

Nitrogen Management in Prunes

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Tehama Prune Day
February 21, 2014



**University of California
Cooperative Extension**

**Agriculture & Natural Resources
Central Valley Region**



**Nitrogen
Deficient**

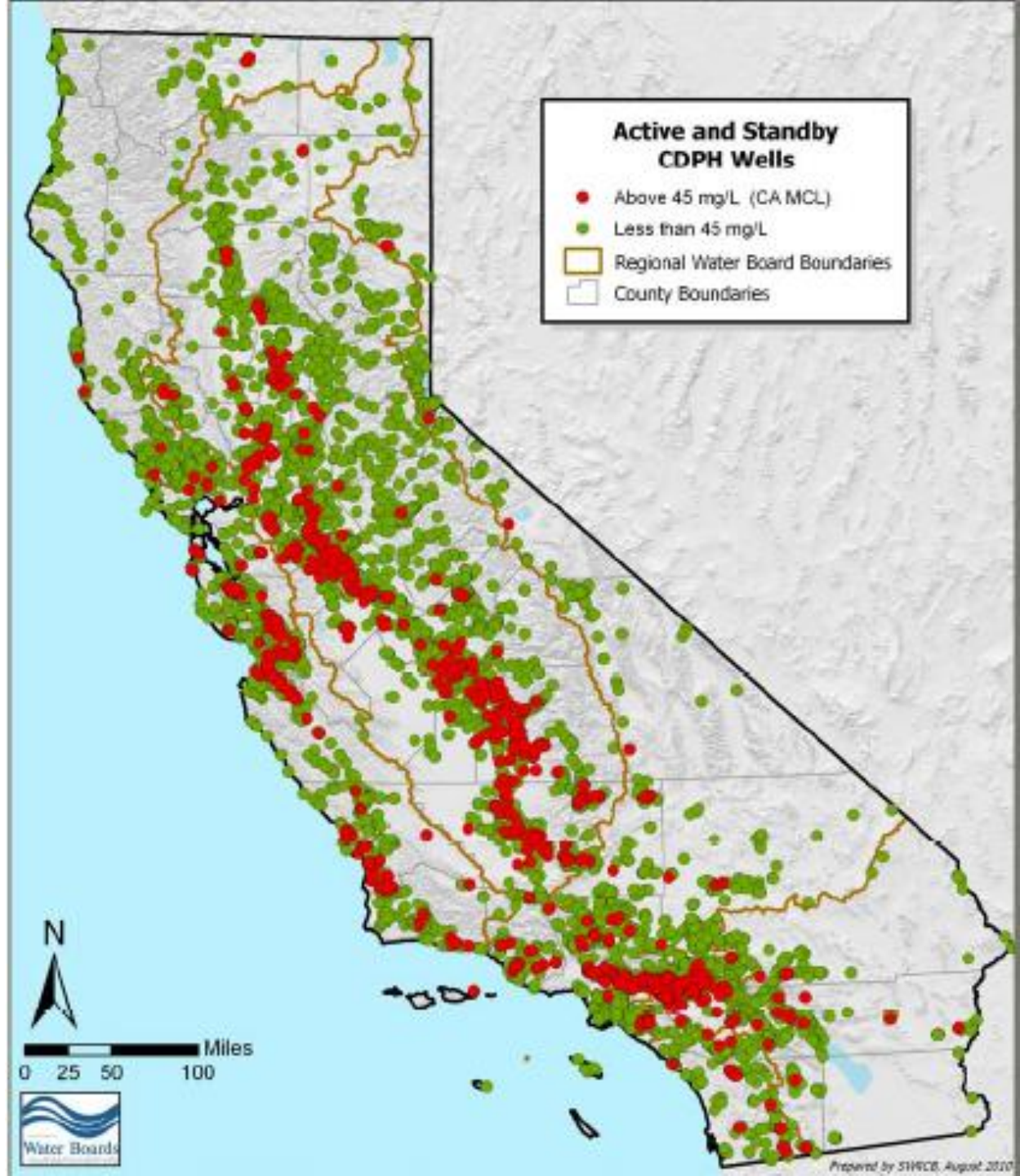
**Nitrogen
Sufficient**

French prune nitrogen rate study; Winters, CA. 1996. Trees were 6th leaf, drip irrigated/fertigated, planted 14' x 17' (183 trees/acre)

N fertilizer rate	Yield/acre (dry wt)	Bac canker rating 0-4 (good to bad) 1995	Summer leaf %N
183 lbs N/acre	3.24 _a	0	2.53 _a
91.5 lbs N/acre	3.14 _a	0	2.47 _a
46 lbs N/acre	3.07 _a	0	2.41 _a
0 lbs N/acre	1.83 _b	1.8	2.19 _b

Areas with shallow groundwater and intensive agriculture are vulnerable to nitrate contamination

- **Above** 45 mg NO₃/L
(10 mg NO₃-N/L)
- **Below** 45 mg NO₃/L
(10 mg NO₃-N/L)



Just enough

4 R's for Fertilizer

- Right time
- Right place
- Right rate
- Right material

Tree Nitrogen Sources

1. Storage (protein in wood)

At bloom, trees have about 1 month supply stored N.

2. Soil nitrogen

3. Nitrate in irrigation water

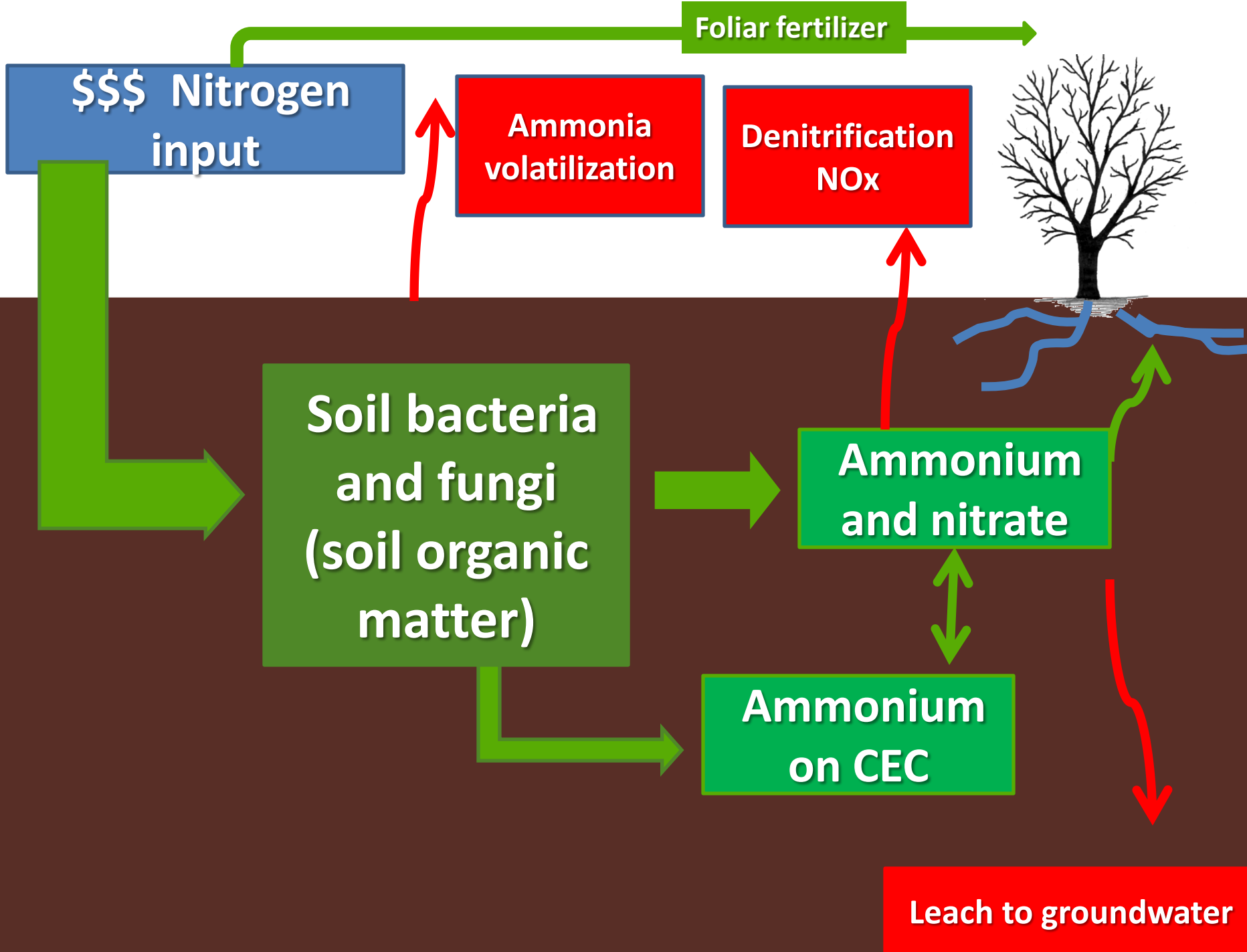
4. Fertilizer

Right Rate for 4 ton crop

N need	#/acre/yr
Crop use (12-18 lb N/dry ton)	50-60
Veg use	20-30
N credits (?)	??
Total N/acre/yr needed by trees	70-90



microbes



KEY POINT

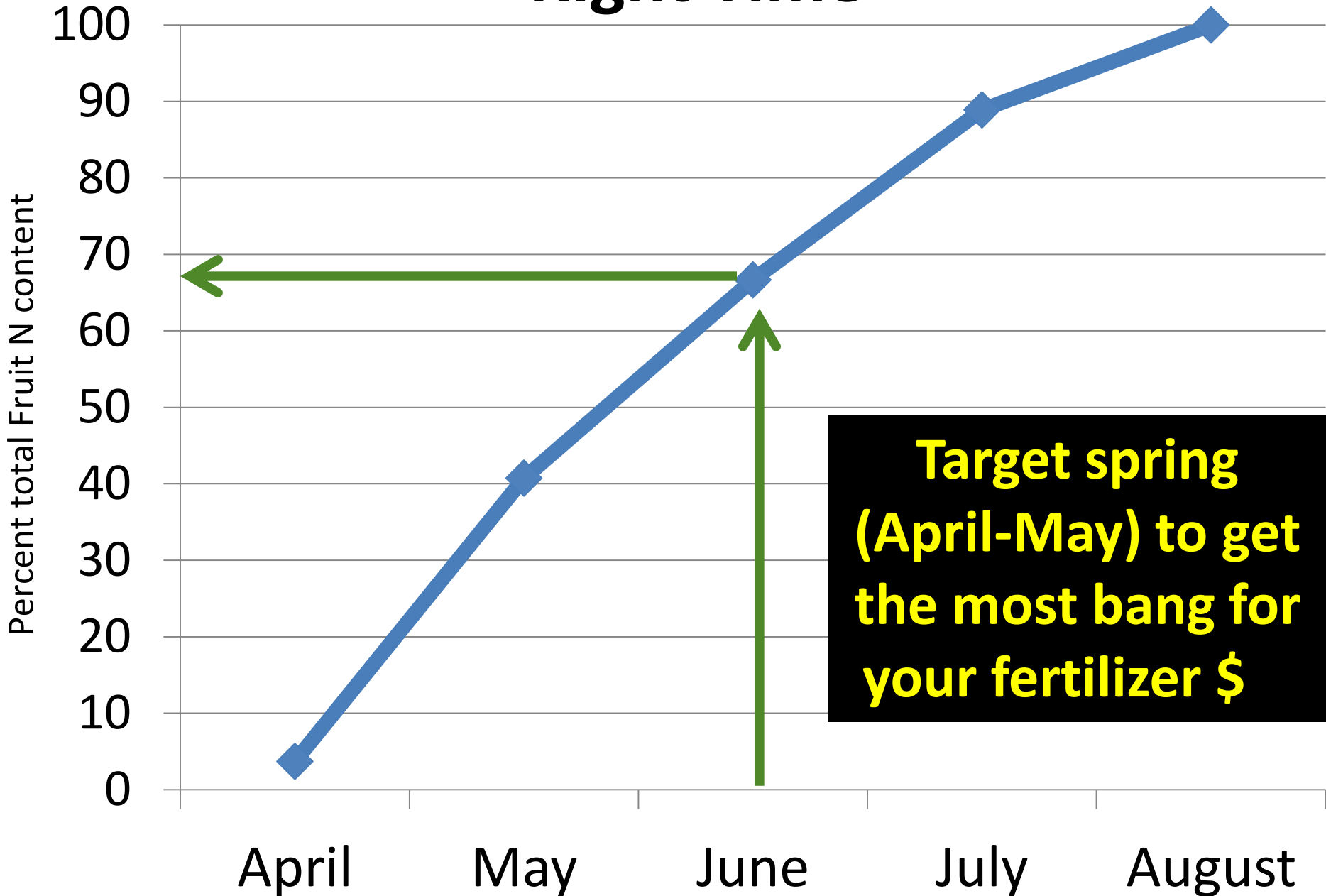
- Because all fertilizer N (urea, nitrogen, etc.) becomes rapidly becomes nitrate within 2 weeks of application...
- Because N from organic N source ultimately becomes nitrate...
- Because nitrate is very soluble and moves with water...

**GOOD IRRIGATION MANAGEMENT =
GOOD NITROGEN MANAGEMENT**

Right Rate for 4 ton crop

N need	#/acre/yr
Crop use (12-18 lb N/dry ton)	50-60
Veg use	20-30
70% efficiency	30-40
N credits (?)	--
Total N/acre/yr	100-130

Right Time



Right Time: When should I apply 110 lbs N/acre to feed a 4 dry ton crop?

(Given 3 fertigation periods through year).

Date	% of Total	lbs of N
Crop Set (mid-April)	20	22
Fruit & shoot growth (May)	50	55
Final fruit swell Mid to late June	30	33

Right Time: When should I apply 110 lbs N/acre to feed a 4 dry ton crop?

(Given 4? fertigation periods through year).

Date	% of Total	lbs of N
Crop Set (mid-April)	20	22
Fruit & shoot growth (May)	50	55
Final fruit swell Mid to late June	30	33
September Early Post-Harvest	As needed	20?

Prunes are not almonds or walnuts.

Maximum production \neq maximum returns.

Optimal N is adequate N.

**Use your thinning data (crop size) to
manage N rate.**

- **Right material--Nitrogen**
 - grower choice.
 - watch leaching of nitrate and urea at injection
- **Right location--Nitrogen**
 - More active roots under micro-irrigation and in tree row. Watch fertigation injection timing.
- **Right rate – Nitrogen**
 - Dry fruit contains 0.7-0.9% N. How big is your crop? Smaller doses at the right time are best.
- **Right timing --Nitrogen**
 - 60-70% of crop & shoot N needed by June 1
 - 20/50/30 in April/May/June?
 - Avoid late fall and winter application

Thank You!



Questions?