



## Seed Treatments for management of Soybean Cyst Nematode

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### Soybean Cyst Nematode in Mid-Atlantic

- Soybean Cyst Nematodes (SCN, *Heterodera glycines*), can greatly impact yield potential.
- Annual SCN yield losses in Delaware and Maryland average over 260,000 bu.<sup>1</sup>
- Above ground symptoms may be limited, so SCN is often referred to as a silent yield robber.
- If present, symptoms can include plant stunting, yellowing of leaves, and early senescence.
- When dug, female SCN may be visible on the roots (Figure 1).



Figure 1: Soybean root system with SCN females indicated at arrows.

### Management of SCN

- Host resistance is the most effective management tool for SCN.
- Unfortunately, efficacy of the PI88788 resistance source has been declining in recent decades.
- Seed treatments are being investigated as an additional management option.

### UD Seed Treatment Trials

- Two trials were conducted at the Carvel Research and Education Center in Georgetown, DE in 2020-2021.
  - Trial 1: Comparison of Saltro & ILEVO to non-treated plain seed.
  - Trial 2: Comparison of multiple chemical & biological treatments to a base seed treatment and plain seed (Table 1).
- Data was collected on percent emergence, SCN populations, and yield.
- Soil sampling to monitor SCN populations was conducted at planting, 30 DAP, and prior to harvest.

Table 1: Seed Treatments used in Trial 2 from 2020-2021

Name	Active Ingredient	Mode of Action
<b>Saltro</b>	Pydiflumetofen	SDHI enzyme inhibitor
<b>ILEVO</b>	Fluopyram	SDHI enzyme inhibitor
<b>Clariva</b>	<i>Pasteuria nishizawae</i>	Biologic, nematode parasite
<b>Trunemco</b>	<i>Bacillus amyloliquefaciens</i> cis-jasmone	Biologic, induced systemic resistance and protective colonization
<b>Aveo EZ</b>	<i>B. amyloliquefaciens</i> strain PTA-4838	Biologic, colonizes roots of soybeans to reduce nematode reproduction
<b>BioST</b>	Heat-killed <i>Burkholderia rinojenses</i>	Biologic, enzymes and toxins that target nematode eggs and juveniles
<b>Base Treatment</b>	Metalaxyl Pyraclostrobin Fluxapyroxad Clothianidin Flo Rite Color Coat Red	PA Qol SDHI nAChR



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### Trial 1 Results

- Treated seed had significantly higher percent emergence at 14 and 28 DAP in both years.
- Treated seed had statistically lower population densities at 30 DAP compared to the control in 2020 (Figure 2).
- Treated seed averaged a 2-6 bu increase over plain seed across both years.

### Trial 2 Results

- Treated seed had significantly higher percent emergence than plain seed, but not the base treatment in both years.
- No significant differences in nematode populations were observed at any collection time point in either year.
- Yield differences were observed in 2021 (Figure 3) and highest yield occurred in the Saltro + Base treatment.

### Conclusions

- Particularly when planting early, seed treatments can increase percent emergence compared to plain seed.
- Response of nematode populations to seed treatment is limited and may be impacted based on population levels at the start of the season.
- Yield response is variable and ranged from +2.8 to +6.6 bu/a over plain seed in Trial 1 and from -3.3 to +7.6 bu/a when compared to a base seed treatment in Trial 2.
- Seed treatments should be used in conjunction with other management strategies, including use of resistant varieties and rotation to nonhost crops.

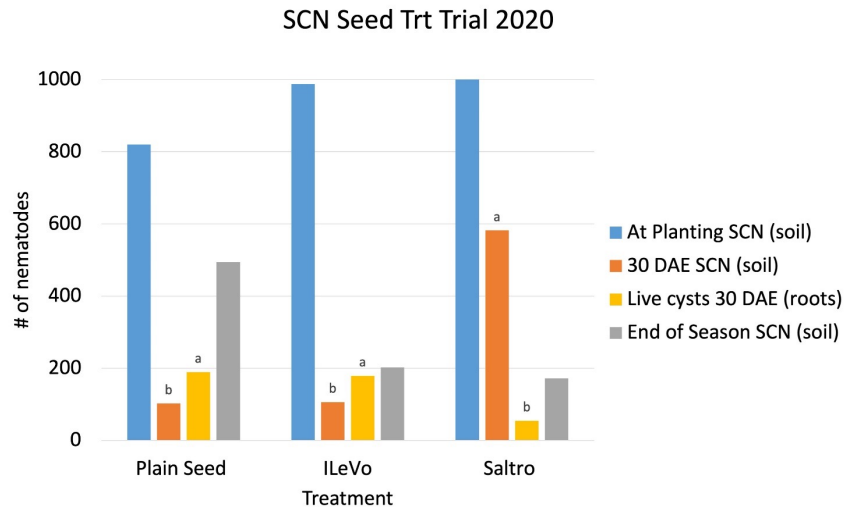


Figure 2: 2020 SCN Seed Treatment Trial 1

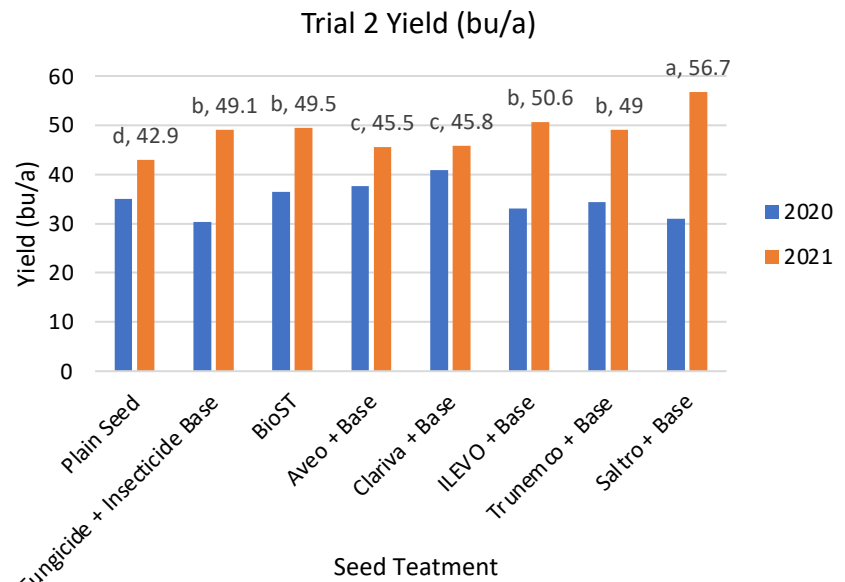


Figure 3: SCN Seed Treatment Trial 2 Yields

### References

- Allen, T. W., Bissonnette, K., Bradley, C. A., Damicone, J. P., Dufault, N. S., Faske, T. R., Isakeit, T., Kemerait, R.C., Koehler, A., Langston, D., Mueller, J.D., Padgett, G.B., Price, P.P., Sikora, E.J., Small, I.M., Thiessen, L., Young, H. 2021. Southern United States Soybean Disease Loss Estimates for 2020. *Proceedings of the Southern Soybean Disease Workers.*