Weed and Nutrient Management in Organic Blueberries

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Nutrient management:
- MSU campus planting
- Farm trials

Weed management:
- Organic herbicides
- Mulches (campus planting)
Fertility Treatments

1. Conventional:
   \((\text{NH}_4)\text{_2SO}_4 + \text{KCl}\), half in April, half in May
   2008: 24 lb N and 22 lb K2O per acre
   2009: 48 lb N and 22 lb K2O per acre

2. Organic:
   McGeary’s organic (8:1:1) applied in April.
   2008: 40 lb N per acre (supplies 24 lb N at 60% mineralization).
   2009: 80 lb N per acre (supplies 48 lb N at 60% mineralization).

3. Compost (custom blended, Morgan Compost):
   2008: 6,000 lb per acre (1.4% N FW, C:N = 11:1)
   supplies **17 lb N** at 20% mineralization
   2009: 12,000 lb per acre (1.7% N FW, C:N = 9:1)
   supplies **40 lb N** at 20% mineralization
Effect of nutrient treatments applied in late April on inorganic N (nitrate + ammonium) in blueberry soils, East Lansing, MI, 2009.
Effect of fertilizers applied in 2008 and 2009 on leaf nutrient levels in 2009.

<table>
<thead>
<tr>
<th></th>
<th>%</th>
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<td>K</td>
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<td>MG</td>
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Deficient
Van Buren County Trials
(treated April 23)

**Trial 1.**
Nature-Safe (13-0-0), 500 lb/acre
Composted bark, (.7-.6-.7), C:N ratio of 42:1, 10,000 lb/acre

**Trial 2.**
Nature-Safe 13-0-0, 1,000 lb/acre
Composted bark, (.7-.6-.7), C:N ratio of 42:1, 10,000 lb/acre
Effect of organic fertilizer and compost applied April 23 on soil inorganic N levels, VanBuren County, 2009
Ottawa County Trial

Mature Duke bushes treated Apr 30

1. No fertilizer
2. Nature-Safe 13-0-0, 440 lb per acre + Nature-Safe 8-5-5, 440 lb per acre
3. Nature-Safe 13-0-0, 880 lb per acre + Nature-Safe 8-5-5, 880 lb per acre
Nutrition
Preliminary Conclusions and Thoughts

1. Organic sources provide a gradual release of N that seems to coincide with blueberry demand.
2. Apply materials earlier in the spring so that N becomes available when plant demand begins.
3. Compost with high C:N ratios may need to be supplemented in order to supply adequate N.
4. Rely on leaf analysis to determine if your program is meeting plant needs.
Organic Herbicides

- **Blackberry & Brush Block** (Greenergy Inc.): Citric Acid - 20%
- **Distilled White Vinegar Concentrate** (National Vinegar Company): Acetic acid – 5%
- **Matratec AG** (Claw El Specialty Products, Division of Brandt Consolidated, Inc): Clove oil - 50%, and others (wintergreen oil, butyl lactate, lecithin) - 50%
- **Weed Zap** (JH Biotech, Inc.): Clove and cinnamon oil - 90%
- **Nature’s Avenger** (Cutting Edge Formulations, Inc): d-limonene 70%

  **Worry Free Weed and Grass Killer Concentrate** (Lilly Miller Brands): d-limonene 70%

- **Scythe** (Dow AgroSciences) ***not approved for organic use***
  pelargonic acid – 57%, related fatty acids - 3%
Control

Matratec AG (8%)

Scythe (10%)

Nature’s Avenger (30%)
Vinegar
General Comments – Organic Herbicides

- Relative efficacy at recommended rates:
  Scythe > vinegar = Nature’s Avenger = Weed Zap = Matratec > Blackberry/Brush Block

- Limitations:
  Expense: ($100 - $2,000 per treated acre)
  Burn-down activity; no residual effects
No mulch
White perforated plastic
Black woven weed barrier
Burlap (recycled coffee sacks)

Spoiled hay  Wheat straw  Wood/bark chips  Bark nuggets  Wood chips
Organic mulches may encourage rodents
<table>
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<th>Mulch type</th>
<th>Weeding time (hr/acre)</th>
<th>Labor cost ($/acre)</th>
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<td>Perforated plastic mulch – white</td>
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Row-middle Cover Crops  
(Dale Mutch and Todd Martin)

1. Annual cereal rye:  
   - seeded Sept 2007 at 3 bu per acre  
   - crimped in June 2008  
   - tilled and re-seeded Sept 2008

2. Annual crimson clover  
   - seeded Sept 2007 at 15 lb per acre  
   - tilled in Sept, 2008

3. Perennial alsike clover  
   - seeded Sept 2007 at 6 lb per acre  
   - re-seeded two plots in April 2008
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Crimping rye
Crimping rye
Weed suppression from crimped rye

June 6 crimped  Aug 19
Questions or Suggestions?