

## Nitrogen

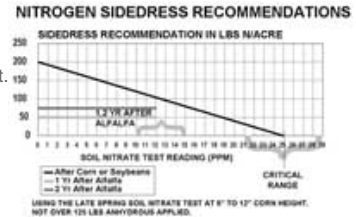
A few years back, nitrogen rate trials were the most common on-farm experiment. That's no longer true, maybe because we now have the late spring soil nitrate test for corn. At the **Neely-Kinyon Research Farm**, near Greenfield, Bernie Havlovic carried out a demonstration of nitrogen rates for corn following soybeans ([Table 3](#)). Four rates were compared: zero, 75, 110, and 150 pounds per acre spring-applied anhydrous ammonia N. The 110 pound rate, which was determined using the late spring soil nitrate test, yielded as well as the 150 pound rate, and both yielded significantly better than the check treatment. The corn yield in the 75 pound treatment was not significantly less than the two high rates. With more replications than the three that were used, the trial might have distinguished the 75 pound treatment as different too.

**Tom  
and  
Irene**

Using the late spring soil nitrate test at 6" to 12" corn height.

Not over 125lbs anhydrous applied.

Figure 2. Sidedress recommendations for the late spring soil nitrate test.



**Frantzen**, New Hampton, tested the nitrogen contribution to corn from a previous crop of berseem clover ([Table 1](#)). There was no yield difference between the corn receiving 80 pounds N and that getting 20 pounds, suggesting that the berseem may have supplied a significant amount of N to the crop. The whole field had also received six tons of hog manure in October, 1993. The late spring soil nitrate test showed both treatments to be in the seventies (very high). However, both treatments gave late season cornstalk tests in the 600's, suggesting the possibility of an N shortage.

In early 1994, there were dry and warm conditions that released soil nitrogen and led to the large number of high readings for the late spring test. Then the rains returned, leaching soil N out of the root zone - and conditions were also excellent for crop removal of nutrients. As a result, some PFI farmers were left wondering if they really did have enough nitrogen in 1994. Dr. Fred Blackmer, who adapted the late spring soil nitrate test for Iowa, recommends always including one field strip of a high nitrogen rate. This can be a very useful reference if questions arise in mid-season.

Table 1. STARTER & OTHER FERTILITY TRIALS					STARTER & OTHER FERTILITY TRIALS						
COOPERATOR	CROP	TREATMENT “A”		TREATMENT “B”		TRT “B”	DIFFERENCE				
		DESCRIPTION	YIELD (bu.)	DESCRIPTION		YIELD (bu.)	YIELD DIFF.	YLD LSD (bu.)	YLD SIG.	\$ BENEFIT OF TRT "A"	COMMENT
ALERT	SOYBEANS	STARTER, 2" BELOW SEED	46.2	NO STARTER		43.1	3.1	1.9	*	(\$6.63)	8+24+48 AS 2-6-12 SUSPENSION
DAVIDSON	SOYBEANS	STARTER FERTILIZER	37.6	NO STARTER		37.9	-0.3	1.8	N.S.	(\$6.33)	2+7+13 AS 2-6-12 1" BELOW SEED. HP204 EDIBLE BEANS
STONECYPHER	CORN	STARTER ON SEED	143.1	NO STARTER		150.6	-7.5	10.9	N.S.	(\$9.45)	1+6+6 IN STARTER
ROSMANN	SOYBEANS	45 LB/ACRE ROCK PHOSPHATE	69.0	7.5 LB/ACRE ROCK PHOSPHATE		69.2	-0.3	0.9	N.S.	(\$3.75)	BLACK PHOSPHATE METERED THROUGH PLANTER INSECTICIDE BOXES. SOIL P1 TEST=21 PPM (HIGH)
TIBBS	SOYBEANS	BANDED 22+70+90	54.5	NO FERTILIZER		53.6	0.8	1.7	N.S.	(\$33.82)	BEANS PLANTED DIRECTLY OVER FALL DEEP BAND. THREE REPS ONLY.
FRANTZEN	CORN	80+8+50 AFTER BERSEEM CLOVER	171.1	20+8+50 AFTER BERSEEM CLOVER		169.1	2.0	8.1	N.S.	(\$13.38)	LATE SPRING SOIL NITRATE: HIGH RATE 77 PPM, LOW 71 PPM STALK NITRATE: 673 PPM HIGH RATE, 605 PPM LOW RATE
LUBBEN	SOYBEANS	ACA W. HERBICIDE ON 6/27	62.7	NO ACA, JUST HERBICIDE		62.8	-0.1	2.3	N.S.	(\$4.14)	UNRANDOMIZED TRIAL, STATISTICS WEAKENED
OLSON	SOYBEANS	GROZYMET™ /AGRI-SC™ PREPLANT BAND	63.9	ZERO CHECK		65.0	-1.0	5.2	N.S.	(\$10.76)	GROZYMET™ SAID TO RELEASE SOIL NUTRIENTS, AGRI-SC SOLD AS SOIL CONDITIONER
OLSON	CORN	GROZYMET™ /AGRI-SC™ POST BAND	165.2	ZERO CHECK		164.0	1.2	16.1	N.S.	(\$10.76)	" "
STOCK	SOYBEANS	ACHIEVE™ & REMEDY™ PREPLANT BROADCAST	54.0	ZERO CHECK		53.0	1.0	6.3	N.S.	(\$13.85)	BIOLOGICAL EFFECT SOMEWHAT CONFOUNDED WITH STRIP “SIDE” (NORTH-SOUTH) EFFECT
STOCK	CORN	ACHIEVE™ & REMEDY™ PREPLANT BROADCAST	159.5	ZERO CHECK		160.5	-1.0	9.6	N.S.	(\$13.85)	
WURPTS	SOYBEANS	BIOLOGICAL FERTILITY PROGRAM	60.6	ISU FERTILITY RECOMMENDATIONS		60.3	0.3	2.3	N.S.	(\$8.75)	
WURPTS	CORN	BIOLOGICAL FERTILITY PROGRAM	184.7	ISU FERTILITY RECOMMENDATIONS		187.3	-2.6	7.2	N.S.	(\$10.11)	

Table 3. MULTIPLE-TREATMENT PLANT POP. & FERTILIZER TRIALS										MULTIPLE-TREATMENT PLANT POP. & FERTILIZER TRIALS										
				TREATMENT "A"						TREATMENT "B"					TREATMENT "C"					
COOPERATOR	CROP	PREVIOUS CROP	YIELD SIGNIFI- CANCE	DESCRIPTION	YIELD (bu or T)	STAT.	TRT COST \$	\$ BENEFIT		DESCRIPTION	YIELD (bu or T)	STAT.	TRT COST \$	\$ BENEFIT	DESCRIPTION	YIELD (bu or T)	STAT.	TRT COST \$	\$ BENEFIT	OVERALL COMMENT \$
RICEVILLE FFA	NK4242	CORN	*	24,200 SEEDS/ACRE (22,200 PLANTS)	151.7	c	\$27.19	\$0.00		27,700 SEEDS 25,400 PLNTS	158.7	b	\$31.13	\$10.11	32,000 SEEDS 28,200 PLNTS	162.9	a	\$35.96	\$13.68	
RICEVILLE FFA	P3751	CORN	*	24,200 SEEDS/ACRE (22,200 PLANTS)	141.8	c	\$24.73	\$0.00		27,700 SEEDS 25,400 PLNTS	144.6	b	\$28.31	\$1.89	32,000 SEEDS 28,200 PLNTS	150.2	a	\$32.70	\$8.76	
ROSMANN	CORN	SOY BEANS	*	21,950 SEEDS/ACRE (16,840 PLANTS)	136.7	c	\$18.59	\$0.00		24,400 SEEDS (19,800 PLANTS)	146.1	b	\$20.67	\$16.68	28,200 SEEDS (23,760 PLANTS)	157.7	a	\$23.89	\$36.76	LATE SPRING SOIL NITRATE 38 PPM, FALL STALK NITRATE LOW IN ALL TRT'S
ALERT	CORN	SOY BEANS	N.S.	20 LBS P, 40 LBS K 2" BELOW SEED (DEEP PLANTER SHOE)	137.0	a	\$34.59	\$0.00		20 LBS P, 40 LBS K TO THE SIDE OF THE SEED	140.2	a	\$34.59	\$0.00	CHECK TREATMENT: NO BANDED P & K	136.9	a	\$22.30	\$12.29	TWO REPS DISCARDED BECAUSE OF MISSING DATA
GRAU	CORN	SOY BEANS	*	BROADCAST P & K	174.4	ab	\$28.73	(\$28.73)		DEEPBAND P & K	182.1	a	\$29.41	\$2.26	CONTROL (NOFERT.)	166.3	b	\$0.00	\$0.00	TREATMENT \$ BENEFIT IS RELATIVE TO CONTROL TRT
OLSON	SOY BEANS	CORN	N.S.	75 LB K PLANTER BAND	64.2	a	\$9.50	\$9.50		150 LB K PLANTER BAND	65.4	a	\$19.00	\$0.00	ZERO K	61.2	a	\$0.00	\$19.00	SOIL K TEST: 125 PPM, MEDIUM-HIGH
NEELEY- KINYON	CORN	SOY BEANS	*	0 LBS ANHYDROUS NITROGEN	136.4	b	\$0.00	\$0.00		75 LBS ANHYDRS. N	154.3	ab	\$8.63	(\$8.63)						* RATE SET W. SOIL NITR. TEST
										* 110 LBS ANHYDRS. N	166.7	a	\$12.65	\$48.83	150 LBS ANHYDRS. N	167.5	a	\$17.25	\$44.23	THREE REPS ONLY