



The Yield Impact of Destratification



Marion Calmer

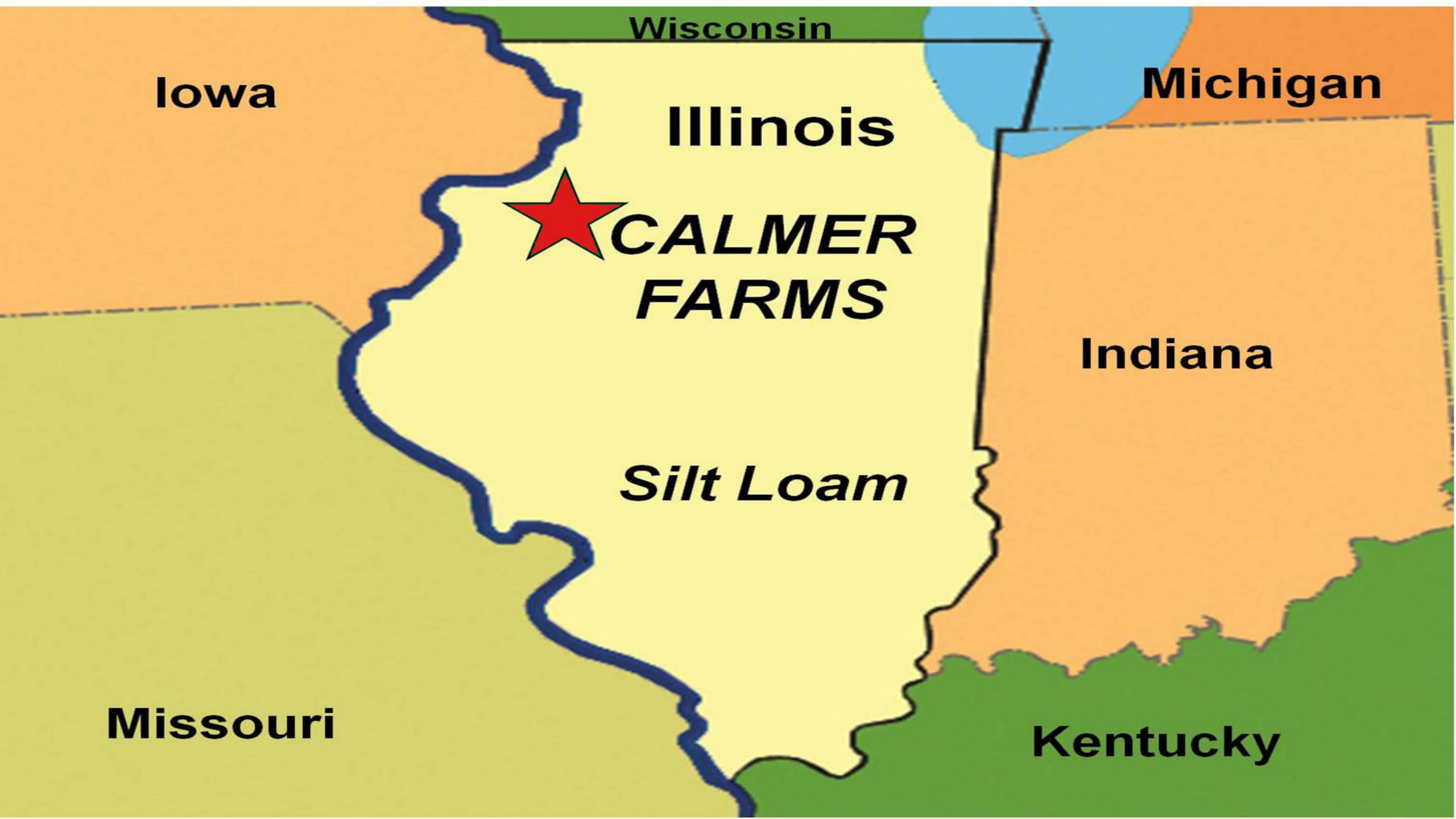
Fourth Generation Farmer in Alpha, IL

Founder of Calmer's Agronomic Research Center

Inventor of World's First 12- and 15-inch Corn Head

Founder/CEO of Calmer Corn Heads, Inc.





Wisconsin

Iowa

Michigan

Illinois

 **CALMER
FARMS**

Indiana

Silt Loam

Missouri

Kentucky

“We can’t improve on things we don’t measure or research.”

-Lord Kelvin



31st Annual
**NATIONAL
NO-TILLAGE
CONFERENCE**

January 10-13, 2023 • St. Louis, Mo.



Ag Leader



SUCCESSFUL FARMING

MAY-JUNE 1992/\$2.00

FOR FAMILIES THAT MAKE FARMING THEIR BUSINESS™

BUSINESS

Side-by-side:
**WATER TEST
KITS . . . 16**

PRODUCTION

Precision
hoeing . . . 36

Cover story:
Farmer-run
research . . . 38

FAMILY

‘Play or pay’
health care . . . 51

ON THE COVER: Alpha, Illinois, research-minded farmers are: Marion Calmer (green shirt), Gary Kness (front), Jeff Newman (red shirt). In background: Virgil Calmer, Kevin Colburn, Joe Kness. See page 38. Cover photo: Russ Munn

6.0 mph

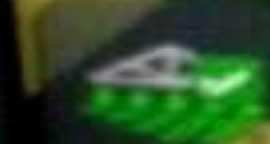


Status



View

L13



L16

Press , footswitch, or turn wheel to disengage

L17



Wedge Left



Shift Up



Wedge Right



Pause

L18



The Yield Impact of Destratification

1. What is Surface Stratification?
2. Does Surface Stratification Occur Naturally?
3. What is Destratification?
4. Is there a Yield Advantage to Destratification?



Plow Down
Phosphorus Moves 1 Inch
Potassium Moves 2 Inches



60' w/
P&K

60' w/o
P&K

60' w/
P&K

60' w/o
P&K

Over 20 years, I **spent \$936** in dry
P&K to grow **\$395** in grain



\$1 worth of P&K only grows
approx. **\$.40 back** in grain

Horizontal Variability of Phosphorus

32.5 #/AC

57 #/AC

25 #
Variability

Horizontal Variability of Potassium

268 #/AC

334
#/AC

66 #
Variability

0-2

2018

UNITED SOILS, INC.

111 South Crystal Lane • P.O. Box 226
FAIRBURY, ILLINOIS 61739
Phone (815) 692-2626

(Fill To Line)

DATE 7/1/18
NAME Marion Calmer
ADDRESS 3056 N 700th Av
Lynn Center IL
FIELD ID Cal West
SAMPLE NO. 0-2

2-4

2018

UNITED SOILS, INC.

111 South Crystal Lane • P.O. Box 226
FAIRBURY, ILLINOIS 61739
Phone (815) 692-2626

(Fill To Line)

DATE 7/1/18
NAME Marion Calmer
ADDRESS _____
FIELD ID Cal West
SAMPLE NO. 2-4

4-6

2018

UNITED SOILS, INC.

111 South Crystal Lane • P.O. Box 226
FAIRBURY, ILLINOIS 61739
Phone (815) 692-2626

(Fill To Line)

DATE 7/1/18
NAME Marion Calmer
ADDRESS _____
FIELD ID Cal West
SAMPLE NO. 4-6

6-8

2018

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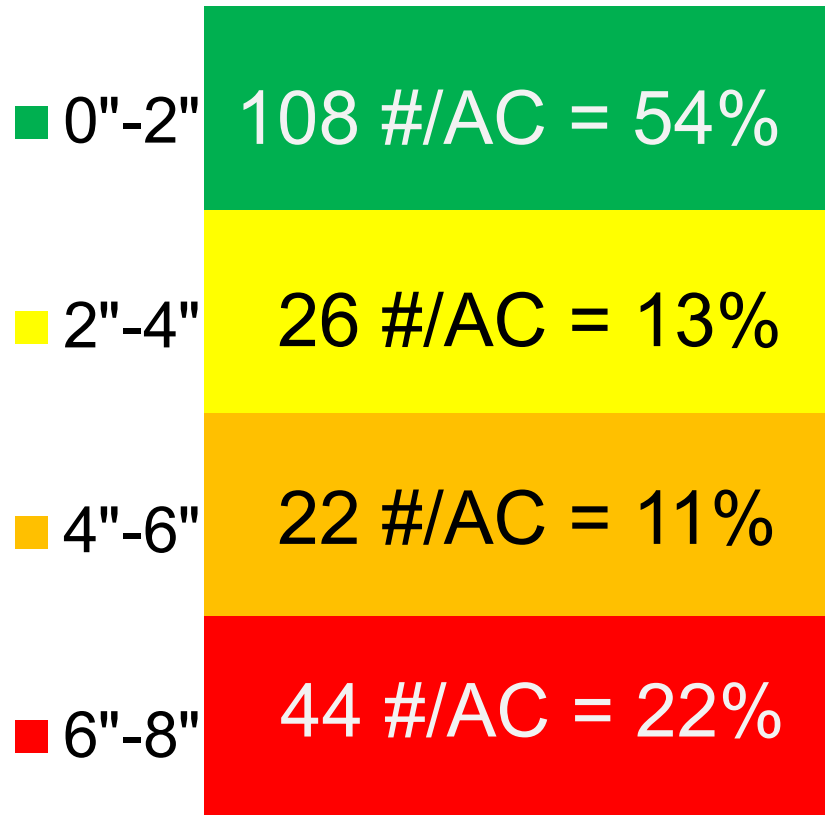
(Fill To Line)

DATE 7/1/18
NAME Marion Calmer
ADDRESS _____
FIELD ID Cal West
SAMPLE NO. 6-8



2018 Soil Test

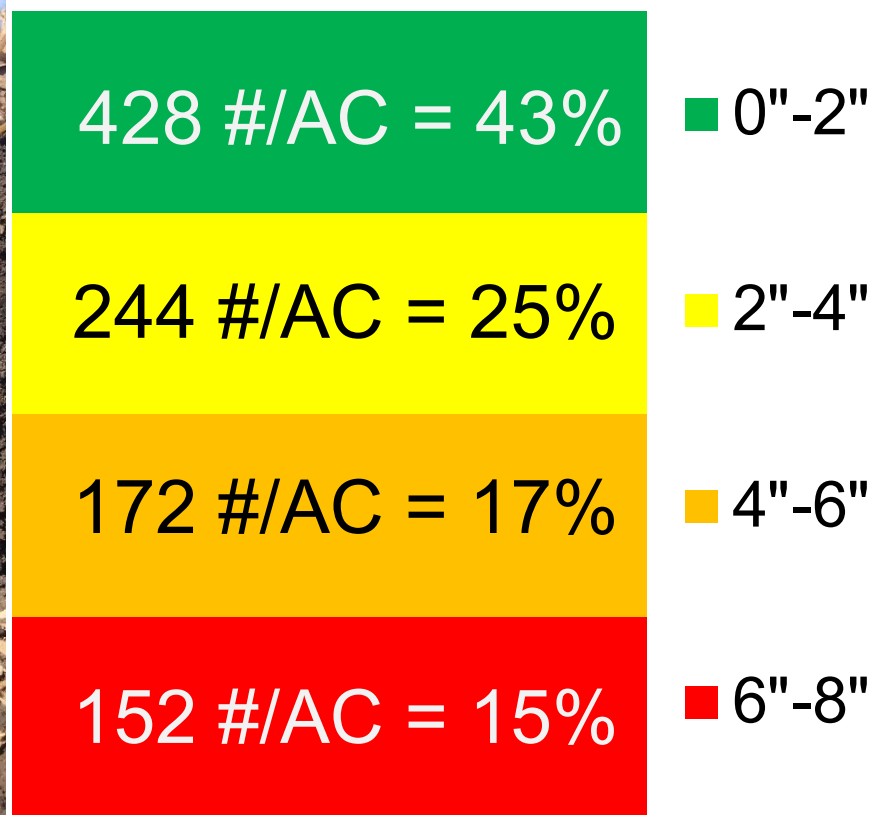
Phosphorus
Avg. 50 #/AC



\$750 worth of P&K applied over 10 years



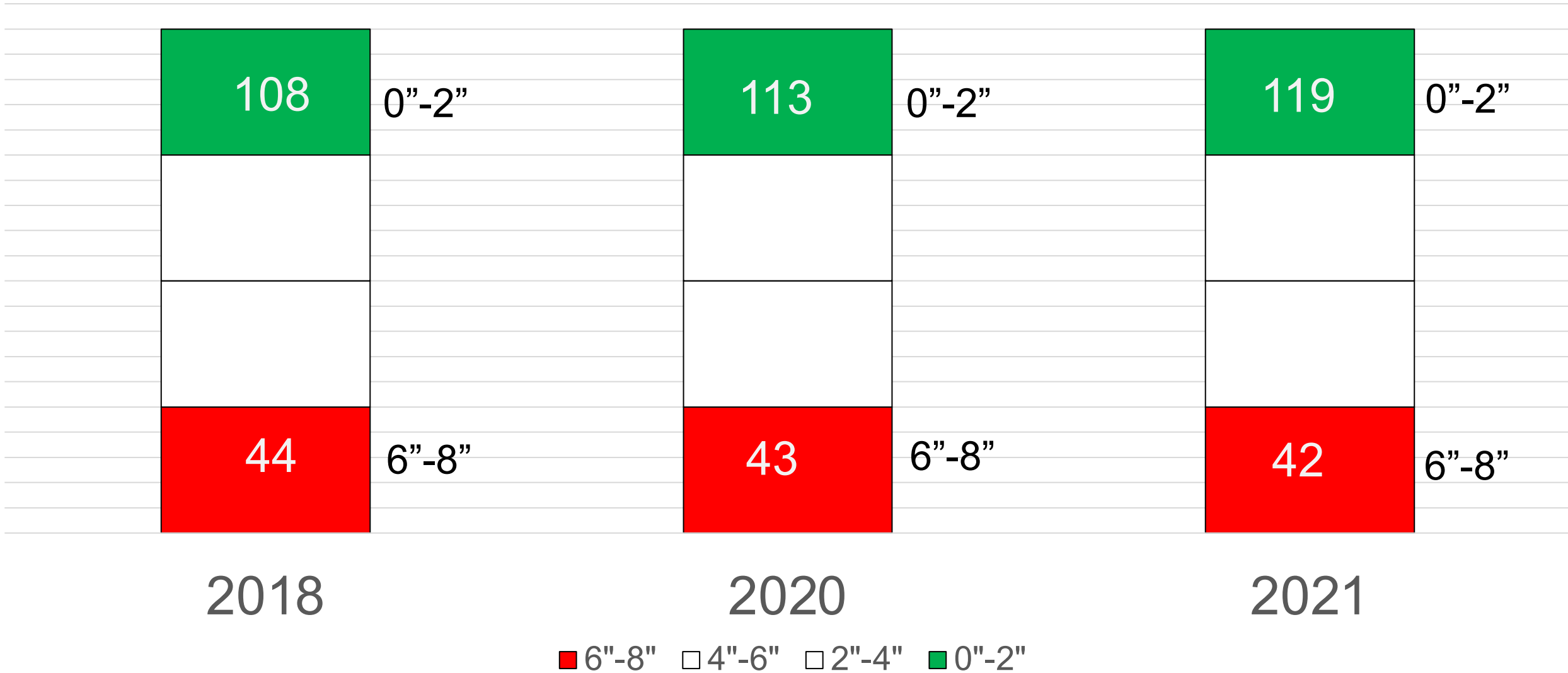
Potassium
Avg. 249 #/AC



\$750 worth of P&K applied over 10 years

Phosphorus Levels

#/AC



600 OLD BT CHOPPER

600 OLD BT CHOPPER

600 NEW BT C
709



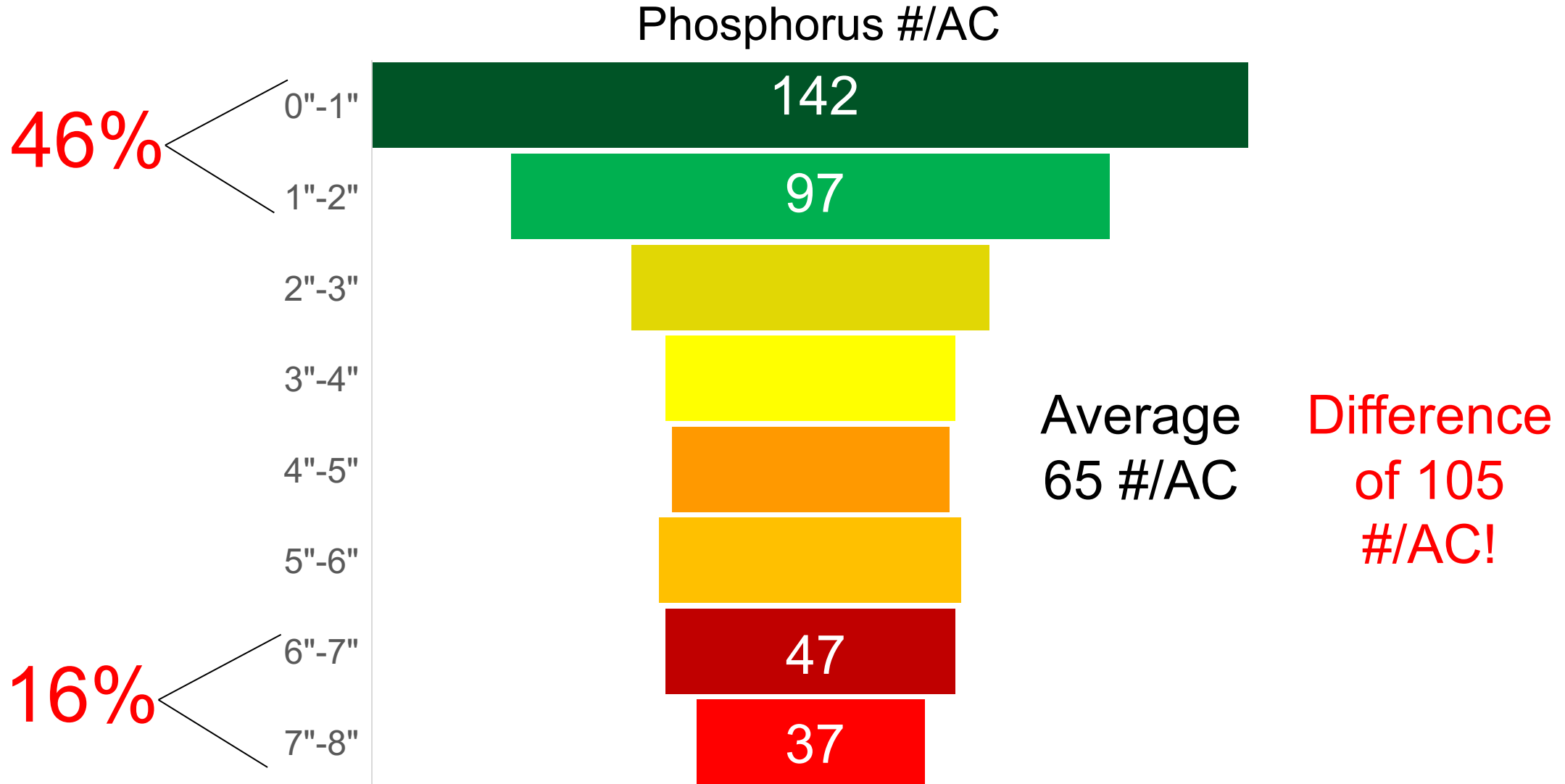
0-1" 1-2" 2-3" 3-4" 4-5" 5-6" 6-7" 7-8"





Purple Leaves =
Phosphorus
Deficiency

14 Years of Surface-Applied Phosphorus

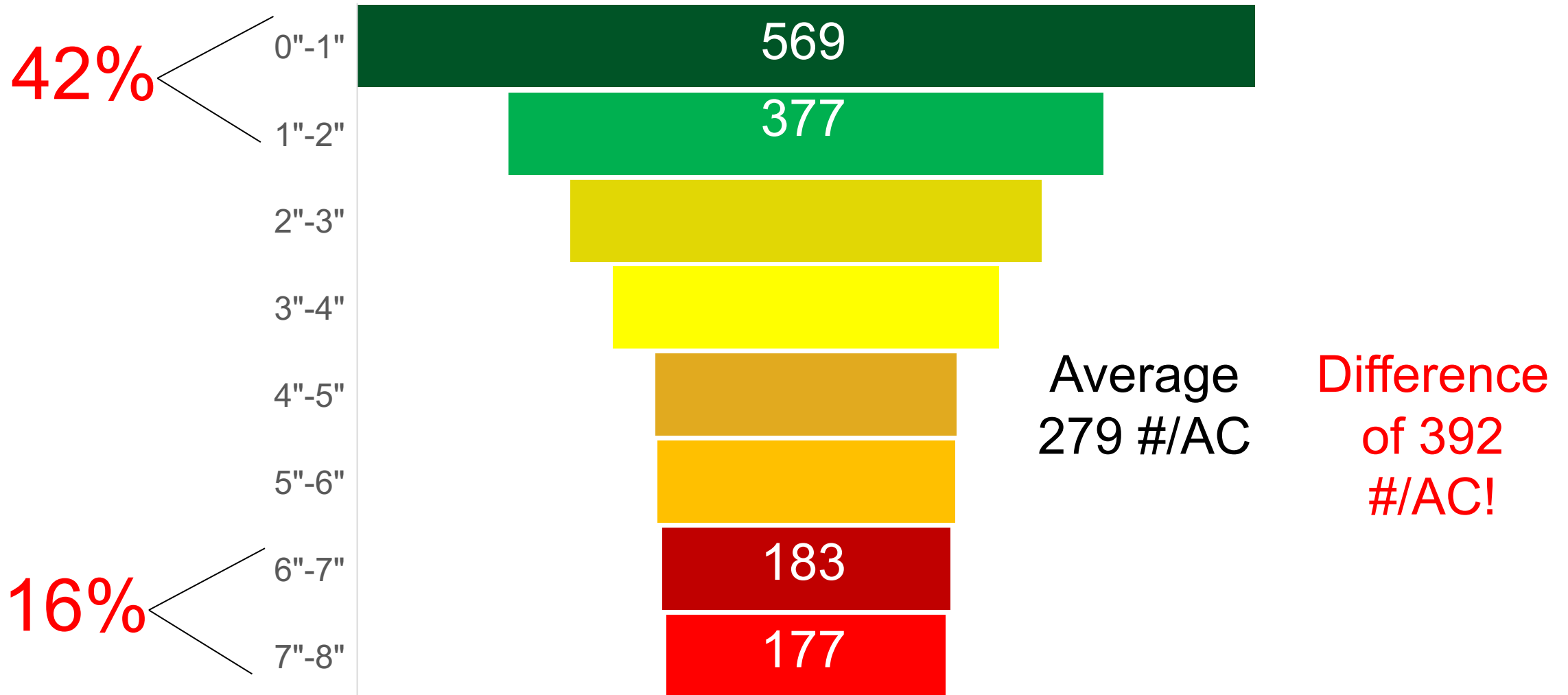




Burnt Yellow Edges = Potassium Deficiency
Yellow Center = Nitrogen Deficiency

14 Years of Surface-Applied Potassium

Potassium #/AC



Nutrient Variability

Horizontal

Vertical

P

25 #/AC

105 #/AC

K

66 #/AC

392 #/AC



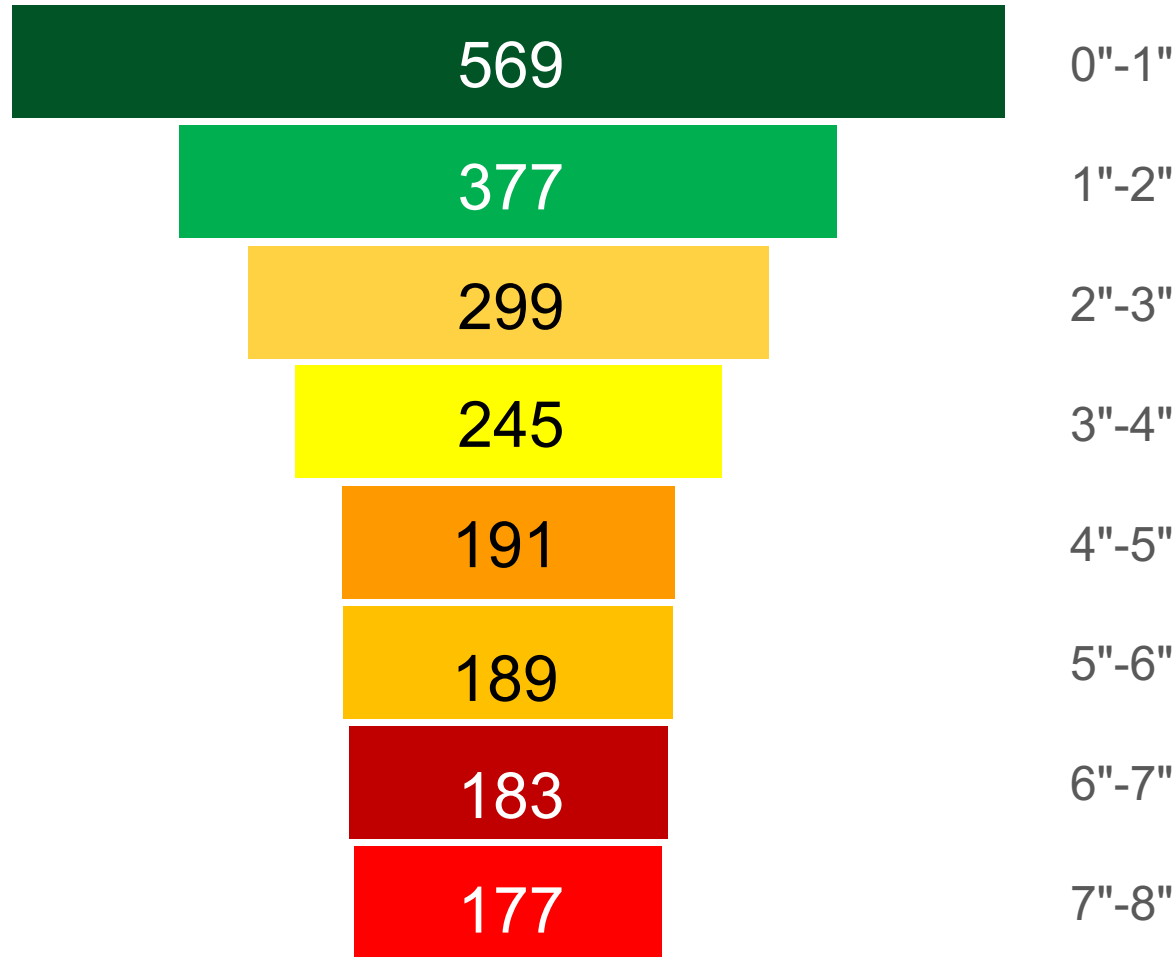
2021
Soil Tests
Before and After
Moldboard Plowing



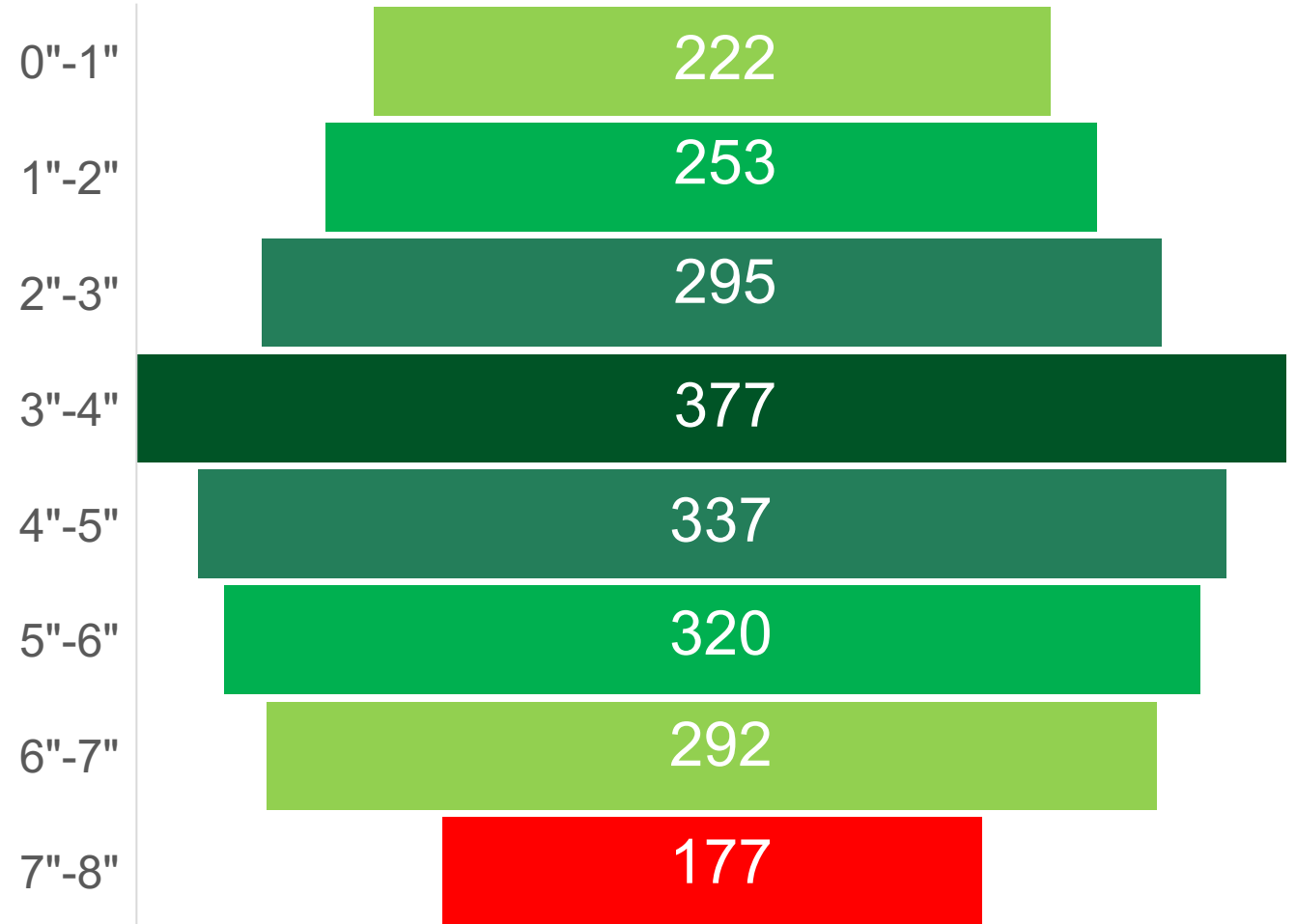
Potassium

Before vs. After Moldboard Plowing

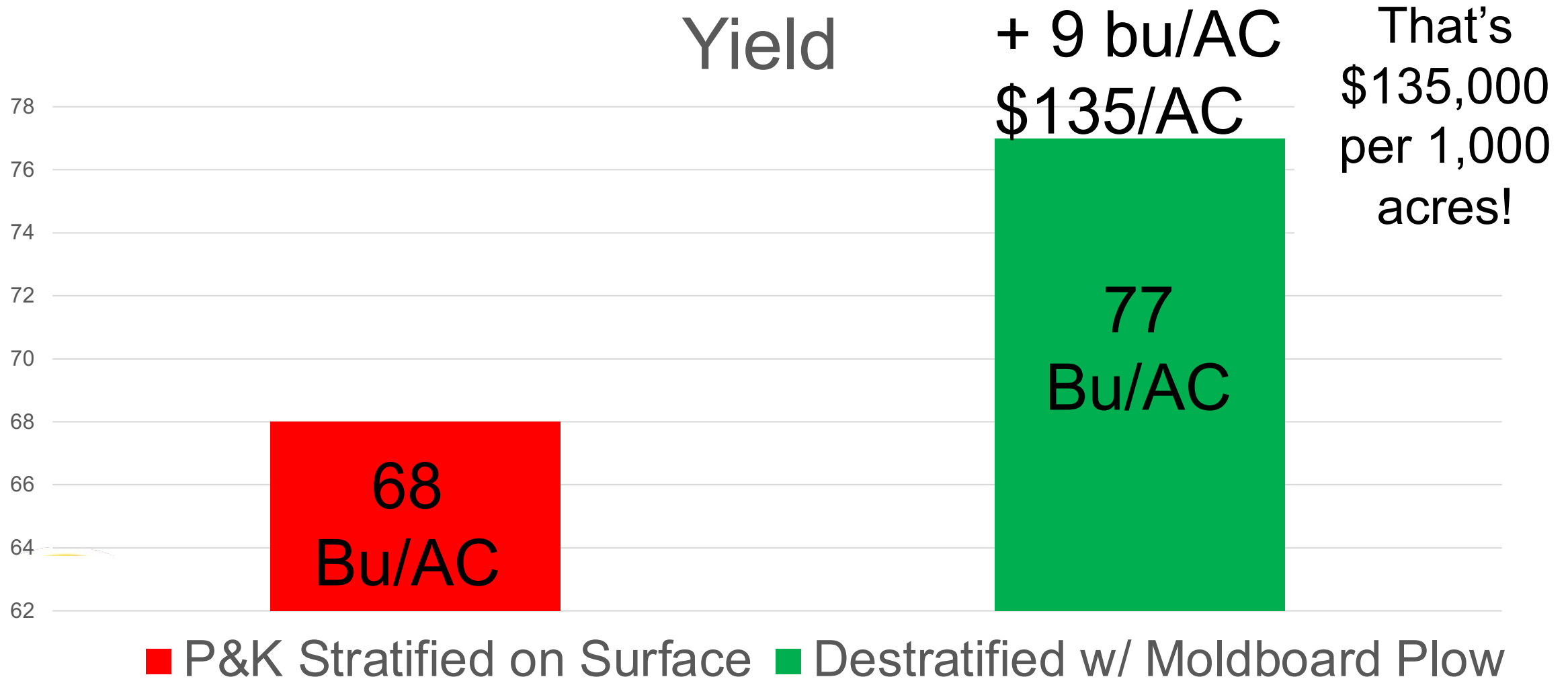
Average: 279 #/AC



Average: 284 #/AC



Yield Advantage to Destratification



Year-Long P&K Study

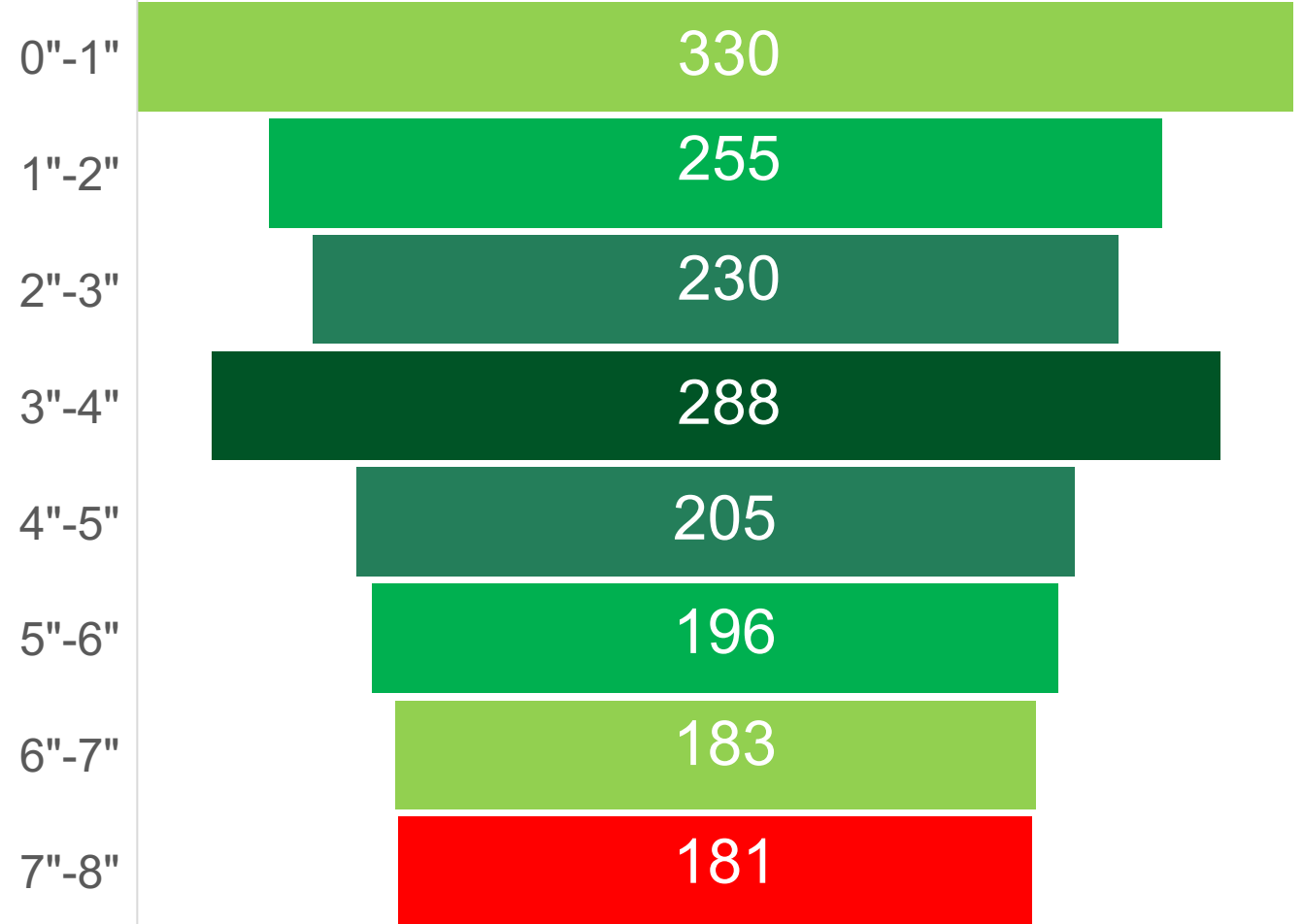
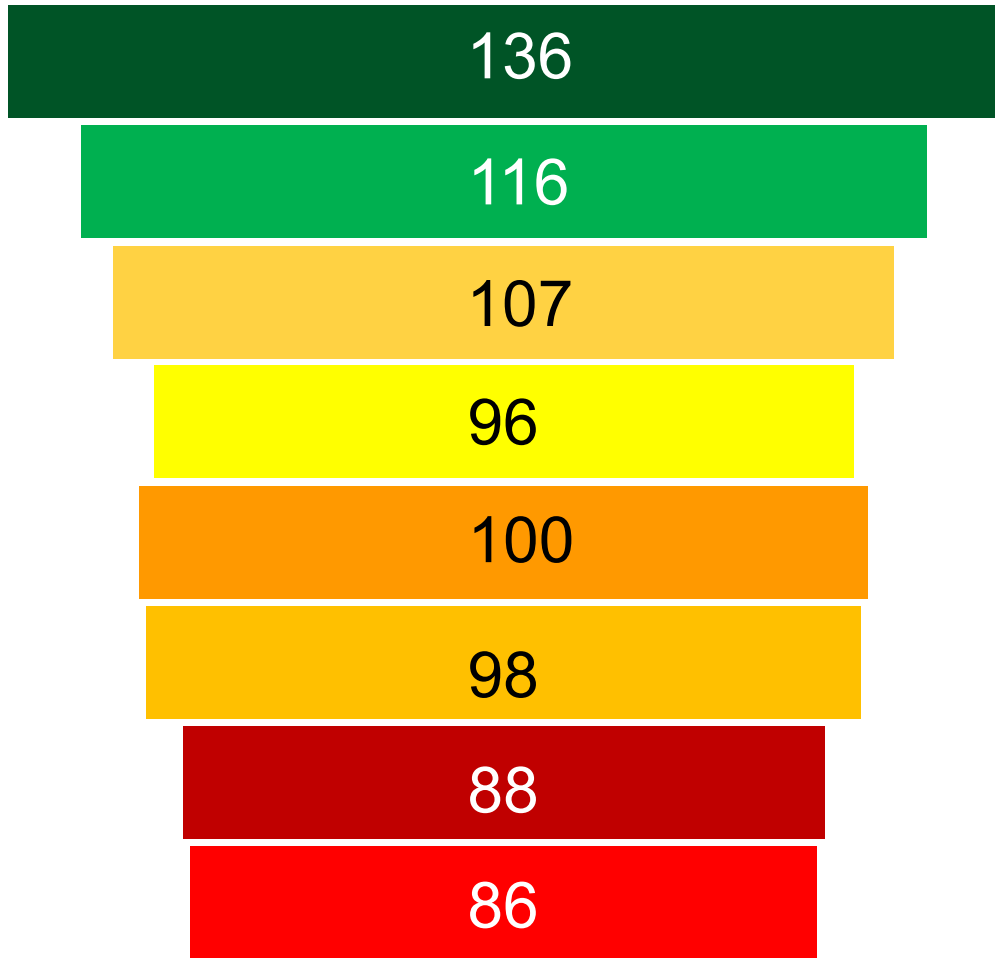
No-Till

31% of P in Top 2".
37% Variability from 0"-1" vs. 7"-8"

31% of K in Top 2"
45% Variability from 0"-1" vs. 7"-8"

Phosphorus: Avg. 103 #/AC

Potassium: Avg. 233 #/AC



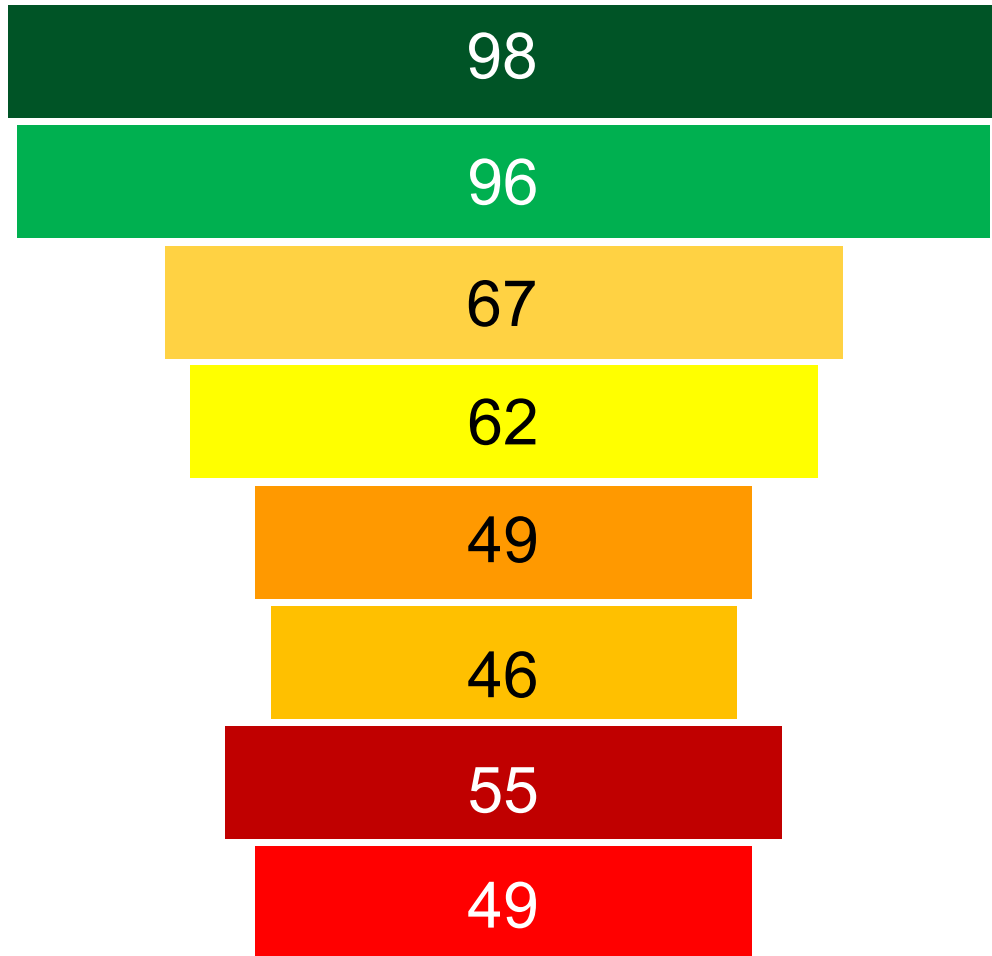
Year-Long P&K Study

Tillage

37% of P in Top 2"

50% Variability from 0"-1" vs. 7"-8"

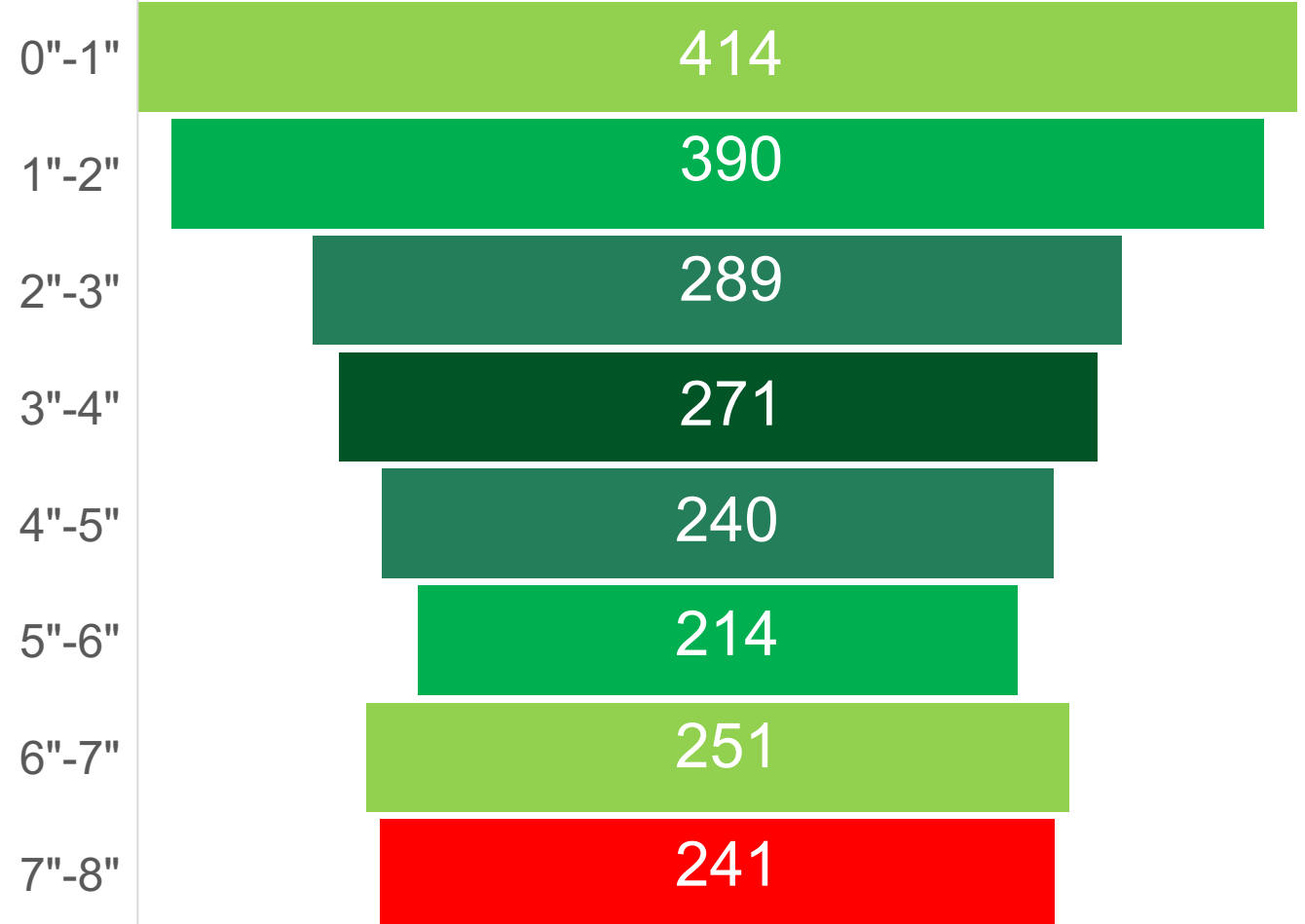
Phosphorus: Avg. 65 #/AC



35% of K in Top 2"

42% Variability from 0"-1" vs. 7"-8"

Potassium: Avg. 289 #/AC





MANSON BROTHERS

DELTA
750

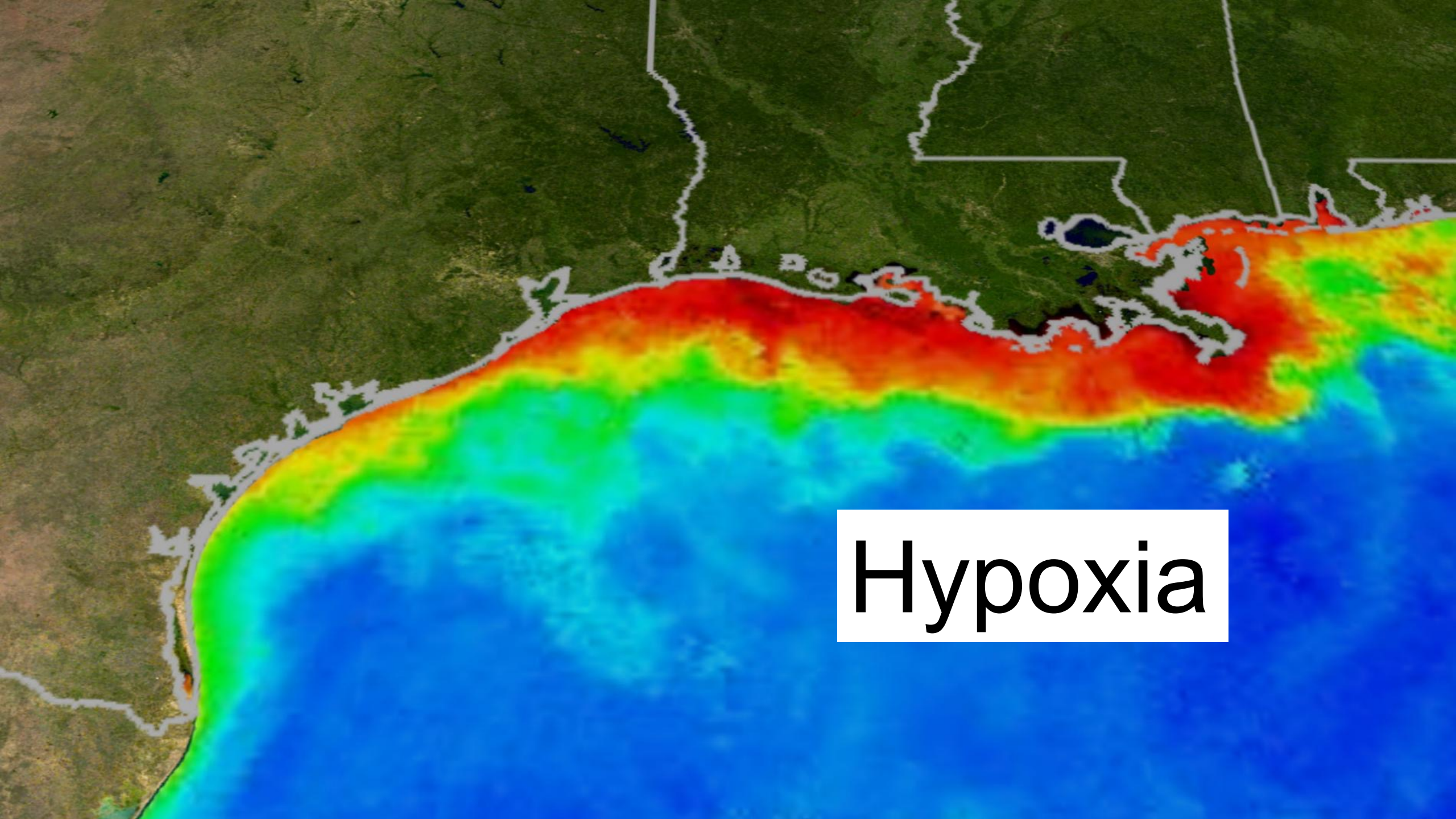
750
750



FEATURE STORY

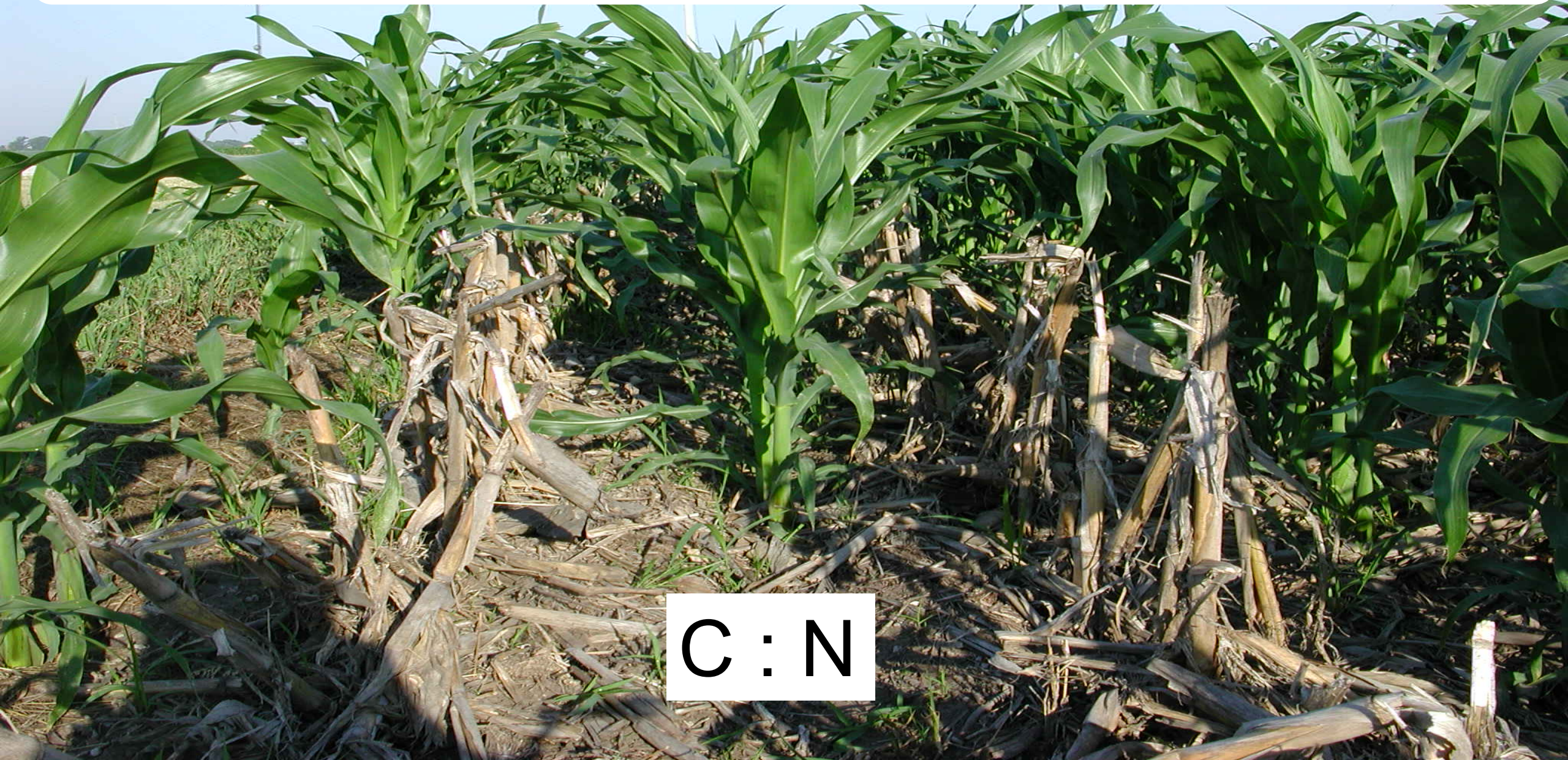






Hypoxia

Does Growing Plants Cause Vertical Stratification?



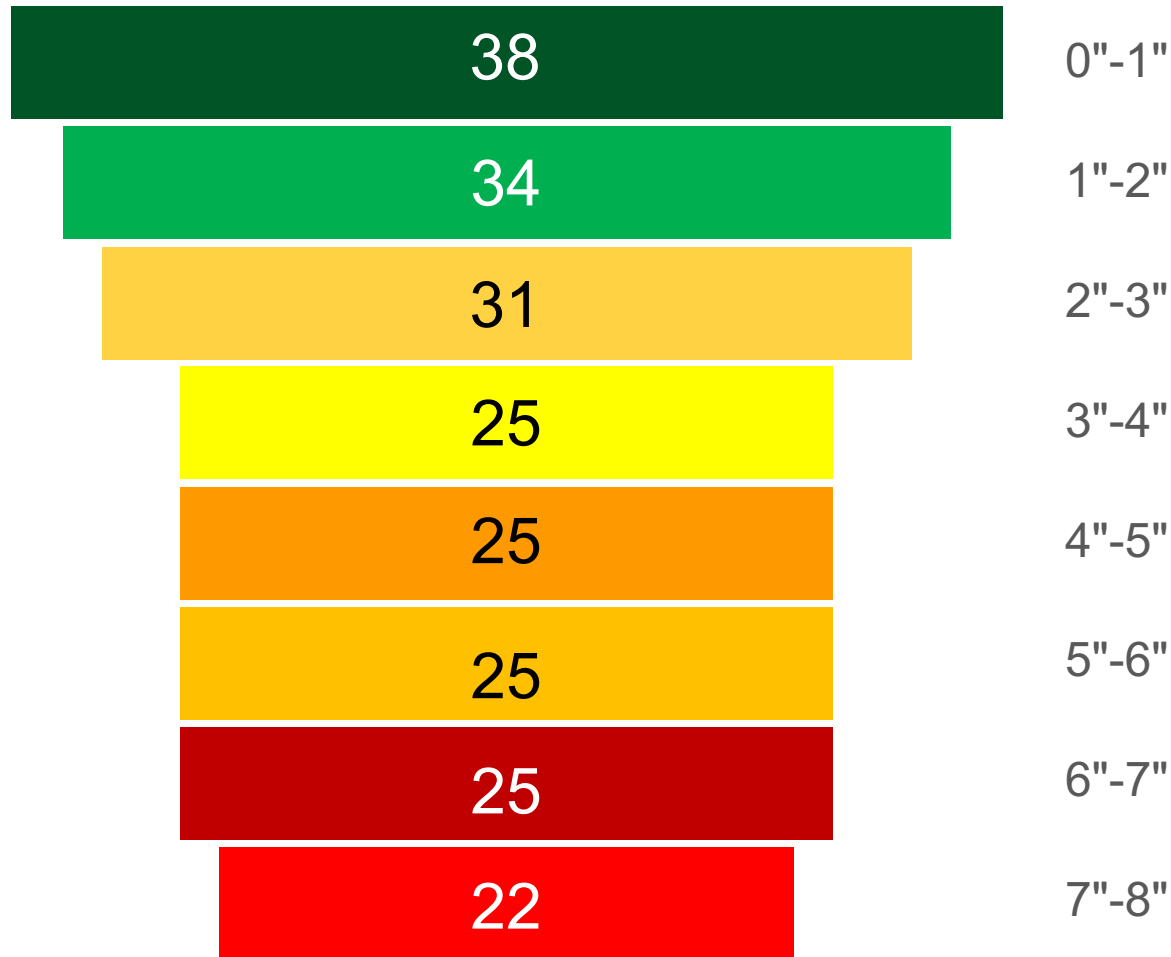
C : N



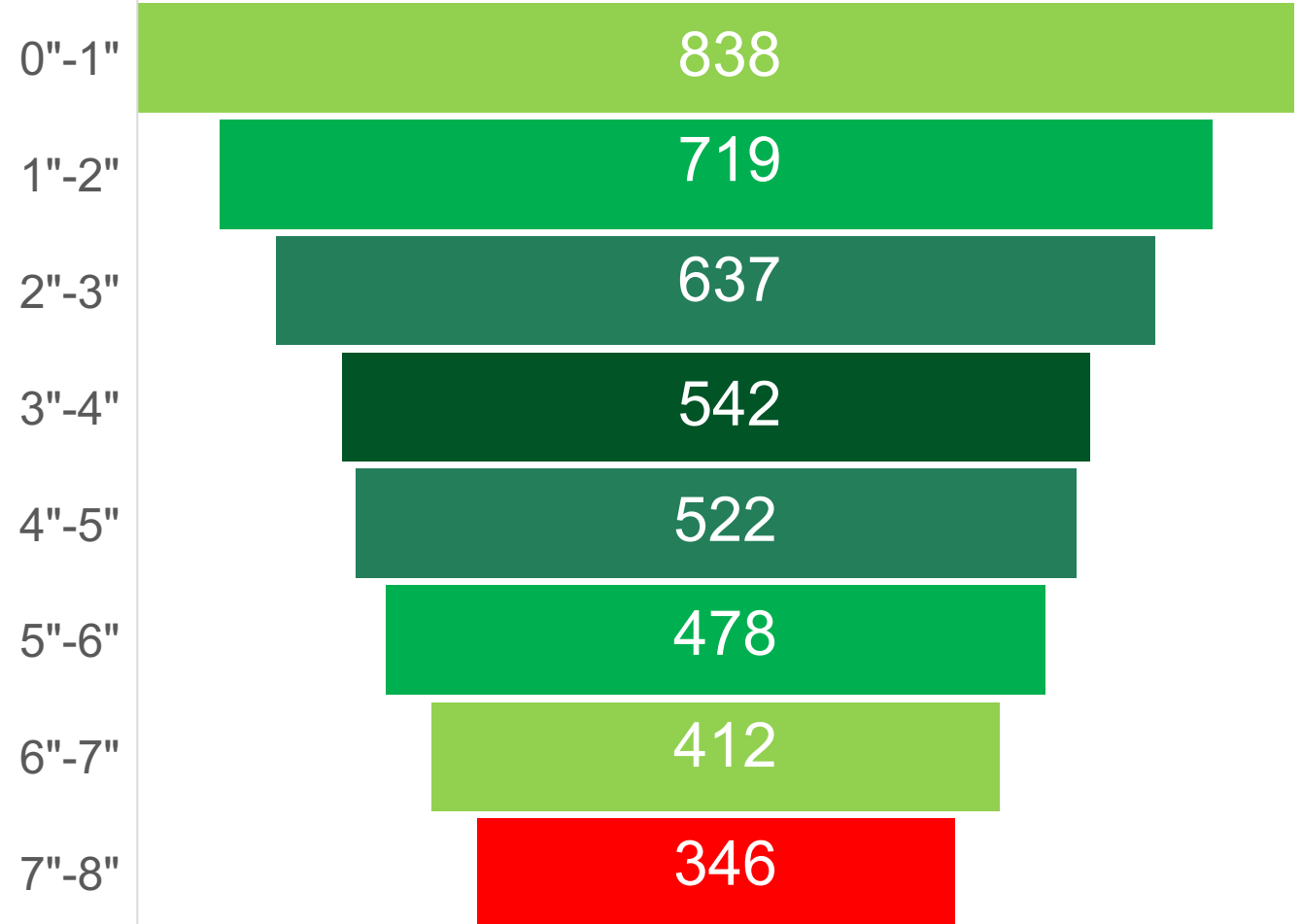
Phosphorus and Potassium

Virgin Soil 2022

Phosphorus: Avg. 28 #/AC

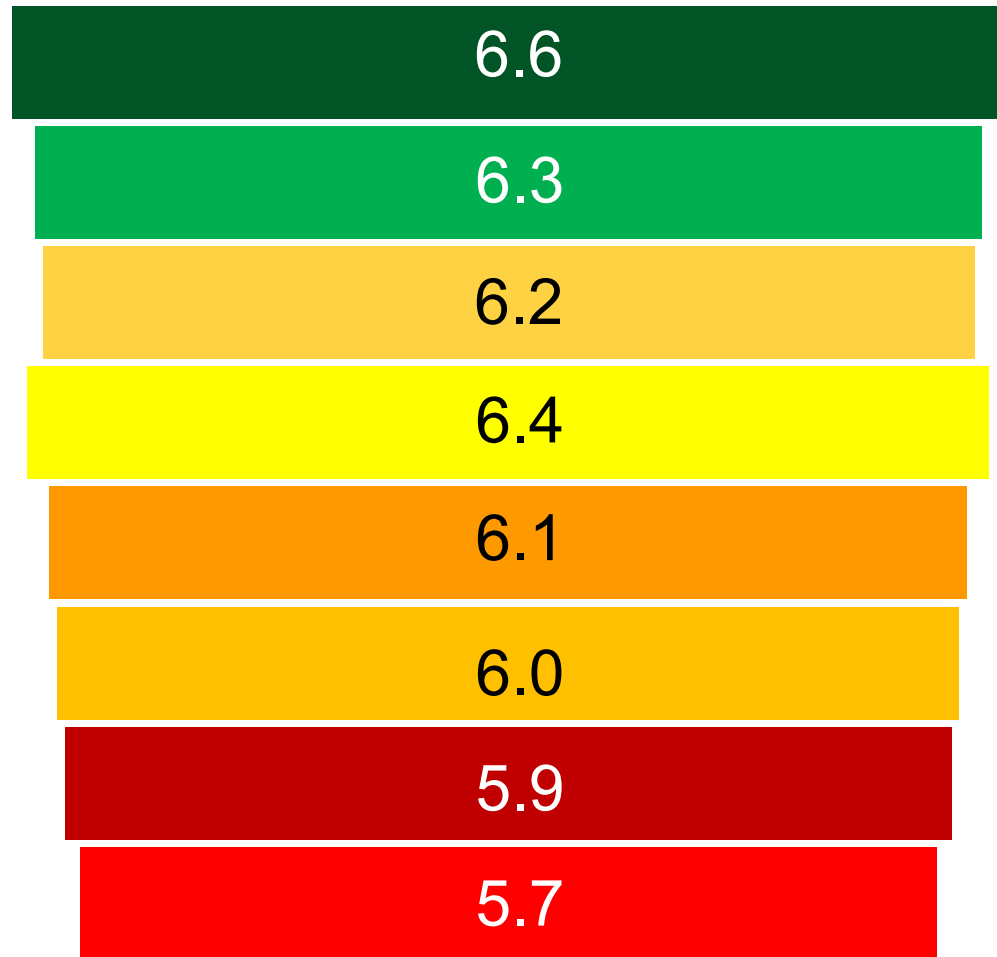


Potassium: Avg. 562 #/AC



pH and OM % Virgin Soil 2022

pH: Avg. 6.2



OM %: Avg. 2.5





10.11.2009

Photo Source: David Brandt

Marion and Herman Warsaw in 1985

370 bu/AC



Marion and Francis Childs in 2002

442 bu/AC



Marion and Randy Dowdy in 2016

521 bu/AC



Marion and David Hula in 2020 616 bu/AC





Herman Warsaw
First Producer to Raise 300 bu. / ac. corn



The AgroVantage® System









Key Takeaways

1. Subsurface P&K application increases profitability.
2. Subsurface P&K application reduces environmental impact.
3. 1) Horizontal P variability = 25 # 2) Vertical P variability = 105 #
4. Vertical stratification doesn't go away. It gets worse!
5. Vertical stratification is not caused by no-till.
6. Soybean yield adv. to destratification = 9 bu. X \$15 = **\$135/AC**
7. Yield Advantage in Corn? Find out at NNTC 2024!



Marion's Goal in the Future

Place P&K in the root zone, not on
top of the root zone!



2188

Soybeans Only

2577

Corn Only

S-680

Corn & Soybeans

9120

Corn Only



Marion's Handouts



Marion's Cell: 309-368-1182
 CalmerCornHeads.com