

## **Final Report**

**Using composted paper mill wood fiber residual as a mulch/soil amendment in  
potato production**

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## Our Goals

The goal of this project was to evaluate the effect of using composted paper mill wood fiber residual as a mulch/soil amendment in potato production. Organic matter loss has had many negative effects on potato growers in Maine. One factor of this loss has been the lightening of the soil's color which reduces its solar collecting ability. The need for organic matter is widely accepted and the benefits to soil structure have been demonstrated. However the cost and the conflict with labor and management time if our short growing season is a barrier to applying organic matter to our soils. If the application method can positively impact growth, yield or other production cost it would increase the use of soil amendments and increase the sustainability of potato production. By applying the compost as a mulch we hoped to increase the rate of growth as measured by rate of row closure and reduce or eliminate the herbicide program.

This farm is a full time potato and small grain farm, which owns 600 tillable acres and rents an additional 25 acres. The farm markets its potatoes as seed and chip potatoes. No additional acreage has been added since the grant. Soybeans are being tested as an additional rotation crop. Our Cooperators were Matt Williams Extension Educator and Heidi Nelson USDA Americorp Volunteer. Matt served as advisor and did data collection and analysis, help prepare this report. Heidi did data collection.

## What We Did

The project was implemented with a randomized block design on twenty rows of var. russet burbank inside a twenty five acre commercial planting. The rows were divided into ten row strips and the mulch was applied on four blocks with another four blocks untreated see table 1.

Table 1.

101 mulch	102 control	103 control	104 mulch
201 control	202 mulch	203 mulch	204 control

To apply the mulch we modified a wet lime spreader by shielding behind the spreaders spinning disk. we applied the compost two rows at a time. Both the treatment and controls were driven over with the same equipment the same number of times even if the practice was not applied. The mulch was applied at emergence (ground crack) to a depth of one inch ( approx. 10 dry tons of compost) Both the mulched and control blocks were treated with Gramoxone to remove emerged weeds just prior to mulch applications, the control blocks were treated with sencor for weed control. The controls were cultivated once and hilled twice. The mulched blocks were hilled at the second hilling for the controls. Each block was evaluated for weed pressure. Each block was measured for the distance between the canopy between rows to measure rate of closure. Leaf petiole samples were taken 50 days post planting. Yield and tuber counts were taken at harvest.

## What We Found

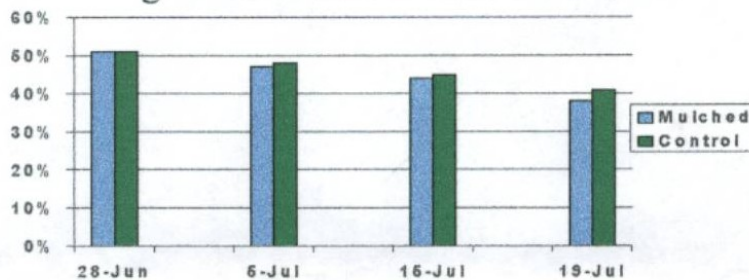
The mulch was very effective at weed control. There was virtually no weed pressure on either the mulch or the control, however there was no check in the control without any herbicide. The canopy did close faster on the mulch as shown in table 2 and chart 1.

**Table 2**

	28-Jun	5-Jul	15-Jul	19-Jul
<b>Mulched</b>	51%	47%	44%	38%
<b>Control</b>	51%	48%	45%	41%

Chart 1.

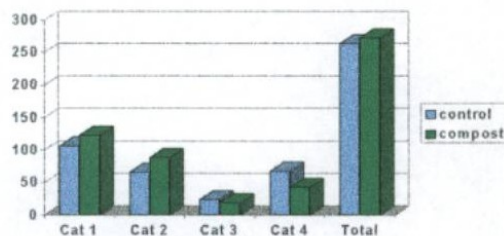
Effect of mulch on Rate of  
closure as percentage of open  
ground between rows



Yield however was reduced under this system, the control averaged 252 cwt/acre while the mulch averaged 244 cwt/acre. This was attributed to abnormally high level of rainfall that occurred after canopy closure. Even though yields were reduced the tuber set increased under the mulch system as shown in Chart 2.

Chart 2.

1996 Russet Trial Mulch



Tuber set

### **Site Specific Information**

As indicated before we experienced high levels of rainfall in July and August on this site, with rainfall exceeding 250% of normal (28 day cumulative averaging over 7 inches. This put all the crops in our area under stress the differences on the leaf petiole samples were those under the mulch averages 89 ppm nitrate compared to 118 ppm for the control ,both these values are well below the 150 ppm minimum. Foliar nitrogen was the only recourse available but was too little to late..

### **Conclusions & Economics**

The results from our test did not come out the way I expected them to. I was looking for a substantial increase in yield. If yield were the only measure, this was a money losing venture, however the increased set and canopy growth both indicate that this process could both increase yield and lower inputs. We need to repeat this trial but must wait until a new round of compost is available probably next year. Certainly this could have a lot of application for an organic production program for weed control. We need to do even more modification on the applicator with some method to assure a even depth of application as well as area. Soil nitrate readings may be more important than petiole readings.

### **What Do I Tell Other Producers**

I like what we have done and I am sure it will work, but the weather extremes really hurt us last year. I have been farming for forty years and have never seen so much rain.

### **Outreach**

Our out reach consisted of two presentations, one at the Maine Potato Conference and one at our local Agricultural Seminar Series. The trial site was also shown to local growers on a summer tour. The results of this study will also be published along with other amendment studies that are currently ongoing.