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Increasing grower awareness and monitoring spread of *Heterodera glycines* in North Dakota, USA

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Introduction: Planted hectares of soybean (*Glycine max*) in the U.S. state of North Dakota (ND) has increased from approximately 0.5M ha to nearly 3M ha since the 1990's. As a result of this rapid expansion many soybean pathogens common in other U.S. states have not been identified in ND, and many ND growers are unfamiliar with many soybean diseases. In 2003, the invasive soil-borne nematode *Heterodera glycines* (Soybean Cyst Nematode [SCN]) was identified in ND. Soybean cyst nematode is one of the most important yield-limiting pathogens in the United States but yield losses can be mitigated if the pathogen is detected early and actively managed before the level of infestation becomes high. However, a lack of awareness and a negative social stigma associated with SCN has limited grower interest to test for SCN infestation, and made it difficult to ascertain the geographic spread of the pathogen.

Objective: The objectives of this study were to increase SCN awareness and sampling by growers, and determine the geographic distribution of SCN in ND.

Materials and methods: In 2013 and 2014, a free and anonymous SCN soil-testing service was provided to growers who submitted soil-samples in pre-paid sample bags distributed through the Cooperative Extension Service. Distribution of bags was accompanied by an Extension awareness campaign that included press interviews, advertising, educational seminars, and field day events. Egg count data (eggs/100cm³) were mailed directly to the submitting grower and a low-resolution map of egg counts was created and publically distributed.

Results: In 2013 and 2014, 193 and 579 SCN-samples, respectively, were submitted by growers using the program. Nematode eggs were identified in approximately 30% of the samples received and were located in 21 counties, including 11 where SCN had not been confirmed previously.

Conclusion: Distribution of the SCN maps coincided with an increase in SCN sampling and requests for educational seminars, interviews and management information; particularly in areas not known to have infested with SCN prior to map distribution. It is likely that this program will result in proactive SCN management and a reduction of economic loss from this invasive pathogen.

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Tomato growers' perception of biocontrol as a driver for adoption and improved extension services

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Introduction: In spite of the decennia-long use of biocontrol in greenhouse tomato production in Flanders (Belgium) and the legal obligation to practice integrated pest management (IPM) since 2014 (according to the Sustainable Use Directive 2009/128/EC), their implementation in commercial greenhouses still is not optimal and the adoption of innovative techniques remains slow.

Objectives: Therefore, we study tomato growers' perceptions and notions on biological pest control and IPM and of the consecutive steps in their implementation. The acquired insights should provide suggestions to improve extension and advisory services on crop protection. A higher success in knowledge transfer, should in turn increase the sustainability of tomato production.

Material and methods: To gain insight in growers' perceptions of biocontrol, we conduct a series of in-depth interviews, covering a list of open-ended topics linked to the production practices in general and pest control in particular, such as the glasshouse holdings' structure, the people making decisions, their notions about IPM, pest prevention, pest and predator monitoring, biological or chemical intervention and their opinions and visions about knowledge transfer. The sample group of tomato growers started with greenhouse holdings' crop protection managers proposed by extension research centres, and continued by using snowball sampling. While conducting and analysing the interviews we use a grounded theory approach. This approach focuses on the social psychology of the actors studied. Data are collected and analysed to identify concepts, ideas and views and to assess the actors' interpretation of the problem and the way they solve it. Grounded theory is generated through the abstraction of concepts and the relations between them from qualitative data, *in casu* interview transcripts.

Oral Presentations
Technology Transfer

Results: Preliminary results from this study will be presented. The revealed concepts and relations provide insight in the tomato growers' perceptions of biocontrol, their attitudes and their motivations for adopting specific practices.

Conclusion: Suggestions can be made to improve crop protection extension services' interaction with tomato growers and make their communication about innovations in crop protection practices more effective.