

Schutter Diagnostic Lab
2008 Plant Disease Summary

Diagnostic Staff:

Kara Schile, Plant Disease Diagnostician (From 10/01/08)

Dr. Nina Zidack, Diagnostic Plant Pathologist (Through 9/30/08)

Plant Pathology Extension Specialists:

Dr. Mary Burrows – All crops except row crops

Dr. Barry Jacobsen - Row crops (sugarbeets, potatoes, drybeans)

Dr. Bill Grey - Small Grains

Total sample volume in 2008 for diseases in the Schutter Diagnostic lab was 777 diagnostic submissions (913 samples submitted as Disease ID). *Note: Multiple samples are sometimes submitted for an individual diagnosis.* Of disease diagnostic samples, 66% were submitted by County Extension Agents or Extension Specialists and 34% were submitted directly to the diagnostic lab by firms or individuals. Sample volume for plant diseases continues to increase. The number of diagnostic submissions for 2008 represents a 3.6% increase when compared to 2007 and a 19.4% increase over 2006; a 26.1% increase overall from 2005. (Figure 1)

Figure 1. Number of plant disease diagnostic sample submissions received by the Schutter Diagnostic Lab in 2005, 2006, 2007 and 2008.

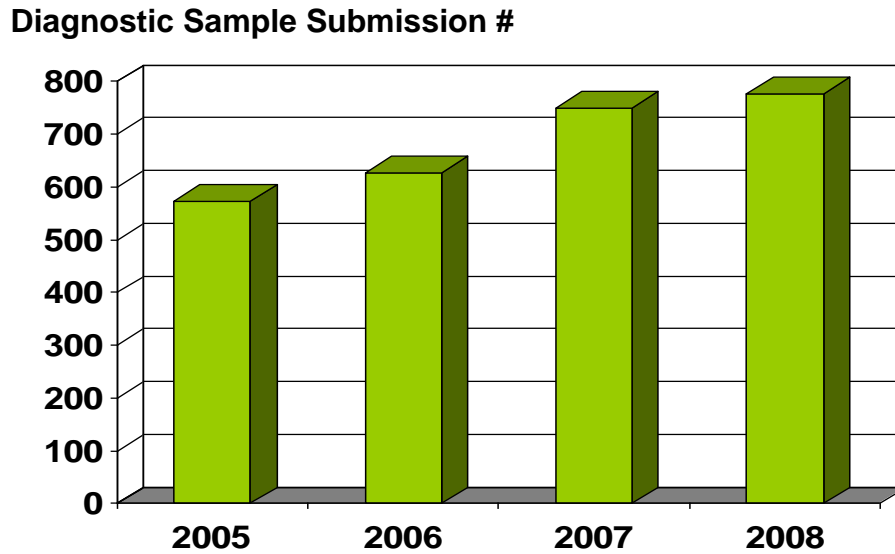


Figure 2. Number of plant disease diagnostic samples received by individual month in 2008.

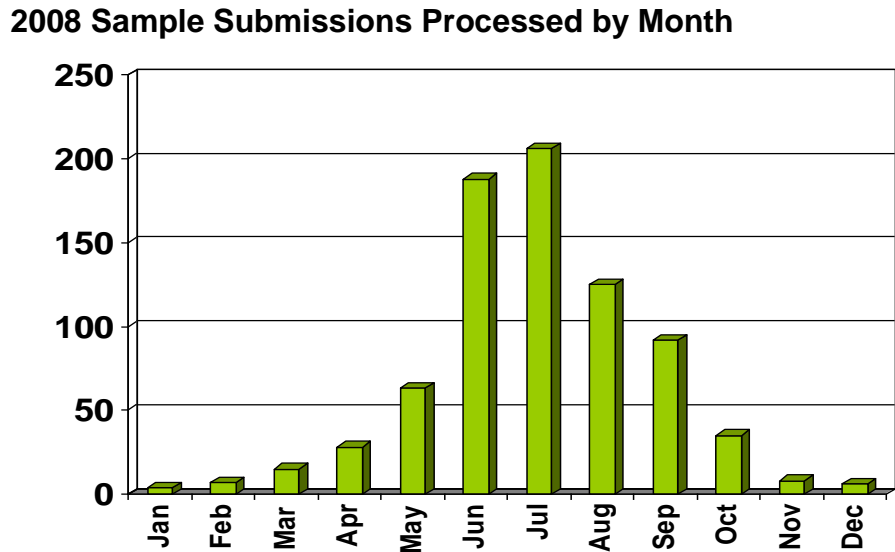
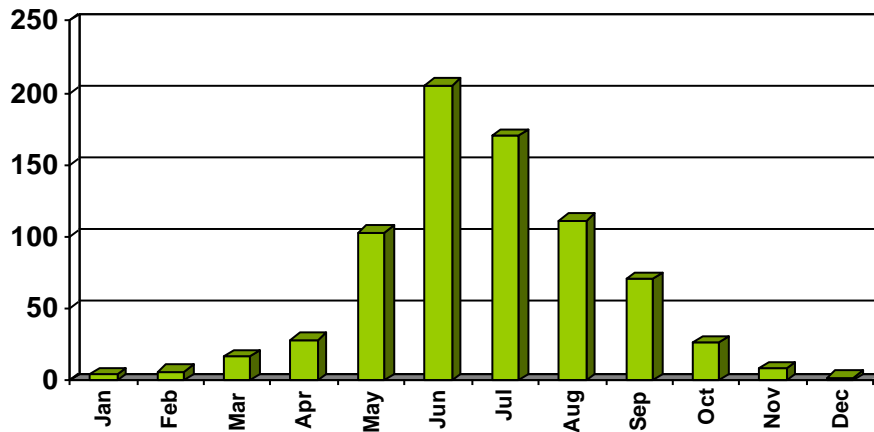


Figure 3. Number of plant disease diagnostic samples received by individual month in 2007.

2007 Sample Submissions Processed by Month



The spring of 2008 was very cool and crop and plant growth, as well as the pests that affect them, were delayed. This resulted in peak sample submissions in July rather than June, as was experienced in 2007 and previous years (**Figures 2 and 3** above). In previous years, (2007 as an example) we would see submissions to the diagnostic lab peak in June, slightly dropping off in number through July when things start to heat up and dry-out in Montana. This process was delayed by a month in 2008 and overall sample submissions were slightly higher than 2009.

The Clinic did not process any Cooperative Agricultural Pest Survey (CAPS) samples for the MT State Department of Agriculture in 2008. Twenty-four (24) alfalfa phytosanitary tests were conducted for the Montana Department of Agriculture. The number of these requests has declined compared to previous years. This may be due to a decline in alfalfa seed production acreage. Another explanation could be an increase in training of the Montana Department of Agriculture inspectors. In previous years the diagnostic lab personnel have worked closely with the inspectors to train them how to identify common diseases such as crown rot. In 2008 all of the Ag inspectors were trained in PDIS

submission. This resulted in a more efficient sample submission and reporting process for both the Department of Agriculture and the Diagnostic Lab personnel.

Diagnostic Methods

For diagnostic samples, 62% of samples were diagnosed based on visual symptoms followed by microscopic observation (17%), culturing (9%), image (7%), serological (4%), and molecular analysis (1%).

Crops Submitted

236 crop sample submissions, 25.9% of regular submissions, were agronomic crops and 74.1% were horticultural/home owner samples. Wheat samples represented the highest number of regular crop submissions for 2008 followed by alfalfa and barley. (Table 1). 68% (70) of the small grain samples (130 total wheat and barley) came from county agents and 32% (33) samples came from crop consultants or individual growers.

Cool soil temperature in May and continued cool temperatures in June caused delayed germination and uneven emergence. Mid-May to mid-June had lower highs and lows in 2008 than Montana had experienced for the last 5 years.

Table 1. Number of samples by crop for 2008

Crop	Number of Submissions
Wheat	103
Alfalfa	40
Barley	27
Field Pea	17
Pasture/Forage	11
Sugar beet	7
Lentil	6
Potato	4
Field Corn	4
Safflower	1

Important Diseases for 2008

Small Grains

A total of 103 wheat samples and 27 barley samples were submitted for disease diagnosis. As part of a 9-state regional survey coordinated by Mary Burrows, virus symptomatic small grain samples were tested for five viruses. *Wheat streak mosaic virus* was found in spring wheat (Chouteau, Fergus, Hill and Pondera counties) and barley (Choteau and Pondera). *High plains virus* was identified for the first time in Montana, in barley from Choteau County and spring wheat in Hill County. *Barley yellow dwarf virus – RPV* was identified in two spring wheat samples from Big Sandy. *Triticum mosaic virus* and *Cereal yellow dwarf virus – RPV* were not identified. In addition we tested all samples for *Wheat soilborne mosaic virus* and barley for *Barley yellow streak mosaic virus* but no positives were found.

A cool, wet spring led to a high incidence of Rhizoctonia root rot (bare patch) in central Montana spring wheat and barley. Bacterial blight (*Xanthomonas translucens*) was frequently observed throughout the state. Leaf diseases including tan spot and septoria leaf spot occurred sporadically early in the season but disappeared with dry conditions in late June and did not cause significant crop damage. No glume blotch symptoms were seen later in the season. Symptoms of tan spot and septoria were noted on winter wheat in the fall at low incidence. The frequency of Fusarium crown rot symptoms was reduced as compared to 2007, but common root rot was increasingly observed at heading. The Dyer/Jacobsen labs did a survey of Montana for these diseases in 2008.

No leaf or stem rust was seen in eastern Montana in late July. Very low levels of stripe rust occurred in Bozeman in the susceptible variety Norris (<10% of plants and < 5% of leaf area) but not in the moderately resistant variety Bynum.

Many small grain fields in eastern Montana were not harvested due to late-season drought and hail.

A section 3 federal registration was received for tebuconazole and metconazole for *Fusarium* head scab control.

Sugarbeets

All sugarbeet samples (7) which underwent testing in 2008 came directly from field representatives of the sugar companies or from growers through Barry Jacobsen. Samples from Yellowstone County were tested for *Beet Necrotic Yellow Vein Virus* (BNYVV) and the virus was not detected. *Fusarium oxysporum* was confirmed in 3 samples in Yellowstone County and 2 samples in Gallatin County.

Potatoes

Common potato scab was the most common problem sent to the clinic by homeowners. Diagnosis included *Verticillium* wilt, but mostly samples were diagnosed as herbicide injury.

Legumes

Seventeen dry pea samples were submitted to the lab, most as part of the Legume PIPE survey described above. Bacterial blight was extremely common in early to mid June in fields throughout the central and eastern parts of the state due to hail and moist conditions. Four legume samples from the Corvallis Experiment Station, “Admiral” pea, “Majoret” pea, “Vantage” lentil, and “Riveland” lentil were all confirmed for *Fusarium oxysporum* mid-summer.

The diagnostic lab performed 64 assays for *Ascochyta* infection of chickpea, lentil and field pea seeds. MSU participated in a national survey for legume diseases (IPM Legume PIPE) and processed 350 leaf samples from soybeans, dry beans, lentils and peas. Diseases monitored and assayed for included

soybean rust, common blight, Sclerotinia white mold, *Alfalfa mosaic virus* (AMV), *Bean common mosaic virus* (BCMV) and *Beet curly top virus* (BCTV). One pea sample tested positive for AMV in Gallatin County, mid-summer, at the MSU Post Farm and BCTV was detected in 1 dry bean sample and 1 soybean sample from Richland County.

Horticultural Crops

The highest total volume of specimens overall was 178 for deciduous trees followed by 117 submittals for evergreens. The most common disease (24 submittals) was fire blight of apple, crabapple, mountain ash, raspberry, spirea, pear and hawthorn. This is a 35% reduction from 2007. This reduction was due to the cool weather we experienced in the late spring and early summer. As the summer progressed, drier weather ensued and drought stress was a common diagnosis for all horticultural crops. A total of 58 turf samples were received at the diagnostic lab which is a significant increase in this category compared to previous years. The hot dry weather mid-summer was conducive to development of melting out (*Drechslera catenaria*), necrotic ring spot (*Ophiosphaerella korrae*) and anthracnose (*Colletotrichum graminicola*) of turf, especially in Yellowstone County.

Other Activities

The Schutter Diagnostic Lab hosted a Web Seminar Series for the Great Plains Diagnostic Network February-March 2008, consisting of 10 meetings via Adobe Connect. This was the first seminar-series of this type in the National Plant Diagnostic Network and is being offered again in 2009. The 2008 topics and speakers are listed in **Table 2**.

Table 2.

Speaker	State	Seminar Title (Web-Link to recorded seminars)
Dr. Don Mathre	MT	Dwarf Bunt and Karnal Bunt, http://extn-breeze.msu.montana.edu/p39949617/
Gary Adams, APHIS	MT	Regulatory Issues for Karnal Bunt,
Gerry Snyder	KS	Online First Detector Modules, http://connect.oznet.ksu.edu/p98849376/
Dr. Eric Rebek	OK	Emerald Ash, http://connect.oznet.ksu.edu/p45458304/
Dr. Tom Isakeit	TX	Soybean Rust - The Texas Experience, http://connect.oznet.ksu.edu/p47804272/
Ronda Koski	CO	White Pine Blister Rust, http://connect.oznet.ksu.edu/p72956787/
Dr. Marie Langham	SD	Legume viruses: Identification and laboratory practices, http://connect.oznet.ksu.edu/p30952587/
Jim Kalisch	NE	Pyemotes Itch Mite,
James Obuya	WY	Rapid Diagnostics for Detecting Fungicide Resistance in <i>Cercospora beticola</i> , http://connect.oznet.ksu.edu/p69296421/
Neil Gudmestad	ND	Diagnostics for Potato Viruses, http://connect.oznet.ksu.edu/p33137538/

Mary Burrows led an ad-hoc committee of the GPDN to coordinate a 9-state wheat virus survey. The results of this have been submitted to Plant Health Progress for publication, and an abstract has been submitted for the APS meeting in 2009.

Burrows is a member of the PR committee planning the NPDN national meeting in Miami, FL in January of 2010.

Burrows was nominated and accepted a position as Associate Editor of Plant Disease.

Mary Burrows offered an online workshop on plant virus identification for the GPDN in October 2008. Guest speakers included Rob Fisher, Ohio Department of Agriculture, dsRNA analysis; Joe Anderson, USDA-ARS, Purdue University, multiplex PCR; Brian Olson, Oklahoma State University, real time PCR. Burrows also coordinated an RNA workshop for the GPDN meeting in Fargo in January, 2009. Kara Schile attended.

Additional training activities sponsored by the National Plant Diagnostic Network have provided professional development opportunities for staff. Kara Schile attended the Potato Cyst Nematode training in Beltsville, Maryland.

Additional Plant Pathology Extension Activities:

23 AgAlerts (Mary Burrows)

7 AgAlerts (Barry Jacobsen)

Press Releases

Browning of Evergreens (Nina Zidack)

Urban IPM Program (Kara Schile)

MSU lab serves agricultural producers, gardeners and helps keep Montanans safe; Bring plant or wildlife questions to Extension at Home Show; Growers gain approval for fungicide to fight wheat and barley scab; Test indicates biocontrol treatments did not control damping off of chickpea; MSU scientists fight stem rust UG99 before it becomes a threat; and 12 press releases on the featured guest at farmers' market in Bozeman (Mary Burrows)

Extension Booth at Gallatin Valley Farmers Market (Mary Burrows, Nina Zidack, Kara Schile). 1,115 questions asked by the public in 12 weeks of appearances

AgAlerts made available by fax to interested parties with poor or no e-mail access; 13 subscribers

Master Gardener training via Adobe Connect to approximately 400 people, presentations in Butte to 49 people.

Two appearances on Montana Ag Live (Mary Burrows)

Two appearances on Montana Ag Live (Nina Zidack)

Initial pesticide applicator training, Helena and Billings, 101 attendees (Burrows)

Eleven radio appearances (Burrows)

Filmed for History Channel's episode of Modern Marvels on Mushrooms and Molds (Burrows and Zidack)

Thirteen plant disease presentations including three invited presentations in Minot, ND, Great Falls, MT, and Davis, CA (Burrows)

Montana Barley Production Guide (Burrows)

Three MontGuides published: Root lesion nematodes in wheat; Fusarium

head blight (scab of wheat and barley); Important Apple Diseases in Montana and Recommended Varieties for Resistance (Burrows, Zidack)

Two extension manuscripts were published (Burrows, Jacobsen):

Jacobsen, B., M. Burrows, and K. Ong. 2008. Extension plant pathology: bringing our science to the public. APSnet feature article, December. www.apsnet.org

M.E. Burrows. 2008. Using local farmer's markets to promote Extension programming. *Journal of Extension*. 46:IAW1.

Mary Burrows served on the planning committee for Extension Annual Conference held in Bozeman, October 2008

Burrows' petition to IR-4 for the registration of pendimethilin on camelina was approved, and camelina is now on the Poast label.

Burrows received approximately 250 extension phone calls and emails.

Burrows received funding for three extension proposals totaling \$183,295 and four research proposals with extension components totaling \$353,149.

Nina Zidack served as co-chair for the GPDN Training and Education Committee

Nina Zidack served on NPDN Training and Education Committee and the NPDN Master Gardener First Detector Training Committee