Strawberry Nitrogen Fertilization from Organic Nutrient Sources

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USA
<table>
<thead>
<tr>
<th><strong>Background and overview</strong></th>
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<td><strong>• Organic or “ecological” production of strawberries is increasing rapidly in the US</strong></td>
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<td><strong>• Prices for organic strawberries are typically 15-25% higher than for conventional berries</strong></td>
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<td><strong>• Prices are also more stable - low prices do not reach as low as conventionally grown fruit</strong></td>
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<td><strong>• Little research-based information available to guide organic growers</strong></td>
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CA Strawberry Acreage

Source: K.Klonsky – CDFA registration
CA Organic Strawberry Acreage

Source: K. Klonsky – CDFA registration
CA Organic Strawberry Sales

Source: K. Klonsky – CDFA registration
Nitrogen and organic strawberry production

- Transplanted strawberries in California usually grown as an annual crop planted October - November and harvested January > July - critical N needs in first 2-6 months
- Timing of N availability is critical for strawberry yield and fruit quality
- Asynchrony of N availability has been documented for organic N systems.
- Organic N management is inefficient and costly.
N availability affects number and size of crown shoots.
Nitrogen in organic systems

- **Multiple studies over many years in diverse cropping environments have shown that preplant applied compost or incorporated green manure do not release appreciable N beyond 6-8 weeks**

- **Synchrony of N supply to strawberries during early development is critical to competitive yields and fruit size.**

- **Periodic N fertilization – liquid N injection – critical to organic production**
Pre-plant organic material mineralization

Rate of N Mineralization and Nitrogen Uptake

Compost incorporation
- Prepare beds. apply plastic,
- drip tape
- Arrival of plants from nursery

Week

Time
Pre-plant organic material mineralization

Prep: Prepare beds. Apply plastic, drip tape. Arrival of plants from nursery.

Compost incorporation

Rate of N mineralization and nitrogen uptake

Southern Districts

Crop N demand

Northern Districts

Time

Week
Liquid fertilizers are valuable and necessary tools but they have special challenges for efficient management:

- If material not finely ground N is lost behind filter or drip emitter.
- Continuous mixing required
- Mineralization characteristics are important
When does N come available?
Pre-plant organic material mineralization

Southern Districts

Crop N demand

Northern Districts

Will need periodic (weekly?) organic N injection
Organic fertilizer problem areas

- lack uniformity
- bulky,
- unstable,
- inconsistency → hidden management costs
- higher cost and variability for research
Certified Organic Fertilizers
Field trials evaluate efficacy of alternative fertilizer materials
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