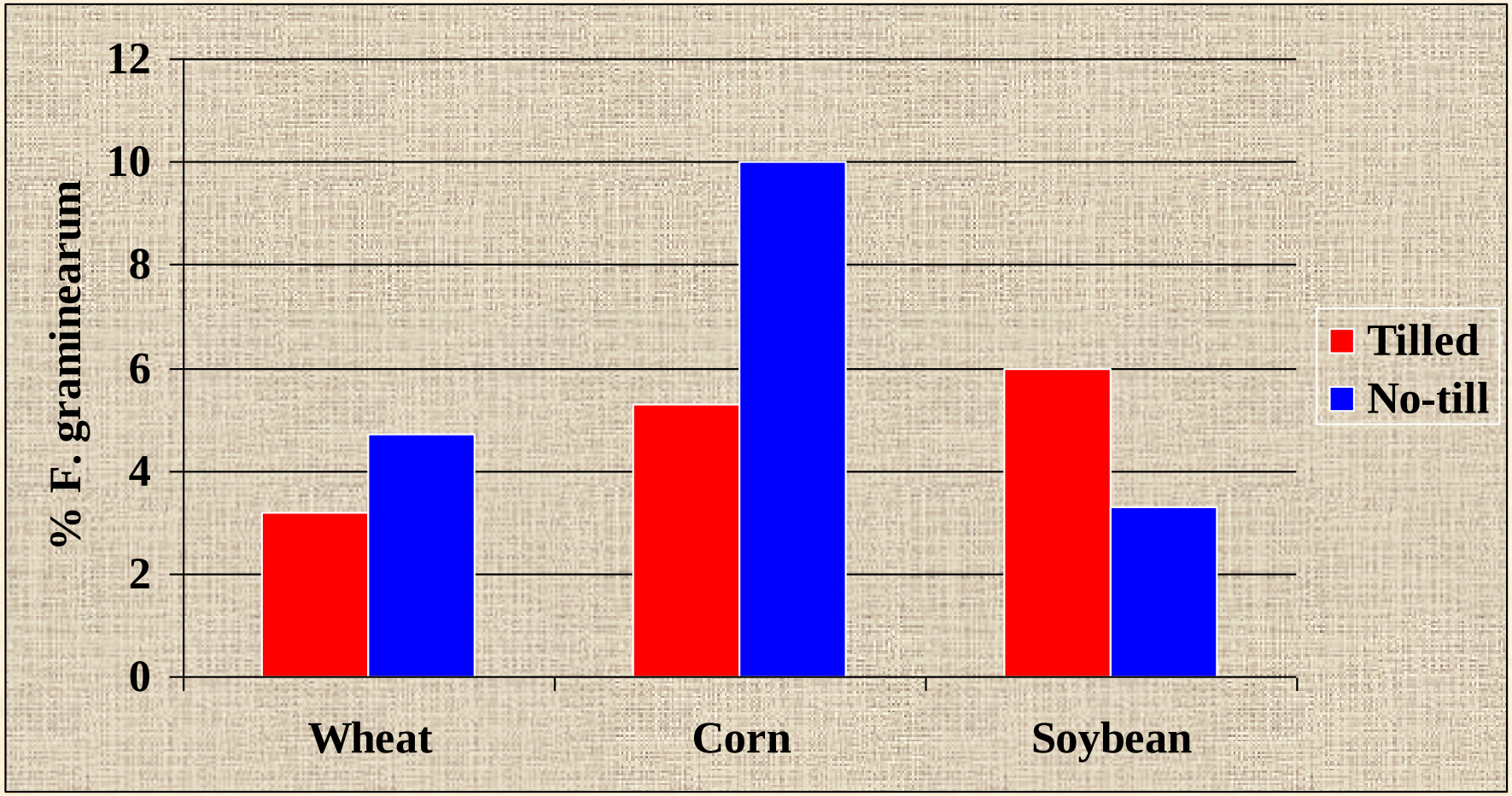
FHB – why the problem?

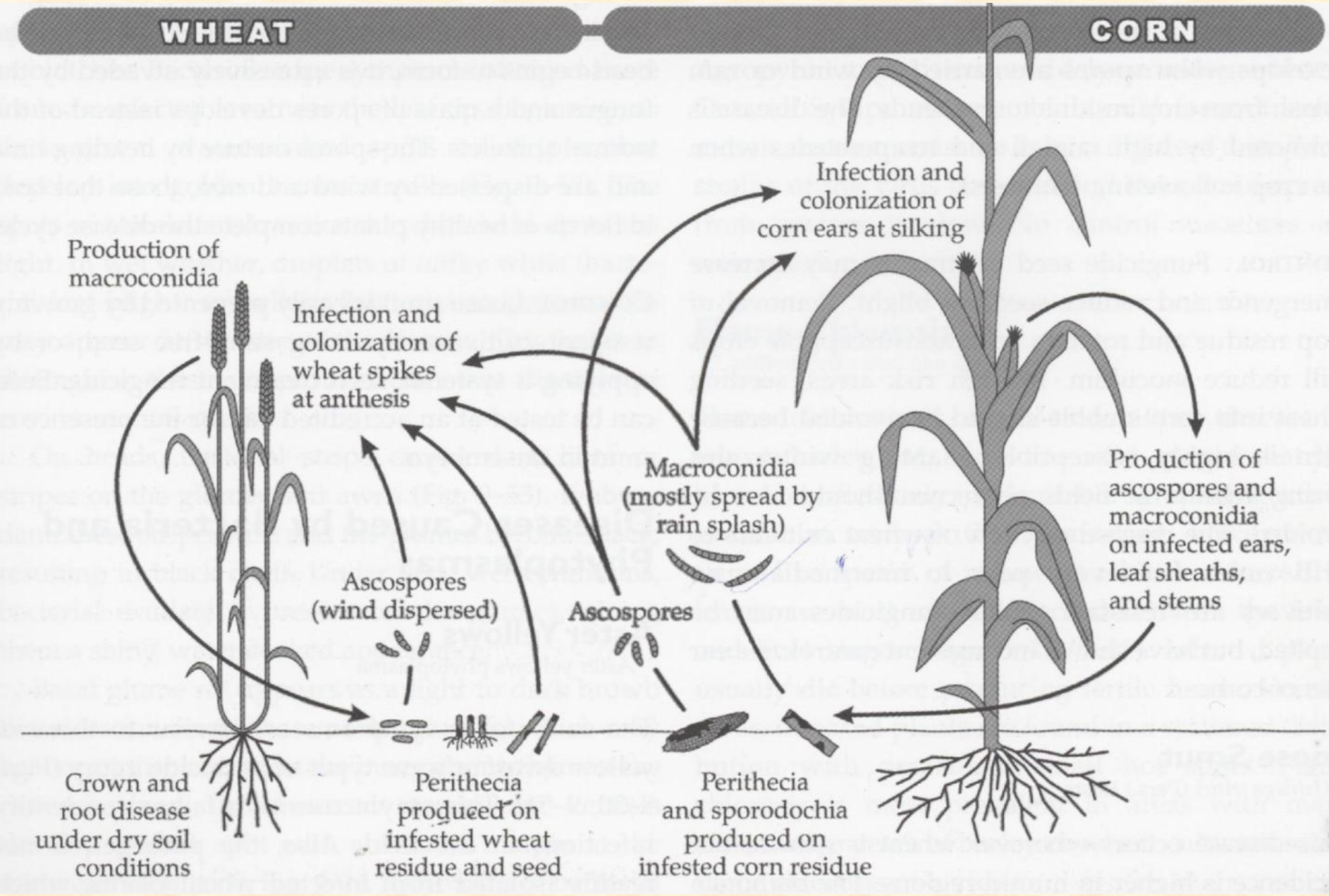
- FHB likely due to:
  - Widespread planting of highly susceptible cultivars
  - Presence of colonized residue from previous crops – reduced tillage?
  - Presence of corn in rotation and shortened rotations with small grains
  - Weather favourable for infection

Dr. B. Stack, NDSU, WGRF Research Magazine, 2004

Differences in incidence of *F. graminearum* in Ontario,

(Miller et al. 1998)





Fusarium Head Blight Disease Cycle – DFCC page 105

FHB, yield and quality losses

- Yield loss
- Grade loss
- Mycotoxin contamination
  - Implications for animal & human health and end use market acceptability
- These losses are additive!
- FHB is difficult to control

Disease cycle: infection

- Infection occurs at anthesis (flowering) in cereals
- requires warm (15-30^{o}C), moist (rain, dew or high relative humidity) conditions at anthesis

FHB, management strategies:

- Rotation
- Resistant varieties
- Fungicides
- Need to do all three,

  Integrated Pest Management

FHB, management strategies

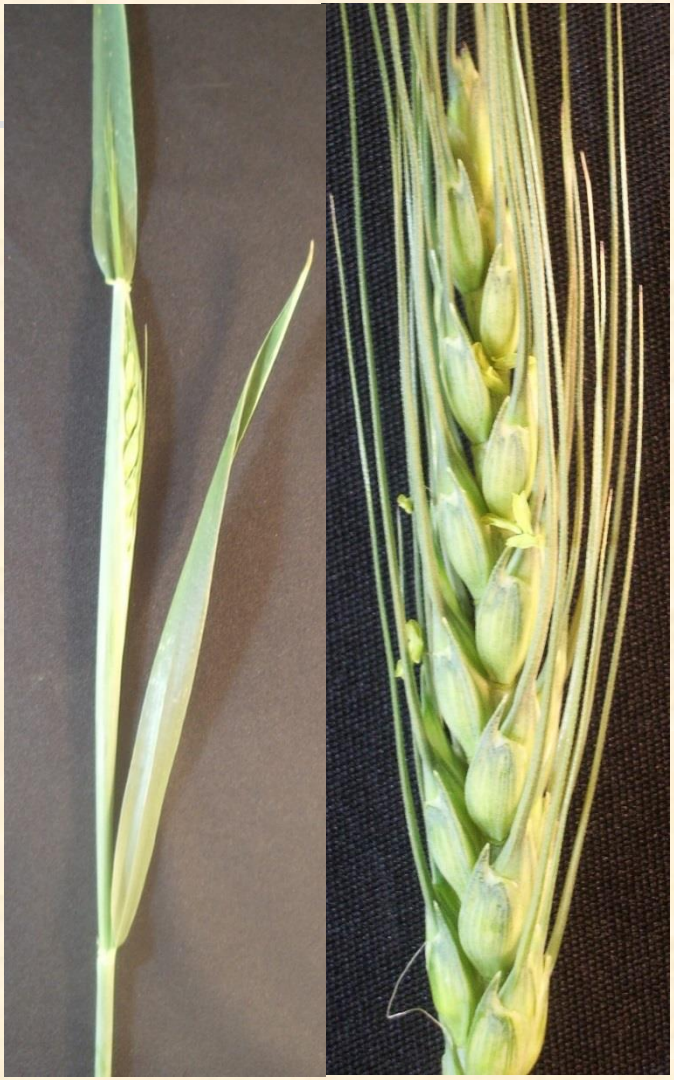
- Decrease quantity of inoculum
  - Crop rotation
  - Residue treatment – straw chopping, and spread
  - Irrigation scheduling
  - Tillage?

FHB, management strategies

- Escape
  - early maturity, staggered planting dates
  - subtle differences among varieties in length of flowering period,
  - avoiding warm, wet weather

FUNGICIDE TIMING

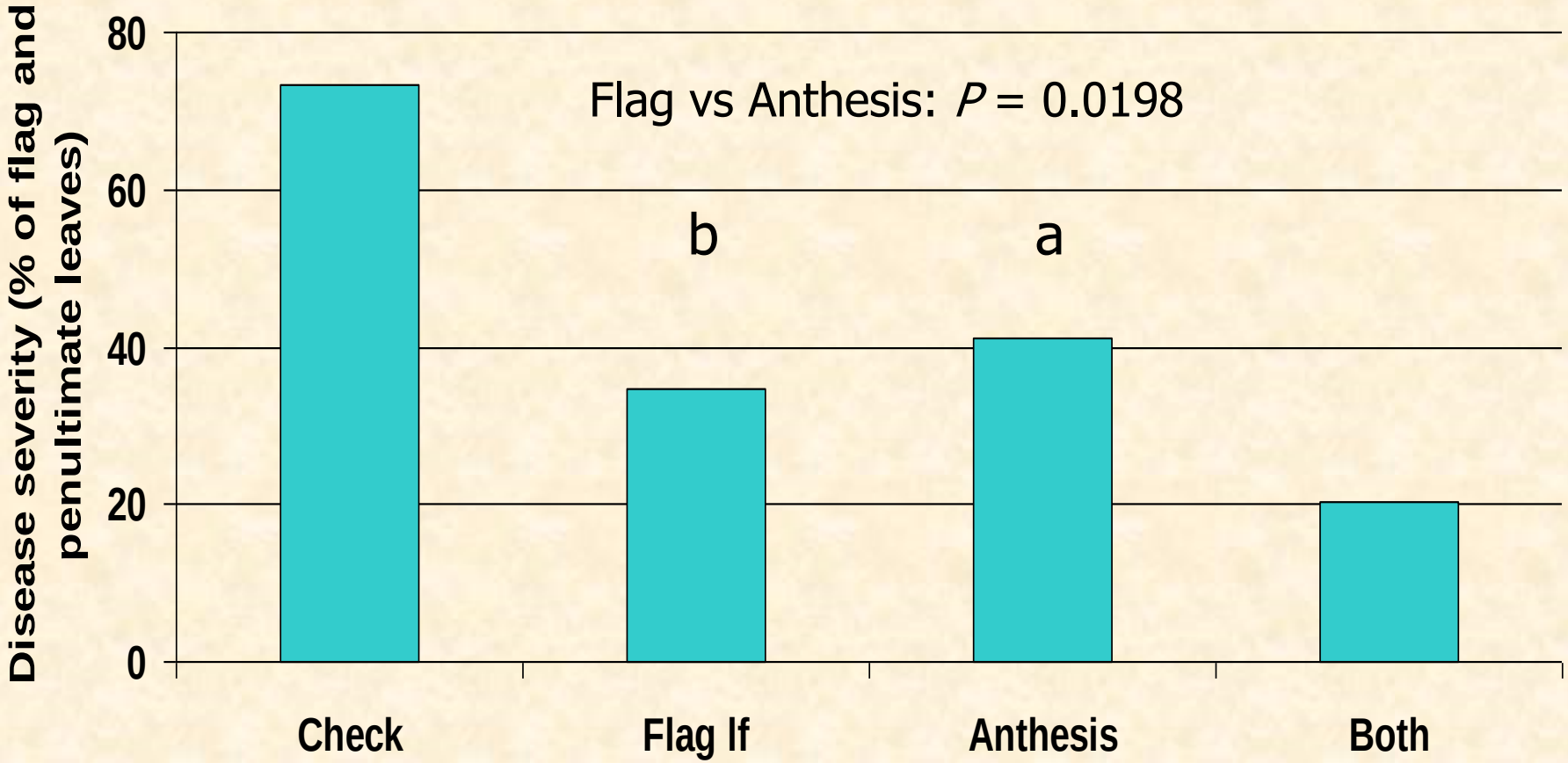
- With increased concern over FHB, what is the impact on leaf spot diseases when delaying spraying until anthesis stage?
- 15 site-year study in 2013-15: 3 AB and 3 SK locations used cv. Carberry to address this question



Dustin MacLean, MSc thesis work

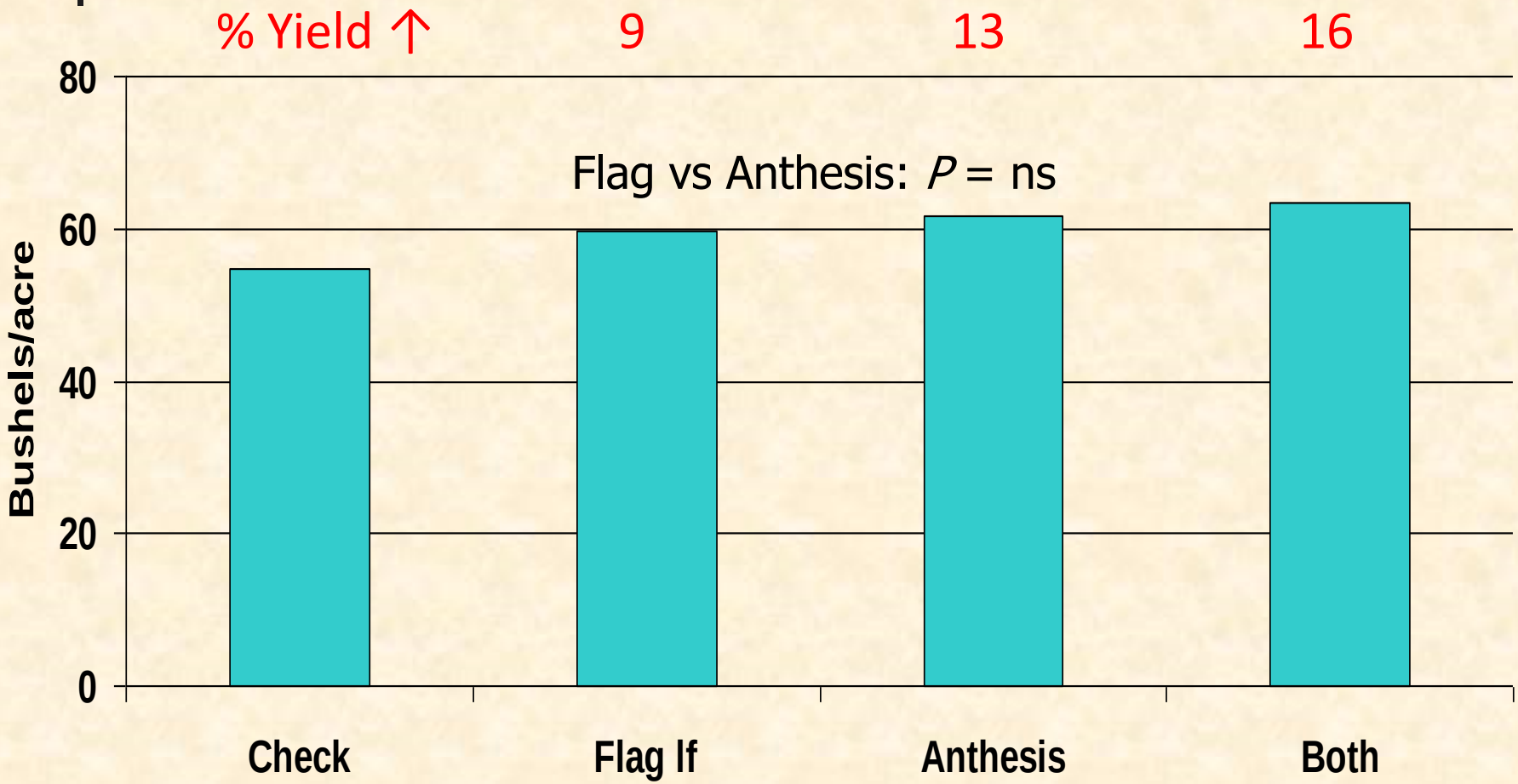
FUNGICIDE APPLICATION TIMING – Disease Sev

Wheat (cv Carberry), high disease severity, Prosaro and Folicur
3 site-years: Saskatoon, Melfort & Lacombe, 2014

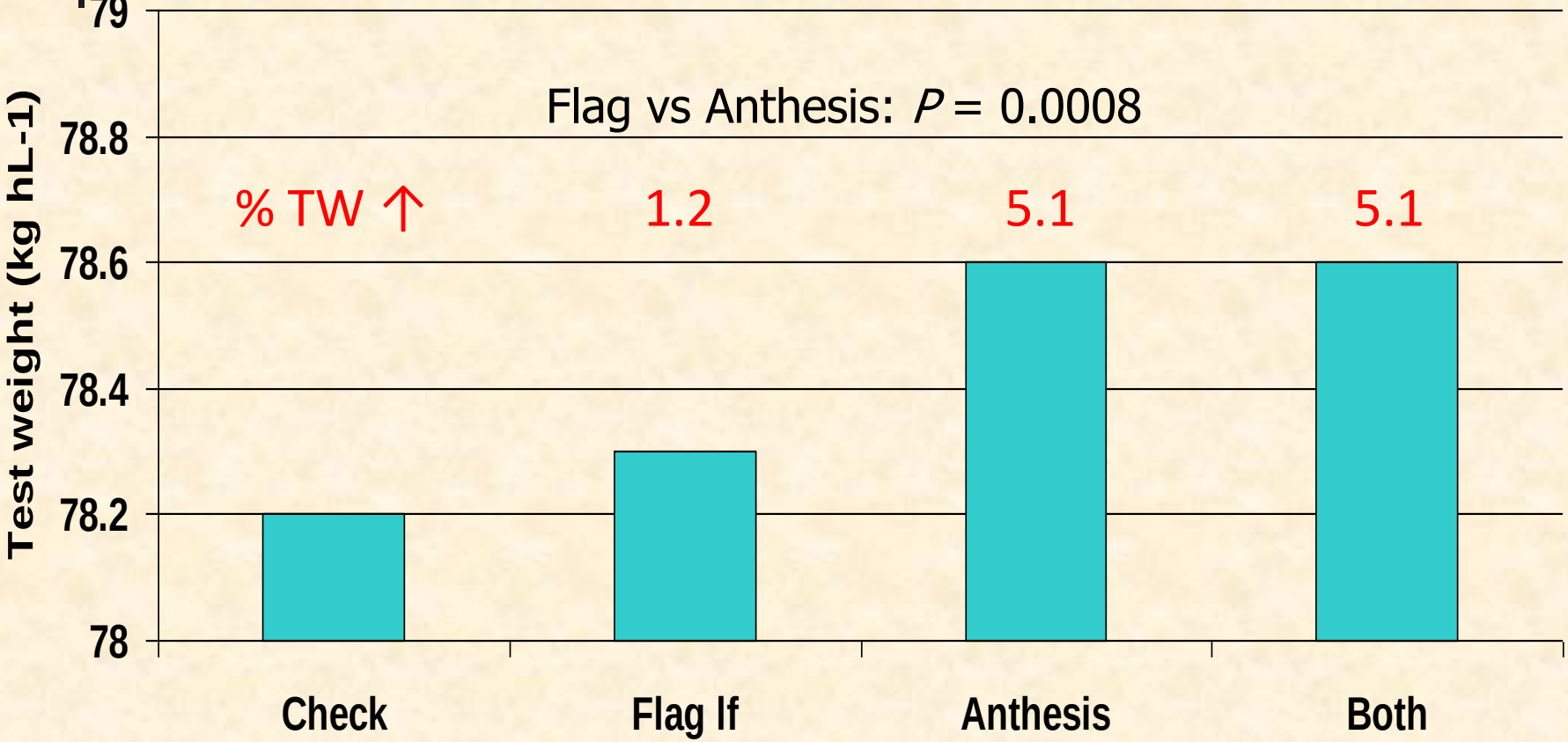


MSc thesis work of D. MacLean

FUNGICIDE APPLICATION TIMING - Yield



FUNGICIDE APPLICATION TIMING - TW



FUNGICIDE TIMING

flag leaf vs anthesis stages

- Data indicates an advantage to anthesis timing for leaf spot control, under the conditions of this study

- Apply at anthesis for control of FHB

Tan spot symptoms
Western Committee on Plant Disease

Summary

- A diverse crop rotation is highly recommended for FHB (minimum of 3 crops)
- Choose the more FHB resistant cultivar (bread wheat growers)
- Use fungicide when conditions warrant
- Fungicide at the FHB timing should give good control of leaf spot diseases


Thank you to WARC for
the invitation today