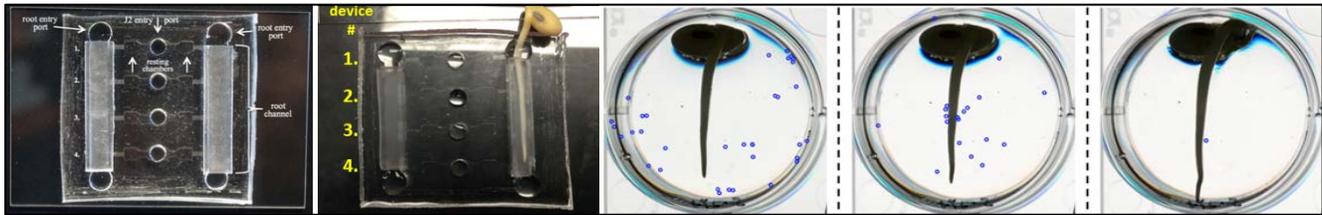


## METHODS

### Toward increased efficacy of soybean cyst nematode management tools



#### DESCRIPTION

This project developed methods to assess how new nematode management products affect specific aspects of the biology of the soybean cyst nematode (SCN), *Heterodera glycines*. The SCN is the most damaging pathogen of soybean in the United States and Canada. Estimated annual soybean yield losses for the United States due to parasitism by SCN exceed \$1 billion. Existing management of the nematode with resistant soybean varieties is becoming ineffective. There is renewed interest in developing novel SCN management products. In year 1 of the project, microfluidic chips were created on 5 cm x 7.5 cm glass slides. Test compounds were added to channels or devices on the chips, and movement of infective juvenile SCN worms towards or away from the materials in the channels were observed. In year 2, methods were developed to assess movement of the SCN juveniles toward or away from young soybean roots growing in modified microfluidic chips. Methods also were developed to study the movement of male SCN worms and to assess the spatial aspects of SCN juvenile infection of young soybean roots.

#### HOW THIS IS DIFFERENT THAN RELATED RESEARCH

Industry and university scientists have conducted a significant amount of research on the effects of nematode management products, especially seed treatments, on host crop yields and nematode population densities in SCN-infested fields. This project is a unique effort involving engineers and nematologists working together to develop methods to determine the underlying biological mechanisms of field-scale changes in SCN population dynamics and reduction in crop yield loss associated with use of SCN management products.

#### MEMBER BENEFITS

- Better understanding of the biological processes of the soybean cyst nematode, a major target for agricultural businesses.
- New techniques and methods that can be used to assess the effects of current and future management products on the biology of the soybean cyst nematode.