FNE04-513

INTERIM REPORT
January 2007

An Organic Hops Nursery - Vegetative Propagation as an Alternate Means to Developing a Hop Field

Project Leader: (name only one; no co-leaders): Larry F. Fisher

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Restatement of Project Goals:

The fundamental goals of the grant application have not changed.

Hops were the largest cash crop in New York State for nearly a century. Interest in alternative crops, historical preservation, microbrewing and terroir have raised interest in Northeast hop production in recent years. Starting even a small hop farm is an expensive proposition. It may cost as much as $8,000 to start a one-acre hop field. Much of that cost is in the rootstock, or rhizomes, which are planted two to a hill on a 5 by 10-foot grid. Thus a thousand or more hop rhizomes may be needed to sow a one-acre farm. Hop rhizomes are only commercially available from the Northwest from a limited number of suppliers at extreme cost. Even in bulk, costs exceed $2.50 per rhizome. Fungal and viral problems with hops from the Northwest make import of hop rhizomes from those areas a questionable practice. Digging and transplanting rhizomes is difficult hand labor. The rhizomes must be harvested in early spring and planted by early May. Establishing a hop farm is thus hampered by cost and availability of healthy root stock, high labor costs and short planting season.

Funded through this SARE grant, Foothill Hops would like to develop an organic hop nursery to propagate hop plants through vegetative propagation as an alternate, less expensive and more flexible means of developing a hop field as compared to rhizome planting. Vegetative cuttings may be taken throughout the hop-growing season. Cuttings will then be rooted and nurtured in a greenhouse and hardened in a small nursery. These plants may then be transplanted to expand the hop field or sold throughout the summer for planting in gardens and other fields. The hops nursery will become an educational center where other farmers can purchase locally proven, organic hop plants and rootstock for culinary, ornamental or agricultural purposes. Information on the history, growing and harvesting of hops will be openly shared both on the farm and through the Northeast Hop Alliance, the Madison County Hop Festival, the NYS Fair and other public opportunities.

Updated Information on our Farm:

Foothill Farms was established in 2001 on approximately 12 acres of heritage hop land in Madison County, New York. We farm part-time and grow hops for sale and herbs and vegetables for personal use and development of hop related products. This is our first farming experience. We read SARE Project FNE98-195, A Commercial Organic Hops Production Trial by Jeffrey Klein of Westerio, New York and repeated the trials of Mr. Klein on a quarter acre of land in 2001. Our trials had fundamentally the same results as the Klein trials.

Encouraged by the results of the 2001 trials and the similar reported experiences of the small number of hop growers in New York State, we purchased additional rhizomes from Washington state and expanded our organic hop yard to approximately three quarters of an acre during 2002. The hop bines are trained on a high wire (20-foot) trellis. There has been no sign of disease or pest in the hop yard. Late in the 2002 season, we experimented with vegetative cuttings as a means of propagation and were able to establish healthy plants. The Northeast Organic Farming Association of New York (NOFA-NY) granted Certified Organic status to Foothill Farms in 2002, which marketed its small second year harvest to craft brewers and homeopathic tea makers. In 2003, we continued to tend the three-quarter acre farm, concentrating on organic soil amendments and weed control. Weight of the laden bines caused the trellis to droop and some plants were lost due to wind damage. We have learned that a more robust trellis system is required. Harvest in the third year was sufficient to deem that growing hops organically in Central New York might be feasible.

Our trials to date have included more than a dozen varieties of hops. This has proven educational and appropriate for small-scale organic sales to home brewers. However, to be successful on a commercial scale, farmers will need to produce larger volumes of a select few varieties. During 2002-2003, Cornell University conducted a market survey for the Northeast Hop Alliance. This survey identified hop varieties that would be desired by the regional microbrewing industry. It also reported that such brewers would be willing to pay a premium for locally grown hops. Hence, during 2004-2006, we expanded our hop yard with a focus on two of the three varieties identified in the market survey, Cascade and Willamette. Trials with the third variety, Kent Golding, were unsuccessful under our farm conditions. Seeking labor and cost savings and a more friendly timeline, we considered vegetative propagation as a means of further expanding the yard. It is our ultimate hope to be able to provide locally proven hop rootstock of choice varieties at reduced cost for Northeast farmers interested in starting a hop field. A quarter-acre organic hop nursery has been developed as a research facility to study the labor, costs and hardiness of vegetative propagation of these two hop varieties for hop field expansion. The nursery field was also a proving ground for more robust trellis system before it was attempted on a larger scale. Records kept in the establishment of the nursery field will provide detailed accounts of startup costs for a hop operation.

Since the proposal of this grant, Foothill Farm has seen a number of changes relative to establishing a viable agri-tourism program. During 2006, we built an educational facility which includes an exhibit of historic hop artifacts, information relative to our hop farm, and a gift shop in which we sell our hops, hop products, and artistic creations. We hope to expand our marketing to include a home brew shop in the near future. To add further interest to our farm and to provide a source of organic fertilizer, we also added a small menagerie of alternative livestock including pygmy goats, miniature Brahma cattle (Zebu) and reindeer.

In 2006, the Madison County Bicentennial Commission developed several historic trails marking the milestones of our county's heritage. Foothill Farms is stop number 3 on the Hop Heritage Trail which highlights the history of hop growing in the county. As the only working hop farm on the tour, we saw a significant increase in the number of visitors seeking information on hop growing during 2006.

Collaborators:
The original collaborators on the project included:
Karen Baese, Cornell Cooperative Extension, Technical Advisor
William Turechek, Cornell University, Plant Pathology
Duncan Hilchey, Cornell University, Market and Research Advisor
Keith Eisamann, Field Advisor, Retired Hop Grower from 1950's
Dave Matlock, Fertrell Company, Organic Soil and Nutrient Advisor

Regrettably, Keith Eisamann passed away in 2005 and is sorely missed as both field advisor and friend. Mr. Turechek accepted a position out of state in 2005 and is no longer able to actively participate in our project. We continue our technical conversations with Ms. Baese, Mr. Hilchey and Mr. Matlock and consult regularly with other members of the Northeast Hop Alliance, most specifically, Rick Pedersen and Kingsley Wratten – hop growers, and Norm and Dorothy Willsey Dann – hop historians and cultivators.

Project Progress:

In 2004, we purchased and constructed the small greenhouse itemized in the grant proposal. We also began development of the nursery plot and a field expansion, including field preparation and erection of trellis poles. Using insight from our other field operations, we decided to construct the new fields using raised beds which have proven much easier to maintain and provide better drainage in our clay soil. We purchased and planted enough rhizomes of the Cascade and Willamette varieties to start the mother field from which the rhizomes and vegetative cuttings would be taken. It was our intention to start the grant research, including plant propagation, in earnest in the spring of 2005. However, an early summer windstorm tore the greenhouse from its anchors and rolled it through the hop field, with significant damage to both. We mended and reconstructed the greenhouse , repaired the fields, strung the trellis wires and installed drip irrigation in 2005. The loss of the greenhouse delayed the start of our propagation research until mid-summer. The heat of the summer proved too intense for the delicate plants, impressing the need for both a misting system and improved ventilation and airflow in the greenhouse. Discouraged, and believing that our project deadline had passed, we discontinued our efforts on the propagation research and focused our energies on improving our farm operations and infrastructure in 2006 including the construction of our education center. However, the desire to continue research in plant propagation never waned.

Informed in December of 2006 that we could still qualify for SARE funding, we eagerly revisited our plans to research the viability of vegetative propagation. With the infrastructure in place and a ready source of both young rhizomes and leaf cuttings maturing, we anticipate resuming the propagation research in April of 2007.

Accomplishments to Date:

1. Greenhouse Construction
2. Field Preparation
3. Trellis Construction
4. Drip Irrigation System
5. Mother field planted and cultivated two years
6. Initial trials in plant propagation.
7. Development of website and outreach program.
8. Creation of education center
9. Farm expansion
10. Presentations and exhibits at New York State Fair, Madison County Hop Festival and Cooperative Extension Conferences

Research Results and Lessons Learned Thus Far:

1. Raised beds facilitate weed control, drainage and rhizome cutting.
2. Vegetative cuttings are highly susceptible to heat necessitating misting system and improved ventilation in greenhouse.
3. Cuttings developed more successfully in shaded conditions than in direct sunlight.
4. Cuttings need to be taken as early as possible in the growing season to assure ample time to develop roots and harden before fall transplant into ground.

Site Conditions and Conditions Specific to Growing Season that May Affect Results:

The poor drainage of our farm's clay soil makes the field often inaccessible and may hinder the vigor of hop plants which do not like wet feet. The spring and summer of 2005 were particularly wet in our area. As the plants were beginning to put forth the lateral shoots from which we would take cuttings, a hail storm stripped most of the leaves from the hop bines. The development of the lateral shoots and the hop cones was nearly halted due to the loss of the energy-producing and shade-providing leaves. The frail cuttings that we were able to take suffered in the heat of August and died before establishing a viable root system. We were unable to complete our research in 2005 as originally proposed.

We focused our energies on developing our farm and outreach in 2006 which also proved to be a productive year for the hop plants. Our experience reflects the chronicles of hop growing throughout history. The season's weather conditions can mean boom or bust for the hop grower.

It is our hope that the weather conditions of 2007 will be equally favorable and that planned modifications to the greenhouse facility will improve our chances of success in our vegetative propagation research.

Economic Findings:

The costs of developing the hop nursery yard were in line with the proposed budget. We do not have data on the economics of vegetative propagation versus rhizome plantings yet.

New Ideas Generated from Project Research:

Our project has been modified slightly from its original proposal. The Kent Golding hop variety did not thrive in our growing conditions. We will continue to work with the Cascade and Willamette varieties and may substitute another variety such as Sterling, which during our earliest propagation trials resulted in healthy plants.

We anticipated that the greenhouse would provide a controlled environment for the establishment of the cuttings. In reality, it was not outfitted to provide the moisture and ventilation necessary to nurture the plants under the hot sun of late July and August. We will retrofit the greenhouse with a misting system and fans.

We may try starting plants under a cold frame equipped with a shade cloth as well as in the greenhouse. Early trials done under the shade of a tree in our back yard resulted in stronger plants than our greenhouse trials.

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