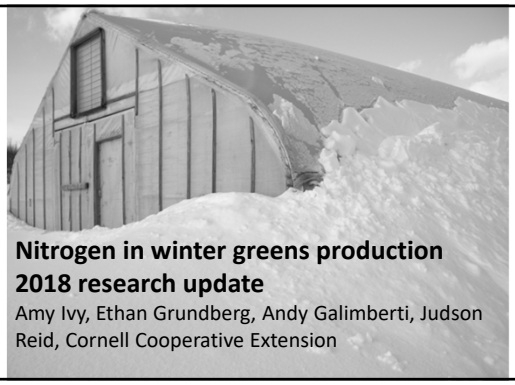


Nitrogen in winter greens production 2018 research update

Amy Ivy, Ethan Grundberg, Andy Galimberti, Judson Reid, Cornell Cooperative Extension

Research questions:

- Does the source or organic nitrogen effect plant uptake or yield?
- Does temperature effect soil nitrogen availability or yield?
- How do these factors affect profitability of winter greens?

The treatments

- 2 plantings, 2 weeks apart
- Sowed seeds into 72 cell trays, transplanted out 4 weeks later
- Variety Space
- Treatments
  - Urea (130 lbs split)
  - Blood meal (130 lbs split
  - Alfalfa meal (130 lbs)
  - Control

2 weeks after transplanting the early planting was showing differences between the treatments.
(yellow – control, green – alfalfa, blue – blood meal)

Outside the tunnel:

- The minimum air temperature was -15.7 in December and -19.5 in January
- There were 7 days each month, December and January, with temperatures below zero.

Inside the tunnel:

- A double layer of rowcover was laid over low hoops once temps went below freezing.
- Minimum soil temperature (2" deep) outside the rowcover by the north wall for the coldest location was 22.97
- Minimum soil temperature (2" deep) under the rowcover near the center of the tunnel for the warmest location was 27.54 degrees
- Minimum air temperature (12" above the soil) in the tunnel outside the rowcover was -14.01 degrees

Element	lbs/acre*	Very Low	Low	Optimum	High	Very High
Phosphorus (P)	25					
Potassium (K)	52					
Calcium (Ca)	1,410					
Magnesium (Mg)	167					

Element	Value	Element	Value	Element	Value
Soil pH	6.7	Manganese (Mn), lbs/acre	12	% OM	1.7
Buffer pH	6.5	Zinc (Zn), lbs/acre	1		
Iron (Fe), lbs/acre	2	Aluminum (Al), lbs/acre	23		

Crop History (1 = last year, etc.)

Year	Crop
3	Tomatoes-All Others
2	Tomatoes-All Others
1	Rye-Cover Crop

Sample Information Summary

Soil Name: Stafford
Crop Code: SPF
Tillage Depth: 7 - 9 Inches
Type: Maintenance
Drainage: Not Specified
% Legume: 100% Non-legume

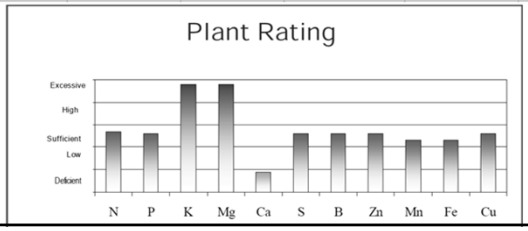
Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	tons / acre Lime	lbs / acre N Range	lbs / acre P2O5 Range	lbs / acre K2O
1	Spinach-Fall	0.00	130	80	150.00

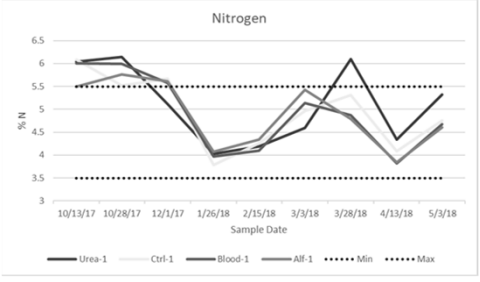
Spinach foliar results identical across treatments!

N	P	K	Mg	Ca	S	B	Zn	Mn	Fe	Cu
5.49 %	0.63 %	10.02 %	1.3 %	1 %	0.49 %	42.2 ppm	125.6 ppm	67 ppm	149 ppm	11.1 ppm

NO_3-N:	Na:	Al:	Mo:	Ni:	Cl:
ppm	%	ppm	ppm	ppm	%

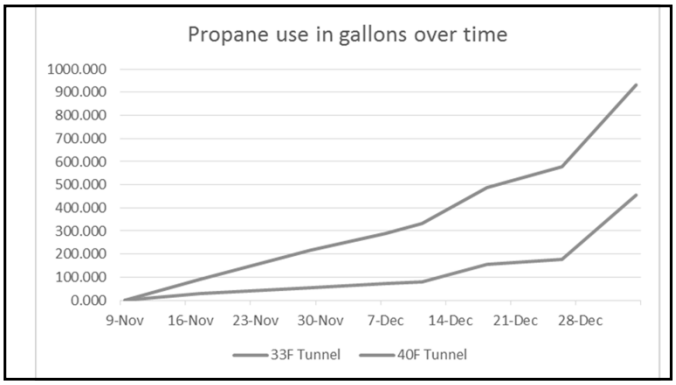


Foliar nitrogen levels early planting



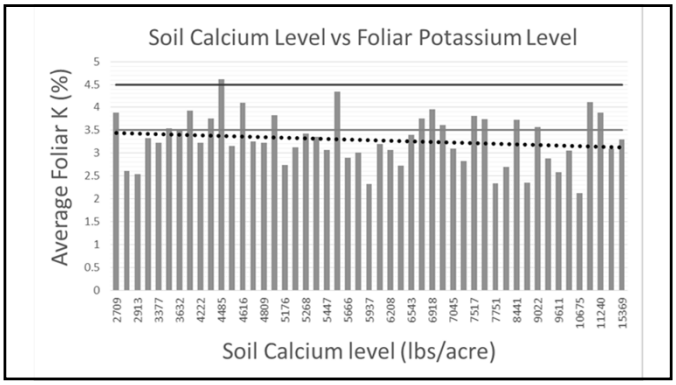
2017/18 Nitrogen Source Trial conclusions

- In the early planting:
  - Urea had a 29% **greater** yield than the control
  - Blood meal had a 24% **greater** yield than the control
  - Alfalfa had a 2% **lower** yield than the control
- In the late planting:
  - Urea had a 17% **greater** yield than the control
  - Blood meal had an 11% **greater** yield than the control
  - Alfalfa had a 12% **lower** yield than the control



2017/18 Temperature/Nitrogen study

- Active soil led to early increased N availability.
- Temperature appears to be positively correlated with PSNT and foliar N, but still too early to tell.
- No yield differences yet in response to temperature or N source but still too early to draw conclusions.
- Alfalfa meal have caused some N tie-up at transplant vs. split applications of urea or blood meal.
- Control plots (0 lbs N) show similar foliar N as fertilized plots, raising the question of total N rate.
- Secondary and micro nutrients-poorly understood in cold soils.

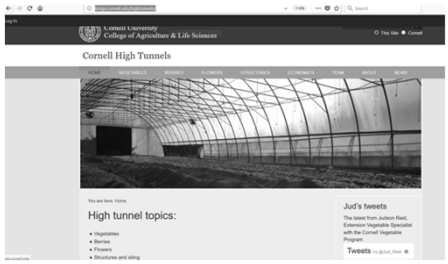


High Tunnel Farmer to Farmer Meeting

Monday, February 4th (Thursday, February 7th snow date)
9:00 AM to 4:30 PM
Poughkeepsie Farm Project ,51 Vassar Farm Rd, Poughkeepsie, NY

https://enych.cce.cornell.edu/event.php?id=1068

http://blogs.cornell.edu/hightunnels/



Thanks to:

NNY ADP
NE SARE
Poughkeepsie Farm Project
-Leon Vehaba
Pleaseant Valley Farm
-Paul and Sandy Arnold

@Jud_Reid