

**SUSTAINABLE AGRICULTURE AND EDUCATION PROGRAM
FARMER/GROWER GRANT FINAL REPORT
FNE-295-2000**

1. This project's goal was to conduct a comparison of conventionally-planted potatoes (i.e., in the soil) to potatoes planted under organic mulch on top of the soil. We hoped to show that small growers without equipment can economically grow and harvest potatoes, traditionally a labor-intensive crop by hand, by growing under mulch, which requires no digging.
2. Vehicle and equipment repairs resulted in little production this year except for the potato project and a few late summer vegetable beds. A mistake on the part of our hay cutter resulted in the mowdown of almost the entire herb area.
3. Technical Advisor, Tom McCutcheon, Roane County Extension Agent, provided review of the proposed project and wireworm information. Mary McCormick, Coordinator for the Roane/Jackson Master Gardener Program, scheduled time through master gardener classes for mention and discussion of the proposed project. A handout of the project results will be distributed in upcoming master gardener classes. Linda Beatty, WV Herb Association Newsletter Editor, will provide space in a future issue for an article on the project results. New editor, Claudia Gianninni, of the Mountain State Organic Growers and Buyers Association newsletter, will provide space in a future issue for an article on the project results.
4. All potato beds were prepared in the same way: Cover crop of winter rye was tilled in the third week in April. No soil amendments were added. To retain certified organic status, certified organic seed potatoes were ordered from Fedco, a much less expensive resource than Johnny's Selected Seeds, where we originally received pricing. Twenty pounds of four varieties were planted on May 7 in five pound increments. Two repetitions of each variety were randomly planted in beds. This resulted in two 5-lb plantings of each variety above the soil and under mulch, and two 5-lb plantings of each variety conventionally under the soil. All tubers were spaced equidistant at 12" apart. Tubers planted under the soil were set 5" deep. Tubers grown under mulch were placed on top of the soil. Tubers grown in the soil were hilled twice during the growing season. Tubers grown on top of the soil were mulched at the same time with hay and grass clippings. We originally planned to use floating row covers to deter deer and the Colorado potato beetle, but determined that it was not a necessity this first year as this was a first year potato planting in the area. Harvesting took place in early October when dieback was complete. All planting, mulching/hilling, and harvesting was done by the same person to avoid variables in labor hours. With the exception of spring tilling, all work was done by hand. We measured and compared: 1. Man-hours used to sow, to mulch or hill soil during growth, and to harvest; 2. Incidence of wireworm damage; and 3. Yield at maturity.
5. We found that man-hours more than doubled in all aspects of underground potatoes compared to aboveground. Creating a 5" furrow and sowing the furrow averaged 35 minutes compared to placement of tubers on top of the soil, which averaged 6 minutes per planting. While hauling mulch to the site was not included in man-hours, mulching each planting compared to hilling the soil also took less time: 14 minutes average for mulching compared to 22 minutes average for hilling. Man-hours saved while harvesting were quite substantial, with the aboveground plantings requiring an average of 24 minutes per planting compared to the underground potatoes where digging the spuds required an average of almost 58 minutes. (See Harvest Chart for individual variety statistics.) Insect damage (chiefly wireworm) was significantly higher in underground tubers compared to tubers under mulch (see Harvest Chart).
- One unexpected result of this comparison was that one variety, Green Mountain, actually yielded higher under mulch than under soil. While the total overall yield for both above and below ground plantings is slight (only 2.42 lbs less for under mulch), the varietal differences, not including Green Mountain, show a larger spread, up to a 5 lb difference.
6. Should we decide to repeat this project or one similar to it using the same crop in the same growing area, we would invest in floating row covers. While Colorado potato beetles were few in number this year, since this was the first year potatoes were grown in this area, I would expect a substantial increase of this pest in this area in subsequent years.
7. Strong reduction in man-hours was evident throughout the entire project with the mulched potatoes. This could result in substantial savings for those who employ labor. Additionally, while the aboveground potatoes yielded slightly less than underground potatoes, the higher rate of insect damage on underground spuds resulted in far fewer marketable potatoes. Planting under mulch offers not only a lower labor expense, but a greater marketable yield, both of which help to improve farm income levels.
8. We would like to repeat this project on a slightly larger scale, to determine if the both the yields and incidence of insect damage hold firm for these varieties. We also hope to use shredded newspaper as a mulch for aboveground potatoes and compare the yield, etc., to hay and grass clipping mulches.
9. We will NEVER plant potatoes in the ground again, except for projects such as these. There are several reasons: A) Conventionally-planted potatoes are too labor-intensive for the small grower with no equipment. B) The higher number of spuds undamaged by insects results in a valuable crop, either for selling or storing for home use. C) One benefit of mulch-grown potatoes, which is of great personal interest, is that the potatoes under mulch are much cleaner than those in the soil. This is especially true if the soil is wet at harvest time.
10. As an longtime organic producer and a frequent contributor in classrooms and at conferences, I feel it's important to encourage other producers to experiment with feasible ideas until they reach the desired results. The SARE Program is a perfect opportunity not only to provide the means to conduct these experiments, but also to make available the results of these projects to a large population of other producers with similar interests.
11. This project has been presented in conjunction with different groups and forums throughout the year 2000 including Master Gardener classes, the Northeast Regional Master Gardener Conference, the West Virginia Herb Association meetings, the Mountain State Organic Growers and Buyers Association conference, as well as on-site visits to our farm. At the project's inception, the project was mentioned in the local county paper, encouraging other growers to perform the same experiment (see attached article). The final results of this project will be published during the winter months 2000-2001 through several of the organizations listed above.

HARVEST CHART FNE00-295

Potato Variety	* In Soil	Insect Damage	Avg. Sowing Time	Avg. Hilling Time	Harvest Time	* Under Mulch	Insect Damage	Avg. Sowing Time	Avg. Mulching Time	Harvest Time
Dark Red Norland	Bed #1	45	35 min.	22 min.	55 min.	13.33	5	6 min.	14 min.	20 min.
	Bed #2	33	"	"	52 min.	11.50	17	"	"	18 min.
	TOTALS	78	70 min.	44 min.	107 min.	24.83	22	12 min.	28 min.	38 min.
Carola	Bed #1	27	35 min.	22 min.	58 min.	15.25	19	6 min.	14 min.	24 min.
	Bed #2	31	"	"	56 min.	11.50	17	"	"	18 min.
	TOTALS	58	70 min.	44 min.	114 min.	26.75	36	12 min.	28 min.	42 min.
Green Mountain	Bed #1	11	35 min.	22 min.	58 min.	19.00	4	6 min.	14 min.	30 min.
	Bed #2	18	"	"	61 min.	22.00	5	"	"	32 min.
	TOTALS	29	70 min.	44 min.	117 min.	41.00	9	12 min.	28 min.	62 min.
Kennebec	Bed #1	22	35 min.	22 min.	63 min.	14.00	4	6 min.	14 min.	20 min.
	Bed #2	15	"	"	58 min.	15.50	6	"	"	21 min.
	TOTALS	37	70 min.	44 min.	121 min.	29.50	10	12 min.	28 min.	41 min.

*denotes number of lbs. harvested

Note: Insect damage numbers denote number of potatoes damaged, not weight