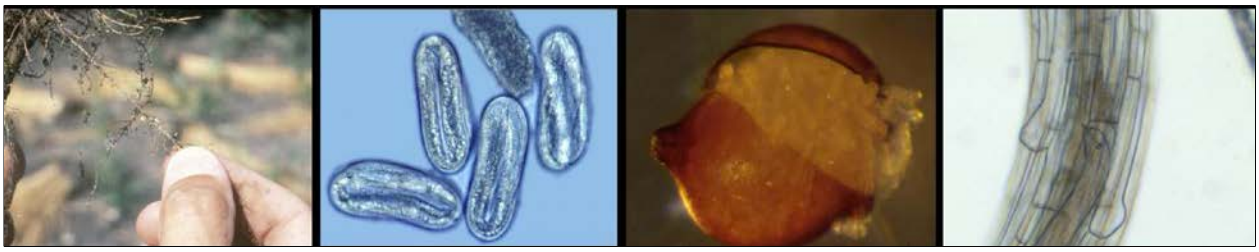
METHODS

Development of a genomic toolkit to explore genetic diversity of soybean cyst nematode populations.



DESCRIPTION

Soybean cyst nematodes (SCN) are among the most damaging plant parasites worldwide. SCN populations are classified into multiple "HG types" based on virulence displayed on pre-established soybean marker lines. Currently, identifying the HG type of a prevalent SCN population is laborious and time consuming: the nematode population has to be maintained on multiple soybean marker lines with appropriate control lines followed by analysis of cyst numbers. Additionally, correct identification can be further complicated by the presence of multiple HG types in a single population. Development of a PCR-based molecular test for efficient and consistent identification of prevalent HG type/s in a given nematode population will help resolve these difficulties but is hindered by the lack of genomic resources and information about genetic diversity of SCN populations. The goal of this project is to sequence and annotate the SCN genome from 15 SCN populations, and explore genetic diversity in HG typed SCN populations.

HOW THIS IS DIFFERENT THAN RELATED RESEARCH

All previous attempts at SCN genome assembly have been stymied by genomic heterozygosity. With the use of long-read sequencing technology and novel approaches to reduce heterozygosity, the quality of the genome assembly has been significantly improved. Assembly quality has significant importance to downstream analyses of genetic variability within and between populations.

MEMBER BENEFITS

- Improved understanding of the SCN genome, gene models and genetic diversity to better inform management of this devastating pest.
- New methods to overcome genomic heterozygosity during genome assembly
- Access to the most complete genome assembly ever generated for a cyst nematode.
- Access to full-length transcriptomic data from a virulent and non-virulent population.
- Genetic diversity in HG typed SCN populations for development of a PCR-based marker test.

CAMTech

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