Maximizing Profitability With Nitrogen Management: Nitrogen Rate Exercise

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Nitrogen Rate Exercise

- Structure of Exercise:
  - You are given three corn production situations where response to N was previously determined.
  - Use this information to determine the N rate that will maximize economic return.

Nitrogen Rate Exercise

- Structure of Exercise:
  - For some production situations you may purchase diagnostic information such as soil N test results.
  - Once your group determines the N rate to apply, you will be given the yield obtained at that rate. You can then calculate return.

Nitrogen Rate Exercise

- Determining N rate to apply:
  - Yield-based:

    (eg. Yield goal x 1.2 lb N/bu)
  - MRTN approach
  - Current UW recommendations
  - Others?

Nitrogen Rate Exercise

- Goals:
  - Estimate economic optimum N rate for each field as accurately as possible.
  - Maximize economic return.

Parameters of the Exercise:

- Cost of N application is $5/a, no application charge for starter N.
- N price = $0.30 /lb N. This is for N applied preplant, starter, and sidedress.
- Corn price = $2.10/bu.
- N can only be applied in 10 lb/a increments.
- PSNT sampling and analysis costs $4/a.
- PPNT sampling and analysis costs $5/a.
- All fields are chisel plowed. All other input/management costs are the same.

1. Calculate Income

Field	Yield	Corn price	Income
	bu/A	$/bu	$/A
1		x 2.10 =	
2		x 2.10 =	
3		x 2.10 =	

2. Calculate Expenses

Field	N applied	N price	N cost		Application Cost		PSNT or PPNT cost		Expenses
	lb/A	$/lb	$/A				$/A		$/A
1		x 0.30 =		+		+		=	
2		x 0.30 =		+		+		=	
3		x 0.30 =		+		+		=	

3. Calculate Return

Field	Income		Expenses		Return		Field Size		Return
	$/A		$/A		$/A		A		$
1		–		=		x	40	=	
2		–		=		x	30	=	
3		–		=		x	35	=	
							Total	=	

Field: 1

Soil	Silt loam, very high yield potential, 3.4 % organic matter
Rotation	Alfalfa, alfalfa, alfalfa, corn, **CORN** Alfalfa stand was 1.5 plants/ft^2 with 9” of regrowth before killed
5 yr average yield	190 bu/a
Manure application	15 T/a solid dairy manure spread Nov. 4 last year, incorporated 2 days after spreading
Fertilizer N applied	10 lb N/a in starter fertilizer
Weather	Slightly cool in early May, then seasonable. Prior fall was cool and dry.
Field size	40 acres
Planting date	April 25
Today’s date	June 15
PSNT sample date	June 13

Field: 2

Soil	Silt loam, very high yield potential, 3.0 % organic matter
Rotation	Soybean, Corn, **CORN**
5 yr average yield	170 bu/a for average but last year was 130 bu/a
Manure application	None within the past 4 years
Fertilizer N applied	None yet
Weather	Last year (2005) very dry with few timely rains
Field size	30 acres
Planting date	Within next week
Today's date	April 15
PPNT sample date	April 1

Field: 3

Soil	Silt loam, high yield potential, 2.5 % organic matter
Rotation	Soybean, **CORN**
5 yr average yield	190 bu/a
Manure application	None within the past 4 years
Fertilizer N applied	10 lb N/a in starter fertilizer
Weather	Slightly cool in early May, then seasonable.
Field size	35 acres
Planting date	May 1
Today's date	June 15
PSNT sample date	June 13