

What we've learned about soils for berry crops

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During the summer of 2012, many growers from throughout the state participated in a SARE project related to soil health. One goal of the project was to perform soil health tests at a large number of farms and determine what approaches individual growers could use to improve soil health at their particular site. Soil health tests consider not just the chemical aspects of soil, but their physical and biological properties as well. These results from across the state allowed us to make some generalizations about the issues to which a typical berry grower should pay attention.

Chemical: The easiest chemical component to measure is soil pH. Test kits are widely available, and the cost to determine soil pH is minimal. Yet, a surprising number of growers have a pH that is outside the optimal range for their crop. Only 10% of the soils tested had a pH that would be considered optimal – the rest were usually below the range considered to be ideal (or too high in the case of blueberries). This impacts the ability of plants to take up other nutrients, so the impacts of a pH that is not optimal can be significant.

Phosphorus, calcium and magnesium were almost always adequate for good plant growth. Growers may be reluctant to add lime to increase soil pH in soils that are already sufficiently high in calcium and magnesium, but it is still important to do so if the pH is below optimum. Potassium is frequently low in soils, but this almost always is associated with sandier soils and with raspberries in particular. Of course, raspberries tend to be planted in well-drained, sandy soils, so they may be predisposed to potassium deficiencies. Growers on these lighter soils need to pay more attention to potassium levels. Micronutrients, including boron, were reasonably good except for iron in blueberry plantings – and again this was because the pH was outside the optimal range.

Physical: In general, sandier soils had a lower water-holding capacity, but better aggregate stability and less surface hardness – both of which favor root growth and water infiltration. However, these sandier soils also lacked organic matter, and if this were to be increased, would improve water-holding capacity.

Biological: Nearly all soils lacked sufficient active carbon and mineralizable nitrogen. Berry soils, on average, were in the bottom 20% of all soils tested in NY State. This suggests that berry soils have fewer microorganisms growing in them than other sorts of crops, and there could be room for improvement in this characteristic. Root health ratings tended to be fairly good, however.

The biggest surprise from this survey was that organic matter and active carbon were typically very low – particularly given that strawberries and blueberries are usually mulched. This type of

mulch may not provide a sufficient source of the right kind of organic matter that results in active carbon (the form of carbon that is readily used by microorganisms).

To summarize the findings, growers in general need to:

- 1) Pay closer attention to soil pH and adjust when needed
- 2) Monitor potassium levels, especially on sandier soils and where raspberries are grown.
- 3) Increase organic matter content when possible with sources that are high in active carbon

Paying closer attention to these three factors and making appropriate adjustments should result in improved berry production over the long term.