Good Data Sells Itself

How One Fertilizer Dealer Uses a Local Database

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Make me different from my competition

Why A Database?

1. To establish the dealer as the local information source
2. To learn what makes corn and soybeans do what they do
3. To gather data on which to modify established soil test recommendations
4. Variable rate application was just around the corner and we needed to be ready
5. To get farmers involved in gathering data
6. To build farmer loyalty

In 1981, we began a very extensive data collection system

1. **Use 100 fields: 50 corn, 50 soybeans**
2. **Establish strips that will be in the same location each year. Use all farmer-owned fields**
3. **Collect data for 10 years**
4. **Take complete soil analysis each year**
5. **Collect additional data: soil type, tillage type and timing; fertilizer type, rate, and timing; planting and harvest date; variety or hybrid; N-Serve use; all pesticide types, rates, and timing; weed, insect, disease, and compaction ratings; planting and harvest populations; rainfall data by field.**
6. **Establish a six-farmer advisory council**

Seek Help From Purdue As to How to Organize and Analyze Data

For Every Parameter or Set of Parameters Analyzed, Must Have a Minimum of 10 Sets of Data Over at Least 5 Different Years

By 1991, We Had 900 Sets of Usable Data

Each Set of Data Contained the Following

Hybrid/ variety	Row cultivation	Pesticide type, rate, and timing	Lodging	Tillage
Planting date	Soil analyses	Starter type, rates, and placement	Insect damage rating	Nitrogen timing
Planting density	Nutrients	Disease rating	Rainfall	N-Serve use and rate
Harvest density	Nutrient rates	Compaction rating	Moisture	Tillage timing
Nitrogen type	Nutrient placement	Weed control rating	Yield	Soft Stalks

Soil pH, P, and K

1982 - 1991 CORN AND SOYBEAN STRIP PLOTS

SOIL pH	SOIL K LEVEL	AVE. YIELD
5.0 - 5.5	80 - 125	107
	126 - 200	124
5.6 - 5.8	80 - 125	120
	126 - 200	124
5.8 - 6.1	80 - 125	142
	126 - 200	138
6.2 - 6.4	80 - 125	138
	126 - 200	147
6.5 - 6.8	80 - 125	130
	126 - 200	148

Example Data From Local Database

Soil pH	Soil test K (ppm)	No. of obs.	Corn Yield (bu/A)	Applied N (lb N/A)
6.2-6.4	75-100	11	143	184
	101-125	32	167	190
	126-150	28	169	192
	151-175	24	170	182
	176-200	10	167	183
Total		100		

1982 - 1991 CORN AND SOYBEAN STRIP PLOTS

COMPARISON OF SOIL pH , SOIL P1 LEVELS, AND YIELD S/C ROTATION, 1.8 - 2.6 % OM SOILS

SOIL pH	SOIL P LEVEL	SOIL K LEVEL	AVERAGE YIELD
5.8 - 6.1	20 - 40	125 - 150	135
	40 - 60	125 - 150	140
6.2 - 6.4	20 - 40	125 - 150	141
	40 - 60	125 - 150	144
6.5 - 6.8	20 - 40	125 - 150	145
	40 - 60	125 - 150	147

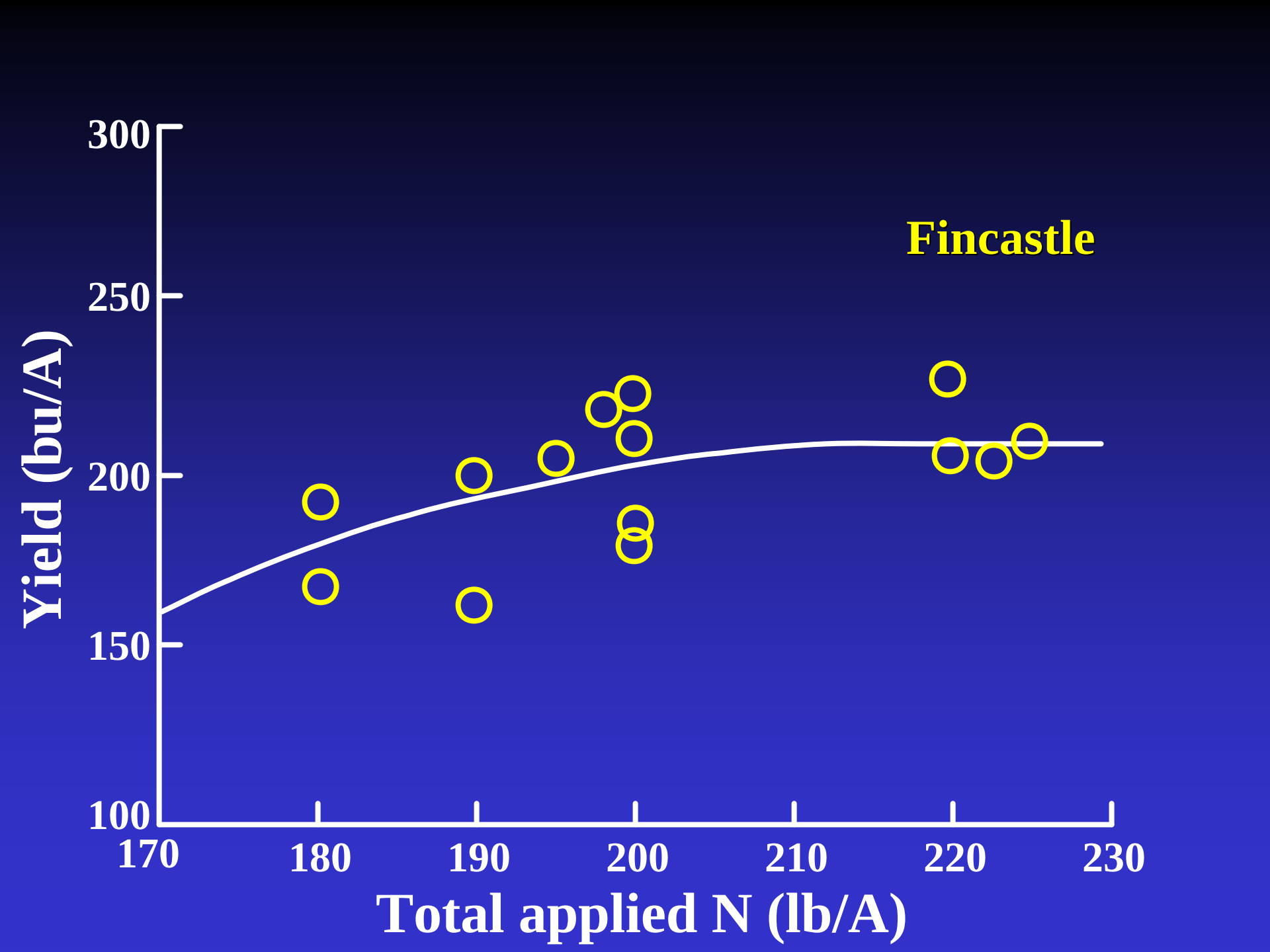
Nitrogen

1981 - 1992 CORN DATABASE
ANALYSIS OF SOIL pH AND NITROGEN RATES

NITROGEN RATES	SOIL pH 5.0 - 6.0	SOIL pH 6.1 - 6.9
140 - 160	124	135
161 - 180	128	138
181 - 200	131	141

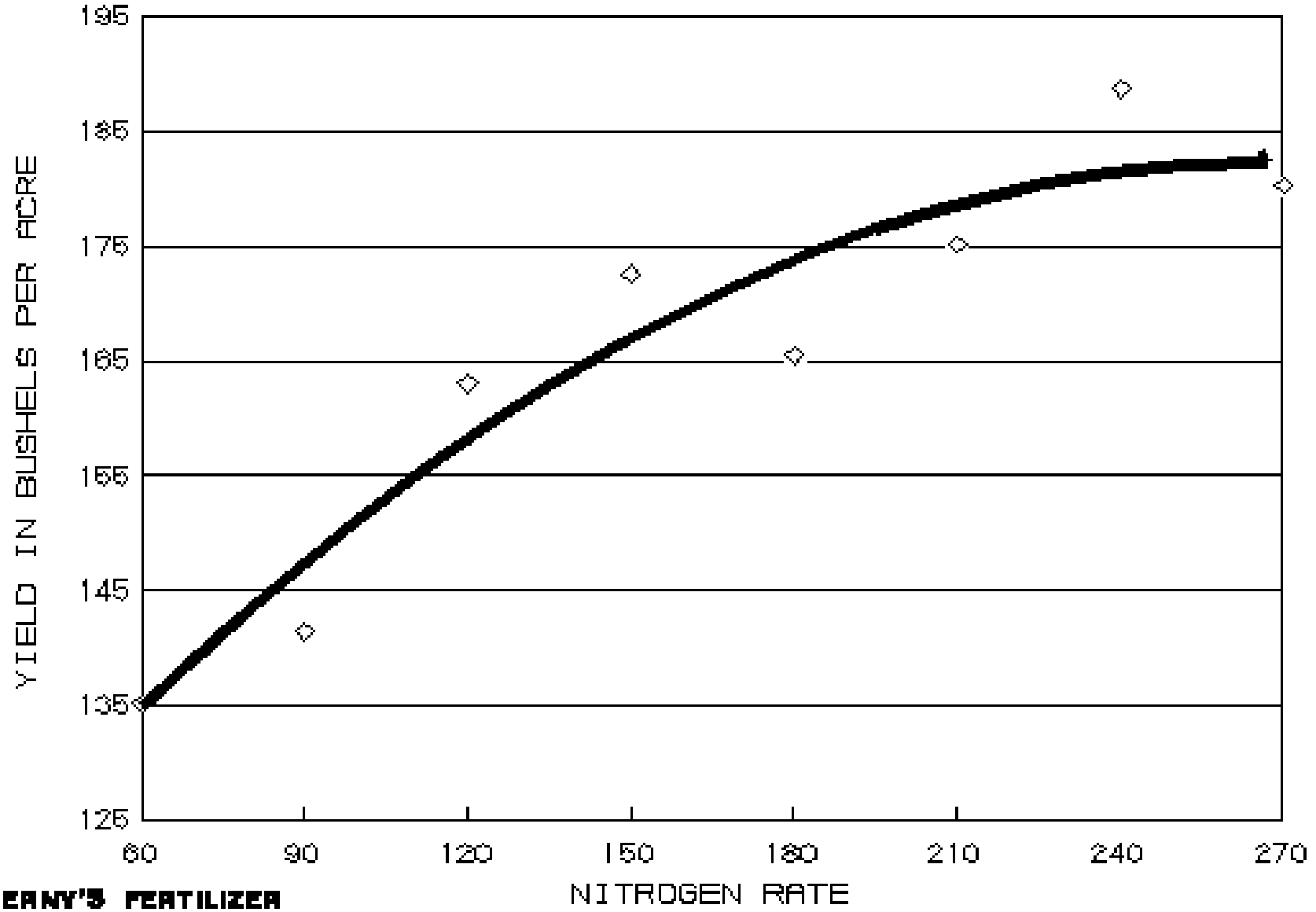
EFFECT OF SOIL pH ON NITROGEN EFFICIENCY

pH RANGE	AVERAGE YIELD	AVG LBS N /ACRE	N EFF. LBS/BU
5.0-5.5	160	198	1.25
5.6-5.8	160	190	1.18
5.9-6.1	162	187	1.15
6.2-6.4	167	190	1.13
6.5-6.8	174	185	1.06


Fincastle
Yield (bu/A)
300
250
200
150
100
170
180
190
200
210
220
230
Total applied N (lb/A)

1992-1995 NITROGEN RATE STUDY

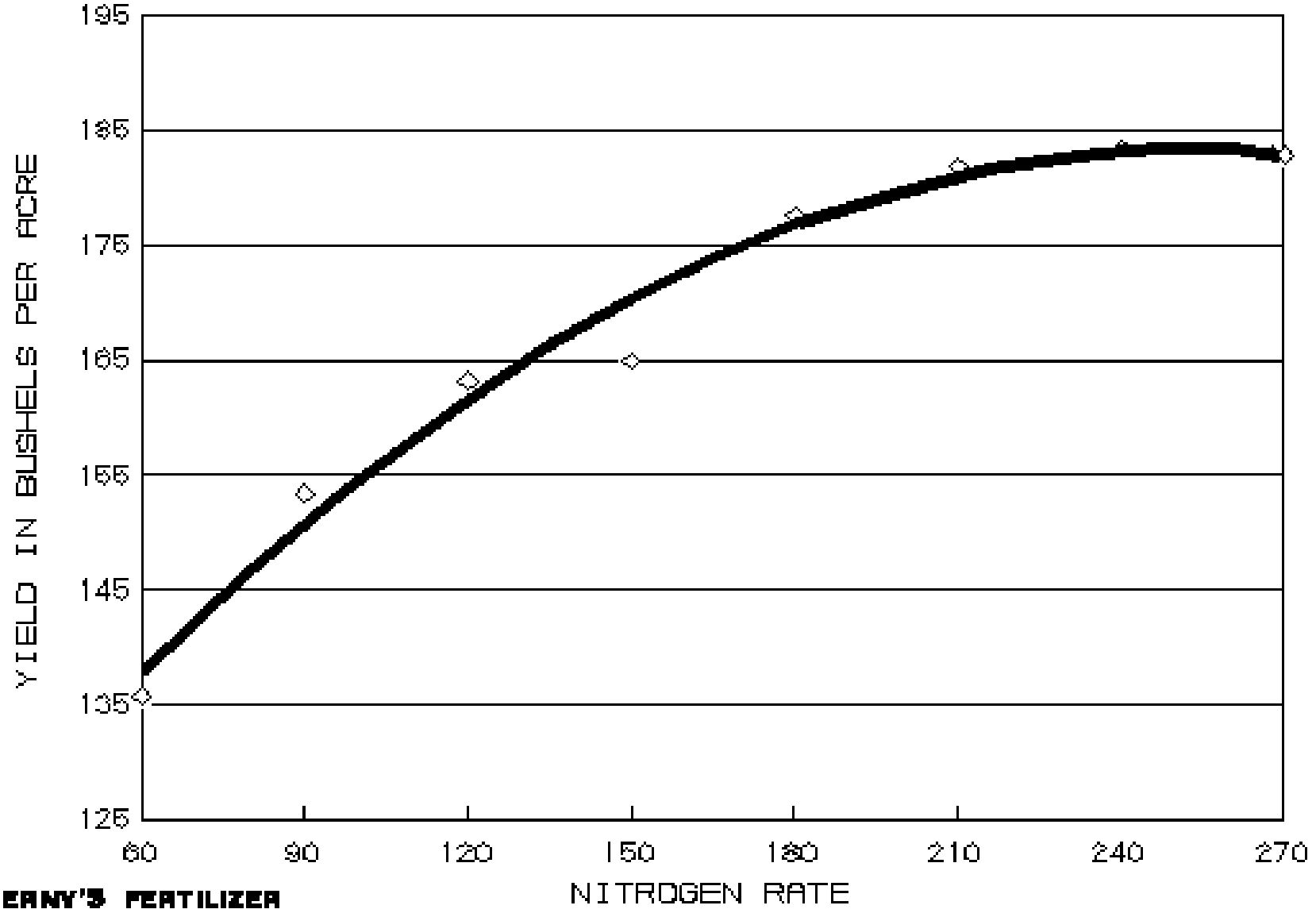
FINCASTLE SOIL



ERNY'S FERTILIZER

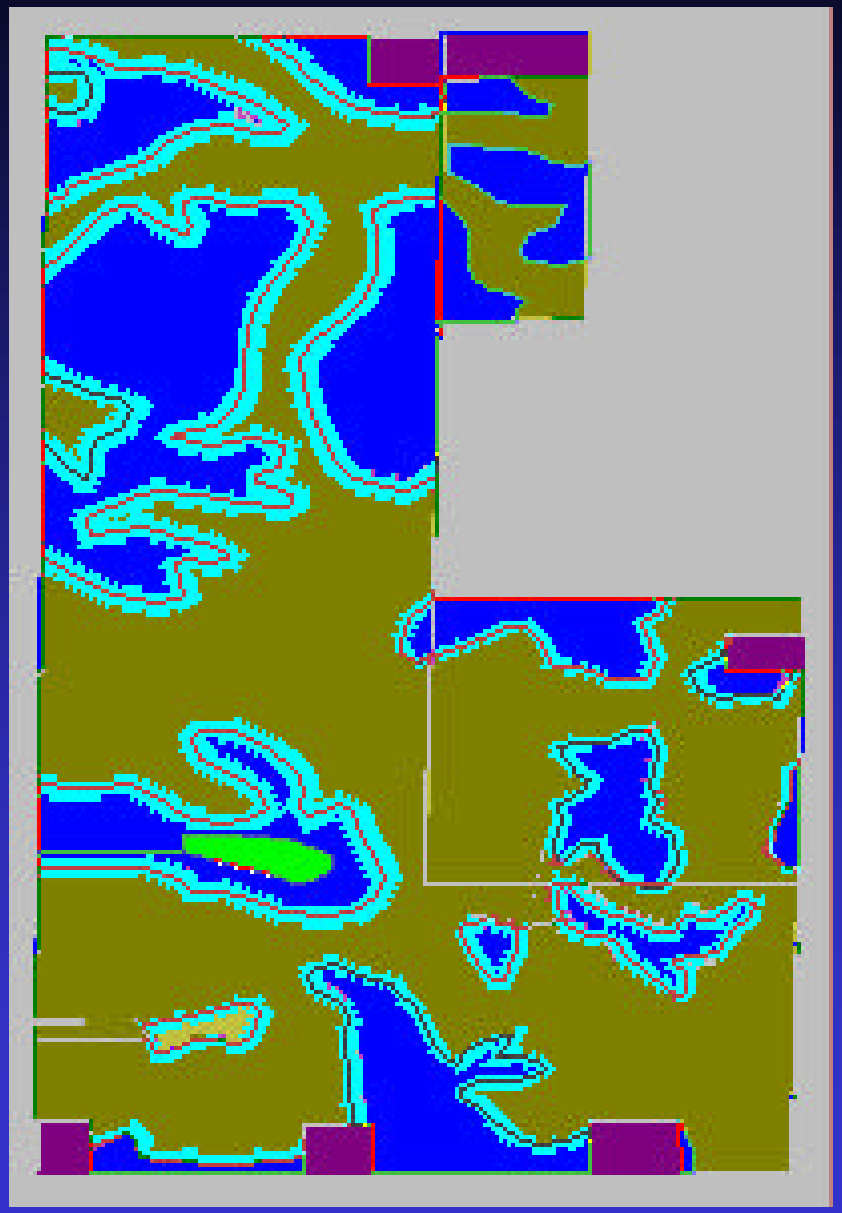
1992-1995 NITROGEN RATE STUDY

CYCLONE SOIL



ERNY'S FERTILIZER

AQUA AMMONIA VRT MAP



GAL. AQUA

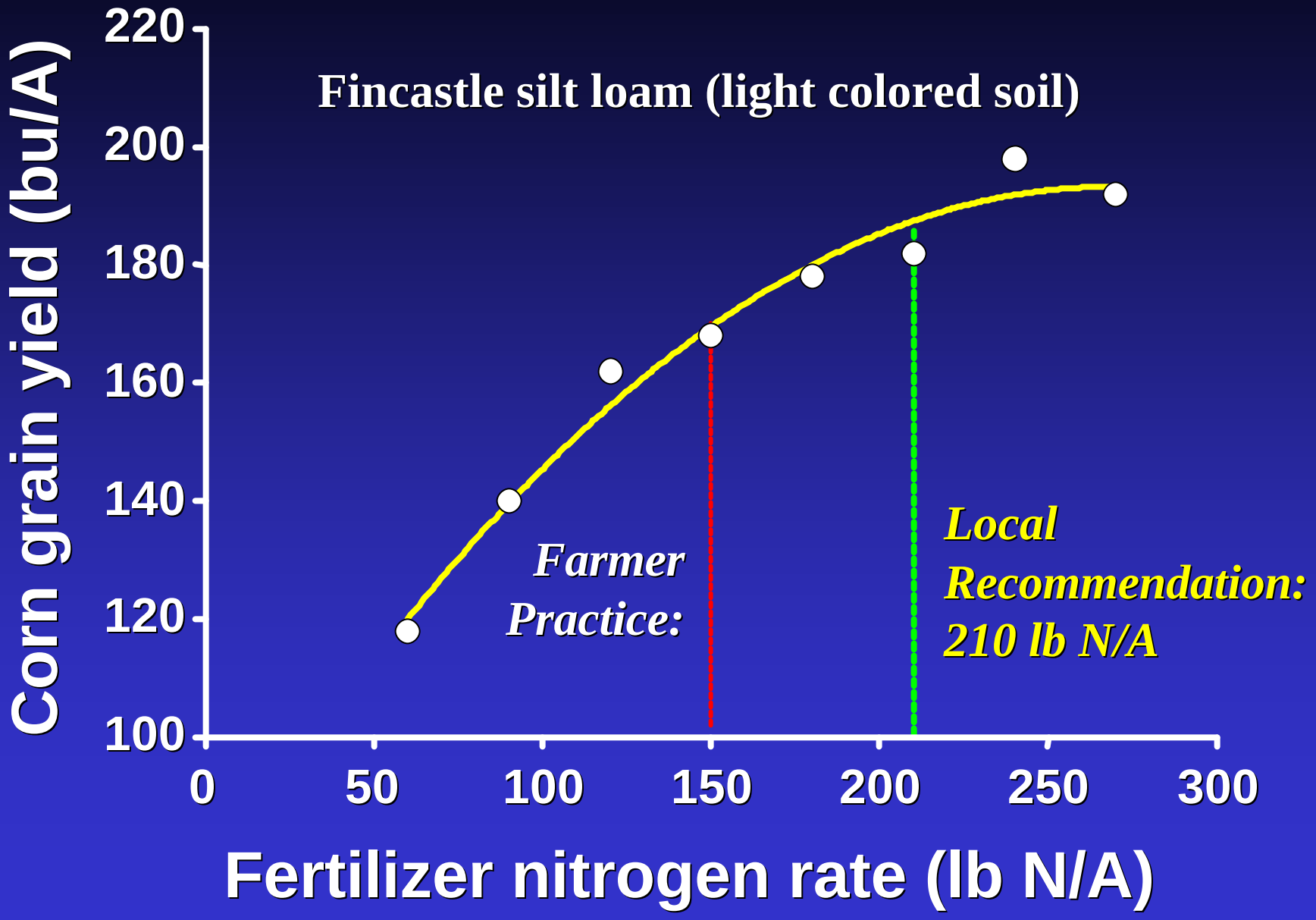
88 - 94

94 - 100

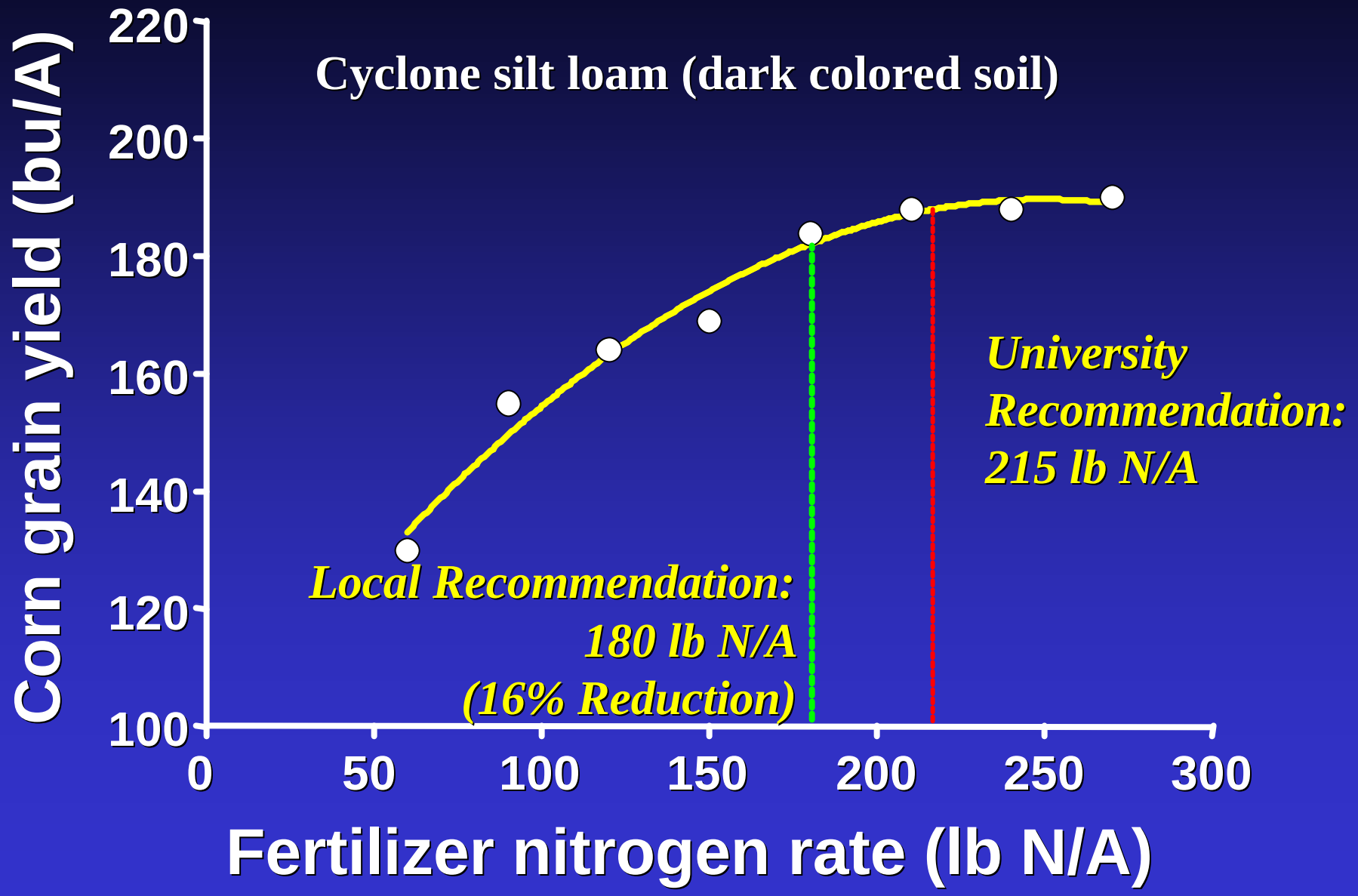
100 - 106

106 - 111

Local Data Changes Perceptions



Local Data Can Refine Recommendations



Soil Compaction

Corn Grain Yield and Soil Compaction (All Rotations)

Compaction rating	No. of obser-vations	Corn grain yield (bu/A)	K soil test (ppm)
Slight	219	170	148
Moderate	86	162	158
Severe	26	154	157

What Can You Do With This Data?

1. **Moderate compaction caused an 8 bushel per acre corn yield reduction, while severe compaction caused a 16 bushel per acre loss.**

2. **Sub-soiling in central Indiana costs $15.00 per acre.**

3. **With moderate compaction, break-even would be at a corn price of $1.88**

4. **With severe soil compaction, break-even would be at a corn price of $0.94**

1982 - 1991 CORN AND SOYBEAN STRIP PLOTS

COMPACTION RATING	CORN YIELD	CORN % SOFT STALKS	SOYBEAN YIELD
SLIGHT	170	23	51
MODERATE	162	37	48
SEVERE	154	52	47

Soil Tests

Potassium Fixation by Soil Type

Soil Type	Soil pH	Lbs/A K_2O to change 1 Lb/A
Fincastle SiL	Normal	13.8
Fincastle SiL	High	23.6
Russell SiL	Normal	5.2
Cyclone SiL	Normal	20.8
Cyclone SiL	High	30.8
Cyclone SiL	Normal	14.8
Gilford SL	Normal	4.8

Soil K Test vs Previous Rainfall

Year	K Test (ppm)	Average Rainfall (in.) Week 1	Week 2	Week 3	Week 4
1982	126	0.0	1.8	0.0	1.8
1984	145	1.5	2.0	0.0	1.2
1986	113	0.2	0.0	2.8	0.4
1988	140	1.7	0.0	1.0	0.0

Impacts of Local Data

- Effective in changing farmer perceptions
- Builds customer loyalty
- Expands trade territory
- Builds relationships with university extension researchers
- Provides scientific defense for management practices (important for regulatory standards)

Local Data Provides a Competitive Edge

1982 - 1991 CORN AND SOYBEAN STRIP PLOTS

EFFECT OF FALL TILLAGE ON CORN YIELD, S/C ROTATION

FALL TILLAGE	AVERAGE YIELD	% SOFT STALKS	COMPACTION RATING
SUBSOIL	174	25	1.1
MOLDBOARD	171	25	1.3
NONE	168	27	1.3
DISC-CHISEL	166	31	1.4
DISC	161	28	1.8

1982 - 1991 CORN AND SOYBEAN STRIP PLOTS

EFFECT OF FALL TILLAGE ON CORN YIELD, C/C ROTATION

FALL TILLAGE	AVERAGE YIELD	% SOFT STALKS	COMPACTION RATING
SUBSOIL	177	38	1.7
MOLDBOARD	168	36	1.5
NONE	161	49	2.0
DISC-CHISEL	169	24	1.3
DISC	154	48	2.0

1988-1995 N-SERVE RESPONSE
FINCASTLE SILT LOAM

LBS N / A	YIELD WITH N-S	WITHOUT N-S
90	155	143
150	164	158
180	167	160
210	171	166

Soil S Test vs Previous Rainfall

Year	S Test (ppm)	Average Rainfall (in.) Week 1	Week 2	Week 3	Week 4
1982	11	0.5	0.0	1.8	0.0
1984	14	3.0	1.5	2.0	0.0
1986	8	0.0	0.2	0.0	2.8
1988	11	0.9	1.7	0.0	1.0

1982 - 1991 CORN AND SOYBEAN STRIP PLOTS

ANALYSIS OF 2,4-D USE, S/C ROTATION

YEAR	2,4-D BU/A GAIN OR LOSS
1989	-8
1990	-4
1991	-15
1992	-11
1993	-4
AVG. LOSS	8.2

Analysis of Soil Test Data
Comparison of Test Data and Crop Grown

Year	Crop	Average Yield (bu / A)	P (ppm)	K (ppm)	pH
1989	Beans	50	28	123	6.2
1990	Corn	158	39	173	6.3
1991	Beans	40	32	164	6.2
1992	Corn	183	35	151	6.4
1993	Beans	48	34	159	6.3

0.45 lb/bu phosphate, 0.81 lb/bu potash applied

Analysis of Soil Test Data
Comparison of Test Data and Crop Grown

Year	Crop	Average Yield (bu / A)	P (ppm)	K (ppm)	pH
1989	Corn	176	46	136	6.3
1990	Beans	54	40	174	6.5
1991	Corn	103	48	184	6.3
1992	Beans	51	51	154	6.2
1993	Corn	150	49	207	6.0

0.50 lb/bu phosphate, 1.11 lb/bu potash applied