Strawberry Production in Soilless Substrate Troughs - An Alternative to Soil Fumigation

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Strawberry soil fumigation facts:

- About 96% of strawberry fields in California are fumigated with either methyl bromide or alternative fumigants.
- Approximately 70% of all fumigants used in California are on strawberries.
- Strawberry has been grown in Europe using peat moss, coconut coir, perlite, or a mixture of these substrates in different types of containers or troughs.
Why using substrate in troughs?
• Disease avoidance

Project initiated Aug 2008 in
• Santa Maria
• Watsonville (Mont. Bay Academy)

Objective:
Overall feasibility & system performance
Substrates

1. Field soil
2. 60% Peat : 40% Perlite
3. 67% Peat : 33% Rice hulls
4. 67% Coir : 33% Rice hulls
5. 100% Coir
6. 100% Peat
Santa Maria Trial

• Planted Nov 2, 2008
  – 2 rows per trough
  – 4 rows per bed

• Cultivars
  – Albion
  – Camino Real,
  – Ventana
    • Replaced in June with Portola
Hemispherical Troughs (10-inch dia.)

Raised beds are typical of district, four-row, 64” spacing, 40” bed-top, 18” height
Each substrate-mulch combination is represented by a single 390-ft raised bed
Mulch was applied over troughs
Mar Vista Farm, Santa Maria, CA
April 16, 2009
Watsonville Trial

• Planted Nov 14, 2008
  – 1 row per trough
  – 2 rows per bed

• Cultivars
  – *Albion*
  – *Monterey*
  – *Portola*
  – *San Andreas*
Watsonville “W” Design
Completed Troughs Formed in Beds

Raised beds are typical of district, two-row, 52” spacing, 30” bed-top, 15” height

Trough is 16” wide at top, tapering to 12” at bottom; Each leg of “W” is 6” deep
Laying Landscape Fabric into Troughs
Adding Substrate to Troughs
Planting Through Mulch
IR Canopy Cover Measurement

Monterey Bay Academy Farm, Watsonville, CA
April 8, 2009
Santa Maria RaBet Study
(Albion, 100 ETc)

Canopy cover (%)

Field soil
Peat:Perlite
Peat:Rice hulls
Coir:Rice hulls
Coir

Time
MBA 2009

- **Irrigation**
- **ETo**

Cumulative Irrigation (mm)

Date

USDA-ARS ~ Water Management Research
San Joaquin Valley Agricultural Sciences Center ~ Parlier, California, USA
Santa Maria Trial – Irrigation

USDA-ARS
Water Management Lab
Parlier, CA

Wireless Modem
Santa Maria Trial – Yield

Santa Maria, 2009

**Substrate Medium**
- Coir
- Coir-Rice hulls
- Field Soil
- Peat-Perlite
- Peat-Rice hulls

**Marketable Yield (kg/ha)**
- 100%ET
- 150%ET
- 200%ET
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