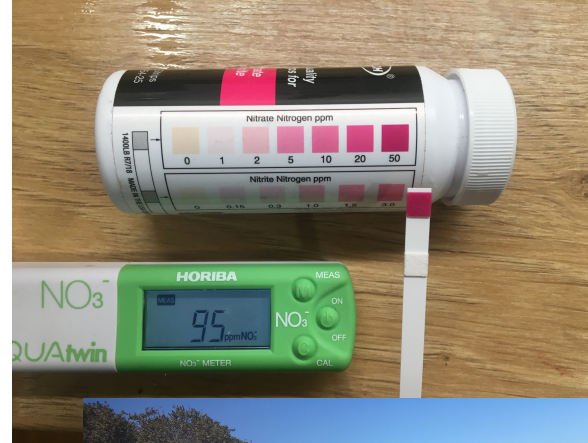


Fertigation with organic fertilizer

Gerry Spinelli, Production Horticulture Advisor



UCCE Organic Agriculture
Workshop 12/8/2022

Injector types

2. Venturi type "Mazzei"

1. Gasoline powered pump

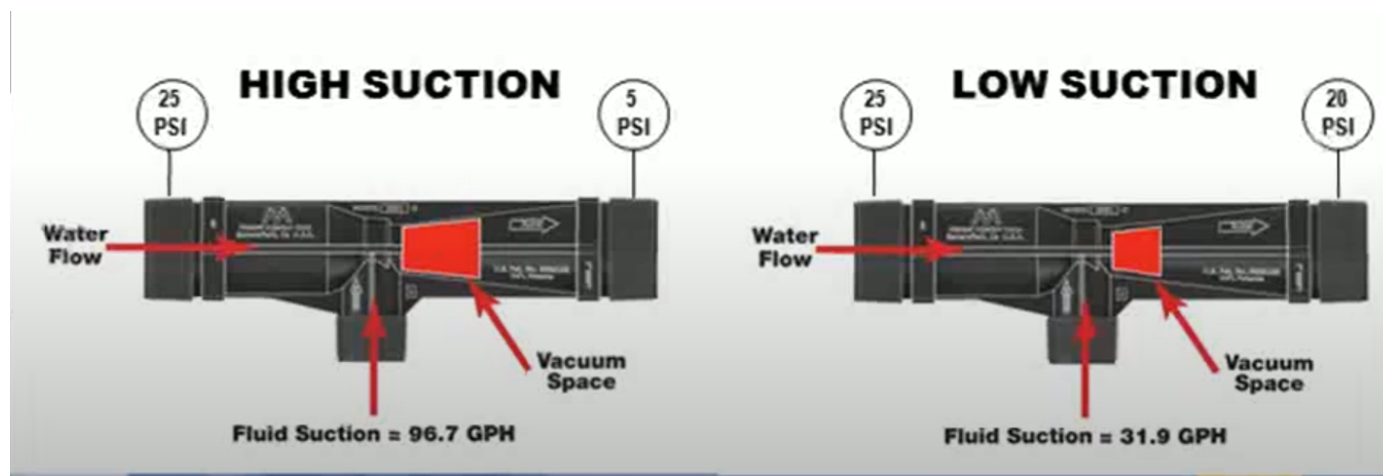


3. Positive displacement pump or proportioner

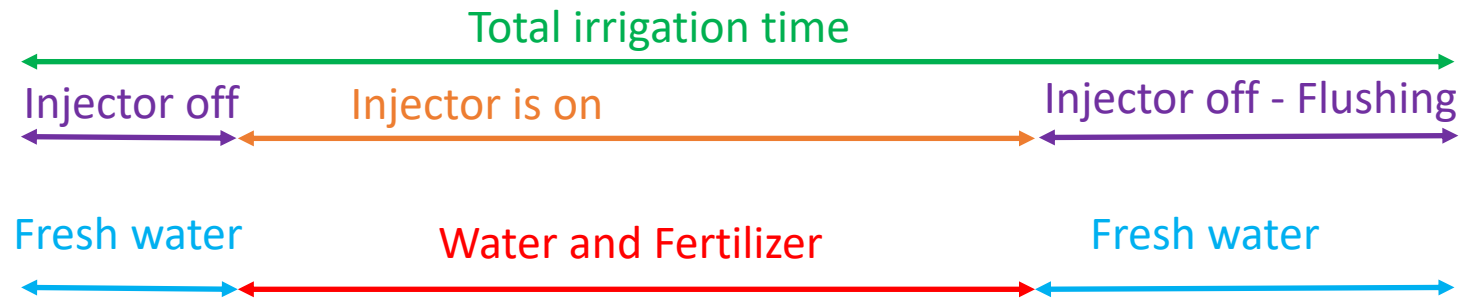


Operating Pressure PSIG		WATER SUCTION		Operating Pressure PSIG		WATER SUCTION	
Injector INLET	Injector OUTLET	Motive Flow GPM	Water Suction GPH	Injector INLET	Injector OUTLET	Motive Flow GPM	Water Suction GPH
5	0	3.6	78.0	60	0	12.3	140
	1		62.5		5		140
	2		42.7		10		140
	3		15.5		15		140
	4				20		138
10	0	5.0	115		30		110
	2		90.7		35		73.3
	5		44.7		40		33.2
	7		19.4		45		
	8						
15	0	6.2	135	70	0	13.3	141
	5		83.1		5		141
	7		58.0		10		140
	10		19.1		15		140
	12				20		140
20	0	7.1	141		30		135
	5		117		40		87.6
	10		57.6		45		44.5
	12		36.1		50		
	15				55		
					0		139

Suction Capacity Performance Table



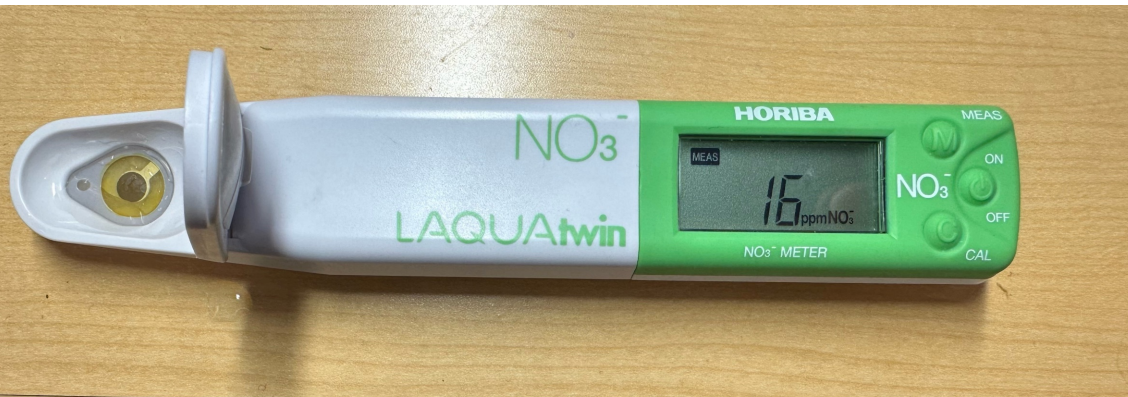
Irrigate with fresh water after injecting fertilizer



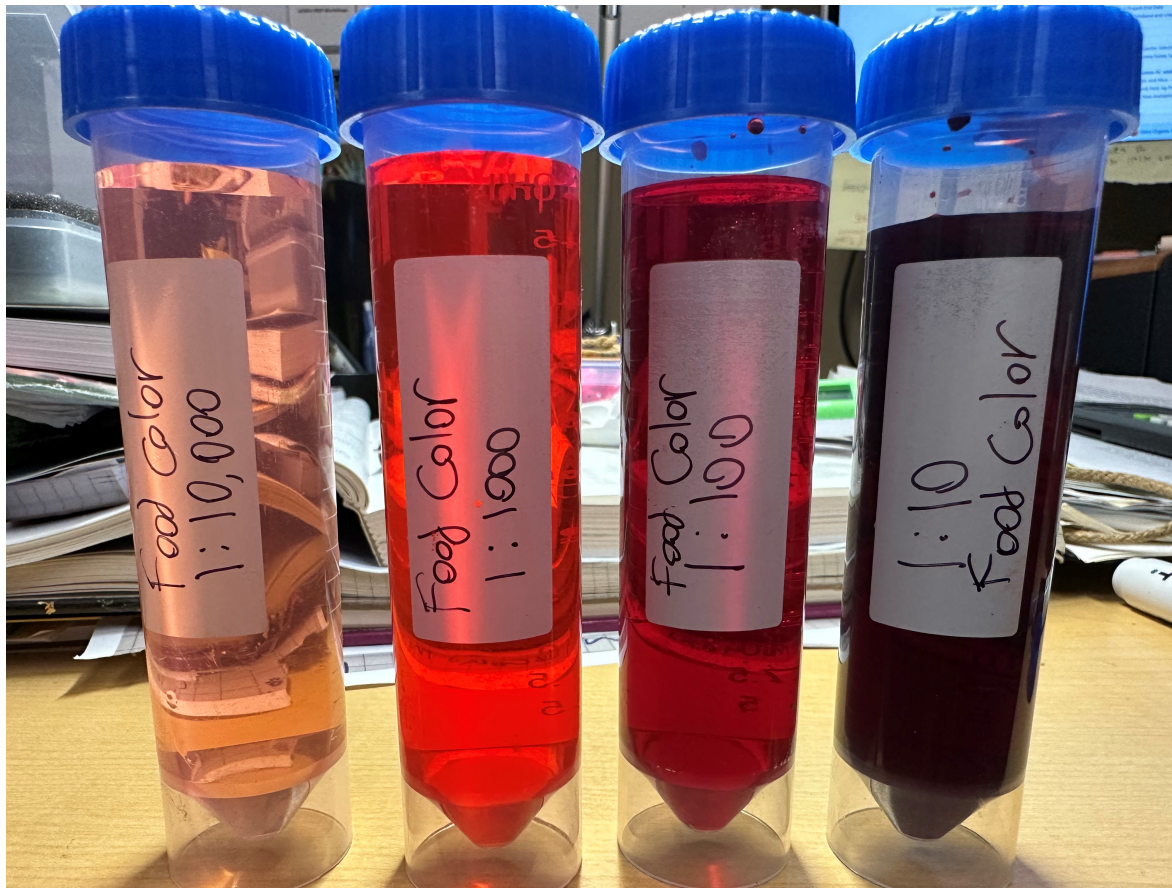
This must be long enough to flush the system

You need to measure how long it takes for water to go from your fertilizer injection point to the end of the furthest dripline

You can measure the Electrical Conductivity of water at the end of the dripline. It will increase substantially when fertilizer gets there. You can also measure nitrate.



Or you can use food color



Flush laterals, tapes and hoses regularly



Vs



Drip hose flushing



Vs







Investigate causes of plugging



Dead Palm



Soy hydrolysate products are more soluble...



EXPLORER 16-0-0

Description of Content:
Product: Plant nutrient for agriculture
Water Solubility: Complete
Color: Tan
Stability: 2 Years
Toxicity: None if used as directed

Guaranteed Analysis:
Total Nitrogen (N): 16%
0.25% Ammoniacal Nitrogen
15.75% Other Water Soluble Nitrogen

Derived From: Soy Protein Hydrolysate

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.htm>

Guaranteed By:
Agroplasma Inc
5865 S. Kyrene Rd., Suite 1
Tempe, AZ 85283
www.ferticellusa.com

Net Contents:
44 lbs. (20 kg)

Explorer™ Plant Protein Nitrogen is vegetable sourced, 100% water soluble product suitable for soil or foliar applications. It will stay in solution in the mixing tank without agitation. Application rates will vary. Consult your PCA or Crop Consultant for application rates and timing.

CAUTION
Keep out of the reach of children. Do not expose to direct sunlight, extreme heat or cold.

Ferticell
Cellular Nutrition

F002314

Due to the fact that soil, weather, and crop conditions may vary, Agroplasma Inc. makes no guarantees or warranties, whether expressed or implied concerning the use of this product. The user of this product takes full responsibility and assumes all risks of usage or handling of this product, whether application instructions were followed or not.

Agroplasma Inc. is a member of the **Ferticell** family.

Agroplasma Inc. is a member of the **Ferticell** family.

BlueGOLD™

14-0-0

GUARANTEED ANALYSIS

F002369

Total Nitrogen (N)	14.00%
13.89%	Water Soluble Nitrogen
0.11%	Water Insoluble Nitrogen

Derived from: Soy Protein Hydrolysate

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.html>.

NITROGEN

PURPOSE:
A Nitrogen source from Soy Protein Hydrolysate for use to address Nitrogen needs in soil and plants.

DIRECTIONS FOR USE:
Agricultural and Horticultural crops: Apply 2-10 pounds per acre when plants are actively growing or as needed based on your nutrient management program determined from soil and plant tissue analysis for your specific crop. This product is a commercial fertilizer and should be used as part of a comprehensive nutrient management program.

STORAGE: Store in the original container in a cool, dry place away from excessive moisture and heat. Reseal container after each use.

CAUTION: May be harmful if swallowed. Avoid contact with eyes, skin, open cuts and sores. KEEP OUT OF REACH OF CHILDREN AND PETS. Wash hands after use. For general clean up use warm soapy water.

NOTICE: Buyer assumes all responsibility for safety and use not in accordance with label directions.

Information regarding the contents and levels of metals in this product is available on the internet at: <https://www.aapfco.org/metals.html>

Guaranteed in the USA by:
EDEN SOLUTIONS LLC
Corporate Offices:
109 East 17th Street, #4564
Cheyenne, WY 82001 U.S.A.
1-877-723-5380
www.EdenBlueGold.com

Net Weight : 50 lbs (22.68 kg)
Expiration Date : 2 yrs from Purchase Date
Lot No.: #A-50

OMRI LISTED For Organic Use

Grower's Secret

NITROGEN FOR ORGANIC PRODUCTION

GROWER'S SECRET NITROGEN 16-0-0

Plant-Based Water Soluble Nitrogen

16-0-0
Guaranteed Analysis

Total Nitrogen (N)	16.0%
15.9% Water Soluble Nitrogen	
0.1% Water Insoluble Nitrogen	

Derived from: Soy protein hydrolysate.

F1840

STORAGE: Store in the original container in a cool, dry place away from excessive moisture and heat. Reseal container after each use.

CAUTION: May be harmful if swallowed. Avoid contact with eyes, skin, open cuts and sores. KEEP OUT OF REACH OF CHILDREN AND PETS. Wash hands after use. For general clean up use warm soapy water.

NOTICE: Buyer assumes all responsibility for safety and use not in accordance with label directions.

Information regarding the contents and levels of metals in this product is available on the internet at: <https://www.aapfco.org/metals.html>

Guaranteed in the USA by:
Grower's Secret, Inc.
2300 Wilbur Lane Building B
Antioch, CA 94509
www.growerssecret.com
Please Recycle

En español

Provides a rich source of nitrogen for nitrogen loving plants. Use to help plants grow quickly, and to improve plant quality and appearance. Suitable for use in commercial agriculture and horticulture.

Grower's Secret Nitrogen 16 (GSN16) is a protein that can be applied by ground or air application to plants, through drench, drip or flood irrigation on soil to prevent or correct nitrogen deficiencies that could limit growth and yields. GSN16 is nontoxic to plants when applied as directed. For best results, apply GSN16 according to recommendations based on plant tissue or soil analysis for a given crop.

MIXING INSTRUCTIONS: Mix well in the desired amount of water. GSN16 is believed to be compatible with most fertilizers and plant nutrient products with the exception of products containing high levels of Calcium such as CAN 17. When mixing with other products it is recommended that a physical compatibility test be conducted before use. A test using small quantities in proportion to field application rates is recommended.

DIRECTIONS FOR USE:
Agricultural and Horticultural crops: Apply 2-10 pounds per acre when plants are actively growing or as needed based on your nutrient management program determined from soil and plant tissue analysis for your specific crop. This product is a commercial fertilizer and should be used as part of a comprehensive nutrient management program.
Lawn and Garden: Mix 1-2 Tablespoons per gallon of water. Apply as a foliar spray, soil drench, or through irrigation systems every 2-4 weeks or as needed. This product can be applied all year long for most plants that are actively growing.
Recommended rates are intended as a guideline only and may not be suitable for all regions, conditions, and crops. Specific application rates should be determined from crop and soil analysis.

☐ Net wt. 1 lb. (0.45 kg) ☐ Net wt. 50 lbs. (22.68 kg) ☐ Net wt. 1225 lbs. (555.65 kg) ☐ Net wt. ____ lbs. (____ kg)

NOTICE OF WARRANTY - Grower's Secret, Inc. warrants that the product conforms to its chemical description as is reasonable for the purposes stated on the label when used in accordance with directions under normal conditions of use. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other material or manner of use or application, all of which are beyond the control of Grower's Secret, Inc. In no case shall Grower's Secret, Inc. be liable for consequential, special or indirect damages resulting from the use or handling of this product. Grower's Secret, Inc. makes no warranties of merchantability or fitness for a particular purpose nor any other express or implied warranty except as stated above.

9-7-22 v1

...but more expensive per lb of N

Percentage of available nitrogen

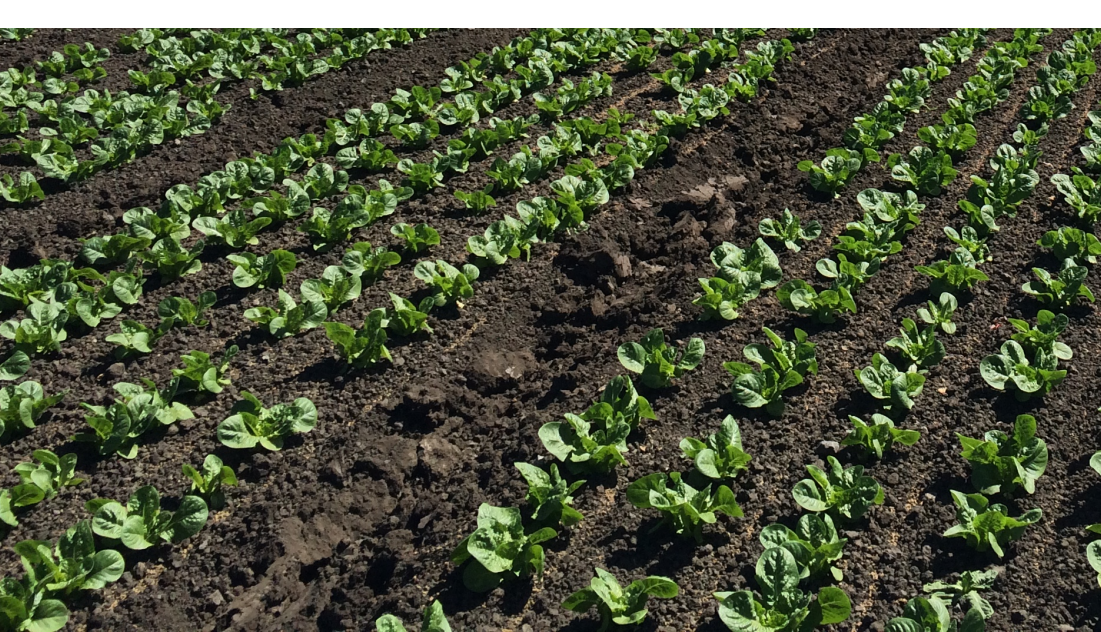
Fish Emulsion: Agrothrive 2.5%-1.5%-2.5%,
30% available → 0.8%

Pelletized chicken manure: 4%-4%-2%,
40% available → 1.6%

Guano 12.5%, 70% available → 8.4%

Feathermeal: 13-0-0, 70% available → 9.1%

Nitrogen management in organic systems





GUARANTEED ANALYSIS

Total Nitrogen (N).....3%
2.6% Water Soluble Nitrogen
0.4% Water Insoluble Nitrogen
Available Phosphate (P_2O_5).....2%
Soluble Potash (K_2O).....3%

Derived from: Fish Solubles Stabilized with Phosphoric Acid, Reduced Sugar Molasses, Corn Steep Liquor, Soy Protein Hydrolysate, Sugar Beet Extract, Sulfate of Potash, and Kelp Extract.
Density.....9.5 lbs/gallon at 68°F **F2192**

- Say you want to apply 10 lbs of N per acre when irrigating a half acre block
- We need to inject $10 \times 0.5 = 5$ lbs of N
- So we need to inject $5 / 0.03 = 166$ lbs of fertilizer
- That correspond to $166 / 9.5 = 17$ gallons of fertilizer

- To apply 100 lbs of N/acre of 4-4-2
- You apply $100/0.04 = 2500$ lbs = 1.25 tons of fertilizer



- To apply 100 lbs of N/acre of 13-0-0
- You apply $100/0.13 = 770$ lbs = 0.38 tons of fertilizer

Measure distribution uniformity with a catch can experiment



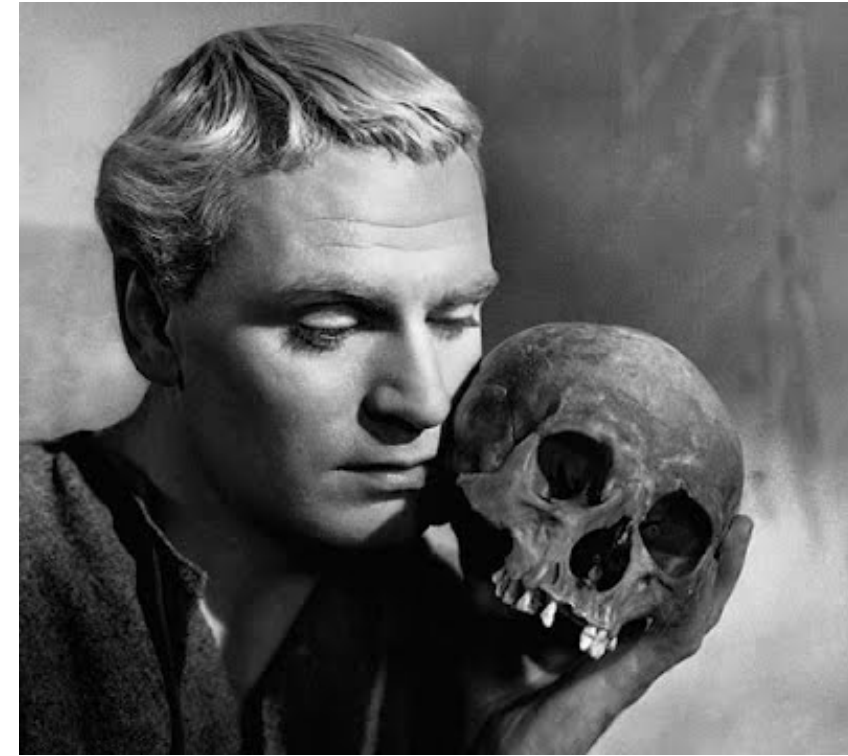
When fertigating, bad distribution uniformity of water means bad distribution of nitrogen!



Also with low DU, some areas are overirrigated and nitrate is leached away

Filters

- Inject before filter or after filter?



Thank you!

Gerardo Spinelli

gspinelli@ucdavis.edu

Office 858 822 7679

Cell 530 304 3738



Please complete the evaluation!

[https://surveys.ucanr.edu/survey.cfm?
surveynumber=33281](https://surveys.ucanr.edu/survey.cfm?surveynumber=33281)

