Update on CTAHR Research Investigating the Use of Vermicompost in Aquaponic Vegetable Production

College of Tropical Agriculture and Human Resources

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Introduction

- About me
  - CTAHR Aquaculture/Aquaponics Extension Program
- Talk
  - Background
  - CTAHR research

Commercial Aquaponic Micronutrient Supplements

- Traditional dogma
  - Nitrification (pH 7.0-9.0)
  - Micronutrient solubility (pH 5.5-6.5)
- Rakocy: pH (~7.4) and micronutrient
  - KOH
  - $Ca(OH)_2$
  - Fe-chelate (EDTA)

Locally Produced Micronutrients: Vermicompost

- Composting with earthworms
- Utilizes organic “waste”, renewable
- Nutrient rich, increases crop yield
- pH buffering
- Can be made into “tea”

Aqueous Vermicompost Extracts (Compost Tea)

- High levels of soluble mineral and biological nutrients
- Suppresses plant disease
- Experiment: investigate use of compost tea to supplement micronutrient and pH buffering requirements in aquaponic system

Experimental Design: CompostTea

- Tea dose-response
  - Hybrid systems (ebb/flow and raft)
  - N=3 treatments (doses), and n=3 systems per treatment
- Pak choi and tilapia:
  - 8 plants: 1 kg/m^3 fish
- Tea added weekly
  - 4 weeks

Results: Compost Tea

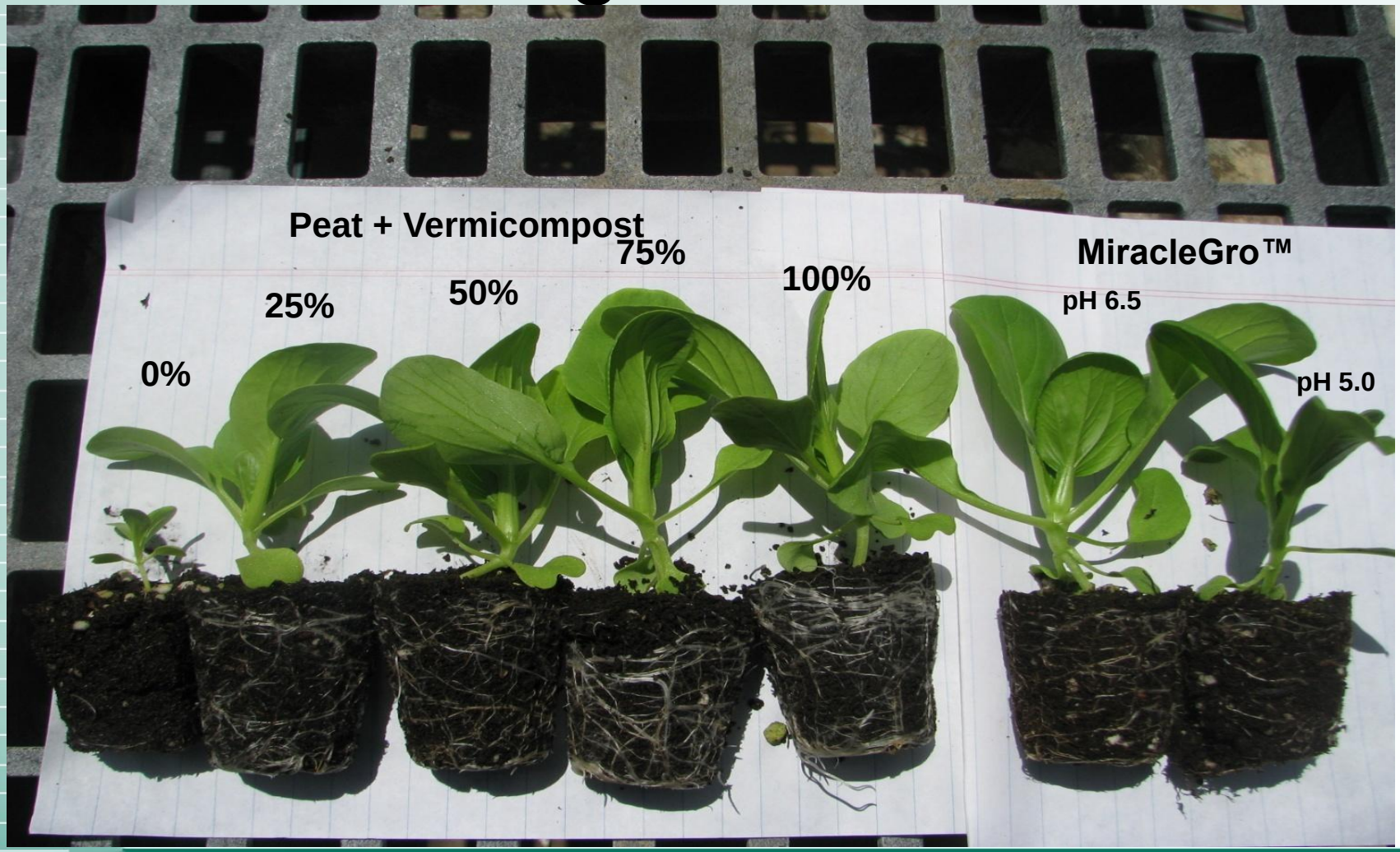
- Leaf number and area
- Fresh and dry weight
- Carotenoids
- Phenolics
- Antioxidant capacity
- pH
- Mineral nutrients (plant and water)

NO EFFECT

No Tea (control)

Static Hydroponic (+ control)

Vermicompost and Seedling Production



Application to Aquaponics

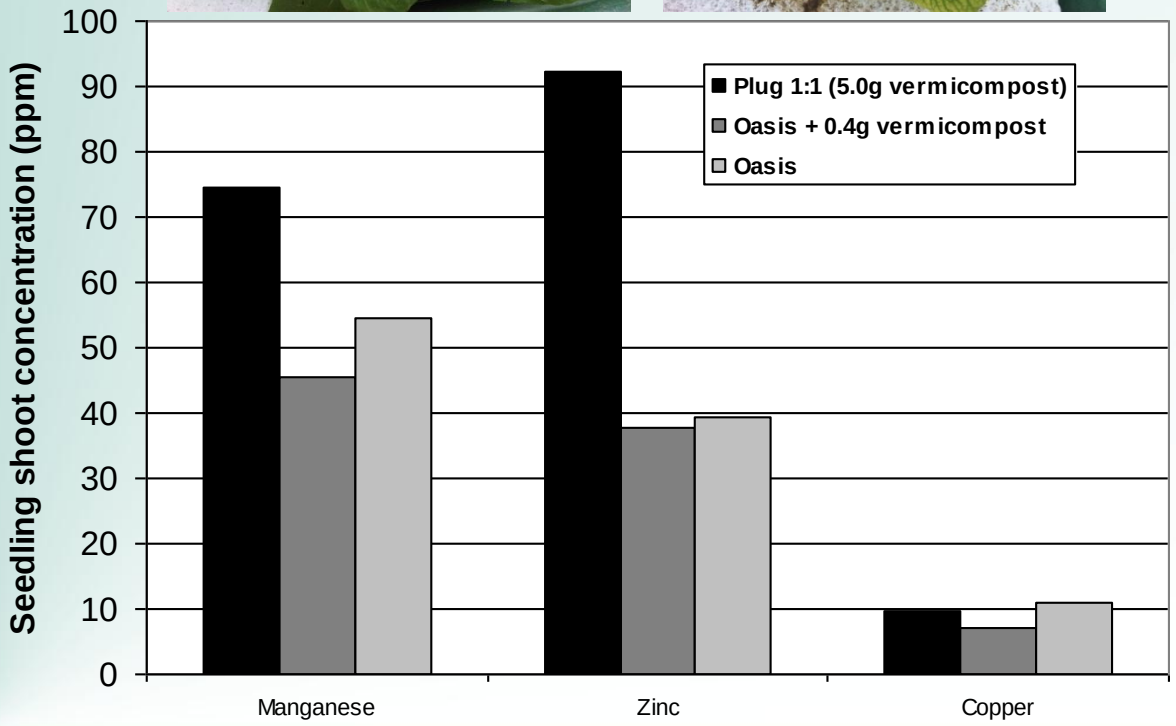
- **Specific nutrient deficiencies in aquaponics.**
- **These were not adjusted with compost tea.**
- **SOP for hydroponic seedlings is to start in oasis with no ferts.**
- **Can yields be improved by inclusion of vermicompost in media?**
- **Three treatments:**
  1-Oasis
  2-Oasis + 0.40g
  3-Plug + 5.0g
  (1:1 peat:vermicompost)

Oasis only

Oasis + Vermi

Vermi + Plug

Are we priming seedlings and avoiding deficiencies?



Impact: ongoing observations on-farm

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