Project No FNE93-20

PROJECT REPORT

ON

DEMONSTRATING A SUSTAINABLE AGRICULTURAL SYSTEM

BY

USING BENEFICIAL INSECTS ON HYDROPONIC EUROPEAN CUCUMBERS

The awarding of the grant provided the impetus for many things to happen. First of all, we grew two crops of European Cucumbers successfully. Cost wise, we spent a little more on insect control than in the past but learned some things that will allow us to lower that expense as we get more experience. We had some trouble on the first crop because we didn't get bring in the spider mite predators soon enough and the spider mites got the upper hand. The second time we started a crop we knew what to look for and things went more smoothly.

This year we have used beneficial insects successfully on a crop of tomatoes which we have been harvesting since June I. We also tried the approach on a greenhouse of sweet bell peppers and we were not successful in controlling the aphids.

People have shown a lot of interest in the concept of using beneficial insects, however we have not found any outstanding markets of pesticide free produce.

As you will see in the video, we had quite an assortment of people take tours of the greenhouse. Pam Comstock from Mass. Farm Bureau organized a tour for the new Commissioner of Food and Agriculture, Jay Healy, some of his staff, and some of the Directors of Massachusetts Agriculture in the Classroom. (By the way the Commissioner is the one who gets all excited when he looks through the hand microscope and sees the good spider mites chasing the bad ones.) Coastal Growers arranged with other branches of the Agriculture Dept. some groups along with restaurant owners and suppliers. We had some newspaper write-ups and I wrote an article in a newsletter of the Westport Watershed Alliance. I'm including some of these in this report.

One of the more far-reaching effects is the fact that I was able to help implement a mini-grant program for Mass. Agr. in the Classroom. One of objectives is to promote farms tours and demonstration projects similar to your program. I'm sending you a copy of the flyer that describes the program. I wrote the introduction and you can see the emphasis on sustainable agriculture.

As you can see your grant had a great impact on me and the surrounding area. I think you should be proud of the program that you have established and promoted.

Trying to get the bugs out

Dartmouth grower using predators to control pests

By MARGO J. MOORE
Special to The Herald News

DARTMOUTH — At a time of year when most people are spraying bug killer trying to get rid of house and garden pests, James "Jim" Munger of South Dartmouth has been introducing several species of beneficial insects into his greenhouses as a form of biological pesticide.

"Be Aware That Bugs Are Working," says a large green sign outside one of Munger's greenhouses at his 18-acre Stony Meadows Farm on Division Road. Financed by a grant from the Northeast Region Sustainable Agriculture Research and Education Program, Munger, a chemistry professor at Roger Williams University, has been testing an innovative form of pest control in his greenhouses, where he grows European cucumbers using hydroponic techniques.

Munger, who was raised on a small farm in Michigan, has been working to demonstrate the use of beneficial insects and predators to control pests in greenhouse production of high-quality cucumbers and to reduce pesticide use in greenhouse production systems.

"When they walk in people are reminded of the rain forest," Munger said. A tropical impression is created by the 12-foot long green vines with enormous leaves that are rooted in a sand and peat mixture and suspended from the ceiling with ropes. Some of the vines show the ravages of the spider mite, but most are healthy, the result of a natural mite predator that Munger has released in the greenhouse.

Spider mites cause damage by munching on the cucumber plant's leaves and drawing moisture out of them.

"The leaves are so large they lose water easily," Munger said. Each day he nouriahes the plants with nutrient-rich water as part of the hydroponic process. To control the spider mites, Munger deployed a natural predator, P. Persimilis, earlier in the season when he saw the mite infestation taking hold.

"I brought in a predator to take care of the spider mite but didn't bring it in soon enough. I've let in two different batches of 2,000 each of P. Persimilis," Munger said.

P. Persimilis is an orange-red, pear-shaped mite slightly longer then its prey. The females lay eggs that hatch in three to four days,

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and then the bugs begin to feed on the spider mite larvae. "Control is achieved in a matter of weeks," Munger explained.

Monitoring pest populations is critical, he said. Once he sees that an infestation is about to happen, Munger can release the proper predator so that it will reach the right state of development to attack when the pest population is large enough to threaten the crop.

"I think I would call it successful," Munger said of his program. His only initial problem was that he "didn't get the spider mite predator introduced soon enough. But the rest of the predators seem to effectively reduce the population so I was able to harvest on a regular basis without waiting for pesticides to break down, because I didn't use pesticides."

The key to using beneficial insects, Munger said, is balance. "You just reach a balance. You don't ever get rid of all the pests. You just keep down the population. One thing you learn in this business is you don't mind seeing a few pests because they're necessary for the predator to survive."

Munger, who has a bachelor's degree in chemistry from the University of Michigan and a master's degree from Stanford University in California, has been growing European cucumbers for three years in the greenhouse. Munger and his son Craig, who just received a degree in electrical engineering from the University of Massachusetts-Lowell, have also been growing 4-inch potted flower plants — zinnias, primroses and Persian violets — for supermarket trade.

Recently, Munger released a batch of ladybugs in the greenhouse where he grows the flowers. The ladybugs are also part of the pest control. Among the other insects he has been using are Encarsia Formosa (EFM) for white fly control and Pirate mite for thrip control.

"One of the objectives of this is to bring tours in and have them see beneficial insects at work and help them get an appreciation for using insects instead of chemical pesticides," Munger said. His farm was one stop for Jonathan Healey, the new state commissioner of food and agriculture who recenlty toured Southeastern Massachusetts.

"He was quite excited at finding them and seeing them work under the microscope because he's a strong supporter of the IPM (Integrated Pest Management) program," Munger said.

Munger was one of 169 applicants for grants through SARE's new Farmer/Grower Grant program. It is a federal program funded through the U.S. Department of Agriculture to develop environmentally sound and economically viable farming practices.

Article Printed in Aug 1993 Westport Watershed Alliance

Please: Don't Step on the Bugs

Currently, we hear titles and slogans such as, "Earth in the Balance", "Partners with Nature", "Limits of Growth" and sustainable environment. We may have a better understanding of the human impact on the earth, however we have a long way to go.

One concept that is important is the fact that many little bits adds up to a large bit. For example, oil pollution; major oil spills make the headlines with the millions of gallons spilled, yet few people realize that all the major oil spills are only very small part of the oil that gets into our water systems. It is the little bits lost from our cars or washed out of empty containers or lost in transfering that makes up the bulk of oil pollution.

The same goes for pesticides in our environment. A recent article in Newsweek* quotes the fact that homeowners use 10 times more chemical pesticides per acre than farmers do. Most farmers also go through training and certification on how to handle these hazardous materials. However much of the pesticide produced is sold over the counter to people with little background on use, precautions and discarding procedures.

Another concept quickly learned by farmers was that more wasn't necessarily better. Insects develop immunity quite quickly because of their short life cycle. How often will the average person go out and buy three different sprays so they can be rotated and somewhat eliminate the immunity problem. There are many cases that can be quoted where the insect comes back stronger than before because in the process of trying to eliminate the insect all the predators have been killed and there is no control over the now immune insect.

Pesticides can be classified by generations.

Generation 1: These were the chemicals used before World War II. They were used in large quantities(pounds per acre) Lead Arsenate is a good example.

Generation 2:These are known as the chlorohydrocarbons. They could be used in much smaller quantities. DDT is the most well known of the group. They have the property of staying around a long time and killing a broad range of insects. It was used so extenstively that we all have some in our bodies.

Generation 3: These are known as the organophosphates and the carbamates. Malathion and Sevin are the respective examples of these. This generation was developed so that they would break down more quickly(in days) and they were more specific to what they would kill.

Generation 4: This group can be classified as the biological insecticides. These include sex attractants , growth hormones and bacteria. The advantage of these is that they are quite specific to the type of insect they affect. Because of their specific nature the market isn't as great and there is less motivation for their development.

As you can see a lot has happened since Rachel Carson wrote, Silent Spring. We still have a long way to go What about the concept of balance and working with nature? Well one way is to use natural predators Remember Only 1% of insects are pests; the rest are helping to maintain the balance of nature. We shouldn't be so anxious to kill everything in sight. I'm presently using benefical insects in growing of European cucumbers. Now when I see some whitefly I don't panic for I know that there must be some whitefly present for the predator to feed upon when it is introduced. I must make sure the conditions are right; For example, plenty of moisture when I introduce the Orius (Minute Pirate Bug) for the control of Western Thrips. Many of these insects can only be seen with a magnifying glass. Many times 3 to 4 thousand will arrive in a pint bottle. Its like introducing a little army.

So if you come to see my European Cucumbers, please don't step on the Bugs!!

*Newsweek; June 21, 1993 pp.62-63

MASSACHUSETTS

FARM & MARKET REPORT

Trudy Coxe, Secretary of Environmental Affairs
Gregory Watson, Commissioner of Food and Agriculture
James Hines, Director, Division of Agricultural Development
Janet Christensen, Chief, Bureau of Markets
Diane Baedeker, Editor, *Farm & Market Report*

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COMMISSIONER'S COLUMN

Court Ruling Makes a Difficult Decision Easier

by Gregory Watson

Next month I will be leaving the Department of Food and Agriculture to join the staff of the Nature Conservancy -- a private non-profit organization dedicated to protecting ecosystems and preserving endangered plant and animal species throughout the United States, Latin America and the Pacific. I am extremely excited about the challenges awaiting me at my new position. As Director of the Conservancy's Eastern Region, I will continue to be involved in issues relevant to sustainable agriculture. However, I will miss my day-to-day contact with Massachusetts growers. As I have stated on many occasions, you are the greatest bunch of folks I've ever had the pleasure of working with. I am honored to have had the opportunity to represent you in state government.

The decision to leave DFA at this time, although difficult, was made a little easier by the State Supreme Court's ruling in April in favor of the state's dairy farmers in their on-going battle with West Lynn Creamery. As I have stated a number of times, it has always been my belief that the struggle to establish a mechanism to ensure that Massachusetts dairy farmers receive a fair price for their milk is in reality a fight on behalf of all of agriculture. Above and beyond the question of how much dairy farmers would be paid for a hundred pounds of milk was the more important question of how much control would these farmers have over their lives? That last question is relevant to each and every farmer in Massachusetts.

That question really gets to the heart of what sustainable agriculture is all about -- empowerment. If we can preserve farmland and farms by developing and implementing strategies that integrate economic and ecological goals, farmers will be able to regain control over agriculture that has been wrestled away from them by regulators and big business.

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Mass. Farmers Awarded Sustainable Agriculture Grants

The Northeast Region Sustainable Agriculture Research and Education Program (SARE) has awarded a total of $2,505 to two Massachusetts farmers to test innovative farming techniques and share what they learn with other producers.

James I. Munger of South Dartmouth will receive a grant to demonstrate the use of beneficial insects and predators to control insect pests in greenhouse production of high-quality, European cucumbers. Munger's project is aimed at demonstrating ways to reduce pesticide use in greenhouse production systems.

Don Ziegler of Sheffield has been awarded a grant to demonstrate an innovative, integrated approach to pest management for greenhouse bedding plants. Ziegler's project is aimed at reducing pesticide use, production costs and health risks for greenhouse workers, Ziegler will test the use of biological agents, insect growth regulators, insecticidal soaps and horticultural oils.

Munger and Ziegler will receive the grants through the Northeast Region SARE program's new Farmer/Grower Grant program. The program received 169 applications for funding from farmers in the 12 state region.

The SARE program is a federal program that receives its funding through the U.S. Department of Agriculture. Its mission is to develop farming practices and systems that are environmentally sound, economically viable and that contribute to the quality of life of farmers and society as a whole. ■

Milk Pricing Order is Constitutional

In a unanimous decision, the Massachusetts Supreme Judicial Court has determined that the milk pricing order instituted last year by Commissioner Gregory Watson to help the state's troubled dairy industry is constitutional and does not violate the interstate commerce clause.

West Lynn Creamery and LeComte's Dairy, Inc., two milk dealers who purchase most of their milk from producers outside Massachusetts, had challenged the pricing order. The order requires all dealers selling milk in Massachusetts to pay into the Dairy Equalization Fund which is disbursed to the state's dairy farmers to help fill the gap between the federally set price of milk and the cost of production.

The amount dealers are required to pay is determined by the current federal milk price and the amount of milk they sell in the Bay State. Farmers receive a sum based on the amount of milk they produce.

The court determined that the local benefits of the order outweigh any incidental effects on inter-state commerce. The pricing order was issued by Commissioner Watson after he declared a state of emergency in the commonwealth's dairy industry. ■

CALENDAR

June 7-11 - **Boston Common Dairy Festival**, featuring the Scooper Bowl to benefit the Jimmy Fund, June 8-10. Sponsored by Milk Promotion Services, Inc. Contact: Mary Moffitt, 617-727-3018, x171.

June 10 - **Fine Foods of Massachusetts Dinner**, Swissotel, Boston, sponsored by the Massachusetts Agriculture Marketing Committee. Contact: Janet Christensen, 617-727-3018, x173.