Southern Ontario Soybean Insect and Disease Survey 2008

Purpose: To determine the weekly distribution and infestation levels of soybean aphids, bean leaf beetles, other insect pests, soybean leaf diseases including soybean rust and soybean viruses in fields across Southern Ontario.

Methods: In 2008, 82 soybean fields were monitored for soybean insects and diseases across Southern and Eastern Ontario by OMAFRA staff and key consultants. 29 of these sites were soybean rust sentinel plots and 53 "mobile" sites were set up in regions of Ontario where sentinel plots did not exist. These mobile sites represented typical grower fields that were planted at normal planting dates for their region, more likely suited for soybean aphid infestations.

Fields were scouted weekly from May to early September. The information collected was included in maps and management recommendations that were uploaded to the Ontario Soybean Growers website (www.soybean.on.ca) and the US PIPE website (http://sba.ipmpipe.org). These maps assisted producers, industry and extension personnel in management of soybean aphid and increased awareness as to changes in population levels within the different regions of the province.

Funding requested through this proposal helped support two research assistants to assist in the collection of field samples, disease and insect monitoring in the summer and validation of thresholds.

Results:

Properly timed surveys help quantify the status of key insect and disease pest species within the province, allowing producers sufficient time for management to take place when necessary. Insect and disease populations continue to increase in the province and therefore so does the potential for increased yield loss and stress in the soybean crop. In addition new invasive species have recently been introduced (e.g. soybean aphids) or are imminent (e.g. soybean rust). With these new pests come other associated issues such as increased soybean viruses which are vectored by insects.

Based on the weekly scouting results, the OMAFRA Field Crop Entomologist and Field Crop Plant Pathologists provided commentary weekly, including scouting and management recommendations for pertinent soybean pest issues that would arise based on the monitoring program. Laresco, a land resource company in London, Ontario provided assistance with the development of these maps for inclusion on the OSG website. Aphid scouting data were also uploaded onto a mapping program of the USDA Pest Information Platform for Extension and Education (PIPE) at http://sba.ipmpipe.org. Timely articles were also written for CropPest newsletter and other media sites to help distribute key pest information to Ontario soybean growers. Yearly results were also presented at various grower meetings and crop conferences throughout the winter months.

Soybean Aphid

2008 was an exceptional year as soybean aphids remained at low to moderate levels throughout the year, never reaching threshold. This is the first time since 2002 that we experienced such low levels of soybean aphid populations. Two of our locations (indicated in yellow in Fig. 1) did near threshold late in the season but was beyond the R5 growth stage and required more aphids per plant before threshold was actually reached. No fields were reported to have been sprayed in 2008. This was contrary to other locations in the US where some states including Illinois, Wisconsin, Minnesota, and North and South Dakota experienced one of the highest aphids years on record, with multiple sprays required at some locations. Given the lower numbers experienced in Ontario in 2008, 2009 could be at risk of experiencing significant aphid populations. Natural enemy populations are going to be lower than usually going into 2009 since they were not able to bulk up in numbers, feeding on aphids in 2008. And suction traps running in Michigan and other states indicate a higher than usual fall catch of soybean aphids moving to buckthorn to overwinter. Years that follow a heavy fall suction trap catch tend to be significant soybean aphid years.

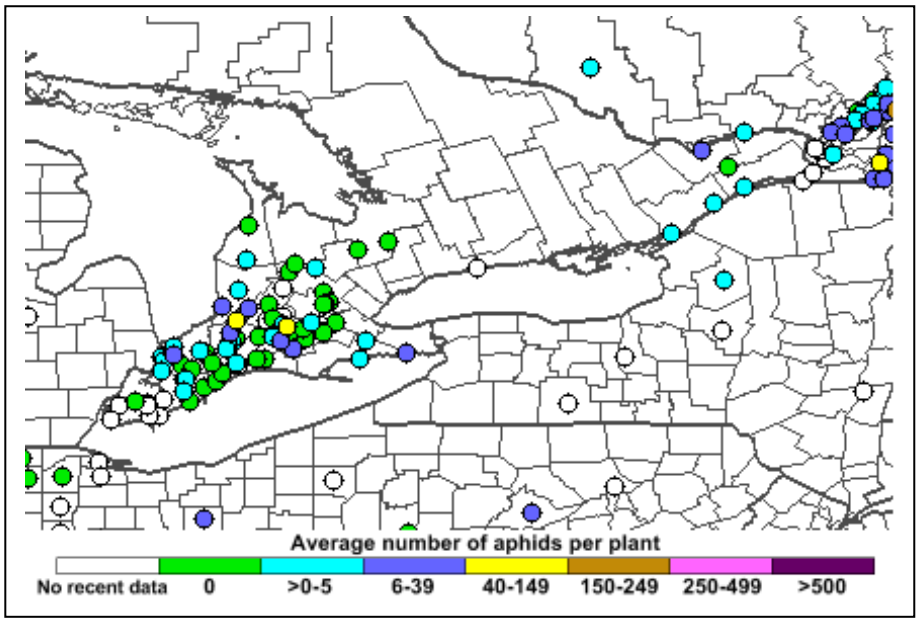

Figure 1. Map taken from the USDA PIPE website (http://sba.ipmpipe.org) indicating soybean aphid scouting results in Ontario for the week of August 21, 2008.

Bean Leaf Beetle

Bean leaf beetles were active early in the season with fields experiencing overwintering populations in areas more north than recorded before, indicating that bean leaf beetles are still increasing their range and are successfully overwintering as far as southern Huron and Perth Counties. By mid season, Bruce and Grey counties experienced 1st and 2nd generation bean leaf beetles for the first time. Though survey results indicate that the majority of the fields had low levels of bean leaf beetle (less than 1 beetle per plant), five sites did experience populations of 2 or more beetles per plant or 10% pod feeding with three sites reaching levels requiring management.

Soybean Rust
Unlike 2007, soybean rust infection was not detected in 2008 from the sentinel plots or commercial fields. To date the only confirmed Canadian soybean rust plant infection occurred in the fall of 2007 from plots on the University of Guelph Ridgetown Campus in Ridgetown, Ontario, Canada. This detection was important since it confirmed that the disease can travel and infect Ontario soybeans.

Soybean Foliar Diseases
Leaf disease levels varied by location and as expected environmental conditions influenced disease levels substantially. The predominant leaf diseases found in the sentinel plots and the commercial fields were Septoria brown spot, downy mildew, powdery mildew and frog-eye leaf spot although all were at relatively low levels. In areas with prolonged or increased moisture levels, white mould symptoms were obvious.

Summary:

In 2008, the number of sites monitored was increased to 82 soybean fields (29 rust sentinel plots and 53 “mobile” sites). It was an exceptional low aphid year compared to other years and other states that did experience record numbers. Bean leaf beetle appears to be expanding its geographical range and is becoming a pest of concern for all of Southern Ontario. Overall foliar leaf disease levels were low in the fields examined in 2008 but white mould damage was obvious in certain fields.

Determining the distribution and corresponding infestation levels of these pests is crucial for effective pest management which in turn, reduces the risk of yield loss for producers. In addition the development of baseline information now can assist us in determining the impacts of climatic change in the future. Without an understanding of the pest problems we presently have and at what levels they occur, it would be impossible to determine what the impact of climatic change or changing agricultural practices (bioeconomy) will have on them.

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