



Soil Health Workshop

Greencreek, Idaho

SOIL PH AND LIME

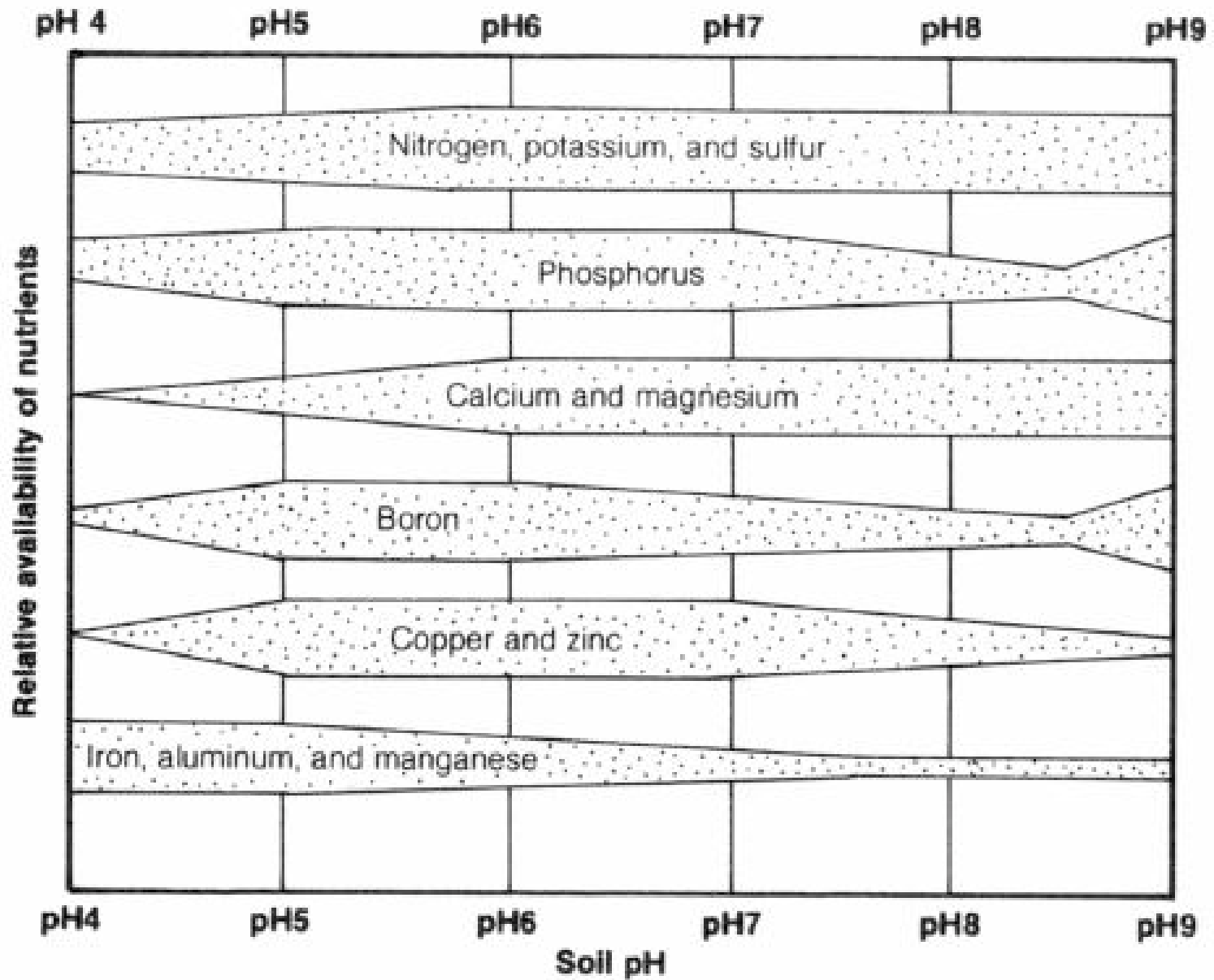
TOM GEHRING

Crop Production

- ▶ **Questions to answer**
- ▶ **What crops are we growing?**
- ▶ **What pH does the crop need?**
- ▶ **What are the parameters for nutrients and Yield?**
- ▶ **Peas, Lentils, Canola, Alfalfa**
- ▶ **pH (Aluminum toxicity)**
- ▶ **Nutrient availability**
- ▶ **Stratification of pH**
- ▶ **Economics of crops we are growing**

pH (What is it?)

- **Soil pH is a measure of the concentration of hydrogen ions in the soil solution on a scale of 1 to 14.**
- **Low values denote acidic conditions, while high values indicate alkaline conditions.**
- **A pH of 7.0 is neutral. pH of 3 is ten x more acidic than pH of 4, and a 3 is one hundred x more acidic than a pH of 5. Logarithmic scale**
- **Soil testing is the only reliable way to determine your soil pH.**
- **In areas where acid soils are known to be a problem, crop insurance may not pay a claim for a new seeding failure unless you can show a soil test with a pH above 6.0.**



Soil pH and Acidity

- ▶ **Soil pH's in the plow layer fluctuate during the growing season according to soil moisture levels.**
- ▶ **The buffer pH (Lime Index) remains more constant.**
- ▶ **As soils dry out, the pH drops due to salt accumulation near the surface of the soils. They may rise after a rain moves the salt downward into the soils.**
- ▶ **Test in the fall when moisture levels are similar**

Soil pH (Concerns)

Soil biology changes – soil microorganisms (fungi, bacteria) become affected

Soil Phosphorus and essential nutrients become less available

Earthworms affected below pH of 5.0

Crop yields are affected along with rotational crops being not a great option

- ▶ **Legume crops become affected by root growth, nodulation and nitrogen production and yields.**
- ▶ **Cereal crops are affected by aluminum toxicity and nutrient availability**
- ▶ **Seedlings are placed in a stressful environment. Root pruning and poor nutrition.**

Soil Test Information

- **If you have an acid soil, there will be two different pH measurements listed on the report.**
- **The first is the pH of the soil solution which tells you if you have a problem or not.**
- **The second is the buffer pH which is an indication of how much acidity is stuck to the soil particles.**
- **This, in turn, tells us how much lime we need to apply to increase the soil pH.**
- **The amount of lime needed is given in the next table.**

Lime needs based on soil pH

Buffer	Target soil pH = 6.5 (Lime if soil pH below 6.1)
T/acre lime to apply (Ag Index 75)	
7.0	0.9
6.8	0.9
6.6	1.4
6.4	1.8
6.2	2.7
6.0	4.0
5.8	5.4
5.6	6.8
5.4	8.5
5.2	9.0
<5.0	9.0

Crop Production- Soil pH



Rotational crops are important for your cropping system



Proper Nutrition is key to a successful crop



The most expensive crop is the crop that is harvested and did not yield!



Soil testing, nutrition, varietal selection and field prep is key to success. Soil pH is left on the back burner and usually not addressed!

How does Alfalfa respond to Fertility?



Alfalfa Grass/Mix Limed field



Visual Symptoms, Verifying and Testing

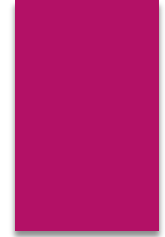
TESTING ZONES

Field Truthing is
Important



Poor area
3.6 pH

Good area
5.5 pH

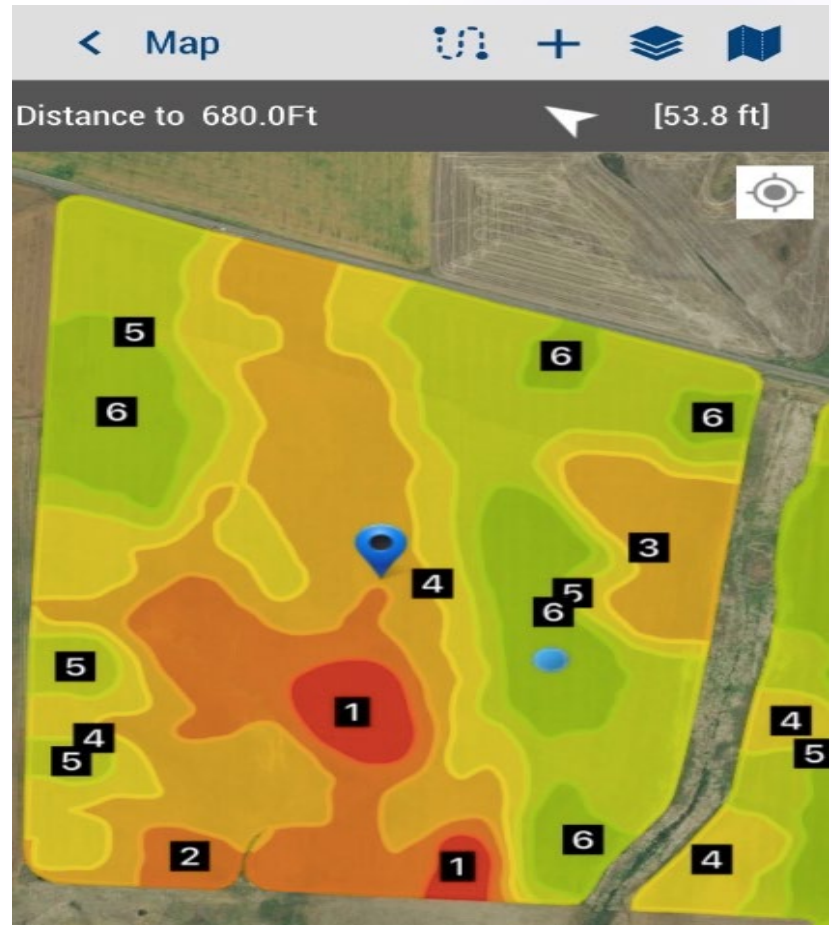


Testing and what do I do next?

Measuring pH at depth



Creating Zone maps for Lime



GALP
Grangeville AG
Lime Production

Based in Grangeville, Idaho

Quarry is located on John Day
Creek

Lime is crushed and brought to
Grangeville for processing

Lime is run through an air
separator to meet specs

Lime is then delivered to the field
for application

John Day Quarry



Grangeville Lime Production



Grangeville Lime Production



Lime Production



Approximately 60 ton per hour production

Reject anything under $\frac{3}{4}$ " to keep clean

Fines are re- run through separator if too large

A fabric building structure is being built this spring to store lime in for moisture control

Lime is adjusted to 7% moisture so you don't get charged for excess moisture

Grangeville lime vs: Sugarbeet lime

- ▶ Lime Score is much higher for GALP lime
- ▶ Density is higher 72 lbs/cu. Ft compared to 50 or less
 - ▶ Equates to tons in the spreader
 - ▶ 20,000 lbs. in spreader vs; 11,000 lbs of beet lime
- ▶ Dust and blowing material
- ▶ Weed seeds
- ▶ Moisture content: 7% vs: 20%

Lime Label for ID, MT, OR & WA



Grangeville Agricultural Limestone Project, LLC

GALP SoilAmend™ Lime

Guaranteed Analysis

Calcium (Ca).....	37%
Calcium Carbonate (CaCO ₃)	90%
Calcium Carbonate Equivalent (CCE)	90%

Minimum percent material that will pass

100 Mesh	65%
60 Mesh.....	72%
10 Mesh.....	90%

Derived from Pulverized Calcitic Limestone

GALP, P.O. Box 609, Grangeville, Idaho 83530

Net Weight as Indicated on the Scale Ticket / Bill of Lading

<https://galpllc.com>

info@galpllc.com

Information regarding the contents and levels of metals in this product is available on the Internet at:

<http://aapfco.org/metals.htm>

Custom Application of Lime (Matt Dyck) Potlatch



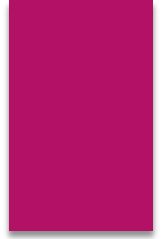
Cost to Lime

- ▶ \$55.50 FOB Grangeville, Idaho
- ▶ Trucking cost to field
- ▶ Application costs
 - ▶ Custom- \$12-\$20 per acre depending on tonnage
 - ▶ Matt Dyke from Potlatch area is doing custom applications
 - ▶ Spreader – Ag Leader 20 ton, variable rate spreader

Alfalfa in Big Fork, MT after lime



Lime Applied in Bigfork, MT on grass hay production



What Next?

- ▶ **Soil Test**
- ▶ **Know what problems you may have with pH**
- ▶ **Plan your crops around pH problem fields**
- ▶ **Budget for liming, grant money, programs?????**
- ▶ **Calculate tonnage per acre of lime needed**
- ▶ **Lime if pH is a big issue**
- ▶ **Pick your field that may be problem field to get larger return first!**
- ▶ **Visit with landlords to help possibly split costs**

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Questions?