FINAL

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Final Report SARE Grant FNE 95-99
Submitted by Michael Macfarlane

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1. This project addressed ways of promoting maximum rooting and plant growth using a variety of mulches, soil amendments and innovative row planting in an organic cranberry bog.
2. This years improvements included the establishment of a 1½ acre cranberry bog, of which we planted one half acre this year. Future years will see the planting of the rest of the bog using our own vine. We had no changes in the 1 acre of specialty crops we grew, but we have eliminated our poultry flock.
3. Cooperators; Dave Yarborough- University of Maine Extension. Dave was our most avid supporter this year. In addition to numerous visits to our bog this year, he was very helpful insofaras making suggestions and recommendations in regard to cultivation, weed suppression and nutrient requirements. He will be recieving a full report of this project and will help disseminate the useful information we gathered this year.
   John Harker- Maine Dept, of Agriculture. As director of product development, John has got his ear to the ground for new ways of establishing bogs, he himself having completed a half acre planting of pre-rooted cranberry vine. As an active member of the Maine Cranberry Growers Association, the useful parts of our study will be brought to their attention.
   Roland DuPre- US Soil Conservation Service. He gave us a lot of assistance with the stabilization of our bog walls and erosion control. Good working relations with he and the entire SCS staff are very important to the success of the fledgling cranberry industry in Maine.
   John and Laura Starr- Cranberry growers. They sold us our vine, and made recomendations in re to planting and bog construction. Their brains were picked thoroughly and often throughout the growing season, and were always glad to help.
4. As stated in our grant application, we hand planted in rows 18 inches apart. In one section, we mulched between the rows with a variety of mulches, including controls and a section with liquid seaweed withheld. Please see inclosed photos.
5. Findings; This section will be divided into two parts; objectives and observations and summary.

   Stated objectives; First: to avoid the loss of expensive vine as seen in traditional dull-disc planting (40-90%) and to thereby reduce vine needed to provide desired coverage in future plantings, we would hand plant in agricultural rows 18 inches apart, leaving space for inter-row weed control. It was hoped that lateral runners would then fill the spaces providing uniform coverage in time. Though labor intensive, this method proved feasible as we were only planting ½ A. Five hundred (500) pounds of vine were purchased from a local bog owner and pre-soaked in liquid seaweed for 24 hours prior to planting. A small quantity was withheld to be used in one area as a control. We planted over a three day period (April 29 thru May 1) using an equivalent of 60 man-hours.

Our second objective was to determine whether by mulching some of the new vine with a variety of mulching materials, we could enhance their establishment and extend to them an anvantage not enjoyed by those vines not mulched; and if so, which mulches appeared to be most effective. To accomplish this, we randomly set aside and roped off a representative area of the bog as a test site. We then ran lines perpendicular to the vine rows, one foot apart in both the North and South sections, thereby defining two one foot rows in both mulched and control sections.

Seven different mulching materials were applied to seven separate rows in the test area with two more rows being left unmulched as controls (see worksheet and graphs). This test area would be inspected biweekly and comparison data recorded throughout the growing season.

Also, we were interested in noting whether the regular application nitrogen in different forms (fish emulsion and blood meal) would show discernable differences when overlaid on the growth data.

Our observation with respect to these objectives were as follows: As to the first objective, the newly planted vine showed uniform development on the bog generally with the first new growth being noted on our June 4 inspection. Weeds soon followed and were controlled with interrow cultivation and hand weeding. By the end of the growing season, it was estimated, using the linear measurement rather than the Daubbinmire Cover Scale, that the vines had been established in a more or less uniform cover to 35% of the planted bog. Variances were noted mostly in the areas of poor drainage due mostly to low spots in the bog. This problem is being corrected by sanding the low areas back to bog grade.

To the second objective, after spreading out the bi-weekly data charts and graphs (included), it is difficult to see where the mulched vine has established a growth advantage over the unmulched vine on the bog generally or in the test area in particular. Although there were individual test areas that might indicate enhanced growth, especially in the South section, their poor showing in the North section seems to question that conclusion and point to the likelihood that some other, uncontrolled variables were at work. It might be noted, however, that certain mulches (leaf mulch, pine needle) controlled early weeds.

We have theorized, based on the evidence in the test area and in the bog in general, that mulching materials may have dampened reflective sunlight, and may in fact be detrimental to vine development.

While I'm on the subject of vine growth, I'd like to point out one observation, that the bar graph bears out. The mulched sections with the greatest number of uprights showed the fewest number of runners almost across the board. (the only exception was the organic potting soil which displayed average upright yet poor lateral growth by number) The standout example of this was the sawdust section which showed the greatest upright yet poorest lateral growth. It is unknown to us at this time whether average upright and average lateral growth (as displayed in brown peat, control, no liquid seaweed and black peat) is most desireable to fill in a bog, or whether one should strive for greatest runner growth. Healthy plant sections are liable to send large numbers of runners next year. I will monitor this next year. Of further interest was the no liquid seaweed, which showed average upright and the greatest lateral numbers.

A note about upright growth. Uprights grew consistently to a lenght of 12-14 cm., which is optimum for the Ben Lear variety that we planted. We were confidient that our nutrition regime was about adequate. We

purposely tried not to over nitrophy, opting for healthy plants with strong root systems over lush overgrowth.

Although an overlay was made to determine whether growth related to the application of fish emulsion vs. blood meal, no conclusions could be drawn. This was due to a number of reasons. First, no controls were in place to measure the differences. Secondly, having different "take up" times, and using the amendments alternatingly, it was not possible to relate growth to one particular amendment. Third, neither would be feasible by itself. Bloodmeal, although very high in nitrogen (and expensive), carries no balance in its nutritive properties. Fish emulsion, on the other hand, is well balanced but far too expensive to use as a sole amendment. In the future, we will be using an organic preparation, probably a granulated chicken and feather meal to facilitate ease of application and reduce costs. We will probably suppliment this with one or two applications of fish emulsion to enhance trace minerals. Cranberry nutrient requirements are small, growing almost on sun, air and water. We showed adequate growth this year with minimal inputs, and will continue to fertilize lightly.

It also appears that treatment of vine with liquid seaweed prior to planting was not advantageous, and we will probably discontinue this in future plantings.

-SUMMARY-

a) Based on evidence from data gathered in the test area, we will discontinue mulching as a method of enhancing vine growth as it seems to be ineffective and possible detrimental. Pretreatment of vine with liquid seaweed also appears ineffective and will be discontinued.

b) Row planting was a standout success in this years grant program. The advantages were:

a) We used 25-50% less vine than conventional dull-disc planting and got an acceptable 35% cover the first year.

b) Inter-row spaces provided easy access on the bog for weed control, and hand hoeing (in our case) and tractor cultivation in larger plantings is feasible and greatly enhances weed control.

c) Although we hand planted the ½acre of ours, adaptations to mechanicalplanters could be easily accomplished, greatly decreasing the planting time for large plantings.

c) No summary of ours could be complete without special notation of what we considered to be two exceedingly important considerations, namely, early planting (early May here in Maine) and grade. Our healthiest vine without exception had the best drainage. In future plantings, care will insure that our new bog sections will have healthy crowns in the subsoils and proper drainage throughout.

7. Our economic findings are as follows:

a) Inter-row mulching will be discontinued until we can observe the mulched sections for one more year. If sections with large numbers of uprights throw large numbers of laterals, we will reconsider our conclusion that the cost of mulching, both material and labor, are not cost effective in establishing new bogs.

b) Liquid seaweed displayed neither enhanced vine growth or runner growth. In fact, untreated sections actually performed better. Cost of liquid seaweed and delays in planting (we could only presoak ½ of our vine at a time) confirm our decision to discontinue this practice.

c) Row planting was considered a complete success. Comparative costs, as we can best estimate are; (for ½A)

1) Disc Planting

a) tractor, operator and labor	$ 200.
b) Vine- minimum 1000 lbs.	2000.
Total	$2200.

2) Hand planting in rows ½A.

a) labor 60hrs.@ $6/hr.	$360.
b) vine 500lbs.	1000.
	$1360.

It is also estimated that we saved 8hrs/wk. for the first 8 weeks of weeding (prior to runner growth) for an additional savings of;

8hrs. x $6.00/hr.x 8 wks. $384.

8. New ideas; Future monitoring of mulched sections to observe whether or not sections of heavy upright growth will in fact throw large numbers of laterals. Sanding of mulched sections to incorporate organic matter into soil layer while increasing sunlight reflectivity.

9. For reasons stated in Parts 5,6 and 7, we will discontinue row mulching and useof liquid seaweed. However, we will continue to row plant, in fact, we will experiment with using less vine in future plantings. We may also use the same amount of vine/acre and close the row space to 12-15 inches rather than the 18" we used this year.

10) Other producer will have full access to this report. In short, we will tell them that mulching and liquid seaweed was of little value, but the row planting showed real promise, and we will continue to use it.

11) At the time of this mailing, copies are being sent to Dave Yarborough, John Harker, Anne Averill, Maine Cranberry Growers Association and the Mass. Cranberry Experiment Station. I may be asked to do a presentation at a future MCGA meeting.