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Introduction

Nematodes have become more problematic in North Carolina cotton production over the past few years, primarily due to the loss of aldicarb as the formerly and primary means of control. Reports of higher nematode numbers on soil test reports, nematode symptomatology on plants, and yield losses have increased in frequency and severity, but remain to be sporadic across the state. Symptoms, depending on species, include discoloration and malformation of both shoot and root tissue, as illustrated in Figure 1. Additionally, symptoms can appear at anytime during the growing season, on both young and older plants. Growers have adopted in-furrow liquids as their primary control measures for thrips, and many growers are no longer equipped to apply granular insecticides, even as aldicarb returned to the marketplace. Cultivar tolerance to nematodes are primarily specific to root-knot nematodes, however, several other species also affect cotton. Velum Total™ has been evaluated as a control measure but can only be used by growers who are equipped to apply in-furrow liquids. NemaStrike™ seed treatment was commercially released in 2018 and is touted to provide broad spectrum control of nematodes.

Objectives

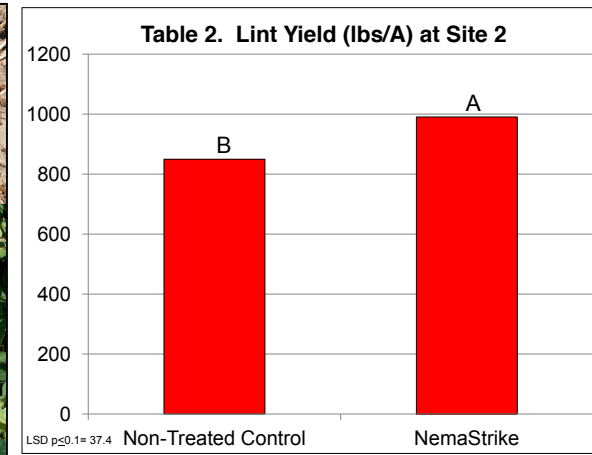
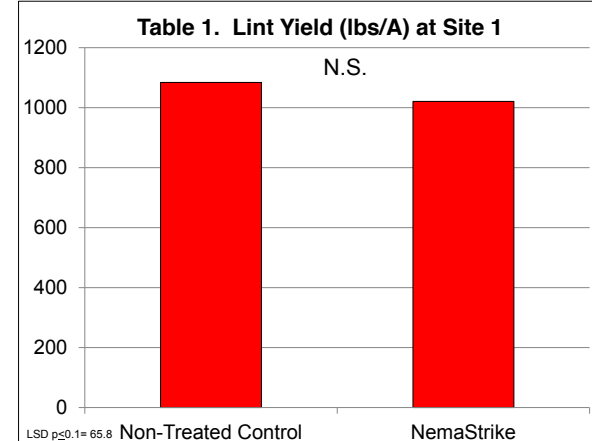
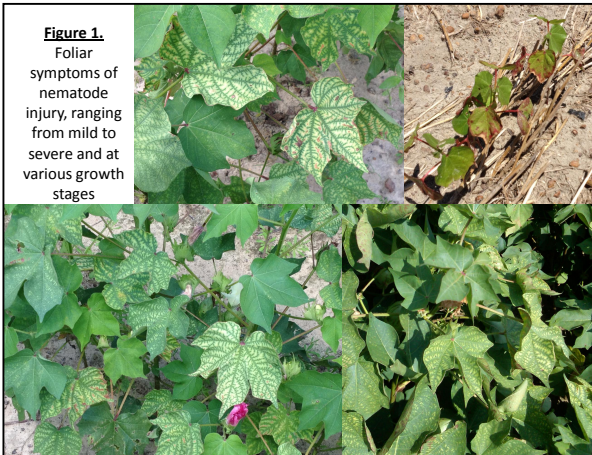
- 1) To evaluate effect of NemaStrike™ on plant growth, symptomology, and numbers of multiple nematode species
- 2) To evaluate the effect of NemaStrike™ on yield of cotton in multiple environments with a history of problematic nematode pressure.

Hypotheses

- 1) Nematode pressure and symptomology will vary within each field and between environments
- 2) Yield responses will vary depending upon prevailing environmental conditions (frequency of rainfall or intensity of drought stress) or any other factor that may affect root development within and between environments

Materials and Methods

- **Field History:** Replicated trials (n=6) were conducted in two separate fields during 2018. Fields were chosen based on soil type (deep sands), history of nematode pressure, and fields that had previously resulted in positive responses to Velum Total™ in prior seasons.
- **Treatments & Sampling Methods:** Treatments consisted of both NemaStrike™-treated and non-treated seed of DP 1646 B2XF from the same seed lot. Non-treated seed received base seed treatment of both fungicide and imidacloprid to control seedling diseases and thrips.
- **Management:** Both environments were managed according to extension recommendations appropriate for the area. Both environments were rain-fed and historically prone to experience significant drought stress. Composite soil samples were collected in each plot prior to harvest.



Results

- No foliar symptoms of nematode injury occurred at either site in 2018
- Mild but inconsistent differences in plant height occurred sporadically at around the 8-leaf stage in both environments, however these differences were transient
- Mild symptoms of nematode injury to roots were observed occasionally in non-treated plots at Site 2 but were seldom and not consistent throughout the trial
- End-season soil samples indicated nematode levels for multiple species requiring chemical treatment in 67% of treated plots and 17% of non-treated plots at site 1.
- End-season soil samples indicated nematode levels for multiple species requiring chemical treatment in 50% of treated plots and 50% of non-treated plots at site 2.
- NemaStrike™ seed treatment resulted in statistically similar yields to that of non-treated at Site 1, but statistically greater yields than non-treated seed at site 2 (Tables 1 & 2).

Conclusions

- Yields were improved by NemaStrike™ seed treatment in one of the two environments with a history of nematode pressure.
- Yield responses appear to be environmentally dependent and not necessarily predicted by soil test results.
- Soil testing for nematodes remains to be the primary method of determining if control practices are necessary, however, sampling may not guarantee yield responses of control practices.
- In one environment, end-season nematode numbers were higher in treated plots, possibly due to greater root mass.
- NemaStrike™ seed treatment may provide some suppression of nematodes and may improve yields in some cases. The frequency of yield responses can only be determined through additional research in a larger number of environments

Future Research

- Conduct similar research in a broader range of environments and soils
- Conduct similar research in conditions with greater drought stress season-long