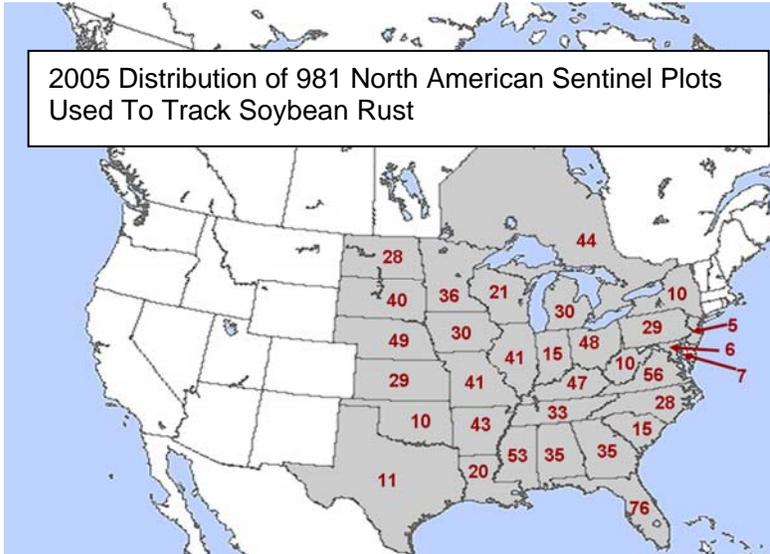


Ontario Soybean Rust Sentinel Plots

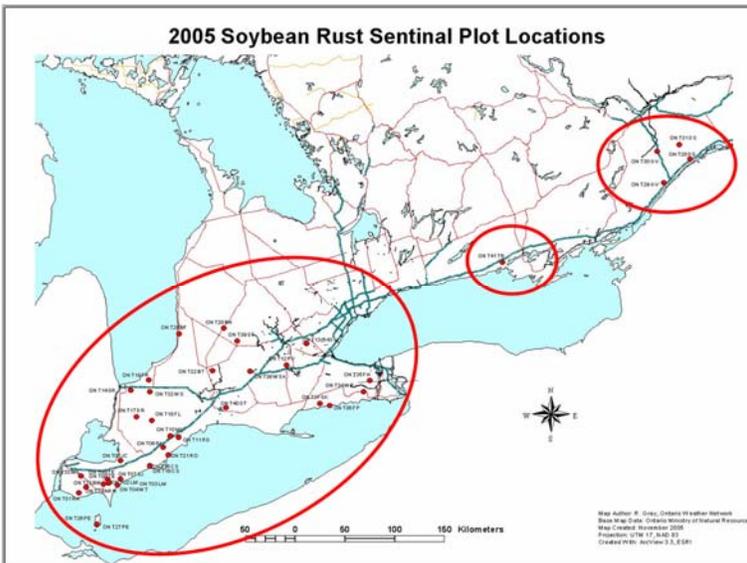
Purpose:

Soybean rust (*Phakospora pachyrhizi*) is a new and invasive fungal disease of soybean in North America. The risk to Ontario and Canadian soybean production has increased substantially with the confirmation and subsequent spread of the disease in the southern United States. As an extension of the comprehensive monitoring program put in place for the 2005 growing season by the US, a series of soybean sentinel plots (44) were established across the soybean production area of southern Ontario (from Windsor to Ottawa).



Methods:

Forty-four soybean sentinel plots were established from Windsor to Ottawa and although soybeans were the main focus of scouting activities in commercial fields, other legume crops (such as dry edible beans) were scouted throughout the season. Planting dates for the 2005 Ontario sentinel plots ranged from April 15 to May 27 which resulted in the plots being 5 to 14 days ahead of most of the grower fields in these areas. The majority of sentinel plots had a single planted variety however multiple variety locations were established primarily on research stations. Varieties were selected based on appropriateness for the selected region. Due to the variation in growing areas within the province, maturity groups ranged from late group 2 in the southwest to mid group 0 in the east.



The majority of sentinel plots were monitored by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) field scouts, certain locations were monitored in conjunction with

Agriculture and Agri-Food Canada (AAFC) and industry partners. Plots were monitored weekly except for certain locations in the southwest which were scouted twice-a-week based on storm front activity and the risk of spore movement into the province or Great Lakes region. Beginning at the R1 growth stage, random and questionable leaf samples were collected from the sentinel plots and evaluated in either Ridgetown or Ottawa. Unresolved leaf samples were screened for the pathogen by AAFC in Ottawa (Dr. Sarah Hambleton) using conventional PCR and real-time PCR detection techniques developed by the USDA.



Results:

Scouting results were posted on the Ontario Soybean Growers website (www.soybean.on.ca) and the USDA website (www.sbrusa.net). Although soybean rust was not detected in Ontario or Canada during the 2005 growing season, the sentinel plot network provides an effective decision support tool for producers and advisors considering whether a fungicide application is appropriate or not as seen in 2005. Based on the southern US experience, soybean rust was detected on soybeans or kudzu weeks before it was detected in commercial fields. These are significant findings since a “preventative” fungicide for instance, must be applied prior to the disease establishing and this network provides sufficient lead time. In addition, tracking the disease within the province can assist in the switch from “protective” to “curative” fungicides. The sentinel plot system proved to be a very effective and successful tool for producers, extension, consultants and the soybean industry.

The sentinel plot network also provided an opportunity to evaluate the protocols and technology transfer mechanisms created. Additional observations made in the sentinel plots included other soybean diseases and soybean aphid population levels which assisted in producer management decisions.

Summary:

The threat of soybean rust has led to unparalleled international cooperation and partnerships. The comprehensive soybean rust “sentinel plot” monitoring program put in place by the United States Department of Agriculture (USDA), United Soybean Board (USB) and the North Central Soybean Research Program (NCSRP) is one such example. Ontario’s involvement in this innovative network resulted in a series of soybean sentinel plots (44) being established across the soybean production area of southern Ontario (from Windsor to Ottawa). The information collected from this North American “early warning system” is posted on the Ontario Soybean Growers website (www.soybean.on.ca) and the USDA soybean rust website (www.sbrusa.net). Information presented in user friendly maps and commentaries. This “early warning” sentinel plot system in conjunction with education, monitoring, spore traps, prediction models, fungicides give producers the tools or weapons needed to track and combat this destructive disease and limit yield losses. The sentinel plot system provides producers, extension, consultants and the soybean industry with a effective and successful decision support tool.

Next Steps:

The sentinel plot system will again play an integral role in OMAFRA’s, the Ontario Soybean Growers and the North American soybean industries preparedness for soybean rust in 2006.

Acknowledgement:

Funding for this project was provided in part by Agriculture and Agri-Food Canada through the Agricultural Adaptation Council's CanAdvance Program, the Ontario Soybean Growers and the Ontario Soybean Rust Coalition.

The Ontario Soybean Rust Coalition which is a partnership of key soybean stakeholders encompassing extension (government), producer, researcher, equipment and chemical company representatives. These partners are not only committed to collect, compile, disseminate information and resources to tackle this debilitating crop disease but to provide a "unified" voice concerning soybean rust to not only Ontario producers but soybean producers in other provinces as well.

We would like to thank all cooperators including - growers, retailers, agri-business/industry, AAFC, University of Guelph, OMAFRA and many others for their hard work. A special thanks to Dr. Sarah Hambleton and her lab at AAFC-Ottawa. The cooperative effort is greatly appreciated !

OMAFRA would also like to thank the United States Department of Agriculture (USDA), United Soybean Board (USB) and the North Central Soybean Research Program (NCSRP) for including the Ontario sentinel plot information on the USDA soybean rust website (www.sbrusa.net).

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Location of Project Final Report:

Please visit the Ontario Soybean Growers Website (www.soybean.on.ca), the USDA Soybean Rust website (www.sbrusa.net) and OMAFRA site (www.omafra.gov.on.ca) for more information on the sentinel plots and other soybean rust related materials.