McGillicuddy Corrigan AGRONOMICS™

IFarmIS.com

Independent Farm Information System

“Helping you to be your own best agronomist”

John McGillicuddy

john@ifarmis.com

319-330-8446

www.mcagronomics.com

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Agronomics

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- This is a real agronomic session

Agronomics

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- There will not be any “magic bullets”

Agronomics

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Also, there will be no:

- Fairy Dust

- Miracles in a jug

- Unicorns

- And Sasquatch will not be appearing

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2020 Crop Planning

- Trade Issues
- Corona Viruses
- Low Prices

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2020 Crop Planning

Based on current prices

- **Nearly all issues in the human existence eventually come down to one question:**

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2020 Crop Planning

Based on current prices

- **Nearly all issues in the human existence eventually come down to one question:**

“OK, what are you going to do about?”

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2020 Crop Planning

Based on current prices

- **Nearly all issues in the human existence eventually come down to one question:**

“OK, what are you going to do about?”

We need to adjust the budget to fit the income

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Good Agronomic Decisions Come From:

- What you see in your fields
  - And your ability to read it.
- What you measure in your own fields
- What you change based on these

Name all the parts of a soybean plant

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Name all the parts of a soybean plant

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- BEANS!
- Leaves
- Stems
- Roots
- Nodes
- Flowers
- Pods
- Nodules

Resource Allocation

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- What are the resources you use to grow a crop?

Crop Production Resources

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Crop Production Resources

- Light
- Water
- Nutrients
- CO^2
- Space
- Time
- Money

Generate an equation for Soybean Yield

___ * ___ = Y

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Generate an equation for Soybean Yield

$$S_{\#} * S_{wt} = Y$$

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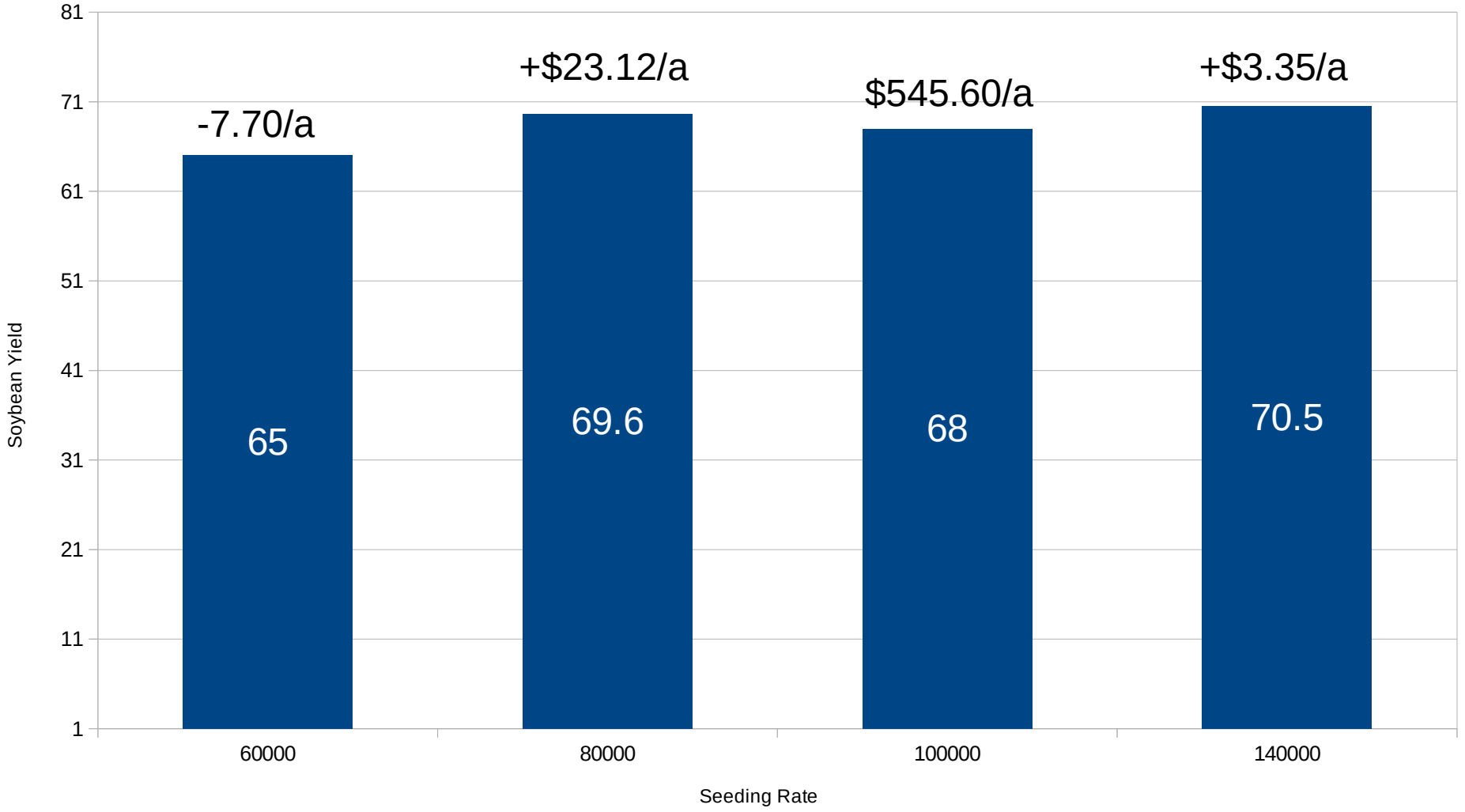
Soybean Yields

- $S_{\#}$
  - Number of Plants
  - Number of Branches
  - Number of Nodes
  - Number of Flowers
  - Number of Pods Established
  - Number of Pods Harvested
  - Seeds per pod
- S_{wt}

Soybean Population

Riceville, IA, Planted 5/22/18, VT, 30” rows



Heavy Rain all season

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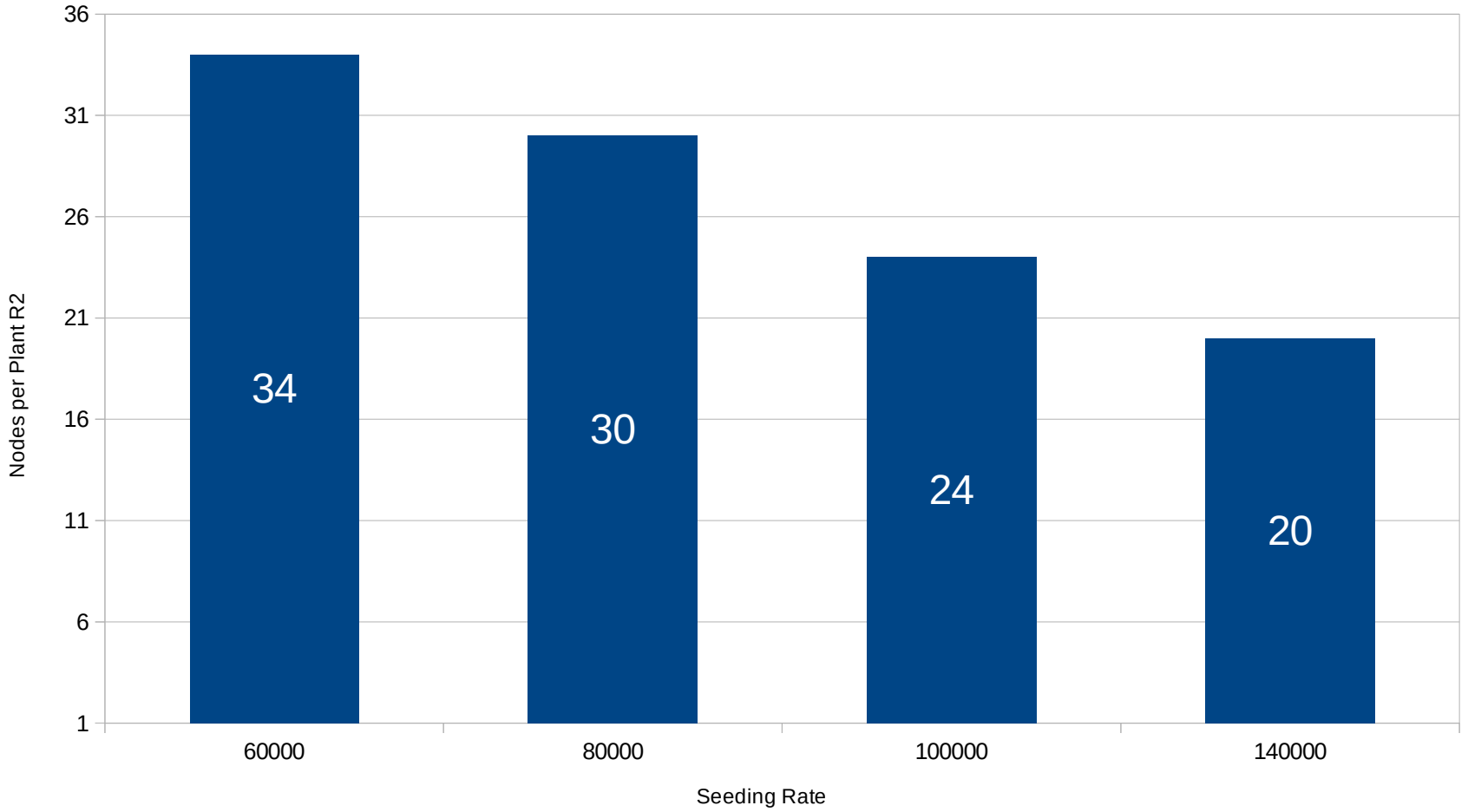

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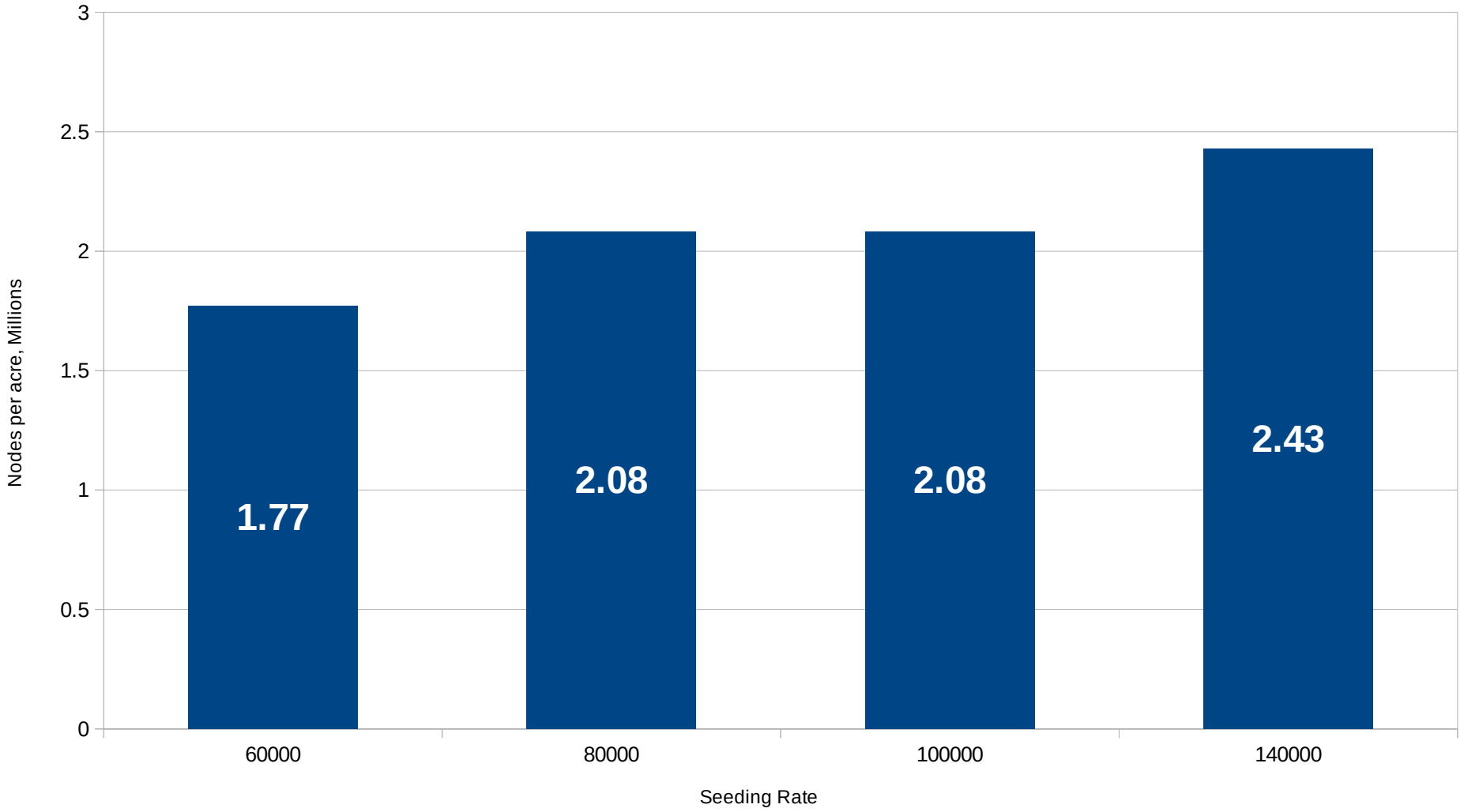

Heavy Rain all season

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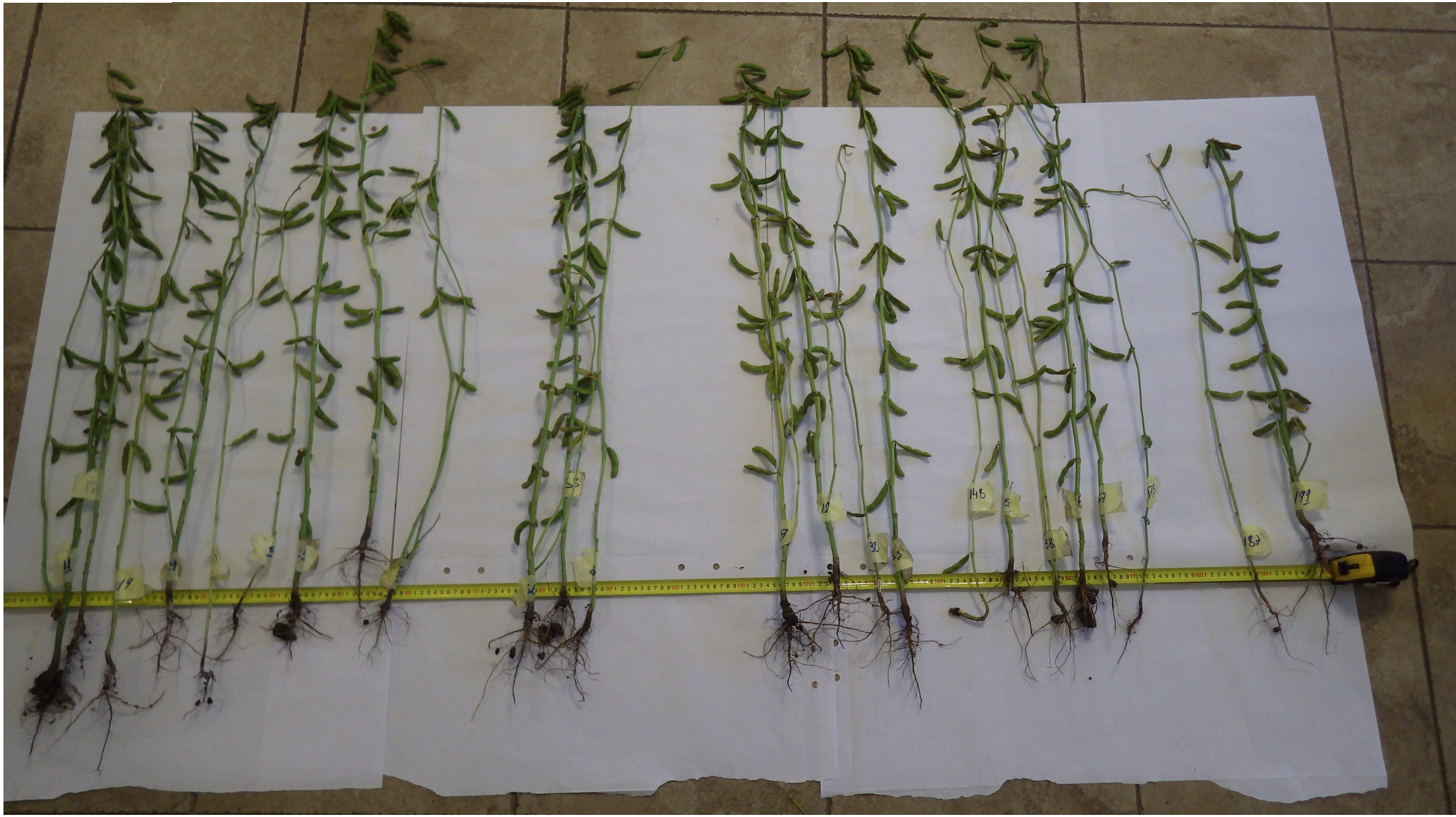

20 Inch Beans, seeded at 140,000, Harvest population is 104,000

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FEDERAL RESERVE NOTE
THE UNITED STATES OF AMERICA
ML 30689369 A
L12
THIS NOTE IS LEGAL TENDER FOR ALL DEBTS, PUBLIC AND PRIVATE
SERIES 2013
Treasurer of the United States
Secretary of the Treasury
GRANT
FIFTY DOLLARS

Soybean Yield

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- Critical Yield determination in many fields appears to be pod retention in late July/August
- Appears to be a resource issue

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Soybean Yields

- $S_{\#}$
  - Number of Plants
  - Number of Branches
  - Number of Nodes
  - Number of Flowers
  - Number of Pods Established
  - Number of Pods Harvested
  - Seeds per pod
- S_{wt}

Soybean Yield

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- Reduce pod drop and barren nodes
- Increase pods/node ratio
- Access/provide needed resources
- Allocate resources to the part of the plant you sell

Pod drop appears to be driven by a resource shortage

Order of Attack in Improving Soybean Yields*

- Maximize effective root mass
- Drainage
- Population and spacing
- Plant nutrition

*Assumes you have your weeds, insects and diseases controlled

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Smarter Use of Inputs

Fertilizers

- Grain prices are low
- Be smart with your money
  - Place your investment for best return
- Key Mistakes
  - Applying fertilizers you do not need
  - Not applying fertilizers you do need
  - Many times in the same field
- How to do it better
  - More critical evaluation before investing
  - Verifying the returns on your fields

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Soil tests only measure concentration

- Nutrient deficiencies arise from 3 common causes
  - Concentration
  - Location
  - Mobility
- Mobility can change greatly through the season

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Sulfur Management in Soybeans

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- Soybeans need S to create protein
- Sulfur soil test is not very helpful
  - Moving target
- Timing can be important
- Wet weather complicates the issue
- Keep your cost down

Sulfur Issues

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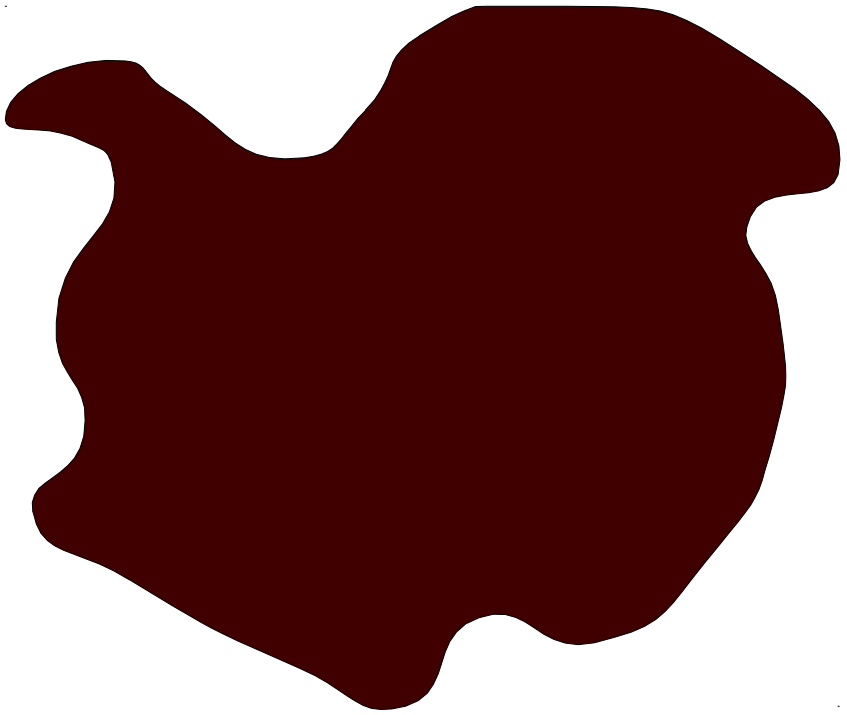
Organic Matter



Mineralization

Immobilization

SO_4^{--}

Heavy Rain

Requires Warm Soils

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Sulfur Forms

- Elemental S, (90-92% S)
- Sulfates, SO_4--
  - Calcium Sulfate(Gypsum, 15-18% S)
  - Ammonium Sulfate (AMS, 24% S)
  - Potassium Sulfate (AMS, 17% S)
  - The sulfate anion is the only available form
- Thiosulfates, S_2O_3--
  - Ammonium Thiosulfate (ATS, 26% S)

Sulfur Management in Soybeans

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- Two common periods of deficiency
- Early in a cold wet winter/spring
  - Sulfate leaching/slow mineralization
  - Inconsistent yield results
- Late June to early July on sands and low OM soils (<2%)

Sulfur Management in Soybeans

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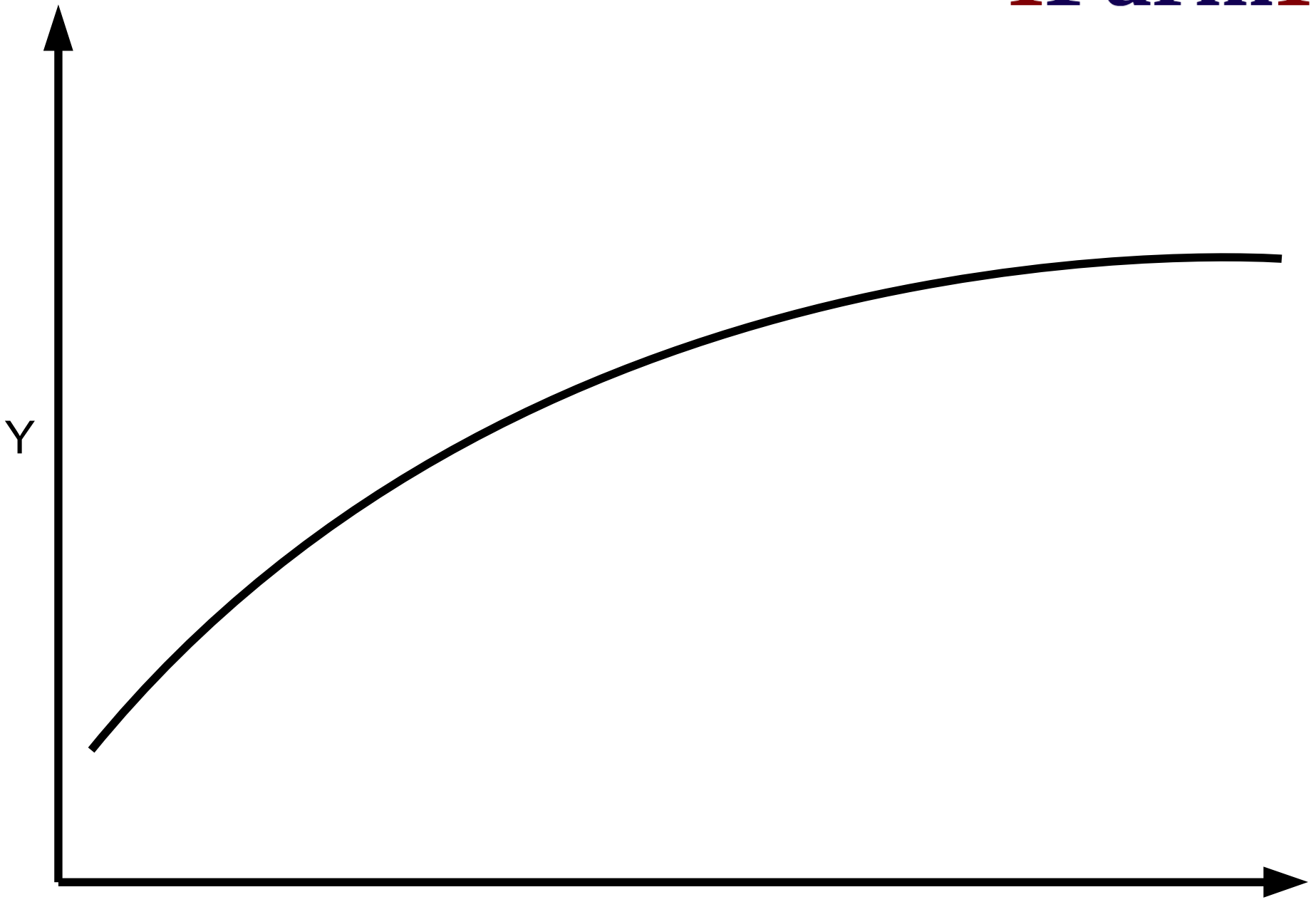
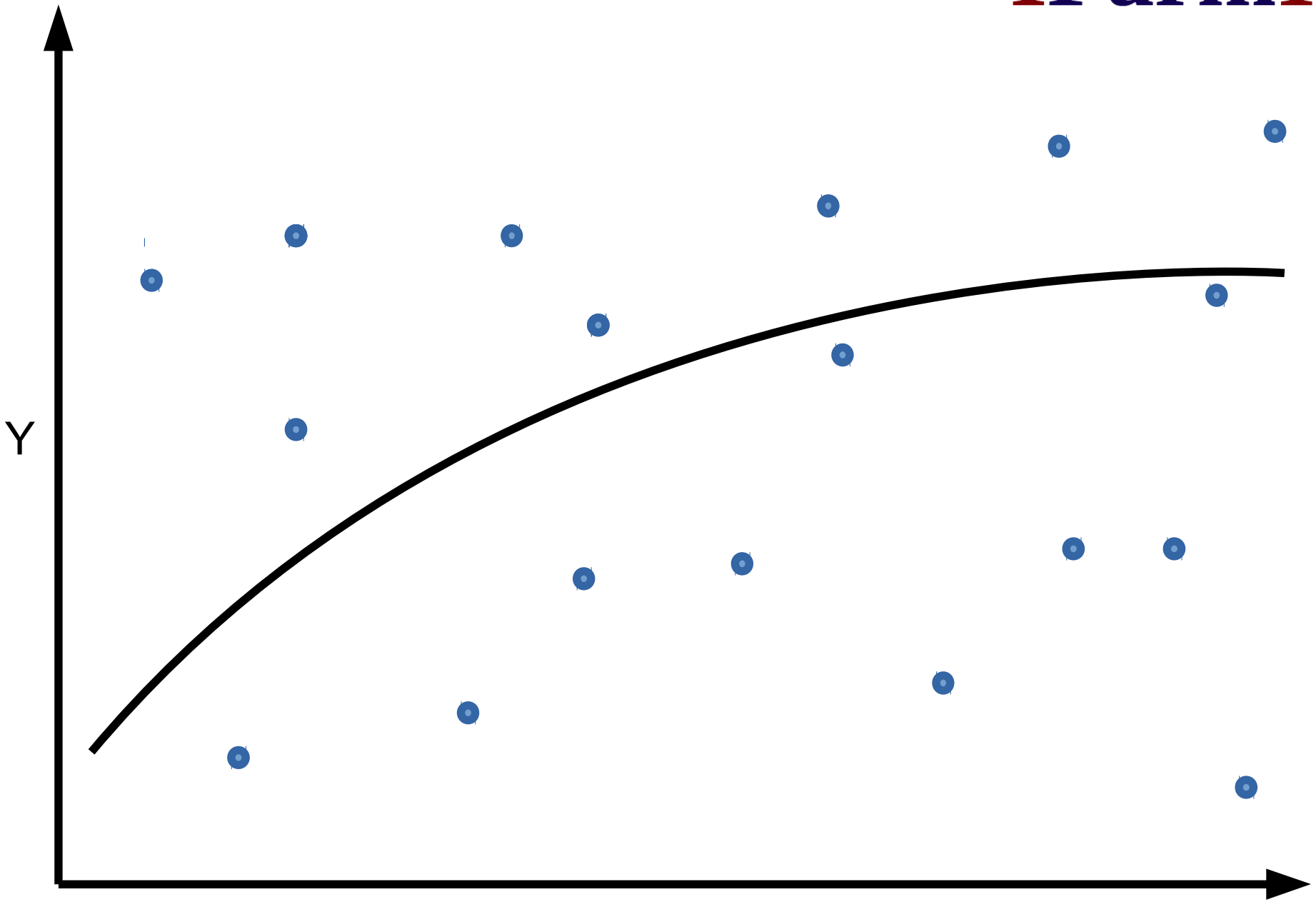
- Start on lower OM soils
- Keep the cost down
- Do not try to “raise the soil test level”
- Late June to early July window can be important
  - Especially in wet summers

Dispelling Some Myths

Fertilizers

- You should always apply enough P and K to get soil tests to “optimum”
  - What is “optimum”
- If you raise your soil test levels to “optimum” you will make money
- If you don’t apply P and K every year your soils tests will crash
- You must apply 100% of removal to maintain your current test levels





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Grower: Farmer	Field: Farmer's Field

Legend

P Rates

6 - 11

11 - 16

16 - 21

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Grower: Farmer	Field: Farmer's Field

Legend

P Rates

6 - 11

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Impact of MAP on Soybeans after Corn

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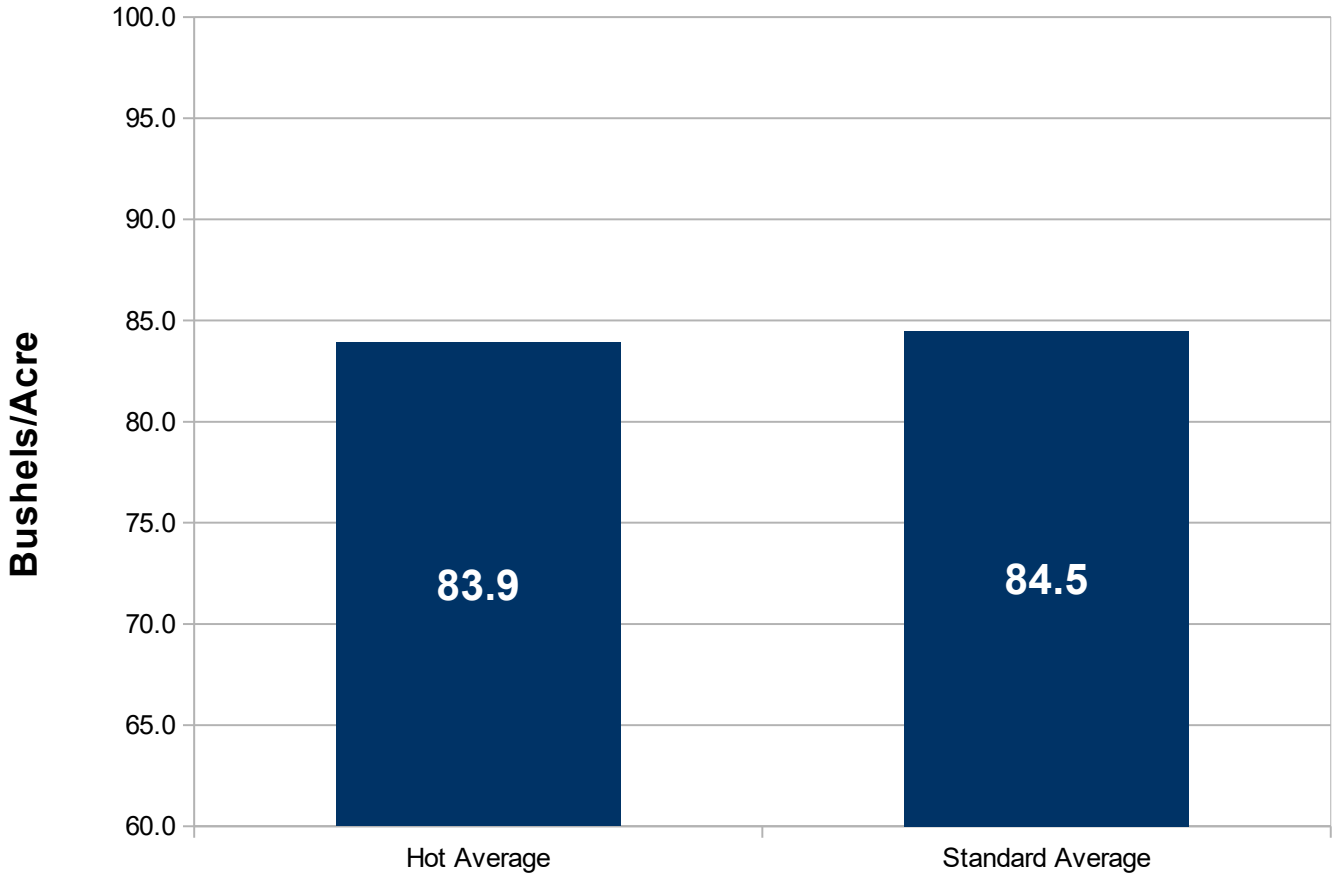
Medium Soil, West Central IL



Average increase was -0.6 Bu. MAP had a positive response in 2 replications out of 10

Some Helpful Facts

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Fertilizers

- Medium and heavy soils in the Midwest have significant P & K reserves
  - Soil test levels do not change quickly
  - Farmed since the early 1800's, fertilized since late 60's (world did not end)
- Nutrients move in and out of availability all the time
- Your "optimum" is unique to your fields
  - Calibrate your fields individually

How much P is out there?

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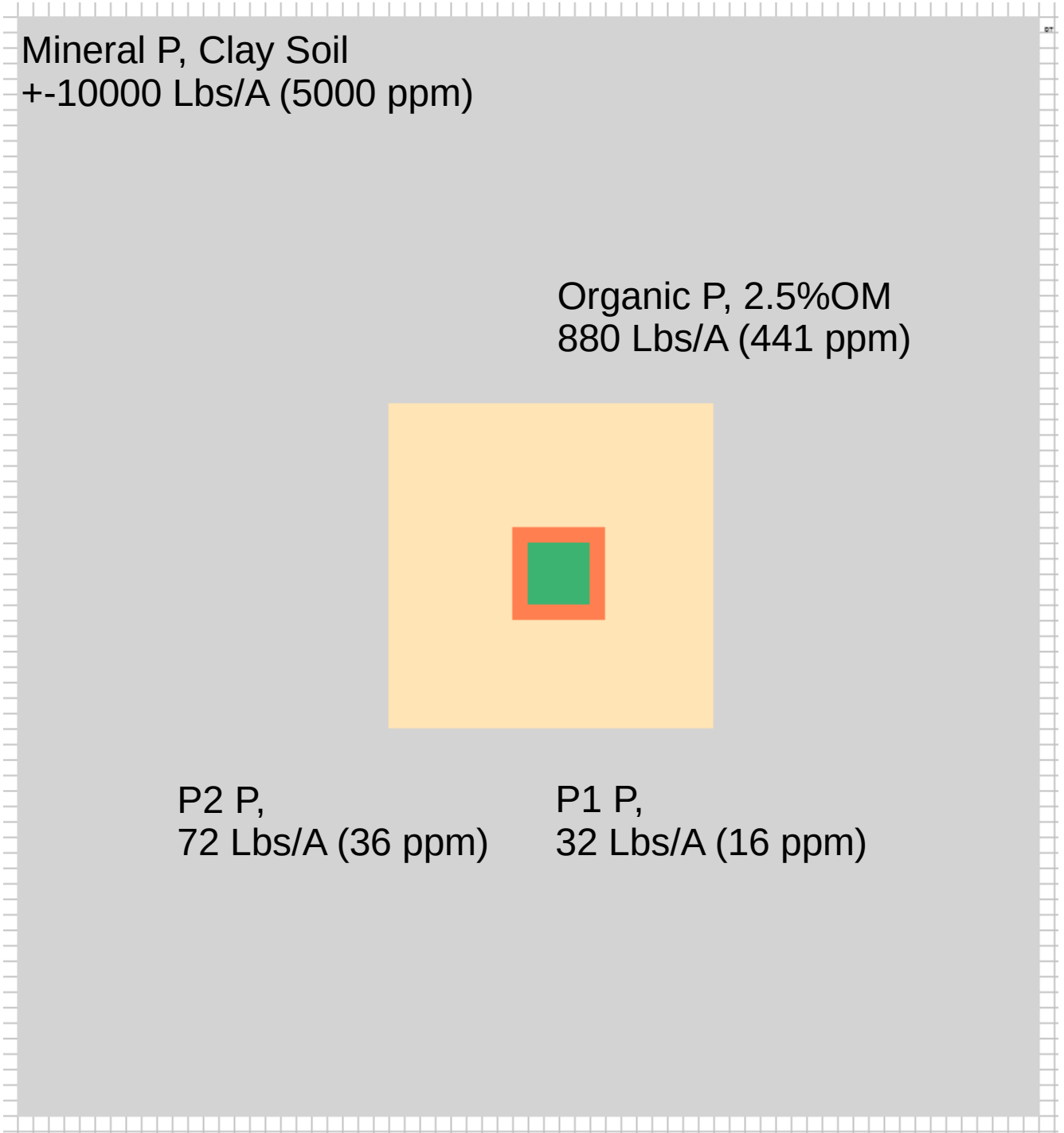
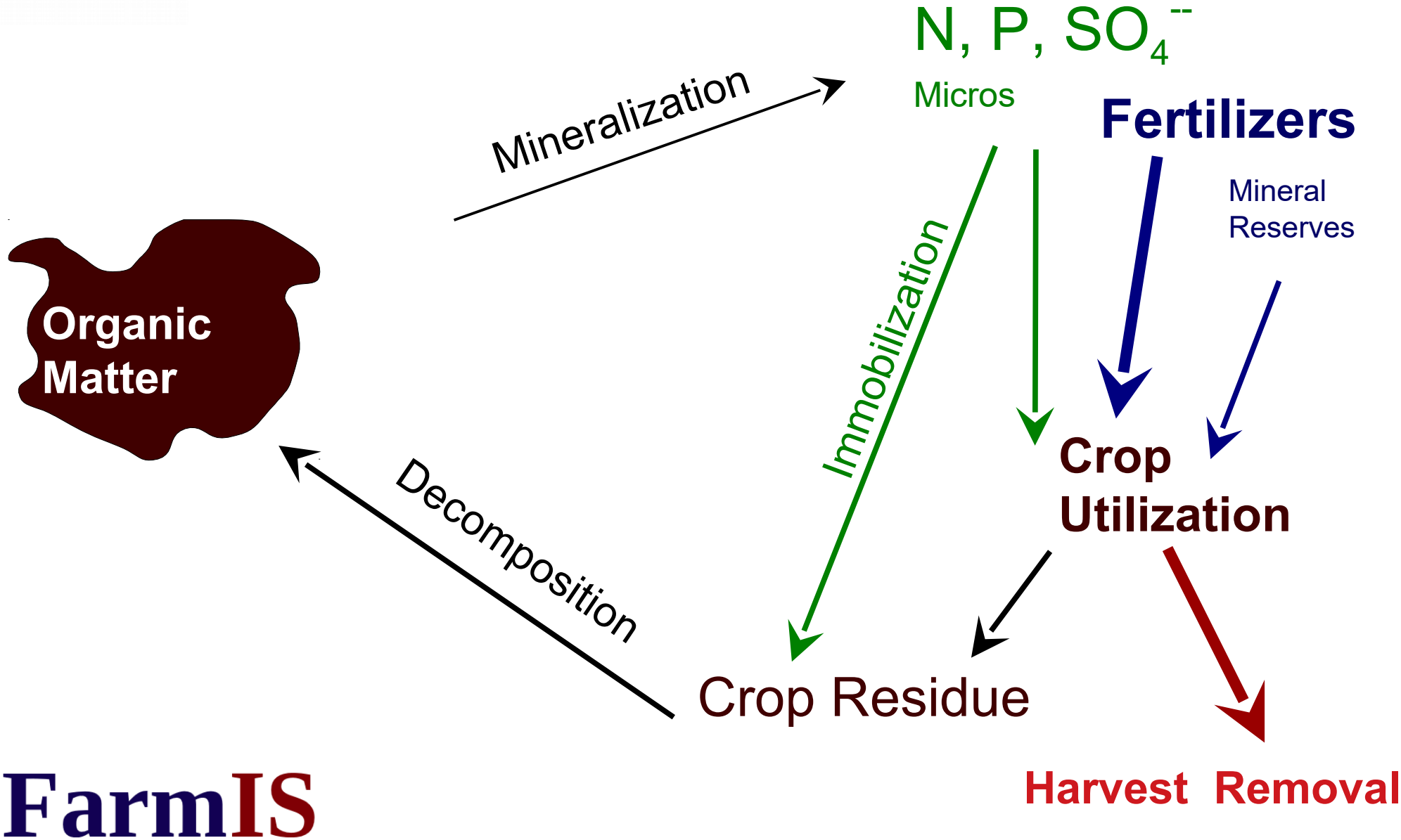
Total P, top 6 inches,
Clay Loam Midwest soil
Around 11000 Lbs per acre
Removal for 32,000 Bu.



OM is a key component of your plant nutrition system



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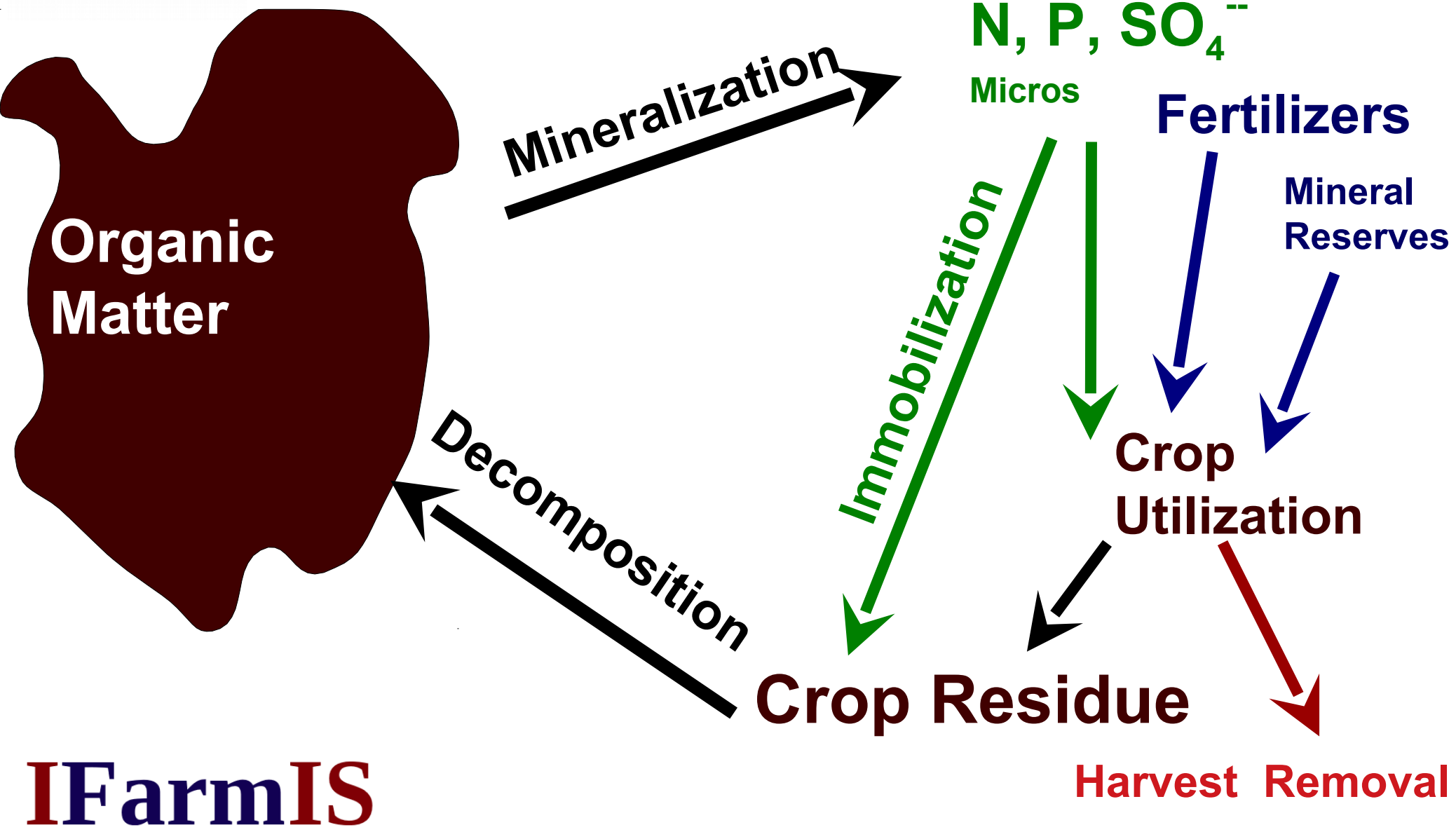

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Organic P Testing

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Location	OM	P1	P2	Organic P
Princeton, IL	2.9	35	39	513
Princeton, IL	3.6	33	60	431
Carthage, IL	2.6	21	37	348
Carthage, IL	3.0	40	69	462
New Boston, IL	2.1	23	41	314
New Boston, IL	2.7	17	47	322
Leonard, ND	2.2	29	50	423
Leonard, ND	3.8	22	47	440

Some Helpful Hints

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Phosphorus

- **Do not invest significant money into P fertilizers on a single analysis**
  - **Mehlich P alone is not enough, add a Bray P2, Organic P, Olson on high pH.**
- **Always consider other opportunities for the money**
- **Identify your own optimum and economic levels and your frequency of a profitable response**

Potassium Management

- Significant mineral reserves
- Mobility, more often than concentration is the issue
- Critical level is highly variable by soil and history
  - 90 to >300 ppm

How much K is out there?

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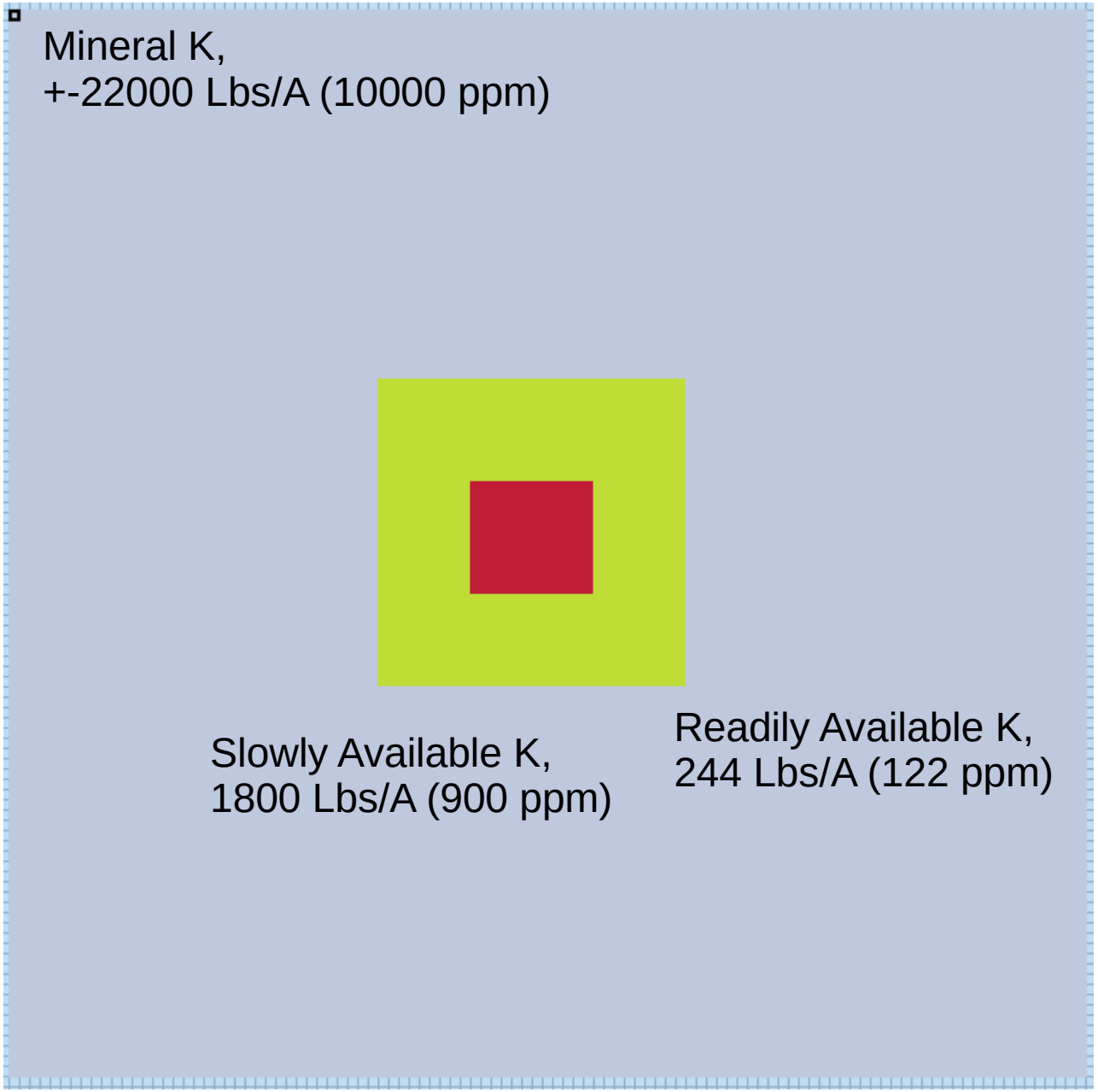
Total K, top 6 inches,
Clay Loam Midwest soil
Around 22000 Lbs per acre
Removal for 85,000 Bu.



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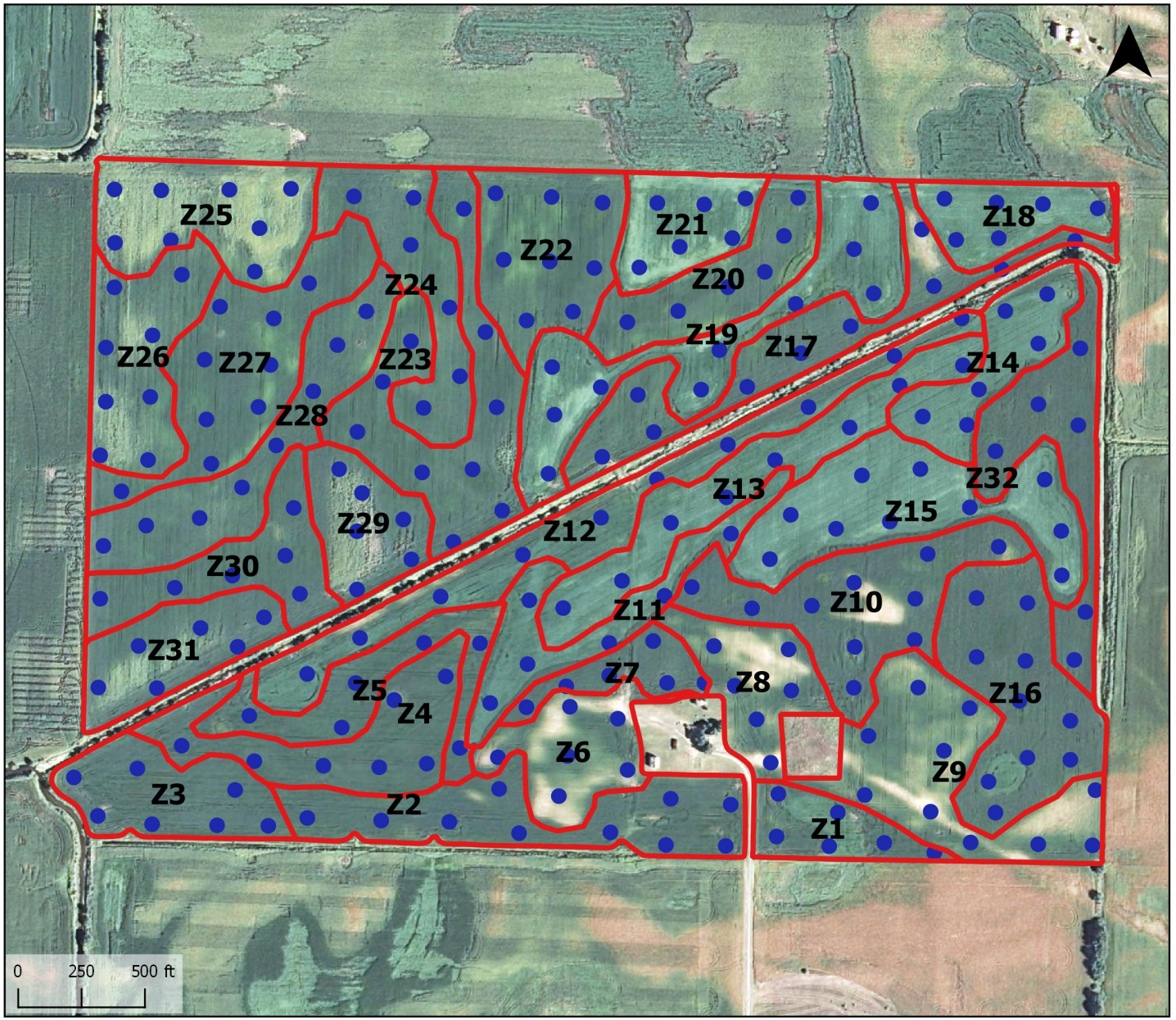
Grower: Profitable operation.	Field: Smart South; 2018F



Smart Farm Zones
Sample Farm_SAMPLE

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Karen Corrigan: 309-314-0699

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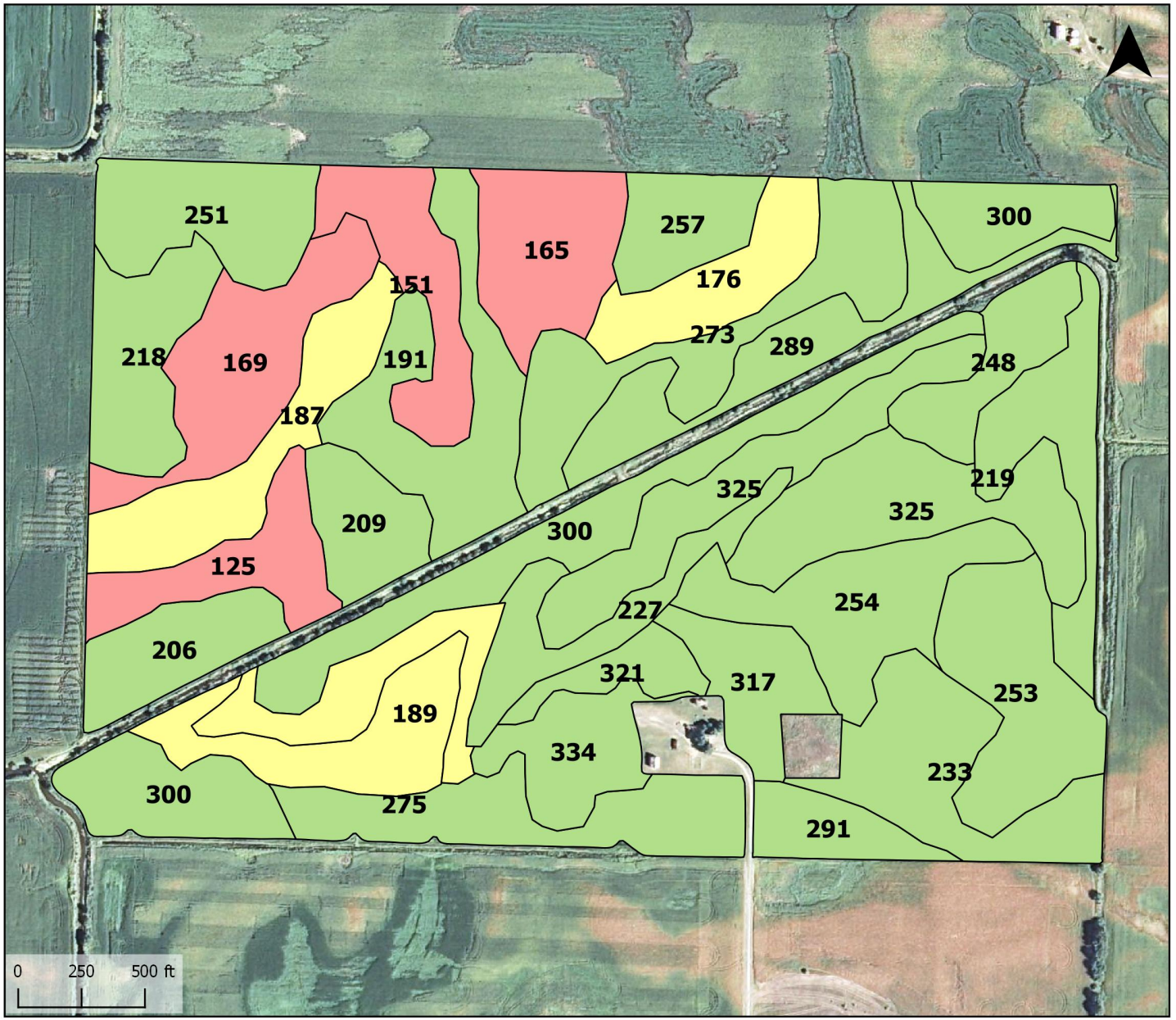

K Soil Test 2018S

- 1 - 170
- 170 - 190
- 190 - 900

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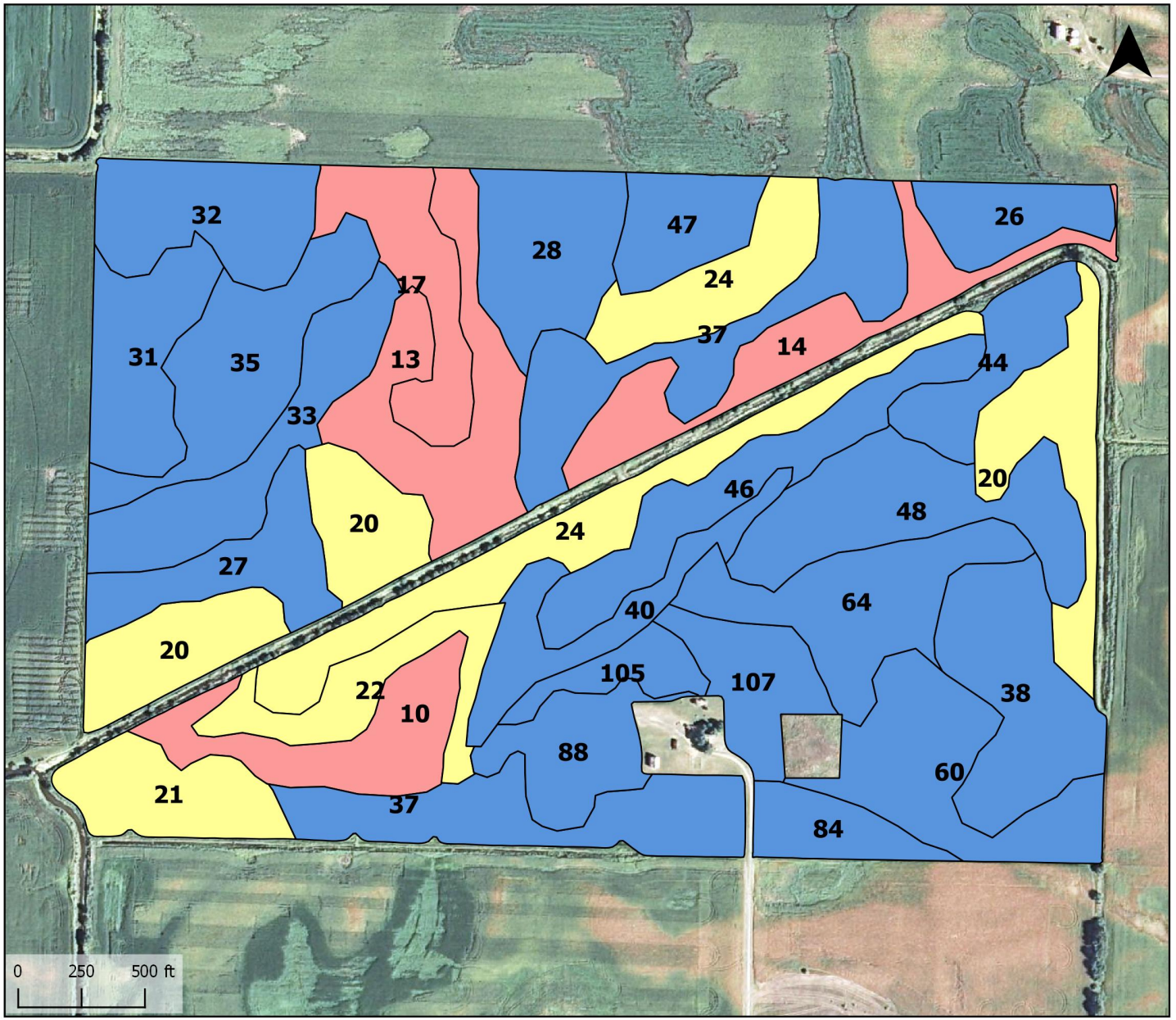

P1 (Bray) soil test 2018S

- 1 - 19
- 19 - 25
- 25 - 300

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Fertilizer “Philosophies”

- Flat rate application
- Removal by yield by field
- Removal by yield monitor
- Put what is needed where by zone, yield goal, removal and soil test level

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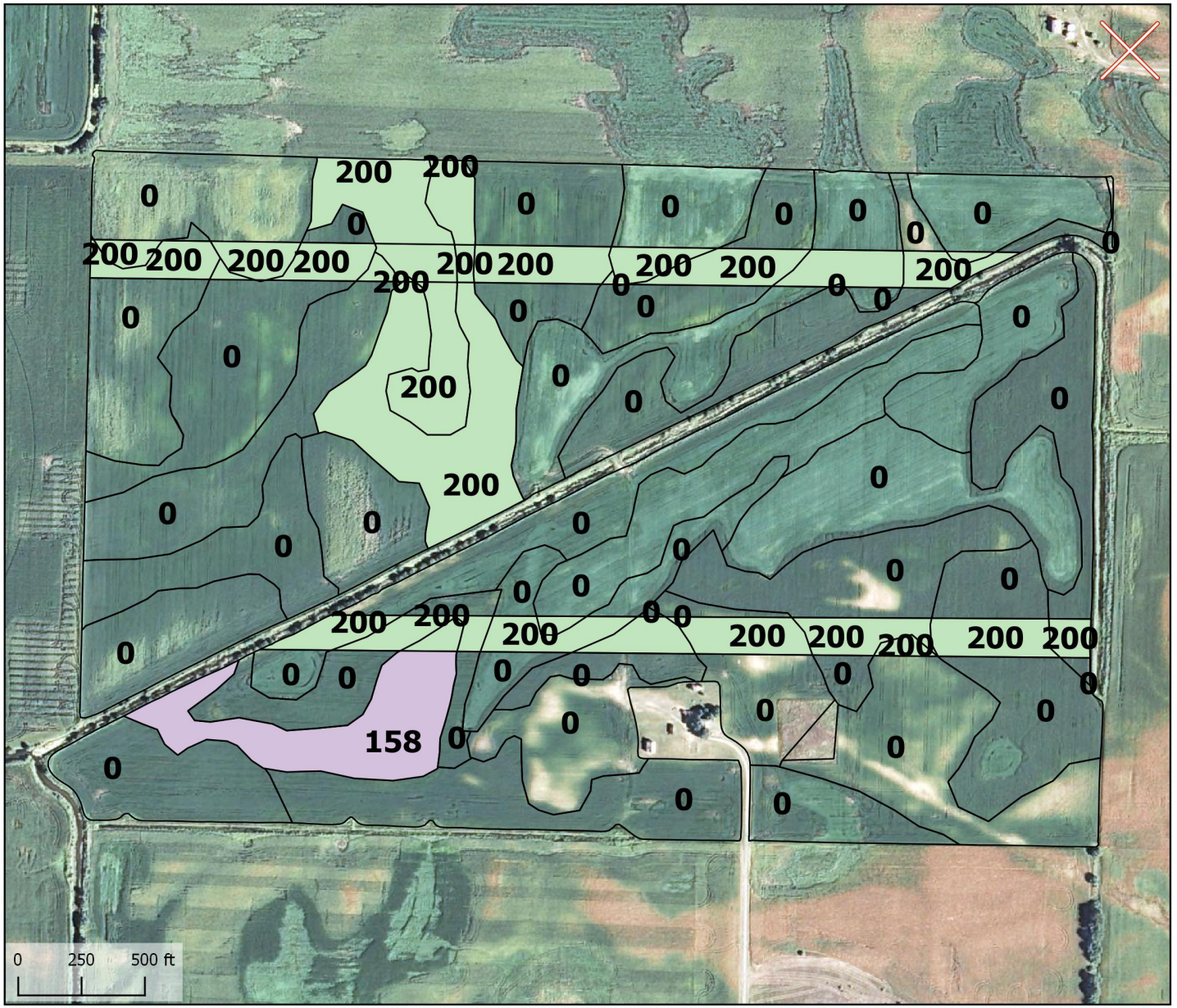
Grower: Profitable Operation	Field: Smart South; 2018F



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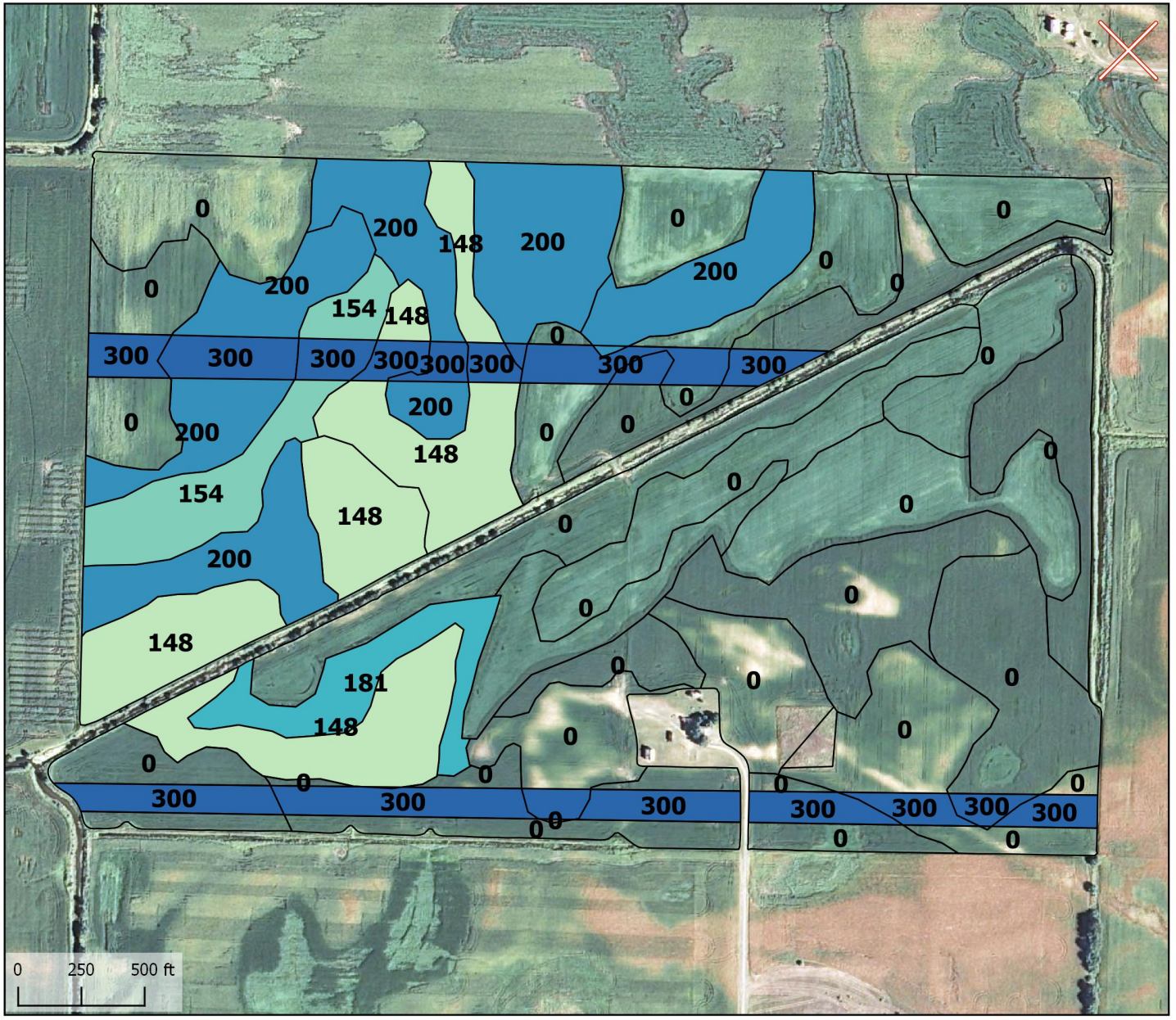

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Economics of Fertilizer Philosophies

Method	Tons Dap	Tons Potash	Application Charges	Net Cost $
Flat 150 Dap, 100 Potash	17.6	11.75	1410	15,658.50
By Removal for 203 BU. Corn	18.15	10.34	1410	15,404.50
By removal by Zone Yield	14.47	8.74	2232.50	13,579.70
Where needed by zone, soil test, yield goal, removal	2.37	7.05	2232.5	6,248.75

Dap at $552, Potash at $384, Vrt Spreading at $9.50 and SRT Spreading at $6.00


Narrow Band
Brown or Black Eyes

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