Nitrogen Experiments

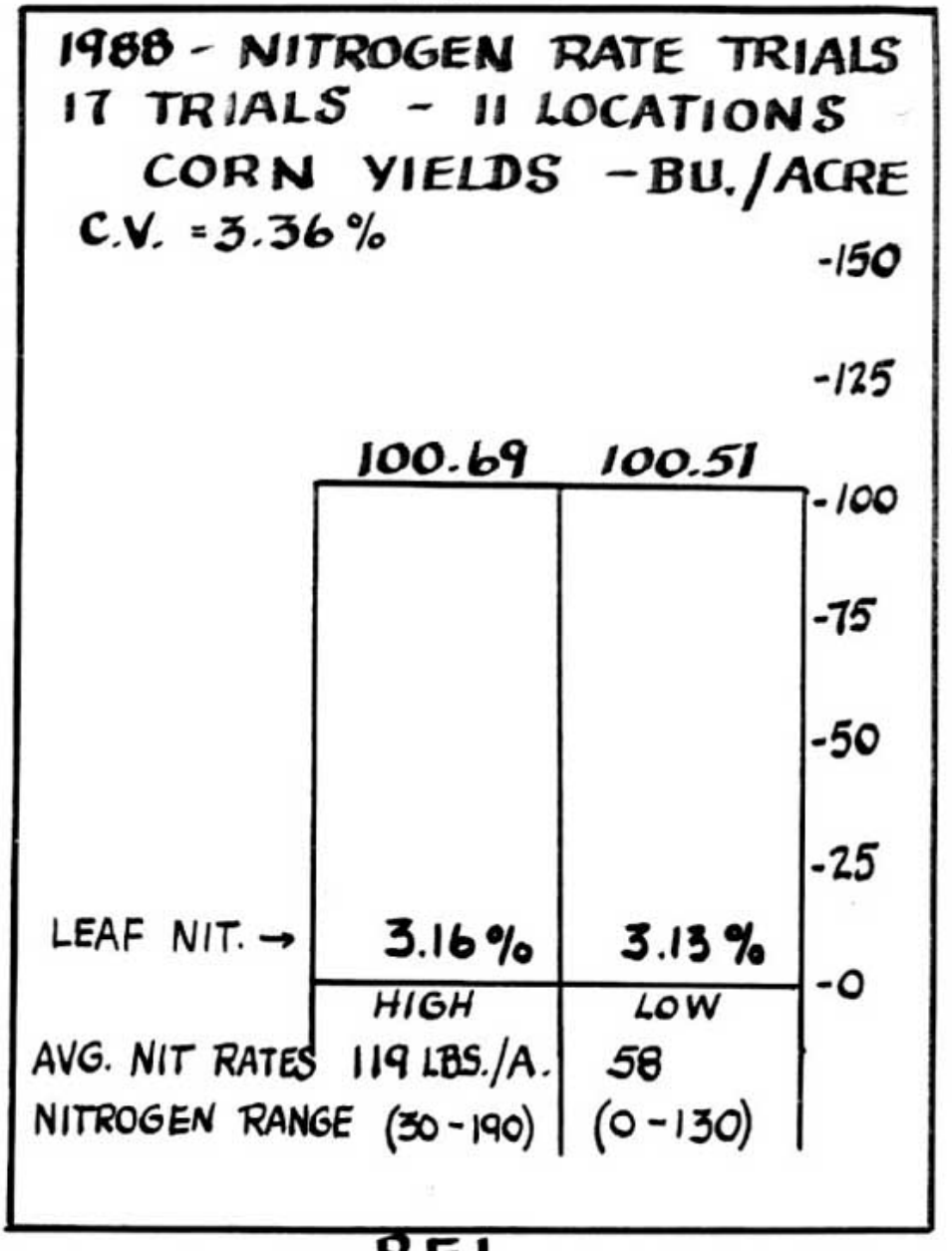
THE AVERAGE NITROGEN RATE PER ACRE (17 TRIALS - 11 LOCATIONS) FOR THE HIGH LEVEL APPLICATION WAS 119 POUNDS, AND 58 POUNDS NITROGEN WAS THE MEAN APPLICATION RATE FOR THE LOW LEVEL.

THE AVERAGE CORN YIELDS FOR BOTH TREATMENTS WAS 100 BUSHELS PER ACRE, CHART 3. THE HIGH NITROGEN APPLICATION RATE HAD A RANGE OF 30 TO 190 POUNDS PER ACRE. THE HIGHEST USAGE BEING ON A CONTINUOUS CORN CASH GRAIN FARM. THE LOW RATE RANGE WAS 0 TO 130 POUNDS PER ACRE. THE LOWEST RATES WERE GENERALLY ON FARMS WITH HAY ROTATIONS, FALL LEGUME COVER CROPS AND MANURE APPLICATIONS.

THE LEAF NITROGEN PERCENT, CHART 3, WAS NOT SIGNIFICANTLY DIFFERENT BETWEEN NITROGEN FERTILIZER RATES ON ANY OF THESE DEMONSTRATIONS. BASED ON $2.75 CORN AND 15 CENTS PER POUND NITROGEN, THE LOWER NITROGEN RATE SAVED $8.49 PER ACRE, CHART 4. THESE SAVINGS OF 61 POUNDS PER ACRE OF IOWA'S 10.7 MILLION ACRES WOULD REDUCE INPUTS COSTS BY $90.8 MILLION. THE ENERGY SAVED IN NOT PRODUCING THIS EXCESS NITROGEN AMOUNTS TO 122.2 MILLION GALLONS OF DIESEL FUEL.

LAST BUT NOT LEAST THERE WOULD BE LESS NITRATE-NITROGEN IN THE GROUNDWATER. CHARTS 5 - 6 EXHIBIT THE VARIOUS CORN YIELDS, LSD(05), COSTS, AND C.V.%. OF THE 17 TRIALS. THE SAME SMALL LETTER NEXT TO THE CORN YIELDS SAYS THERE IS NO SIGNIFICANT YIELD DIFFERENCE. FIFTEEN OF THE NITROGEN TRIALS HAD NO YIELD DIFFERENCES BETWEEN THE NITROGEN RATES. HAGENSICK, CHART 5, TRIAL WITH 152 POUNDS NITROGEN VS. 32 POUNDS PER ACRE HAD A SIGNIFICANT YIELD REDUCTION WITH THE HIGH RATE. THE EXCESS NITROGEN COST $13. 17 PER ACRE PLUS THE 4. 59 BUSHEL LOSS AT $2.75 = $12.62 LOSS WHICH REDUCED PROFITS $25.79 PER ACRE. ON THE OTHER HAND, THE OIEN TRIAL, CHART 6, INCREASED YIELDS SIGNIFICANTLY AT THE HIGH RATE OF 120 POUNDS VS. THE 60 POUND RATE OF NITROGEN. THE INCREASED YIELD OF 8.78 BUSHELS PER ACRE IMPROVED SALES BY $ 24.15 PER ACRE MINUS THE EXTRA NITROGEN COST OF $10.50 LEFT AN INCREASED PROFIT OF $13.65 PER ACRE OVER THE LOW RATE OF NITROGEN.

CHART -3-


1988 - NITROGEN RATE TRIALS
17 TRIALS - 11 LOCATIONS
CORN YIELDS - BU./ACRE
C.V. = 3.36 %
150
125
100
75
50
25
0
100.69
100.51
LEAF NIT. →
3.16 %
3.13 %
HIGH
LOW
AVG. NIT RATES
119 LBS./A.
58
NITROGEN RANGE
(30 - 190)
(0 - 130)

P.F.I.

CHART -4-

1988 NITROGEN EXPERIMENT.

17 TRIALS - 11 LOCATIONS

HIGH AVG. RATE = 119 LBS/A.
LOW AVG. RATE = 58
DIFFERENCE = 61

LOW RATE SAVED $8.49/ACRE
IOWA CORN ACRES = 10.7 M.
10.7 M ACRES x $8.49 = $90.8 M.

EQUAL YIELD FROM BOTH RATES

LOWER RATE SAVED 122.2 M GALLONS DIESEL IF APPLIED TO IOWA'S CORN ACRES.

LOWER NITROGEN RATES WOULD PUT LESS NO_3-N IN THE GROUND WATER.

P.F.I.

Tel: (515) 232-5661
Fax: (515) 232-5649
137 Lynn Avenue, Suite 200
Ames, Iowa 50014
Email: info@practicalfarmers.org
Web: www.practicalfarmers.org

CHART -5-

1988 - NITROGEN RATE TRIALS

CORN YIELDS BU./A.

2.75 optimum tissue N level	HIGH NIT.	LOW NIT.	DIFF FROM LOW	LSD(.05)	COST $ DIFF.	C.V. %
BAUER	105.06 (a) -70-	104.09 (a) -42-	+ 0.97	3.41	-4.90	2.20
BAUER NIT LBS. LEAF NIT	128.3 (a) -70- 3.39 %	129.1 (a) -42- 3.33 %	-0.80	3.23	-4.90	1.69
N-BUMGARNER	103.55 (a) -140- 3.12 %	104.08 (a) -90- 3.13 %	-0.53	3.04	-5.00	1.96
S-BUMGARNER	94.41 (a) -140- 3.15 %	93.06 (a) -90- 3.36 %	+1.35	4.15	-5.00	2.98
GRAAF	76.45 (a) -150-	74.56 (a) -100-	+1.89	7.47	-8.75	6.66
HAGENSICK	120.76 (a) -30- 3.50 %	120.96 (a) -0- 3.39 %	-0.20	2.29	-5.75	1.27
HAGENSICK	125.39 (a) -152- 3.32 %	129.98 (b) -32- 3.34 %	-4.59 *	3.66	-13.17 -12.62 -25.79	2.27
HAGENSICK	108.77 (a) -182- 3.18 %	110.11 (a) -32- 3.22 %	-1.40	1.50	-16.46	1.94

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CHART -6-

	HIGH NIT.	LOW NIT.	DIFF FROM LOW	LSD(.05)	COST DIFF.$	C.V. %
HANKS NIT. LBS. LEAF NIT.	(a) 134.63 -120- 3.13%	(a) 133.43 -60- 2.70%	+ 1.20	7.38	-11.70	3.71
MADSEN	(a) 103.43 -77- 3.11%	(a) 102.30 -42- 3.15%	+1.13	1.64	-6.93	1.07
OIEN	(a) 106.02 -120- 2.98%	(b) 97.24 -60- 2.77%	+8.78*	7.30	-10.50 +24.15 +13.65	5.49
SCHMADEKE	(a) 94.16 -140- 3.02%	(a) 93.00 -80- 2.77%	+ 1.16	2.17	-6.60	1.56
STONECYPHER	(a) 99.02 -120- 3.28%	(a) 99.12 -60- 3.18%	- 0.10	1.31	-8.68	0.89
I - THOMPSON +15 T manure ~70 lb N available	(a) 111.65 -64- 3.27%	(a) 111.70 -0- 3.17%	-0.05	2.80	-12.16	1.92
4II THOMPSON +15 T manure ~70 lb N available	(a) 104.03 -64- 3.09%	(a) 107.80 -0- 3.33%	-3.05	5.12	-12.16	3.70
H - TREIMER	(a) 26.12 -190- 2.75%	(a) 27.70 -130- 3.01%	-1.58	5.60	-11.63	14.03
L - TREIMER	(a) 69.97 -190- 3.15%	(a) 70.43 -130- 3.09%	-0.46	3.87	-11.63	3.71

P.F.I.