Nutrient Management for the upcoming Crop

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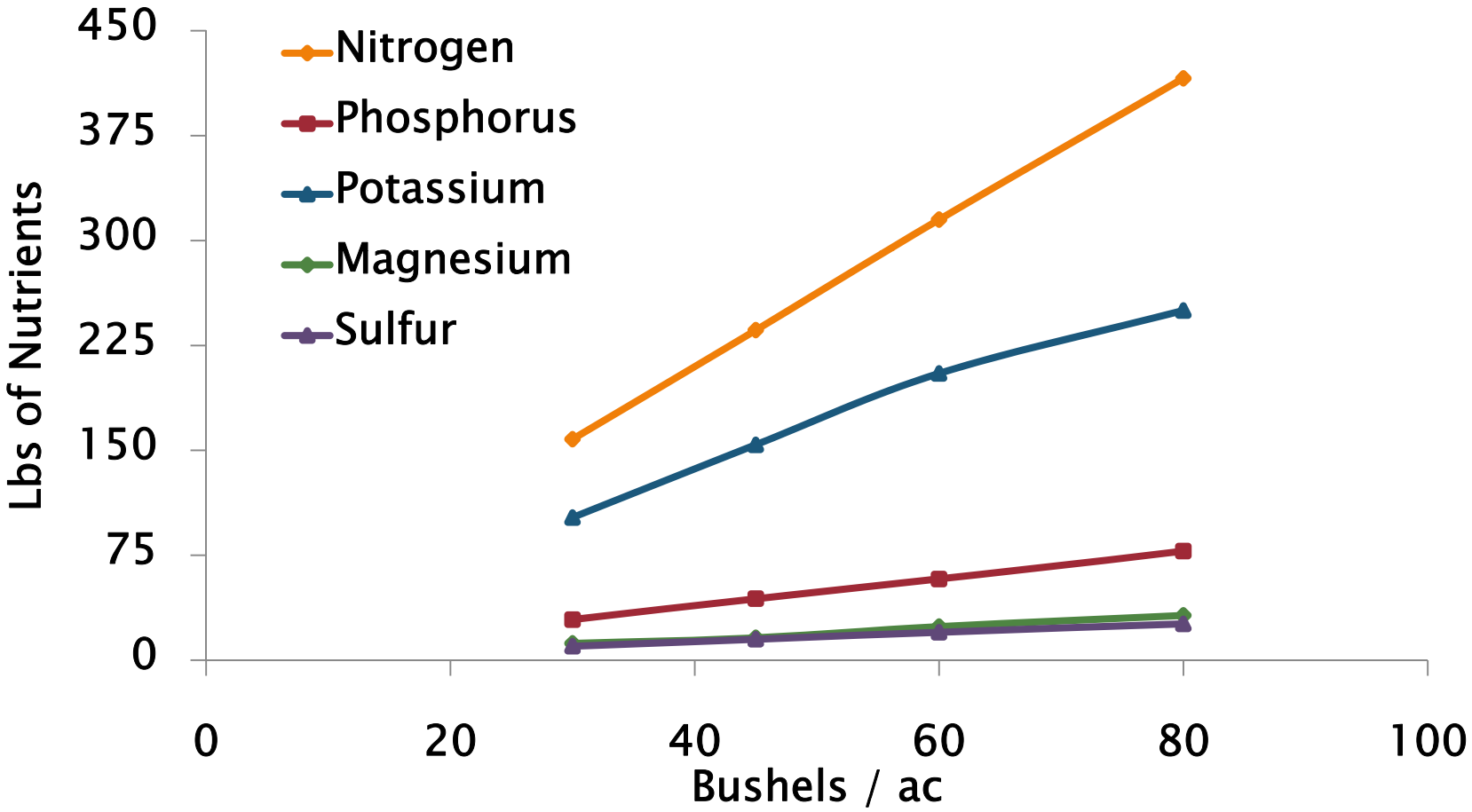
Nutrient Uptake



Nutrients removed in harvested crop

Crop	Unit	N	P2O5	K2O
Soybean	lb/bu	4.00	.80	1.4
Corn	lb/bu	.75	.44	.29
Wheat	lb/bu	1.29	.50	.30
Canola	lb/bu	1.88	.91	.46

Nutrient uptake by plant

Crop	Unit	N	P2O5	K2O
Soybean	lb/bu	5.26	.96	3.4
Corn	lb/bu	1.33	.56	1.33
Wheat	lb/bu	2.076	.675	2.3
Canola	lb/bu	3.00	1.33	2.4

Oklhoma Soil Test Levels

- Phosphorus Levels
  - 52%<40, 62%<50, 70%<60
  - STP 10 → 11% rec 50 lbs P_2O_5 ac^{-1}
    STP 20 → 15% rec 30 lbs P_2O_5 ac^{-1}
    STP 30 → 14% rec 30 lbs P_2O_5 ac^{-1}
- Potassium Levels
  - 18%<160, 37%<240
  - STK 0–80 → 3% rec 100–70 lbs K_2O ac^{-1}
    STK 80–160 → 15% rec 70–50 lbs K_2O ac^{-1}
    STK 160–240 → 17% rec 50–0 lbs K_2O ac^{-1}

16,628 soil samples

Phosphorus

Soil P Index	Percent Sufficiency	P2O5 lb/ac
0	40	70
10	60	50
20	80	30
40	95	20
>65	100	0

- $8.50/bu $0.36/ lb P_2O_5
- STP 20 : 30 lbs lb P_2O_5
- 50 bu Yield Potential : 10 Bu loss
- Spend $10.8 plus application cost or lose $85.00 in Yield
- STP 30: $9.00 in fertilizer/ $43.75 in Yield

Potassium

Soil K Index	Percent Sufficiency	K2O lb/ac
0	40	100
75	60	70
125	75	60
200	90	40
275	100	0
>350	100	0

- STK 125 : 60 lbs lb K_2O
- 50 bu Yield Potential : 12.5 Bu loss
- Spend $28.8 plus application cost or lose $106.25 in Yield
- STK 200: $19.20 in fertilizer/ $42.50 in Yield


Abo
About 2” of below ground biomass

Nitrogen

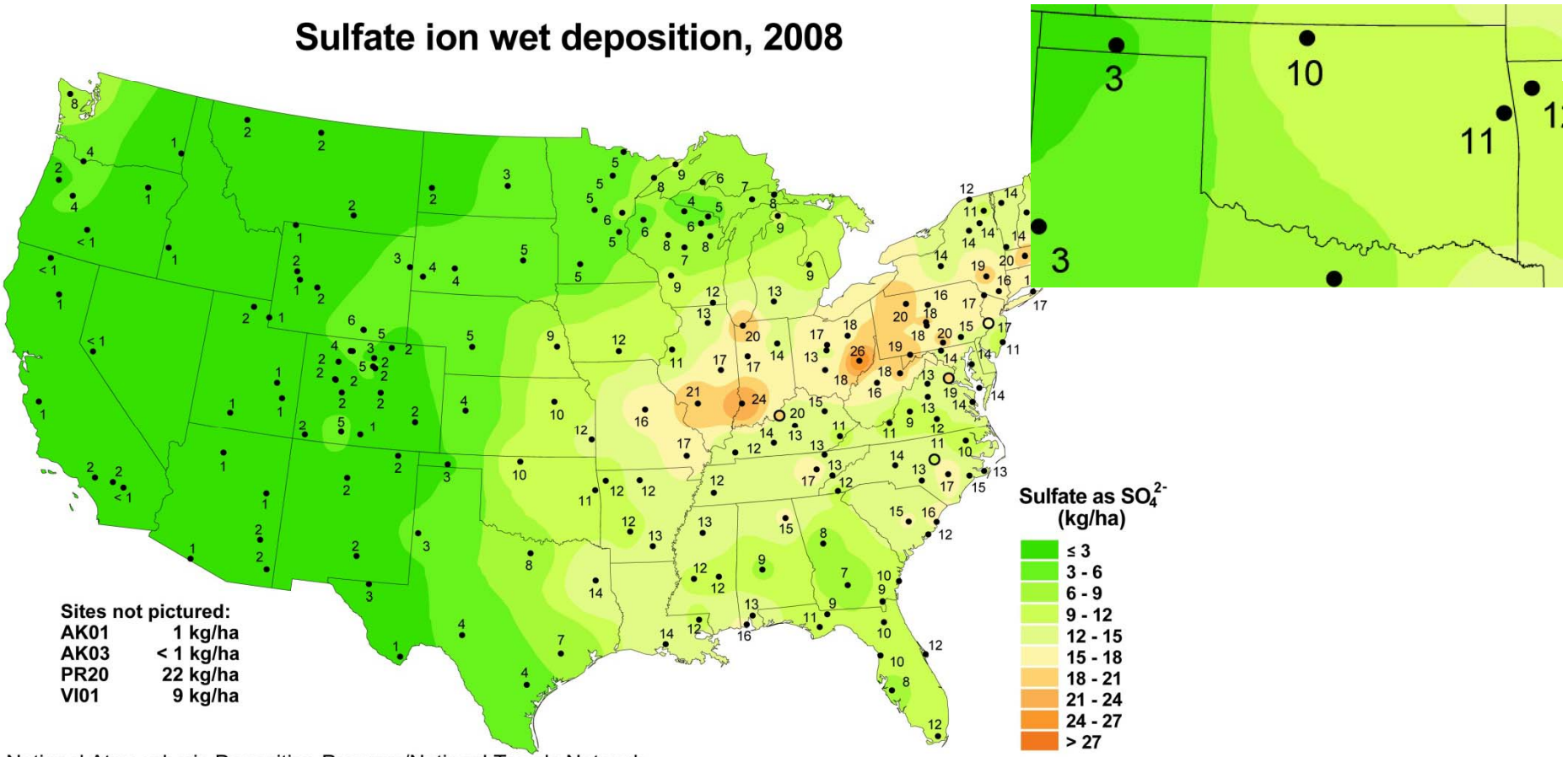
- The soybean a legume
  - In most cases N is not needed
    - If the field is well inoculated.
    - pH
- <60 bushels no N response in yield
- Can Increase Plant Size
- > 60 can benefit from N is residual is low
  - It should be noted that soybeans are extremely sensitive to salt injury and any addition of with seed starter should be done with caution.
- Most N deficiencies in Oklahoma
  - not from exceptional yields
  - improper inoculation procedures or lack of inoculation.

Sulfur

- Sulfur is similar to N in non legumes.

Yield Goal	Sulfur lbs/ac
10	3
20	6
30	9
40	12
50	15
60	18

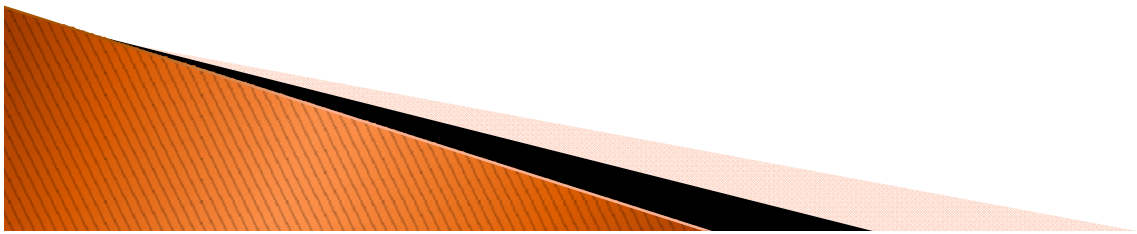
S in Rainfall



Other Nutrients

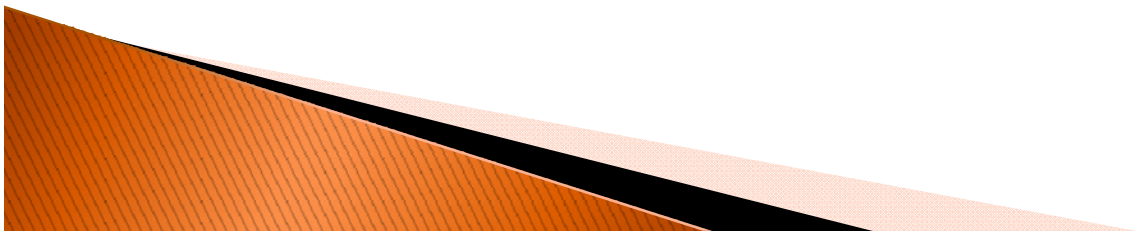
- **Molybdenum.**
- Molybdenum (Mo) is sometimes deficient in highly acid soils. A seed treatment of 0.2-.04 ounce of Mo per acre may be applied.
- Liming will correct Mo deficiency.
- In Oklahoma test, liming has proven to be the best solution for Mo deficiency problems.

- **Iron and Zinc**
- Iron (Fe) and Zinc (Zn) deficiencies may occur on soybeans grown in calcareous (calcium and magnesium rich) and/or high pH (>7.5) soils.
- Foliar spraying of Fe is most effective but expensive.
  - Often fields that are only slightly deficient will grow out of the deficiency without a loss of yield.
- Zinc deficiencies can be corrected by the application of 2 to 4 pounds per acre of zinc in the form of a zinc sulfate or zinc chelate.
  - Normally Zn is applied with a starter fertilizer and may not need to be applied every year.



Fertility Issues

- Banding with seed
  - Soybeans are very sensitive to N and K. Reduced stand.
  - Urea (46-0-0) and DAP (18-46-0) should be avoided as they can release large amounts of free ammonia (NH_3) that will damage seed and seedlings.
- Broadcast application preplant or a 2x2 band
  - Band application is recommended for soybeans, but broadcast application ahead of planting works well.
- Historically
  - Build the fertility levels on the crop previous to soybeans in the rotation, especially in double crop soybeans.
  - Sufficient fertility must be carried over for the soybeans or additional fertilizer will have to be added for the soybean crop.
  - P and K
    - total amount applied is less if the fertilizer is applied prior to the soybean crop as apposed to applying enough for the previous and soybean crop.



Thank you