Organic Growing Substrates and Fertilizers

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Objectives

• Test tomato plant growth and nutrient release using two organic granular fertilizers as a pilot study for evaluating organic substrate and fertilizer strategies.

Tomato organic production

High early stage pH

- Sustane 8-4-4 at 15 lbs/yd³ (top), Verdanta 7-5-10 at 17 lbs/yd³ (bottom) at Day 10.

Organically grown tomato seedlings (Big Beef F1, 4-week age with 2 true leaves) were transplanted into 6 inch standard pots filled with a commercial organic grade peat-based growing substrate (initial pH 6.4 and EC 3.1 mS/cm). pH and EC were tested with a saturated paste extract at day 0 and pour-through at weeks 2 and 3. Additional organic fertilizer was incorporated into the mix at 0, 0.6 and 1.2 lbs N/yd³ before transplanting. Top-watered with zero leaching.

Sustane 8-4-4 (lbs/yd³)

0 7.5 15

Verdanta EcoVita 7-5-10 (lbs/yd³)

0 8.5 17

Day 21

Challenges

1. All the organic nitrogen applied is not readily available. A mix of pre-plant granular, and subsequent liquid fertilizer is needed for long-term crops.
2. Organic fertilizer has high cost.
3. High pH and high salts, including phosphorus (P), sodium (Na) and chloride (Cl). Lime rates need to be reduced when using organic fertilizers. pH tends to rise then may fall depending on nitrogen cycle.
4. Imbalanced N-P₂O₅-K₂O in organic fertilizers, may cause problems for long-term crops, such as tomato.
5. Monitoring of pH, EC, and specific nutrients is needed for consistent results.
6. Organic fertilizers attract fungus gnats, so include bio-control.

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