

HIDDEN MEADOW FARM

A NOFA/CT certified organic farm

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re: Northeast SARE Farmer/Grower Initiated Grant Program
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This project is on **Growing Potatoes Organically 3 Different Ways**.
in the **1996** growing season.

I started out by having a soil sample tested in mid March at the Connecticut Agricultural Experiment Station, for the area where I intended to grow my 3 plots of potatoes, after spreading leaves in the late fall- early winter of 1995 on this area with a PTO driven manure spreader at about a 3 inch thickness.

The results were as follows:

soil samples dated	03/15/96	10/30/96
Soil texture:	sandy loam	sandy loam
Organic matter:	medium high	medium
pH:	7.2	6.0
Nitrate Nitrogen:	very low	medium low
Ammonium Nitrogen:	low	low
Phosphorus:	high	medium low
Potassium:	low	low
Calcium:	medium high	medium high
Magnesium:	high	high

At planting time starting April 18, 1996, I added **50 lb. of 4-5-4** chicken manure-based **dehydrated organic fertilizer** per **1000 feet**. The area that was planted is pie shaped and I started toward the pointed part of the pie shape with area **A**, followed by areas **B** and **C**.

The potatoes grown were **Norland Red (N)** and **Yukon Gold (Y)**. Each area was planted with **250 lb** of each variety, in **36** inch rows. There was deliberately no cultivation of the rows nor any weeding during the whole growing season.

Area **A** was planted strictly in the untilled soil covered with last years leaves and fertilizer.

Area **B** was planted in the untilled soil covered with last years leaves and fertilizer and covered with more leaves after the plants emerged.

Area **C** was planted in the untilled soil covered with last years leaves and fertilizer and was interseeded with **hairy vetch**.

The potatoes were planted between April 19 and May 2, 1996. Vetch was seeded on May 2nd.

The first tops started showing on May 10th but a 28 degree frost on May 14 killed all the tops.

Colorado potato beetles showed on June 11 in this test plot. On June 6 **CPB** showed on other plants.

The 1st digging of early potatoes (**Norland** in area **B**) took place on July 10 by hand. All harvesting of the crop was done in bushel (50 lb) lots for simplicity.

In area **C** the hairy **Vetch** took over in mid summer and completely suppressed the growth of both types of plants.

Dr. Kim Stoner from the CT Agricultural Experiment Station did several **CPB** counts as per attached report.

On August 5, after the plants in all 3 areas had died down and the weeds started to grow, I mowed all the areas because the weeds and dead plants were getting tangled into the **middle buster plow** that I used to dig up the potatoes.

The total crop of each plot was, area	A Norland	975 lb
	B Norland	975 lb
	C Norland	0 lb
	A Yukon	350 lb
	B Yukon	525 lb
	C Yukon	0 lb

Conclusion:

The **Norland** yield was satisfactory in areas **A & B**. **Norland** is an early producer and the **CPB** did not do much damage to the plant before the tubers developed. **Yukon Gold** is a late producer, and the plants were virtually eaten by **CPB** by August so the lower overall yield may be due to **CPB**. As Dr. Stoner stated in her report, **CPB** numbers were higher in area **B** (the area treated with additional leaves in the spring) than area **A**. Weeds were kept in check by leaf mulch better in area **B** than in area **A** despite a very wet season. The higher yield in area **B** than in area **A**, despite higher **CPB** numbers, could be partly due to less competition from weeds, and perhaps because the leaf mulch had other positive effects on plant growth or tuber production.

Area **C** produced no crop due to the vigor of the **Vetch** and other competitive weeds.

As noted by Dr. Stoner in her report, we also tried burning **CPB** in a different area (outside the experiment covered by this grant) planted with "Bintje" potatoes. The burner I built is a 2 row adjustable unit, with 6 burners, that is attached through a 3 point hookup to a tractor and burns liquid propane at a rate of about 500,000 BTU per burner per hour. Burning was done twice, the last time just before flowering. Bintje is a late variety, and after burning it continued to thrive, staying green into mid to late September and produced 800 lb. of potatoes from 100 lb. of seed. Burning may also kill weeds and add nutrients from burned insect and plant matter. Dr. Stoner and I hope to do more research in this area in the next growing season.

I will continue to grow potatoes with leaf mulch, that has been incorporated in previous years, so there will not be any field fires from burning, on a field rotating basis.

I would recommend to other growers to use leaf mulch in prior years before planting potatoes, so that **CPB** will not be a great problem, unless a good method exists for their control. Leaf mulch is a great organic soil amendment that holds the moisture in dry years and in most cases is readily available at no cost. After 2 years it turns into a coffee ground-like material with the largest earth worms.

Since I have a good amount of slides as well as prints, I will be available to give talks on this project to organizations that are interested on this subject.

October 31, 1996

Report on Colorado Potato Beetles in Johan van Achterberg's Experimental Plots

Counts made by Kimberly A. Stoner and Tracy LaProvidenza, CT Agricultural Experiment Station, New Haven.

Methods used: Walked across the field, stopped after each 10 paces, counted all stages of Colorado potato beetles on the nearest primary stem. Small larvae were first or second instar, Large larvae were 3rd or 4th instar. Counted beetles on different numbers of stems in different treatments due to differences in plot dimensions. These plots were not designed for statistical analysis, so none was made.

June 14, 1996

Plot A: Leaves applied in fall only, and rototilled in spring

<u>Variety</u>	<u>no. stems</u>	<u>Adult CPB</u>	<u>Eggmasses</u>	<u>Small Larvae</u>	<u>Large Larvae</u>
Yukon Gold	23	0	1	5	0
	per stem	0	0.04	0.22	0
Norland	20	0	1	0	13
	per stem	0	0.04	0	0.65

Plot B: Leaves added as mulch in spring

<u>Variety</u>	<u>no. stems</u>	<u>Adult CPB</u>	<u>Eggmasses</u>	<u>Small Larvae</u>	<u>Large Larvae</u>
Yukon Gold	25	1	5	138	0
	per stem	0.04	0.20	5.52	0
Norland	25	0	6	19	23
	per stem	0	0.24	0.76	0.92

Plot C: Hairy Vetch planted as living mulch. (Note: Heavy competition of vetch and lambs quarters with potato plants)

<u>Variety</u>	<u>no. stems</u>	<u>Adult CPB</u>	<u>Eggmasses</u>	<u>Small Larvae</u>	<u>Large Larvae</u>
Yukon Gold	41	0	1	29	0
	per stem	0	0.02	0.71	0
Norland	37	0	0	11	35
	per stem	0	0	0.30	0.95

July 17, 1996

Plot A: Leaves applied in fall only

<u>Variety</u>	<u>no. stems</u>	<u>Adult CPB</u>	<u>Eggmasses</u>	<u>Small Larvae</u>	<u>Large Larvae</u>
Yukon Gold	21	10	0	15	15
	per stem	0.48	0	0.71	0.71
Norland	17	6	0	0	0
	per stem	0.35	0	0	0

Plot B: Additional leaves applied as mulch in the spring

<u>Variety</u>	<u>no. stems</u>	<u>Adult CPB</u>	<u>Eggmasses</u>	<u>Small Larvae</u>	<u>Large Larvae</u>
Yukon Gold	18	46	0	49	22
	per stem	2.56	0	2.72	1.22
Norland	17	21	0	23	13
	per stem	1.24	0	1.28	0.76

No counts were made in Plot C, because the potato plants had nearly disappeared among the vetch and lambs quarters.

Conclusions:

For both varieties and both counts, the lowest numbers of Colorado potato beetles (in all stages) were in Plot A, where the leaves had been applied the previous fall, and no additional leaf mulch was applied in the spring. This is consistent with a previous study conducted on our experimental farm, in which I reported that leaf mulch increased the density of Colorado potato beetles, although the effects on soil moisture and temperature might benefit the potato plants in a dry year. The living mulch of hairy vetch did not decrease density of Colorado potato beetles, even though it reduced the size of the potato plants through intense competition.

Results of propane burning for control of Colorado potato beetles, Johan van Achterberg's farm

Counts made by Kim Stoner, CT Agricultural Experiment Station

Methods: Counts made as above. Stems were not marked, so the exact same stems were not counted each time. Variety was "Bintje," and plot was on the opposite side of the same field as the experiments with mulch. There was no control plot. This was a narrow strip of potatoes, and it was all flamed at once.

<u>Date</u>	<u>Notes</u>	<u>no. stems</u>	<u>Adult CPB</u>	<u>Eggmasses</u>	<u>Small Larvae</u>	<u>Large Larvae</u>
6/14/96	before burning	33	0	3	34	14
		per stem	0	0.09	1.03	0.42
6/14/96	just after burning	29	1	3	27	4
		per stem	0.03	0.1	0.93	0.1
6/18/96	3 days after burning	29	0	0	3	9
		per stem	0	0	0.1	0.31

The plot was burned a second time, but I was not able to get out to do more counts.

Conclusions:

Worth taking a more careful look, considering timing and with a control that is not burned.