NITROGEN RATES FOR WINTER WHEAT FOLLOWING SOYBEANS

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Issues

- Many of the new winter wheat acres are coming from the corn- soybean rotation.
- Wheat typically follows soybeans in this situation.
- So what is the optimum N rate for the wheat? How much of a legume credit exists?

Description

- 2 locations– Arlington (Columbia Co.)
  Lancaster (Grant Co.)
- 2 years– harvested in ’05 & ’06
- Wheat planted no-till following soybean harvest (Oct.5-14 over the 2 yr.)
- At Arlington also 2 other cropping systems--following corn silage and corn for grain.
- N applied as ammonium nitrate in early April when wheat ~3 in. tall, GS25 stage.

Wheat Yield Results, '05-06 Lancaster

N Rate	Bu/A
0	76
30	92
60	94
90	95

Wheat Yield Results, ’05-06
Arlington following soybeans

N rate	Bu/A
0	68
25	73
50	75
75	74
100	77
125	72

Plateau N Rate (PNR)
Two years, ’05-06

	N rate	Yield
	lb/a	bu/a
Lancaster	47	94
Arlington	72	76

EONR (Economic Optimum N Rate)

Assume N is $0.36/lb and Wheat is $2.90/bu

Location	EONR
Lancaster	38 lb N/a
Arlington	30

EONR (Economic Optimum N Rate)

Assume N is $0.30/lb and Wheat is $4.70/bu

Location	EONR
Lancaster	41 lb N/a
Arlington	42
(after C.S.	56)

Preplant Soil Nitrate Test (PPNT)

Location	Yr	Prev. crop	PPNT,0-3ft lb NO3-N/a	N recommend Std. ----lb N/a----	PPNT*
Lancaster	05	Sb	43	70	70
"	06	Sb	46	70	70
Arlington	06	Sb	73	70	47

*PPNT recommendation= 70-(PPNT-50)

Preplant Soil Nitrate Test (PPNT)

Location	Yr	Prev. crop	PPNT,0-3ft lb NO3-N/a	N recommend Std. ----lb N/a----	PPNT*	Observed EONR
Lancaster	05	Sb	43	70	70	46
"	06	Sb	46	70	70	30
Arlington	06	Sb	73	70	47	31

*PPNT recommendation= 70-(PPNT-50)

Preplant Soil Nitrate Test (PPNT)

Location	Yr	Prev. crop	PPNT,0-3ft lb NO3-N/a	N recommend Std. ----lb N/a----	PPNT*	Observ. EONR
Lancaster	05	Sb	43	70	70	46
"	06	Sb	46	70	70	30
Arlington	06	Sb	73	70	47	31
"	06	C.gr.	108	70	12	0

*PPNT recommendation= 70-(PPNT-50)

Conclusions

- Take a N credit when wheat follows soybeans.
- The UW “book value” N credit of 40 lb/a results in an N application of 30 lb/a, which compares well with the EONR.
- When wheat prices are higher ($4.70/bu), growers can justify higher N rates, up to ~50 lb/a.
- The PPNT is less reliable in predicting the optimum N rate when wheat follows soybeans than when it follows corn or another nonlegume.

Additional Questions

- When is the optimum time to apply N on wheat in Wisconsin– early or late spring; split application between fall and spring?
- Is the N response following soybeans consistent across widely different soil types in the state?