Sustainable Crop Production After CRP Conversion

Objectives

- Develop high residue management cultural practices to convert CRP to crop production.
- Determine cultural practice influences on sustainable crop production.

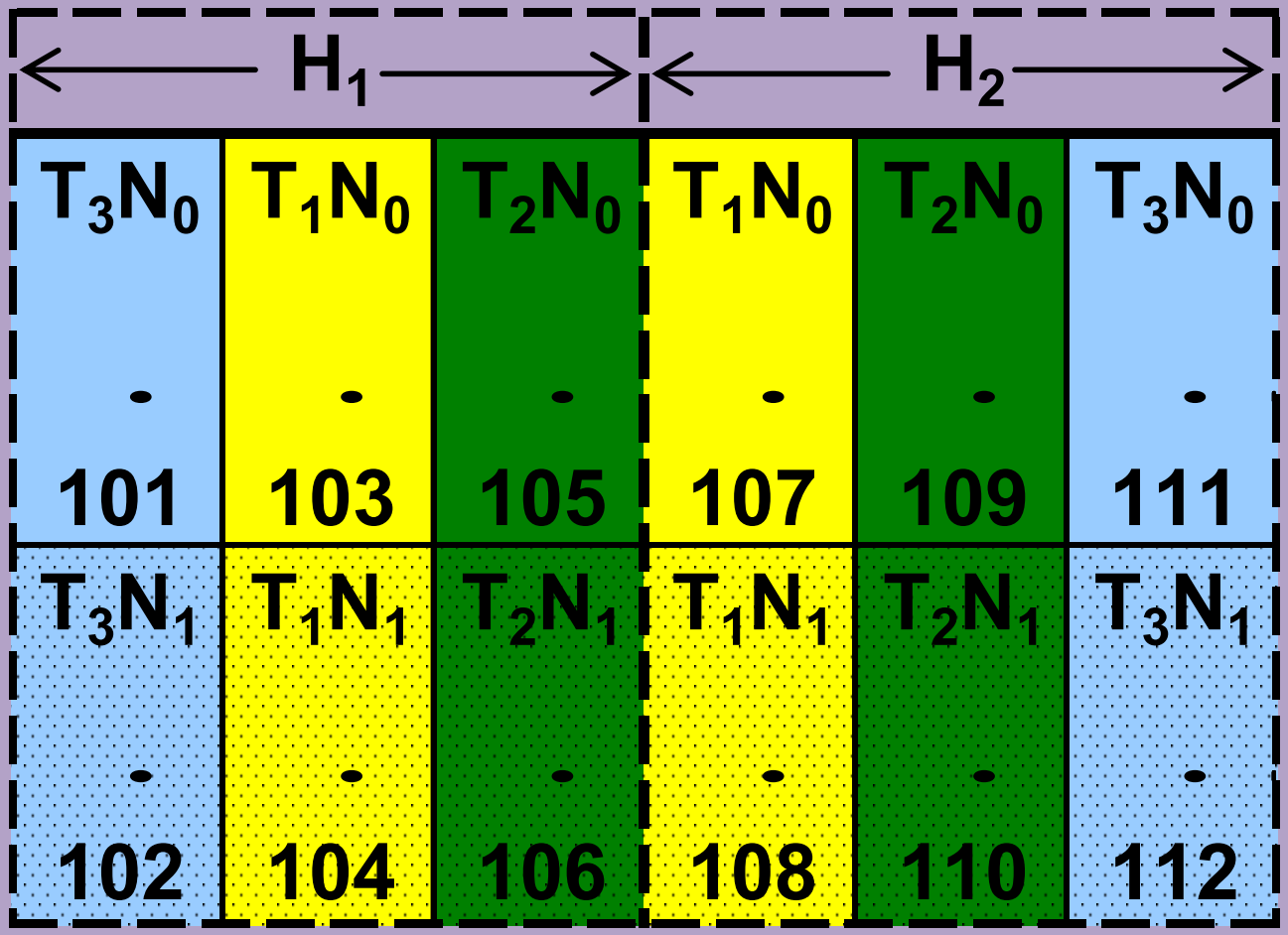
Soil

- Amor – Williams soil association
- Slope – 3 to 15%

Vegetation (early Oct 1994)

Quantities	lb/ac	lb N/ac
Intermediate wheat grass	1700	100
Alfalfa and other	3500	
Litter	5100	100
Total	10,300	200

Experimental Design



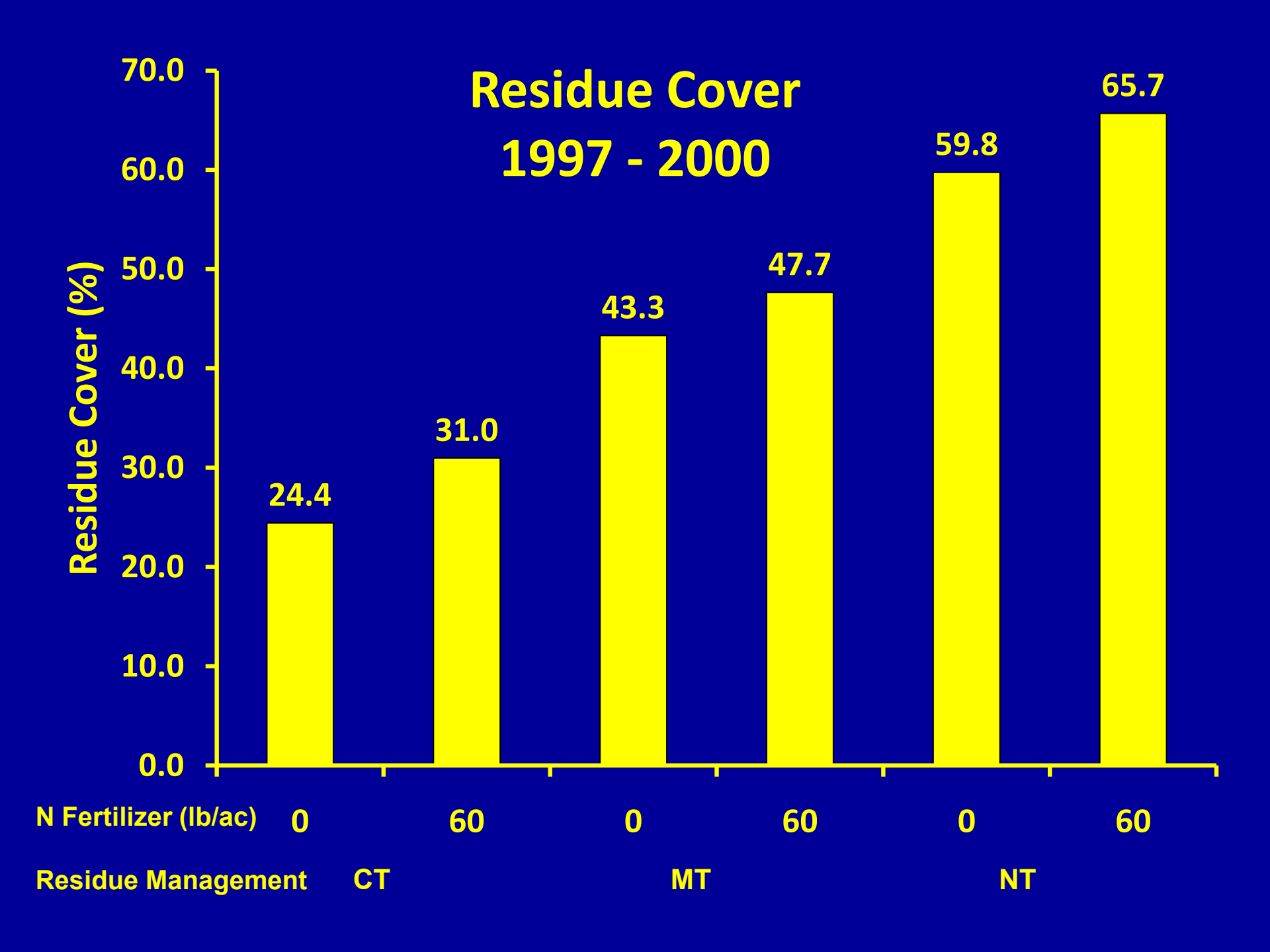
Whole Plot (90'x100')	Split - Plot (30'x100')	Split -Split - Plot (30'x50')	Reference Treatments (30'x100')
H_1 - Hayed	T_1 - Conventional Till, <30% cover	N_0 - 0 lbN/ac	PH - Permanent Hayed Area
H_2 - Nonhayed	T_2 - Minimum Till, 30-60% cover	N_1 - 60 lbN/ac	PC - Permanent Cover Area
	T_3 - No Till, >60% cover		

Cropping System
Spring wheat – winter wheat – dry pea

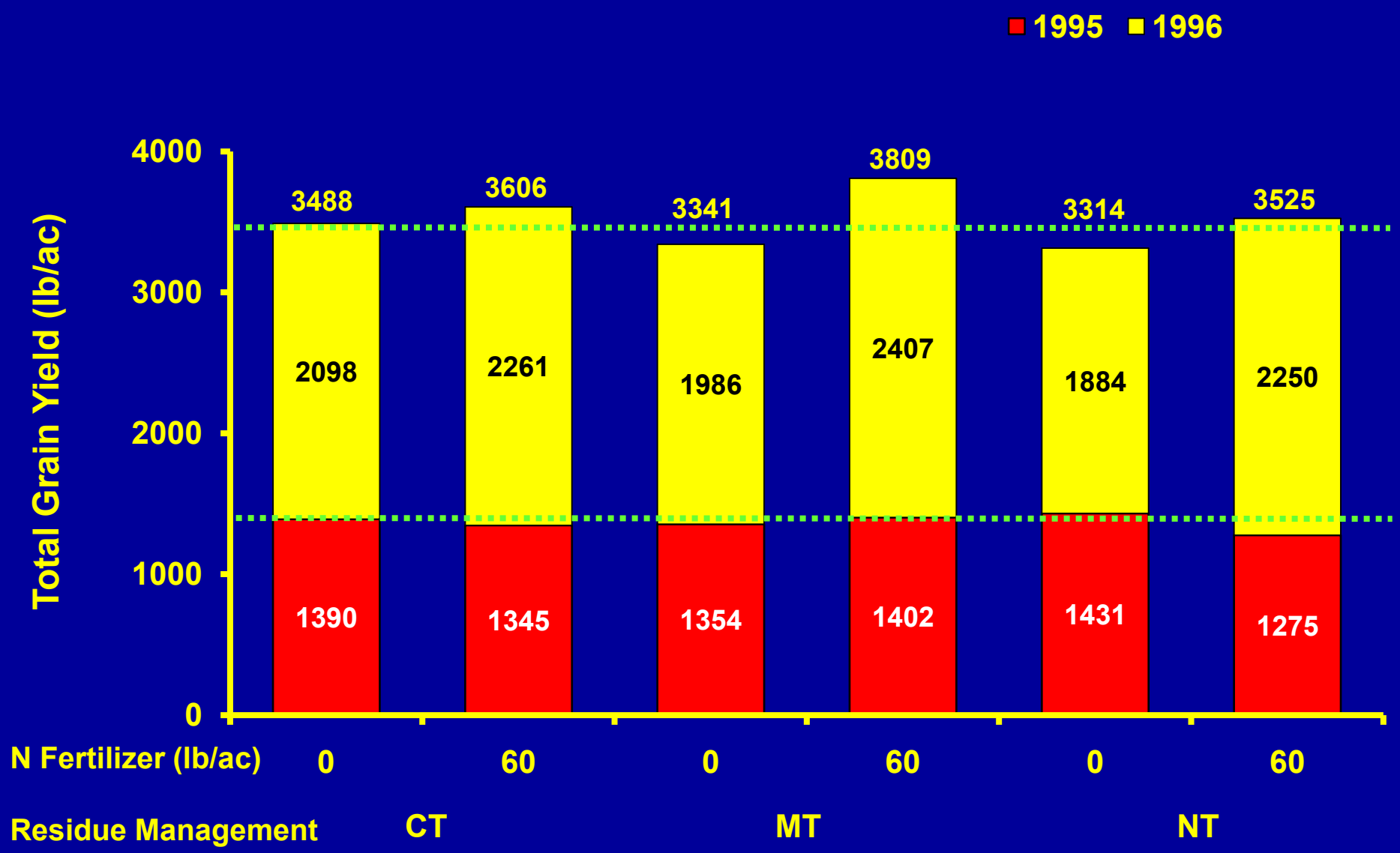
Conventional till

Minimum till

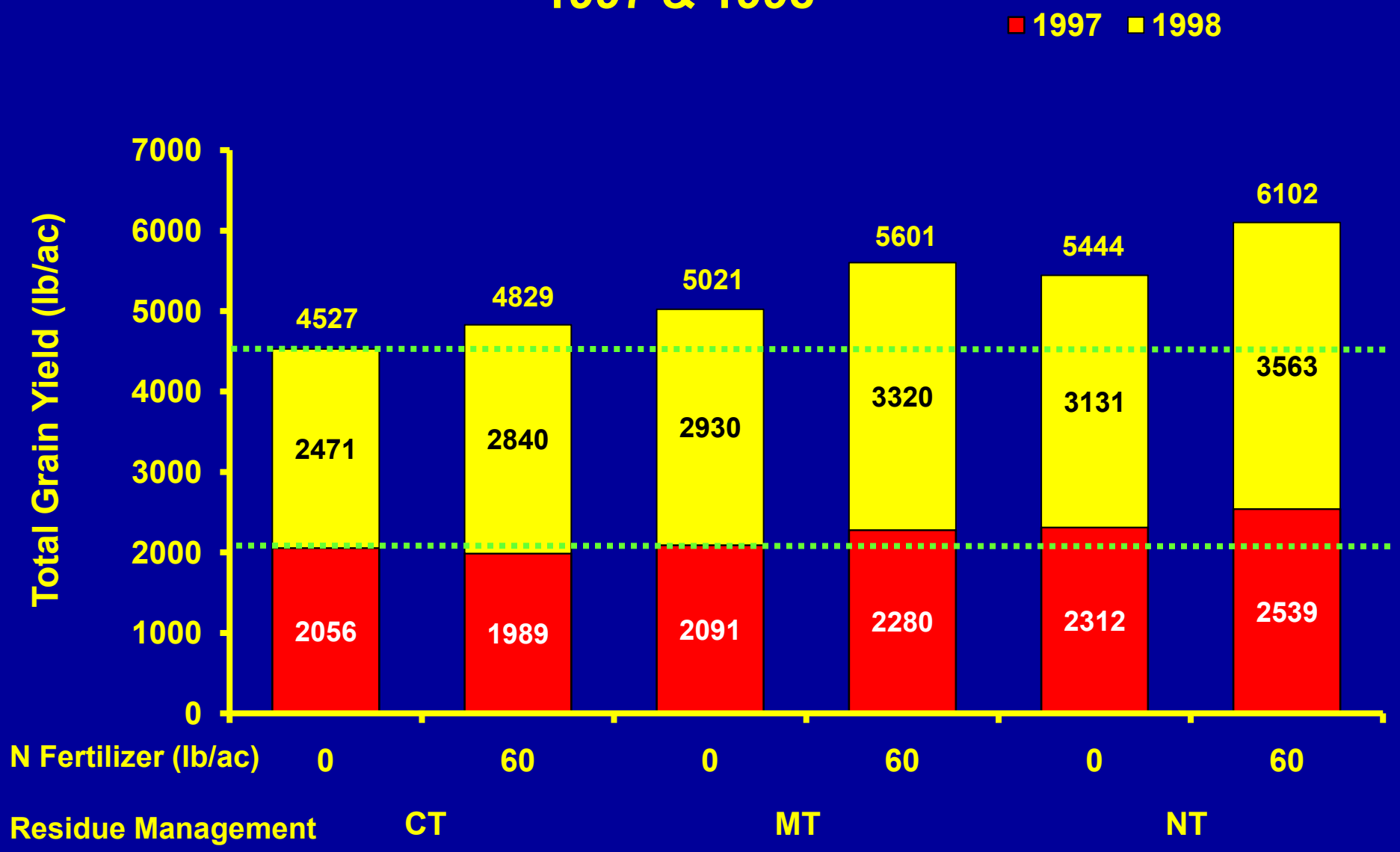
No till

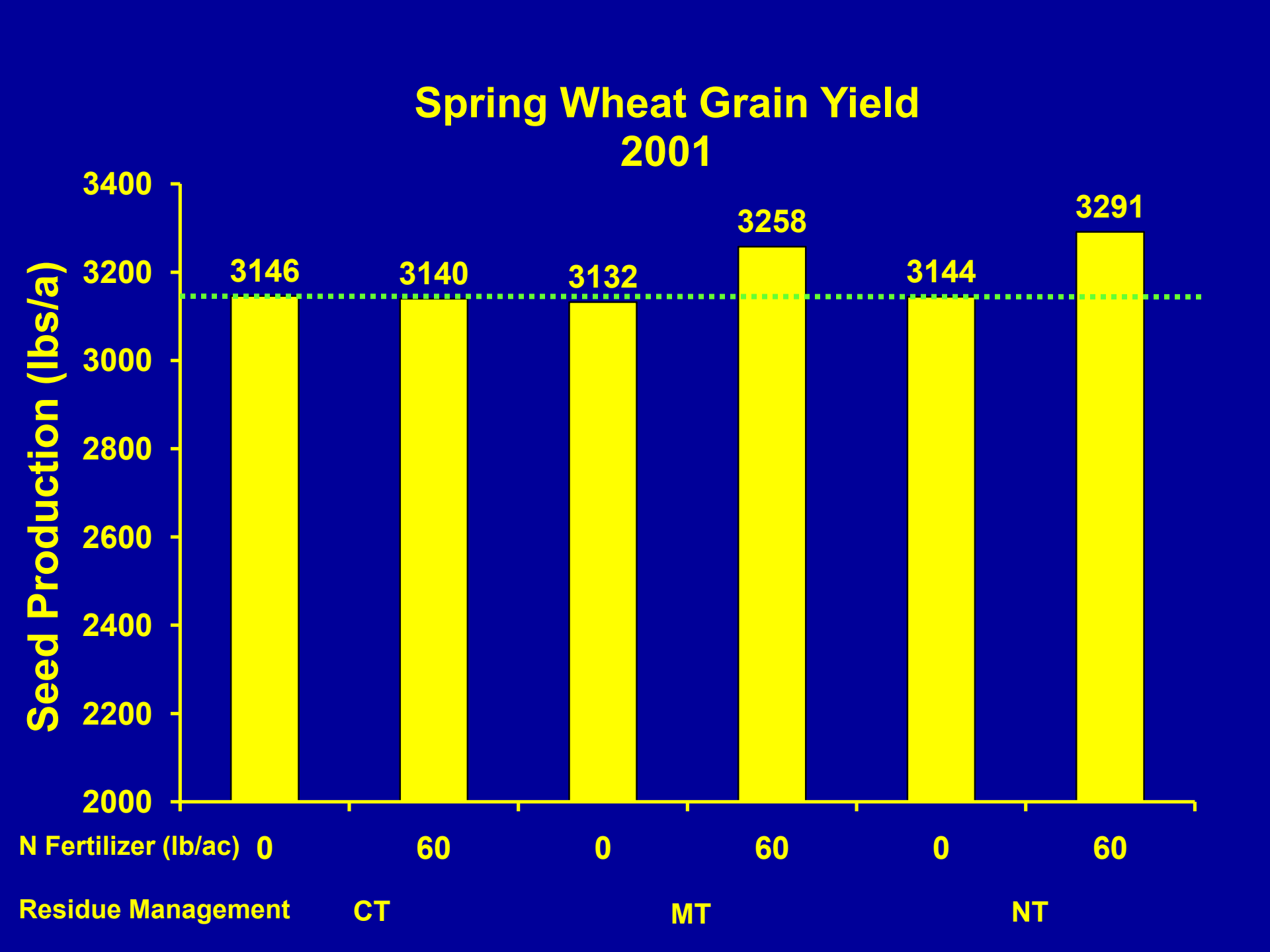

Residue Cover
1997 - 2000
Residue Cover (%)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
24.4
31.0
43.3
47.7
59.8
65.7
N Fertilizer (lb/ac)
0
60
0
60
0
60
Residue Management
CT
MT
NT

Grain Yield
1995 & 1996

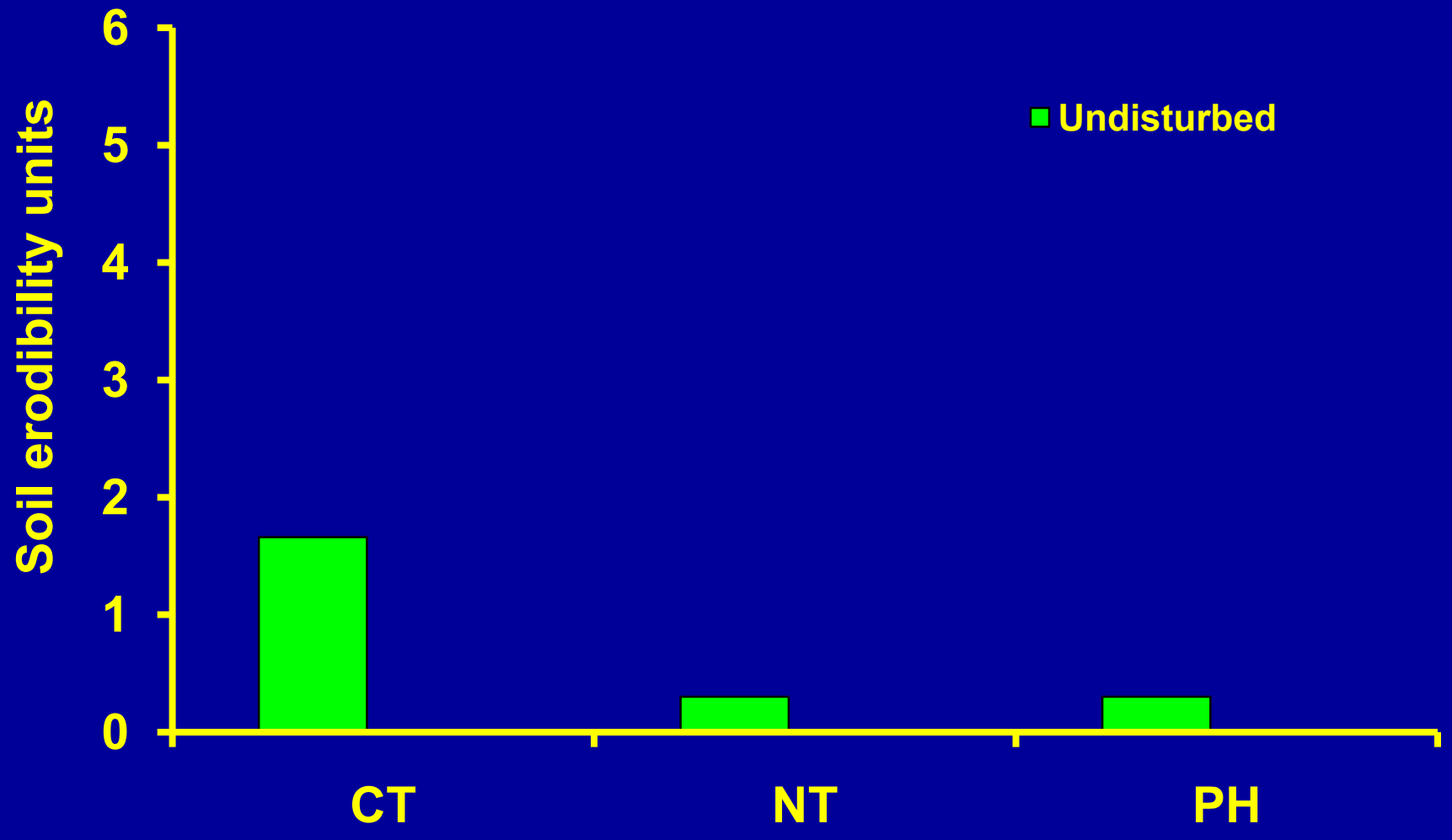


Grain Yield
1997 & 1998



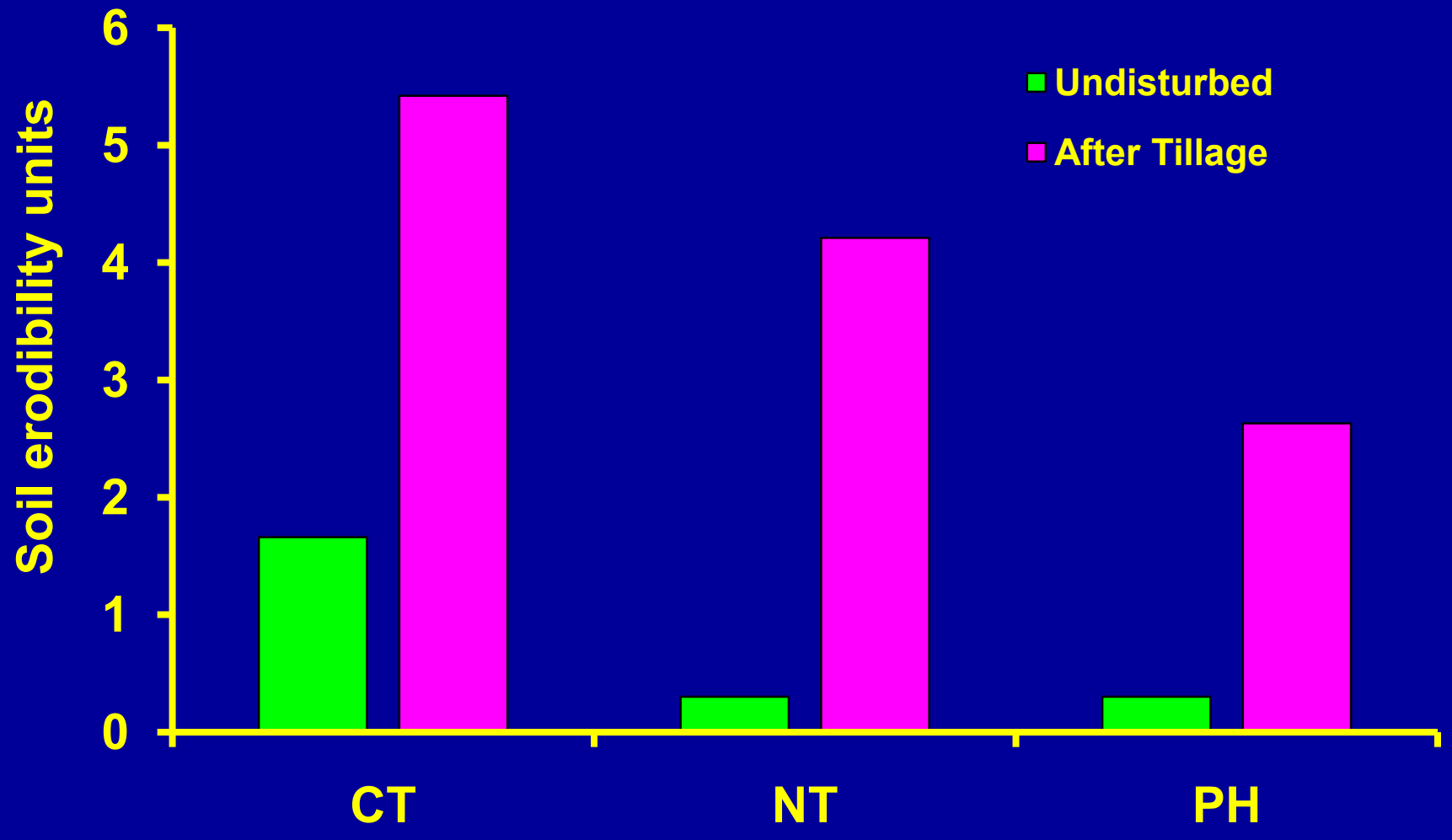

Spring Wheat Grain Yield
2001
Seed Production (lbs/a)
3400
3200
3000
2800
2600
2400
2200
2000
3146
3140
3132
3258
3144
3291
N Fertilizer (lb/ac)
0
60
0
60
0
60
Residue Management
CT
MT
NT

Rainfall Simulation Soil Erodibility



Data by S.D. Merrill et al.

Rainfall Simulation Soil Erodibility



Data by S.D. Merrill et al.

Summary

- Determine the length of your resource management plan.

Summary (cont.)

- Characterize CRP vegetation (problem weeds)

Summary (cont.)

- Tillage increases soil erodibility 3 to 10 times vs. an undisturbed area.

Summary (cont.)

- Sustainable crop production –
  - use no-till
  - cropping systems with diversity
  - cover crops if they fit

Thank you!

Questions???