

Plant Pathology

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Crop Diseases in Alberta

Diseases caused by microorganisms reduce production of Alberta crops each year. Average annual losses to diseases of major grain crops are estimated at between 10% and 15%. Additionally, diseases reduce quality resulting in additive losses. For example, *Fusarium graminearum* is estimated

The mandate of the Plant Pathology Program at CDC South is applied research and extension to help Alberta crop producers reduce losses to diseases. Current research projects are listed in Table 1. Where possible, the Pathology program prioritizes work on regulated pests – i.e. those disease-causing organisms listed in the Regulations of the *Alberta Pests Act*. For example, in 2016, the Program led surveys for *Fusarium graminearum* (Fusarium head blight on cereals), *Leptosphaeria maculans* (blackleg on canola) and *Plasmodiophora brassicae* (clubroot on canola). Program staff

to cause reductions of 5% to 10% in yields, but the losses to downgrading are additive, and more significant than the yield reduction. The resulting losses due to *F. graminearum* are between \$3 and \$100 million dollars in Alberta each year.

provided training sessions for Agricultural Fieldmen and Applied Research Associations in Alberta to assist with surveys and ongoing training for potato crop inspections for the bacterial ring rot pathogen *Clavibacter michiganensis* subsp. *sepedonicus*. These monitoring efforts of regulated pests feed into development of response and management plans and creation of sensible, effective policy that utilize best practices for the benefit of crop producers, industry stakeholders and all Albertans.



Blackleg on canola



Clubroot resting spores in canola



FHB on wheat

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Table 1. Pathology Program 2016 Projects

Project Name	Principal Investigator	Sponsors	Duration
ACIDF-2013F109R- Improving Sclerotinia disease control in edible beans and canola	Michael Harding AAF-Brooks	ACIDF,APGC, ACPC, WGRF	2013-2016
ACIDF-2013F111R-Supporting continued development of clubroot resistant canola and early detection of clubroot outbreaks	Michael Harding AAF-Brooks	ACPC, WGRF	2013-2016
ACIDF-2015-CO17R- Fusarium graminearum in Alberta: how bad is it really?	Michael Harding AAF-Brooks	ACIDF, AWC, ABC	2015-2017
ACIDF-2016-C019R- Monitoring Fusarium populations and fungicide sensitivities in Alberta potato storages	Michael Harding AAF-Brooks	ACIDF, PGA	2016-2017
ACIDF-2016-C020R- Assessing the blackleg disease situation in Alberta	Michael Harding AAF-Brooks	ACIDF	2016-2017
GF2-ROI-3858083- Aerobiological surveillance as a proactive method of potato disease management	Michael Harding AAF-Brooks	GF2 – Internal Initiatives	2016-2017
Bacterial ring rot Inspector training	Michael Harding AAF-Brooks	AAF	Ongoing
Dry bean disease monitoring	Michael Harding AAF-Brooks	AAF	Ongoing
ACIDF-2013-F067R- Prevalence, pathogenicity and risk assessment of Fusarium species causing root rot of field peas	Syama Chatterton AAFC-Lethbridge	ACIDF, APGC	2013-2017
ACIDF-2014-C011R- Fungicide Efficacy on Blossom Blight and Stem Rot of Seed Alfalfa Alberta	Ron Howard R/JH Ag Research	ACIDF, ASCA	2014-2017
ACIDF-2014F054R- Identifying promising genotypes, and optimizing seeding density, nitrogen fixation and irrigation for cost-effective soybean production	Manjula Bandara AAF-Brooks	AFC	2014-2018
ACIDF-2014-F092R-Refining dry bean fertility practices	Doon Pauly AAF-Lethbridge	AFC	2014-2017
ACIDF-2014-FHB- An Integrated approach to FHB management in Alberta	Doon Pauly AAF-Lethbridge	AFC	2014-2017
ACIDF-2015-C008R-Development of strategies to manage and understand the evolving strains of clubroot on canola	Stephen Strelkov University of Alberta	ACIDF, CARP	2016-2018
ACIDF-2015-C013R- Distribution of <i>Aphanomyces euteiches</i> in pulse and forage crops	Syama Chatterton AAFC-Lethbridge	ACIDF, APGC	2015-2016
ACIDF-2016-C038R- Validation of infectivity model for <i>Aphanomyces euteiches</i> for Alberta	Syama Chatterton AAFC-Lethbridge	ACIDF, APGC	2016-2018
Effects of shallow and deep-rooted pulse crops in multiple crop rotations	Manjula Bandara AAF-Brooks		
Fusarium Head Blight Risk Forecast mapping	Brian Kennedy AB Wheat Commission	Pending	2016-2020
GF2-Canola Cluster 3.3 - Management of clubroot in a dynamic environment	Sheau-Fang Hwang AAF-Edmonton	GF2 Canola Cluster	2013-2018
GF2-Canola Cluster 3.4 – Clubroot surveillance and epidemiology – staying ahead of an important canola issue	Stephen Strelkov University of Alberta	GF2 Canola Cluster	2013-2018
GF2-Pulse Science Cluster – Survey of nematode pests of pulse crops and development of rapid molecular quantification of the soybean cyst nematode in soil.	Mario Tenuta U of MB	GF2 Agronomy Cluster	2013-2015
Soybean Root Rot	Kan-Fa Chang AAF-Edmonton	GF2 Pulse Cluster	2013-2018
Verticillium of canola survey	Jie Feng AAF-Edmonton	AAF	2016-2017