Project Report • March 2013 • A year of explorations at The Farm Institute

In the spring of 2012, The Farm Institute initiated the Pilot Parcels Project. Funded by the Northeast Sustainable Agriculture Research and Education (NESARE) branch of the USDA, the project provided five farmers or farmers-to-be with one acre of garden space, along with some financial support, access to water, technical assistance and education. The project contributed to the Island's goals for food self-sufficiency by providing both land and a low-risk environment for agricultural innovation. As we use this snow-filled season to plan again for spring, this project summary is offered to our agricultural community. We are grateful to NESARE for helping us with both our farm and education mission.

–Jon Previant, Executive Director, The FARM Institute

Read the reports from some of the Pilot Parcels farmers on the following pages. For full reports go to our website, **www.farminstitute.org** or contact Rebecca Sanders **rebecca@farminstitute.org.**

Lily Walter Compares Tillage Methods in Her CSA Vegetable Garden

I used the Pilot Parcels project to research the feasibility, limits and benefits of a reduced-till approach in small scale vegetable production. Reduced-till farming can reduce erosion, soil compaction, soil structural damage, fuel costs, labor hours, and irrigation needs. Research has also shown that reduced-till farming greatly increases soil fertility and health.

Method

I subdivided my plot into three main sections: a strip-tilled section (A), a mulched section (B), and a conventional experimental-control section (C).

Section A Strip-Tilled In this section, I used my walk-behind tractor to rototill strips, each 31 inches wide and 50 feet long, into the already established ground cover, primarily vetch, grass, and clover. These strips became my permanent beds, and I left the ground cover as the pathways, which I mowed as needed throughout the season. In one strip, I also tried using a buckwheat cover crop for the pathways instead of the already established cover of grass, vetch, and clover. I used overhead sprinklers for this section.

Section B Mulched In this section, I first strip-tilled beds into the existing ground cover. I then heavily mulched these beds with a layer of cardboard (acquired free from the dumpster of a local business in Edgartown) then a layer of seaweed (collected on local beaches) or grass clippings (dropped off by a local landscaping crew). The pathways remained mowed. Each of the mulched beds was irrigated with drip line irrigation.

Section C Conventionally-Tilled In the conventional-till section, all of the pathways and beds were tilled regularly in order to reduce weed pressure and to establish new crops. I planted a wide variety of vegetables, flowers, and herbs in these beds and irrigated the area with overhead sprinklers.

Lily Walter and brother Christian

The topsoil in sections A and B was well protected. In Section C, erosion was

visible on days with high winds. Section A required tilling only within the permanent beds, since the soil in the pathways was undisturbed. After the initial tillage, Section B required almost no tillage. The mulch suppressed nearly all of the weeds. Over time the cardboard, seaweed and grass clippings will compost directly into the soil, increasing the organic matter.

The weed seed bank throughout the parcel was high. The perennial weeds included vetch, grass, mustards, chickweed, and lambs quarters.

Section A had moderate weed pressure. The pathways remained mowed, a method that helped maintain the weeds. However the permanent beds suffered from encroaching grass from the mowed pathways. On average, these beds required weeding every other week.

Section B had low weed pressure. The heavy mulch suppressed the weeds, eliminating competition for the planted crops. This section was lightly weeded twice during the growing season.

Section C experienced very high weed pressure and required regular tillage and thorough weeding every other week on average.

Challenges

Time The mulching method in section B was extremely time consuming. It required truckloads of cardboard and then many more truckloads of seaweed and grass clippings. These loads were all "free" but high in labor for collecting and spreading.

Equipment I struggled with inadequate equipment. The mowed pathways in sections A and B required a functioning lawn mower (with a bag to collect the clippings) and a weed whacker. At times I lacked both, which allowed the ground cover to become overgrown, sometimes going to seed.

Unsuitable groundcover To keep labor and cost down, I used the established ground cover as the mowed pathways in sections A and B. The cover was an aggressive grass, which was extremely difficult to eliminate from the beds in section A. In the future, I would till in the existing cover in the spring and attempt to establish a less invasive cover, such as a low growing clover.

Summary

Using both conventional-till and reduced-till methods, I had a successful first-year farm business on my one-acre parcel. Some of the reduced-till growing methods I used were only appropriate for certain crops. For example, the mulching method only works for long-season crops or for beds only planted once in a season. While I will continue to experiment with other reduced-till methods, the mixed-tillage approach is a viable option for a small-scale vegetable farm on Martha's Vineyard.

Pat Brown Experiments with Local Stone Soil Amendments

My experiment on this flat sandy loam was to assess the effects of applying locally available stone materials as a soil amendment. I used legume crops and potatoes as a test. I measured the results by testing plant sap in the refractometer, a hand-held optical device that measures the amount of solids in water

I applied crushed native stone and crushed stone imported from Acushnet ("blue" stone, granite and/or basalt source rock) all bought at Goodale's. I applied these by shovel in roughly two-foot wide bands creating rows about six feet apart and 200 feet long, about one and a half tons per row. A third row was planted without stone amendment as a control.

The potatoes were planted in mid-April. I applied dehydrated chicken manure to provide adequate growth for the young plants as potato is a heavy N-feeder. Several tests of growing foliage during the season and a tuber-test done at harvest in late July showed better levels and range of minerals in foliage from the blue stone dust row. Tuber nutrient levels were moderately higher in the blue stone dust row and lowest in the control row. Overall harvest weight was lowest in the native stone dust rows.The legume test crops were largely a failure due to acid of peas (pisum

sativum) planted in late April. Rapid weed growth eliminated the crop. Later rows of fava beans and cowpeas fared better but were not part of the test.

Conclusions

I needed more time and better soil cultivation to properly assess the impact of stone dust amendments. In the potato crop, which was best suited to the acidic condition, the test showed a small positive result for nutrient levels in the tubers for one of the amendments, and higher differences in fresh foliage, indicating that timely cutting and incorporating of green manures would be best for the seasons following introduction of stone dust.

I suspect that low organic matter content of the soil masked the potential effect in this short-term test. Stone dust is highly persistent and over time will likely raise the organic matter in a given area. The small effects multiplied over five or ten years could be very large. Eventually, such an increase in soil organic matter will also raise soil pH, increasing the ability to grow the best legume manure crops.

The tentative results did indicate granite and/or basalt based crushed stone should be favored over mixed glacial rock. For soils that have leached to an acidic condition application of limestone along with granite/basalt would be ideal. Sourcing affordable fine stone dust and finding efficient methods of application remain a problem to be solved.

Pat Brown at work

Master Gardener Teri Praskach Uses Cover Crops in Her Cut Flower Garden

I used my Pilot Parcel to experiment with cover crop interplantings in my cut flower business, Flower Tins.

Planting of seedlings in the ground began in the beginning of June. Seedlings of zinnias and asters were too large to adjust to the Katama conditions of heat and wind. Some were lost. The timing of seedlings leaving the greenhouse for the field wasn't good. Smaller seedlings have a better survival rate and produce blossoms quicker. Nonetheless, many prospered and became quality harvestable blooms.

The cover crop was first planted in mid-July. I used winter rye alone in some rows, and a mix of field peas, crimson clover, hairy vetch and annual rye in others. I didn't see a difference between them.

Weather cooperated for good germination. Tilling began when cover reached a height of one inch. Cut flowers were at various stages of production from buds to not-yet-blooming.

The tilled cover crops made a noticeable difference in even moisture content of the soil. The texture of the soil was light and airy and easy to hoe. Hilling up of plants when they begin to reach good height is necessary for the stems to withstand high winds without blowing over. Where properly hilled, stems withstood winds nicely, and stayed cleaner because the moister soil produced no dust.

The soil where cover-cropped did not compact after a heavy rain compared to non cover-cropped areas and also did not develop a top "crust" of hard soil. The soil also remained less compacted in walking areas. Hoes and tillers moved through the soil more easily in these areas.

In mid-August I did a second seeding of cover crops. The blossoms were also blemish free. Areas without cover crops were weedy. Although it was most notable on ageratum and sunflowers, areas that were cover-cropped had less bug activity. I didn't have a way to distinguish the impact on beneficial insects.

Weeds became unmanageable when cover-crop seeding and tilling stopped. An extra pair of hands was needed to continue through the first frost when crops were finished. It would have been beneficial to have more sowings.

Soil tests are needed to compare nutrient levels in the soil and these have been sent out. But where the soil stayed evenly moist and movable and airy, flowers were bug free and of good clear color with strong petals. I didn't measure vase life.

Continuing the cover crop interplanting definitely seems beneficial.

Notes from Garden Manager Rebecca Sanders, Project Coordinator

Many thanks to everyone who worked with us on the Pilot Parcels project. In addition to Pat Brown, Teri Praskach and Lily Walter, thanks to participants Anna and Dan Merhalski, Alex Rentumis, and Katrina Nevin. Many thanks as well to Hannah Beal, former garden manager, who conceived of this project. Without her creativity and foresight, the Pilot Parcels may never have come to fruition.

Our focus in bringing Pilot Parcels to the community was to attract innovative and experimental projects that would teach us more about efficient ways to grow food and conserve resources. Participants engaged in projects that included both growing non-traditional crops as well as using alternative approaches to soil fertility and water conservation. The project was a success in that it gave growers an opportunity they may not have had otherwise, and valuable knowledge and insight was gained through their work.

These are some lessons that I learned from managing the Pilot Parcels and hope to share with other farmers interested in undertaking a project such as this one.

One acre is big, too big for folks who have never farmed before. An acre also

Rebecca Sanders in the greenhouse

can't be a part time project, a problem for Vineyarders who need to make a living in the summer. In order to avoid setting people up for failure, its good to start small. Prepare the soil well in advance. We got a late start and it proved to be problematic. The soil should be disced and the seed bed prepped so participants can get into their plots by mid April.

Soil samples should be taken as early as possible so amendments can be made before planting begins. Our test results showed that the pH of the plots was low to start with (5.9) and lacking in phosphorous and certain trace minerals.

Weed pressure was very intense, and had a cover crop gone in at the outset of the growing season, the problem would have been more manageable.

The group process works. We all benefitted from each other. Pat taught everyone how to use the refractometer. Alex shared his truck with us during our workday. Anna and Dan brought their bee hives and set them up in their plot. Teri was expert at setting up drip tape and Lily and her crew at setting up deer fencing. Everyone had skills and resources to share.

The workshops presented in conjunction with Pilot Parcels were a great success and showed a need for more. When people come together to learn from talented growers and share their own experiences, it's rewarding for all.

Thanks to NESARE for making this project possible. The Farm Institute will continue to find ways to share its land and its resources with Vineyard growers who wish to develop projects of benefit to our island community.

FARM INSTITUTE
MARTHA'S VINEYARD

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