

Biological Control of Alfalfa Snout Beetle: An Update after a Decade of Nematode Applications

Elson Shields and Tony Testa,
Entomology, Cornell University

Since 2010, more than 20,000 acres of alfalfa have been inoculated with biocontrol nematodes for the control of Alfalfa Snout Beetle (ASB) with excellent results. This is an excellent start but with ASB infesting more than 500,000 acres, we have a ways to go. In addition, a significant number of your neighbors have not applied biocontrol nematodes to start reducing the ASB numbers on their farms. This has two impacts. Your neighbors are suffering increased economic losses from this insect and they are producing ASB to re-infest your fields. In many ways, ASB is a neighborhood problem with a single neighbor producing ASB beetles for their neighbors. The good news is that your application of biocontrol nematodes in a field has shown the ability to handle the influx of beetles from your neighbors with minimal damage to your alfalfa stand.

With a decade of experience and 20,000 acres inoculated, here are some important observations.

- 1) ASB control with biocontrol nematodes requires 2-3 years after a field application. In many cases, farmers will observe ASB spring emergence, the spring after biocontrol nematode inoculation and think the nematode application was a waste of money. This is not the case, but is a result of the insect's two year lifecycle. The emerging beetles were larvae in the year before nematode application and were deep in the soil away from nematode attack. Careful observation in year 2 & 3 will show large reductions in the ASB populations in the field, reduced root damage and stand loss. ASB number reduction is observed quicker when multiple alfalfa fields are inoculated within an area compared to single fields.
- 2) No ASB control failure have been reported to date in fields inoculated with biocontrol nematodes. In 2018, three fields were identified with possible problems after bare spots with ASB larvae were discovered at the field entrance/head land. After investigation, biocontrol nematodes were present in the area, are expected to increase in number and limit the ASB numbers/damage to the field.
- 3) ASB is a costly pest which sneaks up on every producer when it invades a farm over multiple years. Recent calculations involving the losses of alfalfa stands, replacement costs to replant the field and addition soybean meal purchases to offset the loss of home-grown protein reveals a sobering dollar figure. The loss of the alfalfa field with replant costs ranges between \$200-\$500 per acre depending on management/cutting practices and how quickly ASB kills out the stand. Using the rule of thumb that one acre of alfalfa feeds a dairy cow for 1 year, the cost of ASB stand loss is \$200-\$500 per cow every year. Additional feed costs from increased soybean meal purchases to replace the lost protein ranges from \$56-\$200 per cow per year every year. The **total cost of ASB** invading your farm **ranges from \$300-\$600 per cow** per year every year. The **one time cost** of applying Biocontrol Nematodes for the control of ASB is **\$30 per acre** (or per cow) plus application costs.

- 4) Mary DeBeer, located in the Malone area has successfully started a business supplying high quality biocontrol nematodes to area farms with excellent success for the past 4 growing seasons. Approximately 5,200 acres have been inoculated using nematodes produced by Mary DeBeer. NNY farmers should seriously consider purchasing biocontrol nematodes from Mary to promote a NNY business and insure a continuing supply of biocontrol nematodes for the future. Mary's contact information is:
Cell Phone: **(518) 812-8565** Email: **md12957@aol.com**

ASB Biocontrol Nematodes and Corn Rootworm (CRW):

Rotational studies across 75 NNY fields where biocontrol nematodes were applied in alfalfa showed the following things.

- 1) Biocontrol nematodes from a single application persist for the entire 10 years of the study, across the corn rotation and the population of nematodes was higher after 4 years of corn than in the alfalfa before the corn rotation.
- 2) Biocontrol nematodes attack CRW during the corn portion of the rotation. In a separate study, biocontrol nematodes applied 2-years before high populations of CRW larvae protected conventional corn as well as any of the Bt-CRW corn varieties. In another study, NY biocontrol nematodes reduced CRW damage against very high CRW populations in Dalhart, TX.

If you are planning to rotate a biocontrol nematode treated alfalfa field to corn, research data strongly suggests that conventional corn will be adequately protected against CRW for the length of the corn rotation.

Biocontrol Nematode Application to Corn Fields:

If growers are interested in applying biocontrol nematodes directly to corn fields for CRW control, the following guidelines should be followed.

- 1) Nematode application window is pre-plant to the V4 growth stage. Soil temperatures need to be around 50°F. Applications need to be made late in the day to allow the nematodes to penetrate the soil before being killed by UV light.
- 2) If the Biocontrol Nematode Application is being made to a **continuous corn field**, the field should be planted using a Bt-CRW variety, use a soil insecticide or a high rate of seed treatment. This is required because it takes 2 growing seasons for the Biocontrol Nematodes to become fully effective. The full rate of biocontrol nematodes becomes fully active faster than the reduced rate of biocontrol nematodes.
- 3) If the Biocontrol Nematode Application is being made to a **1st year corn field**, then the field can be planted to conventional corn with no additional CRW management practices.