



Optimisation de la fertilisation azotée dans la culture du maïs sucré

**Journées horticoles et grandes cultures
de Saint-Rémi 2019**

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Nitrogen Use Efficiency in Sweet Corn

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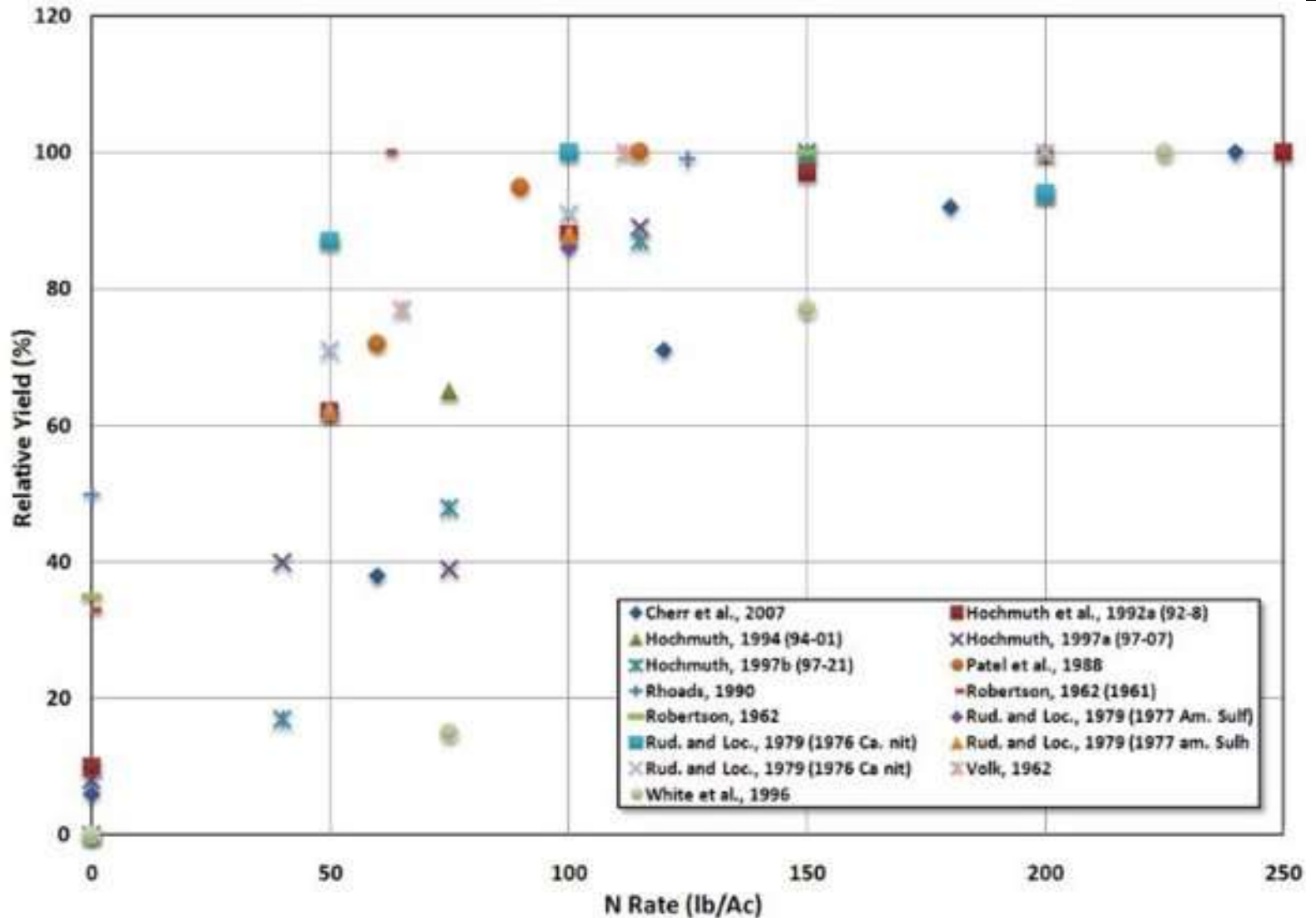
Nitrogen...What Rate is the Right Rate?

State	Total N Rec	Application
Florida	up to 200 lbs/ac	20-25% broadcast remainder in 2 split apps
Mid-West	90 to 100 lbs/ac	60 lbs pre plant 30-40 lbs side-dressed*
Michigan	120 to 130 lbs/ac	50 lbs broadcast 30 lbs banded 40-50 lbs side-dressed
New York	120 to 140 lbs/ac	40 lb broadcast** 40 lbs banded 40-60 lbs side-dressed

* Mid-West: Omit side-dress application on soils with > 3% OM

** NY: On highly leachable soils, replace broadcast application with 2nd side-dress

SL 326: A Summary of N, P, and K Research with Sweet Corn in Florida





Fear of Missing Out

Sweet Corn ≠ Field Corn

- Picked before physiological maturity
 - No grain fill
 - Smaller plants
 - Lower crop removal
- Planted later
 - Capitalize on naturally available soil nitrogen
- Sandy Soils
 - More susceptible to losses

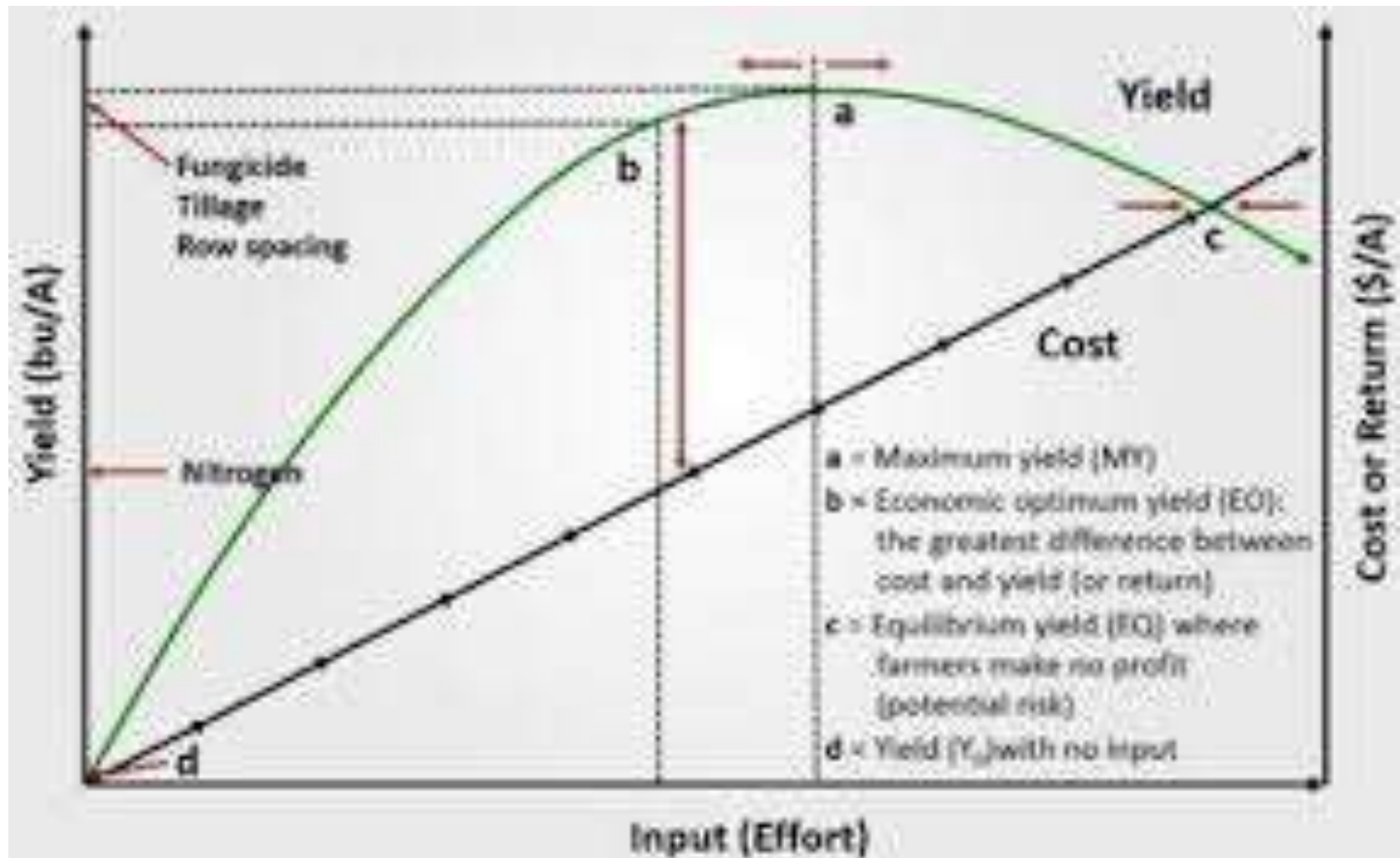


Ontario On-Farm Demonstration Trials (2002-2010)

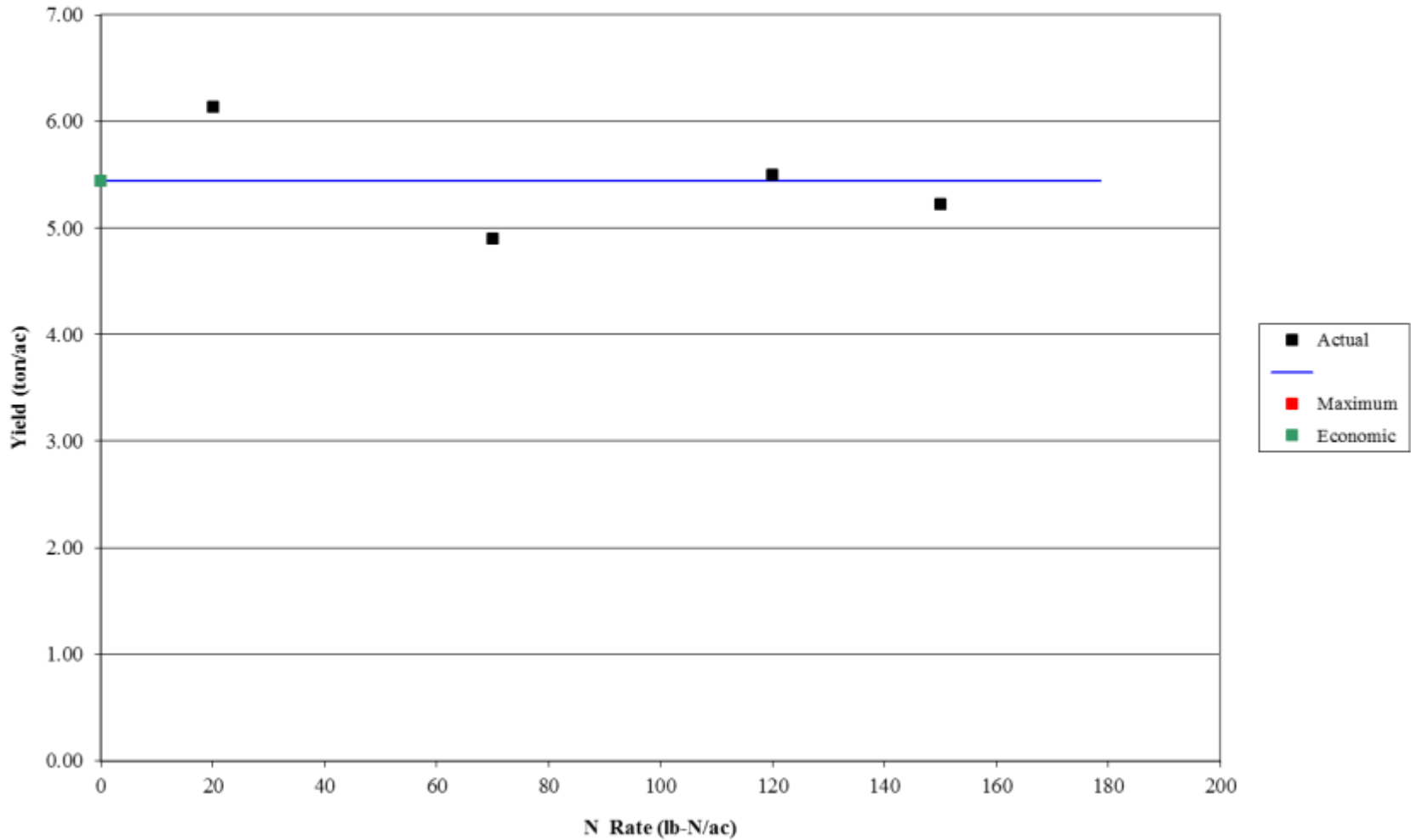
- N-rate Response At 29 Grower Locations
- Late-season, High Yielding Varieties
- Medium-textured Soils
- Assess PSNT Thresholds.
- Residual N at Harvest
- Impact on cob numbers & size
 - (length and row number)



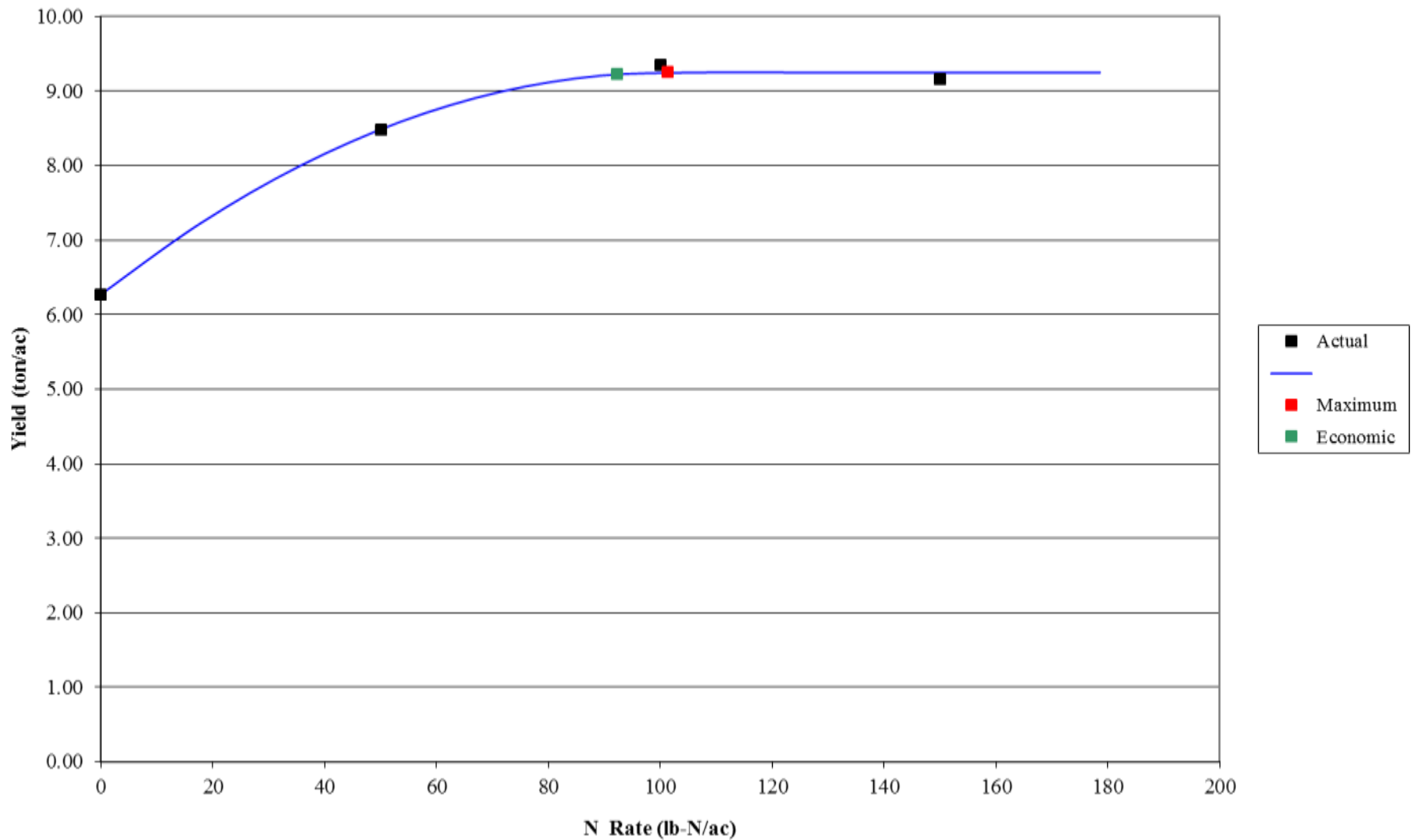
MERN = Most Economic Rate of Nitrogen



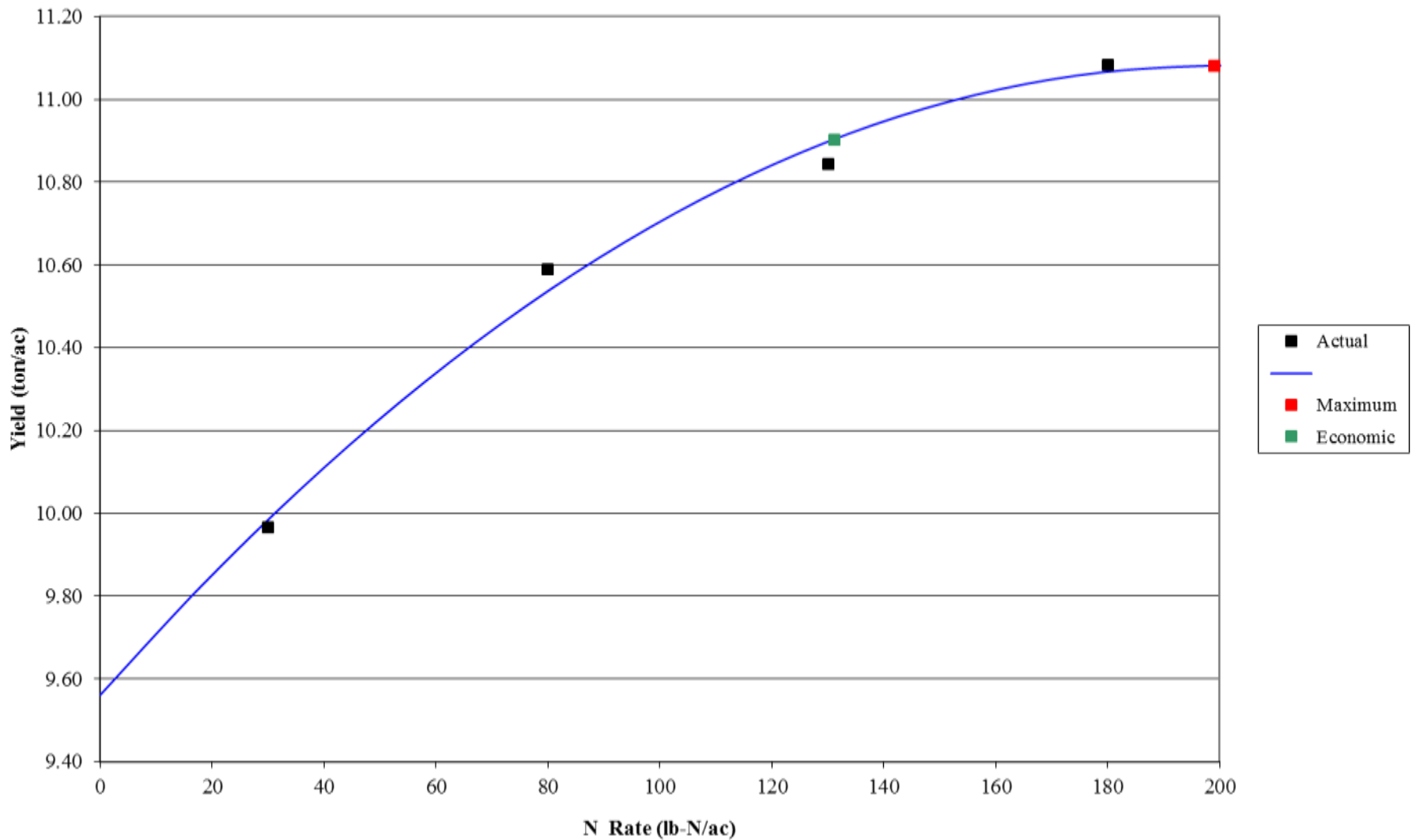
2004 Site 1 – No Response



2009 – Site 1; MERN = 92 lbs/acre

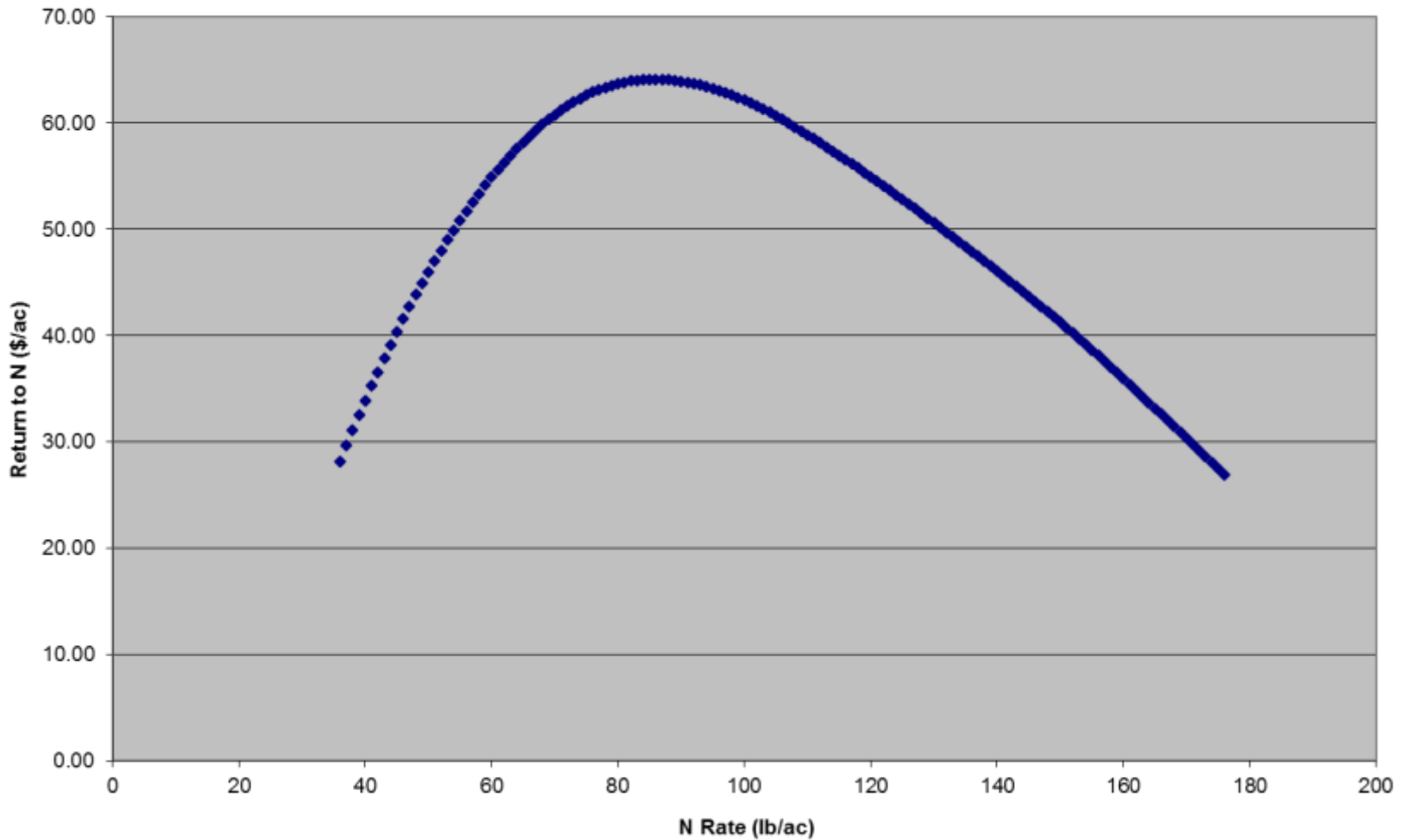


2006 – Site 1; MERN = 131 lbs/acre



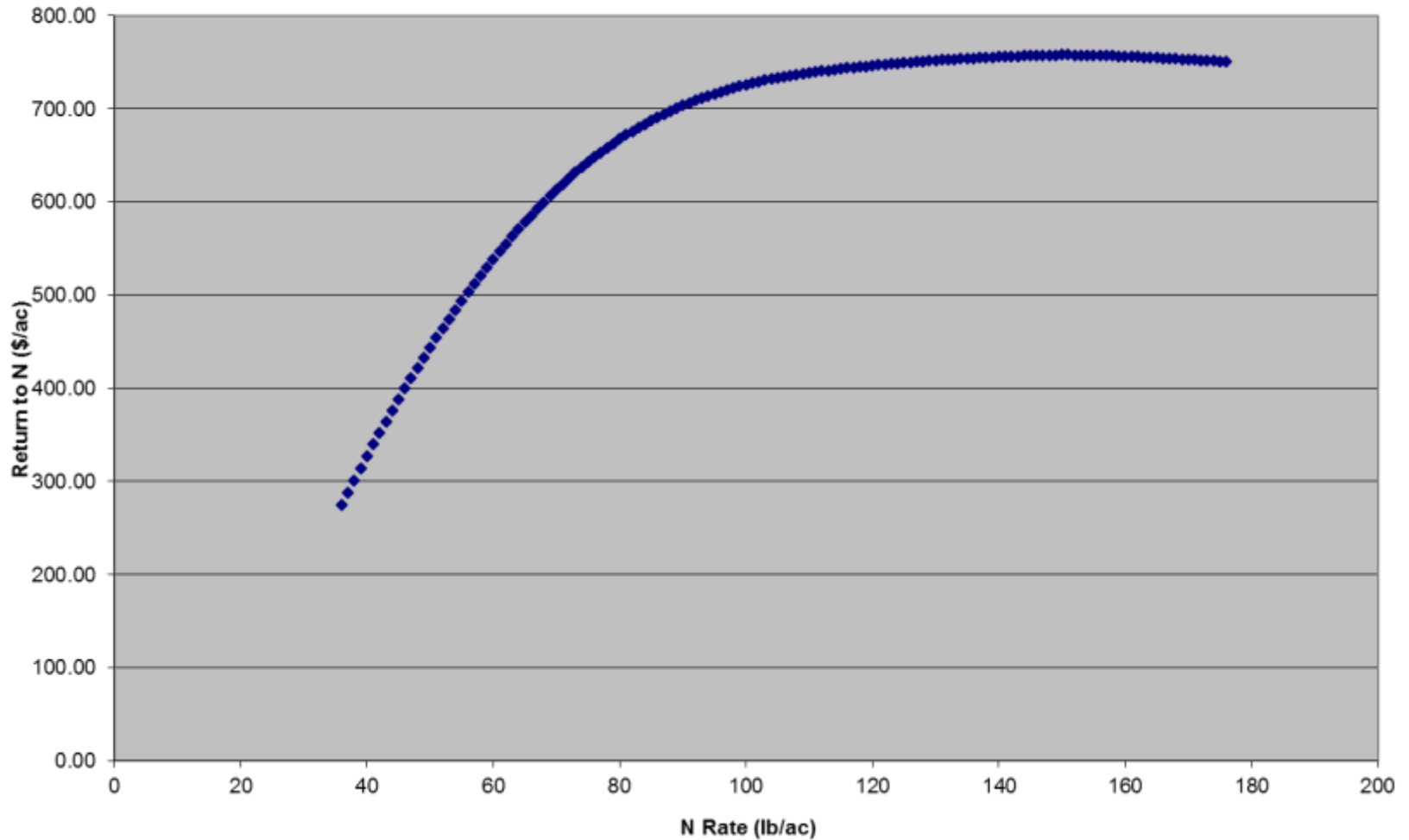
Processing (\$96/ton)

Return to N versus N Rate (no manure)



Fresh Market (\$600/ton)

Return to N versus N Rate (no manure)



MERN is a myth!

So, what do we do?

- Nitrogen is important, but sweet corn is not as responsive as field corn.
- Later planted, higher OM levels may be even less responsive.
- 2/3's of our sites fell below the current Ontario recommendation.
- How can we identify the sites that will be responsive to higher levels of nitrogen?

Pre Side-dress Nitrogen Test (PSNT)

PSNT Thresholds:

0-10 ppm = 120 lbs/ac

11-20 ppm = 80 lbs/ac

21-30 ppm = 40 lbs/ac

> 30 ppm = 0

Assume 4 lbs of nitrogen for every ppm Nitrate

Economic Comparisons

Corn Price x (Yield with N – Yield with Starter only) – (Cost of N x (N rate – starter))

1. Set Rate (OMAFRA)
-80 lbs/ac
2. PSNT derived
3. “Insurance Nitrogen”
-100 lbs/ac

All Sites – Compared to MERN

Average value of N per Ha if applied at MERN = 74.77

	OMAFRA (80 lbs/ac)	PSNT	Insurance (100 lbs/ac)
Average Value of N per acre	\$46.85	\$60.77	\$44.30

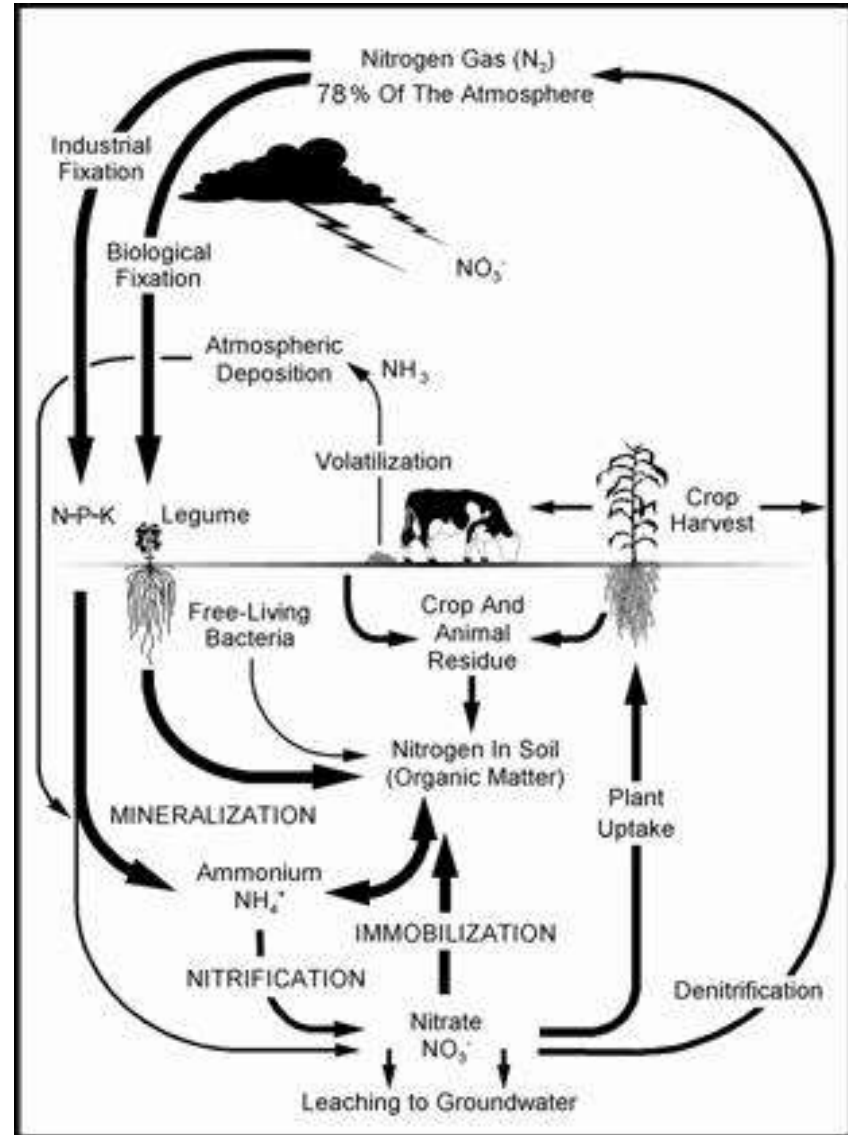
PSNT Sampling

- 12" depth
- Sample at the 6 leaf stage
- Minimum of 20 cores per 12 ac field
- Well-mixed sample
- Keep sample cold until delivered to the lab



Nitrogen Use Efficiency Decreases as the Fertilizer Rate Increases

- Need to minimize residual N left in the field after harvest
- Most leaching losses occur late fall to early spring
- Increase the proportion of the year in which there are actively growing roots
- Cover crops can be inconsistent in the uptake and release of soil N



Merci Beaucoup!