



Using PSNT to improve N efficiency

PSNT evaluations on lettuce 1997-2000



- **25 commercial fields**
- **Compare grower's standard fertilization practice with plots in which sidedress N application was determined by PSNT**
- **Data collected:**
 - marketable yield**
 - crop N status**
 - biomass N accumulation**

Sidedress N application rate determined by PSNT :

Soil NO₃-N (PPM)	N application (lb/acre)
0 – 5	80
5 – 10	60
10 – 15	40
15 - 20	20
> 20	0

PSNT done at both sidedressings

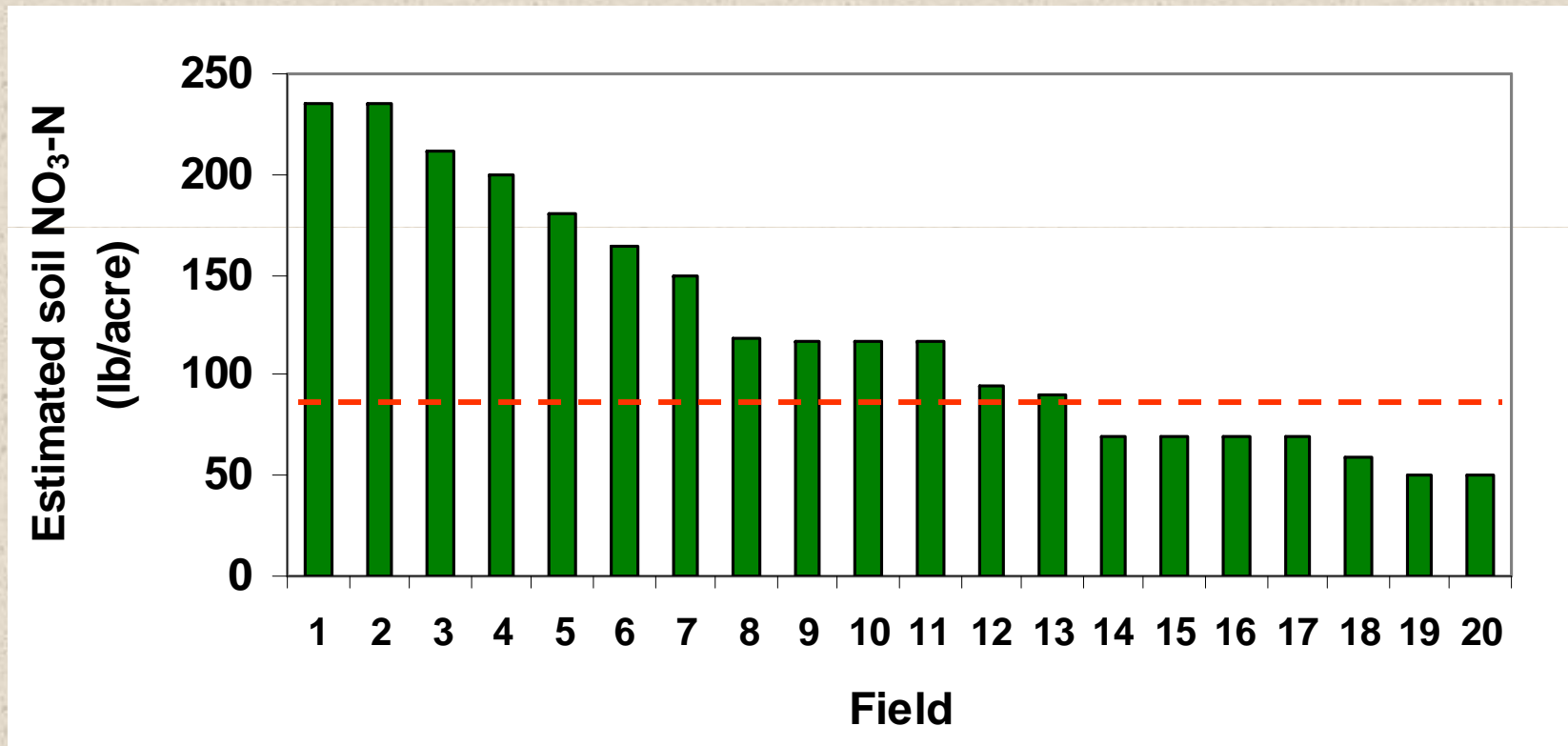
1997-2000 Lettuce PSNT Summary

Mean of 25 fields

	Grower practice	PSNT
Applied N (lb/acre)		
High	339	168
Low	120	40
Ave	218	128
Cartons / acre	904	915
Biomass N (lb/acre)	116	110

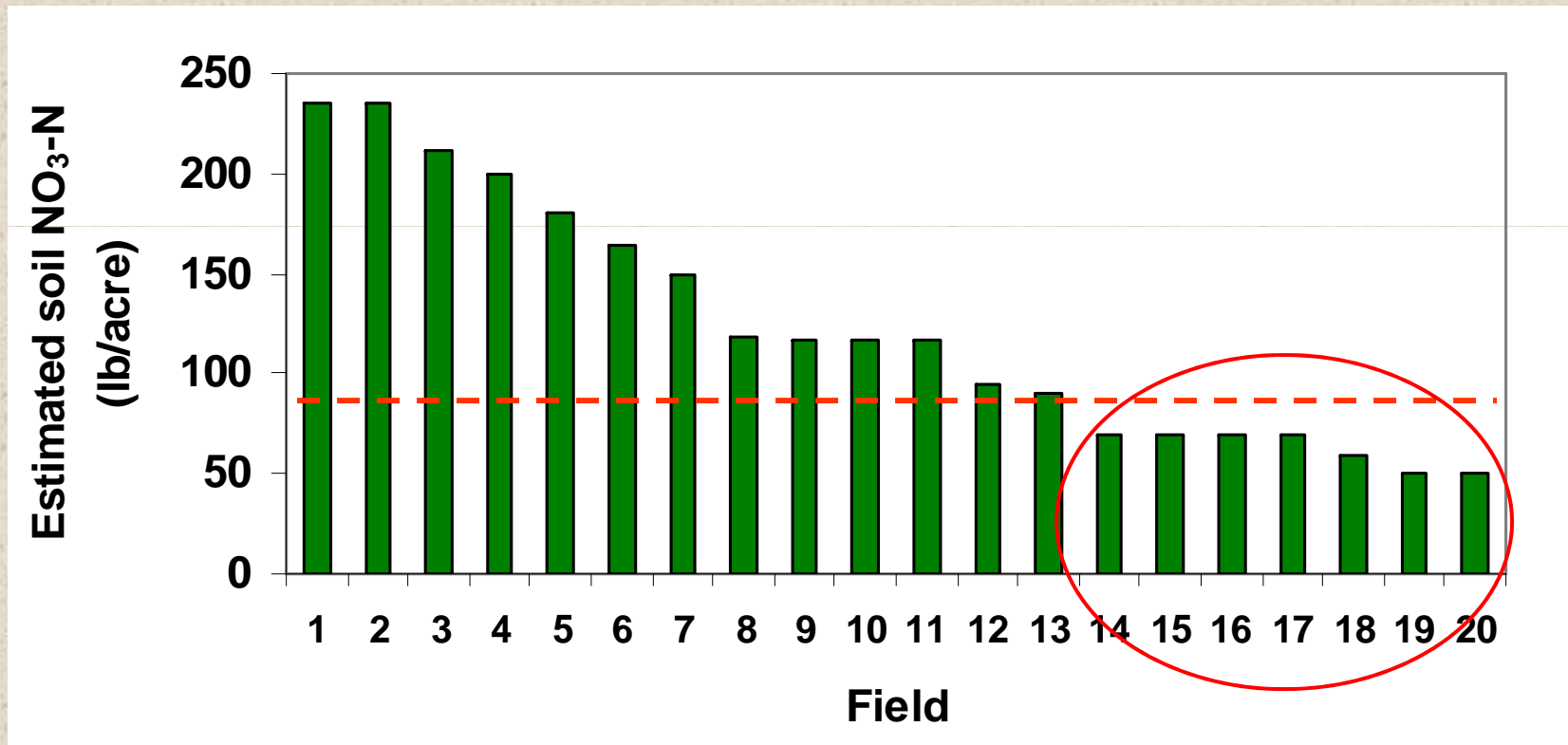
2008 Dole PSNT fields :

All fields sampled before 1st sidedress :



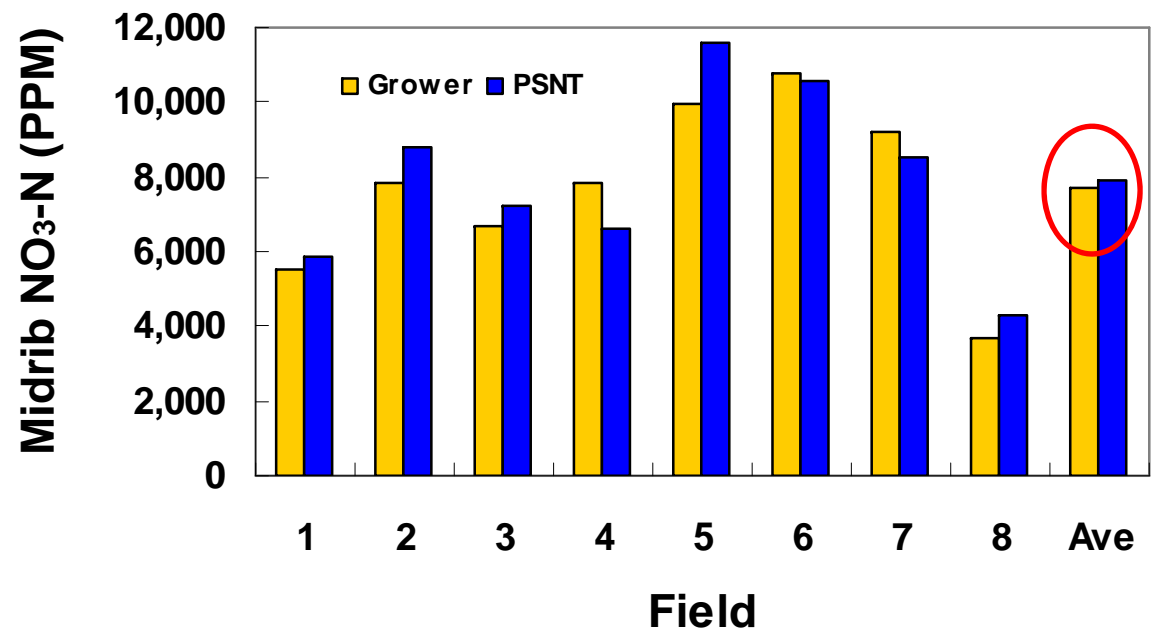
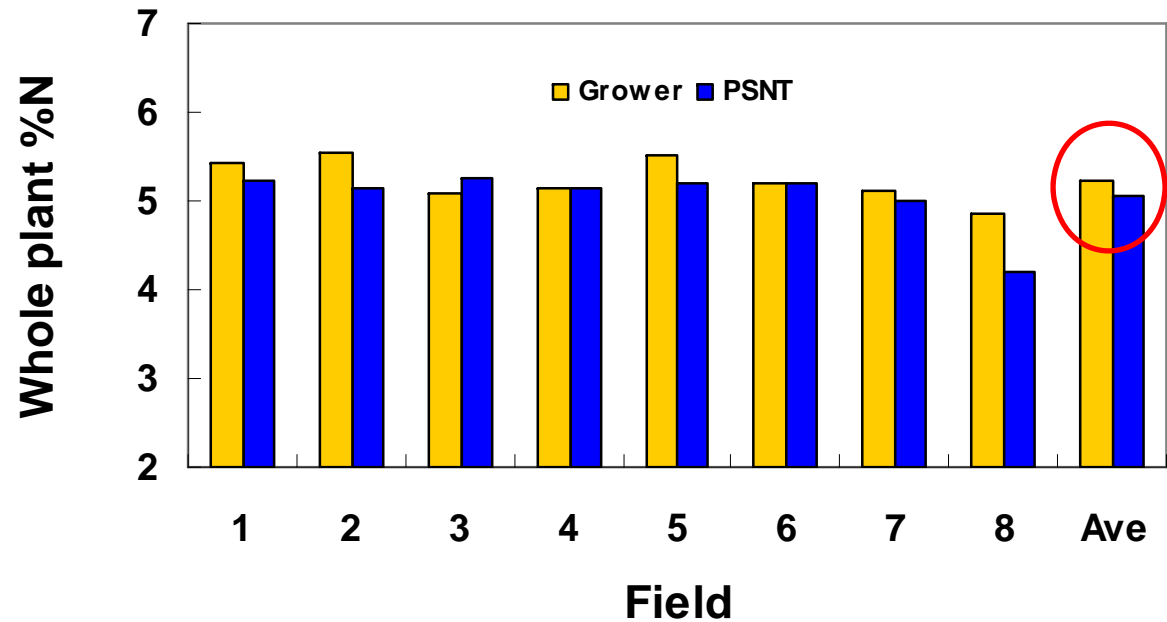
In all fields 1st sidedress skipped in a 12 row plot

2008 Dole PSNT fields :

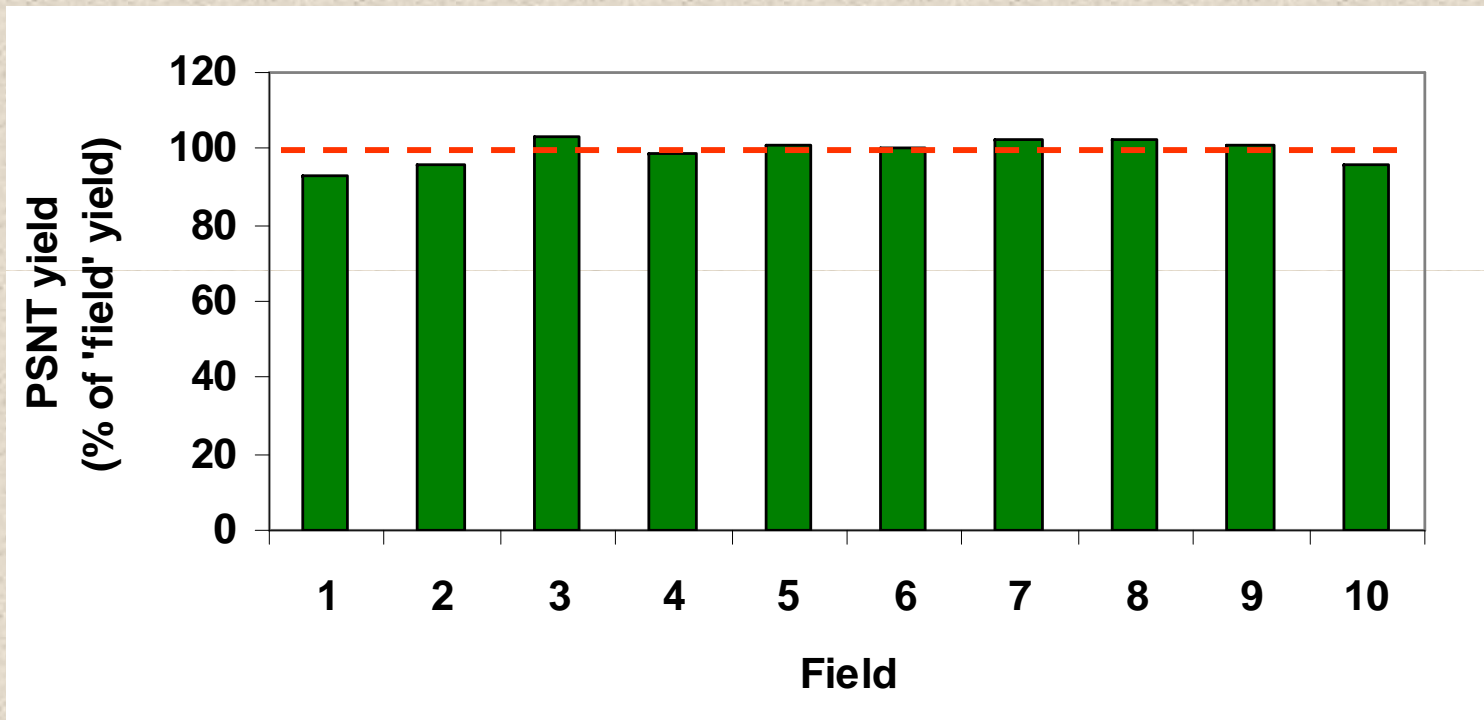


In all fields 1st sidedress skipped in a 12 row plot

Mid-season sampling :



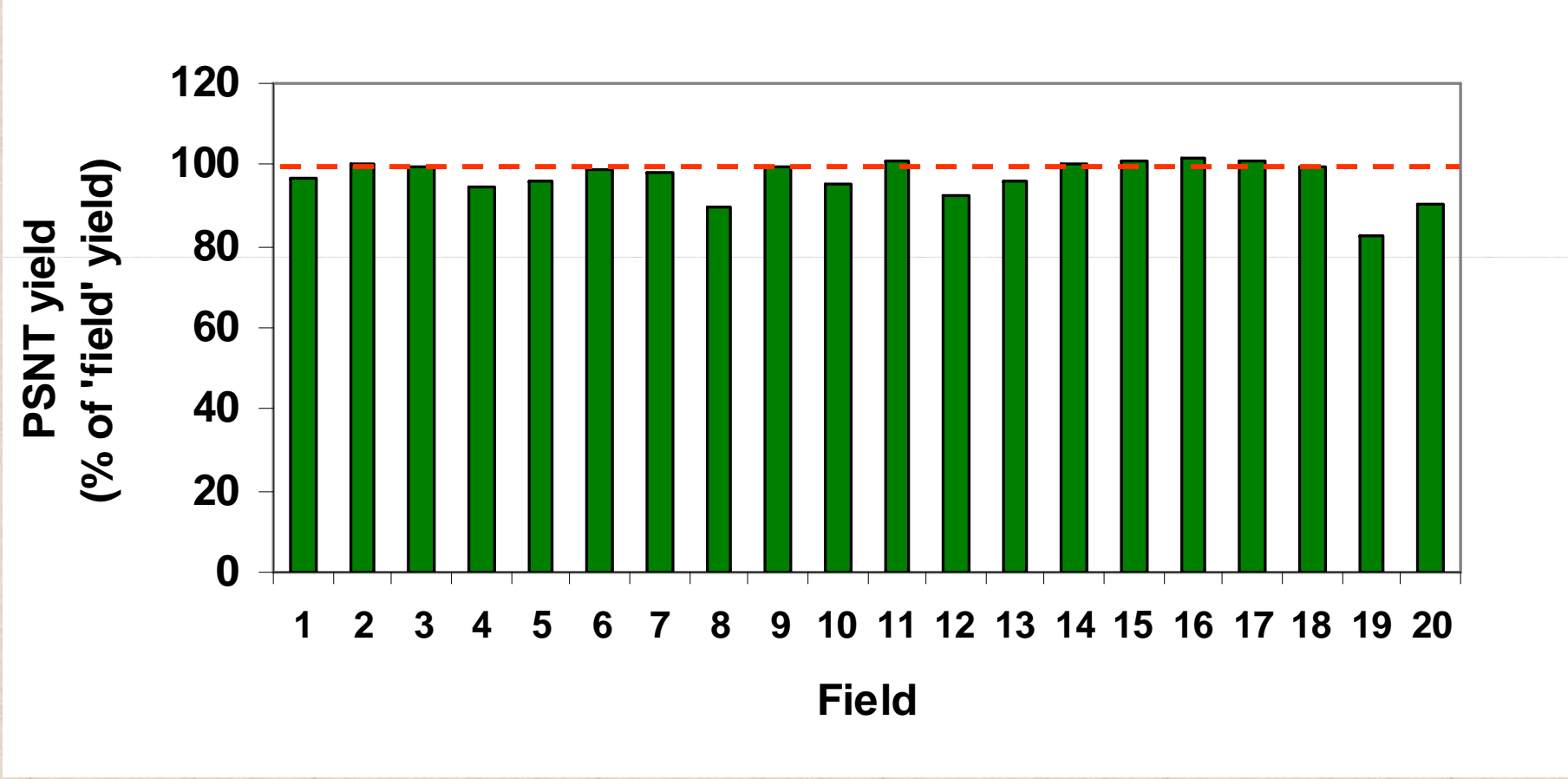
Pre-harvest sampling :



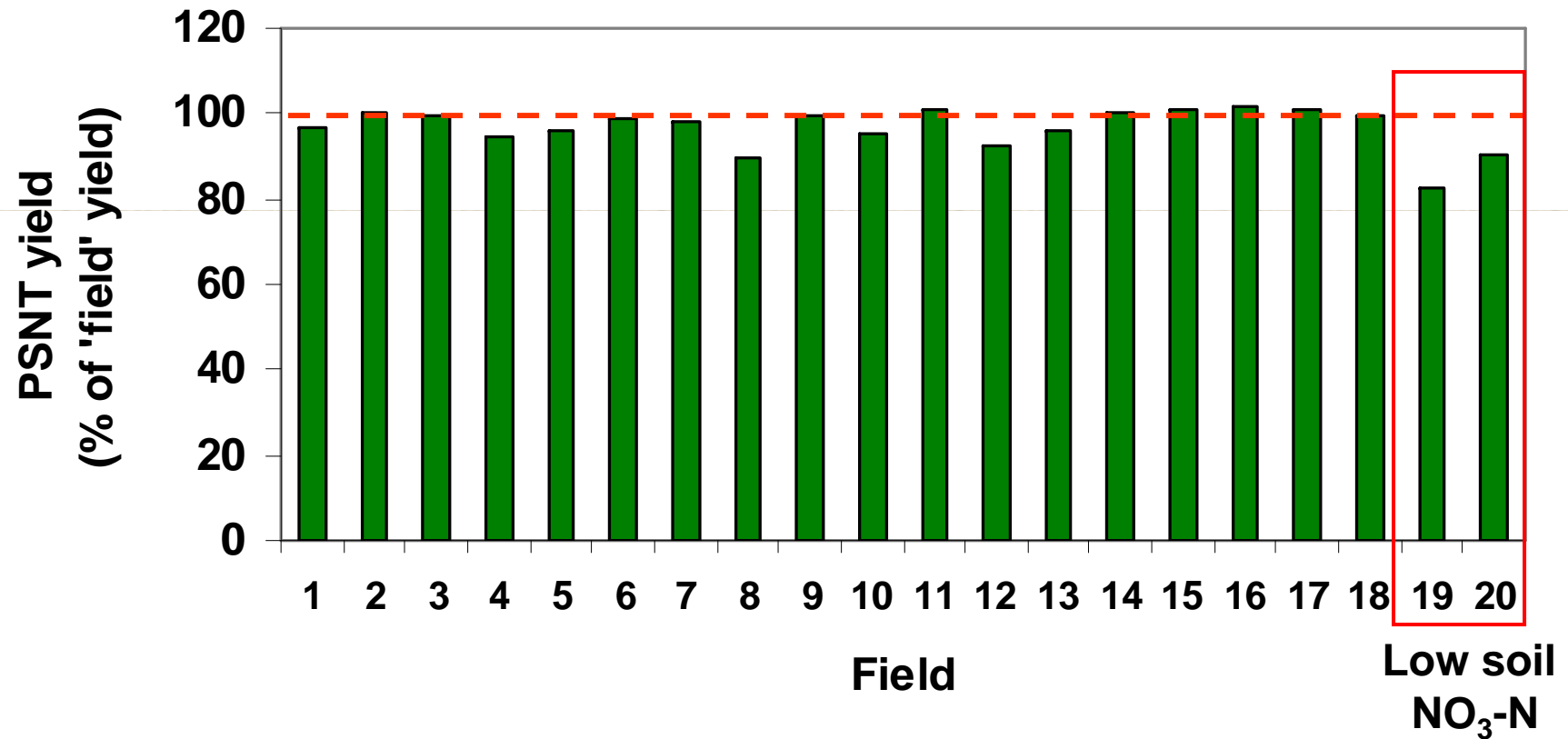
On average:

- ✓ PSNT yield = 99% of grower management
- ✓ PSNT crop N uptake only 3 lb N/acre less than grower, which received about 50 lb/acre less N

Commercial yield estimates :

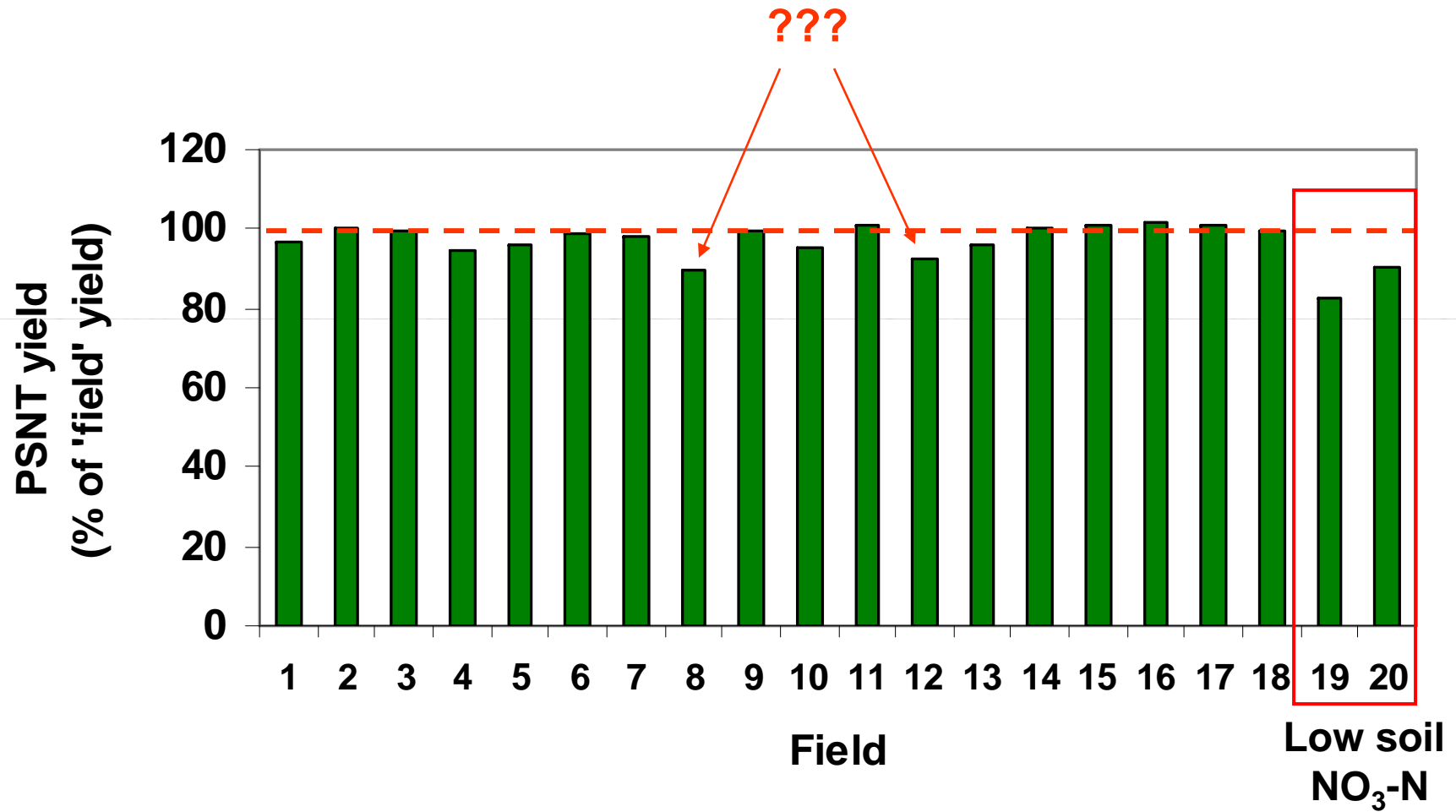


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2007-08 lettuce drip fertigation trials :

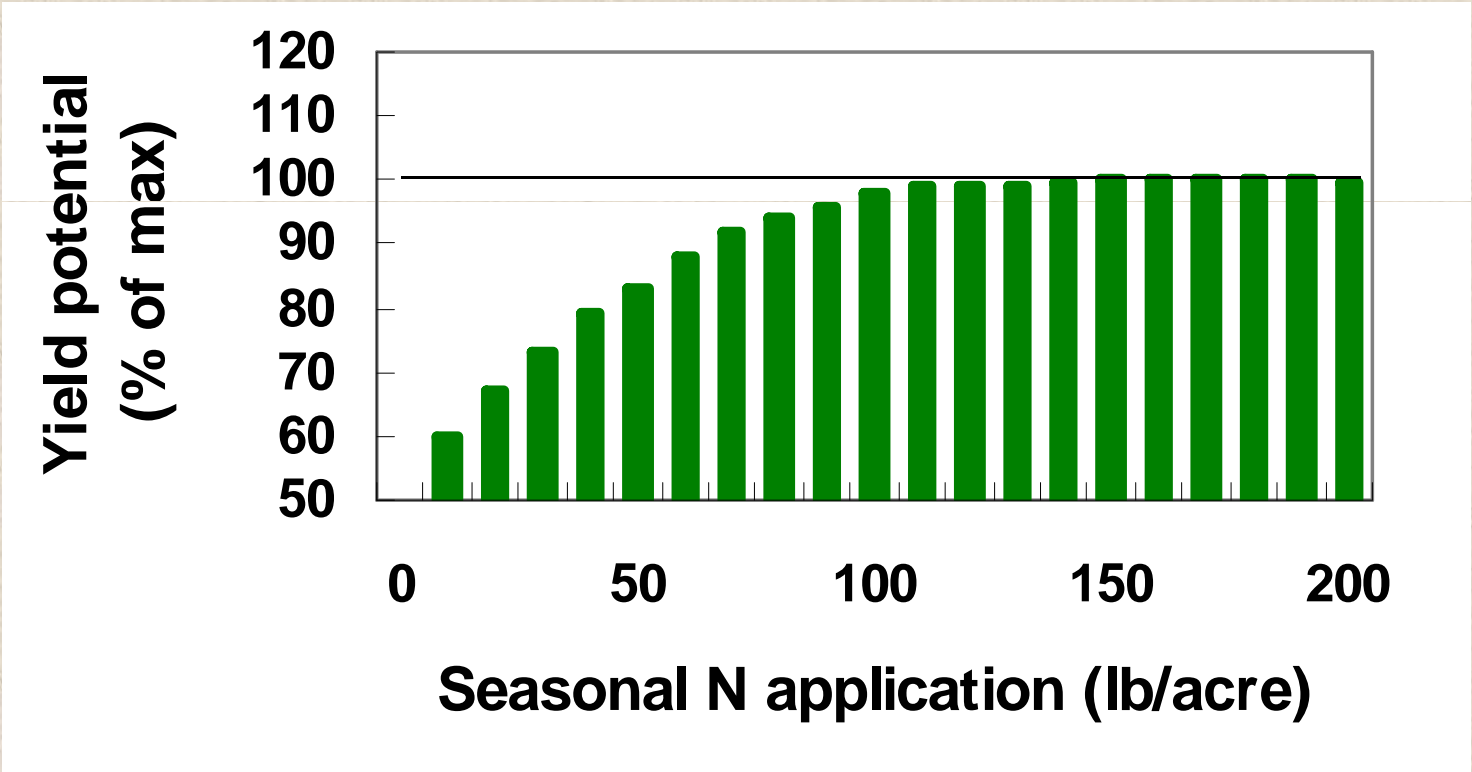
Field	Lettuce type	Soil NO ₃ -N at start of fertigation (PPM)
1	head	20
2	head	27
3	head	19

Based on residual NO₃-N one or more fertigations were eliminated

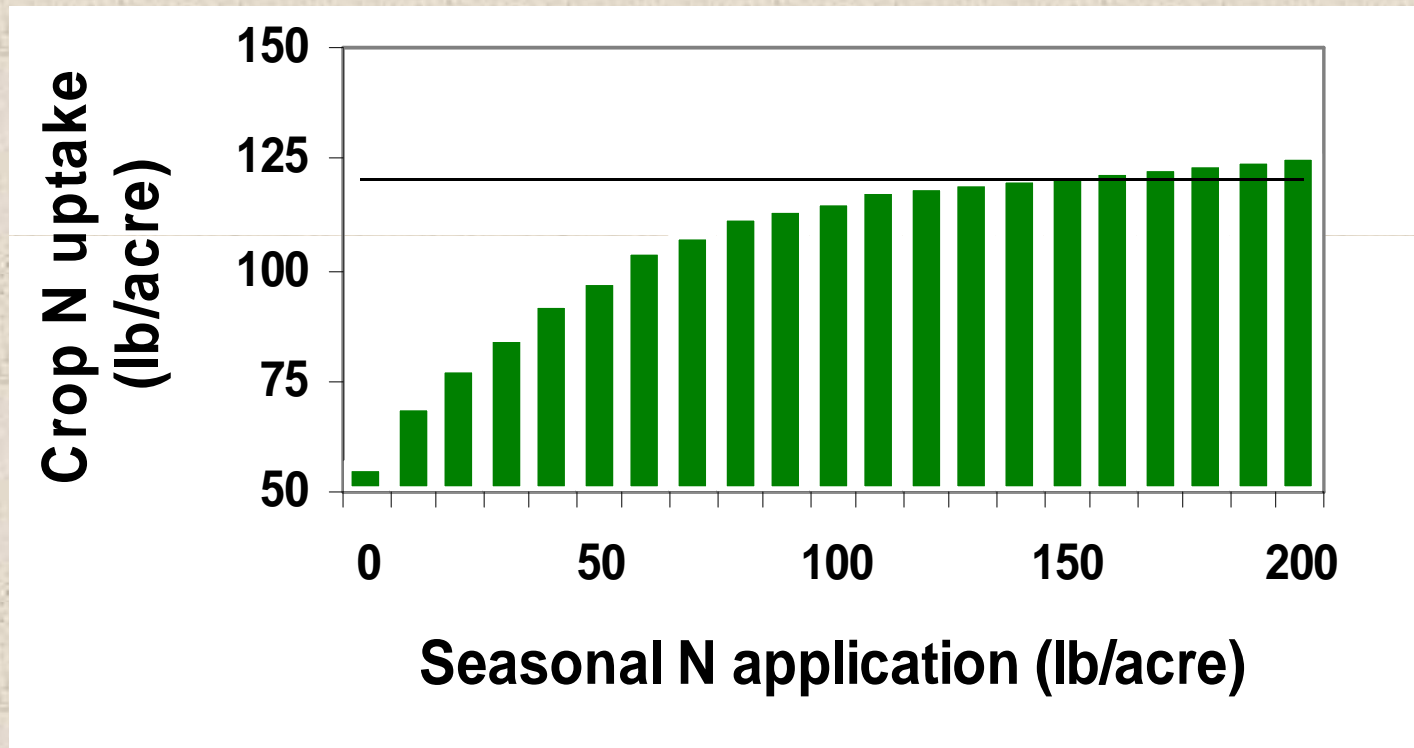
Drip fertigation results :

Field	Treatment	lb N / acre		Mean plant wt (lb)
		total	fertigated	
1	Grower	169	127	2.29
	Reduced N	92	50	2.31
2	Grower	171	153	2.16
	Reduced N	64	46	2.27
3	Grower	211	164	2.60
	Reduced N	125	78	2.55
Ave	Grower	184	148	2.35
	Reduced N	94	58	2.38

Generalized lettuce N response curve :



Generalized lettuce N uptake curve :



- ✓ N fertilizer becomes less efficient as rate increases
- ✓ On average > 90% of 'insurance' N application not even taken up by the crop



Conclusions :

- ✓ **many fields have significant residual $\text{NO}_3\text{-N}$**
- ✓ **in those fields sidedressing can be reduced**
- ✓ **greatest opportunity to reduce N application is at first sidedress**