New England Farmers' On Farm Research Priorities 2009

Complied by Wendy Sue Harper, Ph.D., the Northeast Farming Association of Vermont

From the 2009 Farmer-to-Farmer Exchange:

Answering Questions on the Farm: Conducting Research, Maintaining Records, and Evaluating Production Practices

SARE Grant ONE08-084: Developing On-Farm Research Expertise Among Farmers in Vermont

Introduction

In January of 2009, the Northeast Organic Farming Association of Vermont (NOFA-VT) held a two-day farmer-to-farmer exchange designed to 1) help farmers answer questions on their farms by focusing on how to keep effective records, 2) facilitate farmer evaluation of production practices, and 3) develop research priorities for on-farm research.

Experienced growers were brought in as teachers. On the first day they shared an overview of their own farming systems, production and record-keeping methods, data collection, and software used for production and marketing. Participants were vegetable growers from Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York.

On the second day, these experienced growers formed panels to demonstrate to participants how to answer the following production questions with effective recordkeeping systems:

- *How do I know what to plant?*
- *How do I know what it will cost me to grow something and what to charge?*
- *How do I keep track of soil fertility and decide what amendments I need, if any?*

In the session titled *Conducting research to get information specific to your farm, solve problems, and make money*, speakers addressed how they have used on-farm research. They focused on using research to solve problems or answer production and marketing questions, which ultimately improved their economic viability.

After this session, we conducted an exercise in which grower participants were asked to list at least *three* research ideas that would give them specific information they were missing on their farms. Farmers were told that these ideas would be shared with the university and extension system and agricultural service providers who work with vegetable growers. The compiled farmer research ideas follow. We hope that you will find this information relevant and useful in your work.

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Summary of Growers' On-Farm Research Priorities 2009

Organic Matter and Fertility Issues:

- How does livestock grazing on cover crops impact soil organic matter percentages?
- What is the impact on yields, disease, insect populations and weed pressure to crops grown in beds from applications of manure, compared to applications of compost and applications of both manure and compost together?
- How do yields and the economics of brassicas compare when using a fertigation system versus granular or meal soil fertilizers?
- What is the impact of boron amendments on beet yields?
- Is it more cost effective to spot amend areas of a market garden 1 acre in size that has different soil types or is it better to treat the garden as a whole?
- Look at specific crops and various organic fertilizers to determine their effectiveness.
- Trialing new biological farming methods that Arden Anderson has been referencing in comparison to more traditional organic farming practices (organic fertilizers).
- Examine how organic matter increases on sandy loam with different types of cover crops and track how potassium is impacted by their use.
- How to economically fertilize hay fields organically and sustainably?

Tillage, Cultivation, and Cover Cropping Issues:

- Look at the impact of soil compaction.
- Examine the pros and cons of different cultivation systems.
- Research reduced tillage, its role in conserving soil integrity, and best implements to use for conserving soils integrity.
- Examine the impact of hard pan compaction on cover cropping compared to slicing or disc plowing. Look at all aspects of management and results (weed populations, insect problems, compaction return rate, yield, nutrient availability).
- Determine the impact of strip no-till versus standard cultivation techniques on root crop production.
- Examine the impact of the spader versus a rototiller in vegetable production systems.
- Look at the progression of cultivation techniques through the life of certain crops.
- Research tillage on organic production—the effects on physical/chemical/biological properties of soil, and pests and weeds.
- Develop new cultivation machinery.
- Research the use of dry beans as cover crop/and for sale.

Insect Management Topics

- How can hot cherry pepper be used as a trap crop for pepper maggot?
- Look at effective insect management strategies, specifically for the control of: flea beetle, tarnish plant bug, squash borer, cucumber beetle, and wireworm.
- How can poultry be incorporated to reduce wireworms?
- What are the most efficient ways of using row covers?

Disease Management Topics

- Research the trialing of biofungicides for efficacy in greenhouse and field crops.
- How to grow scab free potatoes in diverse vegetable systems?
- Examine the brassica disease: *Alternaria*.
- Determine how to use soil solarization to eliminate *Fusarium* for successful spinach production.

Weed Management Topics

- Develop better weed management systems combined with integrated intensive cover crop/green manure management?
- Research the type and length of bare fallow periods and their efficacy in reducing weed seeds or rhizomes (e.g. How often to cultivate to kill carpet weed or timing of fallow period to reduce foxtail?).
- Develop year long cover crops. Determine mixtures and timing to achieve best weed suppression.
- Determine the depth of hay as mulch for weed control, effect at 4", 6", or 8"?
- Research how to effectively decrease or eradicate nutsedge.

Production Issues

- Examine both yield and net income differences between direct seeded and transplanted crops—specifically in greens such as mesclun, arugula, and others.
- Complete yield trials with different numbers of rows on direct seeded versus transplanted, cut and come again, and other methods.
- Compare the yield of carrots when thinned versus not thinned and their quality or marketability differences, disease differences, and impact on wire worm populations.
- Conduct lettuce trials; examine varieties throughout the season.
- Trial varieties to include in CSA operations and for use in on-farm processing.

Harvest and Post-Harvest Questions:

- Research drying systems for garlic to maximize its storage life.
- Determine the best and most efficient harvest and washing methods.
- Trial different wash systems for delicate greens.
- Research the development of harvest machinery.

Nutrition and Food Related Questions:

- Research vegetable flavor and how soil chemistry, cultural methods, and soil biology affect flavor—particularly in carrots, onions, and apples.

On-Farm Energy Issues:

- Determine renewable energy use and funding options.
- Develop a geothermal air exchange to cool and heat greenhouses.

Winter Growing and Storing Questions

- A comprehensive research program on winter growing is needed.
- Determine the temperature impact on specific winter/summer crops. How do increases and decreases in temperatures affect certain crops e.g. spinach, mesclun, arugula, kale, and other greens? What are the effects of extreme temperature highs and lows?
- Develop energy conservation measures for winter greenhouses.
- Develop a geothermal loop in a greenhouse for new bottom heat, used for winter salad production.
- Conduct variety trials for winter production.
- Develop vegetable storage systems.
- Determine effective supplemental lighting for growing in November through February.
- Research winter production at temperatures of 40^{o}F and 50^{o}F.
- Examine the use of row covers in hoop houses.
- Develop winter cropping systems for hoop houses.
- Determine the specific needs of greenhouse grown crops to be used in season extension:
    a. Seeding and transplanting dates;
    b. Nutrient requirements/light;
    c. Varieties; and
    d. The use of Reemay: single/double and when to remove it or keep crops covered.

Profitability and Marketing:

- Conduct value-added research on different products that come from seconds (e.g. profitability of making veggie chips from seconds).
- Determine the cost effectiveness of on-farm straw production versus purchasing it off-farm.
- Research economics of an on-site farm stand for fall sales.
- Determine the electricity usage costs for irrigation (electrical pump) from year to year for 2 to 3 years with different rain fall amounts and labor costs to answer the question of profitability of irrigation in mixed vegetable farming.

Social and Management Issues:

- Develop labor organization techniques for growers.
- Develop management techniques for growers.
- Develop a system to link viable farmland to committed farm talent (people with the various skills to use land properly and who are committed to the future).
- Develop a system to link committed individuals with resources to committed and proven farmers who lack resources.
- Develop a system to create backyard farms by sharing knowledge for small scale home food production and community scale production.
- Examine sustainability and profitability: how is it defined, how is it measured, and how do we know when we have achieved it?