

1. Project name and contact information
Energy-Efficient, Short-Term Cold Storage for Vegetables and Herbs
Grant No. FNE06-583

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2. Goals:

Clan Stewart Farm and Singing Creek Farm raise vegetables and herbs for farmers markets, grocery stores, and restaurants/resorts in Central Pennsylvania. To be successful, both farms needed to add cold storage facilities to their farm operations. We are taking advantage of the cold limestone springs on both farms and incorporating them into low-cost, energy-efficient vegetable coolers. The humid and cool conditions within springhouses are nearly ideal for storage of many fruits and vegetables. In addition, the cold springwater is ideal for pre-cooling field-harvested produce. We plan to couple this pre-cooling technique with the holding of produce in the springhouses to store our vegetables and herbs.

We are modifying both springhouses to improve their ability to maintain consistent cool temperatures of 55 to 60 degrees and RH in the 90 to 95 percent range to provide optimum short-term cold storage. These modifications include high-efficiency foil insulation, double-glazed windows, cordwood construction (for one springhouse), and double-glazed windows. We will document the resulting temperature and RH in the houses through the growing season and assess the quality of produce held in the springhouses. We will also determine the energy savings of springhouse storage over traditional refrigeration.

3. Farm profile

Clan Stewart Farm is a 162-acre Bicentennial farm owned and operated by Terry and Linda Stewart Moist. The farm, which has been in our family since 1793, was once a small dairy farm. Since 2000, we have raised grass-fed beef, poultry, and pork on the farm. This hilly property is well-suited to grazing and vegetable production due to an abundance of springs for irrigation and pasture. In 207, we added Dorset sheep to the operation. We have about 25 ewes at present, and we are raising the lambs to a butcher weight of 80 pounds. We direct market our USDA-processed beef, pork, and lamb at farmers markets and to a restaurant/resort.

In 2005, we added vegetables and started a Community-Supported Agriculture venture. In 2007, we added two farm markets as an outlet for our produce. In 2008, we added an additional market in place of the CSA, and are now selling vegetables at three farmers markets

Singing Creek Farm is a 113-acre fallow farm that was purchased in the spring of 1998

by Jim and Marianne Frazier. Both owners are employed off the farm and farm part-time. In July of 2005, Maryanne reduced her off-farm employment to 30 hours a week in order to increase her farm production. In 2004, Singing Creek farm was certified for organic production and that year produced organic cilantro for the Tuscarora Organic Cooperative. Although the farm is presently not certified organic, they have been growing and selling potted herbs to Wegman's Grocery Store in State College, PA. They also sell cut bulk herbs to a local restaurant and a local catering business. In the fall of 2005, they added a greenhouse to the farm to increase potted herb production.

4. Participants

Mike Orzolek, our technical adviser, gave us specific information about temperatures required for various vegetables. Once the Clan Stewart springhouse is ready to install insulation, we will call him for guidance.

5. Project activities

Our project was begun in 2006 when Singing Creek Farm began to adapt its existing spring house. Over the course of the project a wall has been built to divide the spring house into two sections. The walls of the structure have been sealed to prevent water seepage and the ceiling and walls have been insulated. A solar fan will be installed and we expect to begin taking temperature data in June.

Clan Stewart Farm was in the process of rebuilding its original springhouse when the project began in 2006. The process was delayed when we realized that the original foundation was unstable and had to be completely removed, except for part of one wall. After Terry Moist tore a hamstring muscle and had to take a break from construction work, we requested and received a one-year extension for the project. It was originally scheduled to be completed on March 31, 2008, and we now expect completion of the project, including all outreach activities, by March 31, 2009.

Now that the ground has thawed we are again working on the project. Some of the cement base had to be removed and we had to excavate new footers. When we did, new springs opened up, surrounding the old springhouse like a moat. We are presently trying to install new footers despite the water and repair the water troughs to prevent contamination from road runoff. (We are unable to move the walls outside these springs because the springhouse backs up against a state highway.) Last year we cut trees for the cordwood construction and cut, debarked, and stacked the logs.

We hope to have the building completed by July 1 2008, so that we will be ready to take measurements when the first vegetables are ready to harvest. We will keep track of the electric consumption of our neighbor's electric walk-in cooler over the 2008 season so that we can compare energy consumption. We have scheduled a field trip for some Juniata College students to see the project that's currently underway on April 26, 2008. We hope that they will return to see the finished project on October 29, 2008. That day we have scheduled a field day for the PA Women's Agricultural Network to see the Clan

Stewart springhouse and report on the value of using both springhouses. We expect to be finished with the season's temperature and humidity measurements in both springhouses by then and can report on the project's value.

6. Results: We have no results yet.

7. Conditions

Describe any site conditions or conditions specific to your farm and this growing season that may have affected your results.

8. Economics

Describe your economic findings, if any. This would include changes in expenses or net farm income triggered by the project.

9. Assessment

Say whether the results from your project generated new ideas about what is needed to solve the problem you were working on. What do you think is the next step?

10. Adoption

Explain why you plan to continue to use the practice you investigated, or—conversely—why you are not going to. If you plan to revise your approach in light of what you learned, describe those revisions.

11. Outreach

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12. Report Summary