

White Frost Farm
Washingtonville, Pa
On-Farm Research Project 2008

White Frost Farm grows a variety of vegetables for farmers' markets, restaurants and a growing list of local clients who buy direct from the farm. We also maintain a flock of laying hens that are free ranging and fed exclusively certified organic grains bought from a grower less than four miles from our farm. While we are not currently certified organic, we do not use any pesticides, herbicides, or chemical fertilizers. We are in the process of establishing a cover-crop rotation, and we use small scale, lightweight (usually old and inexpensive) equipment to reduce soil compaction. We believe there is a growing interest in buying and eating foods grown locally and fresh. We are proud to be one of the many small farms whose mission includes redefining/resurrecting the concept of buying and feeding their family from foods grown close to their homes. Stewardship is an inherent part of the decision to buy locally: A decision with a broader, positive impact globally.

The decision to grow/produce organically came complete with a whole lot of new challenges. 2006 was our first attempt to grow a variety of Zucchini and winter squash on a market garden scale. We saw early in the season the on-set of a Squash Bug infestation that moved from our summer squash to our winter squash destroying the vines and rendering the finished produce too small and unattractive to sell at market. The crop was too large in area to go vine to vine and pick the bugs, and spraying was not an option. We simply watched our crop falling away before our eyes.

In 2007, Michele Gauger, from PASA, told us Tewksbury Grace Farm had had a similar experience and suggested we become involved with the ***On Farm Research Program***. Cath and I planted four rows of Butternut Squash and four rows of Delicata Squash. Two rows of Butternut Squash were transplants and the other two rows were direct seeded. One row of transplants and one row of direct seeded row were covered with Agribon AG-15. The other two rows were not covered. The same planting and row covering plan was used on the Delicatas. Bumble bees were placed under the Agribon material as pollinators. A copy of last years project on White Frost Farm is available on request.

The On Farm Project participants met at the end of the year to evaluate the project's successes and shortcomings. There was a consensus the agribon AG-15 had some drawbacks. It was very fragile and the growth habits of the Butternut

Squash taxed the tensile strength of the material beyond its designed purpose. The translucence properties of the spun-bond material made it impossible to evaluate the crop at any growing stage, and we were unsure of the range of temperatures and microclimate extreme under the material over the summer season. Monitoring the bee activity was also limited to what we could hear and visually what could be seen through the screening at the ends of each cover. We all agreed our project's direction could become a potentially valuable tool for organic growers and decided to look for an alternative material that would hold up to adverse weather extremes and would enable us to see the crops progress and maintain a comfortable environment for our captive pollinators. Michele Gauger began the grant application process with SARE.

There are three farms involved in the 2008 project. Eric and Anne Nordell of Beech Grove Farm from Trout Run PA attended last year's twilight meeting, and expressed interest in our crop covering methods and have added another unique variation to the project.

Those involved in our project called several companies that manufactured row cover material. The Nordell's found a material manufactured in Europe (Enviromesh) and mailed us all samples. The screening appeared to be made of a strong monofilament material that would hold up under stress, allowing the environment under the material to match the weather conditions outside the mesh, and it was transparent. This became the material for the 2008 project.

At White Frost:

I collected a soil sample and had the analysis done through Penn State. The numbers were all within the optimum range. I added no amendments. However, in the fall of 2007, I planted a heavy cover crop of Hairy Vetch. The previous crop was garlic, and in 2006, the area was part of a free range chicken pasture.

This year's field configuration would be similar to that used in 2007 (one covered row and one uncovered row of transplants; and one covered row, and one uncovered row direct seeded. T-Tape will be used for irrigation, and black plastic will be used for weed control. This year we didn't use a bed-former to lay the black plastic and T-Tape. I also covered the black plastic with old hay to hold it in place. The plastic should come up easily and the hay will be put into the ground as mulch; some extra work, but we're trying to increase the organic matter in the soils on our farm.

We decided to use two, sixty feet long portable hoop houses for this year's project (our existing portable hoop house and the construction of another). This decision was based on some of the shortcomings from last year. We believed the Enviromesh's strength and light weight would easily pull over the PVC hoops with the advantages of clearly seeing the crop and bee activity, provide a comfortable environment for the bees, the ease of securing the mesh to the structure, and the 12 feet of width would be adequate space for the vines to stretch.

The first house took 6 hours to erect and the second one took approximately 16 hours over several days to complete. The first house with the transplanted seedlings is planted with Butternut Squash only. The Hoop House with the direct seeded Butternuts Squash is planted with Zucchini Squash on the north side and cucumbers on the south side. We thought there would be several weeks delay between the direct seeded house and the transplanted house and by providing an earlier crop of zucchini the bees would have a source of natural pollen and we would be able to harvest an early crop for market. We planted the same varieties of Zucchini and cucumbers in the uncovered, direct seeded Butternuts as well.

The seeds for the transplants were started May 22nd and were transplanted into the field June 27th; the same day the direct seeded field was planted. The margins on the leaves of the transplanted Butternut Squash outside the hoop house appeared to be drying a week after being set out. Tom Murphy and Ron Hoover thought it was the result of transplant shock. The new leaves growth was strong.

The bees were placed in the houses July 30th. It took about a week for the bees to become acclimated. There was fruit already beginning to form on the vines before we placed the hives inside. While there were many blossoms already in the houses, we supplemented the bees with some pollen that came with the bees the first week.

The Month of August:

Sunday, August 17th, we noticed there was no bee activity in the direct seeded house. We found the weight of the foliage had pushed the plastic shutter that covers the entrance to the hive closed.

The foliage from the Zucchini had grown large. We decided to harvest the zucchini as a one-time picking and to pull the plants to provide space for the Butternuts to grow. In retrospect, the extensive growing habit of the Butternuts, the 12 feet of width is not wide enough for the vines to fully extend. Planting any

additional crop within the Hoop House growing Butternuts inhibits the value of both crops.

We harvested 65 pounds of Zucchini from the direct seeded Hoop House for the August 9th market. We harvested 86 pounds of Zucchini from the direct seeded, uncovered plot in two pickings.

The evening of the twilight outreach meeting, Squash Bug eggs, nymphs and adults, as well as Cucumber Beetle activity was found in the uncovered Butternut Squash, Zucchini, and Cucumbers. Damage to the crop at this point appeared to be minimal. Powdery Mildew was found as well. No damage to the plants inside the Hoop Houses was apparent. However, our Pumpkin plants at the other end of the farm have had massive damage to the foliage. The planting date of the pumpkins paralleled the planting date of the Butternuts.

A final comment about the mesh material.

It has performed as we had hoped. The hoop house structure/material held up to high winds, was maintenance free, and maintained a captive bee population. The material would snag if it caught on a rough edge but the hole could be worked back into place with two fingers. If the material were to be cut, the damage would be difficult to repair. The material stretches as the vines grow. We purchased enough wiggle wire to secure the ends of the Hoop Houses which allowed for easy access, and it sealed the Hoop House to prevent the bees escaping to the outside world.

Cath and I at White Frost Farm want to thank, Ron Hoover, Penn State On Farm Research Director; Michele Gauger, Pennsylvania Association for Sustainable Agriculture (PASA); Shelby Fleischer, Penn State Entomology Department; Tom Murphy, Penn State/Lycoming County Extension; Sustainable Agriculture Research and Development Program (SARA), Johnny and Leah Tewksbury, Tewksbury Grace Farm; Eric and Anne Nordell, Beech Grove Farm and all those involved in the exploration of alternative farming methods with an emphasis on stewardship affecting people and ultimately the choices they make.