



Minutes of the 32nd annual meeting of the

WESTERN COMMITTEE ON PLANT DISEASE

18 October, 2007

Penticton Lakeside Resort and Convention Centre
Penticton, BC

In Attendance:

Name

Organization

Chair:

Khalid Rashid* Agriculture and Agri-Food Canada

Secretary-Treasurer:

Robert Spencer Alberta Agriculture and Food

Rob Spencer	Alberta Agriculture and Food
Khalid Rashid	AAFC
Ron Howard	Alberta Agriculture and Food
Neil Whatley	Alberta Agriculture and Food
Cyr Lezin Doumbou	Pest Management Regulatory Agency
Krista Anderson	Bayer Crop Science
Mardi Desjardins	Manitoba Agriculture Food and Rural Initiatives
Karen Bedford	AAFC
Kerry Clark	British Columbia Ministry of Agriculture and Lands
Philip Northover	MAFRI
Peter Sholberg	AAFC
Bruce Gossen	AAFC
David Forster	Syngenta Crop Protection
Coreen Franke	Saskatchewan Wheat Pool
Paula Haag	AAFC
Derwyn Hammond	Canola Council of Canada
Rod McLeod	Chemtura
Sheau-Fang Hwang	AAFRD
April Ingraham	Canadian Food Inspection Agency
Gayle Jespersion	BCMAL
Gerald Martens	BASF Canada
Lori-Ann Kaminski	ARDI
Randy Kutcher	AAFC
Ted Labun	Syngenta Crop Protection
Lean Sera	BCMAL Plant Health
Tim MacDonald	AAFC, Pesticide Risk Reduction



<u>Name</u>	<u>Organization</u>
Mary Ruth McDonald	University of Guelph
Bill McPhee	Okanagan Tree Fruit Co.
Robin Morrall	University of Saskatchewan
Chrystel Olivier	AAFC
Penny Pearse	Saskatchewan Agriculture and Food
Andy Tekauz	AAFC
Siva Sabaratnam	BCMAL
Sarah Stokes	AAFC
Jered Veness	Bayer Crop Science
Peter Walsh	Lakeland College
Shannon Warren	ADFARM

1.0 WELCOME & INTRODUCTIONS KHALID RASHID, CHAIR

Come to order 8:12 AM. Chair Khalid Rashid outlined housekeeping items (CCA Credit signup, acknowledged sponsors) and made brief welcoming remarks. Brief introductions of participants were made around the room.

2.0 ADOPTION OF THE AGENDA

Move adoption of the agenda as presented. (Northover/Kutcher – Carried)

3.0 MINUTES OF THE 31ST ANNUAL MEETING IN 2006, WINNIPEG, MB ROBERT SPENCER, SECRETARY

Minutes of the 2006 meeting were available on the website and when the option to forego review of the minutes was presented, those in attendance accepted. A few small changes (mostly relating to attendees, etc) were sent in the fall by K. Rashid.

Move acceptance of the 2006 minutes as on web. (Pearse/Northover – Carried)

4.0 BUSINESS ARISING FROM THE MINUTES

4.1. TREASURERS REPORT, ROBERT SPENCER

The WCPD bank account remains at the CIBC in Morden, MB. The account goes dormant on a regular basis, due to the lack of transactions. Some activity is required to maintain an open account. Steps have been taken to ensure the account stays active, through a regular withdrawal and re-deposit from a distance.

CHECKING

Expenses for the past year were \$0.00, as there were no charges incurred.

TRANSACTIONS 2006 / 2007

Balance 16 October, 2006	\$3357.18
Debit – Money for deposit into GIC – 19 October, 2006	\$2000.00
Balance forward 25 October, 2006	\$1357.18
 Balance 18 October, 2006	 \$1357.18



BONUS RATE GIC

In response to a motion put forward at the 2006 WCPD meeting, the \$2000.00 was placed in a FlexiGIC account with the CIBC. This account had an annual interest rate of 3.65%. This account type allows for withdrawal from the account (minimum amount is \$1000) as long as a minimum of \$1000 is maintained in the account. It matures after a year and a day.

TRANSACTIONS 2006/2007

Deposit – Creation of GIC – 19 October, 2006	\$2000.00
Interest from maturation of GIC	\$73.00
 Balance 19 October, 2007	 \$2073.00

The money will be reinvested into another 1 year GIC with an annual interest rate of 4.5%, maturing on October 20, 2008.

There was brief discussion of the move to combine the slide set account with the general WCPD checking account.
(Tekauz/Morrall – Carried)

4.2. DISPOSITION OF 2006 RESOLUTIONS

First resolution was to thank the Local Arrangements Committee for a successful event. Second resolution was to merge the slide set account and the WCPD account. This second resolution was not completed as of yet, as the digitization and finalization of the slide set collection has only recently been completed. The combination of accounts will be dealt with after the meeting.

4.3. CORRESPONDENCE

Most correspondence comes by email. Nothing specific was received this year.

5.0 APPOINTMENTS

5.1. NOMINATIONS COMMITTEE

The nominations committee was comprised of K. Rashid, A. Tekauz, R. Kutcher and R. Howard.

There is a need for a chair, vice-chair and some chapter chairs and alternates

5.2. RESOLUTIONS COMMITTEE

The resolutions committee was comprised of P. Pearse, P. Northover

6.0 REPORT FROM EDITORS

6.1. GUIDELINES EDITORS REPORT, MARDI DESJARDINS – PRESENTED BY MARDI DESJARDINS

As always, Thank you! to the Chapter Chairs for their time and effort in preparing the Guidelines and also for their patience with the many questions that come their way from the editors. For the 2006 edition of the Guidelines there was one chapter (Cereals) that was not updated and was posted to our website with a note indicating that it was represented by the last revised edition for that Chapter. Over the past year, Chair of the Cereals chapter Andy Tekauz has kept us updated on the status of the chapter as he has continued to make some major revisions to the disease ratings system that was formerly used in the Cereals chapter.



The good news is that he is nearing completion of the work and it will be ready for posting with the 2007 edition of the guidelines. At this point in time we are not anticipating any problems with revisions of any of the chapters for this year. Guidelines Co-editor Tracy Shinnors-Carnelley has returned from her leave and we have both already begun to plan the work for the 2007 edition of the Guidelines.

Chapters in a word processor format suitable for review and revision are available to the Chapter Chairs on the Western Committee website. Last year we had some changes to the numbers assigned to various chapters but for this round of revisions there are no changes to format or other chapter features planned or anticipated. The completed Guidelines are available in a pdf (Acrobat) format file for general viewing on the Western Forum website and the previous version remains available until the new edition is completed and posted.

A reminder for those updating material in the Guidelines, when revising chemical control recommendations, please do not include rate information since the Committee wishes to keep rates out of the document due to liability issues. This is especially important now that the document is posted on the internet and has a wider audience than previous methods of distribution. Also, look at references given for diseases in your Chapter with a critical eye to see if any of those should be replaced with updated references and if possible to eliminate references that may be redundant.

For this year, the deadline for getting the revised Chapters to your editors is set as November 5th. If Chairs anticipate that they may need additional time, please indicate the anticipated completion date so that work flow can be planned. The completed revisions can be returned in either hard copy or electronic format.

6.2. SLIDE SET / DIGITAL IMAGES EDITORS REPORT, PHILIP NORTHOVER – PRESENTED BY PHILIP NORTHOVER

In 2007, 3 CD-ROM sets were sold (Oilseed, Cereals, and Special Crops). The chequing account is with TD Canada Trust in Edmonton, but access is via the branch in Winnipeg, MB. Mardi Desjardins and Philip Northover have signing authority. The current bank balance (as of October 15th, 2007) is **\$1401.79**.

Account Activity since October 13th, 2006:

Description	Debit	Deposit	Date	Balance
Balance Forward			Sept 30, 2007	\$2993.26
KW Data Solutions (scanning, database construction)	1,418.15		Sept 27, 2007	\$1575.11
KW Data Solutions (order of complete set and shipping charges)	173.32		Oct 11, 2007	\$1401.79
Order for 4 image sets*		\$150.00*		

*Payment due on receipt (CD's shipped October 12th, 2007), 4 CD's sent, (one for free) due to long delay in shipping (order was placed in July).

Explanation of Charges:
September 27, 2007 (\$1418.15)

Invoice from KW Data solutions for scanning of supplied slides, colour repair, dust and scratch removal, design and construction of web data base with meta data, design CD cover and surface and provide one complete set of discs:



October 11th, 2007 (173.32)

Invoice for KW Data Solutions for 12 CD-ROM's for demonstration of the image collections (\$108.00), 4 CD's (\$36.00) to fill the first customer order, and \$10.00 in shipping charges to ship 4 CD's, plus GST and PST.

In the 2005 WCPD meeting in Canmore, AB, a motion to digitize the slide sets was carried, there was also the suggestion of closing the slide set/digital image account and combining this account with the WCPD account. With the entire process now complete, and all services paid for, the combining of the accounts will be conducted after the 2007 meeting, if the committee still wishes to do this.

In the 2006 WCPD meeting in Winnipeg, MB a motion was passed by the resolutions committee to include GST, and shipping charges in the \$50.00 fee, subtracting the GST each CD is sold for \$47.17, subtract a \$9.00 cost for each CD-ROM and the return on each CD is \$38.18 before shipping. Net return will be between \$33.00 and \$37.00 per CD after shipping. All initial costs will be covered if at least 35-40 CD-ROM's are sold. This motion did not consider the possibility of companies and governments that are GST free.

Should WCPD still consider the \$50.00 fee that includes the GST or add the 6% to the \$50.00 for a total of \$53.00?

Future Guidelines/Rules for Slide Set Editor to follow:

- allow uses for webpages—for free, charge?
- uses in publications such as trade journals, newspapers
- how image should be cited include original photographer, or only mention Western Committee on Plant Disease.

Advertising:

Currently the only promotion of the CD-ROM's has been on the Western Forum Website at: http://www.westernforum.org/wcpd_slide_set.htm since March. An additional notice will be sent for the next and future CPS news updates.

Other possibilities: request a link be placed on the CPS website?
Mention or display at regional and national CPS meetings or other plant pathology/agronomy meetings?

Procedures for Shipping and Handling

With no indication as to how popular these collections will be (now that the cost of each collection is considerably cheaper than the previous process of recopying slides). Shipping and maintenance of CD inventories, becomes an issue.

KW Data Solutions has offered to print off the CD collections, as orders come in, and ship them to the customers at cost. The slide set editor/WCPD

The ordering and shipping process is below:

- 1: WCPD slide set editor receives an order.
- 2: WCPD slide set editor generates invoice.
- 3: WCPD emails invoice and details to KWDS
- 4: KWDS prints CD jacket(s) and burns CD(s) (WCPD is charged \$9.00 per CD)
- 5: KWDS packages and ships CD(S) to end user.



6: KWDS generates a monthly statement (invoice) for work done.

The cost for this process is \$10.00 per order (there is no difference in cost when shipping by Canada Post for 3 CD's -12 CD's) If the order is 1 or 2 CD's they could be shipped in a padded envelope for \$5.00. Larger orders (more than 12 will be determined individually).

The \$10.00 cost covers the mailing charges and a 6X6X6 inch box. WCPD will be billed monthly for shipping for any orders sent out that month. Shipping of any CD order will take place each Tuesday.

Attached are a list of all "missing images"--diseases mentioned in each of the chapters, which have not corresponding pictures. In the past the slide sets were limited in size, with the slides now digitized, this is not a concern. Each CD-ROM can hold about 250 images, a DVD was able to hold all of the existing images. This is not a request for more images now, but any future updates could benefit from having images of the diseases listed. If you have any of these disease, on slides or digital images, put them in a safe place for now.

Discussion – R. Howard asked about the process for adding new images. P. Northover responded that slides could be scanned and a master list created. New images could be added yearly. P. Walsh asked about the addition of digital images. 11 megapixel camera minimum is required.

6.3. WEB SITE EDITORS REPORT, RALPH LANGE – PRESENTED BY KHALID RASHID

The Western Forum on Pest Management (WFPM) web site is located at www.westernforum.org. The site currently has content from the Western Committee on Crop Pests (WCCP) and Western Committee on Plant Disease (WCPD); the sites for each of these committees are sub-pages linking from the WFPM home page. The WFPM site continues to be hosted by Geo-Hosting <http://www.geohost.ca/>. The WFPM has an annually-renewed "Bronze" contract, and is entitled to 100 MB web space and 100 GB web traffic per month. Currently WF is using 76.61 MB of web space, an increase of 22.11 MB from last year. Storage space requirements have been increasing by approximately 22 MB annually. Average web traffic for the past month was 314.716 MB, up from 210.9 MB and 8.9 MB for the same periods in 2006 and 2007, respectively. The busiest month in 2007 is October. The site was created and is maintained using Microsoft FrontPage 2000. The current web editor would be pleased to pass responsibilities to a successor, should anyone want the job. Annual costs (Canadian dollars) to WFPM for the website are \$90.10 for domain registration, hosting, and GST. Expenditures are detailed in Table 1. Nearly three quarters of requests to the web site are for WCPD-related files. For the period 12 September 2006 to 12 October 2006, 72.44% of requests were made for WCPD documents, 72.44% for WCCP documents, and 5.52% for WFPM or general files such as logos. Table 2 is a listing of the 20 most common search terms in September – October. I have including the table because the terms may provide some clues about the type of information that users would like to access.

Table 1. Payments to Telligent corporation for web hosting and westernforum.org domain registration since inception of the current Western Forum web site.

Bill Description	Bill Amount	Bill Due Date	Bill Payment Date	Next Billing Date
Signup - Windows Bronze Web (1 years), New Domain: westernforum.org (1 years)	\$90.95	May 6, 2004	May 6, 2004	May 6, 2005
Renewal - Windows Bronze Web hosting with features for 1 year(s) and domain westernforum.org for 1	\$90.95	May 6, 2005	April 22, 2005	May 6, 2006



year(s) - \$(75+10) plus 7% GST				
Renewal - Windows Bronze Web hosting with features for 1 year(s) and domain westernforum.org for 1 year(s) - \$(75+10) plus 7% GST	\$90.95	May 6, 2006	April 21, 2006	May 6, 2007
Renewal - Windows Bronze Web hosting with features for 1 year(s) and domain westernforum.org for 1 year(s) - \$(75+10)	\$90.10	May 6, 2007	April 25, 2007	May 6, 2008

Table 2. Top 20 search terms used to locate information on the WFPM website, September to October, 2007.

Search term	Number of requests	% of top 20 requests
western	66	11.7%
forum	51	9.0%
of	43	7.6%
on	40	7.1%
pest	31	5.5%
and	30	5.3%
plant	27	4.8%
greenhouse	25	4.4%
in	25	4.4%
disease	25	4.4%
diseases	25	4.4%
oil	21	3.7%
virkon	20	3.5%
compositions	20	3.5%
filetype : doc	20	3.5%
aerosol	20	3.5%
rose	20	3.5%
vegetable	20	3.5%
management	19	3.4%
control	16	2.8%
Remaining 829 search terms	1453	n/a

(Tekauz/Gossen – Carried) – motion for all 3 reports

7.0 STATUS OF CPS PUBLICATIONS AND MEETINGS

7.1. DISEASES & PESTS OF VEGETABLE CROPS IN CANADA (BRUCE GOSSEN)

Reported that some progress is being made now on the Vegetable book update. R. Howard, M. McDonald and B. Gossen are the editor team. Currently developing a list of contributors and chapter editors, as well as formats. They are also preparing materials for posting on the CPS website. This includes the English version of the glossary from the Veg book, as it is an excellent resource. At the same time, Robin Morrall and Luke Couture are working on preparing the French Field Crops glossary, and it will be posted very soon. The next segments of the vegetable book to be put on the web are the introductory chapters, dealing with identification, sample preparation, etc. This should be up very soon and will increase visibility. They have gone through the scan and are looking for glitches and very outdated materials. Mary Ruth McDonald is going to be taking the lead of the field vegetable book, Ron Howard will take the lead on the



greenhouse vegetable book and Bruce Gossen will be leading the Herb & Spice and Medicinal book, which will include a lot of material. It will be an 8 book series. Timelines depend on a number of factors, including money from CPS, success, etc.

K. Rashid asked about a link to CPS from the WCPD website and the reverse link from CPS to WCPD.

7.2. DISEASES OF FIELD CROPS IN CANADA (B. GOSSEN/ROBIN MORRALL)

Published at the end of 2003. 8000 copies were initially printed, with approximately 1500-2000 left, due to good brisk sales initially. They want to reprint before it goes out of print, with no revisions done before reprinting. The French edition will include a special cover page promoting glossary on the website. There have been sluggish sales since the initial burst.

7.3. ANNUAL MEETING OF THE CANADIAN PHYTOPATHOLOGICAL SOCIETY (B. GOSSEN)

The 2007 CPS meeting was fantastic, with over 550 participants. It was a good venue with terrific science and great weather. There was some worry about losses, but there was good profit made on walk ins. It is expected that profits may exceed \$40,000.

The 2008 meeting will be CPS alone and will be held in Prince Edward Island.

The 2009 meeting will be held in Winnipeg.

Plant Canada and CPS hold joint meetings every 4 years.

CPS Regional and Alberta pathology groups will meet together in Fall of 2008.

The 2011 meeting will be Halifax.

7.4. CANADIAN PLANT DISEASE SURVEY (R. MORRALL)

Call for reports has gone out from Section editors for 2008 edition. There will be a couple of differences this year. CPS has been running a deficit on this and this will be reduced by raising profits. The CPDS will now operate on a cost recovery basis and will not be subsidized. There will now be a fee of \$35 per article to publish. Libraries that request hard copies of the CPDS will now be charged. In addition to this change, to increase interest with the 2nd language group, an annual summary of major diseases will be prepared "New and Noteworthy Diseases of Canada" in both languages. It will consist of a couple of pages. Submitters are asked to provide a 2-4 sentence highlight summary of their results.

8.0 REPORTS FROM THE PESTICIDE INDUSTRY

There were no pre-arranged reports and when the floor was opened up for chemical companies to discuss new products, there were no requests.



9.0 REPORTS FROM GOVERNMENT AGENCIES

9.1. PEST MANAGEMENT REGULATORY AGENCY (DR. CYR LEZIN DOUMBOU)

Report on emergency, new, conditional and minor use registrations in 2006-2007.

Reported that 9 Emergency use registrations (a number of products are have had emergency registration of a number of years, 4 proposed full registrations, 5 conditional registrations (these registration require confirmatory data, requiring 1-2 years to conduct efficiency/residue trials or whatever else might be required) and 6 URMULEs (Minor Use) were granted this year.

9.2. CANADIAN FOOD INSPECTION AGENCY (APRIL INGRAHAM)

Presented a review of the various quarantine pests that have been discovered over the past 5 years, with information as to the monitoring and containment of those pests. These included:

- Sudden Oak Death (*Phytophthora ramorum*) Sudden Oak Death (*Phytophthora ramorum*) – First found in 2003; in 2004 10 homeowner sites identified and eradicated; in 2005 survey detected positives; National Survey Protocol re-drafted; Surveys conducted in 2006 in sites in BC, ON, QC and Atlantic provinces; Some positive samples from sites positive in past years. Sites surveyed in BC, ON, QC, NS, PEI, and NB in 2007. Sampling is complete in everywhere but BC. 38,000 samples were collected from 50 nurseries in BC. Detected at several wholesale nurseries and landscape sites in lower mainland and Vancouver Island, most traceable to 1 wholesale nursery. No finds in wild land areas.
- Chrysanthemum White Rust (*Puccinia horiana*) – found in 2005; re-survey of all positive locations negative; positive sample in October 2006 in floral shop with trace back to production facility. CFIA has asked for deregulation. USDA has tightened controls, increasing surveillance and now regulating cut flowers. Industry consultations are ongoing regarding increasing import restrictions. Currently, whole states are regulated if no surveys to indicate freedom. 2007 survey of 9 lower mainland sites, 5 island sites. 1 positive nursery in Fraser Valley, traceforward found multiple positives, which have been destroyed.
- Plum Pox Virus (PPV) – regulated areas in Ontario and Nova Scotia, surveys in both areas with positives detected; no surveys in BC or QC because negative last 3 years; Strain D in Canadian survey, new strain (PPV-W) detected in 2 trees in one isolated site. In ON, 565,683 samples have been collected from orchard samples and 11,265 samples from residential sites; 216 positives from orchards, 78 positives from public/residential. In NS, 106 samples collected with no positives. No surveys were carried out in BC and QC following 3 years of negatives. Motherblock surveying in BC found no positives.
- Blueberry Scorch Virus (BIScV) – 2 strains, USDA feels BC strain more aggressive than Eastern U.S. strain; Wide distribution in Canada. Starting in November 2007, USDA enforcing regulation (certification of freedom from strain BC1 and BC2). CFIA certification program will not be able to meet US regulations (hard to meet regulations). In 2006, Canada exported \$2.6 million in



Blueberry plants. No *vaccinium* will move south of the border very soon. Host list is increasing. CFIA does not feel that this meets the definition of quarantine pest, therefore industry must develop a certification program. It is difficult to maintain “free-from” status due to aphid transmission.

- Potato Cyst Nematodes (GOLDEN NEMATODE, *GLOBODERA ROSTOCHIENSIS*; PALE CYST NEMATODE, *GLOBODERA PALLIDA*) – Considered international quarantine pests. Golden Nematode detected in Newfoundland in 1962 and Vancouver Island in 1965; Pale Cyst Nematode reported in Idaho in April 2006; Golden Nematode detected in Quebec in August 2006; extensive surveying to delimit infested area. CFIA and USDA have developed a joint certification protocol for potatoes traded between USA and Canada. In March 2006, seed lots still in storage tested. Huge issue this year. Extensive field surveys in Fall 2007. Perimeter sampling of every field of seed potatoes destined for the US. 5600 samples collected to date in Western area, results pending. Very rigorous sample collection “Holier than the pope” and very rigorous biosecurity process – slows everything down. 2008 survey and beyond – need to maintain surveillance of regulated areas, national surveillance will likely continue (may focus on establishing field status prior to production) and may expand to include some commercial fields, maintenance of pest free production site and area, maintain and gain access to importing countries, Certification requirements.
- Grapevine Phytoplasmas (Flavescence Dore; Bois Noir) – Area planted to grapes for wine production increasing yearly. There has been a dramatic increase in imports of grapevines from France since 2004 (1,000,000 vines to BC this year alone). Surveys of vineyards planted with off-continent vines (France/Germany) in last 3-4 years; survey for visual symptoms; 2007 surveys in BC, ON, QC, NS. BC survey of 81 sites in BC interior. 2 Bois Noir finds in ON (1 from 2006 import, 1 from 2001), trace-back activities underway.
- Soybean Cyst Nematode (*Heterodera glycines*) – regulated pest – soybeans, potatoes, root crops, soil. Survey using field perimeter soil sampling. found in Southern Illinois; Last Canadian survey = 2002; 2006 survey of ON, QC, MB. No positives in MB in 2006. In 2007, 25 sites surveyed in MB, 15 counties surveyed in ON, QC sampled. Results pending.
- Bacterial Wilt of Alfalfa (*Clavibacter michiganensis subsp. insidiosus*) – The EU has officially recognized Canada as pest free for BWA. Field certification and seed testing no longer required. CFIA will continue to survey for this pest, in order to justify the pest free status.
- Verticillium wilt in Alfalfa – delegation from China did sampling but status of survey is unknown.

9.3. OTHER PRESENTATIONS –TIM MACDONALD AND KAREN BEDFORD

Due to the nature of their topics (Pesticide Risk Reduction Program and Minor Use Program), of concern/interest to both pathologists and entomologists, these presentations were scheduled for the WFPM meeting to be held the next day.



10.0 DISEASE SITUATION REPORTS AND GUIDELINE UPDATES

10.1. CEREALS (ANDY TEKAUZ)

Environmental Conditions

The 2007 growing season can best be characterized as being variable across all crop types, including cereals. Early season soil moisture and temperature conditions were generally favourable for seeding and crop emergence, and also favourable for early-season disease development. In some regions, excessive moisture in mid-May resulted in a halt in seeding operations which then resumed towards the end of the month. In wheat, in particular, tan spot was reported as quite widespread on seedling and tillering plants and foliar fungicide application was common (e.g. at half-rate levels), particularly in Saskatchewan and Manitoba. However, from late June to early August a hot, dry spell occurred in many regions, at the time most cereal crops were heading and flowering, which curtailed development of leaf spots, some rusts, and fusarium head blight for which previous conditions appeared to be favourable to trigger a 2007 disease epidemic. Conditions in the latter part of the growing season were variable, but generally this was a cooler period, with some localized showers which impeded harvesting operations in the latter part of August and early September. In Central Alberta, conditions remained drier than normal, or desirable, for much of the 2007 season, and growing conditions were less favourable than normal.

Rusts

In 2007, wheat leaf rust was found at higher than average levels in Manitoba (15.7 % vs. seven-year average of 11.9%) and at about average levels in Saskatchewan (4.9% vs. 6.6%). This was one of the notable 'highlights' of the disease situation on the prairies. Stripe rust was seldom seen and generally only at very low levels in spring wheat. Stripe rust was however seen at significant levels in some winter wheat crops and experimental trials in Saskatchewan and central Alberta (up to 100% severity), suggesting that winter wheat could act as an 'early warning system' for stripe rust in the spring crop. As usual, no stem rust was seen in wheat, and there were only a very few barley fields in which a trace - 5% of stem rust was seen. In oats only low levels of damage occurred to stem rust in 2007, and no damage in wheat or barley. Early seeding of many crops in Manitoba where stem rust would be most prevalent and the widespread use of foliar fungicides in 2007 contributed to low rust levels. In oats, a trace of crown rust was first seen on July 6 on wild oats in Manitoba, but crown rust subsequently only developed slowly due to the hot temperatures and lack of moisture. For the most part crown rust levels were still mainly at trace by August 1. Some later-planted fields had higher severities (5-40%), but these more significant rust levels developed at about the early dough stage, too late for the rust to cause any significant damage. (Aecia of crown rust were first observed on June 18 in MB and June 6 in Saskatoon SK; the latter indicates that the fungus can complete its life cycle in that region).

Smuts

No particularly notable developments.

23% of 110 fields of common wheat, mainly at Tr

69% of 16 durum fields, mainly at Tr

0% of 34 fields of oat



39% of 18 fields of 6-row barley, mainly at Tr (loose smut)
8% of 39 fields of 2-row barley, all Tr (loose smut)
0% of barley, 2 and 6-row (covered smut, false loose smut)
(6 isolates of *Ustilago tritici* from common wheat were able to germinate and grow on agar medium amended with carboxin)

Fusarium head blight

Manitoba

	FHB Index	Incidence	Severity
Winter wheat	3.3% (0.2-14.2%)	5.9% (0.3-18.1%)	56.1% (25.0-90.0%)
Barley	1.3% (0-11.4%)	9.4% (0.6-37.9%)	10.1% (3.0-30.0%)
Oat	0.03% (0-0.23%)	0.5% (0-3.8%)	5.4% (0-6.0%)
Spring wheat	10.1% (14.0%)	21.7% (30.0%)	32.8% (47.7%) (southern MB)

No information on causal species.

Other: DON levels in winter wheat much higher than expected (based on sampling of a few crops); most winter wheat in MB was CDC Falcon; “a fungicide regimen of Folicur followed by Tilt appeared to provide a better measure of FHB control”.

Saskatchewan

Total of 240 fields surveyed

110 common wheat, 40 durum, 48 barley, 17 oat, 25 corn

Only 23% of both common and durum crops had FHB.

FHB severity (FHB Index) 0.2% for both wheat and durum

- highest severity of 16% found in an irrigated field of CPS wheat (*F. graminearum*), next highest 2.4% (irrigated HRS wheat, not F.g.)

- most common species, *F. poae* (53%), F.g (28%, = 5 fields, all from south east region or from irrigated)

58% of barley crops had low levels of FHB

- FHB Severity 0.6%

- highest severity 7.2% (two-row barley in east-central region, *F. poae*)

- most common species F.p. (84%), *F. sporotrichioides* (7%); F.g. from only one field (irrigated 6-row field of Conquest barley)

24% of oat crops had FHB

- FHB severity 0.04%

- all infections caused by F.p.

No data for corn at this time.

(Quality of 2006 cereal seed for 2007 spring planting was good, and only the level of F.g. was low, and average of only 0.1%; total Fusarium was 4.0%, mainly F.p. and *F. avenaceum*)

Alberta

16 field surveyed in central Alberta

- 2 fields with one suspect head found in each - causal agent(s) not available at this time

No formal survey of barley, but one ‘suspicious’ head recovered from one field

Leaf spots



Manitoba

- no notable developments from field crop surveys

Leaf spots in wheat, barley and oats all at normal to below normal levels resulting in minimal damage to crops. No information on causal agents, i.e. the most prevalent diseases.

Saskatchewan

The lush growth in spring resulted in rapid leaf spot development in wheat, and in particular of tan spot (*Pyrenophora tritici-repentis*). There was a 'push' to apply ½ rate of foliar fungicides with herbicides at the seedling stage (many farmers feel that once they have applied a fungicide that they will get protection for the entire season). Subsequent hot, dry weather curtailed leaf spot development

The most commonly isolated leaf spot pathogen was P.t-r., followed by *Stagonospora nodorum*, *Septoria tritici*, and *Cochliobolus sitivus* at the lowest frequency.

Barley leaf spot sample analysis has not been completed at this time.

Alberta

All 16 wheat fields surveyed were diagnosed with 'Septoria' leaf spots, and levels were in the trace to moderate range in the upper canopy, a level that was higher than seen in the previous two years. Tan spot was found in 5 of 16 fields at low levels (one field was 'moderate').

In barley, 10 of 15 field had scald at low to moderate levels (0-5 on 0-9 scale), net blotch in 10 of 15 fields (severity of 4); all 15 fields had some type of 'other' leaf spotting (1-7 severity level), likely the result of a combination of spotted net blotch, spot blotch and physiological leaf spotting. Overall, leaf spotting levels in 2007 were lower than observed in 2006.

Root Rots

Alberta

CRR was detected in 13 of 16 wheat fields and 14 of 15 barley fields. Severities were generally 'low'. CRR incidence in wheat was of higher incidence than in previous years. One barley field had a 'high' level of root rot. Take-all was observed in only 2 wheat fields at trace levels.

Virus

Saskatchewan

More calls than usual were fielded by SK personnel regarding BYD and WSM in wheat, oat or barley crops in Saskatchewan. Hot weather in July further stressed plants making viral symptoms more obvious. The continued interest in production of winter wheat (almost double the acreage seeded in fall 2007 compared to 2006; up 30% in Manitoba) suggests that viral diseases, particularly in wheat, will become a larger problem and require closer scrutiny and attention).

Other Issues/Observations/Comments

Some ergot reported on fall rye and grasses grown for seed in Saskatchewan. Ergot was detected in brome and other ditch grasses, based on anecdotal observations. Some ergot



may have developed in early-seeded cereals that flowered in June when the 'sticky spore' stage of ergot occurred in grasses and may have been spread to these cereal crops.

The MAFRI diagnostic laboratory experienced a significant increase (2 - 5x) in the number of cereal submissions in 2007, particularly for CRR (22 samples), FHB (16), leaf rust (30), Septoria leaf spots (22), Tan spot (26) and WSMV (18). In oat, bacterial blight was diagnosed in 11 samples.

Cereal Chapter

Major revisions were undertaken and completed this year. Changed rating system for varieties to a 5 category system to match most provincial seed guides. Most diseases in 5 categories unless disease is a treat or not treat thing, or if varieties were not tested for a long time and therefore only have 3 ratings (Older varieties haven't been tested against new strains, so have the old ratings). Alberta was urged to go to a 5 category system.

K. Rashid → Follow cereal chapter for other chapters – either right away or next year. Vote next year.

10.2. FORAGE LEGUMES

SHEAU-FANG HWANG

Alberta (S.F. Hwang, R.J. Howard, G.D. Turnbull, C. Yoder, G. Hutton)

No formal forage disease surveys were conducted in 2007. Samples and reports received included spring blackstem, downy mildew, verticillium wilt and boron deficiency in alfalfa. Hot, dry weather deterred the development of most common foliar diseases in southern Alberta. No major diseases were reported from the Peace region except for a case where alfalfa leaves wilted and turned black. No follow-up was available for this case.

Saskatchewan (M. Tremblay, P. Pearse, B. Gossen)

Few calls were received concerning forage legume diseases, except for spring black stem in alfalfa. Hot July weather reduced the risk of leaf spots in forage legume crops. The provincial Crop Protection Lab received 6 forage legume samples this season. Five of these were alfalfa samples: 2 with spring black stem / leaf spot (*Phoma medicaginis*); 2 with crown / root rot (*Fusarium*, *Rhizoctonia* spp.); and 1 with chemical injury. One sample of clover was received with northern anthracnose (*Aureobasidium caulivorium*).

Many areas of Saskatchewan had above average snow cover in the winter of 2006-2007. This, coupled with soil moisture from rain in fall 2006, resulted in minimal winterkill in alfalfa, although low areas in some fields in the northeast were killed due to flooding. Late spring frosts in central and northern regions had a negative impact on forage legumes, slowing development. Most regions, except for west-central and southwest areas, achieved yields above the 5-year average, but generally lower than those achieved in 2006. Hot, dry weather in July reduced the rate of regrowth on many alfalfa fields. Alfalfa seed crops had decent flowering and seed set (due to good bee activity), but yields will be less than those of 2006. Quality is yet to be determined as some crops received wet and cool conditions this fall. The red clover crop is late and in danger of receiving frost.

Manitoba (P. Northover and M. Desjardins)



A total of 22 forage legume samples were diagnosed at the MAFRI Crop Diagnostic Centre. One case of summer black stem (*Cercospora medicaginis*) was found on alfalfa. This is quite a rare occurrence. Five samples were infected by *Phoma medicaginis* (spring black stem and leaf spot), four by common leaf spot (*Pseudopeziza medicaginis*), two by yellow leaf blotch (*Leptotrochila medicaginis*), two by downy mildew (*Peronospora trifoliorum*), and one each by rust (*Uromyces striatus*), sclerotinia stem rot (*Sclerotinia trifoliorum*), stemphylium leaf spot (*Stemphylium* sp.), and verticillium wilt (*Verticillium albo-atrum*). Of the remaining four samples, two were affected by nutrient deficiency, and one each by environmental and herbicide injury. Yellow Blotch of alfalfa was a concern in 2007, and was observed in a number of fields across the province, this disease appears to be on the upswing in Manitoba as it has been observed in an increasing number of fields and in increasing severity over the past 3 years. Blossom blight (Botrytis) caused an estimated 50% loss in one field in the Beausejour area this year on seed alfalfa.

Research Update

Bacterial Wilt of alfalfa was a subject of a study a few years ago. As a result of this work, CABI removed this pathogen from its distribution maps of diseases from the Canadian Prairies: http://www.cps-scp.ca/download/cpds_v85.pdf#page=60

Alfalfa seed growers in southern Alberta would like to see some research done on foliar and flower diseases in alfalfa. They have noticed poor seed set in some fields and think that spring blackstem or some other disease is spreading to the blossoms from the foliage and causing poor pollination and/or seed abortion. They would like to have this problem investigated and possibly some more chemical control trials done. Several growers reported that Headline seemed to work better than Lance against foliar diseases this year.

A study is being conducted in the Peace region on herbicide tolerance in established red clover crops used for seed production. Another study on the control of case bearer larva is also being conducted in red clover seed crops.

COMMENTS → B. Gossen – recommended watching for blossom diseases from Botrytis; careful diagnostics

P. Pearse – disease forecasting

10.3. GRASSES

BRUCE GOSSEN

Wet conditions during the fall of 2006 and early spring of 2007 in many areas of the prairies set the stage for a good forage crop in 2007. Winter conditions were generally moderate and there were no reports of significant winter damage to forage crops. First-cut yield and quality were generally good. Due to high yields in the past few years, hay prices have often been below normal. Dry conditions prevailed across large portions of the region in mid to late summer and disease levels were generally low.

Manitoba (M. Desjardins, P. Northover) - Brown stripe (*Cercosporidium graminis*) developed on timothy (*Phleum pratense*) and other grass species in early July. Samples submitted to the Manitoba Crop Diagnostic Centre were as follows:



Summary of diseases on grasses submitted to the MAFRI Crop Diagnostic Centre in 2007.

Crop	Disease	Causal agent	# Samples
Turf grasses	Anthracnose	<i>Colletotrichum graminicola</i>	4
	Dollar spot	<i>Sclerotinia homeocarpa</i>	1
	Fusarium blight	<i>Fusarium</i> spp.	2
	Leaf spot	<i>Leptosphaerulina australis</i>	2
	Melting out	<i>Drechslera</i> sp.	2
Pasture grass (orchardgrass-brome)	Brown stripe	<i>Cercosporidium graminis</i>	2
Russian wildrye	Ergot	<i>Claviceps purpurea</i>	1
	Root rot	<i>Fusarium avenaceum</i>	1

Saskatchewan (P. Pearse, M. Tremblay, B.D. Gossen) - Snow mold damage on fine turf was minimal. Infection was generally superficial and the turf recovered quickly. Late spring frosts in central and northern regions had a negative impact on some forage grasses, which slowed development. Seed yield of smooth brome grass was low due to diseases (leaf spots, ergot), poor pollination weather, and reduced heading. Meadow brome grass seed yields were also low, likely because of the frost in spring.

Alberta (D.A. Benard, R.J. Howard) - No high or unusual levels of disease were noted.

British Columbia (V. Joshi) - No high or unusual levels of disease were noted.

Research Update

There was little or no research on diseases of grasses in western Canada in 2007.

However, fungicides for stem/leaf spot complex in grass seed production (the mancozeb-based products, Tilt, Stratego and Headline) have been put forward under the Minor Use of Pesticides Program for creeping red fescue, perennial and annual ryegrasses, tall fescue and timothy seed production. Stem eyespot of creeping red fescue continues to be an issue in the Peace River region, and a research initiative on this disease is required.

COMMENTS → Ergot in brome; lower brome yields; dollar spot in turf in Manitoba was significant.

10.4. GREENHOUSE CROPS

ROBERT SPENCER

British Columbia - Prepared / Submitted by Vippen Joshi & Siva Sabaratnam, BCMAL Greenhouse Vegetables

A number of samples with various viruses were submitted to the BCMAL Plant Diagnostic Laboratory. In addition to the samples received by the Diagnostic lab, the following diseases have also been reported from growers and Greenhouse Industry in 2006/2007. These diseases tend to occur annually, causing substantial yield losses.

Cucumber

- Powdery Mildew (*Sphaerotheca fuliginea*)
- Gummy Stem Blight (*Didymella bryoniae*)
- Fusarium wilt (*Fusarium oxysporum* f. sp. *cucumerinum*)
- Pythium root rot (*Pythium* spp.)



Pepper

- Powdery Mildew (*Leveillula taurica*)
- Pythium root rot (*Pythium* spp.)
- Tomato Mosaic Virus

Tomato

- Botrytis blight and stem canker (*Botrytis cinerea*)
- Bacterial Stem Canker (*Clavibacter michiganensis* subsp. *michiganensis*)
- Moldy Calyx or stem-end rot (several post-harvest rot fungi)

Greenhouse Floriculture

A number of floriculture samples from various crops were received by the BCMAL Diagnostic lab. Diagnosed diseases included viruses, root rots, bacterial diseases, oomycetes, etc. There were also a number of Chrysanthemum white rust samples received.

Alberta - Submissions by Ron Howard, Mohyuddin Mirza, Rob Spencer

No organized disease surveys were conducted by Alberta Agriculture and Food for greenhouse crops in 2007.

Cucumbers: *Fusarium lactis*, which has been isolated from pepper internal fruit rot, has been found on roots of cucumbers grown on coir. Water recycling is used by these growers. *Fusarium oxysporum* was also found on the same plants. Powdery mildew was seen on tolerant varieties when temperature and RH was conducive. *Fusarium* and *Pythium* stem rots were also reported.

Tomatoes: *F.oxysporum* was found in two greenhouses. Powdrey mildew was also observed.

Peppers: Internal fruit rot was reported by a number of growers and the primary agent was *Fusarium lactis*.

Eggplants: An unidentified fungal fruit rot was reported.

Bedding Plants: Powdery mildew on petunias was common especially vegetative petunias where high ammonium nitrogen is used to maintain vegetative growth. Fuchsia rust was observed on one set of cuttings obtained from US.

Roses: Powdery mildew was the most common issue. Response to Millstop was good but has to be repeated several times.

General Notes:

New strategies need to be developed in cucumber production with the introduction of the use of supplemental lights, high wire training system and intercropping techniques.

Disease pressure is generally increasing. One grower is using ECA water where active chlorine is generated by an electrolysis process and fed to the plants.

Fusarium Diseases complex in Greenhouse Vegetables in Alberta, 2007

Prem Kharbanda¹, Jian Yang¹, Ron Howard², and M. Mirza³

¹. Alberta Research Council, Vegreville, AB. T9C 1T4; ². Alberta Agriculture and Food, CDC South, Brooks, AB. T1R 1E6 ³. Alberta Agriculture and Food, CDC North, Edmonton, AB. T5B 4K3

The Alberta greenhouse vegetable industry is positioning itself to take advantage of winter production when price is higher for greenhouse cucumbers. Investing in supplementary lights to produce cucumbers year-round has been very successful in some Alberta greenhouses. Production of 225 cucumbers/m² has been achieved encouraging



further expansions for 2007-2008. Other factors responsible for this achievement are adoption of newer crop management practices and technologies such as high wire training, intercropping, and water recycling. However, it appears that this has also considerably increased disease pressure due to *Fusarium* diseases; 10-15% production loss has been recorded due to *Fusarium* stem and root rot in cucumbers and losses of up to 50% have been observed in some cucumber operations.

Greenhouse peppers, have also suffered losses of up to 20% in certain greenhouses due to a new disease, internal fruit rot. Over the past three years, we found the cause of this new pepper disease to be *Fusarium lactis*, which has never before been reported on peppers. Moreover, recently, we found *Fusarium proliferatum*, which is closely related to *F. lactis*, associated with cucumber stem rot for the first time ever. The extent of this problem is not known and we still have to determine if this isolate of *F. proliferatum*, is pathogenic on cucumbers.

Fusarium was a serious problem in greenhouse crops over 25 years ago when most of the growers were planting crops directly into the soil. With the introduction of hydroponics, *Fusarium* problems did decline for a while. However, with the adoption of modern crop management practices and technologies, intercropping and water recycling, new *Fusarium* problems have been reported. It appears that *Fusarium* disease complex is making a come-back and has caused losses of over \$3 million in cucumbers alone over the past 2 years.

Plans to expand our research on *Fusarium* disease complex on greenhouse cucumbers and peppers are underway.

Saskatchewan - Submitted by Glen Sweetman & Penny Pearse

It was a relatively quiet year for greenhouse issues. **Diseases were light in bedding plants.** There were the usual damping off / blights caused by *Pythium*, *Rhizoctonia*, *Sclerotinia*, and *Botrytis* spp. Aphids and spider mites were at typical levels.

The usual diseases were found in greenhouse vegetables. There were low levels of powdery mildew infestations on tomatoes and cucumbers, and downy mildew on cucumbers. No gummy stem blight or sclerotinia was reported. There were more nutritional and environmental damage witnessed this year, likely as a result of inexperienced growers. There were typical levels of insects in vegetables, including spider mites, aphids, and thrips.

Saskatchewan lost 3 greenhouse producers this year because of their inability to be competitive. However, there are new products coming on. The price has maintained for most vegetables, with an increased price for peppers.

The **provincial Crop Protection Lab** received 2 samples of tomatoes grown in the greenhouse in 2007. One sample had leaf mould (*Fulvia* sp.) with secondary infections caused by *Cladosporium* and *Alternaria* spp. Another sample had chemical injury.



Conference and Tradeshow: The SK Greenhouse Growers Association & SK Vegetable Growers Association conference is being held Nov 9-11 at TC Place in Saskatoon. For more information, contact Glen Sweetman at gsweetman@agr.gov.sk.ca or (306) 787-6606.

Manitoba - Submitted by Mardi Desjardins and Philip Northover

We only had a few greenhouse samples into our lab for diagnosis this year. Summary of submissions as follows:

<i>Crop</i>	Pathogen
Cucumber	1 root rot, <i>Pythium</i> sp.
Cucumber	1 mite injury
Tomato	2 chemical injury

Research Update

British Columbia

Research Projects completed or in-progress:

- 1) Evaluation of spray pruners for targeted delivery of fungicides to leaf cut-wounds for controlling botrytis stem canker of greenhouse tomato (Funded by PMC-AAFC and completed in March 2007)
- 2) Evaluation of various seed treatments to prevent bacterial canker in greenhouse tomatoes.
- 3) Evaluation of commercial and experimental disinfectants for efficacy against selected bacterial, fungal and viral pathogens of greenhouse vegetable crops.

Alberta

Alberta Agriculture and Food Projects

We carried out a couple of trials looking at the efficacy of Chemprocide for disinfesting coco coir and sawdust infested with *Pythium* and *Fusarium*. The product did reduce the population levels of both pathogens, but we have not completed the data analysis as yet. Pace Chemicals is interested in expanding the label uses for their product and many growers are interested in reusing their substrate bags to reduce costs.

Saskatchewan

No disease research reported.

Manitoba

No research into greenhouse plant diseases is being conducted in Manitoba at this time.

10.5. OILSEEDS

RANDY KUTCHER

The growing conditions during spring were good for most of the prairie region although parts of northeastern and east-central Saskatchewan received excess moisture which delayed seeding. The onset of hot dry conditions in early July throughout most of the prairies resulted in stress to the canola crop during the flowering stage. As a result, spraying fungicide for *Sclerotinia* control was reduced and decisions on spraying were often being made on a field by field basis. The continuing warm temperatures in August contributed to an early harvest for many Manitoba and Saskatchewan growers. Harvest was also ahead of normal for Alberta with rain delays later in the season. In spite of heat



stress which would have caused some flower abortion, crop yields were generally good. Statistics Canada estimates released on October 5th estimated Manitoba yields at 32.1 bu/ac, Saskatchewan yields were 25.8 bu/ac while Alberta's crop yield estimate was 31.4 bu/ac.

Surveys of the canola diseases were conducted in 33 Manitoba fields and in 101 Saskatchewan fields. In Alberta, a survey specific to clubroot was undertaken. Sclerotinia disease levels were low across all three provinces as the result of high temperatures coupled with low precipitation during most of the flowering period. In Manitoba, Sclerotinia was observed in 39% of the fields with a mean incidence of 3.1% which was similar to the 2005 level. Sclerotinia was present in 34% of the fields in Saskatchewan with a mean incidence of 1.1% which is comparable to incidence in other dry seasons in the province.

Surveys of Manitoba canola fields identified blackleg stem lesions in 61% of the fields with a mean disease of 6.1%. Basal stem cankers from blackleg were present in 39% of the fields with a mean disease incidence of 7.9. Surveys of canola fields in Saskatchewan identified blackleg disease in 38% of the fields with a mean disease severity of 5.2%. In the SK survey, for two fields which had suffered from hail damage, the disease incidence reached 100%. Samples were collected from these two fields for race identification. Although no official survey for blackleg was conducted in Alberta there were reports of blackleg appearing on products classified as resistant which is indicative of new races of the fungus. These reports were primarily from the east-central region of Alberta. Only a few submissions of blackleg infected canola from commercial fields were made to Dilantha Fernando at the University of Manitoba.

Fusarium wilt was found in 18% of Manitoba fields with a mean incidence of 1.2%. The Saskatchewan survey did not find any Fusarium wilt. Fusarium wilt was observed near Lavoy, Alberta although an examination of other fields in the area of the affected variety didn't pick up Fusarium wilt. Research at ARC in which isolates of *Fusarium oxysporum* fsp *conglutinans* were examined, found that they are homogeneous for virulence on selected checks and most belong to VCG A which corresponds to VCG 010, the same group that contains most cabbage yellows isolates.

Other diseases such as foot rot, Alternaria black spot and aster yellows were present at very low levels in both the Manitoba and Saskatchewan surveys. However, there were reports of Alternaria in central Alberta and a number of fields in the Meadow Lake, Rabbit Lake area were affected by aster yellows. Staghead and brown girdling root rot disease did not show up in surveys.

Clubroot has now been identified in 7 counties in Alberta primarily in the region around Edmonton. Surveys of 244 canola fields found 66 new cases of clubroot in 2006. The spread of this disease continues to be a major concern in this region.



The final disease survey reports for Manitoba and Saskatchewan will be published in <http://www.cps-scp.ca/cpds.htm>

From samples submitted to seed labs, chemical injury was the major problem identified in canola, flax and sunflower. The number of samples diagnosed with disease was much lower than in 2005.

The flax survey covered 42 flax crops in Manitoba, 41 crops in Saskatchewan, and four in southern Alberta (4% were Solin). PasmO was the most prevalent disease although severity was lower than in previous years due to dry conditions in July and August. It was found in 92% of the crops surveyed with a range in severity from trace to 5% in most crops and only up to 20% stem area affected in 13% of the crops. Fusarium wilt/root rot complex was observed in 85% of the crops with low severity levels. Powdery mildew was at a long-time low since it was first observed in 1997, and was found in only three crops at traces to 5% leaf area affected. Traces of Alternaria blight were observed in several crops. Rust and aster yellows (Phytoplasma) were not observed in 2006. Lodging in flax was at long-time low in 2006.

A total of 53 sunflower crops (80% confection, 20% oilseed) were surveyed in Manitoba. Dry and above normal temperature conditions were favourable for the sunflower growth and unfavourable for disease infections and development. Incidence and severity of sunflower diseases were at a long-time low. Downy mildew was observed in 42% of the crops at trace to 10% infected plants, much lower than in previous years. Sclerotinia wilt/basal stem infection was present in 72% of the crops surveyed, with incidences ranging from trace to 10%, which is a normal disease incidence in most years. Sclerotinia head rot and mid-stem breakage were present in 47% of all crops surveyed with incidence ranging from traces to 5%. Rust was present in 66% of the crops with severity ranging from trace to 20% leaf area affected. Verticillium wilt was present in 87% of the crops surveyed, with incidence ranging from trace to 20%. *Septoria helianthi* and *Alternaria* spp. were observed in 57% of the crops with trace to 20% of the leaf area affected. Powdery mildew and stem lesions caused by *Phoma* and *Phomopsis* were observed at trace to 5% infected tissue.

12:15 - 13:30 Lunch Break

10.6. ORNAMENTALS

SIVA SABARATNAM

Compiled By: Vippen Joshi, Plant Diagnostic Plant Pathologist
BC Ministry of Agriculture & Lands, Abbotsford

British Columbia (Contributors: Vippen Joshi, Siva Sabaratnam & Dave Woodske (BCMAL))

Nursery Plants – *Phytophthora ramorum* (*P. ramorum*) Blight and Dieback and Sudden Oak death (SOD)



- *P. ramorum* is a quarantine pathogen, known to infect over 70 plant genera, including many native and nursery plant species. *Rhododendron*, *Viburnum* and *Camellia* species are highly susceptible to *P. ramorum*.
- Since 2003, *P. ramorum* has been detected in several nurseries in B.C; it was initially introduced into B.C. on plants imported from the USA.
- Nurseries detected with *P. ramorum* are placed under quarantine and eradication measures are carried out by the CFIA. ***P. ramorum* is not established in B.C.**
- The nursery-lead (CNCP) Certification Program assists B.C. nurseries to ship nursery stock to the USA and within Canada.
- Since 2004, BCMAL Plant Diagnostic Lab carryout the testing of nursery samples for *P. ramorum* for the certification program.
- CFIA and USDA are engaged in bilateral discussions that may lead to harmonization of *P. ramorum*-related programs both in Canada and the USA.

Common Diseases of concern:

- Bacterial blight (*Pseudomonas syringae* and *Pseudomonas* spp.)
- Powdery Mildew

A range of diseases were also diagnosed by the BCMAL Plant Diagnostic Lab, including root rots, foliar blights, cankers, leaf spots, wilts, etc. Powdery mildew on Fir (*Sawadea tulasnei*) was the first report of this species through the lab in 20 years.

Manitoba (Contributor: *Mardi Desjardin, MAFRI*)

A range of diseases were diagnosed by the Diagnostic lab, including fire blight, herbicide and environmental injury, blights, leaf spots, and cankers.

Ornamental Chokecherries - Black Knot:

In spite of the fact that the lab records don't show it, there does seem to be a fairly significant amount of black knot (*Apiosporium morbosa*) on ornamental chokecherry in Manitoba. I think that it is ignored by some folks because they think it is "normal" for the knots to be on the branches. Since there hasn't really been any real survey or investigation all I can say is black knot isn't hard to find, especially in the Schubert chokecherries.

Rose – Rust:

There was an "outbreak" of Rose Rust (*Phragmidium* spp.) in and around the Carman area (<http://www.gov.mb.ca/agriculture/crops/diseases/fac61s00.html>).

Alberta

Not available

Saskatchewan

Not available

Research Update

British Columbia

Research Projects completed or in-progress:

- 1) Evaluation of biocontrols and reduced risk fungicides for control of black spot (*Diplocarpon rosae*) of hybrid roses in British Columbia, Canada: efficacy and crop tolerance



10.7. TREES

RON HOWARD

Ron Howard, Alberta Agriculture and Food, Brooks, AB
Karen Bedford, Agriculture and Agri-Food Canada, Summerland, BC

British Columbia (*Vippen Joshi, BCMAL, Abbotsford*)

The BCMAL Plant Diagnostic laboratory received a range of tree samples with assorted root and crown rots, cankers, wilts, leaf / needle blights, leaf spots / blotches, diebacks and blights, as well as fire blight, anthracnose and powdery mildew.

Alberta (*Janet Feddes-Calpas, Plantuition Inc., Ponoka, AB*)

This year STOPDED (Society to Prevent Dutch Elm Disease) has expanded their vision and mission.

- Vision statement “To protect Alberta’s landscape trees at risk”.
- Mission statement “To work in partnership with communities and government to protect Alberta’s landscape trees”.

The DED prevention program components are public awareness, monitoring for the SEEBB, NEBB, and BEBB, surveillance of elm trees for DED, sampling of suspicious trees, proper elm maintenance, elm inventory upkeep, firewood confiscation at the Alberta-Montana ports of entry, response plan and the provincial hotline.

Pheromone baited sticky traps are used to monitor for the vectors. This past season a total of 455 traps were placed throughout the province. This included 117 municipalities, 29 nurseries, 5 ports of entry, and 29 provincial parks and recreation areas. The larger cities change the traps monthly where as the traps in the remaining sites are replaced twice per season. The first set of traps is set up mid May and the last set taken down the end of September. Medicine Hat doubled their trapping locations within the city due to the detection of one BEBB in 2006. No BEBB were found in 2007 and the number of SEEBB captured has declined dramatically from previous years. To date, Calgary has captured 4 SEEBB all season, Medicine Hat 5 SEEBB in May; and Edmonton has captured one SEEBB also in May. Results are still pending on the last set of traps in all locations.

Forty nine suspect elm samples were submitted for diagnosis to Dr. Stephen Strelkov (University of Alberta, Edmonton). No *O. ulmi* or *O. nova ulmi* was found on any of the samples. To date, the City of Edmonton has confirmed 34 more cases of *Dothiorella ulmi*. Other fungi found in association with *D. ulmi* on the samples were *Cytospora* sp., *Coniothyrium* sp., *Botrytis* sp., *Penicillium* sp., *Cladosporium* sp., *Phyllosticta* sp. and *bacteria*. Lethbridge one sample included *Alternaria alternata* *Verticillium dahliae*, *Fusarium* sp., *Alternaria alternata*, *Aureobasidium (Pullularia) pullulans*. Medicine Hat submitted 3 samples, which included *Cytospora* sp., *Phyllosticta* sp., *bacteria* and unidentified moniliales.

STOPDED's Exotic Forest Pests survey is a new project being undertaken by the Society to monitor our urban forests for exotic insect pests in Alberta cities using pheromone-baited Lindgren funnel traps. The project uses a survey protocol specified by the Canadian Food Inspection Agency's Plant Health Surveillance unit in their monitoring of Invasive Alien Species.



The Society's survey is targeting certain insect groups - bark beetles, metallic wood-boring beetles, longhorn beetles, and wood wasps. To date, about 200 biweekly samples have been received from survey cooperators in Lethbridge, Medicine Hat, Calgary, Red Deer, Fort McMurray, and Grande Prairie with about 1,300 target insects collected. The City of Edmonton, another survey cooperator, is also collecting and tallying its insects. Alberta has been fortunate to remain DED-free. For more information, check out www.stoppeded.org or call the toll free DED hotline number by dialing 310-0000 and ask for 403-782-8613.

Saskatchewan (Penny Pearse, SAF, Regina, SK)

Dutch Elm Disease (DED) Report (Prepared by Laura Duncan, DED summer student)

The Dutch elm disease (DED) program of elm surveillance and tree removal continued in 2007. The program is maintained by SK Environment. Saskatchewan Agriculture and Food assists by cost-sharing a DED summer student who performs the testing in the provincial Crop Protection Lab and answers phone inquiries about the disease.

BioForest, the contract company hired by SK Environment to survey the province for infected elms with DED, has completed a second round of infection monitoring in each of the surveillance communities throughout the province. The surveillance communities are those that have at least 400 elms per 800 people. A GPS system has helped pinpoint where infected elm trees are located that are marked for removal, where past infections have occurred, and where healthy trees are currently growing. Removal of many infected trees has already occurred this season and more will come in the months to follow.

New areas of infection this year included Wynyard, Pangman and Radville. Indian Head had its first positive DED infection in the town, even though many infections have been identified in previous years in the buffer area surrounding the town. Katepwa Provincial Park also had its first infection identified. The infections in Indian Head and Katepwa Provincial Park are not anomalies because both of these areas are encircled or surrounded by infections. Moose Jaw had only two positive samples, after having their first positive case of DED in 2001 and four positive samples submitted last year.

DED continues to make its way westward in the Qu'Appelle valley. Infections are occurring along Pasqua and Echo Lakes in Echo Valley Provincial Park. DED has infected almost all elm trees in Buffalo Pound Provincial Park. Regina lost ten trees this year after only losing one last year. Lumsden continues to be severely affected by DED, with a total of 17 confirmed positive submissions in 2007. Saskatoon continues to remain free of DED.

As of August 27, the Crop Protection Lab received 258 elm samples for DED testing. Of these samples, 64% tested positive for DED. At this time last year, the lab had received 317 samples, of which 48% tested positive. The increase in positives could be attributed to many factors such as: not removing dead elm wood quickly; pruning elms during the ban; or natural spread of the disease by the beetle carrying the fungus. On the other hand, diligent efforts in surveillance, testing and removals have certainly played a role in keeping the numbers of infected elms in the cities and buffer zones to a minimum.



One of the most difficult challenges faced by the program is public cooperation in the enforcement of *The Dutch Elm Disease Regulations* in *The Forest Resources Management Act*. The public is usually eager to allow the surveillance crews to look at their elms, but on occasion property owners refuse access. This can create large non-monitored areas in these buffer zones and has upset those neighbours who have made the effort to protect their trees. The “no pruning ban” is mandated from April 1st to August 31st since that is when the beetles feed and then bore into healthy elms. The beetle is attracted to the smell of freshly cut wood.

Public education is the best tool that the program can use to help prolong the life of our elms. There is a toll-free line for public inquiries about DED: 1-800-SASKELM (1-800-727-5356).

The SK Crop Protection Lab received samples with anthracnose, root rot, Marssonina leaf spot, chemical damage, brown felt/snow mould, etc.

Manitoba (*Mardi Desjardins, Crop Diagnostic Centre, MAFRI, Winnipeg, MB*)

The Crop Diagnostic Lab received a range of plant samples, including anthracnose, cankers, leaf spots, wilts, rusts, needle casts, blights, environmental injury and DED. Numbers and kinds of problems have been fairly typical except that numbers of samples with herbicide injuries were down somewhat this season. Needle diseases of spruce continue to be the most commonly encountered tree disease problem in our diagnostic laboratory. Dutch Elm Disease samples in our records are trees submitted by the City of Winnipeg when the affected tree is on private property and the owner requests proof of disease before allowing the City to proceed with removal.

I spoke with Dave Domke who is the Forester for the City of Winnipeg. His main observation about tree diseases for Winnipeg for 2007 is that, in general, there was little disease observed with insect problems being the major concern. Anthracnose of green ash had been a concern for 2005 and 2006 and with the wet spring we experienced this season he was expecting a third bad year with a possibility of twig dieback due to repeated infections but instead of being bad, it was almost non-existent. For elms, the city groups trees with Dutch Elm Disease and hazard elms together in the same figure and the number was down to 4300 for this year from 5600 in 2006. He mentioned that of that 4300, a higher proportion than normal were hazard trees with the dieback likely due to unfavourable environmental conditions in the previous 1 or 2 seasons. In that context, the incidence of DED infected trees was down significantly this year.

Research Update

British Columbia

No report was received.

Alberta

A survey for Bronze Leaf Disease (BLD), a new and potentially destructive disease of columnar aspen and poplar species, was conducted in Alberta in 2007. This survey was coordinated by Alberta Agriculture and Food, with the cooperation and support of the



Landscape Alberta Nursery Trades Association, rural and urban municipalities, and individual tree owners. Financial support from the Alberta Horticultural Growers Congress and Foundation Society made the survey possible. The nursery industry in Alberta is concerned about the potential introduction and spread of this disease and its impact on tree health.

Alberta Agriculture staff and volunteer surveyors visited dozens of plantings of Tower poplar and Swedish columnar aspen across the province in the spring and fall. Several samples with symptoms resembling those of BLD were collected and sent to CDC South, Brooks for visual examination. These samples are awaiting confirmatory testing by Dr. L. Kawchuk, Agriculture and Agri-Food Canada, Lethbridge using a newly developed molecular diagnostic test. The information collected during this survey will be compiled, analyzed and reported to stakeholders.

Saskatchewan

The AAFC-PFRA Shelterbelt Centre at Indian Head is not directly involved in tree disease research, but they do carry out a number of studies aimed at improving the hardiness, vigour and suitability of trees for prairie shelterbelt and agroforestry uses.

Manitoba

No report received.

10.8. POTATOES

JILL THOMSON / FOUAD DAAYF

This report was presented by K. Rashid.

Alberta

Infectious disease levels were generally below those seen in 2005 and 2006, mostly because of the hot, dry weather that prevailed during late June, July and early August.

The "usuals" were out there of course, e.g. early blight and brown spot, rhizoctonia canker and black scurf, common and powdery scabs, silver scurf, blackleg, white mold, and the early dying complex (*Verticillium*, *Fusarium*, nematodes and *Colletotrichum*). Blackleg was observed in a number of commercial fields. One sample of possible PVY infection was received. There were no reports of late blight this year. It is suspected that some leak, pink rot, silver scurf, soft rot and dry rot problems may develop in storage through the winter.

British Columbia

Disease: Late blight had been first seen in Sumas and Surrey by the last week of June. By the middle of August it had been found to be widespread in Cloverdale, Richmond and Delta as well. By the last week of July, Botrytis (grey mould) was on the increase in most fields.

Physiological: More potatoes with swollen lenticels have been seen going into storage this year, as a result of wet soil conditions. High soil moisture leading to oxygen deprivation is thought to lead to swollen lenticels. These can provide entry points for opportunistic pathogens such as *Erwinia*, *Pythium* and *Phytophthora*.

The provincial lab reported 2 potato samples:



Potato	Norchip	Soft rot	<i>Pseudomonas marginalis</i>	1
	Cascade	Sunken lesions on tubers	<i>Alternaria</i> and <i>Fusarium</i> spp.	1

Submitted by Susan Smith, Field Vegetables and Organics Specialist, BCMAL and Gayle Jespersen, Plant Pathologist, BCMAL

Survey: In spring 2007, Elmhirst Diagnostics & Research and ES CropConsult Ltd. conducted a survey of stored potato tubers in the BC Lower Mainland (Fraser Valley) for black dot (*Colletotrichum*) and silver scurf (*Helminosporium solani*). Only silver scurf was found; no black dot.

Submitted by Janice Elmhirst, Elmhirst Diagnostics.

Manitoba

Diagnostic Report:

The Manitoba Agriculture, Food, and Rural Initiatives Crop Diagnostic Centre received 57 potato samples in 2007 (as of September 26, 2007) (Table1).

Table 1. Summary of diseases diagnosed on **potato crops** submitted to the Manitoba Agriculture, Food and Rural Initiatives Crop Diagnostic Centre in 2007.

SYMPTOM/ DISEASE	CAUSAL AGENT	NUMBER OF SAMPLES
Aster Yellows, purple top wilt	Aster Yellows phytoplasma	1
Bacterial soft rot	<i>Erwinia carotovora</i> subsp. <i>carotovora</i>	2
Blackleg	<i>Erwinia carotovora</i> subsp. <i>atroseptica</i>	4
Black dot, on tubers	<i>Colletotrichum coccodes</i>	1
Black dot, on stems	<i>Colletotrichum coccodes</i>	6
Black scurf	<i>Rhizoctonia solani</i>	5
Early blight	<i>Alternaria solani</i>	1
Fusarium dry rot	<i>Fusarium sambucinum</i>	1
Fusarium dry rot	<i>Fusarium solani</i>	1
Fusarium wilt	<i>Fusarium avenaceum</i>	1
Gray mould	<i>Botrytis cinerea</i>	4
Leak	<i>Pythium ultimum</i>	1
Pink eye	unknown	2
Rhizoctonia stem and stolon canker	<i>Rhizoctonia solani</i>	2
Rubbery rot	<i>Geotrichum candidum</i>	2
Scab, common	<i>Streptomyces</i> spp.	3
Silver scurf	<i>Helminthosporium solani</i>	7
Verticillium wilt	<i>Verticillium dahliae</i>	9
Physiological disorders		3
Environmental injury		1

Field Report:

The relatively hot and dry conditions throughout the 2007 growing season resulted in relatively low foliar disease pressure for the growing season. Moisture conditions were adequate in most areas during the critical tuber initiation stage and therefore processing potato quality should not be negatively impacted by “sugar ends” as compared to the 2006 crop.



In early July there were initial reports of purple top symptoms. This disease is present every year; however the incidence of purple top continued to increase to levels not seen in the recent past. In some fields purple top incidence was estimated to be 8-10%. At this time, no tuber damage associated with purple top infection has been reported.

Early blight continues to be a prevalent foliar disease in many areas, but the most severe cases occur on the coarse sandy soils that are heavily irrigated. Information on the management of early blight and other leaf lesion fungi, referred to as the leaf-lesion complex, is needed as the “marketing push” on newly registered fungicides targeted for early blight control is out-pacing the agronomic information on the use of these fungicide tools as part of an integrated approach. The number of strobilurin fungicide applications per season is increasing, and with this comes the potential for resistance to develop.

Early-dying remains a major concern in some areas of Manitoba. Symptoms of this disease complex appeared in August. *Verticillium* remains the main fungal pathogen involved in this complex.

There were no reports of late blight in Manitoba in 2007.

Other potato industry points of interest:

- Dr. Rick Peters of AAFC Charlottetown, has recently diagnosed 4 lots of potatoes with *Fusarium* dry rot. The isolates of *Fusarium* appear to be insensitive to fludioxonil (active ingredient of Maxim PSP). It is thought to be the first report of resistance to this chemistry.
- As a result of the new CFIA and USDA-APHIS regulatory requirements for the movement of seed potatoes to the United States, all seed potato lots destined for the US must be field tested for the presence of potato cyst nematode. The field sampling is being done according to a 4 x 8 grid technique on 10% of the perimeter of each seed lot. The sampling must be completed by freeze-up as out-of-storage samples will not be acceptable for the 2007 crop. This affects a large portion of the western Canadian seed potato industry as a large percentage of the crop is exported to the US.

Product Registration Update:

The following products are newly registered.

Scala SC, PCP# 28011 – Early blight control

Ranman 400 SC, PCP# 27984 – Late blight control

Ridomil Gold SL, PCP# 28474 - Suppression of pink rot (in-furrow application)

Submitted by

Tracy Shinnars-Carnelley, Farm Production Extension, Potato Pests, MAFRI.

Mardi Desjardins, Farm Production Extension, Crop Diagnostics, MAFRI.

Saskatchewan

Field Report :

There were no significant disease issues observed in potatoes in Saskatchewan this season. No late blight infections were reported. Isolated cases of blackleg were observed. The high levels of aster yellows that occurred in other crops coupled with the high



populations of leaf hoppers present in potato fields resulted in development of a small number of purple top wilt infections.

Two potato samples were received by the Crop Protection Diagnostic Laboratory in Regina (*G. Holzgang*). The causal organisms were identified as *Alternaria solani* and Environmental damage.

Research Update:

Saskatchewan

A number of research trials are being conducted at the University of Saskatchewan.

1. Evaluation of seed piece treatments and in-furrow treatments for control of common and powdery scab and *Rhizoctonia*. In collaboration with R. Howard, Alberta Agriculture.
2. Evaluation of the impact of green manure treatments on development of common and powdery scab. In collaboration with M. Korschuh, Alberta Agriculture.
3. Integrated pest management study for the control of *Rhizoctonia* and blackleg problems on seed potatoes. Funded by: Saskatchewan Agriculture Development Fund, 2006-2009.
4. Study on the impact of silver scurf and black dot on seed potatoes. M.Sc. project, Arcadio Viveros-Guzman, supervisor Dr. D. Waterer.
5. Impact of plant growth regulators on potato skin color and diseases. Dr, D Waterer.
6. The Department of Plant Sciences, working in affiliation with the Saskatchewan Seed Potato Growers Association, Saskatchewan Agriculture and Food and Dr. Ron Pitblado (Weather Innovations Network) continued to conduct research targeted at developing and then delivering Late Blight Forecasting Programs suited to Saskatchewan growing conditions. The disease prediction information generated by this program was made available to potato growers throughout Saskatchewan in 2007.

Submitted by Connie Achtymichuk, Vegetable Specialist, SK Agriculture & Food; Dr. Jill Thomson & Dr. Doug Waterer, Dept. Plant Sciences, University of Saskatchewan.

Alberta

R.J. Howard carried out field projects on powdery scab and silver scurf this summer and will have storage trials with dry rot, silver scurf, pink rot and late blight this fall and winter. All of these trials are focussed on chemical control where registered products will be compared to promising unregistered compounds with a view to gathering data to register more effective or alternative reduced risk products. Some disinfectant trials involving the bacterial ring rot, silver scurf, dry rot, soft rot and pink rot pathogens in simulated storage conditions will be conducted.

- Use of green manure crops to reduce soil-borne pests and diseases of Alberta potato crops – M. Korschuh, R. Howard, R. McKenzie, J. Thomson, D. Waterer, L. Kawchuk, S. Woods

Research conducted at AAFC, Lethbridge

- Molecular consortium – L. Kawchuk – disease resistance introduction into existing cultivars – 5 year project (1st year)
- Western Canada Potato Pathology – L. Kawchuk – Development of diagnostics and control strategies for late blight, verticillium wilt, potato viruses, and other diseases



10.9. SPECIAL CROPS

PENNY PEARSE

Collated by: Penny Pearse, Saskatchewan Agriculture and Food, Regina, SK & Debbie McLaren, Agriculture and Agri-Food Canada, Brandon, MB

- A few calls on canaryseed were received from south-central and eastern regions of SK regarding septoria leaf mottle (*Septoria triseti*) due to the cool, wet spring in June. However, disease pressure decreased as a result of hot, dry weather starting in July. Limited foliar fungicide applications were made. Canaryseed is shallow-rooted and is even more sensitive to heat and drought stress than wheat. Mechanisms used by the plant to adjust for stress include tiller die-back and blasting of the top portion of the head. Non-pollinated florets turned white and did not produce seed. The provincial lab received 2 canaryseed samples: 1 with seedling blight (*Cochliobolus sativus*, *Rhizoctonia solani*); 1 with environmental injury.
- Caraway begins flowering in early June, and as for previous years, the bloom period coincided with moist June weather which favoured blossom blight (*Ascochyta* sp., *Fusarium* spp., *Botrytis*, *Sclerotinia*). The July temperatures would have stopped disease, but by then the damage was done. Disease severities tend to be worse in older stands and in regions where caraway has been produced for successive years. The decline in acreage can be contributed in large part to this disease (as well as low prices over the past few years). There are currently no fungicides registered for disease control in caraway. However, fungicide trials are currently underway and results should provide data for minor use registrations (J. Thomson, U of S).
- Chickpea seed quality is expected to be good this year (e.g. low disease levels, low green seed). Chickpea crops were seeded early and emerged quickly in the spring. Early June moisture was sufficient and chickpeas developed lush canopies, but by the end of June, many regions of the south were short of topsoil moisture. Conditions continued to be very hot and dry in July and August, advancing crop maturity. Some areas received scattered thundershowers and hail damage. **Ascochyta blight** (*Ascochyta rabiei*) developed very early in SK in 2007 and reports in commercial fields were received by June 3 and fungicide applications began the first week of June. Widespread disease reports were received by mid-June and some growers were already on their 2nd fungicide application by then. Scattered showers and cool temperatures in early June were favourable for early disease development. In AB, a few ascochyta blight complaints were received due to cool, wet spring conditions. Some producers said that they sprayed fungicides at least three times (Ron Howard).
 - In SK, there was some concern early in the season as blight symptoms were as easily observed on those varieties rated as 'fair' resistance (e.g. CDC Frontier) as on the susceptible varieties. However, as the season progressed, ascochyta blight did not develop as quickly on CDC Frontier and growers were satisfied with the variety.
 - Once again, this season reiterated that a first fungicide application is needed at the seedling stage in order to limit early spore development and spread. However, there is a need for updated research on the fungicide timings and regimes for these newer varieties.
 - The hot and dry conditions in July reduced disease pressure and growers have reported using 1 or 2 fewer fungicide applications this season.
 - There was also the issue of strobiluron resistance in the fungal population this season. Some of the *Ascochyta rabiei* samples tested by AAFC-Saskatoon (in 2003) and BASF (in 2006) were confirmed to have strobiluron resistance. The response was for BASF to develop a tank-mix package of Headline (Group 11) and Lance (Group 7). Recommendations were to not make 2 strobiluron



applications in a row (whether applied solo or in a tank-mix) and to not end the season with a strobiluron fungicide.

- Other diseases such as botrytis, root rot and sclerotinia were negligible in chickpea.
- The provincial Crop Protection Lab received only 2 chickpea samples in 2007: 1 had herbicide injury with secondary ascochyta blight development; 1 was insect damage caused by alfalfa looper (*Autographa californica*). Chickpea sample submissions to the lab are low because most agronomists / farmers are experienced in identifying chickpea issues.
- A survey was conducted in 26 chickpea fields near the Foremost, Milk River, Skiff, Taber and Wrentham areas of southern Alberta during July, 2007 to determine the occurrence of ascochyta blight (*Ascochyta rabiei*). The disease was widely spread in all fields surveyed although there were variations in disease incidence (0.05 - 100) and severity (0.2 - 3.0) among the locations. Severe disease was observed early in July in the Foremost area. Areas near Skiff, Taber, Wrentham and Milk River had less disease.
- The Crop Diagnostic Centre in MB received 4 corn samples: 2 root rot (*Fusarium* spp., *Rhizoctonia solani*); 1 holcus spot (*Pseudomonas syringae*); and 1 nutrient deficiency.
- Coriander is an annual spice crop and begins flowering in July. Farmers were advised to monitor coriander just before bloom and watch the weather forecast to determine risk of **blossom blight** (*Aureobasidium* sp., *Fusarium* spp, *Botrytis*, *Sclerotinia*). However, the hot and dry conditions limited blossom blight in coriander this season. Extremely high levels (10%) of aster yellows infection were observed in coriander research plots (J. Thomson). The infected plants showed delayed maturity which affected the overall plot maturity and harvesting date.
- The Crop Diagnostic Centre in MB received 13 fababean samples: 8 samples with root rot (*Fusarium*, *Pythium* spp., *Rhizoctonia solani*), 4 samples with chocolate spot (*Botrytis fabae*), and 1 with anthracnose (*Colletotrichum* sp.)
- The Crop Diagnostic Centre in MB received 20 field bean samples: 8 root rot (*Fusarium* spp., *Rhizoctonia solani*); 3 common blight (*Xanthomonas axonopodis* pv. *phaseoli*); 2 halo blight (*Pseudomonas syringae* pv. *phaseolicola*) and 1 brown spot (*Pseudomonas syringae* pv. *syringae*); 2 anthracnose (*Colletotrichum lindemuthianum*); and 4 herbicide injury.
 - Anthracnose was found in the Outlook, SK irrigation region on navy beans and black beans. There was limited common and halo blight observed on beans grown under irrigation. There were no reports of bacterial wilt. The provincial Crop Protection Lab received no bean samples in 2007.
 - Levels of bacterial blight and white mold in AB were much lower this year than in the previous two years, presumably due to the hot, dry growing conditions this summer. R. Howard participated in the legume PIPE (Pest Information Platform for Extension and Education) group out of the U.S.A. again this year. We had sentinel plots of soybeans and dry beans at CDC South and Bow Island where we documented disease occurrence. No Asian soybean rust or any other diseases were found in the soybeans and only white mold, common blight and root rot in the dry beans. We also sampled for *Bean Common Mosaic Virus*, *Alfalfa Mosaic Virus* and *Beet Curly Top Virus* in these plots and none was found.
- The Crop Diagnostic Centre received 23 field pea samples: 7 samples with mycosphaerella blight (*Mycosphaerella pinodes*); 5 root rot (*Fusarium* spp.); 3 downy mildew (*Peronospora*



viciae); 1 anthracnose (*Colletotrichum pisi*); 1 aphanomyces root rot (*Aphanomyces euteiches*); 1 marsh spot (manganese deficiency); 1 environmental injury; and 4 herbicide injury.

- Field peas were surveyed at 33 locations in Manitoba for root diseases during the last week of June and the first two weeks of July when most plants were in the full flowering stage. High temperatures prevailed during the month of July and pea fields matured rapidly. The most prevalent disease observed during this survey was fusarium root rot (*Fusarium solani* f.sp. *pisi*). Other diseases included fusarium wilt (*Fusarium oxysporum*), and rhizoctonia root rot (*Rhizoctonia solani*). (D.L. McLaren, R.L. Conner, D.J. Hausermann and W. Penner)
- Pea foliar diseases were surveyed at 40 locations during the last week of July and first week of August. Most plants were at the round pod stage. *Mycosphaerella* blight (*Mycosphaerella pinodes*) was the most prevalent disease and was found in all fields. Powdery mildew (*Erysiphe pisi*) was observed in only 1 field. White mould (*Sclerotinia sclerotiorum*) was found in 25% of surveyed fields in 2007 compared to 8% of surveyed fields in 2006. Bacterial blight (*Pseudomonas syringae* pv. *pisi*) was not observed in any of the surveyed fields.
- Anthracnose (*Colletotrichum* sp.) was observed in 2 of the surveyed fields in 2007.
- Quality in SK is expected to be good due to early harvest, with some problems reported with green seed in yellow peas and bleached seed in green peas. There was sufficient moisture during June for good canopy development, but then conditions turned hot and dry in July and rapidly advanced crop development. Overall, there were few disease inquires for field peas. **Ascochyta (mycosphaerella) blight** (*M. pinodes*, *A. pisi*) was low due to dry conditions during crop flowering. There were a few reports of powdery mildew in older non-resistant green pea varieties. The provincial Crop Protection Laboratory received a total of 13 field pea samples in 2007: 2 samples had mycosphaerella blight; 11 had root rot (*Fusarium*, *Rhizoctonia*, *Pythium* spp.) with mycosphearella blight as a secondary infection.
- *Mycosphaerella* blight was prevalent in many fields of central Alberta but less severe than last year. Downy mildew of yellow pea was prevalent in many fields in the Vermilion and Beiseker areas. Although downy mildew and *mycosphaerella* blight got off to any early start in some pea crops, the hot, dry weather in July dramatically slowed disease development. *Fusarium* root rot of field pea also occurred in fields near Beiseker.
- Two ginseng samples were received at the BCMAL diagnostic lab: 1 was infected with alternaria blight (*Alternaria panax*) and 1 with botrytis blight (*Botrytis* sp.). Powdery mildew was a significant problem in commercial ginseng plantings this year.
- The Crop Diagnostic Centre in MB received 1 hemp sample with leaf spot (*Alternaria* sp).
- Lentil quality in SK is good, with some discolouration of seed due to the very high temperatures at maturity. **There were few disease problems in lentils in 2007.** Risk of **anthracnose** (*Colletotrichum truncatum*) was low and fungicide applications were mostly not warranted. **Ascochyta blight** (*A. lentis*) was also at low levels in 2007 and very few growers applied fungicides. **Stemphylium blight** was at moderate or high levels by July 20 in several crops in the Regina and Conquest areas (and probably elsewhere) (R. Morrall). This was attributed to the hot humid weather in July. Fungicide applications gave substantial control of this disease in fields and plots, but it is still unclear whether an economic benefit is derived from spraying. More work on chemical control and genetic resistance to this disease is needed. The provincial lab received 15 lentil samples in 2007: 8 had herbicide damage, 3 had



seedling blight / root rot (*Fusarium*, *Pythium* spp.), 3 had anthracnose (*C. truncatum*), and 1 had insect damage.

- The Crop Diagnostic Centre in MB received 13 soybean samples: 4 samples with root rot (*Fusarium oxysporum*, *F. solani*, *Pythium* spp., *Rhizoctonia solani*); 1 bacterial blight (unknown); 1 downy mildew (*Peronospora manshurica*); 1 fusarium wilt (*F. oxysporum*); 1 septoria leaf spot (*Septoria glycines*); 3 with nutrient deficiency; 1 with environment injury; and 1 with herbicide injury.
- Seedling emergence problems in cumin continue to be an issue for potential growers and have also impeded research on this crop (J. Thomson). The provincial lab received 2 cumin samples in 2007, both with blight caused by *Alternaria* spp. and secondary seed rotting pathogens.
- The first case of *Cercospora* sp. (most likely *C. transversiana*) in fenugreek was confirmed at the Crop Protection Lab in SK. Symptoms of cercospora leaf spot include blackening of leaves and stems, leading to significant yield loss.
- Lupin (*Lupinus angustifolius* L.) crops were surveyed for diseases at Rowley, Three Hills, Viking, Barrhead, Lacombe, and Namao in the third week of June and August, 2007. Powdery mildew (*Erysiphe cichoracearum* DC.) occurred only in the experimental field near Lacombe. The disease appeared in early August when mildew spores blew into the lupin plots from adjacent pea fields. It became severe and covered the whole plants in late August. Root rot and wilt were unevenly distributed in the fields surveyed. Seedling blight occurred in the field near Rowley where excessive rains (30 cm) fell in the period between April 20 and June 25. Average disease incidence was 6.5% and ranged from 0-14%. High temperatures (26°C) occurred in the first week of July and August and resulted in severely stunted plants. A heavy hailstorm occurred in the region during mid-July. This removed many of the flowers and caused various sizes of lesions on the main stems. Crops near Viking and Lacombe were mostly healthy in the early growing season. At the blooming stage, a few plants became stunted, and bore only one or two pods per plant at Viking. Many plants showed root rot symptoms in the field near Lacombe. Root rot incidence at Three Hills was 5.6% and ranged from 0 to 25%. Plants at Barrhead and Namao were stunted due to dry soil conditions with root rot incidences of 2.6% and 1.8%, respectively.
- The Crop Diagnostic Centre received 1 millet sample with leaf spot caused by *Bipolaris sorokiniana*.

General comments regarding season - Ron Howard (AAF)

- It was generally a quiet year on the disease front in most of the special crops that we grow in southern Alberta. The cool, wet spring weather resulted in delayed emergence and damping-off in some early seeded crops. The summer heat favored crops such as corn, peppermint, spearmint and spice crops, and I believe that disease levels were mostly below average and yield and quality were generally above average.

RESEARCH ACTIVITIES

MANITOBA – submitted by D. L. McLaren, AAFC:

- Development of a decision support system for the application of fungicides for white mould of dry bean (D.L. McLaren, R.L. Conner, H.C. Huang, D. McAndrew).
- Biological control of sclerotinia diseases in dry bean and canola (D.L. McLaren, R.L. Conner, H.C. Huang, B. Irvine, D. McAndrew).



- Innovative management and breeding strategies for pea root rot diseases in western Canada (D.L. McLaren, R.L. Conner, S.-F. Hwang, K.F. Chang, R. Mohr, B.D. Gossen,)
- Integrated Pest Management strategy for the control of anthracnose for the Canadian Dry Bean Industry. (C.L. Gillard, G. Boland and R.L. Conner)
- Marker-assisted development of dry bean cultivars with multiple disease resistance. (S.J. Park, K. Yu, H.H. Muendel, P. Balasubramanian, R.L. Conner).
- Sources of resistance/tolerance to *Mycosphaerella* blight of field pea. (B.D. Gossen and R.L. Conner)
- Bacterial wilt screening of dry bean cultivars. (Conner, R.L., H.C. Huang, H.H. Muendel and P. Balasubramanian).
- Screening of advanced breeding lines of dry beans for root rot resistance. (S.J. Park and R.L. Conner)
- Development of a PCR based system for the rapid detection and quantification of bean anthracnose infection. (R.L. Conner, Y. Chen, G. Boland, C.L. Gillard, S. F. Hwang, K.F. Chang and D.L. McLaren)

SASKATCHEWAN

Crop Development Centre, University of Saskatchewan (B. Tar'an; T. Warkentin):

- *Molecular approaches for fast track genetic improvement of kabuli chickpea for western Canada:* The research focussed on the genetic improvement of ascochyta blight resistance in chickpea and double podding by molecular marker-assisted backcrossing. A common set of quantitative trait loci (QTL) that are related to resistance to ascochyta have been identified in various genetic backgrounds and crosses. These loci have moderate to small additive effects on disease resistance so it is desirable to incorporate a large number of these loci into new chickpea breeding lines. The research aimed to simultaneously introgress the QTL for ascochyta resistance and double podding while monitoring restoration of the genetic background and select progeny with recombination events in critical chromosome positions by assisted backcrossing.
- *Off season evaluation of chickpea breeding lines (Phase II):* The project continues to utilize the off-season nurseries at ICARDA (Aleppo, Syria) to evaluate the reaction to ascochyta blight, fusarium wilt and cold tolerance of CDC chickpea breeding lines in a systematic manner. This allows effective and consistent selection for ascochyta resistance on a large number of breeding lines. In addition, the nursery will enable us to screen for resistance to fusarium wilt and for tolerance to cold in chickpea. Cold tolerance is a desirable trait for western Canada; it will allow the crop to be seeded early in the season, whereas resistance to fusarium wilt is needed in some years with above average precipitation.

Crop Development Centre, University of Saskatchewan (Sabine Banniza):

- Investigation into the biology of *Stemphylium botryosum*, a potentially new pathogen in lentil production in Saskatchewan. S. Banniza, A. Vandenberg. Co-funded by Saskatchewan Agricultural Development Fund and Saskatchewan Pulse Growers Association, 2003-2006.
- From biotrophy to necrotrophy: Interaction of the hemibiotrophic fungus *Colletotrichum truncatum* with its host plants. S. Banniza. Funded by: NSERC discovery grant, 2004-2009.
- Basal branching in field pea: a strategy for reducing seeding rates and increasing weed competition. Shirliffe, S., Warkentin, T., and S. Banniza. 2005-2008.
- Ascochyta resistance in chickpea – search for superior sources of resistance in the perennial *Cicer* species. Warkentin, T., Luilsdorf, M., Tar'an, B., Banniza, S. and A. Diederichsen. Funded by: Saskatchewan Agricultural Development Fund and Saskatchewan Pulse Grower's Association, 2004 – 2008.



- *Ascochyta pisi* on field pea in Saskatchewan: A new look at an old disease and the implications for disease management. Banniza, S., Warkentin, T.D., Morrall, R.A.A. Funded by: Saskatchewan Pulse Growers, Discovery Seed Labs, 2006.
- Pathogenic, genetic and molecular characterization and differentiation of races of *Colletotrichum truncatum* from lentil. Banniza, S. Wei, Y.-D., Vandenberg, A. Funded by: NSERC, 2007-2012.

Department of Plant Science, University of Saskatchewan (Jill Thomson):

- This is the final year for the spice disease research project. Funded by SAF Agriculture Development Fund, 2005-2007. Project includes the management of diseases of cumin, coriander and caraway using seed treatments and foliar fungicides. Establishment of the field-sown cumin trial was very poor, despite application of a seed-treatment. Greenhouse experiments with cumin to study the interaction of seed-treatment and soil microflora are being conducted. The caraway and coriander trials are to evaluate the efficacy of number and timing of Quadris applications. Blossom blight disease levels were low in both crops. Plots have been harvested; yield and disease level data will be analyzed.

AAFC Saskatoon (Bruce Gossen):

- Collaborating with R. Conner (AAFC, Morden) and S.F. Hwang (ARC, Vegreville) to find *Pisum* species with potential new sources of mycosphaerella resistance, assess the impact of seed infection on mycosphaerella epidemics, and assess management options.
- Collaborating with Y. Gan (AAFC, Swift Current), P. Pearse (SAFRD), S. Banniza (CDC, Saskatoon) and others to develop an early-warning system for ascochyta blight in chickpea.
- Collaboration with S.F. Hwang (ARC, Vegreville) on management of root rot in pulse crops
- Initiating a study with Wolf, Hwang and M.R. McDonald (U of G, Guelph) on the effect of fungicide application technology on foliar severity of chickpea and field pea.
- Initiating a study on incidence of strobilurin resistance in *Ascochyta rabiei*.

Reduced Risk Project on Ascochyta Blight of Chickpea (P. Pearse, R. McVicar, S. Banniza, B. Taran, Y. Gan, B. Gossen, M. Goodwin, J. Moen, K. Agblor):

- Project title: "Decision support tools for ascochyta blight on chickpeas". Three-year project funded by Agriculture and Agri-Food Canada under their "pesticide risk reduction strategy". The purpose is to develop better disease scouting tools to help farmers make decisions regarding fungicide control of ascochyta blight in chickpea.

ALBERTA

Alberta Agriculture and Food (Kan-Fa Chang & Sheau-Fang Hwang)

- Screening cultivars and lines of field pea for resistance to fusarium root rot under controlled and field conditions. K.F. Chang, S.F. Hwang, R. Conner, R. Howard, D.J. Bing.
- Etiology, impact and control of lupine seedling blight and root rot in Alberta. K.F. Chang, S.F. Hwang, B. Gossen, R. Howard, D.J. Bing, M. Olson. Funded by: ACIDF, 2005-2009.
- Evaluation of fungicidal seed treatments for the control of rhizoctonia and fusarium seedling blight of faba bean, pea and lupin. K.F. Chang, S.F. Hwang, K. Lopetinsky, M. Olson, R. Howard, D.J. Bing.
- Improved genetic resistance to mycosphaerella blight of field pea (S. F. Hwang, K.F.Chang, B.D. Gossen, R.L. Conner).
- Fusarium Root Rot of Pea: Characterization, Impact on Nitrogen Fixation, and Control (Sheau-Fang Hwang, K.F.Chang, B.D. Gossen, R.L. Conner, D. McLaren, D.J. Bing).
- Investigation of foliar and seed treatment fungicides to control ascochyta blight and prevention of fungicide resistance (S. F. Hwang, K.F.Chang, B.D. Gossen, R. Howard).

Alberta Agriculture and Food (R. Howard)

CDC South staff conducted dry bean research trials in 2007:



- Determining the cause of early yellowing syndrome on dry beans in Alberta
- Evaluating alternative fungicides for the control of white mould on dry beans in Alberta
 - I had a large number of field trials this year examining the efficacy of registered and unregistered biological and chemical fungicides against white mold. Some trials were conducted at CDC South, while others were done in growers' fields. Several of these were federal research permit (FRP) trials, e.g. four trials comparing Switch and Proline to Lance, and four trials comparing fall- and spring-applied Contans WG (*Coniothyrium minitans*) to Lance.
- Understanding the epidemiology of bacterial blight diseases on dry beans in Alberta
 - We also had seven trials where we looked at the efficacy of various formulations of copper bactericides against seed-borne halo and common blight, as well as the performance of Kocide 101 and Kocide 2000 applied as foliar sprays against these same two diseases where the pathogens were artificially inoculated onto the foliage.

10.10. FRUITS

PHILIP NORTHOVER

General Summary

In the three Prairie Provinces, there appeared to be relatively few disease problems and what did occur appears to be restricted to small outbreaks. High temperatures and prolonged dry periods in much of July and August were not conducive to disease development for the vast majority of plant pathogens in Alberta, Saskatchewan, and Manitoba. Saskatoon berry diseases were observed and Fire blight was reported from all three provinces.

In British Columbia, root and trunk disease complexes were causing a decline in some grape vineyards, in 2007. Root rots of blueberry and bacterial blights appeared to be significant problems in 2007. Nematode damage to blueberry and raspberry was also reported. Reports suggest that bacterial blight of cherry was a common occurrence in 2007. Fire blight outbreaks were sporadic and but did cause damage to some apple and pear orchards.

Manitoba (*Mardi Desjardins and Philip Northover- MAFRI*)

In Manitoba there did not appear to be anything out of the ordinary in 2007. *Botrytis cinerea* fruit rot was found on sea buckthorn, which was a new to disease Manitoba sea buckthorn growers, but on the whole, there was little else to report, that was unusual.

Fire Blight (*Erwinia amylovora*) was observed on Apple, Raspberry, and Saskatoon berry samples submitted to the Crop diagnostic centre, but there were no reports of this disease being widespread in Manitoba in 2007.

Black knot (*Dibotryon morbosum*) samples were submitted on chokecherry. If there is any disease of fruit that could be considered at epidemic levels in Manitoba (and likely the rest of the prairies), this would be one. Despite the easily identifiable signs of the fungus, the disease is not noticed or not thought of as a problem, by the general public, until much of the plant is consumed by the fungus.

A range of other disease samples were submitted to the lab for diagnosis, including leaf spots, anthracnose, cankers, powdery mildew, etc.



To summarize the Manitoba Fruit Disease Situation, the hot weather for extended periods throughout the summer likely reduced the ability for any pathogen to cause widespread damage.

COMMENT – P. Northover indicated Sporopsus rot and Picnidopicrus (sp?) were new diseases of post-harvest and pears.

Saskatchewan (*Penny Pearse and Clarence Peters – SK Agriculture and Food*)

In Saskatchewan in 2007, rust on saskatoon berry was considered a common occurrence. Entomosporium leaf spot on saskatoon berry was also observed, but the outbreaks did not cause great concern as the disease developed subsequent to harvest, although it still presents concerns for a source of inoculum in the spring. Fire Blight was also reported on raspberries in 2007. The Provincial Lab received samples including fire blight on apples, apple scab on crab apples, fire blight on Saskatoon berries and pathogenic nematodes on strawberries.

It appears that Saskatchewan was spared any significant outbreaks of disease in 2007.

Alberta (*Robert Spencer and Ron Howard - Alberta Agriculture and Food*)

In Alberta 2007, hot and dry weather seem to prevent any significant widespread outbreaks of any disease. Inquiries to the Ag-Info Centre, and anecdotal reports did not suggest anything unusual from previous years with Entomosporium leaf spot (*Entomosporium mespili*), black leaf (Witches Broom) (*Apiosporina collinsii*), and brown fruit rot (*Monilinia amelantheris*) on saskatoon being reported.

Gray Mold (*Botrytis cinerea*) was reported on strawberry, fire blight (*Erwinia amylovora*) and environmental disorders including sunscald on raspberry and winterkill damage to black currant were noted in 2007.

Overall, fruit diseases in Alberta in 2007, appeared to be at very low levels.

British Columbia (*Vippen Joshi and Gayle Jespersen-(BC Ministry of Agriculture & Lands), Peter Sholberg (Agriculture and Agri-Food Canada), and Bill McPhee (Okanagan Tree Fruit Company)*)

Tree Fruit and Grape Diseases

Apple, apricot, cherry, grape and peach samples were submitted to the Plant Diagnostic lab in 2007.

Most samples submitted were cherry diseases notably bacterial blights (*Pseudomonas syringae* pv. *syringae*), and root disorders associated with *Pratylenchus* nematodes and oomycetes. Root rots and stem cankers in apple, grape and peach (Please see the tables at the end of this section for further information).

Cytospora canker, bacterial canker, powdery mildew and botrytis fruit rot were commonly observed on cherry trees in 2007. It was interesting to note the botrytis fruit rot was more common than brown rot on cherries in 2007.

On apples and pears fireblight was sporadic, with a few serious outbreaks in individual orchards, powdery mildew on apples was also observed.



Apple scab was at very low levels, in 2007 has decreased in incidence in the Okanagan/Similkameen in recent years likely due to dry weather and good preventative fungicidal control, targeted at powdery mildew.

In 2007, a grape problem involving the wilting and sudden death of vines was observed in several vineyards. There are a number of terms used to describe these problems which can be attributed to numerous pathogens of roots and wood.

Young vine decline/young Esca; Esca/*Eutypa* decline/*Botryosphaeria* decline and *Cylindrocarpon* root rot were discussed at a meeting by Dr. Doug Gubler of UCLA Davis and provided important information to the grape grower cooperative in B.C. The practice of stressing plants in order to produce optimum wine, was rejected as a sound practice, as stressing the plants in the early years of growth could lead to development of these problems later on, and changes to pruning practices could help reduce the incidence of these grape problems.

Bois Noir, an important quarantine-level phytoplasma disease was detected in BC in 2006 (confirmed in November by CFIA). The positive was on Grenache clonal 70 on rootstock 3309 clonal 143, imported from France in 2006. There were 1965 vines in the affected lot, planted at 3 distinct locations within the Oliver area. All plants in the affected lot were destroyed. The national survey for grapevine phytoplasmas continues, as well as leafhopper monitoring. Bois Noir was also recently detected in an Ontario vineyard; trace back is underway. As of this spring, hot water treatment of imported grapevines (from France and Germany) is necessary in order to avoid the introduction and establishment of Bois Noir and Flavescence Dorée in Canada. Between BC and Ontario, there were approximately 2 million vines imported from France and Germany in 2005. All of these vines remain under post-entry quarantine.

Small Fruit (Berry Crops) Diseases

Of the 119 small fruit samples sent to the plant diagnostic lab, 92 were from different cultivars of blueberries. About a third of the blueberry samples were root related problems caused by *Phytophthora*, *Pythium*, nematodes (*Pratylenchus*/ root lesion in at least one case), or *Armillaria*. Bacterial Blights caused by *Pseudomonas syringae*, were diagnosed in 17 samples. Godronia blight and Godronia canker (*Godronia cassandrae*/*Fusicoccum putrefaciens*). Blueberry Scorch and Shock Viruses were also reported.

Raspberries were afflicted with nematode damage from *Pratylenchus* and to a lesser extent *Xiphinema* (dagger nematodes), in addition to various root rots attributed to oomycetes.

Various root rots were reported on strawberry and hazelnut, rust on blackberry, and cankers on cranberry and hazelnut samples were all reported.

Research Update

Alberta, Saskatchewan, and Manitoba



Saskatoon Berry

Quinn Holtslag (Red River Community College—MB) is in the second year of a study to evaluate a monitoring/forecasting system to assist in pinpointing fungicide applications for management of common leaf and berry spot, *Entomosporium mespili* across the prairie provinces.

Alberta

Ron Howard started a new project in 2007 that included examining samples of fresh fruits and vegetables obtained from 10 farmers' markets in southern Alberta for food spoilage organisms. Over 500 isolates of bacteria, fungi and yeasts were obtained over the summer and identifications are pending. Representative isolates will be screened for sensitivity to various chemical disinfectants in a effort to identify effective products for disinfecting farm machinery, handling and harvesting equipment, and storages. Other studies will examine the efficacy of disinfectants against mixed biofilms comprised of food spoilage organisms and human pathogens such as *Esherichia coli* O157:H7 *Salmonella* and *Listeria*.

British Columbia

Tree Fruit and Small Fruit Research Projects currently being conducted in B.C.

1. At PARC, Summerland a national program on the testing of Bloomtime Biological, Blightban, Serenade Max, and Apogee in a demonstration trial to show that these new products were effective against fire blight and how they should be integrated in a disease control program with streptomycin. (P. Sholberg-Summerland B.C.)
2. A fire blight screening trail testing some new antibiotics (Kasumin) and evaluated the systemic-acquired resistance compound, Actigard for control of fire blight. (P.Sholberg-Summerland B.C.)
3. In cooperation with the University of British Columbia-Okanagan work on developing new biological control fungicides for postharvest diseases of apples. The research is being conducted by Dr. Louise Nelson, her postdoctoral scientist, Danielle Hirkala, and masters student, Daylin Manteyca in cooperation with PARC, Summerland. (P.Sholberg-Summerland B.C.)
4. AAFC in cooperation with the BC Ministry of Agriculture and Land surveying apple, rose, and cherry pathogens for resistance to DMI fungicides in the BC interior. (P.Sholberg-Summerland B.C.)
5. We have smaller projects in cooperation with the BC grape growers to study sour rot and identify possible controls, in cooperation with the BC fruit growers we are studying the effect of drought on expression of fire blight in apples. (P.Sholberg-Summerland B.C.)
6. A spring blossom/ apple core rot trial. Post-harvest losses of pome fruit caused by fungal diseases has been identified as a high priority by the tree fruit industry, and causes significant losses annually. This project will address Identification of pathogens, assess severity of blossom infections leading to rots, & screen isolates for fungicide tolerance, in cooperation with Dr. Bill McPhee, Okanagan Tree Fruit Company we are studying postharvest diseases of 'Ambrosia' apple.
7. Powdery Mildew Control in Cherries - Duane Holder, FarmQuest Consulting/ Okanagan-Kootenay Cherry Growers Association and BCMAL



10.11. VEGETABLES

GAYLE JESPERSON

British Columbia Contributors: *Siva Sabaratnam, Vippen Joshi, Susan Smith (BCMAL)*

Cole crops:

- Club Root (*Plasmodiophora brassicae*)
- Root lesion nematodes

Diseases of “Organic” vegetable crops

Lettuce:

- White mold (*Sclerotinia sclerotiorum* or *S. minor*)
- Downy Mildew (*Bremia lactucae*)

Swiss chard and beet:

- Cercospora leaf spot (*Cercospora beticola*)

There were a range of samples submitted to the BCMAL Diagnostic Laboratory, including crown, root and head rots, wilts, damping off and leaf spots / blights.

Alberta (Contributors: *Kan-Fa Chang, Ron Howard - Alberta Agriculture and Food*)

In general, the growing season was favourable for most types of vegetables. Hot, dry summer weather in the south favoured rapid growth and maturation and seemed to suppress some of the common foliar diseases. Vegetable crops were harvested much earlier this year in central Alberta due to the hot summer.

Cabbage: One farm in the Edmonton area had an average of 12% infection rate with *Sclerotinia* blight.

Carrot: The crop has an average of 10% infection with aster yellows (Edmonton area).

Club root survey (cruciferous vegetables) - Ron Howard

The clubroot survey entailed visits to about 10 vegetable farms and market gardens in central and southern areas of the province. The disease was present in two operations and was at high enough levels to cause economic yield losses in some fields on these farms.

We don't have a diagnostic lab at CDC South anymore, but I do occasionally receive unsolicited samples. One that I saw was cob rot on sweet corn caused by *Fusarium graminearum*. It was a new variety that a local processor was trying and it was heavily infected. The company has decided not to grow it again. I heard a few reports of downy mildew and powdery mildew on processing peas, aster yellows and white mold on carrots, and red leaf on rhubarb.

Manitoba (Contributors: *Philip Northover, MAFRI*)

The 2007 season could be best summarized as mixed bag of weather for Manitoba. A warm April, followed by rainfall, and some violent storms (some of which spawned tornadoes, and hail storms). High relative humidity and temperatures in the mid to high 30's for much of July and August produced record setting humidex values. Little precipitation fell in late July and August.

Onions



Onions had a number of disease concerns in 2007. The season began with the appearance of Botrytis soil-line rot (*Botrytis cinerea*), in onions in a field Portage la Prairie, at the end of June, which likely developed with the assistance of wet and humid conditions in the early portion of the growing season.

Following hail damage in July, opportunistic bacteria took full advantage of the damaged tissue and in one 30 acre field almost half of the plants were showing signs of bacterial infection. The high humidity and already saturated soil from previous rains, created an ideal environment for such problems.

Stemphylium leaf blight symptoms (*Stemphylium vesicarium*) were observed in July, almost exclusively in fields damaged by hail. This fungus tends to colonize necrotic portions of the plant, but due to long wetting periods, it appears this fungus may have been infecting healthy tissue. Disease severity declined with the onset of higher temperatures and production of new leaves. This fungus is commonly observed in Manitoba and is rarely a problem by itself. *Stemphylium vesicarium* is often found in association with two very severe diseases, downy mildew and purple blotch; neither of these two diseases were observed by our scouting program in 2007.

Of all of the diseases observed in onions in 2007, pink root (*Phoma terrestris*), was the most worrisome, and the most widespread, being found in fields in Winkler and Portage la Prairie. In 2006 this disease was first observed in low incidence levels. In 2007 it was much more common. After first detection in mid-July, it continued to be found in new fields and on new onion cultivars almost weekly. Where pink root occurs, there can be major problems associated with reduced bulb size, due to destruction of the root system. In the fields scouted; severity levels were not high, though the incidence level was. There are concerns this could become a more significant in future years.

Fusarium basal plate rot (*Fusarium oxysporum* f.sp *cepae*), onion smut (*Urocystis cepulae*), and penicillium rot (*Penicillium* spp.) were observed in fields this year but were not widespread, and did not approach economically significant levels. Fusarium basal plate rot, in previous years has led to removal of significant proportions of some fields.

Symptoms that appeared to be aster yellows, based on the appearance of the symptoms and the fact it was about 15 feet from the edge of a carrot field with aster yellow symptoms was observed in a field in Portage. On the whole, Aster yellows didn't appear to be a big problem in onions in 2007, in fact, we haven't observed onions having aster yellows before this year.

Botrytis neck rot (*Botrytis allii*) is a big concern to onion producers as the losses can be substantial. In 2007, this disease was observed first on red onions in a storage in Portage; a survey in mid-September of two other fields of red and yellow onions, showed levels of 2.3% and 11.5% respectively. This is a disease in which infection occurs in the field and the symptoms do not show up until very late in the season or in storage. In addition to the



reduced quality, other economic losses may occur due to the costs incurred in storing an economically unviable crop.

In September, multiple centers were observed in a number of stored onions. From what is known, this is a physiological problem attributed to water stress early in the development of the bulb. Prior to harvest, the onions would appear to have “multiple stems” i.e. leaves are coming out from multiple points of the neck. Though these onions are still edible, they are considered of lower quality, than a single centered onion, and thus a reduction in potential income can result.

Cabbage

There were no significant disease concerns to report in 2007. Symptoms that resemble aster yellows were observed on random plants in fields that were not scouted regularly.

Alternaria black spot (*Alternaria brassicae*) was observed on cabbage late in the season at very low levels.

Sweet Corn

Corn Smut (*Ustilago maydis*), Holcus Spot (*Pseudomonas syringae* pv. *syringae*), and corn rust (*Puccinia sorghi*), were observed in 2007. These pathogens generally show up every year in Manitoba and in 2007 none were of great concern.

Holcus spot, is a bacterial disease that may cause concern in the early portion of the year, but generally the plants can “outgrow” the disease. It was observed in early spring, on the young seedlings, when the conditions were wet, but was a non-factor in 2007.

Corn rust was first observed the week of July 27th. This disease can be a serious problem further well south of the border, but generally in Manitoba the disease shows up too late in crop development to do any significant damage.

Fusarium root rot (*Fusarium graminearum*) was first detected the week of September 9th, while damage to the individual plants was extensive, and the long period without rain exacerbated the problem further, the damage was not widespread.

Cucurbits

The cucurbit/gourd crops regularly scouted in 2007 included pumpkin, spaghetti squash, acorn squash, and butternut squash (*Cucurbita* spp.) It was not until late in the year (August 31) that powdery mildew was observed for the first time in 2007 in a scouted pumpkin field. This is not unusual in Manitoba, and in the case of this specific field the crop was far enough advanced that this presented no economic concern.

In spaghetti squash, *Sclerotinia* rot was observed, there was a complete collapse of the stems, and a rot of the fruit (gourd). In some cases, the rot was so severe that all the internal tissues of the fruit were consumed, leaving only the outer rind, imparting an egg-like appearance and feel to the gourd.

Perhaps the most interesting disease event in cucurbits occurred on butternut squash, in the Winkler area, in which symptoms attributed to Squash Mosaic Virus (SqMV) were



found. Observed the first week of September, but likely the result of infections earlier in the year, this was a new disease to our scouting report. The symptoms observed showed pronounced distortions of the leaves and a marked reduction in internode length.

The SqMV virus is known to be vectored by cucumber beetles, the western striped cucumber beetle (*Acalymma vittatum*), and the spotted cucumber beetle *Diabrotica undecimpunctata howardi*. As we did not see the fields first hand until August, we are not sure when symptoms first showed up. It appears it was early in the development of the plant as the older portions of the plant were exhibiting symptoms. This virus is also seedborne, and based on the distribution of the symptoms in the planting, which also include mottling of the gourds/fruit, this may be how the virus first entered the planting.

Parsnips

Parsnips in 2007 were impacted by aster yellows; leaf and root symptoms were observed. Alternaria leaf spot of parsnip was observed in early August. This is not considered an economic problem.

Celery

Celery with symptoms of Aster yellows were observed. It is not known how widespread the problem was.

Lettuce

Romaine lettuce this week showed symptoms of aster yellows, in the small 2 acre field that we scouted the incidence level was 100%, and the crop was completely lost.

Peas

Succulent peas had extensive powdery mildew, which is not unusual, but in 2007 it was very severe, though we do not have numbers as to crop losses.

Peppers

Sunsald was observed in fields that suffered from drought stress. Loss of leaves was observed, followed by alternaria rot. This tends to be more of a storage disease, that can occur with rough handling. This problem occurs every year.

Blackening of pepper skin was observed. This appears to have little effect on flavour, storage time or much else, but it is a condition that influences prices, therefore it is an economic problem. The cause is uncertain. Cold wind has been suggested as a possibility, which could explain why this symptom is generally observed on one side.

Red Beets

A leaf spot on red beet was observed in the one field scouted this year, and occurred over a significant portion of the field. At this time the cause is still unknown, but *Cercospora beticola*, the cause of Beet leaf spot, has been ruled out. Attempts to duplicate the symptoms using three isolates of a *Pseudomonas* bacterium isolated from these spots was unsuccessful.

A survey of nematodes conducted in early August, found two types spiral nematodes (*Helicotylenchus* spp. and also dagger nematodes (*Xiphinema* spp.)). Spiral nematodes are generally not considered a problem on red beets and dagger nematodes which can vector viruses were well below thresholds on even the most susceptible crops. The field had



problems with sizing of the beets, and it was thought the damage could have been partly attributed to nematode activity.

Rutabaga

Rutabaga were largely disease free in 2007. There were symptoms of aster yellows observed, but it did not appear to be at high levels.

Tomato

The only disease we observed on tomato (based on only two scouting trips) was aster yellows.

Carrots

In 2007, carrot disease concerns could be expressed in two words: “Aster Yellows” For years this has always been a problem and 2007 was not any different. The first symptoms were observed July 6, and by the end of the year the levels in our five scouted fields were at 12,11,13, 13 and 52%. The 52% field near Delta, MB was a 60 acre field, and this level of disease represents a major economic loss.

Alternaria leaf blight, Sclerotinia, and Rhizoctonia were all observed in 2007. At this point we have not heard of any problems in storage for carrots.

Also see: Manitoba Weekly Vegetable report

<http://web2.gov.mb.ca/agriculture/mwvr/index.php>) for more complete information and some wonderful disease images.

Saskatchewan (*Contributors: Connie Achtymichuk, Vegetable Specialist, SK Agriculture & Food; Dr. Jill Thomson & Dr. Doug Waterer, Dept. Plant Sciences, University of Saskatchewan.*)

Field Observations:

The most significant disease observed this season was aster yellows. Extremely high levels occurred in a carrot trial at the University of Saskatchewan, with almost 100% of plants infected in some cultivars. Aster yellows was also observed in the University of Saskatchewan’s zucchini and pumpkin trials. Infected pumpkins were very chlorotic with abnormal flower growth and no fruit production. Fruit from affected zucchini were off-colored and extremely tough. Local hobby and market gardeners also reported high levels of this disease in various vegetable crops. Extensive infection of dandelions and other perennial weeds growing in non-cropped areas has been observed. These plants may serve as potential sources of over-wintering inoculum of the pathogen. Given the presence of abundant initial infection sources problems with aster yellows may occur next season if conditions are again conducive for leaf hoppers.

A bacterial spot (pathogen not identified) was observed in the heirloom cultivar tomato trial.

The Saskatchewan Crop Protection Diagnostic Lab received a range of samples, including abiotic and environmental damage, leaf mould, bacterial spot, blossom end rot, etc.

Ontario Update



Mary Ruth McDonald reported on the common diseases of Ontario this year. Included aster yellows, white rot of onions and neck rot of onions (maybe). No sclerotinia. Pretty quiet year.

Research Update

British Columbia – Research Projects completed or in-progress:

- 1) Review of management strategies for clubroot disease of cole crops – current literature was reviewed on club root management, along with a survey of the Fraser Valley cole crop industry and experts on current practices. (*ES Cropconsult*)
- 2) Fungicide screening for the control of Clubroot – field trial is underway for screening for efficacy of potential new fungicides (e.g. Ranman and Allegro) to control clubroot of Chinese cabbage grown in fields with historical clubroot issues. (*ES Cropconsult*)
- 3) Development of Information on Pests of Importance in BC Asian Vegetables and Promotion of Good Pest Management Practices (Susan Smith, BCMAL/ ES Cropconsult)

Alberta (*Ron Howard, Alberta Agriculture and Food*)

We examined the efficacy of five fungicides on Chinese cabbage in a replicated trial in a clubroot-infested canola field south of Edmonton. The products included Allegro, Blinix, Hydrated Lime, Calcium Cyanamide and Quintozene. These products were incorporated into the soil prior to planting or applied as post-plant drenches. The level of clubroot infection was moderately heavy through the plot and permitted disease incidence and severity data to be taken. In other trials at the same location, we evaluated the susceptibility of ca. 50 cultivars of cruciferous vegetables, including winter cabbage, Chinese cabbage, broccoli, Brussels sprouts, kohlrabi, radish, rutabaga and turnip to clubroot. Once again, disease levels were fairly high. Data analysis is pending for all of the aforementioned trials.

We initiated a new trial this year which focussed on examining samples of fresh fruits and vegetables obtained from 10 farmers' markets in southern Alberta for food spoilage organisms. Over 500 isolates of bacteria, fungi and yeasts were obtained over the summer, and identifications are in process. Representative isolates will be used in disinfectant efficacy trials in a effort to identify superior products for disinfecting farm machinery, handling and harvesting equipment, and storages. Other studies will examine the efficacy of disinfectants against mixed biofilms comprised of food spoilage organisms and human pathogens such as *E. coli*, *Salmonella* and *Listeria*.

Manitoba

1. Determining the levels of *Botrytis* neck rot in MB onion storages (myself in conjunction with Brent Elliott (MAFRI Entomologist and Mardi Desjardins (MAFRI diagnostician))
2. Determination of the survival time of *Botrytis allii* sclerotia MB soils in the absence of onions (Philip Northover and Mardi Desjardins)
3. Determination of pathogenicity of a *Pseudomonas* spp. on Red Beet (Mardi Desjardins and Philip Northover)
4. Identification of nematodes population in MB Red Beet fields (Philip Northover)
5. Identification of Cucurbit viruses in Manitoba (Mardi Desjardins and Philip Northover)



Saskatchewan

Varietal evaluations were conducted at the University of Saskatchewan in 2007 on sweet corn, ornamental corn, leaf lettuce, cabbage, carrots, heirloom tomatoes, cantaloupe, summer turnips, green beans, watermelon, zucchini, Spanish onions and garlic. Disease reactions are included in the variety evaluations.

A fungicide spray trial was conducted to evaluate the potential to control in-season Sclerotinia infection of pumpkin fruit using seven chemical products. No rot was observed on the pumpkins prior to harvest and further evaluations are being carried out on pumpkins in storage. Soil and plants were inoculated with Sclerotinia during the growing season to increase the probability of infection.

10.12. INTERIORSCAPES

SIMA MPOFU

No diseases in interiorscape plants were reported from any province. Some chapter updates to be submitted.

DISCUSSION → B. Gossen suggested that as there is so little work being done with forage legumes and grasses, we should consider the consolidation of these 2 chapters.

Motion: B. Gossen / R. Morrall (Carried)

13:00 - 18:00 Afternoon session (coffee break at 15:00)

11.0 OTHER COMMITTEE REPORTS

11.1. NOMINATION COMMITTEE KUTCHER / RON HOWARD

KHALID RASHID / ANDY TEKAUZ / RANDY

Nominations listed below for the year 2007-2008:

Executive Committee:

Chair	<i>Randy Kutcher</i>
Vice-Chair	<i>Philip Northover</i>
Secretary/Treasurer	Robert Spencer
Guidelines Editor	Mardi Desjardins & Tracy Shinnars-Carnelley
Slide Set Editor	Philip Northover
Website Editor	Ralph Lange

Chapter Chairs/Alternates

<u>Chapter</u>	<u>Chair</u>	<u>Alternate</u>
Cereals	Andy Tekauz	Kelly Turkington
<i>Forage legumes / Grasses</i>	<i>Bruce Gossen</i>	<i>Sheau-Fang Hwang</i>
Greenhouse	Robert Spencer	Jian Yang
Oilseeds	<i>Kerry Clark</i>	Khalid Rashid
Ornamentals	Vippen Joshi	Siva Sabaratnam
Trees & Shelterbelts	Ron Howard	Karen Bedford
Potatoes	<i>Karen Bedford</i>	<i>Krista Anderson</i>



Special crops	<i>Debbie McLaren</i>	<i>Penny Pearse</i>
Fruits	Philip Northover	Peter Sholberg
Vegetables	Gayle Jespersen	Janice Elmhirst
Interiorscapes	Sima Mpofu	Ron Howard

Italics indicate new nominees

WFPM Chair: Khalid Rashid

NOTE: R. Spencer will contact those individuals whose names were put forward to continue as chair or alternate to confirm their acceptance of the position.

(Howard / Franke) – Carried)

11.2. RESOLUTION COMMITTEE *PENNY PEARSE / PHILIP NORTHOVER*

- 1) Be it resolved that the Western Committee on Plant Diseases thank the Local Organizing Committee for the excellent arrangements, program and facilities for the 32nd annual Western Forum on Pest Management

(Pearse/Morrall) – Carried

11.3. GUIDELINES-WEB COMMITTEE
D. KAMINSKI, T. SHINNERS-CARNELLEY, P. PEARSE, I. EVANS, G. JESPERSON, K. RASHID, J. MENZIES

This committee is dormant. Will be kept in place if needed.

12.0 2008 ANNUAL MEETING

The next meeting of the WCPD will be determined by the WFPM. According to the normal rotation between provinces, Saskatchewan should be the next host province. There was some discussion about merging/combining with the CPS/AB Plant Pathology Society meetings. This was to be presented to the WFPM. The 2009 meeting is scheduled for Alberta, however the Entomological Society of Canada is scheduled for Manitoba in 2009. It is suggested that there be a switch between host provinces for AB and MB in 2009 and 2010. Will be discussed/presented at the WFPM meeting.

13.0 OTHER BUSINESS

A. Tekauz – Fusarium Head Blight Workshop will be held in Winnipeg, MB 27-30 November, 2007. This will be the 5th edition of this workshop, with it being held every 2 years. It has a full program, with 32 presenters on FHB. Speakers are international. There is a website for this conference.

A. Tekauz – The 5 category rating system may not be desirable and necessary for all chapters.



A. Tekauz – There is now a product for FHB control / management in barley

A. Tekauz – Tom Atkinson, a colleague who was in Lethbridge at the time of the formation of the WCPD in 1976 is doing fine and said to say hello.

R. Morrall – Indicated that a new book/booklet “Ascochyta blight on Grain Legumes” is now available

K. Rashid – The 5 category system – can either be done or can leave it. R. Morrall – it may be possible for pulses
The option will be left for the chapter chairs / alternates to decide

14.0 SPECIAL TOPICS

- 14.1. *PREVENTIVE EXTENSION PROGRAM – POST HARVEST CONTROL STRATEGY (B. MCPHEE)*
- 14.2. *EFFECT OF TEMPERATURE ON DEVELOPMENT OF CLUBROOT IN LEAFY VEGETABLE BRASSICA CROPS (M. McDONALD)*
- 14.3. *CLUBROOT OF CANOLA – UPDATE FOR 2007 (RON HOWARD)*
- 14.4. *ASTER YELLOW DISEASE IN CANOLA / ASTER YELLOWS IN MANITOBA VEGETABLE CROPS (C. OLIVIER / P. NORTHOVER)*
- 14.5. *INCIDENCE OF RESISTENCE TO STROBILURIN FUNGICIDES IN ASCOCHYTA RABEII (B. GOSSEN)*
- 14.6. *WHEAT RUST UPDATE FOR WESTERN CANADA (P. PEARSE, B. MCCALLUM, C. MCCARTNEY, T. FETCH, K. TURKINGTON, K. XI)*
- 14.7. *UPDATE ON STEMPHYLLIUM BLIGHT OF LENTILS (R. MORRALL)*
- 14.8. *CANADIAN SCLEROTINIA WORKING GROUP (K. RASHID)*

15.0 ADJOURNMENT

17:45 (Tekauz/Spencer)