CONSERVATION TILLAGE PRODUCES CHANGES IN FERTILIZER MANAGEMENT

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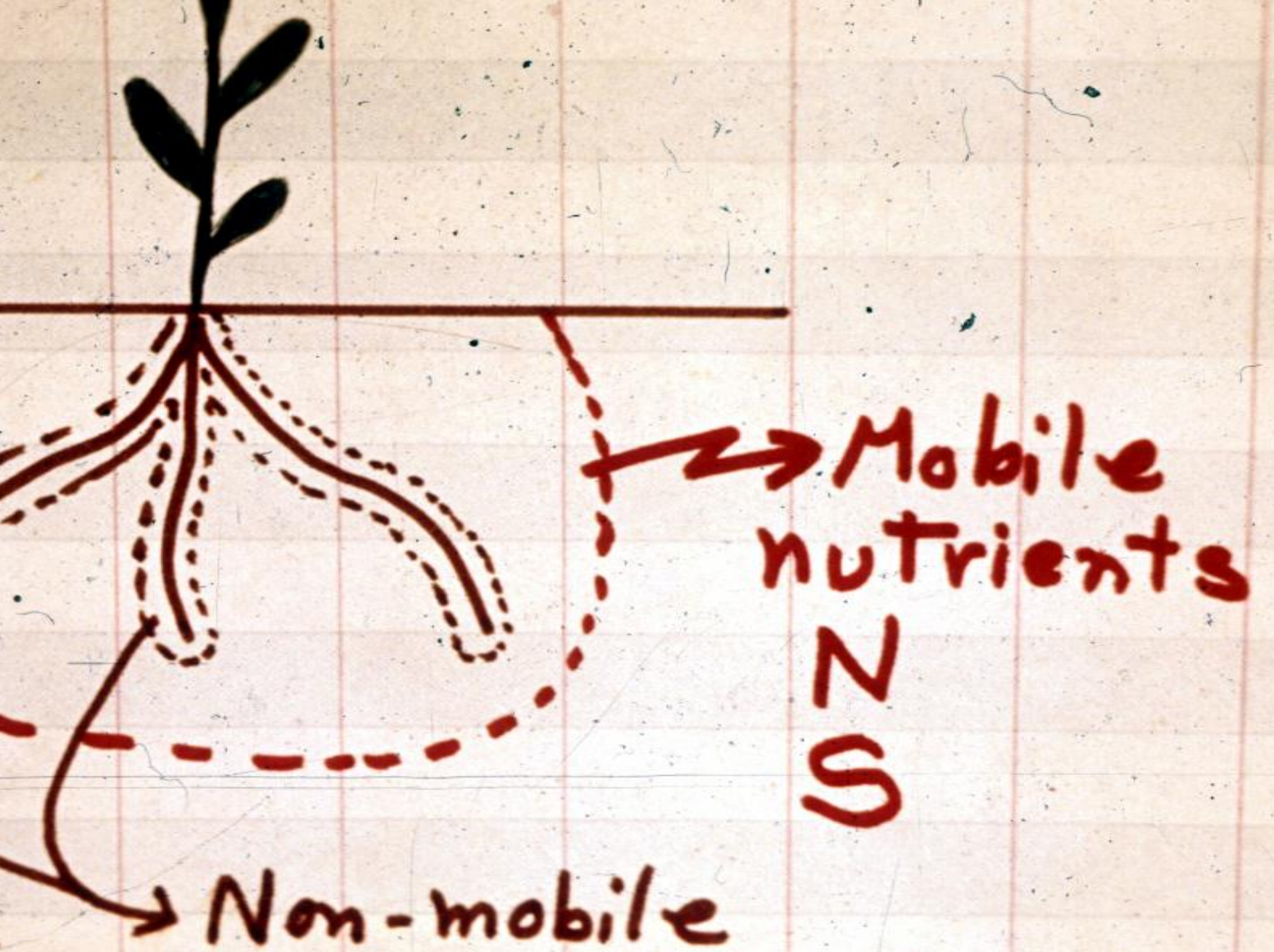

Mobile
nutrients
N
S
Non-mobile
nutrients
P, Zn, K

Nitrogen Management

- no reason to change rate
- no difference in time of application
- change placement; place below the residue
- if managed with consideration for loss, all N sources are equal

Nitrogen Placement and Tillage System

Tillage System	Broadcast	Inject
	Yield, bu./acre	
plow	136	136
chisel	131	140
no-till	121	137

Source: Griffith and Mannering, Purdue; N source = 28-0-0; rate = 120 lb.N/acre

Conservation Tillage Systems Cause Change

- stratification of soil pH
- stratification of immobile nutrients

For Immobile Nutrients

- band instead of broadcast
- no best location for the band
- not restricted to a 2 x 2 starter

Soil Volume Fertilized

Volume Fertilized	Top Growth	Root Growth
%	Gm/plant	Feet/plant
3	5.05	120.1
6	4.27	147.6
12	4.33	139.4
25	4.01	103.7

Root Growth--Distance of Fertilizer From Seed

	Days After Planting					
	20		55		100	
Distance	depth	length	depth	length	depth	length
	In.					
0	22	480	63	25,920	68	38,210
4	18	400	56	17,125	61	24,020
8	13	190	50	15,885	57	20,800

Source: Mike Peterson, Orthman Manufacturing

Best Plan For Management of Immobile Nutrients

- deep band beneath intended row
- use pop-up at planting

Pop-Up Placement-Corn Emergence Silty Clay Loam

	Placement		
grade	with seed	above seed	below seed
	% of control		
10-34-0	96.7	94.1	96.7
4-10-10	98.4	94.7	96.7
3-18-18	98.7	101.3	96.1

control = 33,106 plants/acre; rate = 10 gal./acre of 10-34-0 and4-10-10 6.8 gal./acre of 3-18-18

Pop-Up Placement – Corn Yield Silty Clay Loam

	Placement		
grade	with seed	above seed	below seed
	bu./acre		
10-34-0	212	214	213
4-10-10	205	210	203
3-18-18	201	215	211

control = 209 bu./acre; rate = 10 gal./acre of 10-34-0 and 4-10-10 ; 6.8 gal./acre for 3-18-18

Pop-Up Placement – Soybean Emergence

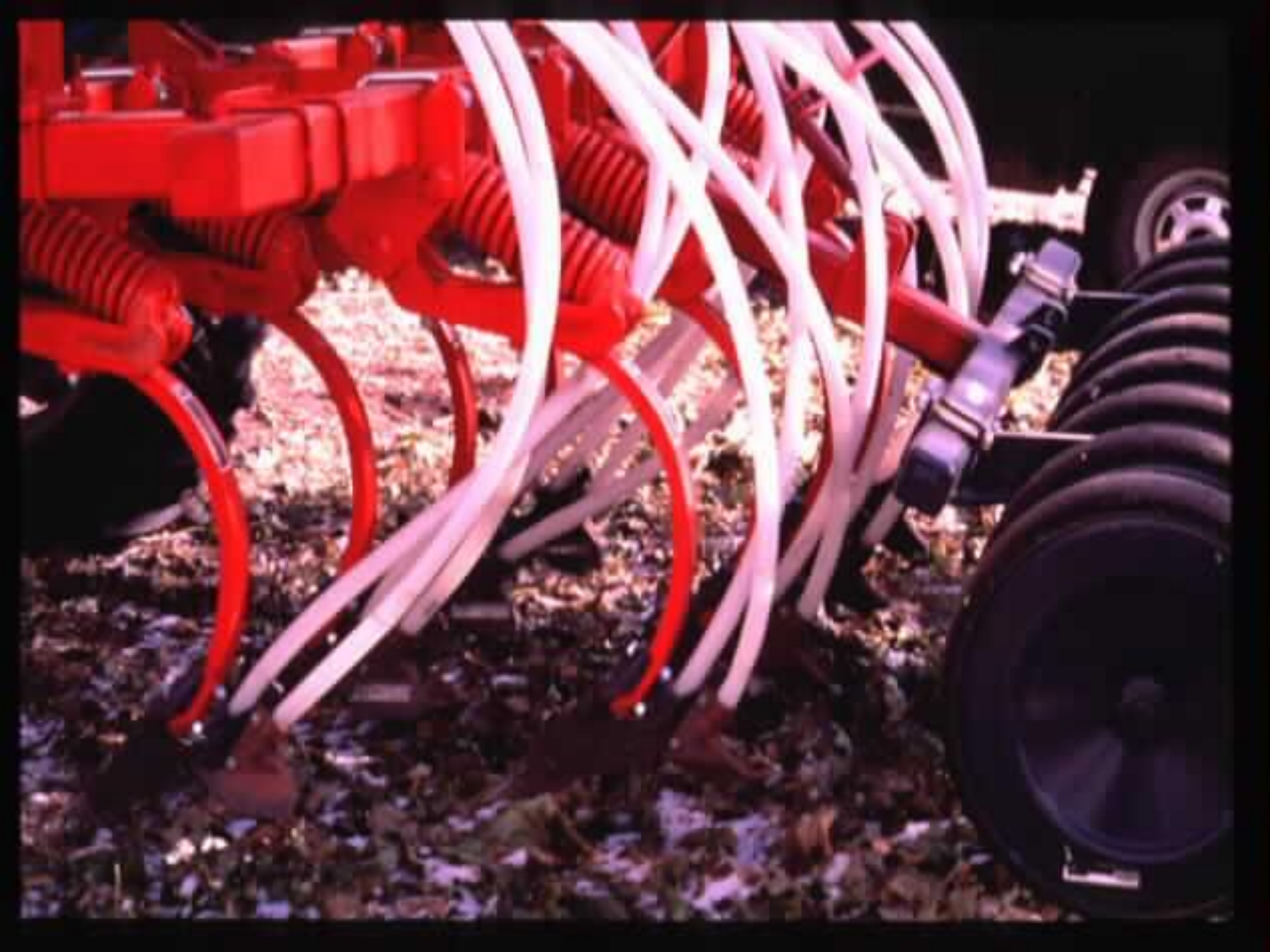
	Placement		
	with seed	below seed	above seed
grade	% of control		
10-34-0	63.3	70.3	91.5
4-10-10	89.4	97.7	100.3
3-18-18	74.4	76.5	99.5

Control = 168,577 plants/acre; rate = 6 gal./acre of 10-34-0 and 4-10-10 and 4 gal/acre of 3-18-18

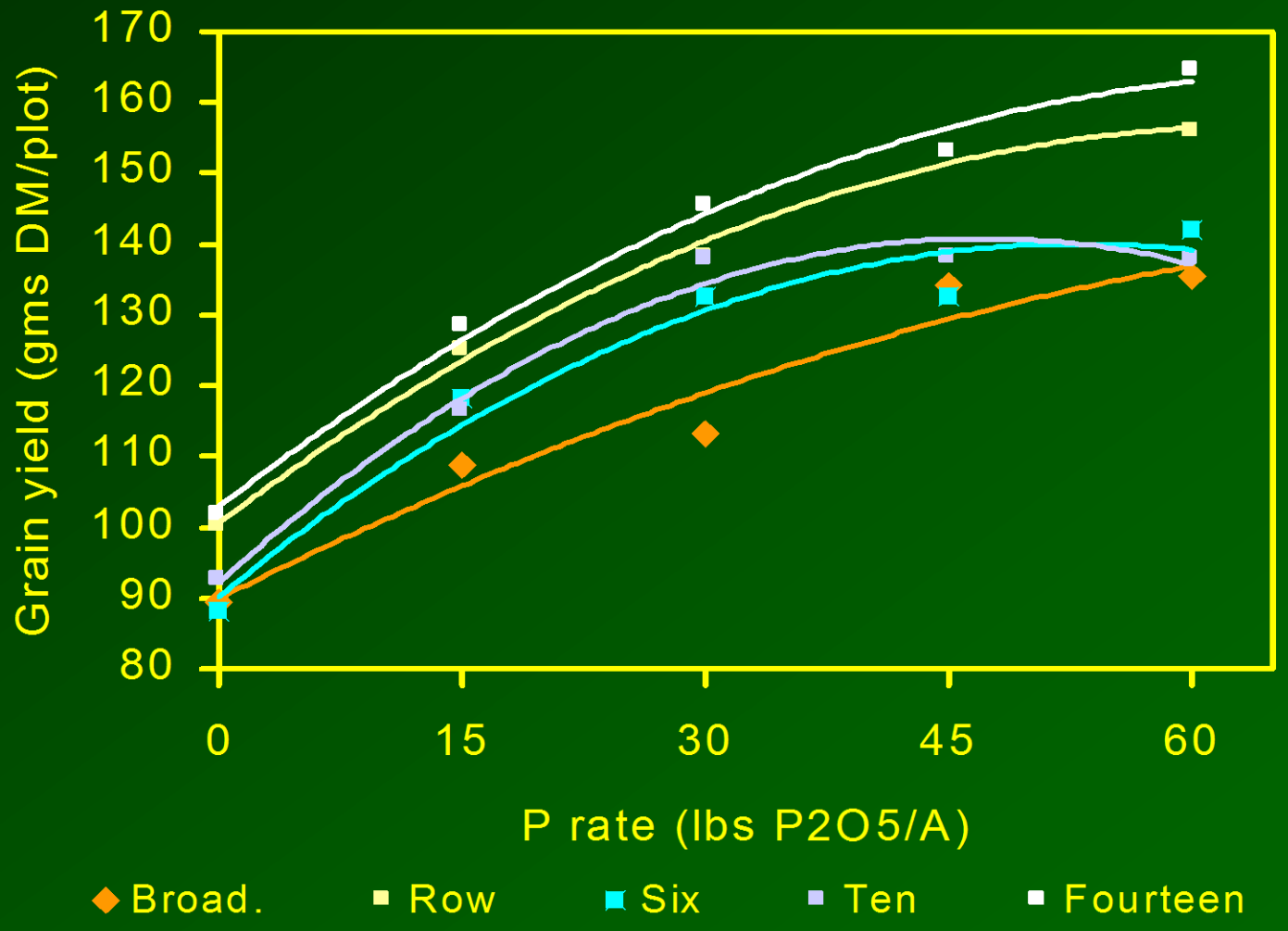
Pop-Up Placement -- Soybean Yield– Silt Loam Soil

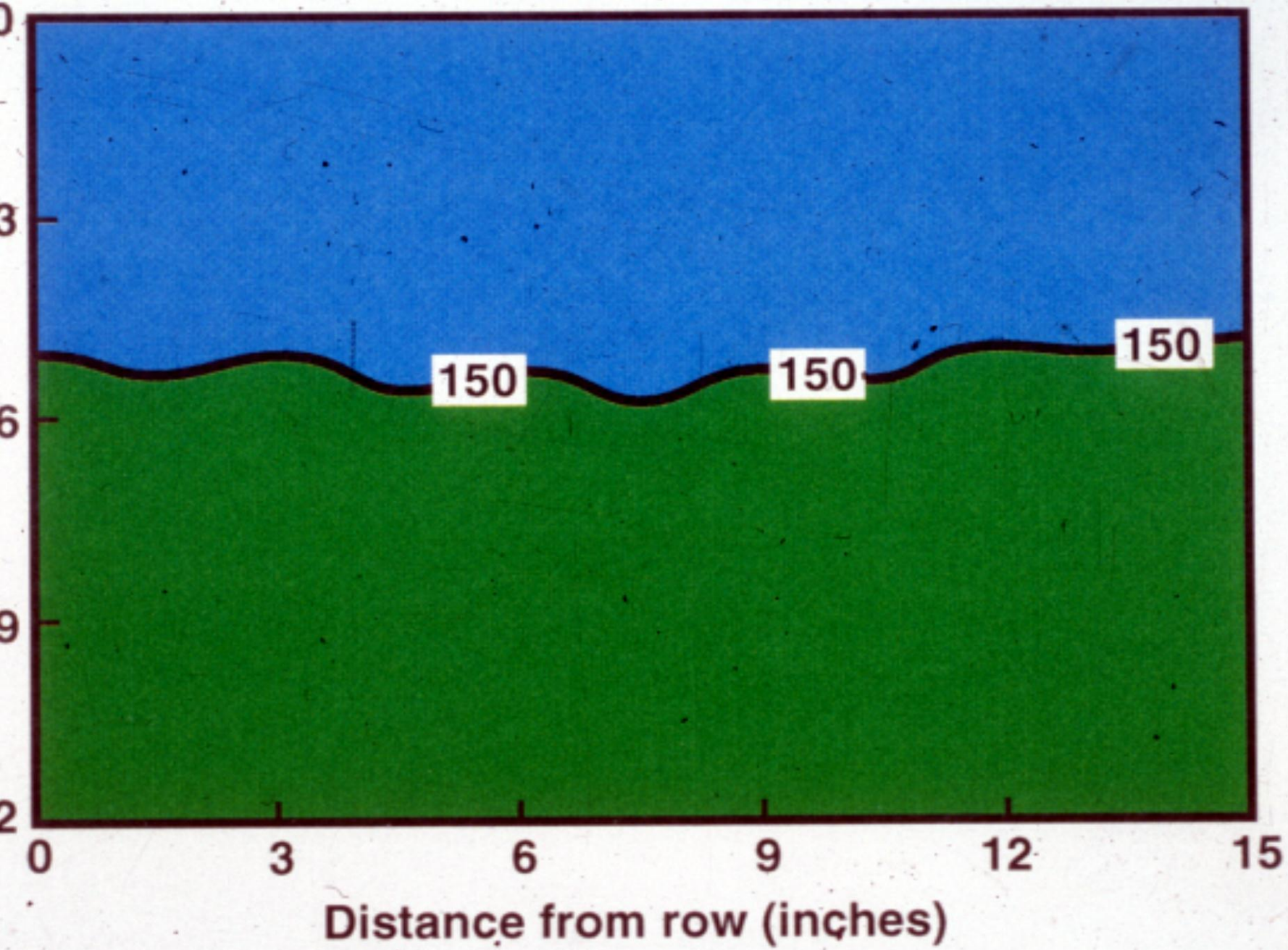
	Placement		
grade	with seed	above seed	below seed
	bu./acre		
10-34-0	61.9	63.3	62.3
4-10-10	65.3	63.4	65.6
3-18-18	62.7	66.7	63.4

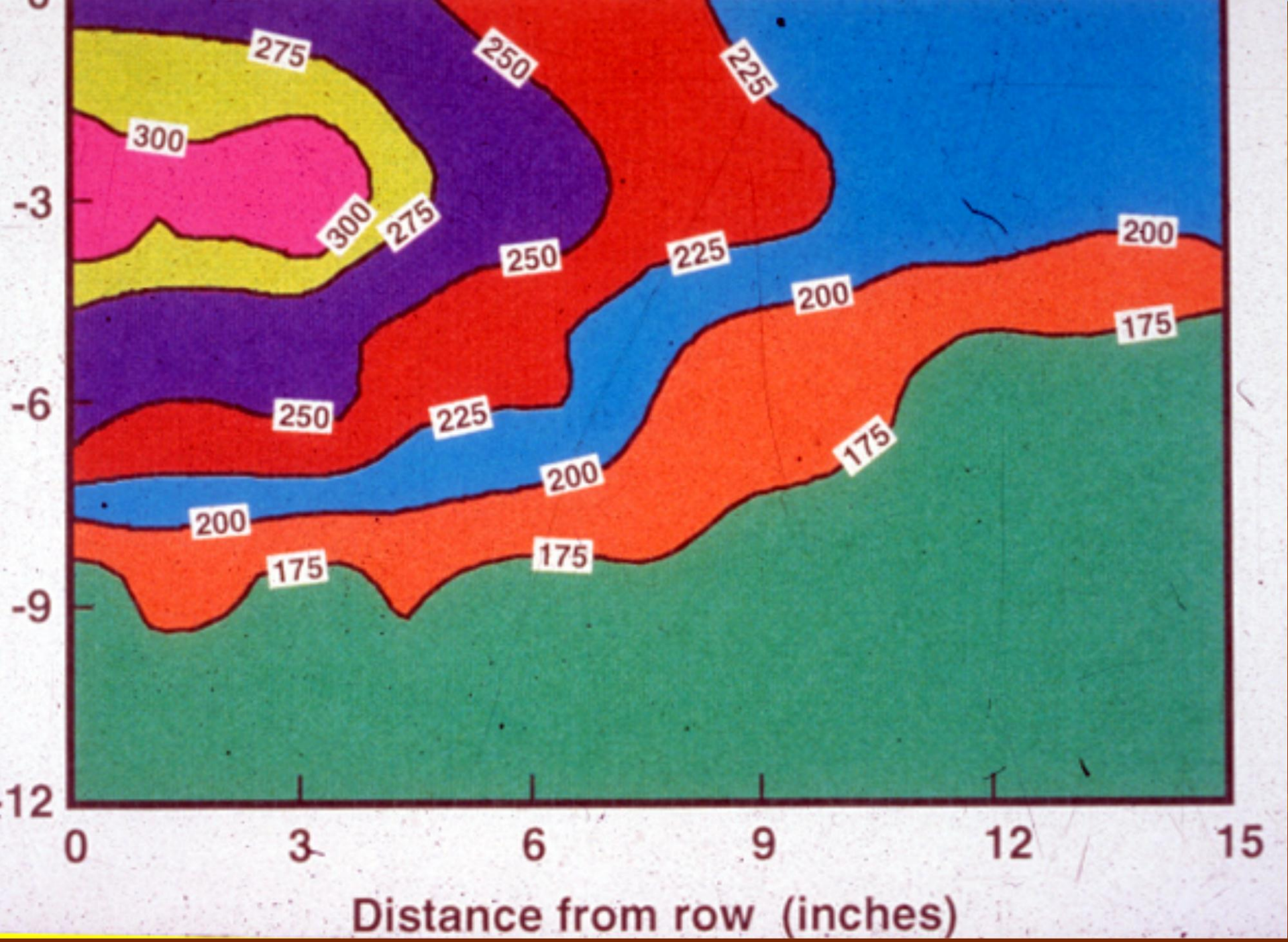
control = 63.1 bu./acre; rate = 6 gal./acre of 10-34-0 and 4-10-10; 4 gal./acre of 3-18-18



Microplot Grain Yields in 2000




0
3
6
9
12
15
Distance from row (inches)
150
150
150


275
250
225
300
300
275
250
225
200
250
225
200
175
200
175
175
-3
-6
-9
-12
0
3
6
9
12
15
Distance from row (inches)

Soil Sampling With Repeated Banding

- collect cores 6 inches from the row to a depth of 6 inches

Thank You For Your Kind Attention