

Report on use of a test plot at the Farm Institute, Katama, Edgartown, Ma.

My plan for this plot of flat sandy loam was to test for any positive results from the application of locally-available stone materials. I planned to use a couple of legume crops and potatoes, un-irrigated, for the test and to measure the results by testing plant sap in the refractometer scaled for brix.

The materials applied were crushed native stone and crushed stone imported from Acushnet ("blue" stone, granite and/or basalt source rock); both bought at Goodale's yard. I applied these by shovel in roughly 2-foot wide bands creating rows about 6 feet apart and several hundred feet long. (approx. 1 ½ tons of rock material was applied per row) A third row was planted without stone amendment as a control.

The potatoes were planted in mid-april, all three rows recieved a modest application of dehydrated chicken manure to provide adequate growth for the young plants, as potato is a heavy N-feeder. Several brix tests of growing foliage during the season and a tuber-test done upon harvest in late july indicated that the blue stone dust from Acushnet resulted in significantly better levels and range of minerals in fresh foliage as compared to the other two rows; tuber nutrient levels were moderately higher in range in the blue stone dust row and lowest in the control row; overall harvest weight was lowest in the native stone dust row.

The legume test crops were largely a failure due to acid soil conditions greatly inhibited the germination and growth of pisum sativum planted in late april; subsequent rapid weed growth eliminated the crop. A row of fava beans fared much better in germination and early growth in the acid conditions but these were not planted in the three test rows. Later in the season cowpeas (*vigna unguiculata*) was planted and fared very slightly better than pisum sativum but was also untestable.

Conclusion:

In general, this plan was too short in duration with insufficient soil preparation to properly assess the impacts of stone dust amendments. In the potato crop, which was best suited to the acidic condition, the test showed a small positive result for nutrient levels in the tubers for one of the amendments, and higher differences in fresh foliage, indicating that timely cutting and incorporating of green manures would be best for the seasons following introduction of stone dust. I suspect that

low organic matter content of the soil greatly masked the potential effect in this short-term test; stone dust is highly persistent and over time will likely raise the organic matter in a given area, based on the small increase in a 3-month crop when this is multiplied over 5 or 10 years of manure crops the increase could be very large. Eventually, such an increase in SOM will also raise soil ph, increasing the ability to grow the best leguminous manure crops.

The test does seem to indicate that granite and/or basalt based crushed stone should be favored over mixed glacial rock. For soils that have leached to an acidic condition application of limestone along with granite/basalt would be ideal. Sourcing of fine stone dust at an affordable cost and efficient methods of application remain a problem to be solved.

Patrick Brown

DATA

Refractometer measurements of sucrose levels in sweet potato foliage and tubers:

Numbers represent degrees brix on a scale of 1 – 10
(1 being lowest sugar content and 10 being the highest)

Date, Time and Weather Conditions:

June 2, 2012 3:30 p.m.
heavy overcast, light rain.

Plant parts:

foliage

tubers

row 1 pond fines	8.5 / 9 (hazy)	n/a
row 2 control	8.5 (hazy)	n/a
row 3 bluestone	10 (very hazy)	n/a

Date, Time and Weather Conditions:

June 22, 2012 9 a.m.
hot, sunny and clear

Plant Part:	foliage	tuber
row 1 pond fines	12 hazy	7 hazy
row 2 control	fail	7.5 very hazy
row 3 bluestone	fail	8.5 very hazy

Date, Time and Weather Conditions:

July 13, 2012 8:30 a.m.
warm and overcast

Plant parts:	foliage	tubers
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row 1 pond fines	n/a	8.5 slightly hazy
row 2 control	n/a	8 clear
row 3 bluestone	n/a	6.5 – 7 hazy