

Volume 12  
Issue 15  
August 9,  
2007

Ontario Ministry of Agriculture, Food & Rural Affairs  
Agriculture Development Branch (Field Crops Unit)  
Editor: Albert Tenuta - Plant Pathologist (519) 674-1617  
[www.omafra.gov.on.ca/croppest](http://www.omafra.gov.on.ca/croppest)



ISSN 1203-2204

# CROPEST ONTARIO

Inside Issue 15 (2007):	Pg.
Cysts on Roots of Corn Plants	1
New Cyst Nematode Species Found on Corn	2
Soybean Aphid Populations Increased Dramatically Last Week	4
Spider Mite Alert	5
Soybean Rust Increasing in Texas, Louisiana, Arkansas and Now Oklahoma!	5

There has been considerable speculation and discussion surrounding events last year in Tennessee when “cysts” were observed on the roots of severely stunted corn plants. After a comprehensive investigation it was determined that a new cyst nematode species that can reproduce on corn was responsible for the severe crop injury.

At a recent meeting I attended the information surrounding this event was released to the public. The following article summarizes the events and possible implications quite well. I would like to thank my friend Dr. Greg Tylka (Extension Nematologist) from Iowa State University for the article.

I regularly look at corn roots for nematodes and after hearing of the Tennessee events, I checked corn fields last fall and this year for this new cyst nematode. To date we have not observed this new cyst nematode species in Ontario. I will continue to check and keep you updated. – Albert Tenuta

## New Cyst Nematode Species Found on Corn

Greg Tylka, Nematologist, Iowa State University

Soybean producers and agronomists are well aware of soybean cyst nematode (SCN), the plant-parasitic nematode that



**Figure 1. Adult females and cysts of the nematode discovered on corn in Tennessee in 2006. (R. Heinz and M. Mitchum)**

is widespread through Ontario and the US Midwest and can seriously reduce soybean yields. And many people are aware of other plant-parasitic nematodes that can cause significant yield reductions on corn. But most crop professionals probably are unaware that there is a corn cyst nematode that has been in the northeastern United States since 1981. And just recently, a new cyst nematode species that reproduces on corn was discovered in Tennessee.

The corn cyst nematode, *Heterodera zea*, initially was reported in India in 1970. It was first discovered in the United States in Kent County, Maryland, in 1981. The corn cyst nematode has been found only in four counties in Maryland (Cecil,

Harford, Kent, and Queen Anne's) and in Cumberland County, Virginia. The fields known to be infested with the corn cyst nematode were quarantined by the United States Department of Agriculture in 1981, but the quarantine was lifted in 1996.

The biology of the corn cyst nematode is similar to that of SCN. The life cycle takes 18–21 days under ideal conditions, and several generations can occur in a growing season. The ideal temperature for the corn cyst nematode is 86 °F, which is considerably higher than the 78 °F optimum temperature for SCN. All of the numerous corn hybrids tested in the 1980s in Maryland were susceptible to the corn cyst nematode. Other host plants of the corn cyst nematode include barley, oats, rice, sorghum, sugarcane, wheat, and several grass weeds.

### New species of cyst nematode discovered on corn in 2006

On July 29, 2007, at a scientific conference, university nematologists from Missouri, Nebraska, and Tennessee and USDA nematologists announced that a new cyst nematode species was discovered on corn. Juveniles and cysts (egg-filled, dead females) were discovered in a soil sample taken from a field of stunted corn in northwestern Tennessee (Obion County) in 2006. University of Missouri nematologists made the discovery and verified reproduction of the nematode on corn and also found no reproduction on soybean in greenhouse tests. The nematode reproduced well on many different corn hybrids but poorly on other monocots. No dicots were found to be hosts. The cysts of this nematode look different than those of the corn cyst nematode discussed above, and genetic

analyses confirmed that the nematode was not the corn cyst nematode. The nematode appears identical to a cyst nematode discovered on goosegrass, a weed, in Lauderdale County, Tennessee, in 1978.

**Will new cyst nematode species affect corn production in Ontario and the Midwest United States?**

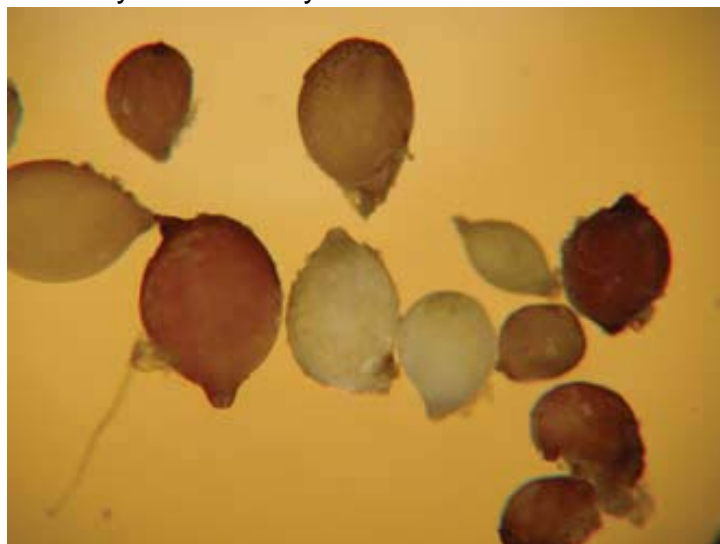
It is difficult to predict whether the new cyst nematode discovered on corn in Tennessee will move into other states and Canada. But in the 11 years since the quarantine was lifted on the fields infested with the corn cyst nematode in Maryland and Virginia, the nematode has not been found in any other state.

It also is unclear how damaging the new cyst nematode discovered in Tennessee would be to corn if it moved to the Midwest. The corn cyst nematode, *H. zea*, causes significant yield reductions only in hot environments, such as in India and Pakistan. Currently, it is not possible to predict how the new cyst nematode discovered on corn in Tennessee might affect corn yields because details such as the length of the nematode life cycle, number of generations per season, optimum temperature, survival in frozen soil, and ability to damage corn are not available.

**Greg's article appeared in the Iowa State University Integrated Crop Management Newsletter — July 30, 2007**

**New cyst nematode species on corn would hinder SCN field sampling and research**

Spread of this new cyst nematode on corn into fields in the Midwest and Canada would seriously hinder field soil sampling as well as research on the biology and management of SCN. Currently, no other cyst nematode species commonly exists in corn or soybean fields in the Midwest or Canada. Eggs recovered from cysts extracted from soils in these regions are assumed to be SCN eggs. But eggs of SCN and other cyst nematodes look similar and cannot be distinguished by appearance. Determining SCN egg population densities for management or research purposes would be impossible using current techniques if other cyst nematodes were present. A stain that is specific for SCN eggs currently is not available, and developing such a stain likely would take years.



**Figure 2. Adult females and cysts of the soybean cyst nematode. (*G. Tylka*)**

## Soybean Aphid Populations Increased Dramatically Last Week

Tracey Baute, Field Crop Entomologist, OMAFRA-Ridgetown

Those who have been watching their fields closely every week noticed a big change in the aphid activity early last week. Aphid populations built up in many fields and reached threshold. Other fields that had barely any aphids in them before were found to have at or above threshold numbers within the same week. After some consultation with colleagues in neighbouring states and provinces, we suspect a flush of winged adults were brought from the Midwest via the storm fronts last week, as Ohio, Michigan, Ontario and Quebec all experienced this sudden appearance of more aphids. The heat didn't help us, as it was too hot to spray but it didn't entirely help the aphids either. The aphids don't like it that hot and their reproduction is slowed down. But now that we are back to cooler nights and not as hot days, aphids have a chance to build up again if their natural enemies can't keep up. So go and check your fields again.

How much longer do we have to worry about them? Once your crop is into the R6 stage of soybeans, you need more aphids per plant before control is necessary. Plants are in the R6 stage, also known as the "Full Seed" stage when the seeds in the top pods of the plant are large and filling the entire pod cavity. Though we do not have thresholds set yet for the R6 stage, based on past spray trials, you need at least 1000 aphids per plant to see a yield response. And once the soybeans are beyond the R6 stage, economic return from an insecticide application is not likely.

Spraying them has been challenging for some while others have had good success. Spray coverage has been the biggest problem. Use high water volumes..20 gals..30 gals preferred. Set your boom and nozzles as though the target pest is at the middle of the plants, not at the tops. And keep in mind that Matador is heat sensitive so you do not want to be spraying it in temperatures higher than 27 degrees C. Hold off and spray it in the evenings or very early mornings when the temperatures are cooler.

The winged adults can also land in edible bean fields. Though they can vector a virus into the plants, the aphids can not survive beyond the 1<sup>st</sup> instar nymphs on edible beans. Spraying them with insecticides will not reduce the incidence of virus vectoring..if the aphids are on the plant, they've already plugged in and would have transmitted the virus if they were carrying it. But they do have to pick it up first from an unhealthy plant so it really depends on where that aphid has been as to whether it even has the virus in it to vector.

And finally, the rains that went though should help a bit. It **does not** knock aphids off but it will help the plants put out new flowers and deal with the aphids that are sucking the nutrients out of them. But if you've reached thresholds, you still have to spray. Rain can help with the spider mite situation so if you were going to spray for mites just before the rain came but didn't get around to it, check the field out again before you spray to make sure the mites are still there. With any luck, the mites will have vanished though the damage they have done will not recover.

## **Spider Mite Alert**

**Tracey Baute, Field Crop  
Entomologist, OMAFRA-Ridgetown**

Over the past few weeks I've been seeing more and more fields suffering from spider mites injury. Though most fields saw rain this week, don't assume that the mite problem is gone. Rain has been known to knock mites off but that is not always the case so make sure to scout fields again to determine if they are still there.

Spider mites usually start at the edges of the field but windy days have carried them in from other sites, with pockets starting up deeper into the field. From the road these pockets may have been confused for drought stress. Instead of turning yellow, the plants have a bronze/dull grey appearance to them. Looking at the underside of their leaves you find a dusting or webbing and once you shake these on a piece of paper you see the small spots moving around on the paper.

Four (4) mites per leaflet or one severely infested plant indicates that control is necessary. Spot treatments in these infested areas can be effective, as long as you ensure that the mites are not present throughout the field. Use Cygon or Lagon to control mites. DO NOT use Matador which is a pyrethroid and will cause the mites to flare up. Scout a week or so after treatment to ensure the control was effective. If mite eggs were present at the time of application, they can survive the spray, hatch and start up new colonies.

Hopefully the rain and humidity will help the fungus that controls the mites kick into

gear soon and help eliminate this very damaging pest.

## **Soybean Rust Increasing in Texas, Louisiana, Arkansas and Now Oklahoma!**

**Albert Tenuta, Field Crop Plant  
Pathologist, OMAFRA,  
Ridgetown**

As I mentioned in my last update two weeks ago the weather conditions in the southern US especially in Louisiana and Texas have been very favourable for soybean rust development and that most likely we would see more infected areas. That has been the case and a good example is what occurred on August 9<sup>th</sup> in Louisiana where Asian soybean rust was reported on soybeans (commercial fields and/or sentinel plots) in 6 new counties (Jefferson Davis, Allen, Evangeline, Concordia, East Baton Rouge and Bossier Parishes). On August 8<sup>th</sup>, soybean rust was reported on soybeans in Tulsa County, Oklahoma, marking the farthest north the disease has been found in 2007.

In 2007, rust has now been reported in 24 counties in Texas (23 soybeans), five counties in Alabama (one soybean), four counties in Arkansas (soybean), 11 counties in Florida (two soybean), five counties in Georgia (all kudzu), 13 parishes in Louisiana (12 soybean), one county in Mississippi (kudzu), and five counties in Oklahoma (soybean). There also has been one account of soybean rust earlier this year in Mexico in the state of Veracruz on yam bean (*Pachyrhizus erosus*). Weather conditions have been favorable for rust development in many

parts of the south and to the states just north of the gulf states. Soybean rust monitoring continues throughout the soybean growing areas in Ontario and the US.

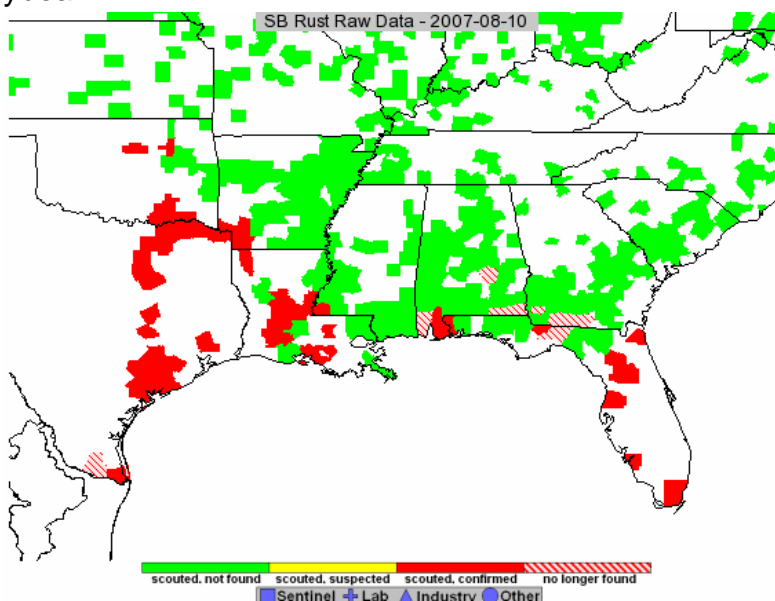
The increase in Texas, Louisiana and Oklahoma does not at this time change the risk to Ontario and Canadian soybean producers. We will continue to see more counties and possible new states reporting soybean rust infections over the next week or so. The question remains “how severe and could these areas be a significant inoculum (spore) source for Canada and the US corn belt”? The US soybean rust situation is ahead of last year (Figures 1 and 2) but again time is on our time.

One area that needs to be taken into consideration is the time it takes for the disease to develop in a new area. For instance if spores were to be deposited into Ontario over the next week or so and the environmental conditions were favourable it would still take 10-14 days for the disease to become visible. Even then it would take another two or more weeks to develop further. By this time the majority of Ontario’s soybean crop would be nearing maturity.

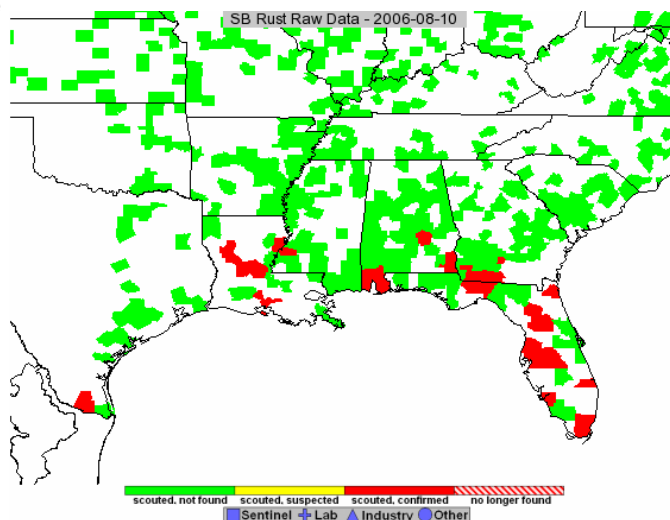
Updates will continue to be provided through the Crop Pest Ontario, the Ontario Soybean Growers website ([www.soybean.on.ca](http://www.soybean.on.ca)) and the US PIPE/SBR website ([www.sbrusa.net](http://www.sbrusa.net)). Alerts will also be posted through the CropLine if things change rapidly.

Funding for many of the Ontario soybean rust projects was provided in part through

the Canada-Ontario Research and Development (CORD) Program administered by the Agricultural Adaptation Council as well as the AAFC Pest Management Centre, the Ontario Soybean Growers and the Ontario Soybean Rust Coalition.



**Figure 1 – Soybean rust in Louisiana, Texas, Oklahoma and Arkansas continues.**



**Figure 2 – Soybean rust distribution last year at this time (Aug 10, 2006) had not developed in Arkansas and Oklahoma or much in Texas .**