# Crop Disease Synopsis for 2012 and Forecast for 2013

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### 2012 Growing Season in Review

The season got off to a slow start because of cool temperatures and frequent showers that delayed soil warming and drying Excessive moisture caused crop yellowing in some fields and promoted seedling blight, root rot and leaf diseases Lush foliage, dense crop canopies and high relative humidities favored heavy leaf spot and rust infections in cereals Warm, dry weather in July, August and September helped crops catch, up but some suffered from heat stress and disease Harvesting started in mid-August and continued to late October Strong winds damaged swathes in many canola fields Yields and quality were average to above-average in many areas

#### The Disease Triangle in 2012





#### Cereal Surveys in Southern AB (B. Puchalski, AAFC, Lethbridge)

- Many winter wheat fields were infected with stripe rust (SR) in fall 2011, and pustules were also seen on foxtail barley
- Spores collected from fields in the Lethbridge-Cardston-Warner area did not survive the winter
- Conditions favorable for SR infection
  occurred in early June
- SR was observed on AC Radiant in the Taber-Bow Island area
- Slower disease progression on spring versus winter wheat
- High Temperature Adult Plant (HTAP) resistance genes were active
- SR was most common along Hwy 3
- WW crops became infected in fall
- Virulence of 2012 strains was similar to those collected in 2011

#### Cereal Surveys in Southern AB (B. Puchalski, AAFC, Lethbridge)

- Field surveys were started on May 16
- Tan spot (TS) occurred in 70% of 36 winter wheat fields surveyed in June
- TS was observed in early spring wheat fields by mid-May and continued to develop across the south throughout the summer





#### Cereal Surveys in Central AB (Turkington/Rauhala, AAFC, Lacombe; Xi et al., ARD, Lacombe)

- Barley leaf diseases were less severe in 2012 than in recent years
- Scald was found in 16 of the 20 fields surveyed and net form net blotch (NNB) in was seen in all of the 20 fields surveyed
- Spot form net blotch (SNB) and/or spot blotch occurred in 20 of 20 fields
- Common root rot was seen in 20 of 20 fields surveyed
- Tan spot and septoria leaf spot were widespread and severe in some wheat fields
- No stripe rust was observed in any of the wheat or barley fields surveyed, but it showed up at low levels in some breeding nurseries





Fusarium Head Blight on Wheat and Barley







HETCHING A RELE FOR THE NORTHERN LIGHTS TOUT



Palse growers see promise in soybeans





# FHB Overview in 2012

FHB was especially severe in the eastern Prairies Crop Districts 6, 7, 8 and 9 in Saskatchewan were hit hard by FHB in 2012 Grading statistics from the Canadian Grain Commission, Winnipeg showed that FHB was not as serious in Alberta Analysis for *Fusarium* graminearum and its chemotypes will be done on soft white spring wheat samples later this year The lab is switching from the traditional plating test to a molecular diagnostic test called PCR



### FDKs in Alberta in 2011-12

Crop Districts in Alberta	CWRS (% FDK)		CWAD (% FDK)	
	2011*	2012**	2011*	2012**
1	0.0/0.0	7.5/0.55	1.8/0.87	11.1/0.91
2	9.1/1.16	18.6/0.70	2.9/2.44	16.1/1.19
3	4.9/1.01	5.0/0.37	0.0/0.0	0.0/0.0
4	2.5/0.97	12.9/0.64		
5	2.4/1.02	19.4/0.65		
6	2.9/0.7	8.8/0.86		
7	2.0/1.13	1.9/0.12		

\* The first number in each column is the average percentage of grain samples degraded because of *Fusarium*-damaged kernels and the second number is the average percentage of FDKs amongst the samples degraded.

\*\* The first number in each column is the average percentage of grain samples, both non-degraded and degraded, containing FDKs and the second number is the average percentage of FDKs amongst the samples tested that were positive for *Fusarium*.

## Provincial Canola Disease Survey 2012

- Coordinated by Ralph Lange, Alberta Innovates Technology Futures, Vegreville
- A total of 188 fields in 53 municipalities in AB were surveyed Fields were randomly sampled (100 plants per field)
- Surveyed for blackleg plus other diseases
- All stems were returned to Vegreville for visual blackleg evaluation
- Samples were retained for PCR confirmation of the blackleg pathogen (*Leptosphaeria maculans*) by CFIA
- Virulence ratings by AITF





## Virulent Blackleg in Western Canada







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CAR & RM	Basal Canker Incidence (%)
4A	44.39
Flagstaff	61.86
Paintearth	21.50
Provost	31.00
Stettler	33.33
Wainwright	40.25
4B	25.32
Beaver	35.60
Camrose	20.43
Lamont	29.50
Minburn	15.83
Two Hills	38.00
Vermilion	
River	19.57
4A and 4B	31.92

### **Sclerotinia Stem Rot**









### Sclerotinia Incidence (% plants with symptoms)

CAR & RM	Stem Rot Incidence (%)
4A	12
Flagstaff	13
Paintearth	7
Provost	4
Stettler	16
Wainwright	17
4B	17
Beaver	11
Camrose	25
Lamont	25
Minburn	7
Two Hills	18
Vermilion	
River	14
4A & 4B	15

# Clubroot



- 390 canola fields in 21 counties were surveyed by University of Alberta staff and 64 new infestations were found
- One new positive field was found in southern Alberta in SA #3
- Another 168 new cases were identified in ASB surveys for a grand total of 233 CR positives
- First records for Athabasca, Beaver, Minburn and Stettler Cos.
- Clubroot has now been confirmed in four vegetable fields and 1064 canola fields and the City of Edmonton since 2003
- There are now 24 counties with confirmed cases of clubroot

# Clubroot

#### Alberta Clubroot Map

Cumulative clubroot infestations as of November 2012 from University of Alberta, Alberta Agriculture and ASB/ARA surveys

#### New Finds in 2012

- 64 'new' infested fields
- 4 'new' positive counties: Athabasca, Beaver, Minburn and Stettler
- Grand total of 233 fields



### **Aster Yellows**

- Caused by the AY phytoplasma
- Vectored by the aster leafhopper
- Can affect >350 plant species
- Outbreaks in 2000, 2007 and 2012
- Leafhoppers overwintered further north
- Winds carried migrants into the Prairies
- High levels of infectivity (12% vs. 1-2%)







Field Peas (R. Bowness and K.F. Chang, AARD, Lacombe/Edmonton)

- About 50 fields in central AB were surveyed in June-July
- Levels of mycosphaerella blight were low to moderate
- 30 fields surveyed in August all had high levels of disease Fungicides were helpful
- Septoria leaf blotch occurred in some fields in southern AB





#### **Downy Mildew**



#### Stem Rot



#### Root Rot



- Vegreville-Vermilion-Red Deer areas
- Very little seen
- Isolated pockets
- Observed in the mid-canopy
- Deterred by heat

- First seen in Strathmore area in June
- Low incidence
- Isolated pockets
- Found in 10 fields by late season
- Bad in Minburn County

- Found in 20 of 20 fields surveyed
- Localized areas
- Incidence was low
- Mostly Fusarium
- Fusarium wilt found in Minburn/Sturgeon

#### Lentils (Robyne Bowness, AARD, Lacombe)

- About 15 fields in central and southern AB were surveyed
- Sclerotinia stem rot was seen in 6 fields from Lethbridge to St. Albert
- More common where canopies were thick
- Gray mold (*Botrytis*) was seen in 4 fields in the
- Lethbridge-Strathmore area These fields also had
- *Sclerotinia* stem rot
- Stem rot was worse in some hailed fields in southern AB
- Some root rot was observed



#### Dry Beans (S. Chatterton et al., AAFC, Lethbridge)

- 44 fields in southern AB were surveyed from June to August
- 40/44 fields had bacterial blight (avg. DI = 19% and DS = 1.4)
- i Halo blight and brown spot were confirmed in samples
- White mold was found in 39 fields (avg. DI = 7% and DS = 1.2)
- One field had severe fusarium root rot

**Bacterial Blight** 



Root Rot







#### Long-Range Weather Forecast (The Old Farmer's Almanac 2013)

- Heaviest snowfalls will occur in mid- to late January, mid- to late March and early April
- April and May will be cooler and drier than normal
- Summer will be cooler than normal, on average, with the hottest periods occurring in late June and early July
- Rainfall will be above-normal in the east and below-normal in the west
- September and October will be warmer and drier than normal

### **Disease Forecast for 2013**

Overwintering inoculum levels will be high for seed and residue-borne diseases, e.g. tan spot, septoria and FHB on wheat, net blotch and scald on barley, ascochyta blight on chickpea and pea, and white mold on canola and pulses Cool, dry conditions could delay germination Excess precipitation in early April could encourage seed decay and seedling blight Cool, dry weather in summer should slow the build-up of root, foliar and head diseases Warm, dry conditions in the fall should favor harvesting operations and deter late season and post-harvest diseases Growers are advised to follow recommended crop rotations, use resistant varieties where available, scout fields on a regular basis, and use seed treatments and other crop protection products where required

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#### The 2012 Crop Year in Review Major Disease Issues

- Sereals
- § Canola
- § Pulses
- Souther Crops
- Disease Forecast for 2013
- Acknowledgements

# **Blackleg Severity** (o - 5)

CAR & RM	AVERAGE BASAL
4A	1.91
Flagstaff	2.19
Paintearth	1.10
Provost	1.34
Stettler	1.44
Wainwright	2.44
4B	1.38
Beaver	1.29
Camrose	1.69
Lamont	1.22
Minburn	1.25
Two Hills	1.56
Vermilion	
River	1.21
4A & 4B	1.56



+ 0

. 0.1 - 1 • 1.1-2 • 2.1-3

• 3.1-4

• 4.1-5

0 0.1-1

1.1-2

2.1-3 3.1 - 4 4.1-5 Not surveyed

# Sclerotinia Severity



-	Sclerotinia severity (0-
CAR & RM	5)
4A	3.33
Flagstaff	3.82
Paintearth	1.50
Provost	3.59
Stettler	2.47
Wainwright	3.88
4B	2.68
Beaver	2.39
Camrose	2.77
Lamont	2.00
Minburn	3.39
Two Hills	3.11
Vermilion	
River	2.27
4A & 4B	2.90