

PURPOSE:

Evaluate the return on investment for using Suståne's standard and enriched compost teas for organic vegetable production.

METHODS:

Summer squash was transplanted into covered raised beds in May, 2018. Soil quality was very good, as the field had been well managed according to NOP standards for more than five years. Legume-containing cover crops and Suståne granules delivering approximately 100 lbs. of N per acre were plowed under prior to bed formation and transplanting.

To test crop responses to fertigation, a replicated block design was used with 3 treatments and 3 replicates of each. Fertigation was applied five times between June 15 and July 30. Suståne's standard Compost Tea (CT) and Enriched Compost Tea (ECT) were prepared according to our standard recipe in 50-gallon barrels using local well water and injected through the drip lines. Each fertigation was done in parallel with simple irrigation and followed with at least two volumes of well water to keep the drip lines clean. All plots received equal amounts of water, which was applied on an as need basis during the summer months.

To determine the quality of the brewed compost teas, samples of CT and ECT along with the Untreated Check (UTC) water used to brew them were collected and analyzed by a commercial testing lab.

Summer squash was harvested eighteen times from July 12 through Aug 4. Fruits were harvested from 100-ft-row of each plot on a daily basis and weighed. Fresh weight yields of marketable squash were then calculated on a per plot and per treatment basis. Calculations of gross farm receipts, net added value, and return on investment assumed a wholesale price of \$1.00 per lb.



Figure 1: Compost teas brewed at Mile Creek Farms during mid-summer. Five pounds of Suståne 4-6-4 granular was placed in organic cotton bags and steeped in 50-gallon barrels of well water, and mixed with pumped air for 24-48 hrs. prior to enrichment with Hi-N 12-0-1 and injected into field drip lines.

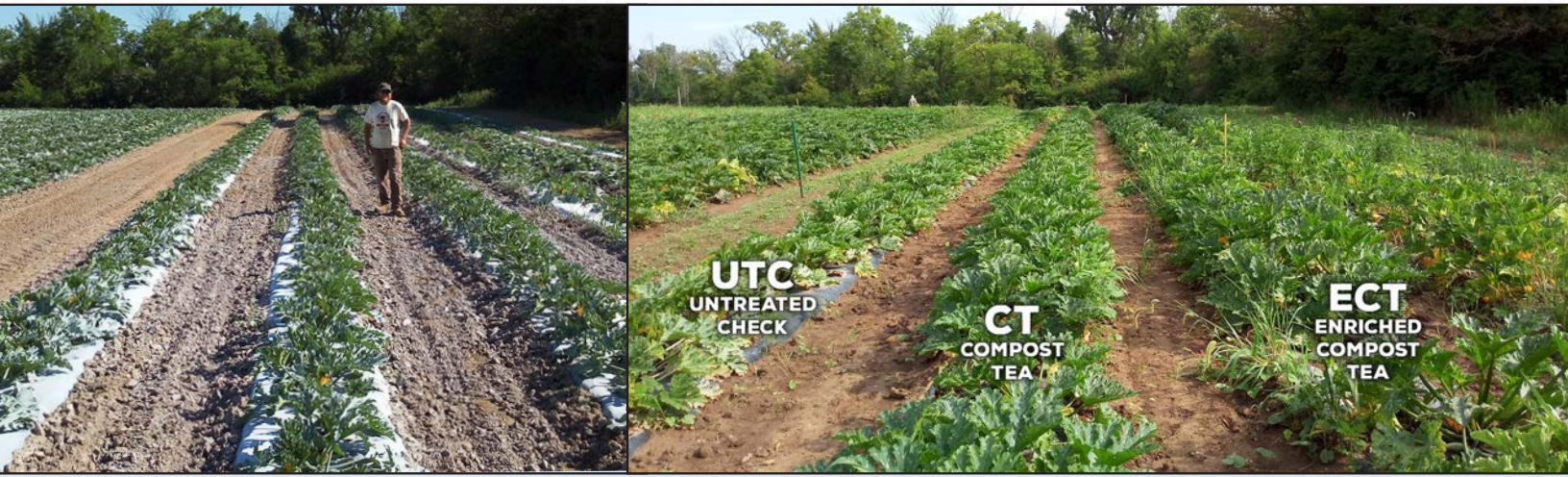


Figure 2: Visible differences in plant canopy and color due to fertigation with Suståne compost tea (CT) and Hi-N-Enriched (ECT) Compost Tea after two applications (left panel) and 5 applications (right panel).

RESULTS:

Analyses revealed the expected differences in the composition of the standard and Hi-N-enriched compost teas (Table 1). Here, the standard compost tea (CT) produced with Sustāne 4-6-4 released approximately 20% of the N, 10% of the P, and 90% of the K present in the granules, as well as roughly 30% of the S and 5% of the micronutrients were released. Addition of the Hi-N 12-0-1 during the final hour or two of brewing to create the enriched compost tea (ECT) added the expect amount of soluble N, K₂O and S. However, the addition of Hi-N also lowered the pH and increased the proportion of available micronutrients (P<0.10) in ECT as compared to the CT, making for a superior fertigation material.

| TREATMENT | pH | EC | N | P ₂ O ₅ | K ₂ O | Ca | Mg | S | MICRO |
|-----------|-----|-----|------|-------------------------------|------------------|----|----|-----|-------|
| UTC | 7.8 | 0.7 | 0 | 0 | 3 | 75 | 46 | 21 | 0 |
| CT | 7.6 | 2.2 | 96 | 56 | 471 | 83 | 58 | 124 | 4 |
| ECT | 7.1 | 5.6 | 1093 | 275 | 777 | 78 | 67 | 176 | 6 |

Table 1: Nutrient characterization of compost tea. This analysis compares Sustāne compost tea (CT) or Hi-N-enriched compost tea (ECT) to untreated check (UTC) water used for brewing and irrigation in this trial. Nutrient values are listed in PPM. With the exception of Ca and Mg, all test values differ by treatment in each column (P<0.10).

Yield assessments revealed significant yield and profitability increases were provided by Sustāne compost teas. Both fertigation materials increased the number and weight of harvested fruit, and this led to greater net returns for both treatments than seen for irrigation alone (UTC). The standard compost tea (CT) provided 4.7% more, and the Hi-N-enriched compost tea (ECT) provided 13.4% more marketable yield than irrigation alone. This led to a significant increase in net returns per A for the grower. Overall return on investment (ROI) for compost tea applications were well over 3:1, even for the more expensive ECT option.

| TMT | HARVESTED LBS./PLOT/DAY | YIELD LBS./A | NET RETURN \$/A | ROI |
|-----|-------------------------|--------------|-----------------|-----|
| UTC | 9.4 | 12608 B | - | - |
| CT | 10.2 | 13197 AB | \$589 | 7.6 |
| ECT | 10.8 | 14309 A | \$1,701 | 3.4 |

Table 2: Effect of compost tea treatments on organic summer squash. Values represent responses to 5 applications of Sustāne compost tea (CT) or Hi-N-enriched compost tea (ECT) as compared to the untreated check (UTC). Values in the same column followed by different letters differ significantly (P<0.2).

FOR MORE INFORMATION ON THIS PROJECT,
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