



Agriculture and
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Pulse disease update for 2017

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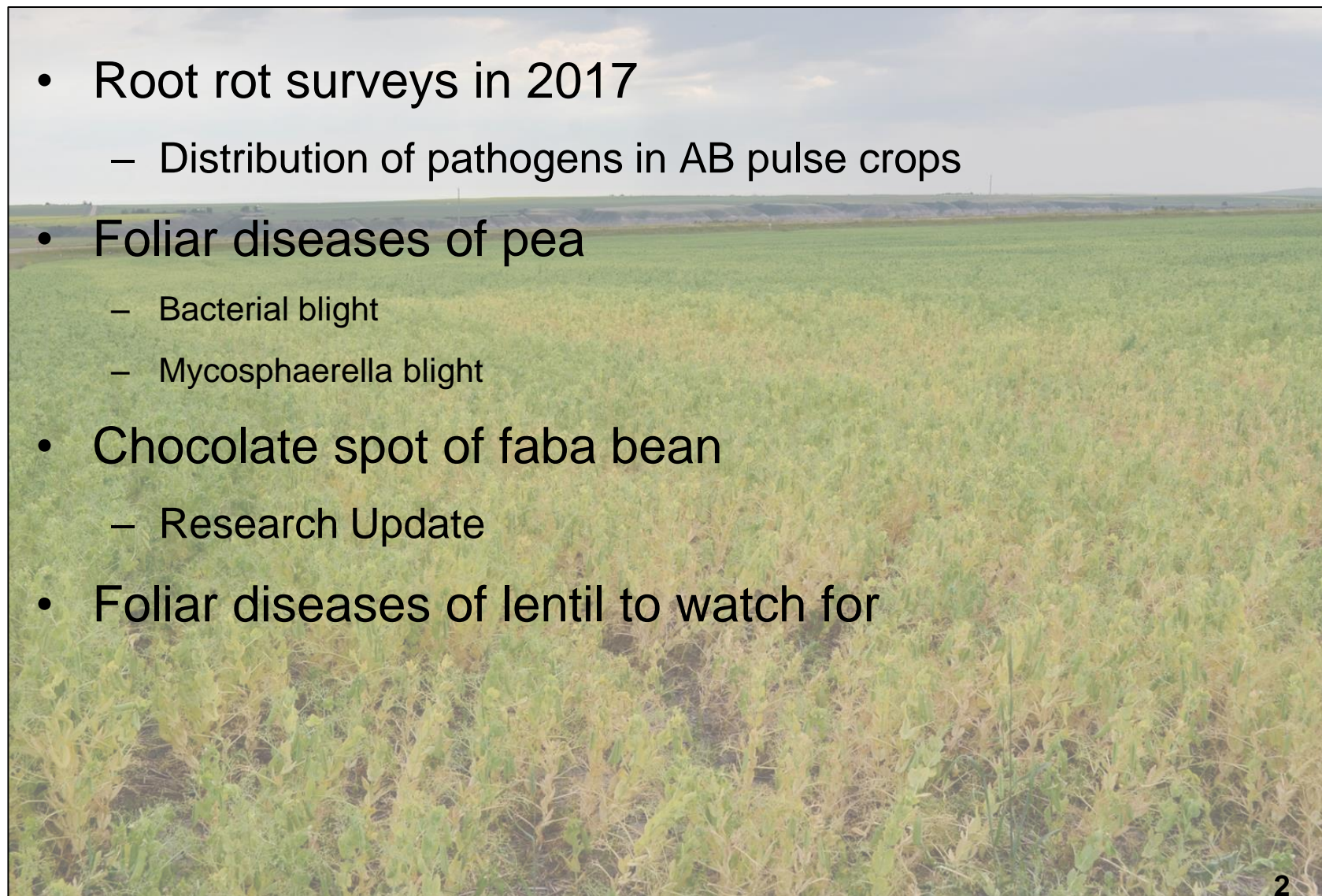
Agronomy Update

January 9-10, 2018, Red Deer, AB

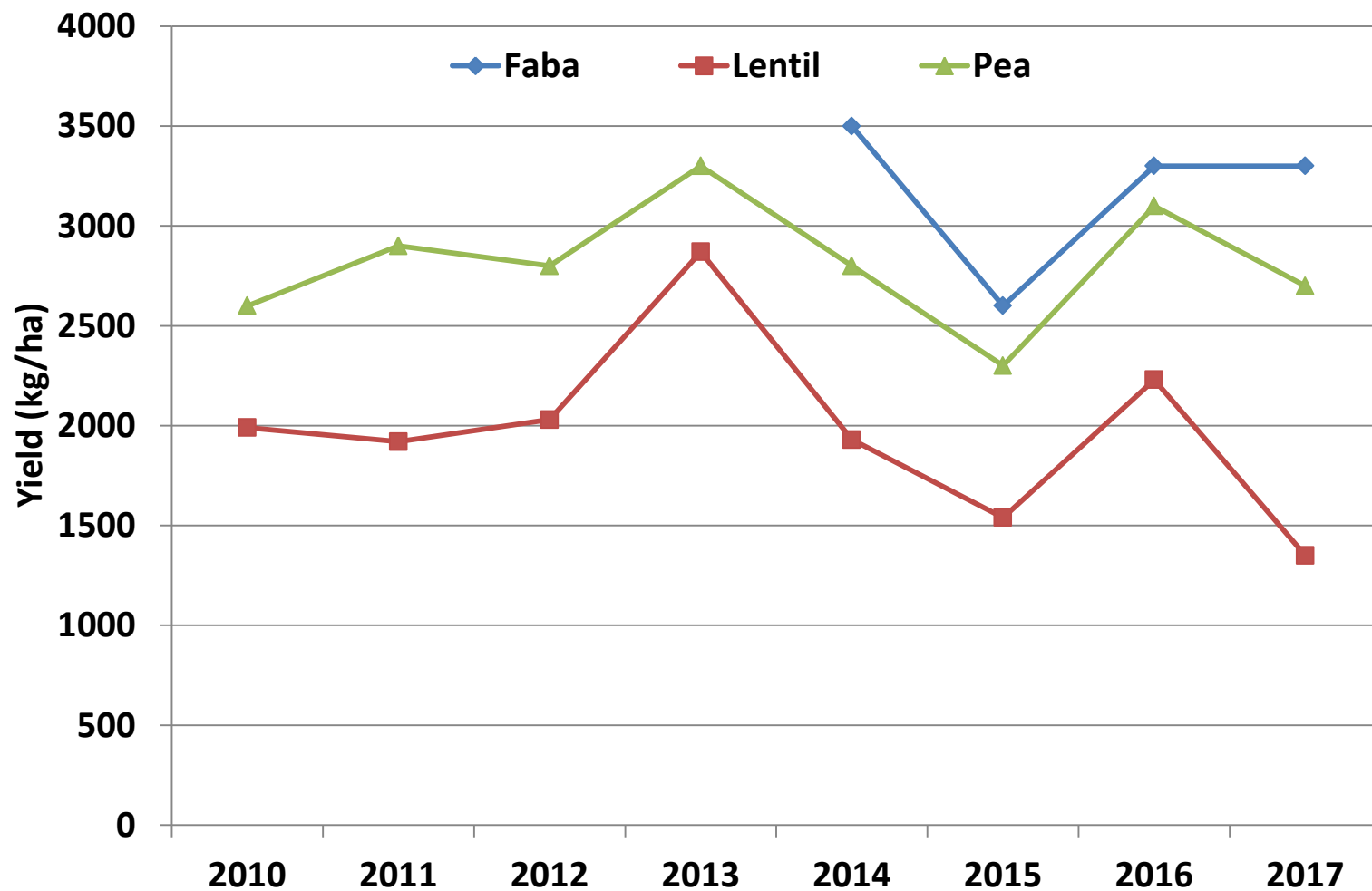
Canada 

Overview

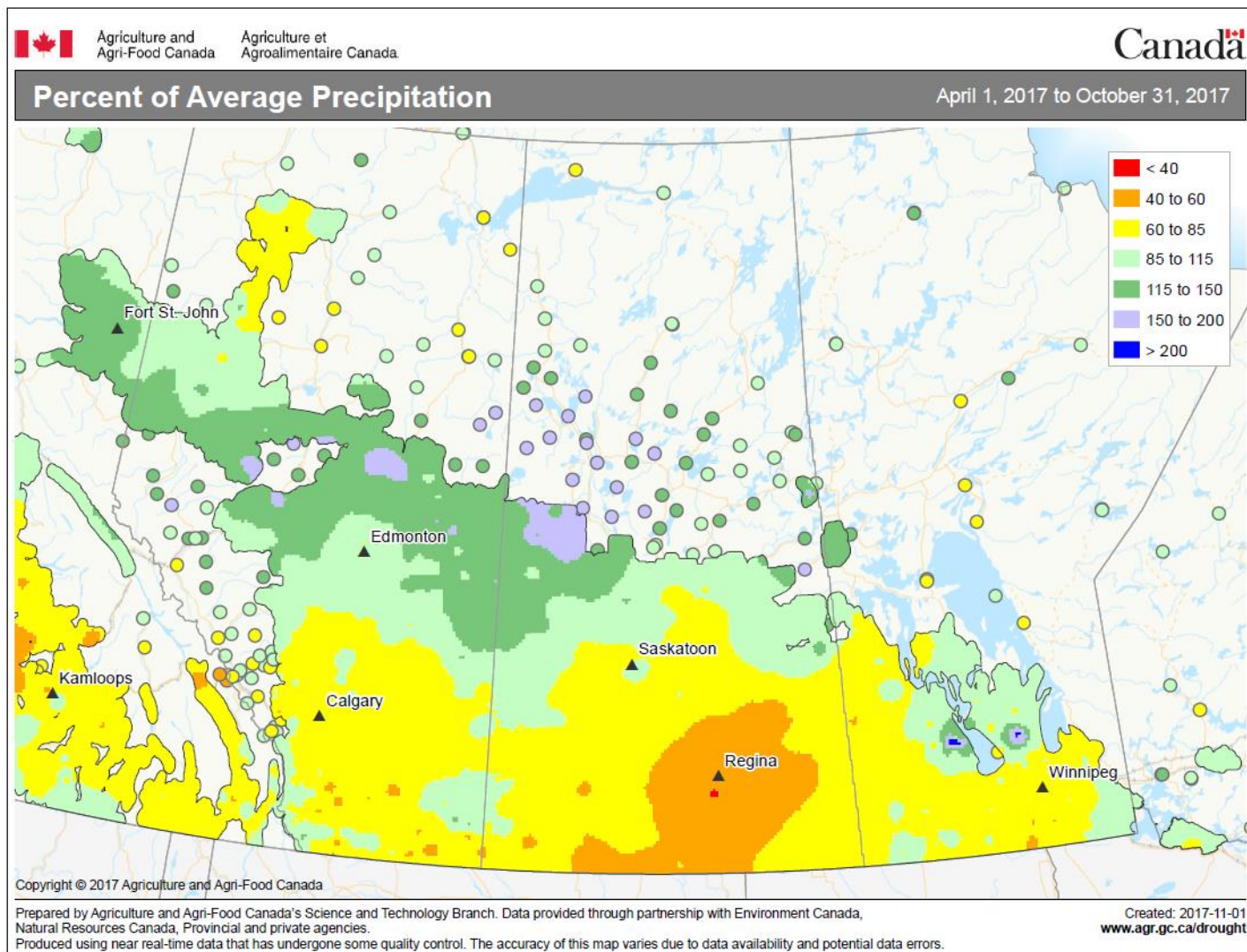
- Root rot surveys in 2017
 - Distribution of pathogens in AB pulse crops
- Foliar diseases of pea
 - Bacterial blight
 - Mycosphaerella blight
- Chocolate spot of faba bean
 - Research Update
- Foliar diseases of lentil to watch for



Yield trends since 2010



Weather patterns in 2017



Field surveys for root rot of pulse crops in 2017

- 16 lentil and 147 pea fields surveyed during flowering
- Samples sent to Lethbridge for rating and analysis
- Diagnostic DNA tests for common pathogens



Disease severity rating scale



Healthy

Moderate

Severe

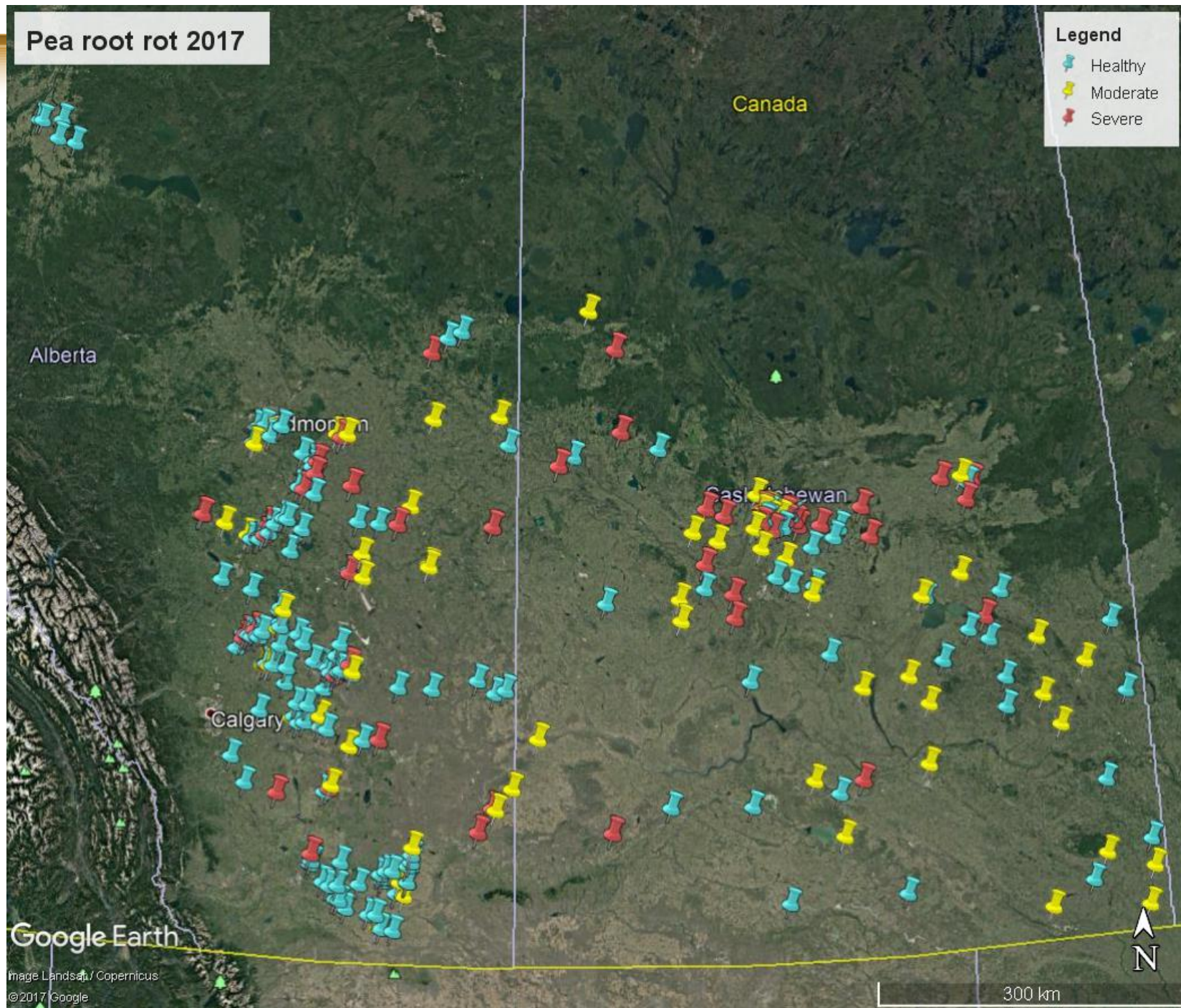
Pea root rot by soil zones in 2017

	Incidence DS > 1 (healthy – severe)	Incidence DS > 3 (moderate + severe)	Mean DS
Black	79	34	3.0
Dark Brown	77	34	3.0
Brown	75	29	2.8
Peace	35	6	1.6

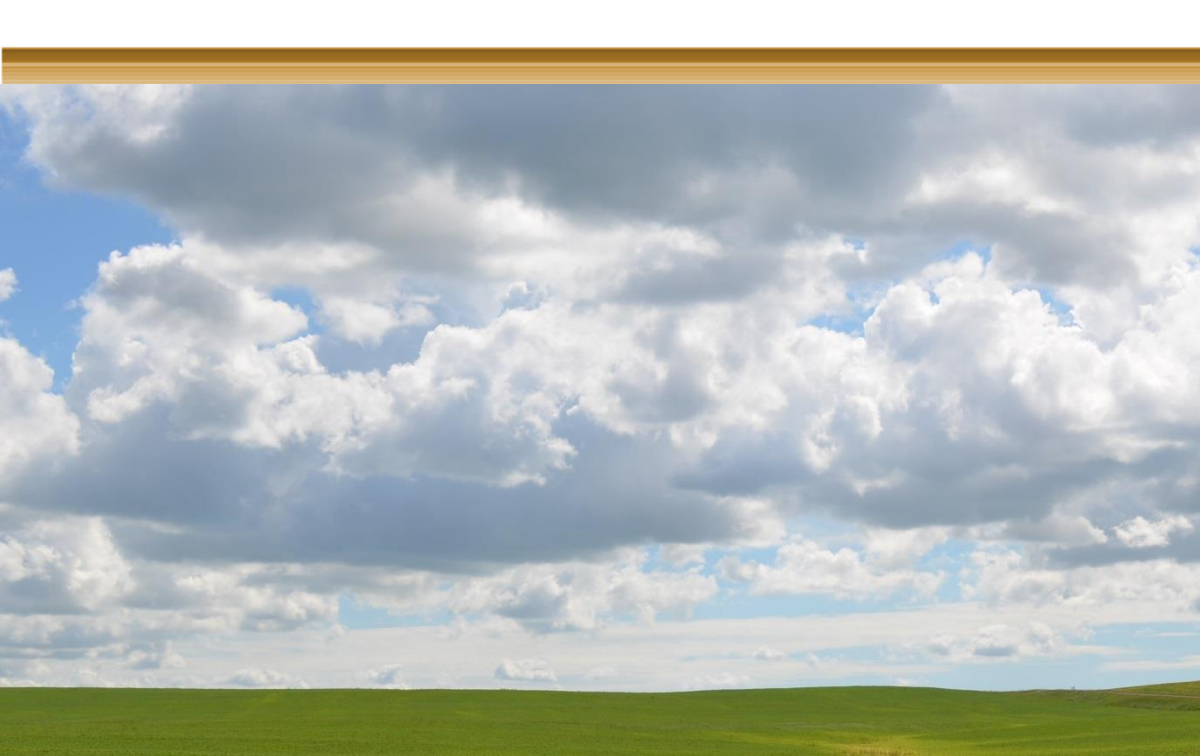
Pea root rot 2017

Legend

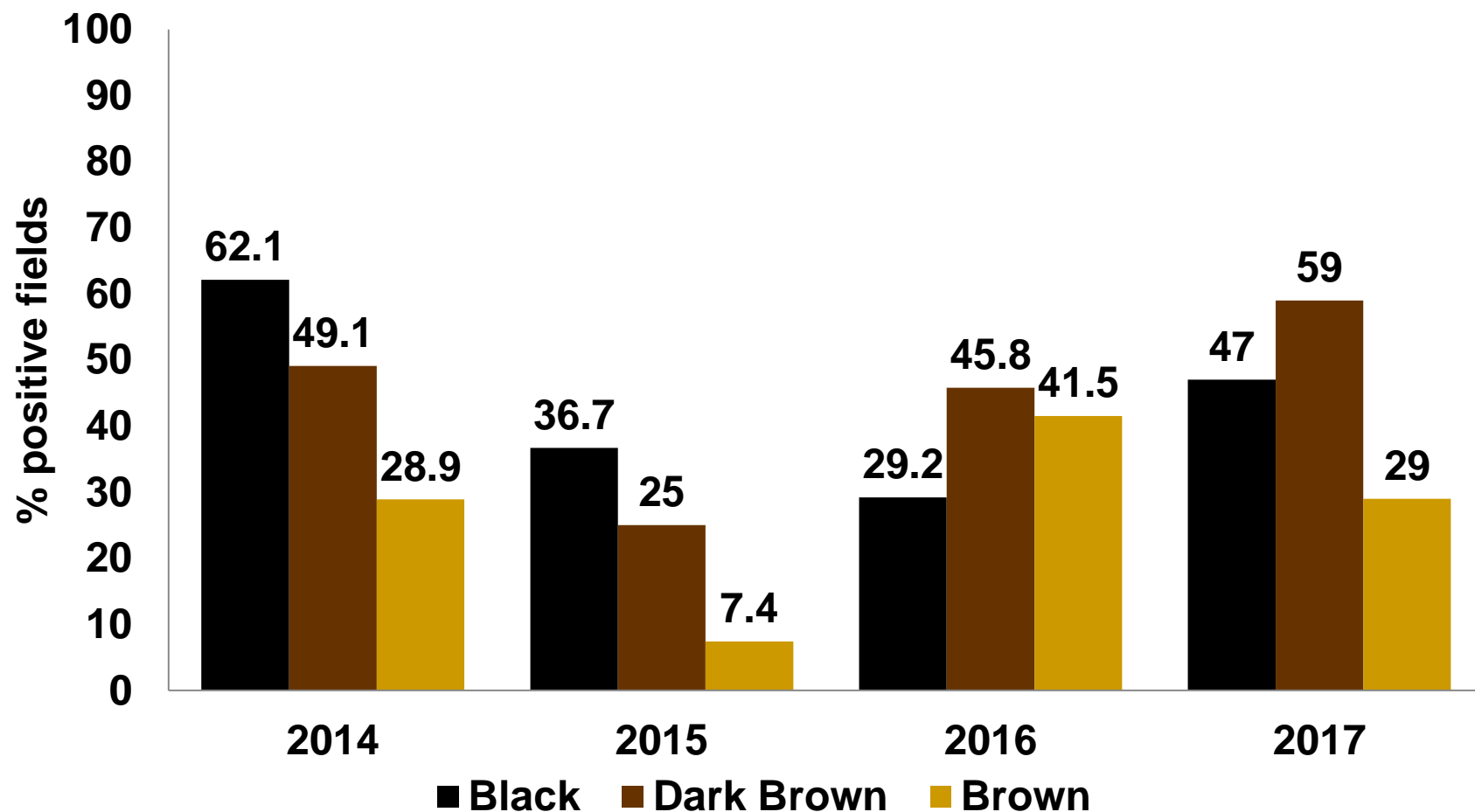
- Healthy
- Moderate
- Severe



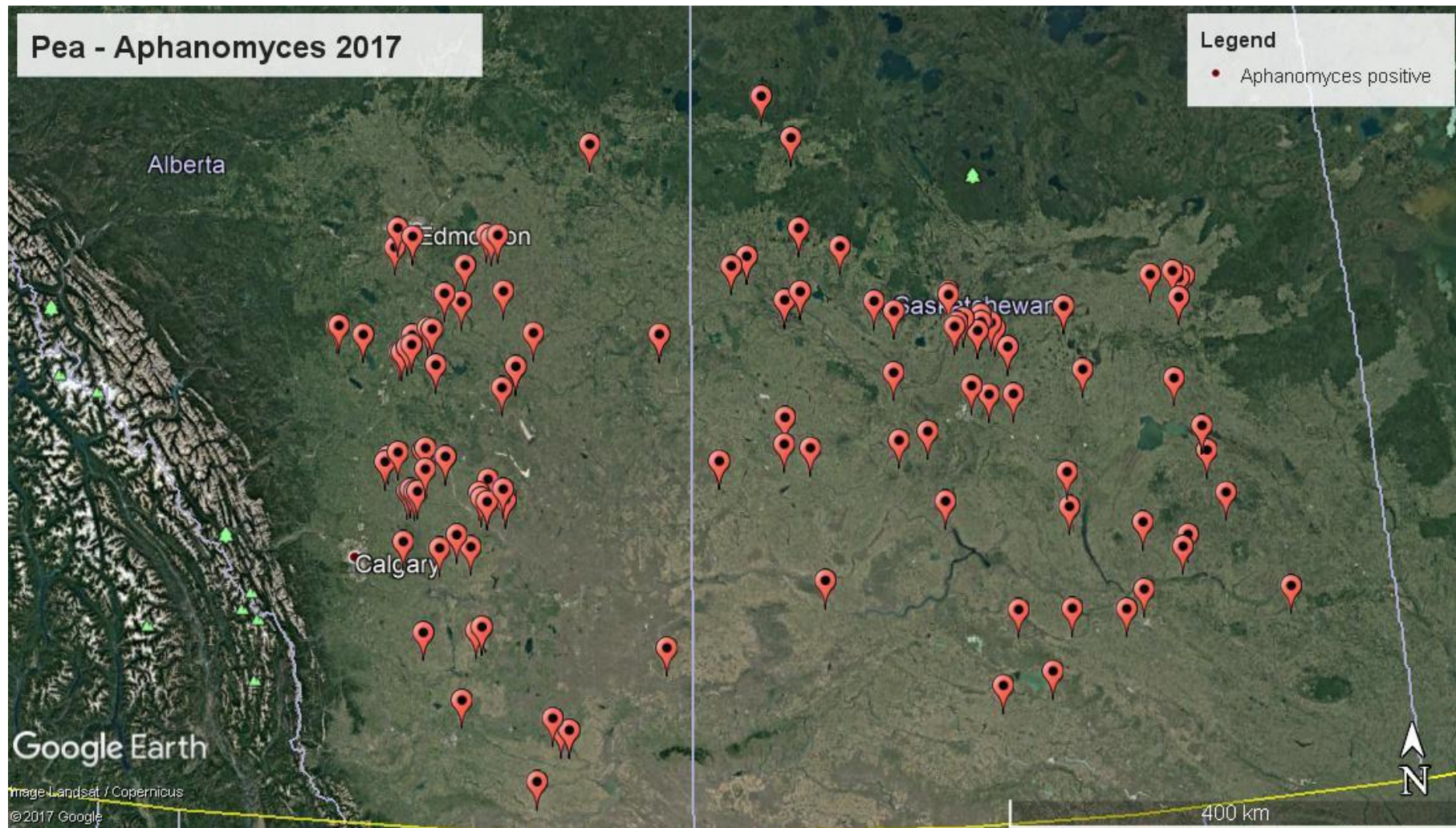




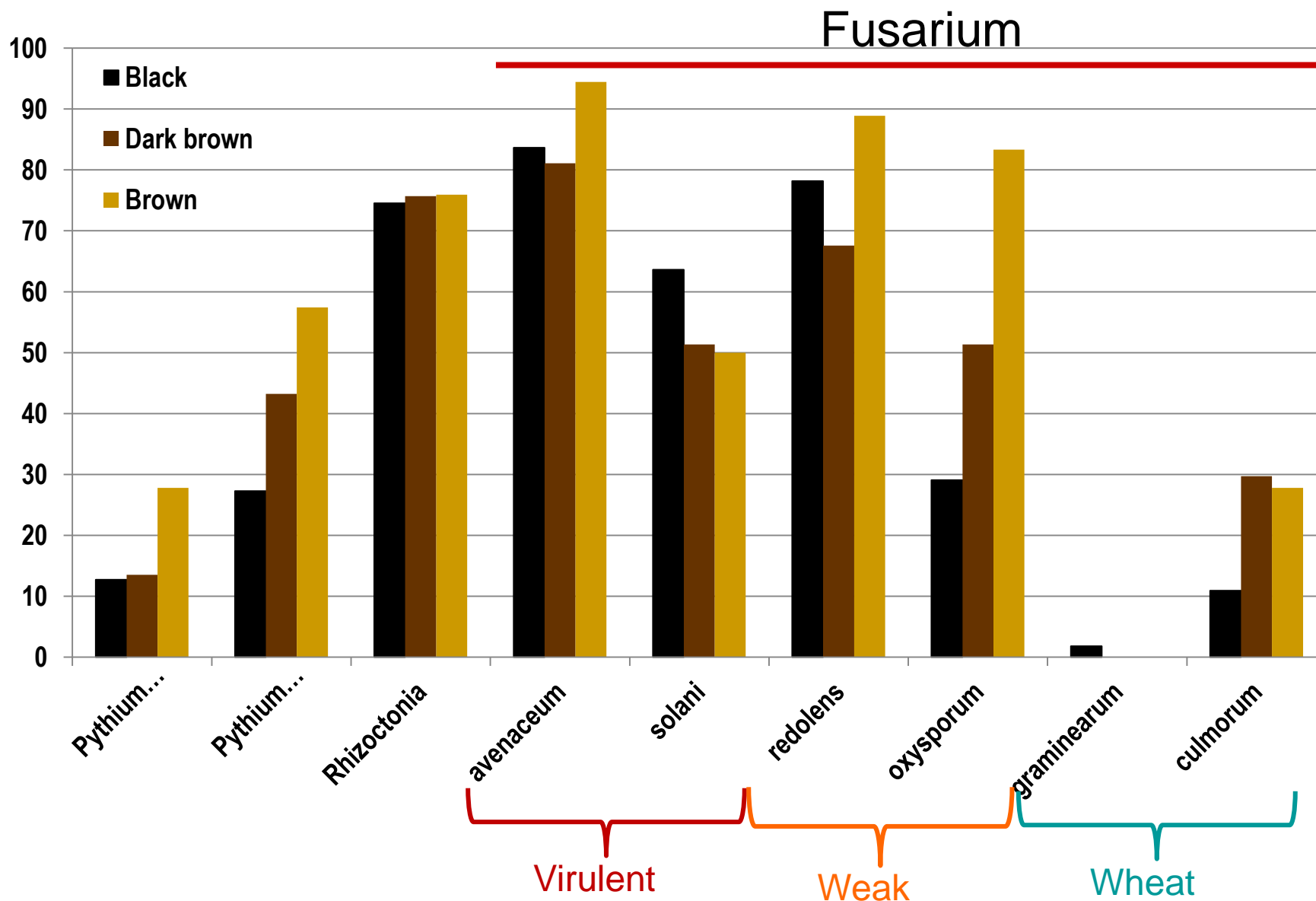
Percent pea fields positive for *Aphanomyces euteiches* over 4 years



Pea - Aphanomyces 2017



Other soilborne fungi....



Symptom expression is not clear-cut



Most often roots are infected with a pathogen complex

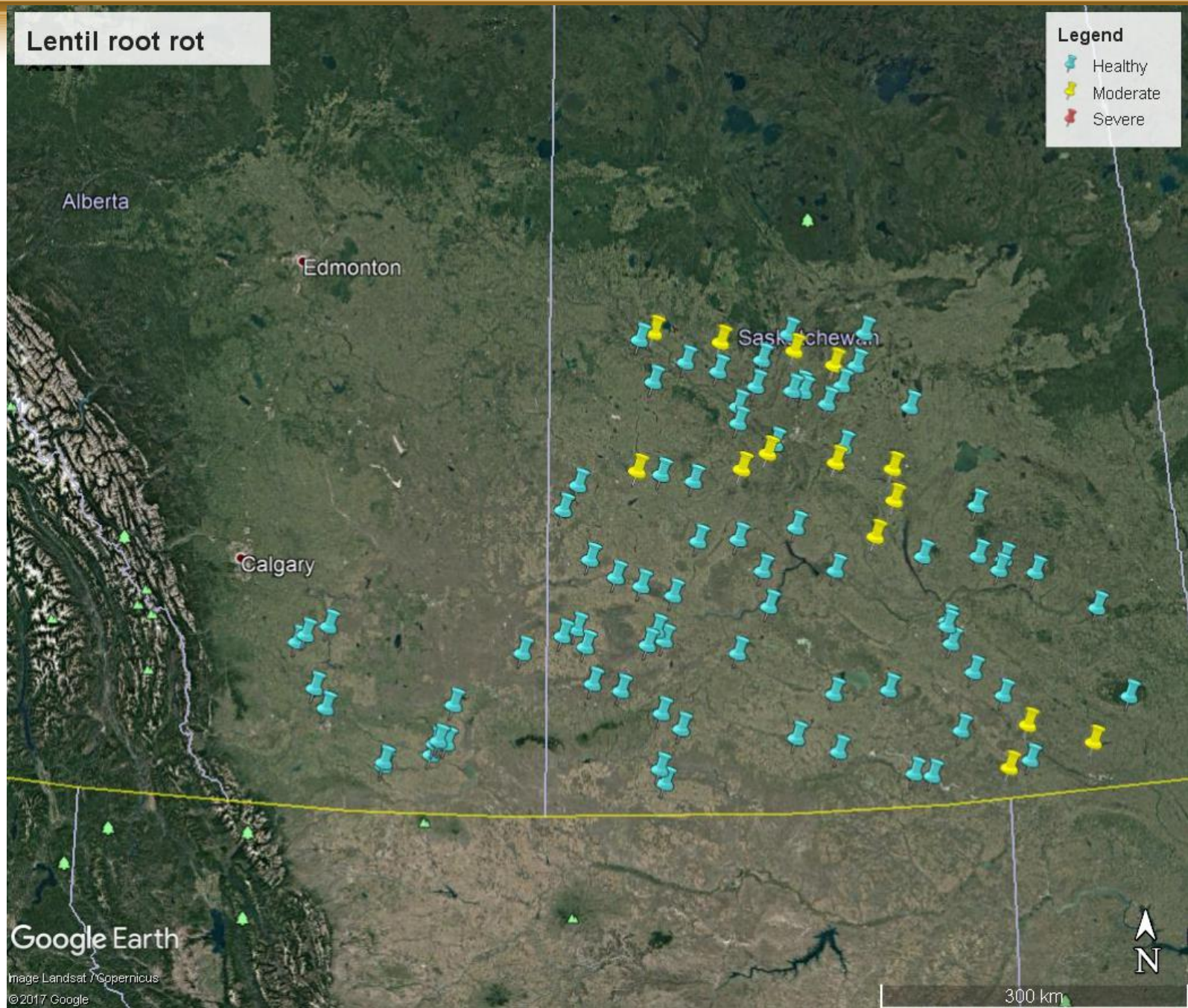
Lentil root rot

	2017	2016	2015
Incidence DS > 1	79	76	76
Incidence DS > 3	3.3	31	21
Mean DS	2.1	2.8	2.5
% Ae	0	48	5

Lentil root rot

Legend

- Healthy
- Moderate
- Severe





Root rot in other legume crops

	Incidence DS > 1	Incidence DS > 3	Mean DS	Ae positive
Alfalfa	32	5.2	1.5	1/5
Dry Bean	40	0	1.5	2/15
Faba bean	25	0	1.3	0/14
Chickpea*	100	29	3	0/3



Root rot incidence and severity and white mold incidence in 29 soybean crops in southern Alberta in 2016

Location	# fields surveyed	Root rot incidence (%)			Root rot severity (0-4)			White mold incidence (%)	
		Range	Mean		Range	Mean		Range	Mean
Brooks	10	25-100	80		0.2-2.7	1.4		0.0	0.0
Duchess	4	60-100	94		0.8-3.6	2.0		18-20	19
Lethbridge	1	95-100	99		1.1-2.8	2.1		0.0	0.0
Seven Persons	10	75-100	98		1.7-3.3	2.8		12-16	14
Medicine Hat	2	94-100	97		2.2-2.3	3.3		11-15	13
Turin	2	45-100	81		0.7-2.8	2.0		16-19	17.5
Total*/Avg.	29*	25-100	90		0.2-3.6	2.0		0-20	8.7

Research activities on root rots

- Field trials
 - Seed treatment efficacy evaluation
 - Cover crops and rotation
 - Tracking changes in inoculum levels over time
 - Distribution patterns of inoculum within the soil profile
- Laboratory work
 - Determining inoculum thresholds for different soil types
 - Quantification of soilborne inoculum for distinguishing risk categories and a decision support system

Foliar diseases of field pea

- Bacterial blight was unusually common in 2017
- Symptoms were shocking in early season, but no effect long-term
- Seedborne – likely seed infection in 2016 due to wet conditions in fall
- No fungicide sprays
- Will it be a problem in 2018?



Bacterial blight:

Mycosphaerella blight:





Bacterial blight incidence

	BB prevalence (%)	BB incidence (%)	Mean disease score
East-central	41	17	0.2
West-central	88	91	0.3
Southern	50	35	0.5



Mycosphaerella blight in 2017

	Prevalence (%)	Incidence (%)	Mean disease score
East-central	98	80	1.2
West-central	51	25	0.3
Southern	53	24	0.3



Faba bean diseases



BRACE YOURSELVES

DISEASES ARE COMING

Foliar diseases of faba bean

- Surveying and isolating pathogens for 3 years
- 2017
 - 100% of fields had leaf spots
 - Site incidence ranged from 20 – 100%
 - Severity was low (primarily small discrete lesions covering 1-2% of leaf surface)

Chocolate spot (*Botrytis* spp.) symptoms



Mix of symptoms/pathogens



Alternaria



Fusarium + Alternaria



Botrytis + Alternaria



Pathogenicity testing of isolated fungi

	2015	2016
<i>Botrytis</i> spp.	4.0 \pm 0.32	3.8 \pm 0.17
<i>Ascochyta</i> spp.	-	2.0 \pm 0.1
<i>Alternaria</i> spp.	1.8 \pm 0.05	2.3 \pm 0.1
<i>Fusarium</i> spp.	2.5 \pm 0.2	3.1 \pm 0.2
<i>Stemphylium</i> spp.	2.4 \pm 0.07	3.7 \pm 0.5



Research projects

- Efficacy of fungicide products in managing chocolate spot (Robyne Bowness)
- Tracking and predicting infectious periods of Botrytis in AB and SK
- Conditions leading to infection by Botrytis on tannin and non-tannin cultivars

Foliar diseases of lentils

- No formal foliar disease surveys conducted in 2017
- No symptoms of concern were noted on foliar symptoms during root rot surveys
- Too hot and dry in lentil growing areas for diseases
- Lentil canopies tended to remain open, growth was sparse and yields were lower than average

Lentil foliar diseases to watch for

- Ascochyta/Stemphylium/Anthracnose



Mary Burrows, IPMImages

Foliar diseases of lentil

- *Sclerotinia sclerotiorum*
- *Botrytis cinerea*



http://www.ars.usda.gov/Research/docs.htm?docid=20320&pf=1&cg_id=0

Conclusions

- 2017 was a good year for diseases (but bad for pathologists!)
- Root rot (peas, particularly) is still and will continue to be an issue
 - Fusarium root rot in chickpeas and soybeans
- Watch out for bacterial blight of peas in 2018
- Continue to monitor for chocolate spot in faba bean



Technical Assistance

- Christine Vucurevich
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- John Nielsen
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