

Nutrient Management in Hops

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Objectives of Nutrient Management in Hops

- Low risk crop but still has the potential to erode soil and leach nutrients, especially nitrogen
- Crop needs a lot of nitrogen in a short amount of time, how best to get the proper amount of nutrients
- Have you heard of the 4R's?
- Nutrient management all depends on your soil quality and ability to hold nutrients and water
- Things to think about with Nutrient Management in Hops Production



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Nutrient Management 4 R's

- Right Source at the
- Right Time at the
- Right Rate and the
- Right Placement



<https://www.nutrientstewardship.com/4rs/>

202.296.0490 nutrientstewardship@ifi.org Partner Login

 **4Rs** News Research Training Advocates Partners 





HOME > WHAT ARE THE 4RS

- 4R Summit
- 4RS
- 4R Principles
- Benefits of Using the 4Rs
- Implementation
- Sustainability
- 4R Summit

RESOURCES

- 4R Pocket Guide

What are the 4Rs

			
RIGHT SOURCE Matches fertilizer type to crop needs.	RIGHT RATE Matches amount of fertilizer type crop needs.	RIGHT TIME Makes nutrients available when crops needs them.	RIGHT PLACE Keep nutrients where crops can use them.



Right Source

- Commercial Fertilizer
- Manure
- Green Manure/Cover Crops
- Compost
- Mulch

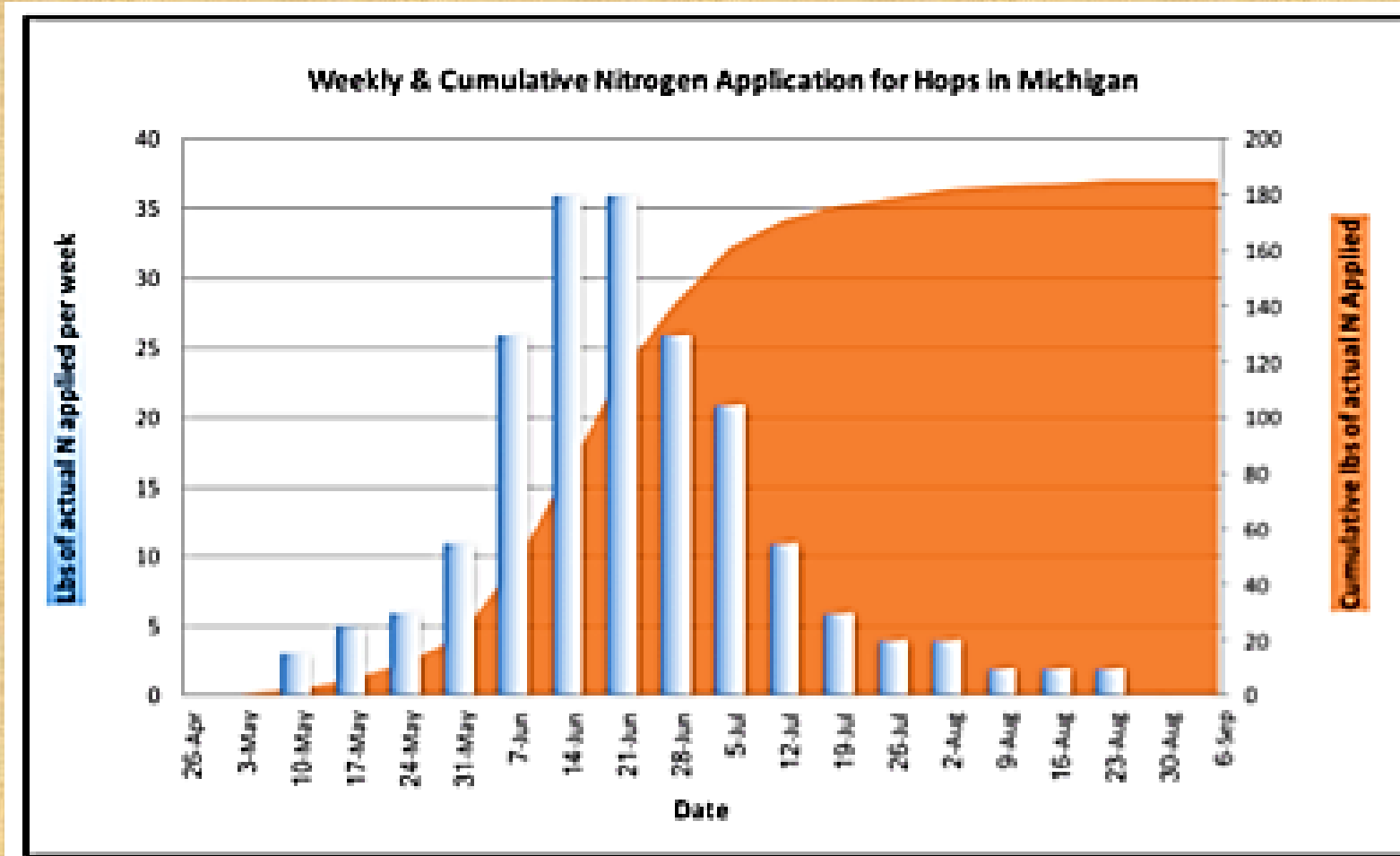
SOIL

Over 50% of nutrient delivery is from the soil



Right Time

Graph Courtesy of J. Robert Serrine, PhD. MSUE



Right Rate

- Phosphorus
 - Requirements low when compared to N and K
 - 9-10 bale/ac yield only removes 2-30 P/ac.
- Potassium
 - Hops takes up 80-150 lbs./ac. of K depending on yield
- Boron
 - In Western Oregon hopyards, boron applications are recommended when values are 1.5 ppm or below
- Zinc
 - Required for optimum growth. Zn. deficiency is associated with high pH soils >7.5

Information courtesy of J. Robert Serrine, PhD. MSUE



Right Rate - continued

- Nitrogen
 - 60-150 lb/ac actual N – based on yield and variety.
 - Apply in late may thru June. Method and type very important
 - Lots of loss with granular applications – coated/time release N, account for losses
 - Foliar and fertigation possible (fertigation comes with its own risks, but great tool!)
 - Make sure to take proper nutrient credits for manure, cover crops, returning bines and/or compost back to yards, etc.
 - There is no evidence that you get significant yield increase on applications of Nitrogen over 150lb/ac – its all about getting the 4R's right!
- Sulfur
 - Needed in many other crops now due to cleaner air
 - Can and will adjust soil PH

Information courtesy of J. Robert Serrine, PhD. MSUE



Right Placement

- Soil Applied Pre-Plant
- Soil Applied at Planting
- Soil Applied Annually
- Fertigation



Evaluate Nutrient Management Plan

Graph Courtesy of J. Robert Surrine, PhD. MSUE

Petiole/Leaf Testing

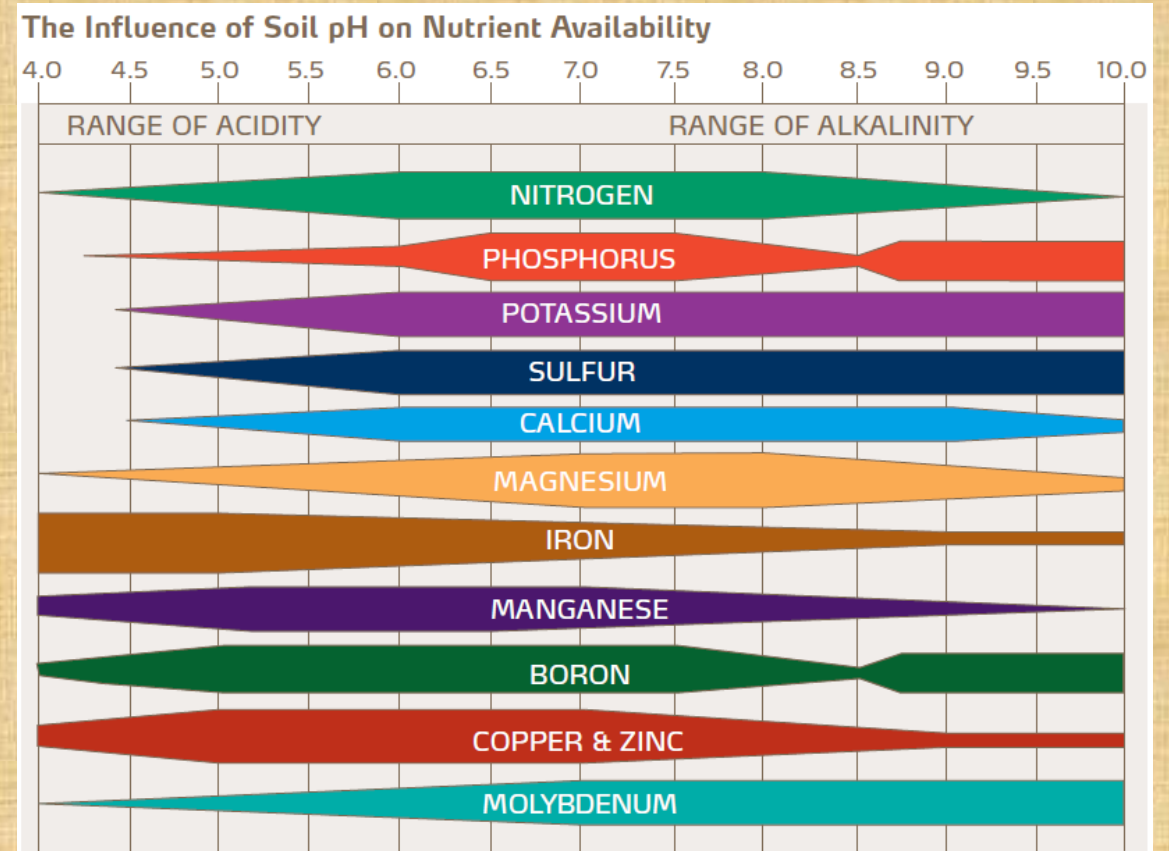
NUTRIENTS	JOHN I HAAS	Optimum Nutrient Ranges		
		Plant Analysis Handbook III		
		Vegetative Stage Pre-Bloom	Reproductive stage & Full Bloom	western labs 5.5 ft above ground
Nitrogen (%)		3.2 - 5.6	2.13 - 3.93	4.0
Potassium (%)	1.49 - 2.5	1.6 - 3.4	0.97 - 2.55	3.0
Phosphorous (%)	0.29 - 0.6	0.27 - 0.54	0.18 - 0.43	0.4
Calcium (%)	0.79 - 1.2	1.03 - 2.57	3.09 - 6.05	2.5
Magnesium (%)	0.24 - 0.8	0.29 - 0.67	0.55 - 1.71	0.4
Manganese (ppm)	25 - 150	45 - 125	50 - 150	85
Iron (ppm)	30 - 60	44.3 - 97.9	35.4 - 151	
Copper (ppm)	10 - 25	8 - 29	5.7 - 16.6	10
Boron (ppm)	24 - 75	17.6 - 63.2	48 - 150	55
Zinc (ppm)	24 - 50	23.2 - 108	19.4 - 57.1	60
% Sulfur Sampled Basis	0.16 - 0.32	0.2 - 0.34	0.18 - 0.30	0.25
% Sulfur Dry Matter Basis	0.16 - 0.32	0.2 - 0.34	0.18 - 0.30	
Mo		0.5 - 3	1 - 5	
Na	0 - 1400			
NO3 ppm	4000-12000			



Evaluate Nutrient Management Plan - continued

Don't forget soil pH!

- Soil pH and Nutrient Availability
- Soil pH effects soil biology
- Bacteria more prevalent in Alkaline soils
- Fungi more prevalent in Acidic soils
- Easier to adjust soil pH prior to plant
- Soils will progressively acidify with normal farming practices



Graph Courtesy of MSU Hops Management Guide



Fertigation concerns

Irrigation and Fertigation

- 4Rs still important
- Amount, duration and frequency are key
- Best way to get that amount of nutrient to the plant without significant losses
- MAKE SURE TO HAVE PROPER BACKFLOW PROTECTION

Fertigation Valve



Picture courtesy of Beau Schaklette w Trickl-Eez



Fertigation concerns

Irrigation and Fertigation

- Proper storage and handling facility
- Check with your local irrigation supplier
- Risk for backflow of nutrients into water supply are very real
- MAKE SURE TO HAVE PROPER BACKFLOW PROTECTION Fertigation Valve



Picture courtesy of Dan Busby



Have you been MAEAP Verified yet?

- Voluntary and confidential
- FREE paid for by pesticide and fertilizer funds
- Conformance with rules and regulations on farm
- Verification good for 5 years
- Assists with food safety audits and sustainability initiatives
- Sign up at MAEAP booth



What are you waiting for?

- Assist with marketing
- Reduce risk on your farm
- RUP credits available
- Cost share for BMP's
- Sign up at MAEAP booth
- Or check out <http://www.maeap.org/>

