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PLANT AND SOIL SCIENCES

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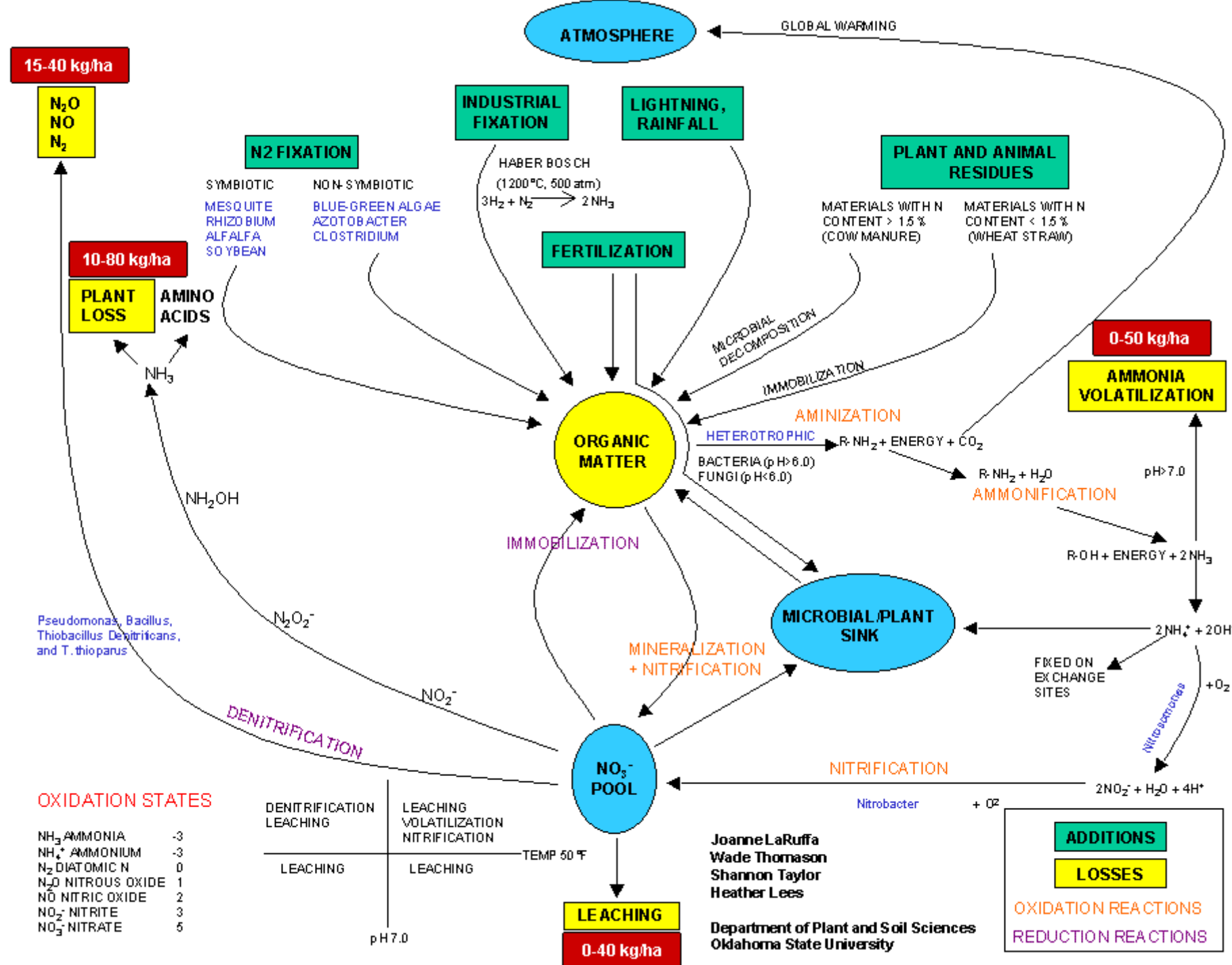
www.AgLandLease.info

A website to bridge the gap between Landlords and Leesses

Value of in-season Nutrient Management

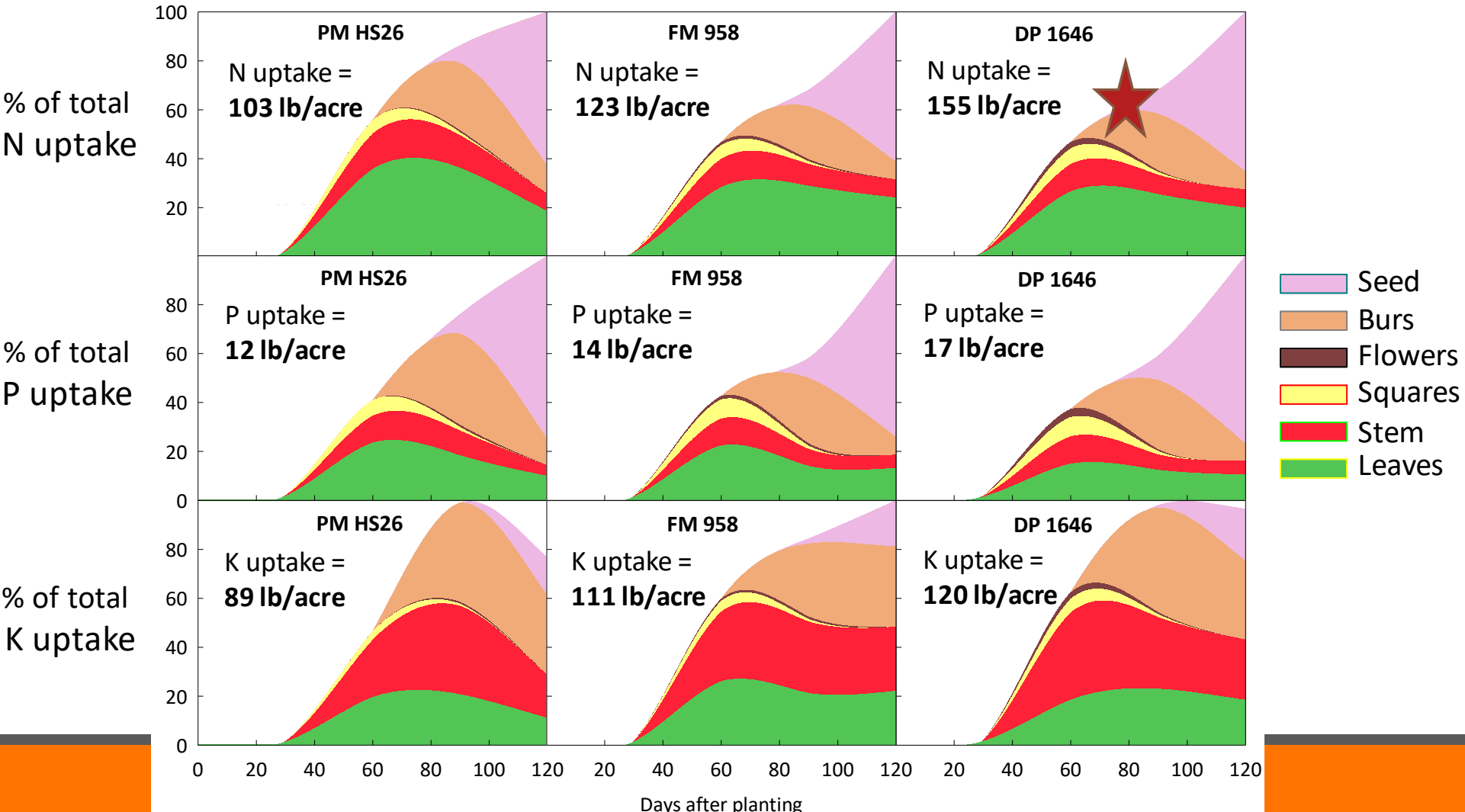
BRIAN ARNALL -PRECISION NUTRIENT MANAGEMENT

OKLAHOMA STATE UNIVERSITY



Dr. Lewis Findings

Fruit of modern cultivars are more nutrient-dense than previously reported



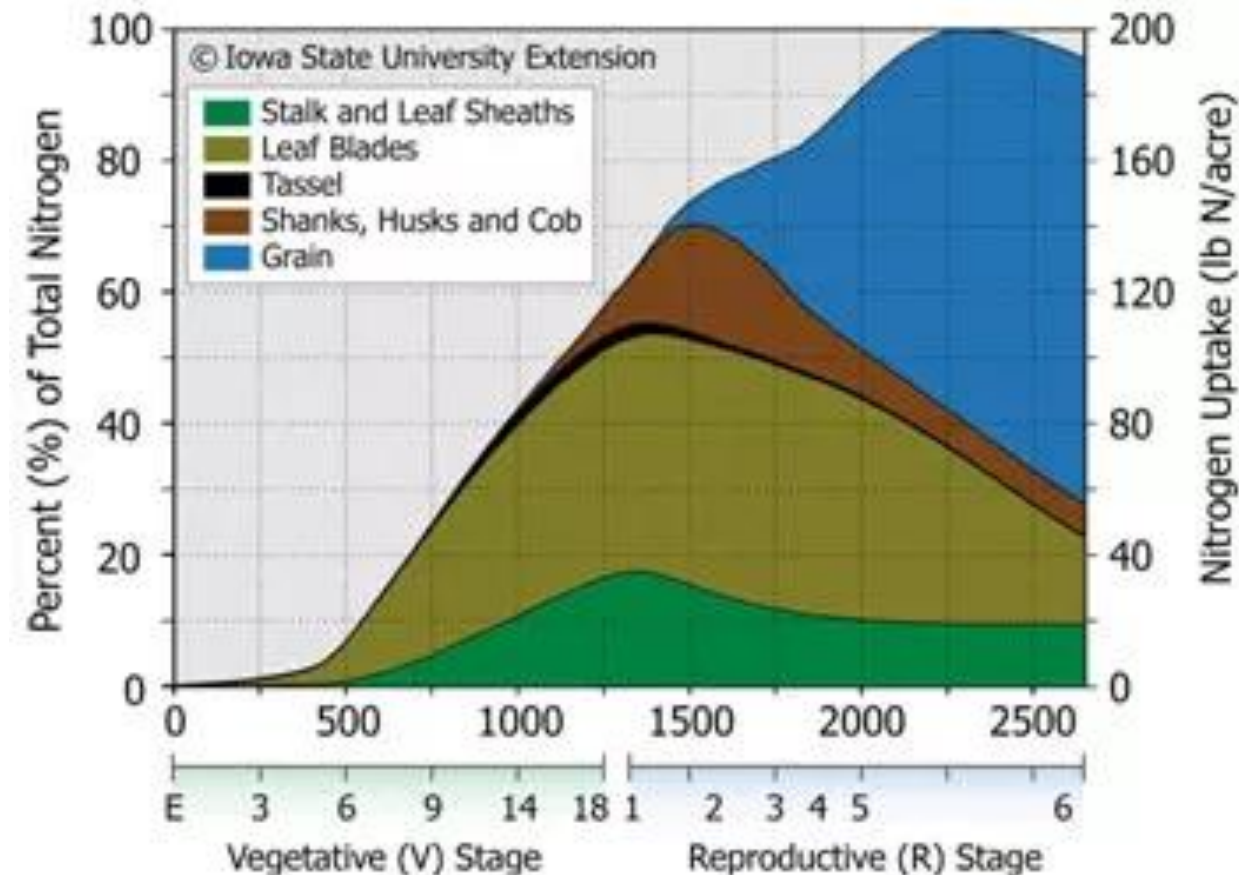
Nitrogen uptake Corn

<10% of N is taken up by V6.

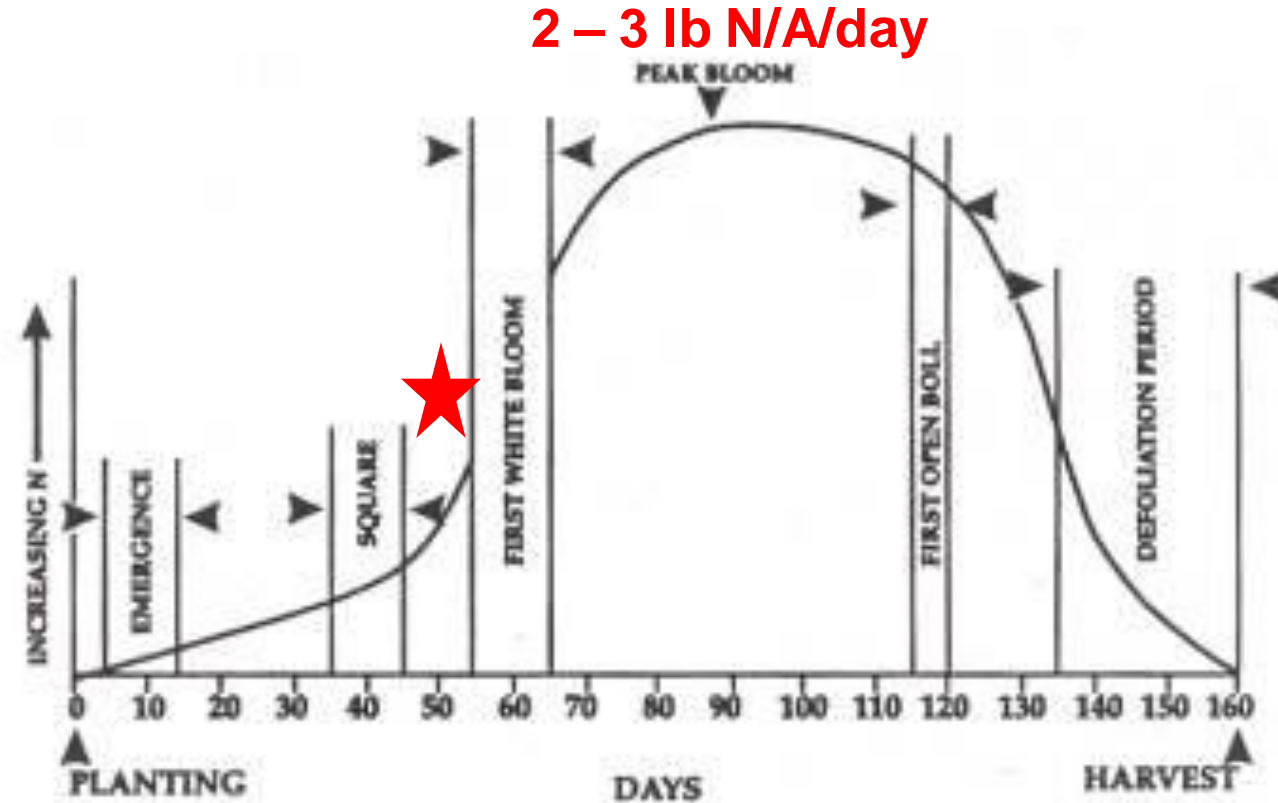
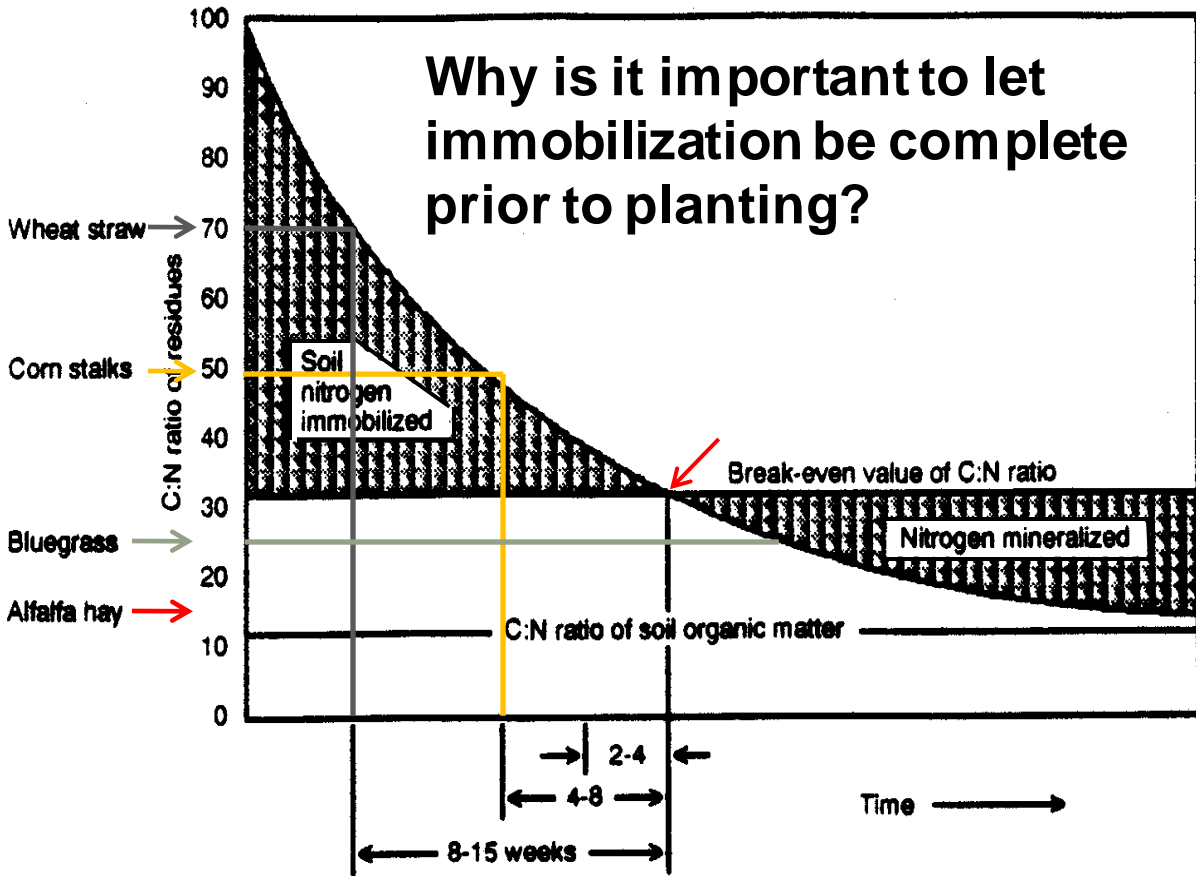
60% taken up by R1.

We now you wont Lose N in the High Plains

But Use time to your advantage, with High N Prices.

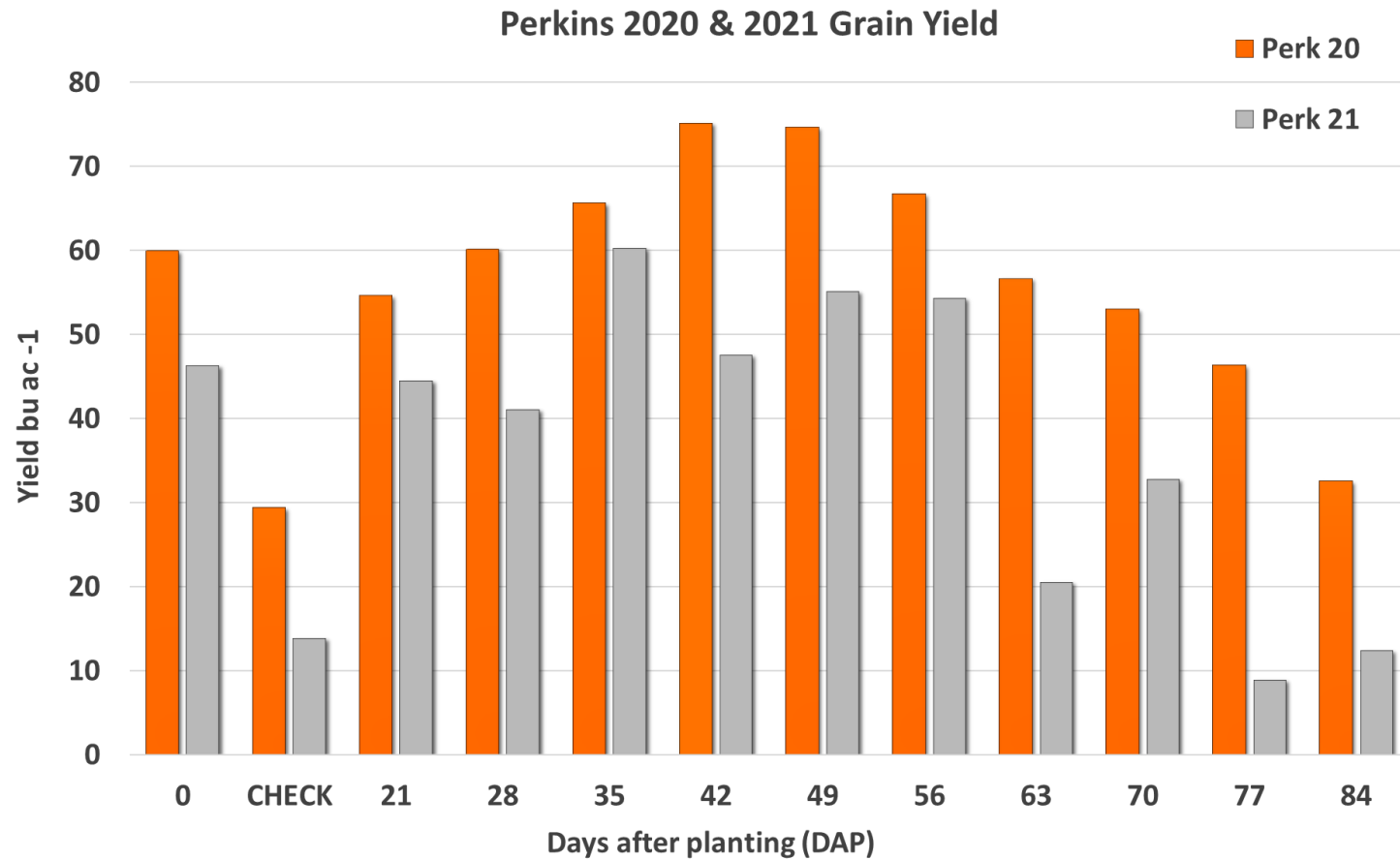


Nitrogen Availability and Demand



Time required for completion of N immobilization
as affected by C:N ratio of crop residue

Sorghum Nitrogen



Sorghum Nitrogen – Burn



Urea Broadcast

Urea Between Row

UAN Flat Fan 20"

UAN Streamer 60" Drop

UAN Streamer 60"

UAN Streamer 30"

UAN Streamer 30" Drop

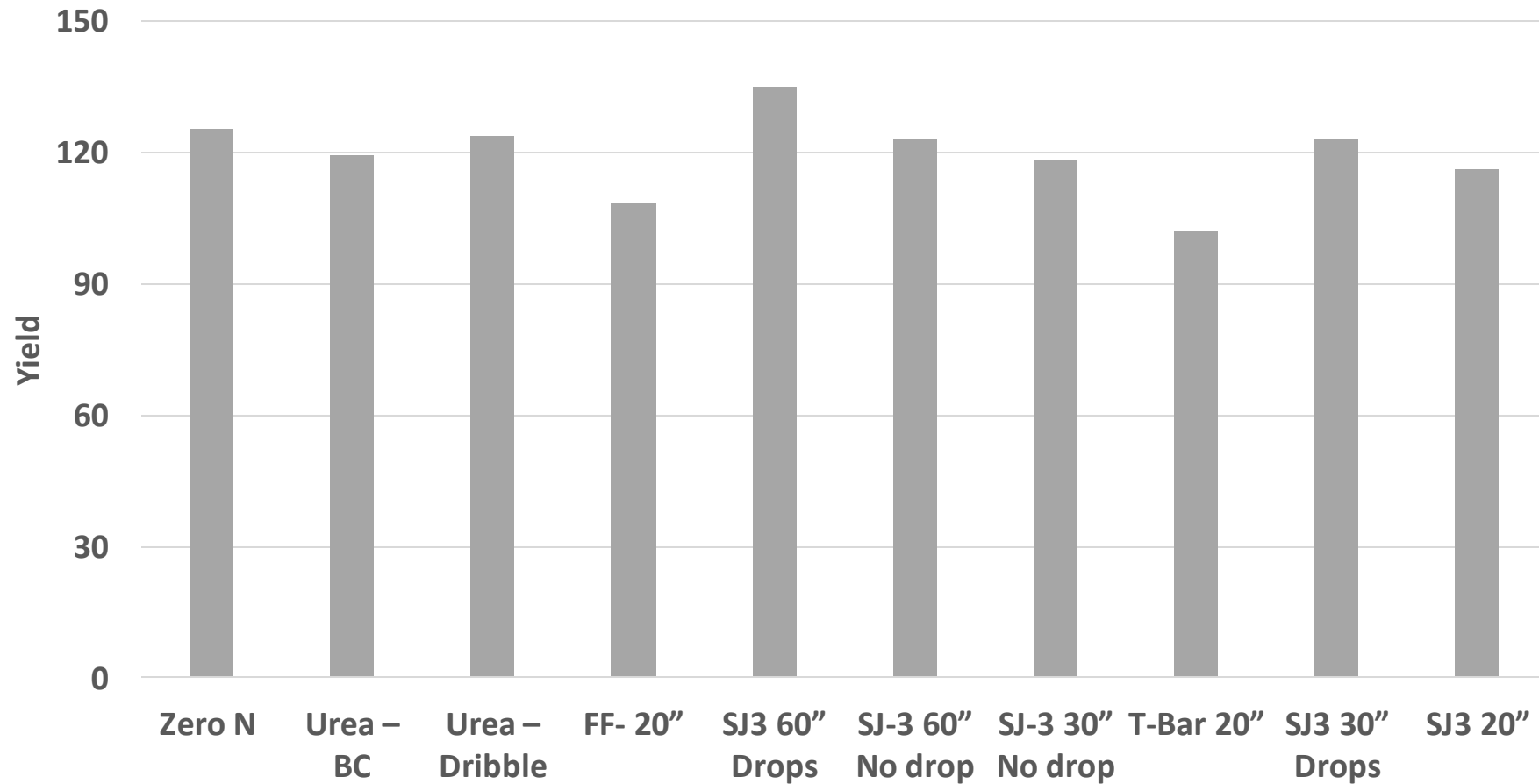
UAN Streamer 20"

UAN T-Bar 20"

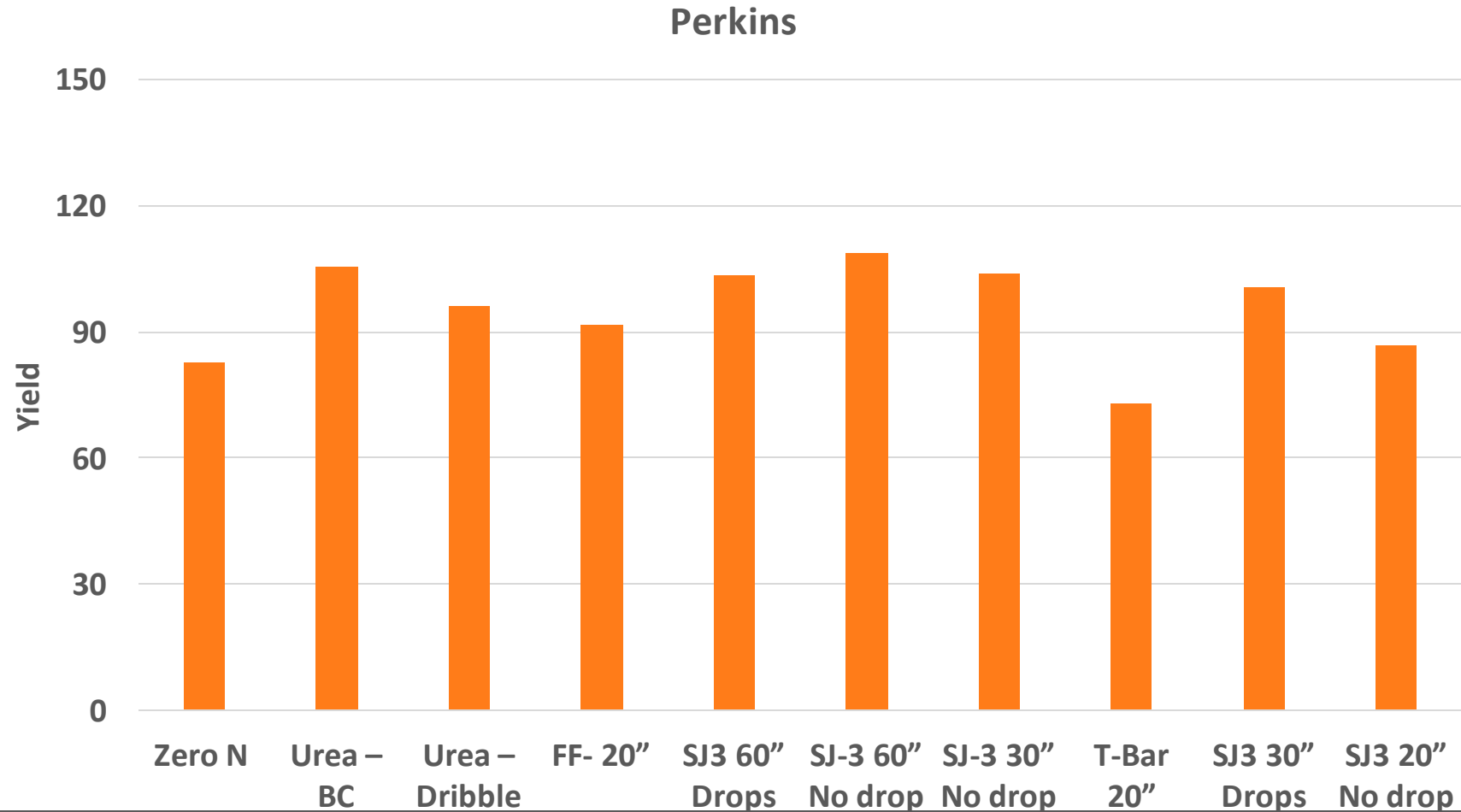
- Planted on 30" row spacing
- 28% UAN
- 60 lbs N applied Pre
- 60 lbs N applied in-season



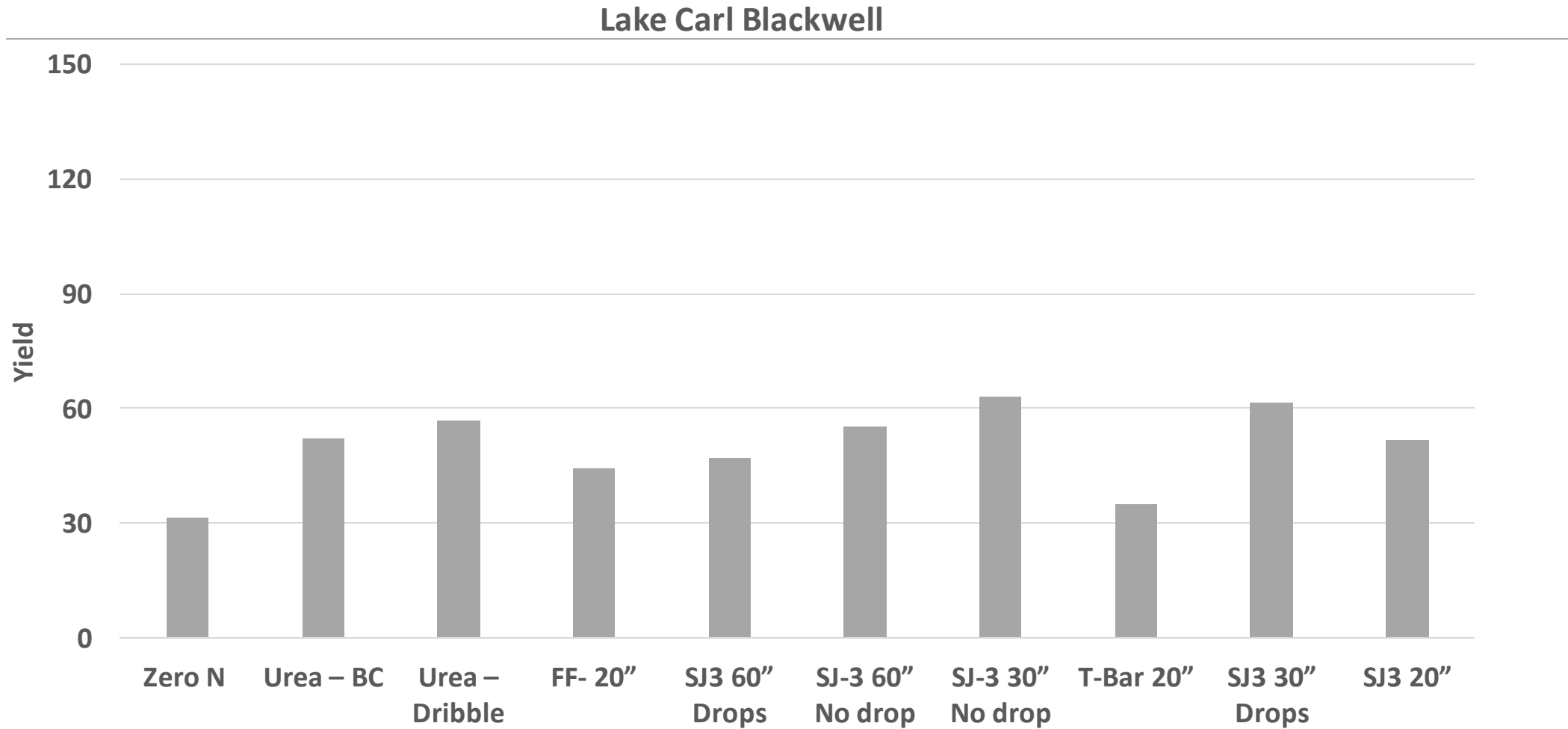
Influence of Application Method on Sorghum



Influence of Application Method on Sorghum



Influence of Application Method on Sorghum



Influence of Application Method on Sorghum

T-bar on 20" spacing consistently decreased yield.

Flat Fan nozzles on 20" spacing trended towards a decrease in yield but was not significant at any site.

When the use of drops was compared by spacing there was no benefit to utilizing drops at any location.

Moving from 30" to 60" spacing did not impact yield.

Visual burn symptomology usually did not equate to a significant yield loss in these experiments.

Excessively stressful conditions may contribute to greater yield losses.

Where is the opportunity

- N-Crop: Is the yield Temporally Variable? Spatially Variable?
- N-Soil: Do you have 2% OM and inconsistent weather?
- E-Fert - is your texture or landscape spatially variable?
- Can you adjust based on Management.
- Can you adjust based on Weather.
- Can you adjust your E_{Fert}



$$N_{\text{fert}} = (N_{\text{crop}} - N_{\text{soil}}) / e_{\text{fert}}$$

Nitrogen Fertilizer Rate is Not = to Yield

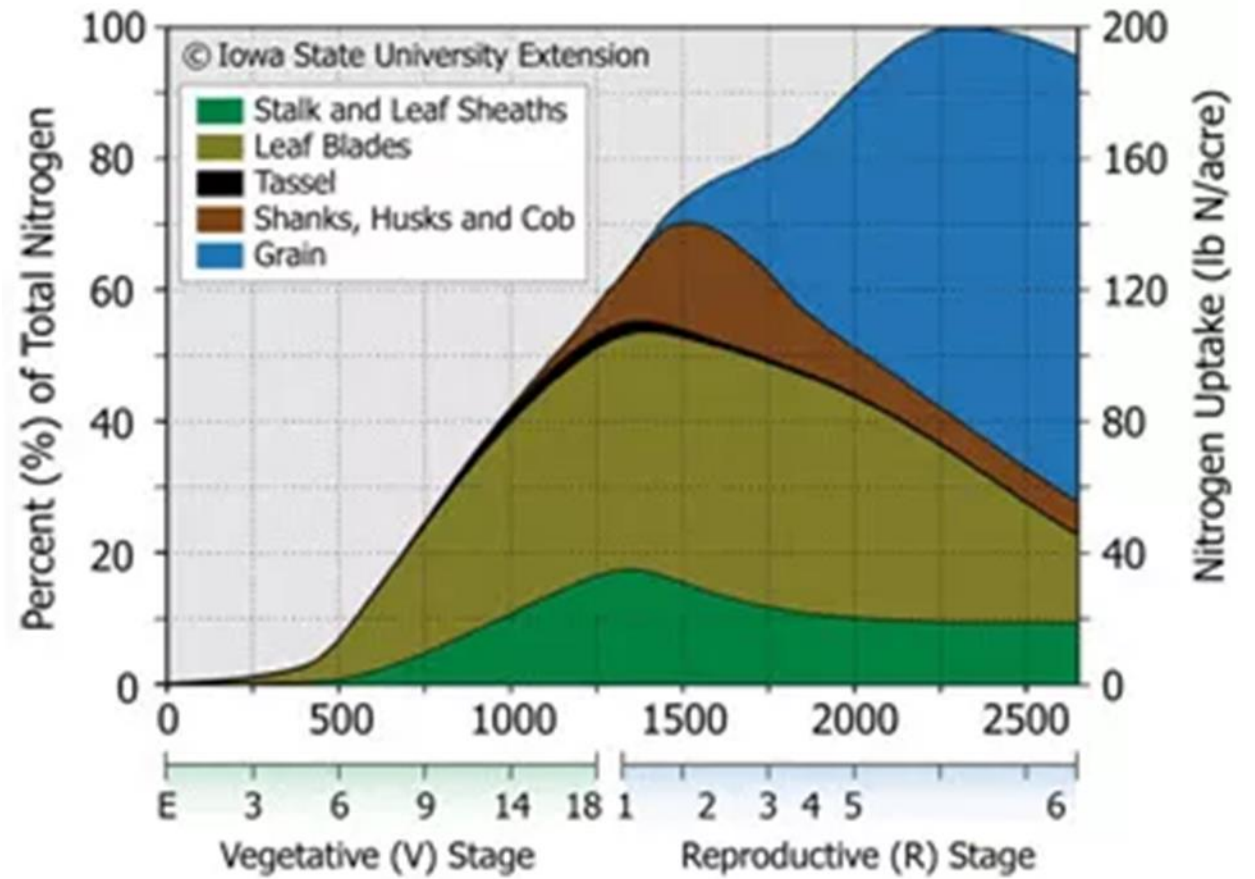
Nitrogen Uptake = Yield

Nitrogen Fertilizer = Yield and Soil N

Soil N = Environment

If Environment not Stable is Fertilizer N?

Nitrogen provide by the Soil – Zero NS



K's a big Deal

Potassium is not “Absolutely Immobile”.

Course well drained soils with rain and yield

Potassium and drought

Don't forget K is not just K.

K is more than Chemistry.



P and K Rate amid record prices..

How are your recommendations made?

What is your drawdown point, when do you go to Zero?

What is your Replacement Plan for 2022?

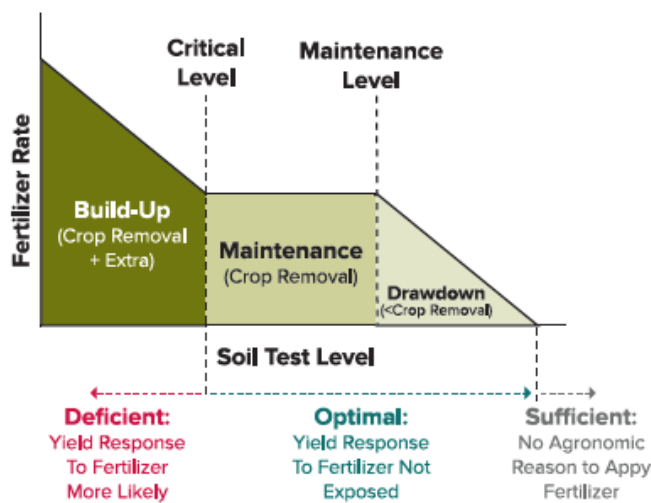


Figure 1. The Original Tri-State Fertilizer Recommendation Framework

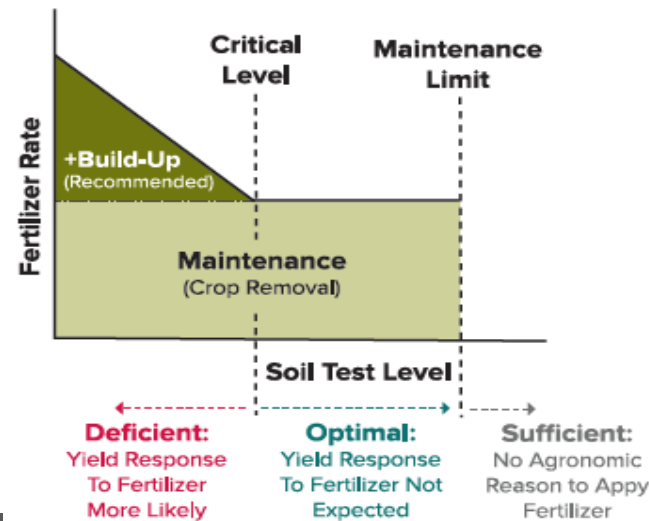


Figure 2. The New Tri-State Fertilizer Recommendation Framework

Nutrient	Content per Bushel* (15.5% moisture)	Total Removal 300 bu/acre
	lbs/bu	lbs
Nitrogen (N)	0.615	184.5
Phosphorus (P ₂ O ₅)	0.428	128.4
Potassium (K ₂ O)	0.273	81.9
Sulfur (S)	0.0506	15.18
Magnesium (Mg)	0.0733	21.99
Calcium (Ca)	0.0132	3.96
Iron (Fe)	0.00168	0.504
Zinc (Zn)	0.00126	0.378
Boron (B)	0.00028	0.084
Manganese (Mn)	0.00023	0.069
Copper (Cu)	0.00015	0.045
Molybdenum (Mo)	Trace	Trace
Chlorine (Cl)	Unknown	Unknown

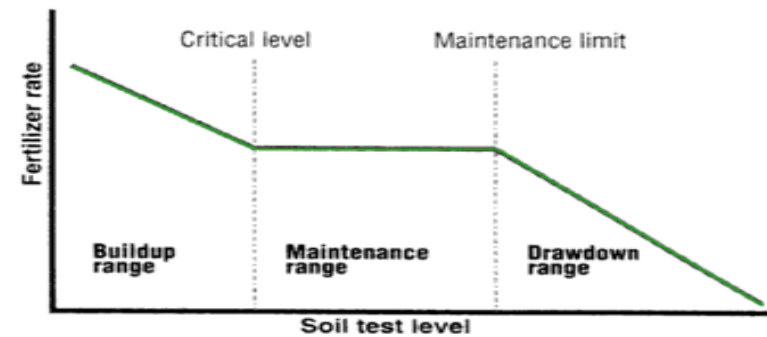
How we Do Phosphorus Recs

Build-Maintain (Replacement)

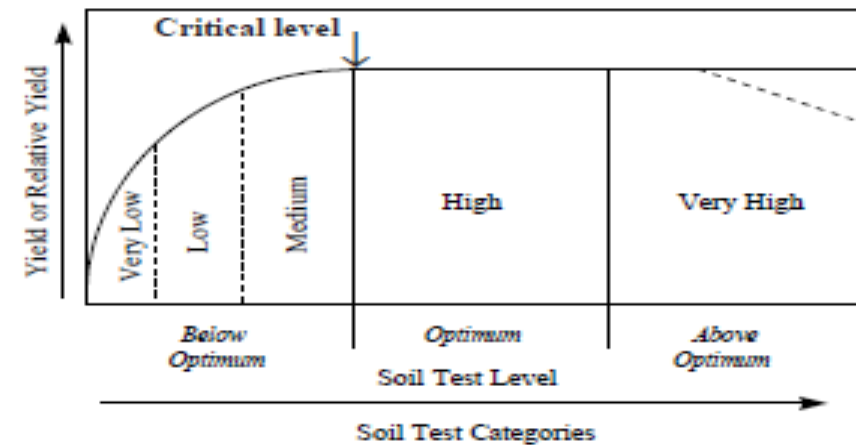
Feed the Soil.

If we are using this
approach,
Does rate matter??

**FERTILIZER RECOMMENDATION SCHEME
USED IN THE TRI-STATE REGION**



Build-up maintain fertilizer scheme suggested by the Ohio State



Nutrient response curve based on soil test, Rutgers Cooperative Extension.

Importance of Proper Fertility

K.I.S.S. - Keep It Simple Stupid



Great advice... Hurts my feelings every time

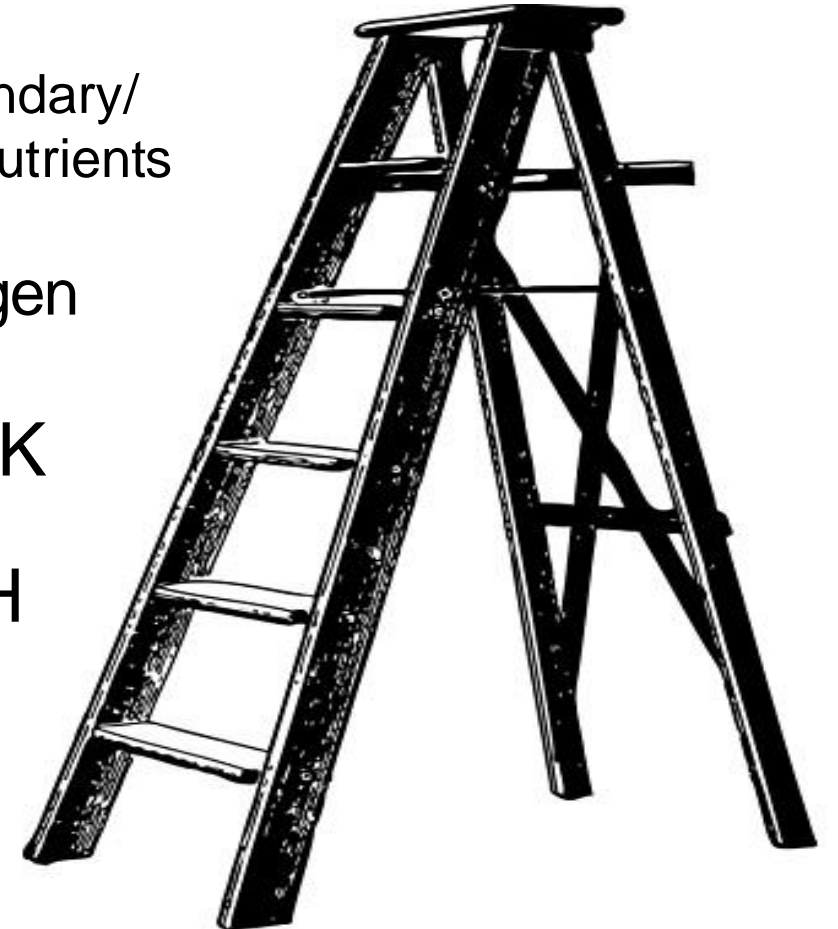
Secondary/
Micronutrients

Nitrogen

P & K

Soil pH

Soil Test





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A website to bridge the gap between Landlords and Leases



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