Evaluating soybean cyst nematode (SCN) seed treatments in SCN populations with high and low PI 88788 female indices

Eichenburch, S., Seyer, B., Barizon, J., Biggs, M., Kuhlman, J., and Bissonnette, K.M.

Introduction

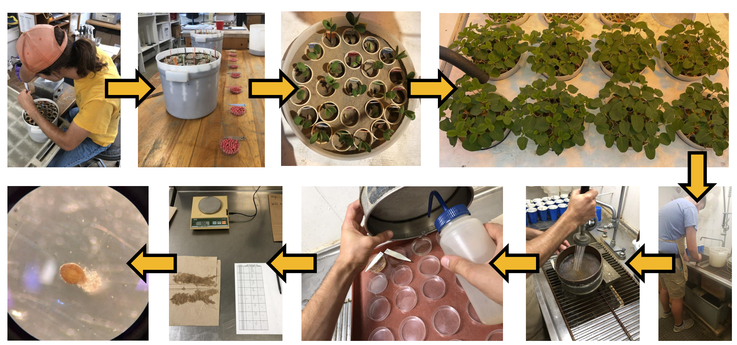
- SCN is the number one soybean pest in the U.S. and Canada.
- Historically, crop rotation and the PI 88788 source of resistance have been the main management strategies used by farmers to combat SCN.
- PI 88788 is used in 95% of commercially planted fields and SCN populations virulent on PI 88788 have been increasing in recent years.
- Seed treatments and crop rotation are options to decrease SCN egg densities

Objectives

- Test soybean seed treatment effectiveness for preventing SCN reproduction in the greenhouse
- Evaluate how PI 88788 female index influences effectiveness of nematode protectant seed treatments

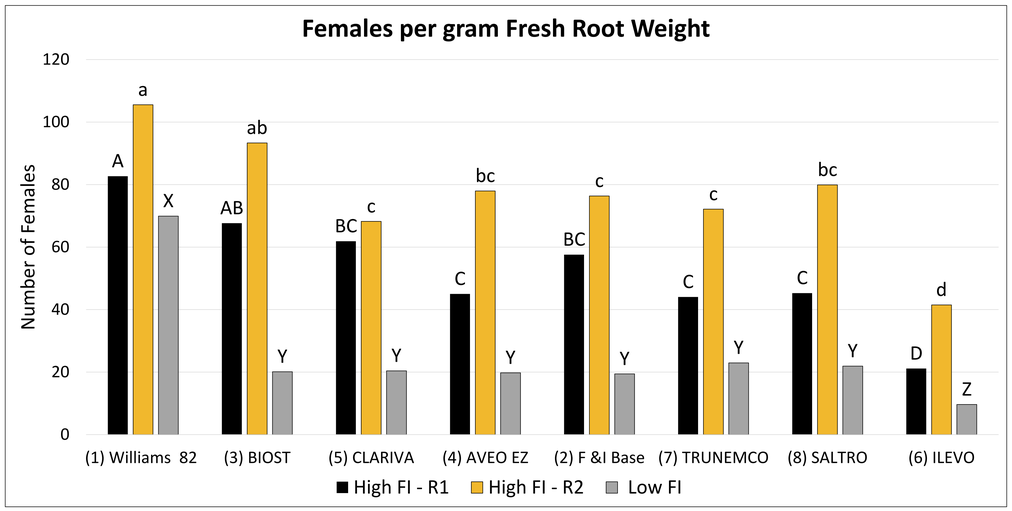
Materials and Methods

- Greenhouse Setup
  - Varieties - P37A27X (PI 88788 resistance) and Williams 82 (SCN susceptible)
  - 6 seed treatments and 2 controls (Table 1)
  - 1” PVC tubes cut to 6.25” placed in crocks
  - Seed planted into sterile sandy loam field soil
  - Replicated 6 times
  - 2 runs were completed
- Egg Extraction
  - 2 SCN populations were used, HG Type 2 with high (65%) and low (19.1%) females indices (FI) on PI 88788
  - Cyst samples from SCN populations were crushed and eggs were counted
  - Each tube was Inoculated with 500 SCN eggs and juveniles
- Greenhouse Bioassay
  - Soybeans were grown for 30 days in constant temperature water bath at 27°C
  - After 30 days, females were blasted from roots and counted
  - Root fresh and dry weight was recorded after blasting
- Analysis
  - All analyses were conducted in SAS 9.4 using Proc Mixed



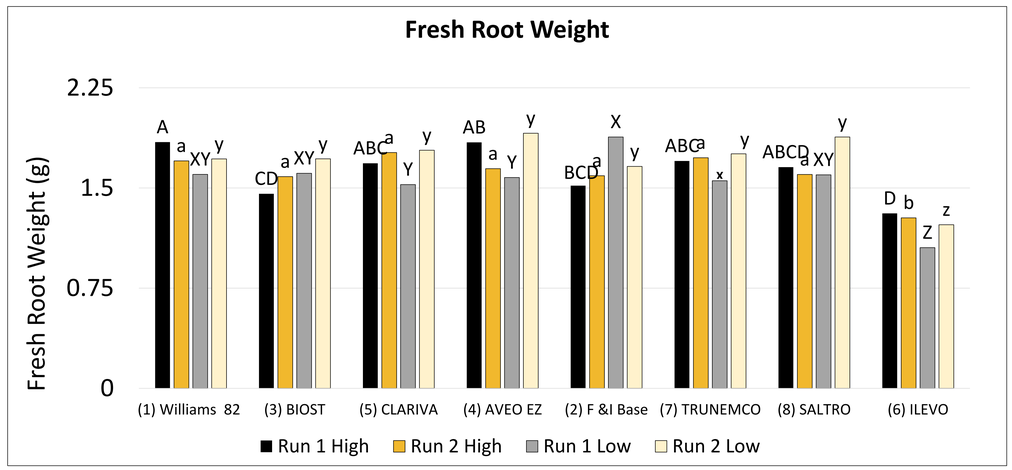
Conclusions

- Female reproduction was only inhibited by ILeVO in both high and low FI population, even with a PI 88788 variety.
- In high FI population, there is variability in female reproduction among all other nematode protectant products.



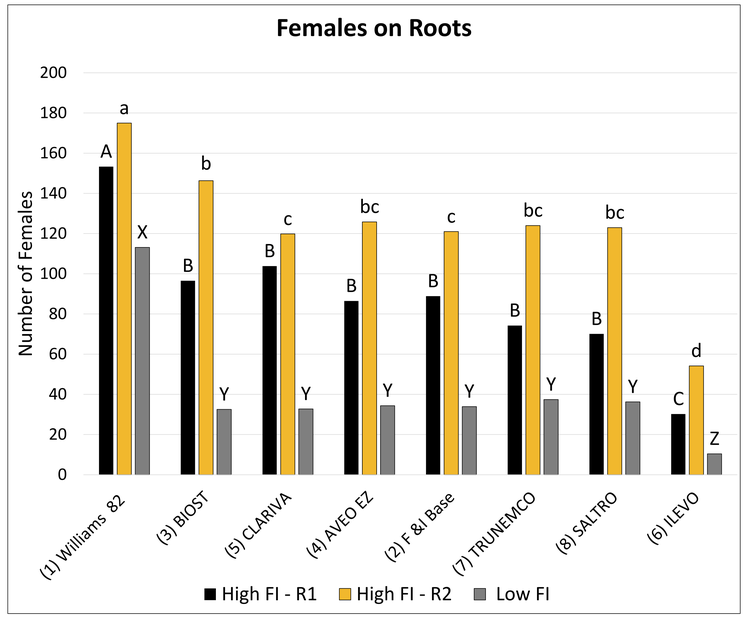
Results

- In some cases, there was no significant difference between the susceptible check and seed treated with nematode protectant.
- There was a significant statistical difference between Run 1 and 2 for the high FI population, indicating a higher level of variability.
- In all but Run 1 High PI 88788 reproduction, fresh root weight for ILEVO was statistically lower than all other treatments.



Seed Treatment	Active Ingredient
(1) Williams 82	-
(2) Fungicide + Insecticide Base	Allegiance, Stamina, Systiva, Poncho
(3) BIOST	Heat-killed Burkholderia rinojensis
(4) AVEO EZ	Bacillus amyloliquefaciens
(5) CLARIVA	Pasteuria nishizawae
(6) ILEVO	Fluopyram
(7) TRUNEMCO	Bacillus amyloliquefaciens and cis-Jasmone
(8) SALTRO	Pydiflumetofen

Table 1. Nematode protectant seed treatments evaluated in greenhouse bioassay and associated active ingredients. All nematode protectant products included the fungicide plus insecticide base treatment.



Future Investigations

- Evaluate impact of high and low populations on different varieties
- Evaluate effectiveness of seed treatments for different seed varieties
- Field trials gathering yield data

Acknowledgements

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