NYS IPM Project Annual Report

Project Title: Soybean Commodity Cooperative Agricultural Pest Survey
Principal Investigators: Ken Wise, NYS Integrated Pest Management Program

Executive Summary
The NYS IPM program has partnered with NYS Dept. of Agriculture and Markets and USDA Animal and Plant Health Inspection Service (APHIS) for many years on various commodity surveys to monitor for potentially invasive species that would be of concern to NYS agriculture. Our 2019-2020 soybean commodity survey was successful, and we were asked to continue. In 2021, five NYS IPM and CCE collaborators surveyed 25 soybean fields in 23 counties from June until October. No moths of the two potentially invasive species were caught, demonstrating that they still aren’t a present threat to NY farmers. We started to look for soybean gall midge in 2020 and 2021. This pest was not found in NYS. In 2021 soybean cyst nematode was identified in soil samples collected from 8 fields in 8 counties. In total, we have found 36 counties in NYS with SCN. This means that where soybeans are grown in NYS there is a high risk of having SCN in those fields. Soybean cyst nematode is by far the worst yield-damaging pest of soybeans in the United States.

Issue
Annual funding in the Plant Protection Act 7721 supports the Cooperative Agricultural Pest Survey (CAPS) pest detection program, led by the USDA Animal and Plant Health Inspection Service (APHIS), to safeguard against introductions of potentially harmful plant pests and diseases. These surveys ensure the early detection of potentially invasive species that could negatively impact U.S. agriculture and/or environmental resources. The NYS Department of Agriculture and Markets (NYSAGM) works with APHIS to prioritize the potentially invasive species to monitor in economically important commodities in NY each year. In 2019 to 2021, NYSAGM collaborated with the NYS Integrated Pest Management (IPM) program to coordinate a soybean CAPS survey to monitor for two potentially invasive moth species, as well as to expand monitoring of the soybean cyst nematode across New York soybean production areas, and added the potentially invasive soybean gall midge in 2020 and 2021.

The overarching goal of the CAPS program is to monitor for species that shouldn’t be here, and to confirm that they still aren’t in NY or even the U.S. These surveys are often the result of cooperation among state and federal employees, such as APHIS pest inspectors, NYSAGM inspectors and extension specialists. This ‘boots on the ground’ approach allows for broad coverage of the surveys across the state involving many individuals with agricultural and pest identification expertise.

The soybean cyst nematode (SCN) is considered the number one pest of economic concern of soybean nationally and globally, potentially causing 10-30% yield loss in the absence of above ground symptoms. In 2017, national estimates reported over 109 million bushels lost to this pest in the U.S. alone. Considering that this pest is confirmed in surrounding states and provinces, and given its potential to spread, statewide survey efforts have been underway since 2013 to determine the presence or absence of the soybean cyst nematode in NY. From 2013-2016,
numerous fields in 17 counties were sampled and tested as part of a statewide soybean disease survey led by Cornell’s Field Crops Pathology program, funded by Northern NY Agricultural Development Program and NY Corn and Soybean Growers Association. In 2016, SCN was confirmed in one field in Cayuga County by Cornell’s USDA ARS Nematology lab, albeit at very low levels. Since then, survey efforts have continued, including this soybean CAPS survey effort, because it is widely assumed that SCN is much more prevalent in NY.

**Progress Summary**

The soybean commodity CAPS survey was coordinated and executed according to established protocols, in cooperation with NYS Dept. of Ag. and Markets. A total of 75 fields (2019-2021) in 25 counties were monitored for two potentially invasive moth species (Golden Twin Spot Moth and Silver Y Moth) using pheromone traps from May through September. Fortunately, no target moths were caught. In October – November, collaborators collected soil samples from each of the 75 fields to have tested for the presence of the soybean cyst nematode. In 2020 and 2021, the survey added soybean gall midge to the scouting efforts. No target moths species or gall midge were identified in this survey.

In 2019, seven fields tested positive in six different counties for SCN, bringing the total number of counties confirmed positive for SCN to seven. SCN survey results in 2020 confirmed the nematode in an additional 17 fields in another 14 counties. In 2021, we had 25 fields in 23 counties. We had eight fields test positive for SCN. In figure, one shows the positive tests for SCN conducted by the CAPS survey from 2019-2021.
Most of the egg counts in each positive sample were <500 eggs per cup of soil which is very low compared to population levels of SCN in other states where it is very well established and problematic. However, we identified some fields with SCN egg counts above 500 eggs per cup of soil. These results are alarming, and indicative that NY growers need to start actively managing for this pest before SCN becomes the number one pest of soybeans in NY. We are in a good position to stay ahead of this potentially devastating pest with good integrated pest management practices.

Outreach and education efforts are underway to inform all soybean stakeholders (growers, consultants and agribusiness associates) about the risks and challenges of managing SCN. This was an invited topic for presentations at a number of winter extension meetings. These results were presented at the advanced training sessions at the annual northeast certified crop advisors training, crop congresses, and winter pest management workshops.
**Expected and Observed Impact**

On a positive note, it is good that we didn’t catch any moths of the two target species, nor did we identify the soybean gall midge in any fields. For now, at least, these are pests our growers don’t need to be concerned about. Growers who were made aware of this CAPS survey gave positive feedback, indicating that they were glad these sort of efforts were underway, and some offered their farms as additional survey sites in future years.

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We will continue our outreach efforts in coming years, and expect that as growers learn and understand how important this pest can be, they will increase their own testing efforts and adopt integrated pest management tactics towards minimizing losses.

**Project Conclusion:**

No Silver Y or Golden Twin Spot moths were caught during this survey, which likely means that they still are not species of concern to NY farmers. The soybean gall midge will continue to be a pest of concern for monitoring until it is confirmed in the state. However, the expanded detection of the soybean cyst nematode is cause for concern. We are fortunate that the SCN populations are mostly at low levels. This means we are ahead of the curve compared to other states where this pest can be devastating. However, the detection of a few fields with moderate or high levels of SCN are concerning, and require attention.

Thanks to Mike Stanyard, Janice Degni, Mike Hunter and Erik Smith for all their work on this survey.