

Northeast Sustainable Agriculture Research and Education Program

Farmer/Grower Grant Interim Report

1. Project name and contact information

Project Title: Growing Weed Free Strawberries

FNE04-528

Project Leader: **David Pike**

Address: 115 Mountain View Road

Farmington, Maine 04938-6407

Telephone: (207)-778-2187 Best Time to call: **8AM to 8PM** Mon. thru Sat.

E-mail address: depik@prexar.com

S.A.R.E. request: **\$1989.00**

2. Goals

My goal is to economically grow strawberries, using the plasti-culture system, by late planting of two rows of dormant bare-root transplants on 42-in wide raised beds with buried drip tape, covered with plastic on unfumigated soil. The area between the plastic strips will be inter-seeded with a slow-growing perennial rye grass seed ensuring a dense growth. This will greatly reduce soil erosion and any weed growth in the aisle and will eliminate the need to cultivate or use weed sprays in the initial or second year. To control its height, the grass will be mowed when needed with a 21-in. rotary mulching lawn mower. For winter protection 1.2-oz. floating row cover will be used instead of straw, which is a source of unwanted weed and volunteer grain seeds.

3. Farm Profile

My farm is located next to a major highway in the foothills of the Appalachian Mountains and near the Sandy River. I grow approximately 12 acres of fruits and vegetables, strawberries being the main crop (pick-your-own and pre-picked for my roadside stand). The land is fairly flat and has no rocks. This area is usually blessed with a good snow cover, although some winters there is minimal snow cover.

4. Participants

N/A

5. Project activities

Land preparation began mid-June since early July is the best time to plant.

- As a result of soil test recommendations, fertilizer and amendments were broadcast and then incorporated. Beneficial amendments to improve microbial activity were also added.
- Beds were preformed to 72-in. on center with multihead rototiller and furrow forming blades. (60-in. wheel centers are common to many growers). A three-shank subsoiler was used to loosen soil in bed zone. Additional fertilizer was banded onto the beds and incorporated with a 40-in. rototiller. All fertilizing for the life of the bed must be done before plastic is laid, except for foliar or drip-feeding.
- Soil must be moist before doing the final bed shaping. This required setting up the overhead sprinkler system. Beds were shaped using a Kenneco super bedder and press pan mounted to a 55 hp MWD tractor. Two rows of drip tape (15 mil thick with 12-in. emitter spacing) was installed 18-in. apart 4-in. deep. Final bed was 42-in. wide at the top with 4 ½-in. sides and a 1 ½-in. crown for water drainage. A firm and well-shaped bed without voids is critical and requires careful adjustments. There are some excellent bed shapers available that will shape the bed, band fertilizer, lay drip tape, and lay plastic in one operation. The equipment I am using requires a few more passes.
- The press pan was then attached to a modified plastic layer. I use 1 ¼ mil thick x 66-in. wide embossed black plastic mulch. It is important that the plastic is stretched taut so that wind does not allow the plastic to lift off the plants during establishment. Ends are then graded and plastic ends buried. The drip line ends are properly placed at this time to close off or to be ready for attaching to the header.
- Before slitting the plastic, I broadcast 2-bu. per acre of a dwarf perennial rye grass with hand crank seeder. It was then necessary to blow the rye seed off the plastic onto the driving row with an air blast sprayer. I used my Troy Bilt tiller to lightly scratch seed in the driving row. It took about a week to get the seeding well established. This grass reduces soil erosion on the edges of the plastic, provides living mulch, suppresses weeds, keeps the fruit clean, will not become muddy, and is comfortable to walk upon.
- While the grass was getting established, I connected the drip lines to the header to check out the system for problems and to pre-wet the beds.
- A 2-row punch wheel machine with centering guide wheels was assembled. The rows were 24-in. apart with a 10-in. spacing between plants. These small slits greatly reduce the potential for light to germinate weed seeds.

- Holes were punched just prior to planting to avoid the soil from drying out. I used dormant bare root plants that had been in cold storage since the previous fall. The same varieties of eastern June-bearing plants that I have used in the past were planted. At the 10-in. spacing about 17,400 plants will be required per acre. To assist in planting, I fabricated a hand-made tool from flat bar stock 1 3/4-in. wide x 1/8-in. thick x 15-in. long, filed a concave on one end, and formed a 4-in. handle on the other end, wrapping the handle with duct tape. (A similar tool is used in other parts of the country). Prior to planting, each bundle of plants was soaked in a transplant solution and Agri-Gel, reducing chances of the plants drying out during planting.
- Planting was started around July 8, 2004 and was finished July 16, 2004. First, place transplant root tip over the slit and use the hand tool to draw plant to desired depth, and then firm soil around the crown. One must exercise care to not cut off the roots and to minimize excessive “J” rooting. An experienced planter can do about 150 to 200 plants per hour. Next, drip irrigate to supply needed moisture. Moisture sensors should be installed to determine irrigation timing. Remove blossom trusses after about three weeks or as the planting develops. Grass should be mown weekly during the season with hand mulching rotary mower. To burn down the grass next to the plastic, use “Alldown” (OMRI approved) herbicide twice with a backpack sprayer. I sent leaf samples to a laboratory for analysis and injected or foliar fed nutrients as recommended. Beneficial nematodes (Hb) were injected late August through drip lines to control root weevil larvae.
- Runner removal started mid-August after the first flush started. This later planting produces fewer runners, which helps to reduce the cost of labor. I finished this operation by mid-October. By mid-November the plants are dormant and ready for 1.2-oz. floating row cover. Row cover is secured with mesh rock bags. By using row covers no herbicide is required since no seeds are introduced to germinate in the spring.

6. Results

This was the planting and establishment year and the final report will be given in December 2005. The planting is doing well and I am looking forward to a successful crop in the summer of 2005. I did plant a crop in 2003 with the harvest in 2004 as an initial trial using this method. I was able to harvest approximately two weeks earlier than other growers in the more southern regions of Maine and experienced no winter damage. By being earlier I was able to charge a higher price and received excellent press from both TV and state-wide newspapers.

7. Conditions

I was delayed in my early July planting because of several days of rain, so I did not finish planting until July 16, 2004. This may have some impact on the two to three branch crown developments, but this will not be known until summer of 2005.

8. Economics

As this is a two year project, the true economic implications will not be known until the life of the bed is over. A final report will be submitted after the first bearing year. With renovation, two to three bearing years are possible and the costs per year are greatly reduced after the planting year. The expected yield for the first bearing year should be between 15,000 to 18,000 pounds per acre.

Planting year costs for 2004

Variable costs:

Fertilizer – preplant	\$350.00
postplant (drip/foliar)	\$200.00
Soil and tissue tests	\$150.00

Materials:

Drip tape 4 rolls x \$115.00=	\$460.00
Plastic mulch 4 roll X \$95.00=	\$380.00
Perennial rye grass 2 bu. X \$70.00=	\$140.00
Mesh bag material	\$ 50.00
Row covers 1.2-oz. (35-ft. X 400-ft.) 4 x \$340.00=	\$1360.00
Miscellaneous drip supplies	\$200.00
Strawberry plants (17,328)	\$1557.00

Pesticides:

Insecticides and Fungicides (some OMRI approved)	\$149.00
“Alldown” herbicide (OMRI approved)	\$103.00
Beneficial Nematodes (Hb)	\$150.00

Machine and equipment fuel/oil

\$175.00

Total variable costs: \$5424.00

Fixed costs:

Cost of owning and operating machinery per acre	\$802.00
Overhead per acre	\$157.00
Labor planting year (420 hr. x \$7.00)=	\$2940.00

Total fixed costs: \$3899.00

Total cost: \$ 9323.00

9. Assessment

As a result of my trials using this system, there are a few areas that need further exploration. Production levels of 20,000 to 30,000 pounds per acre should be achievable, but will require additional research and trials.

- Determine the cultivars best suited to one's climate, thereby providing the highest production level to obtain the greater profit. Therefore, growers must select available cultivars for quality, winter hardiness, disease resistance, and production.
- Reduce planting labor cost either by hiring a seasoned planting crew or by using mechanical transplanters. There are no appropriate mechanical transplanters (to plant dormant bare-root transplants through plastic) available at this time. Should a suitable mechanical planter become available, this would encourage the adoption of this method.
- Runner removal labor cost must be reduced to make this system viable. When runners are left on the plants, there is poorer air movement and increased risk for harboring diseases. It takes approximately 120 man-hours per acre to remove runners by hand, even if cultivars are selected that produce less runners. Growth regulator trials, being conducted by university researchers, appear to be very effective and would virtually eliminate this expense. This would also allow for an earlier planting target date (mid to late June) and result in more branch crowns (three to four) to ensure a larger crop the first harvest season. Two production seasons should provide for a very good margin of profit. Organic growers would have to remove runners by hand, but the increased price they can charge for their berries would probably offset the increased labor cost.

10. Outreach

- Farmer to Farmer Conference at Bar Harbor, Maine, in Nov. 2003 sponsored by Maine Organic Farmer Gardeners Assoc. (MOFGA) 100 growers in attendance
- Maine Vegetable & Fruit School at New Gloucester, Maine, and Newport, Maine, in March and April 2004, sponsored by University of Maine Cooperative Extension. 80 growers in attendance
- Maine Department of Agriculture personnel with the commissioner, Mr. Bob Spear, came on site to view the early crop, "spearheading" the 2004 Maine strawberry season. WCSH-TV was on hand, along with several newspaper reporters, providing exposure throughout the state.

Name: David Cipit

Date: 2/2/2005