

Longcane Production: Fertility Management

NARBA 2023



Soil to Substrate

- Traditional soil production is a buffered system that allows for mistakes
- Slow to change, whether good or bad
- Substrate production is more controlled and carries more risk
- Rapid changes in conditions
- Attention to detail is critical



Soil System

- Must start with correct pH, but impact in season is minimal with good fertility program (nitrate nitrogen)
- High volume and low frequency irrigation/fertigation system
- Typically 150-30-200# NPK with 30# S and 40-50# Ca
- Potassium nitrate / calcium nitrate / UAN style blends (5-1-7 2% Ca)
- Sulfur supplied as supplement ATS/KTS
- Seeing more automation and controlled PPM focused fert



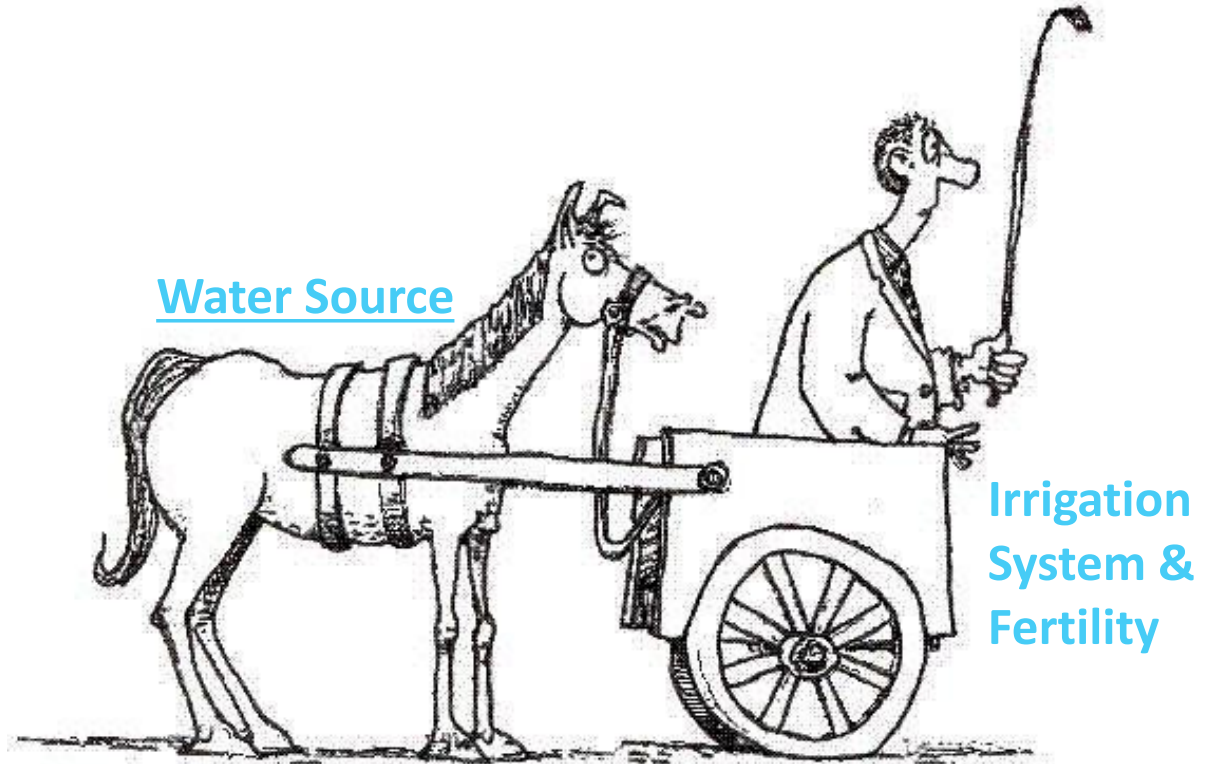
Substrate System

- Rapid pH manipulation possible through water treatment and fertilizer selection
- Low volume and high frequency system, typically 2-3 minute run times 20-30 times daily
- Fert is driven by PPM targets by crop stage, which are delivered in every irrigation cycle
- Potassium nitrate/calcium nitrate/potassium sulfate and sulfate based minors
- Calcium and sulfur delivered together, if water quality allows



Water Quality

- Knowing the quality and consistency of your water source is critical
- Well/municipal/surface
- Surface water is variable and typically low pH and higher EC
- pH management is very important (**5.5 target in drip**)
- Potassium Bicarbonate to increase pH & acids to decrease
- Iron often an issue (>0.5ppm)



Nuts and Bolts

- Substrate irrigation systems are low volume and high frequency
- Longcane typically will have 14-20 run times per day @ 2-3 minutes per
- Constant pressure system needed for fert uniformity
- Run times are based on % moisture in substrate and drainage
- Typically 50% moisture and 15-20% drainage



Injection Systems

- Two stage injection system
- Calcium and Sulfur based to eliminate solids and uptake issues
- Fertilizer is diluted and/or rate is controlled by injection ratio (1:300 ex)
- Longcane systems can be running in Winter months, fert needs to stay above 50 F



Fertilizer Sources

- Water soluble blends are best option
- Liquid fertilizers are an option, with less customization but reduced labor
- Many options to find the same end goal, as long as product form/ratios are correct
- Nutrient form matters! Can have large impact on pH (especially nitrogen)



LIBERTY ACRES™
FERTILIZER

5-12-24 BERRY
TANK B MIX
WATER SOLUBLE FERTILIZER

NOTICE: This product is designed to be used in conjunction with **14-0-0 Tank A Mix** in order to provide a complete nutritional program. If making a concentrated stock solution, these products should remain separate and not be combined.

GUARANTEED ANALYSIS

Total Nitrogen (N).....	5.00%
5.00% Nitrate Nitrogen	
Available Phosphate (P ₂ O ₅).....	12.00%
Soluble Potash (K ₂ O).....	24.00%
Magnesium (Mg).....	5.000%
Magnesium (MgO).....	7.300%
Sulfur (S) (Combined).....	5.000%
Boron (B).....	0.020%
Copper (Cu).....	0.020%
Manganese (Mn).....	0.120%
0.12% Chelated Manganese	
Molybdenum (Mo).....	0.005%
Zinc (Zn).....	0.060%

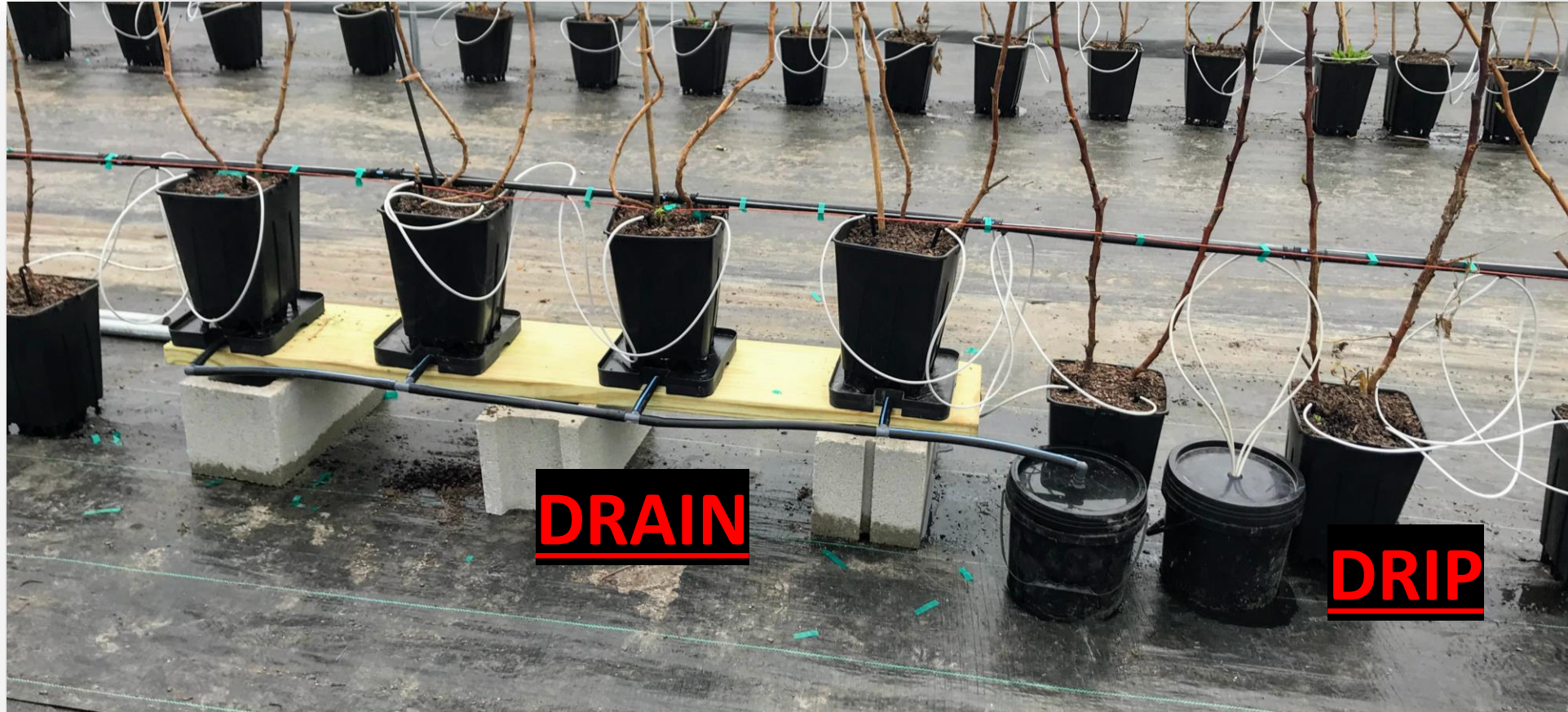
Derived from: Potassium Nitrate, Magnesium Nitrate, Monopotassium Phosphate, Sodium Borate, Copper Sulfate, Magnesium Sulfate, Manganese EDTA, Sodium Molybdate, and Zinc Sulfate. Chelating agent is Ethylenediaminetetraacetic Acid (EDTA).

Example Program – Longcane Bramble

	NO ₃ - N	NH ₄ - N	P	K	Mg	Ca	S	Fe	Mn	Zn	B	Cu	Mo
Vegetative Targets	150-175	10-25	20-50	120-150	30-50	130-160	20-50	1-3	0.5-1.5	0.25-1	0.1-0.3	0.1-0.2	0.05
Fruiting Targets	130-140	5-10	20-50	200-250	30-50	100-120	20-50	1-3	0.5-1.5	0.25-1	0.1-0.3	0.1-0.2	0.05

pH	EC (mS)	Combined EC Max (mS)
5.5	1.6	3.5
5.5	1.3	3

Fert Program Management



SYSTEM MANAGEMENT – CRITICAL CONCEPT

MOISTURE 50%	pH	EC (mS)	Combined EC Max (mS)
Vegetative Targets	5.5	1.6	3.5
Fruiting Targets	5.5	1.3	3

EC too high, will
get tip burn and
root damage, too
much salt

- Combined EC is Drip EC + Drain EC
- Push and pull relationship
- Drip target is 1.6, so if drain EC approaches 1.6 (combined 3.2) begin decreasing drip (TOO MUCH FERT)
- If drip isn't decreased, combined will exceed 3.5 and damage will happen

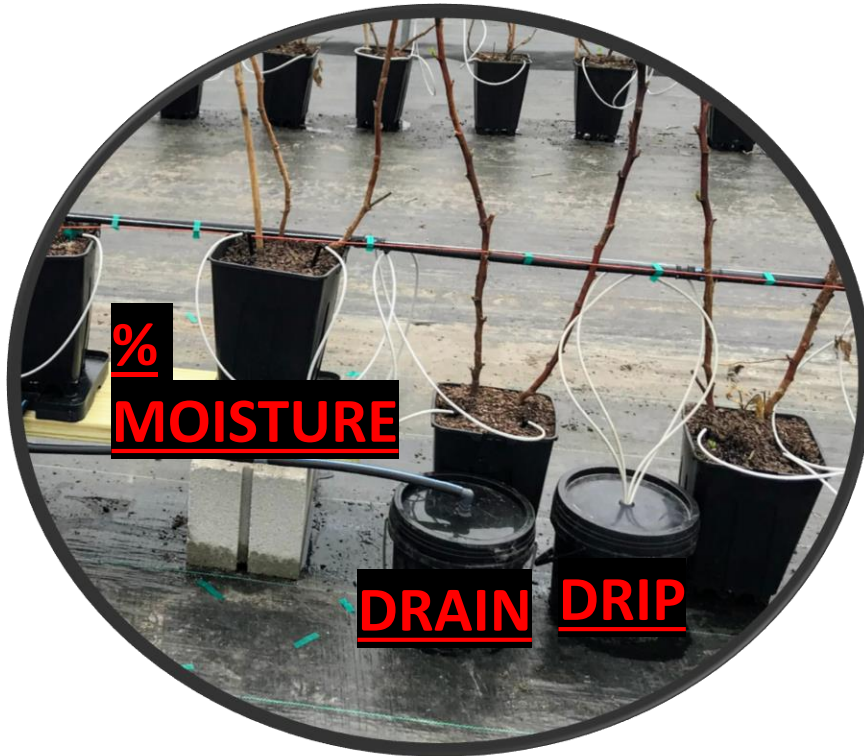
PROBLEMATIC SCENARIOS

- System is running to maintain 50% moisture in media and 1.6 EC in the drip
- Weather conditions consistent in temperature and sunshine
 - **plants growing well**
- 2-4 day weather event of cooler and overcast conditions
 - **Plants SLOW DOWN**
 - **When plants slow down, take up less water and nutrients**
 - **System stays on same run times and EC, so moisture too high and too much salt**
- Tip burn happens and salts get too high, have to flush the system with clean water and then dry back down to ideal moisture
- Rollercoaster scenario causes stress, yield loss and poor fruit quality
- **MUST COMPENSATE FOR WEATHER CONDITIONS AND PLANT GROWTH**

PROBLEMATIC SCENARIOS

- System is running to maintain 50% moisture in media and 1.6 EC in the drip
- Weather conditions consistent in temperature and sunshine
 - **plants growing well**
- 2-4 day weather event of very high temperatures
 - **Plants SPEED UP**
 - **When plants speed up, take up more water and nutrients**
 - **System stays on same run times and EC, so moisture too low**
- Moisture too low results in stress/wilting and a stressed plant stops taking up fertilizer, salts begin to accumulate
- Rollercoaster scenario causes stress, yield loss and poor fruit quality
- **MUST COMPENSATE FOR WEATHER CONDITIONS AND PLANT GROWTH**

MONITORING SYSTEM - SENSOR TECHNOLOGY



**THANK
YOU FOR
YOUR
TIME!**

