

Final Report For Research Subcontract #K009607-ASC2

Between

The Regents Of The University Of California

And

The Amalgamated Sugar Company, LLC

Submitted By: Dennis Searle

June 14, 2007

Title: Promoting Best Management Practices:

Green Manure Crops for Controlling Cyst Nematode in Sugar Beets

The main objective of this research was to promote the use of green manure crops in the control of cyst nematodes in sugar beets. Three sugar beet growers were to be selected from across the companies' growing area. Because this was done in conjunction with a research grant from American Farmland Trust and the EPA, we were able to gather information from five different growers. Instead of 90 acres we were able to gather test results from 232.6 acres

In July 2006 we selected the growers and fields where we were going to do the research. We then established three random plot areas within each field. Each plot area would be made up of a check plot 30'by100' and a green manure plot of the same size next to the check. That would give us three check plots and three green manure plots in each field. Nematode samples were taken in each plot prior to the planting of the green manure crop. This sample would establish that there were nematode present and how severe the problem was.

The green manure crops were planted in mid August. It takes about three weeks for the green manure crop to establish itself. After that period of time you begin to get rapid ground cover and a good canopy. The recommendations from the University Of Idaho Nematologist are to allow the green manure crop 8 to 10 weeks of growth to get the best nematode control. After ten weeks the green manure crops were worked into the soil and the fields were prepared for the 2006 sugar beet crop. Another Nematode sample was taken at this time.

In September of 2006 after the green manure crops had established a good canopy we began to hold our field days. September is a busy month for the growers so rather than have a formal setting we would gather up four or five growers at a time and show them the fields. That allowed flexibility for the growers and gave us as a company more time to spend with each grower answering any questions he might have.

During the winter months we presented our work to the growers in our annual growers meetings. These meetings are held in each growing area and are used to educate the growers on better agronomic practices.

In the spring of 2007 after the sugar beet crop was planted the plots were reestablished and a nematode sample was taken in each plot. The results of the tests showed that we had a high of 85.5%control and a low of 41.6% control. The 41.6% control was in a field that was planted in early September. There was a limited amount of growth mass. This just reinforces the need to be timely with your green manure plantings. You need 8 to 10 weeks of growth to get good results. We will get harvest

results from these fields this fall to see the effects the control, or lack thereof, had on yields.

This study also involved the monitoring of nitrates throughout the winter. We found that by tying the nitrates up in the organic matter of the green manure crop we can hold the nitrates at the surface until spring when the temperatures warm up and the nitrogen is released through organic breakdown. The new crop is then present to take up the released nitrates and use them in growth. This saves the nitrates from leaching into ground water.

This information along with the information we are gathering through the help of the grant from American Farmland Trust and the EPA will be published in our company grower magazine, presented at our winter grower education meetings and used in any educational setting that is made available to the company.

Having the funding to do this kind of research helps the company show the grower that chemicals are not the only answer to pest control. It has been very beneficial to do this work. We have learned that first of all it is possible to control cyst nematodes biologically and second that it is important to be timely in the process. We can also better manage nitrate loss, saving the ground water and the grower money because of more available nitrogen in the spring.