The 2008 New York On-Farm Soybean Rust / Soybean Aphid Monitoring Network

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Objectives
1) Establish soybean sentinel sites to enable timely collection of soybean crop growth and development and specific pest data from representative areas of NY soybean production.
2) Share results of sentinel plot surveys with NY producers and national soybean rust and soybean aphid websites: USDA SBA/SBR PIPE (www.sbrusa.net) and Stop Soybean Rust www.stopsoybeanrust.com.

Background and Justification:
Soybean acreage has increased nearly 6 fold in NY since 1989 with an estimated 226,000 acres planted in 2008, the largest on record (1989-2008 NYS Ag Stats). Soybeans fit well with typical cash grain and dairy production systems, providing a useful crop rotation option, an excellent on-farm addition to dairy and livestock rations, and provide a valuable cash crop. The trend in NY soybean acreage expansion is expected to continue as commodity price remains high, as producers incorporate soybean feedstuffs into dairy rations and local markets are enhanced by availability of commercial roasters and oil processing plants.

Soybean pest concerns have historically been minimal in the Northeast, generally restricted to weed competition, with relatively few insect, disease and vertebrate pests affecting crop yields. Two new pest species, the Asian soybean aphid and Asian soybean rust, have however, recently been introduced into the US and threaten soybean production. Soybean aphid populations were first detected in the US in 2000 and observed in NY in 2001. Soybean rust was confirmed in the southeastern US in November 2004. Fortunately, this disease has not been detected in NY.

The national Soybean Rust Pest Information Platform for Extension and Education (SBR PIPE) effort has been funded since 2006 by the US Department of Agriculture (USDA), the United Soybean Board (USB), and the North Central Soybean Research Program (NCSRP). The goal of the Soybean PIPE project is to assist in the early detection and extent of soybean rust in soybean producing areas of the US and Canada and enhance timely communication of findings to interested stakeholders.

A single SBR and SBA monitoring protocol was developed and used in evaluating all the USB/NCSRP, USDA, and Canadian plots. Data from all sentinel plots was uploaded to the USDA - Legume Pest Information Platform for Extension and Education (PIPE) website. More

information on monitoring protocols and the USDA PIPE network is available at: www.sbrusa.net.

The New York State (NYS) Sentinel Plot Network has been active since 2005. In 2006 and 2007, the number of sentinel plots scouted doubled from 10 in 2005 to 20 in 2007. In 2008 16 sentinel sites were regularly monitored. All sentinel fields were monitored by volunteers from industry, Cornell University and Cornell Cooperative Extension. Plots were monitored from early vegetative growth stages (mid-June) through mid- to late pod fill (September). Foliar samples were collected for presence of diseases. All samples submitted from sentinel plots during this time period were not only examined for soybean rust but also for several foliar diseases including septoria brown spot, downy mildew, bacterial pustule, bacterial blight and frogeye leafspot. In 2006 monitoring efforts were expanded to include an assessment of soybean aphid populations.

In addition to providing the New York soybean industry with an early detection and communication system for Asian soybean rust (SBR) and soybean aphid (SBA), the sentinel plot network also serves as a focal point for assessment and communication of broader pest management issues affecting soybean production.

Procedures:
CCE personnel were provided an overview of the program objectives and invited to participate in the 2008 sentinel monitoring network. Interested CCE staff contacted commercial field crop producers to identify local soybean fields for enrollment as sentinel plots. Efforts were made to increase statewide coverage by including locations in counties along the Northern NY border and the Pennsylvania border. The 2008 NYS sentinel plot network consisted of 16 sentinel plots (50 x 50 ft areas within commercial soybean fields) established in the following counties: Cayuga, Chautauqua, Chemung, Columbia, Cortland, Jefferson, Lewis, Madison, Niagara, Oneida, Ontario, Schoharie, Seneca, Steuben, Wayne and Yates (See Figure 1).

Scouting was conducted by volunteers from Cornell Cooperative Extension (CCE), industry and USDA-NRCS (See list of collaborators). Protocols for establishing, monitoring and sampling sentinel plots were provided by USDA and are available via the Soybean PIPE website. Sentinel plot monitoring began at early soybean vegetative growth stages (mid-June) and continued through mid- to late pod fill (September).

CCE collaborators shared New York SBR/SBA sentinel site foliar samples and soybean aphid observations weekly with the project leaders. Disease samples were processed by the Cornell Plant Disease Diagnostic Clinic. Disease and soybean aphid data was regularly uploaded to the USDA IPM PIPE Database (www.sbrusa.net). Bergstrom (SBR) and Waldron (SBA) compiled and summarized SBR and SBA information from NY state reports. These data were uploaded by Mary McKellar and Patty Clement (NEPDN and Cornell Plant Disease Diagnostic Clinic) to the national PIPE website (www.sbrusa.net) in a timely manner consistent with scouting frequency. In addition, summaries were shared with New York clientele via updates to the New York Soybean Rust Information Center (www.ppath.cornell.edu/soybeanrustny/) and the NYS IPM Program Weekly Field Crop Pest Report (http://nysipm.cornell.edu/fieldcrops/tag/pestrpt/).

Results and Discussion:
Thanks to the efforts of Cornell Cooperative extension, USDA personnel and cooperating soybean producers sixteen soybean rust / soybean aphid sentinel sites were established in 14 New York counties in 2008. Sentinel sites were established in the following counties: Cayuga, Chautauqua, Chemung, Columbia, Cortland, Jefferson, Lewis, Madison, Niagara, Oneida, Ontario, Schoharie, Seneca, Steuben, Wayne and Yates (See Figure 1).

Disease monitoring:
The majority of foliar disease samples were collected from July through August. All foliar samples were processed by the Cornell Plant Disease Diagnostic Clinic which also serves as the Northeast Plant Diagnostic Network's Regional Hub Laboratory.

NYS sentinel plot samples were assessed for soybean rust and other soybean diseases. Soybean rust was not detected in NY this season. Weekly scouting efforts did, however, document occurrence of other soybean diseases including Septoria brown spot, downy mildew, bacterial pustule and frogeye leafspot. White mold (*Sclerotinia sclerotiorum)* was a significant concern in some production fields outside of the sentinel project this season.

Insect monitoring:
Soybean aphid (SBA) populations were consistently very low across NY in 2008. SBA populations did not exceed threshold in any sentinel site this season and there were no reports of significant SBA populations at other locations across NY. There were, however, reports of some fields being sprayed for soybean aphids. It is questionable if these situations were based on actual need. Nationally, SBA populations were generally low in 2008, except for late season population surges in some areas of the Midwest. Japanese beetles were widely reported infesting soybean fields in NY, however, economically significant defoliation damage was not reported.

Soybean pest monitoring insights and outreach linkage:
New York soybean pest information was enhanced by frequent contributions by CCE personnel from soybean producing regions across the state. One particularly helpful group were CCE personnel involved in a Northeast Soybean Promotion Board funded project "On-Farm Soybean IPM Education Programs: Cultivating Enhanced Soybean Management" also known as "Soybean Tactical Agriculture teams" or Soybean TAg.

Soybean TAg programs were implemented on sixteen farms by Cornell Cooperative extension personnel working with sixteen producers in 3 NYS counties. Three of the 2008 NY sentinel sites were located on farms participating in this TAg program. The soybean TAg program provided an additional opportunity to closely monitor and document soybean pests and crop development. Additional soybean producer field meetings were held in Cayuga, Columbia, Jefferson, Oneida/Madison, Seneca and Tompkins counties. These field meetings extended the reach of soybean IPM and ICM on-farm education beyond the more intensive TAg groups to 110 soybean producers in areas where soybean acreage is expanding. More information on Tactical Agriculture (TAg) teams can be found at: www.nysipm.cornell.edu in the field crops section. The 2008 Soybean TAg report can be found at: http://www.nysipm.cornell.edu/reports/.

Another source of exchange of timely soybean pest management information was a weekly conference call among field crop extension educators from across the state. These calls provided an opportunity for individuals to share updates of local crop and pest observations. Highlights of pest information from TAg programs and the weekly conference call were summarized and included in the on-line Weekly Field Crop Pest report distributed via Cornell field crop list serves and the NYS IPM Program website at: http://nysipm.cornell.edu/fieldcrops/tag/pestrpt/.

Soybean rust was not detected and soybean aphid populations were well below threshold in NY soybean fields this season. It is uncertain whether the USDA Soybean PIPE project funding will be available in 2009. Efforts are underway to explore mechanisms to continue sharing disease detection information and soybean aphid population development among soybean producing states. SBR development will largely be a function of successful overwintering of the pathogen and weather conditions next season. For SBA populations, 2008 fall Midwestern US aphid suction trap collection data observed extremely high numbers of aphids moving to overwintering sites. This would suggest that 2009 SBA populations could be significant.

Treatment of sub-economic SBA populations by some producers indicates additional work is needed to better educate soybean producers about the risks of such actions in terms of economics, impacts on beneficial populations, potential exacerbation of spider mite populations and potential risk of developing insecticide resistant SBA populations.

Summary:
The SBR/SBA sentinel monitoring program did not detect presence of soybean rust in NY this season. Soybean aphid populations were extremely low across NY with no over threshold situations observed in any sentinel plot. The network created an excellent opportunity to strengthen communication among CCE personnel, growers and other stakeholders.

This season's soybean rust monitoring information and sentinel plot reports are available on the Cornell plant pathology department website at: www.ppath.cornell.edu/soybeanrustny/. Soybean aphid monitoring observations and other NY information are archived in the NY information section at: www.sbrusa.net/.

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Figure1. Location of NY Soybean Sentinel Survey Sites 2008