

Alternate nutrient management strategies: Fertigation

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5 NITROGEN ROI KILLERS

– *and how to beat them*

1 **Paying twice**

With most nitrogen (N) sources you'll have to make two or more applications to get your plants the N they need for season-long feeding.

2 **N loss**

Many N sources are highly susceptible to leaching, volatilization, and denitrification that rob your plants of vital - and expensive - N.

3 **Not factoring in fuel costs**

When you double your applications you double your fuel costs.

4 **Not factoring in run time on your equipment**

Extra wear and tear and servicing costs from extra applications are budget busters.

5 **Smaller yields and lower quality crops.**

N plays a big role in yields and quality. If you're not getting maximum yields and quality, you're not getting maximum returns.

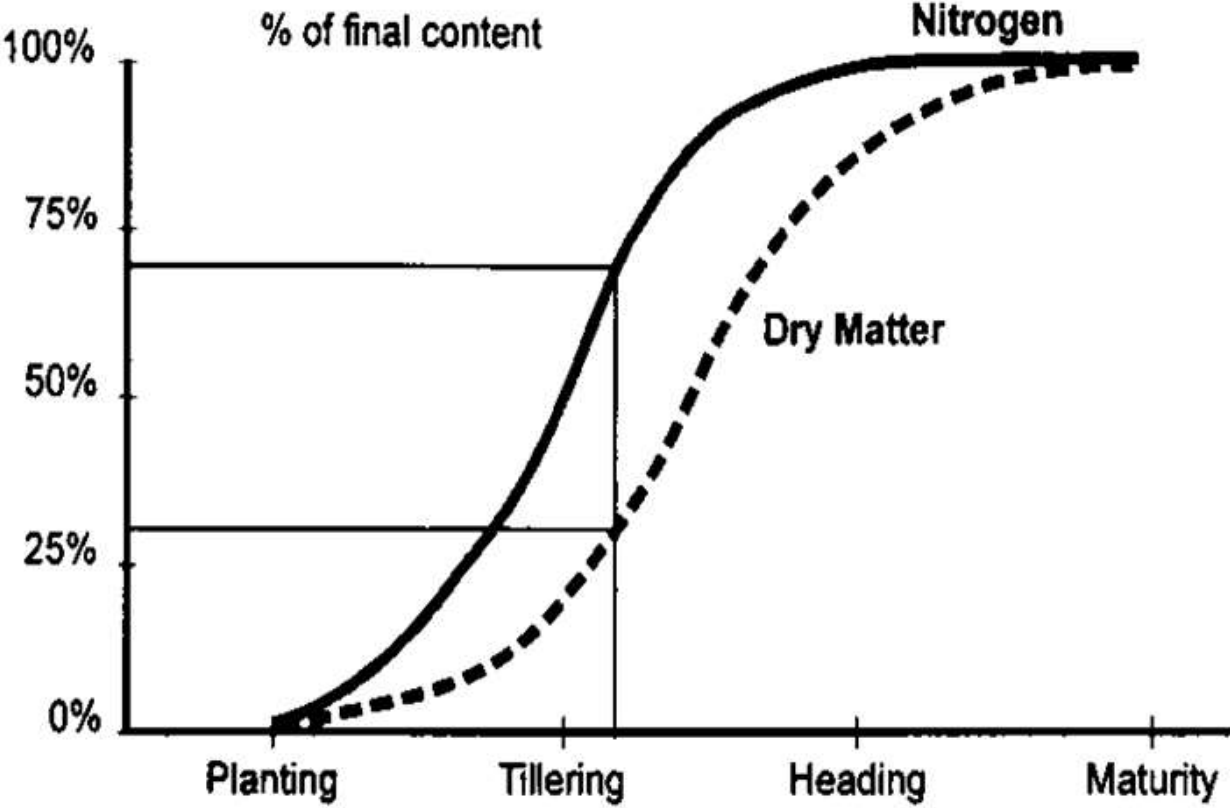


Can you afford to lose your nitrogen?

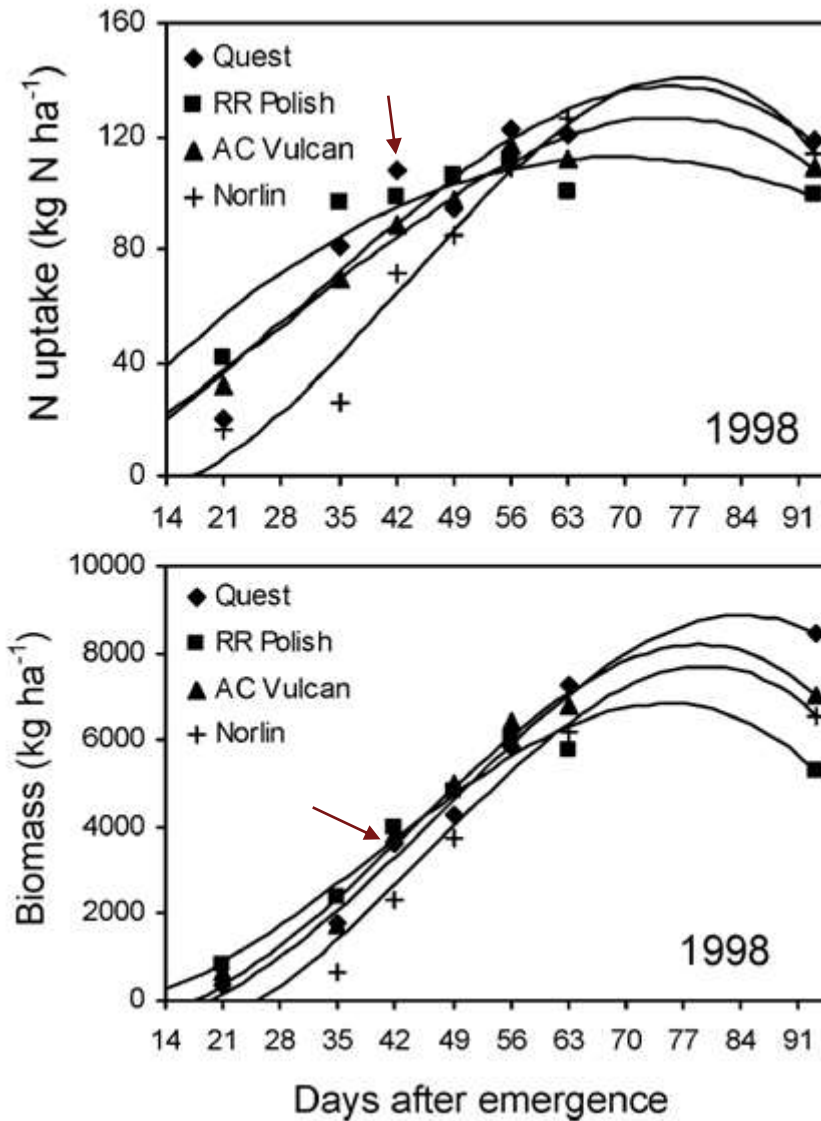
John Niemeyer's contact with crop farmers in Illinois, Iowa, Missouri, northern Arkansas and parts of Wisconsin has allowed him to see first hand the positive impact of... [READ MORE](#)

http://cdn.topcropmanager.com/TCW/eBlast/2017/01/27/?custnum=21001256610&title=Agronomy+Research+Scientist&utm_source=937_3RDP&utm_medium=email&utm_campaign=170125AC Accessed Jan 27, 2017

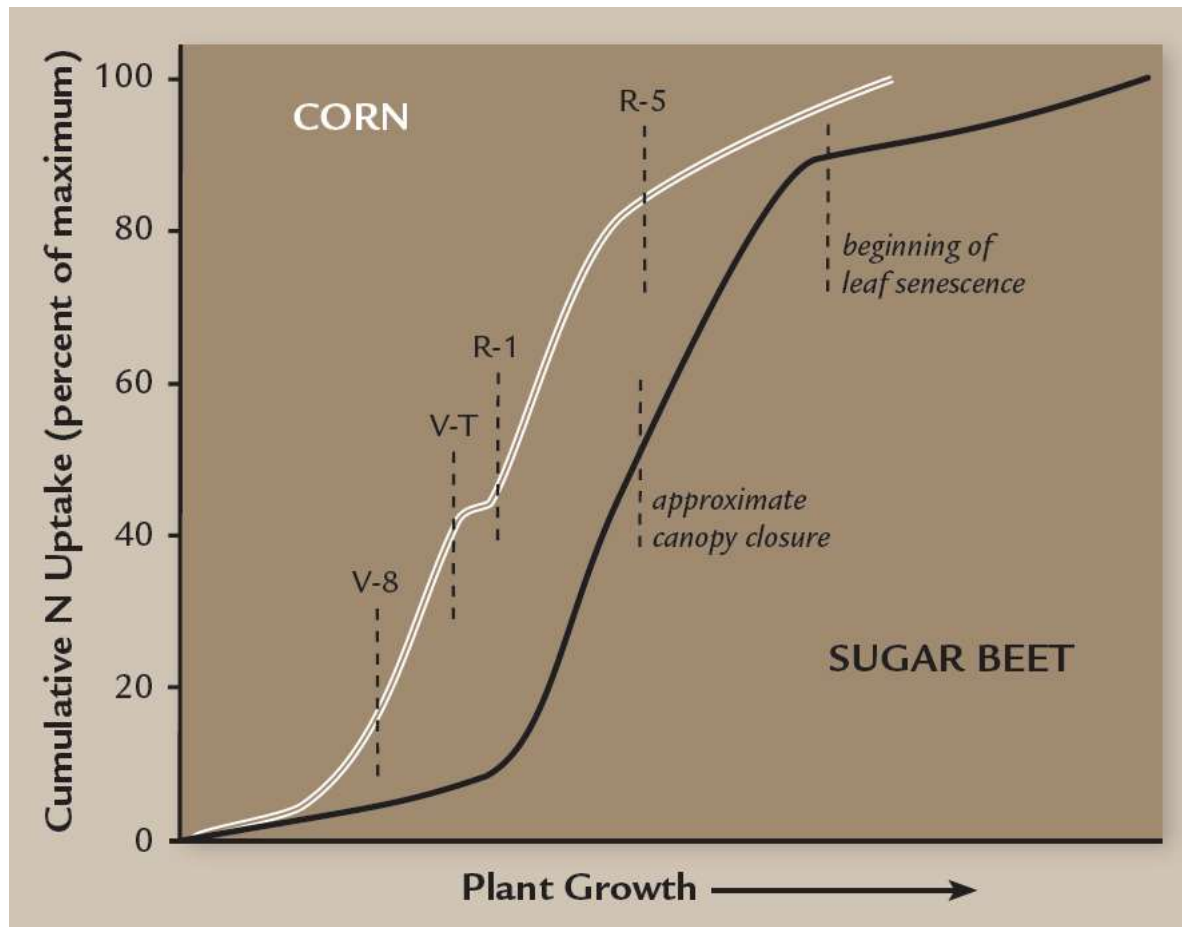
Nitrogen uptake and dry matter accumulation in cereals



N Uptake and biomass accumulation by oilseed crops at Melfort



Cumulative N uptake by corn and sugar beets



As reported in: Nutrient uptake timing by crops: to assist with fertilizing decisions. Montana State University
<http://landresources.montana.edu/soilfertility/PDFbyformat/publication%20pdfs/Nutrient%20Uptake%20Timing%20EB0191.pdf>

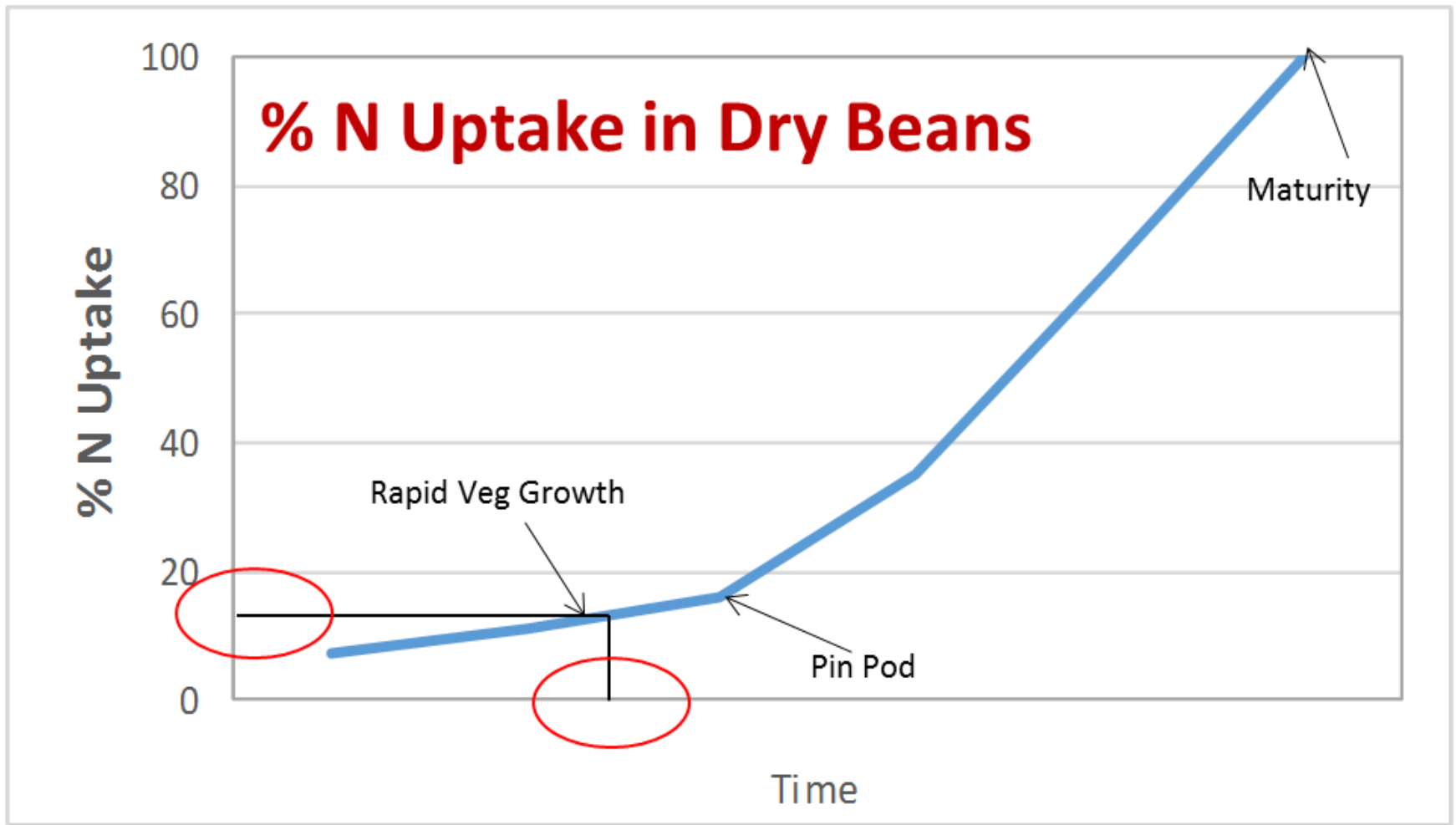


Figure courtesy John Heard,
Manitoba Agriculture

Nitrogen Uptake by potatoes

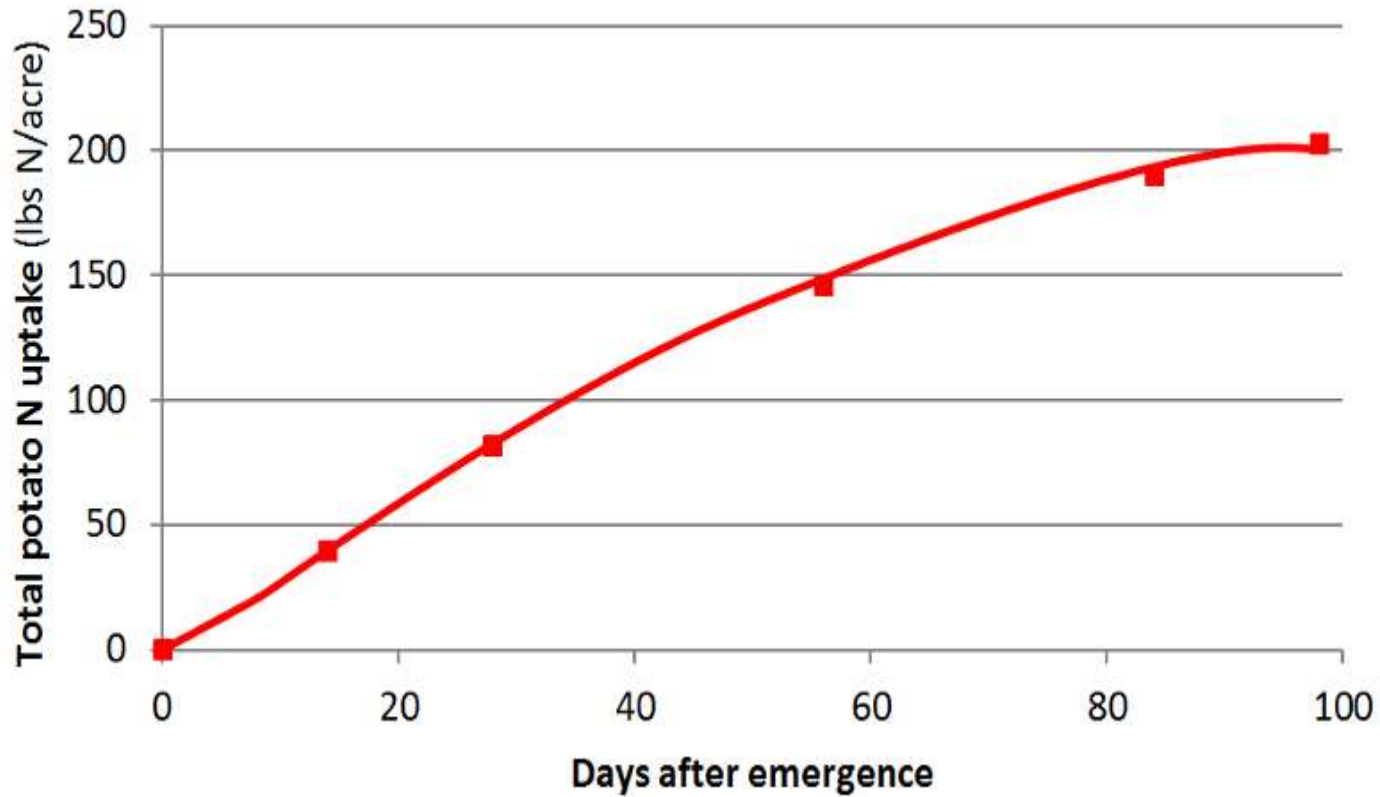


Figure courtesy Michele Konschuh,
Alberta Agriculture

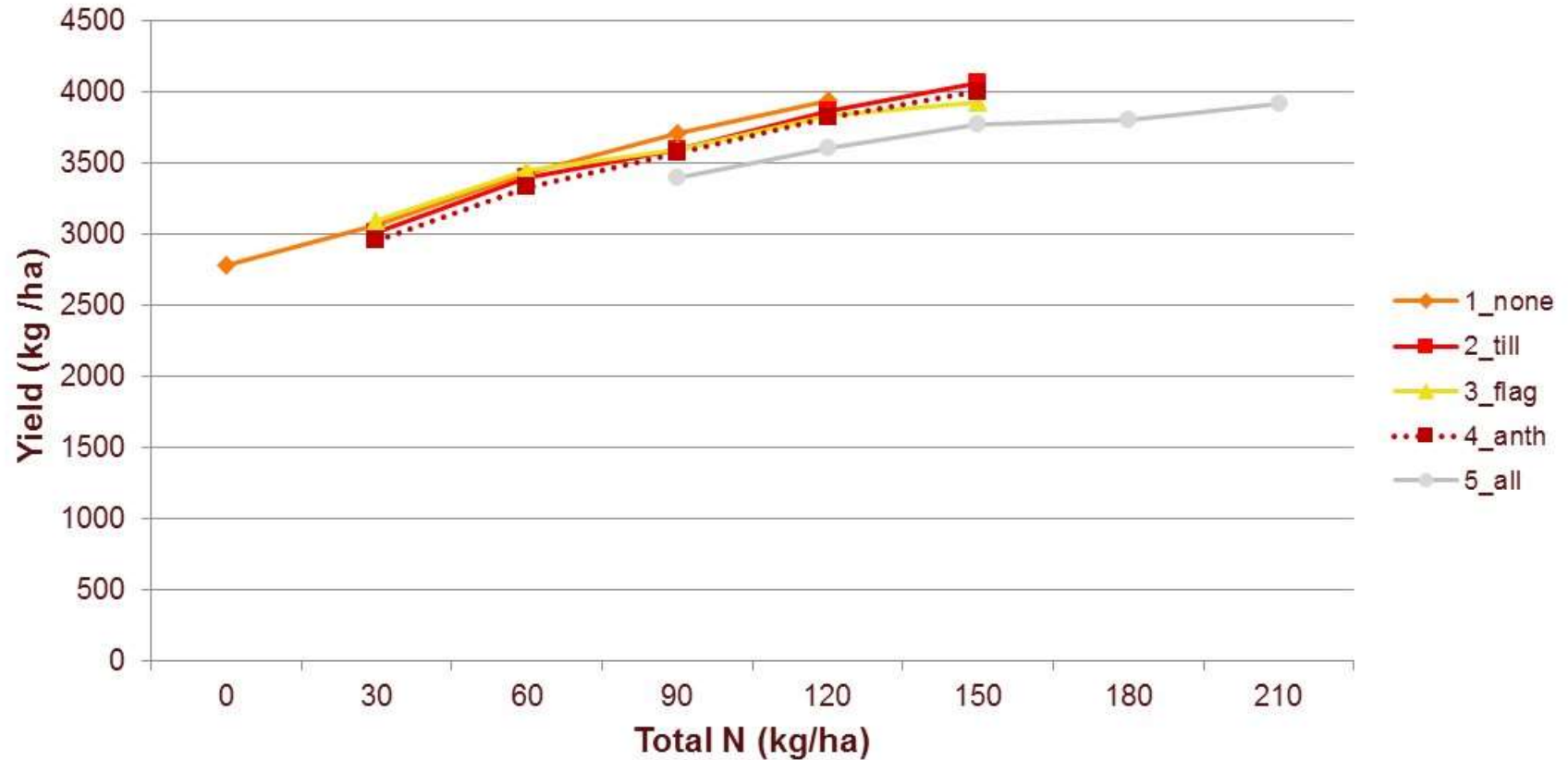
Crop N uptake and potential for loss

- The longer N is sitting in soil as nitrate waiting for crop uptake, the greater the potential for loss
- In theory, if you can deliver N so it is available for uptake when the crop needs it, you should minimize loss potential and maximize N recovery

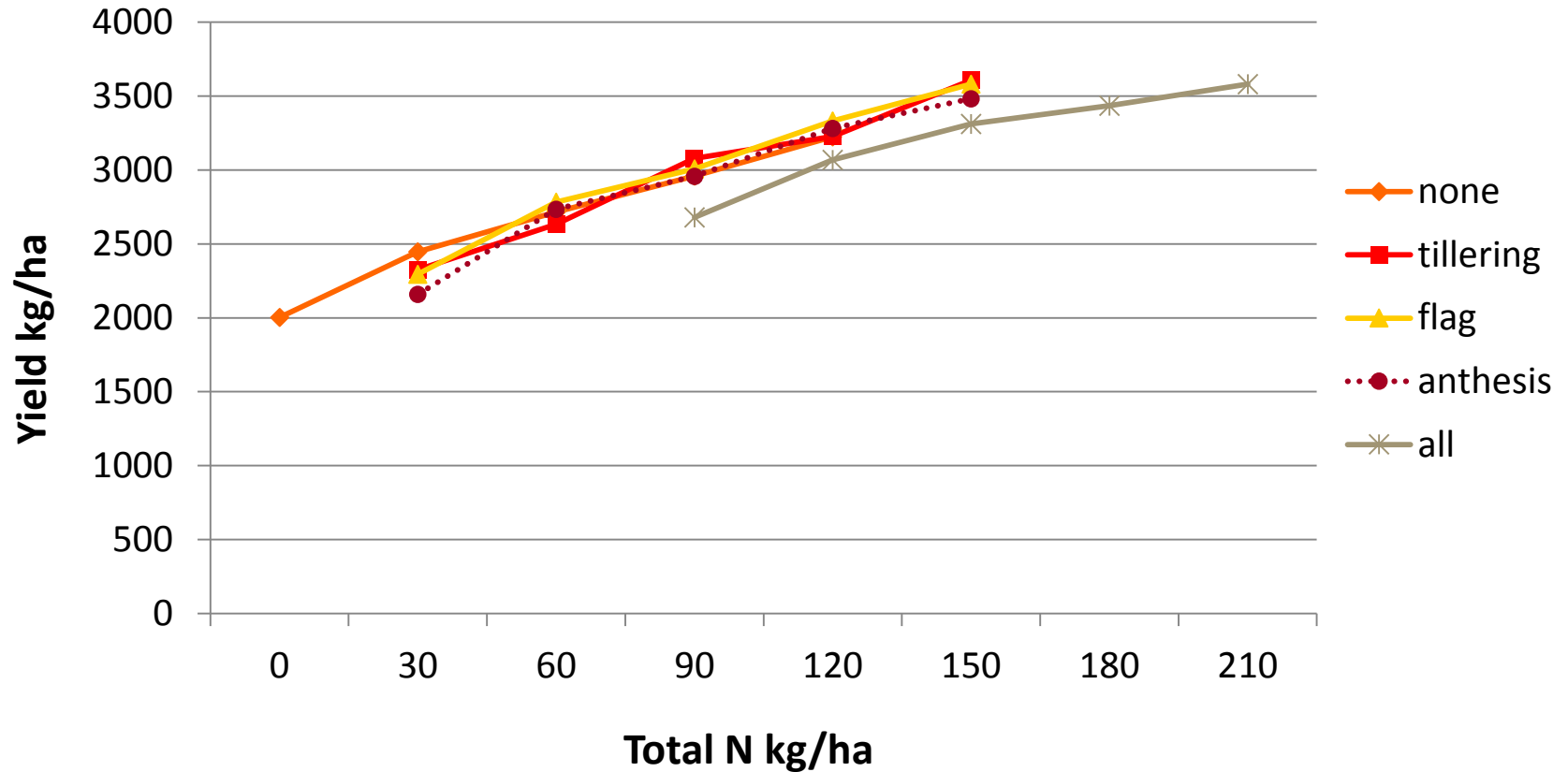
Wheat and canola response to fertigation

- Base fertilization: 0, 30, 60, 90, 120 kg N/ha mid-row banded at seeding
- ESN mid-row banded at 60 kg N/ha
- 30 kg N/ha fertigation applied with 12 mm water at 1 of 3 times or all 3 times

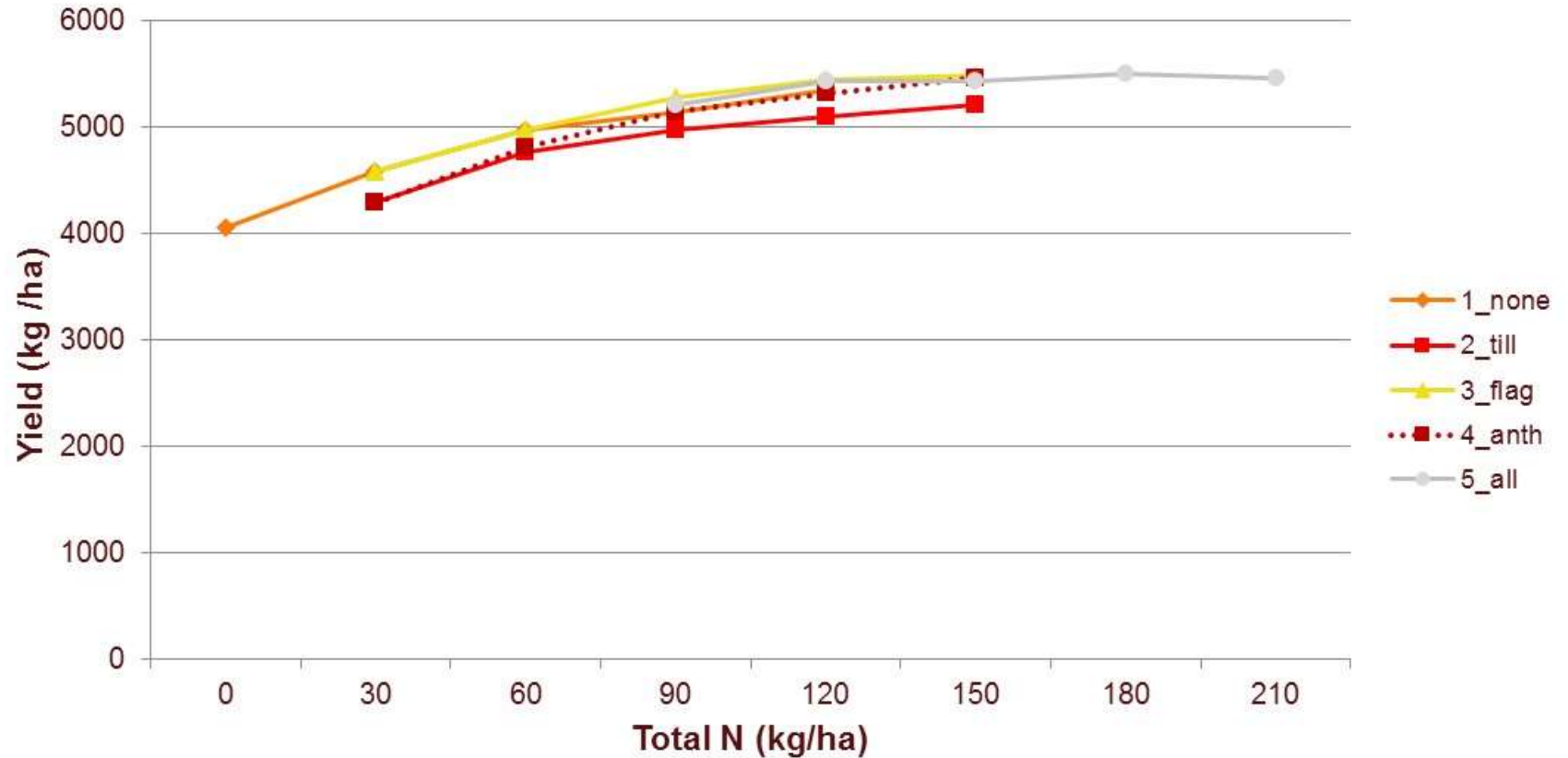
2013-2016 Canola yield response to N



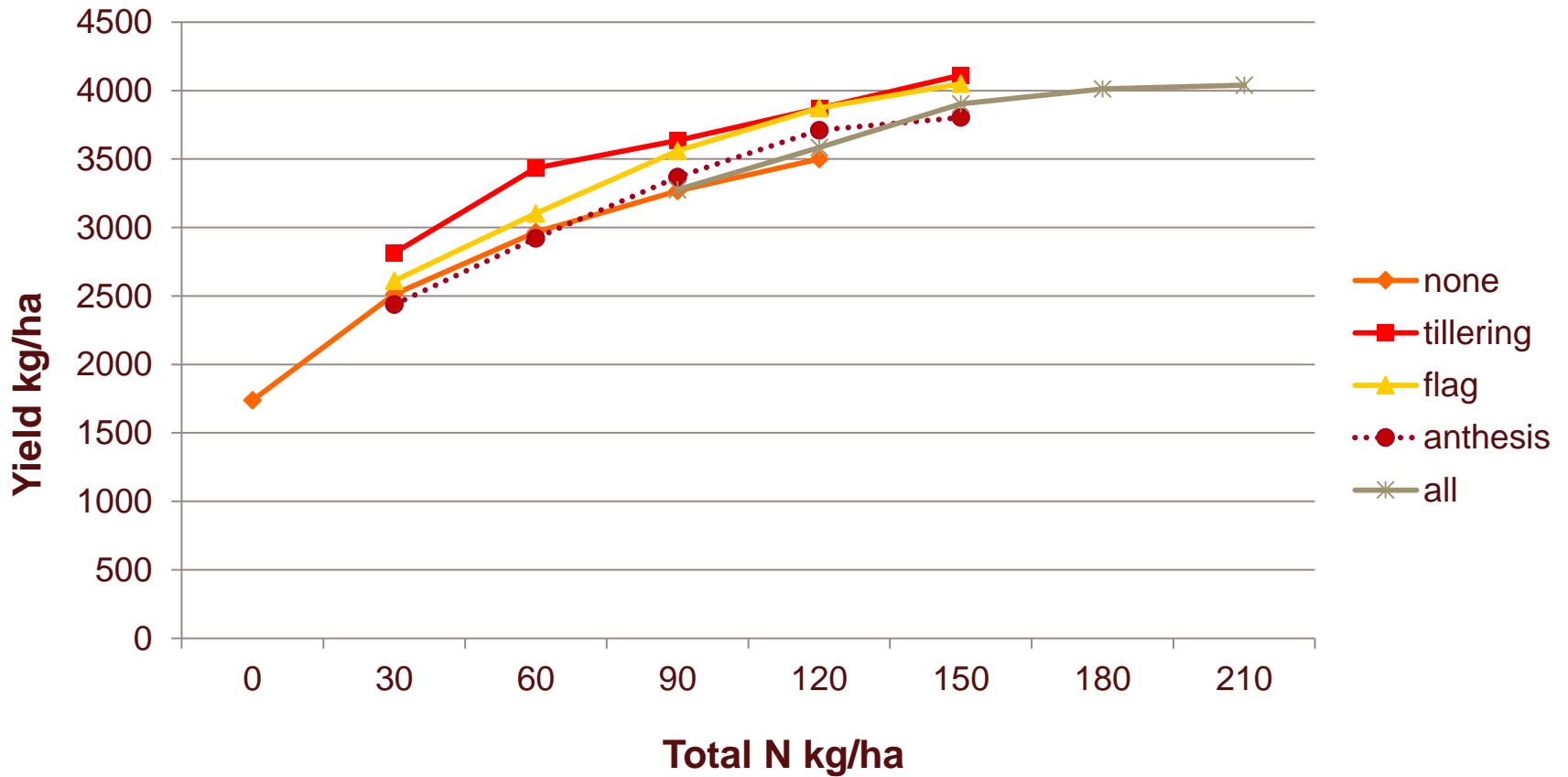
2013 Canola yield response to N



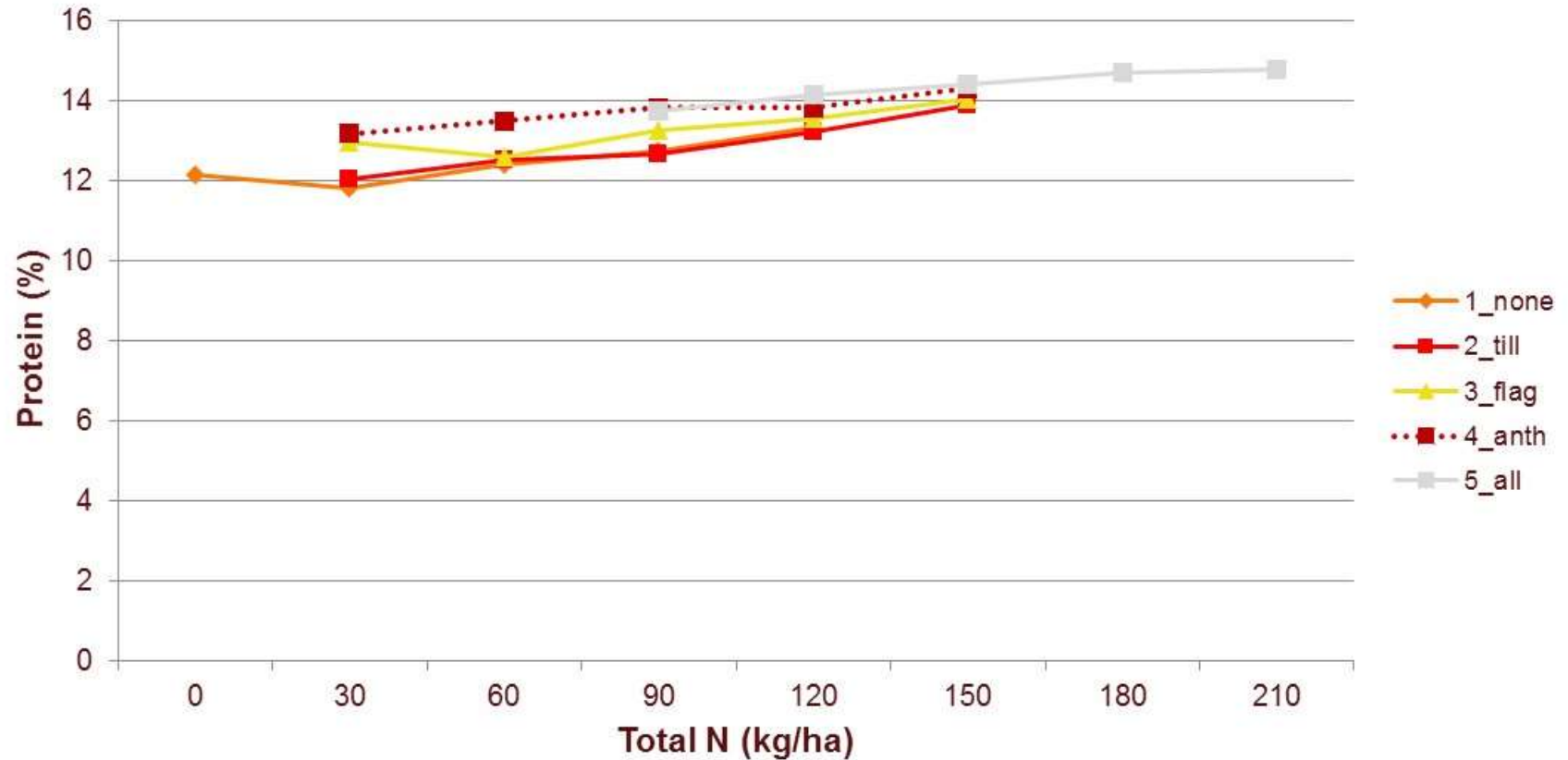
2013-2016 Wheat yield response to N



2013 Wheat yield response to N



2013-2016 Wheat protein response to N



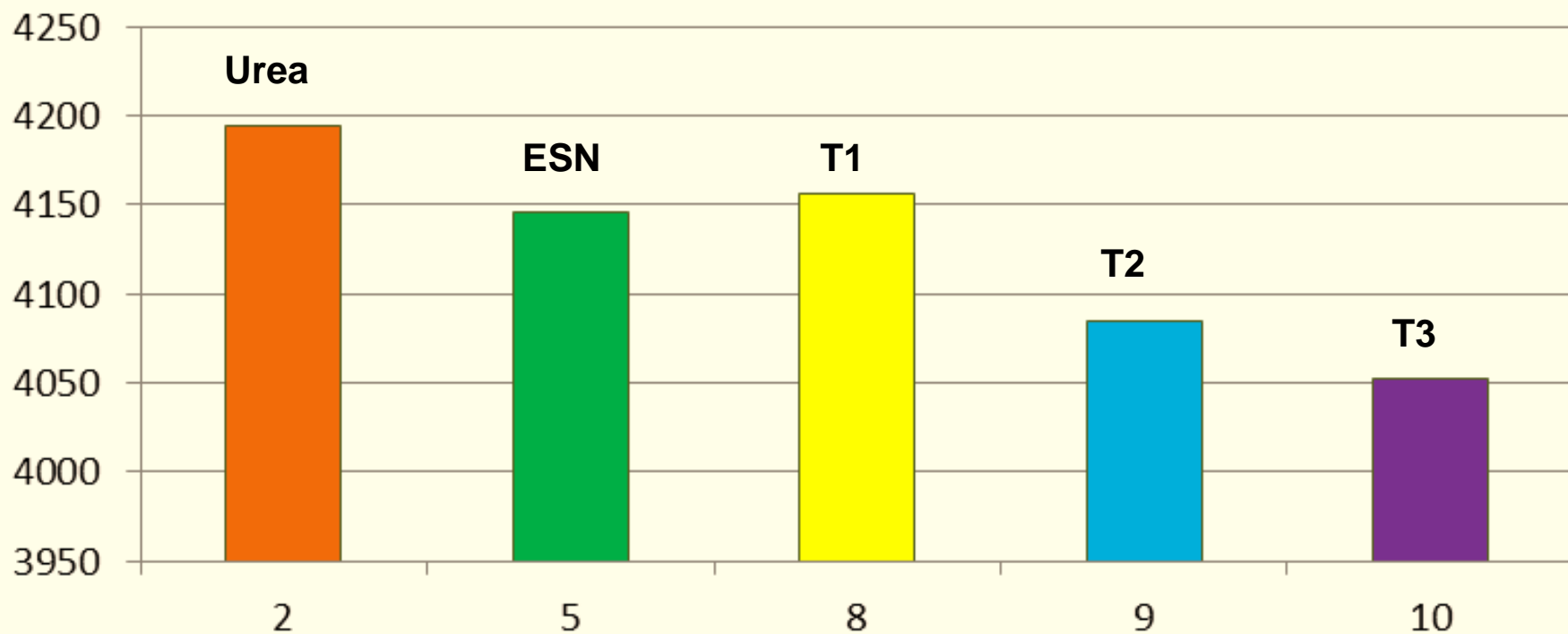
UAN application timing on beans



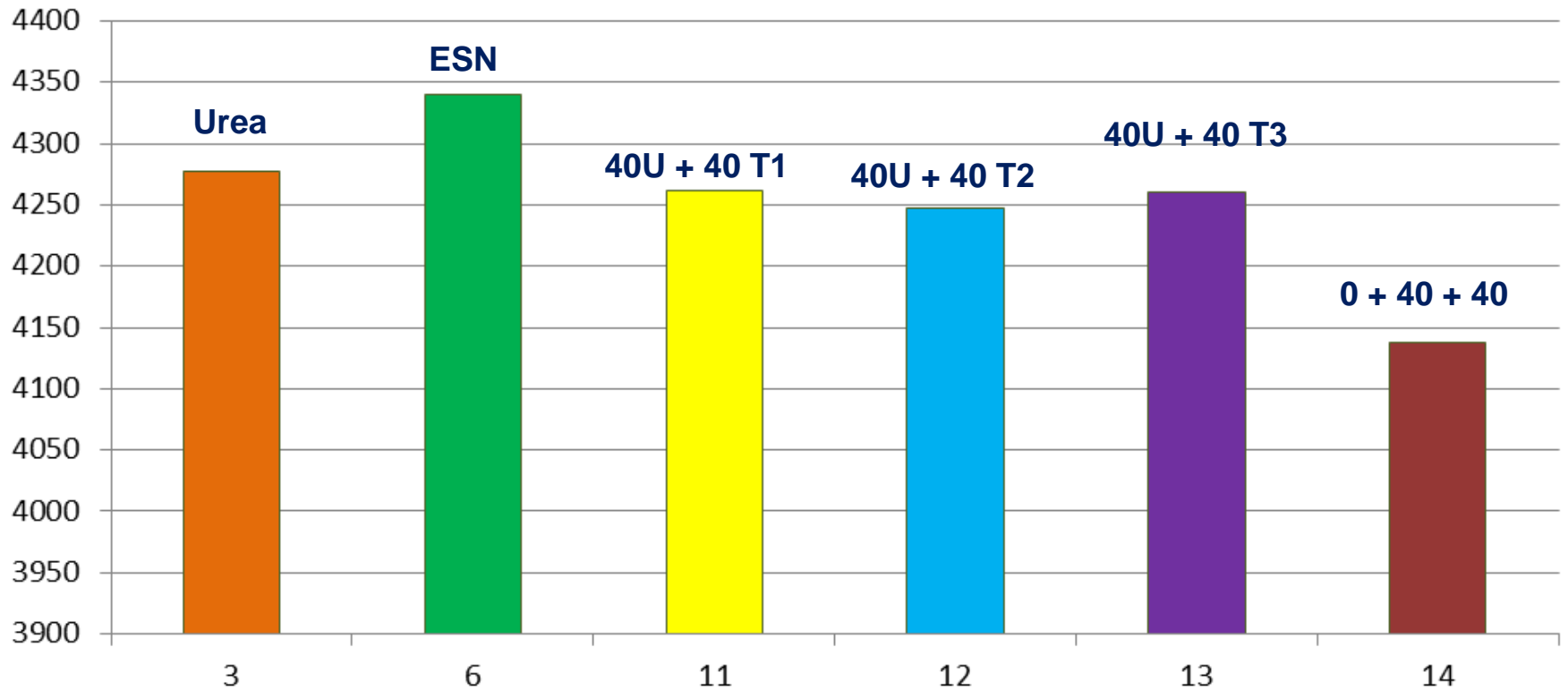
2014-2016

Seed Yield of 40 kg/ha treatments

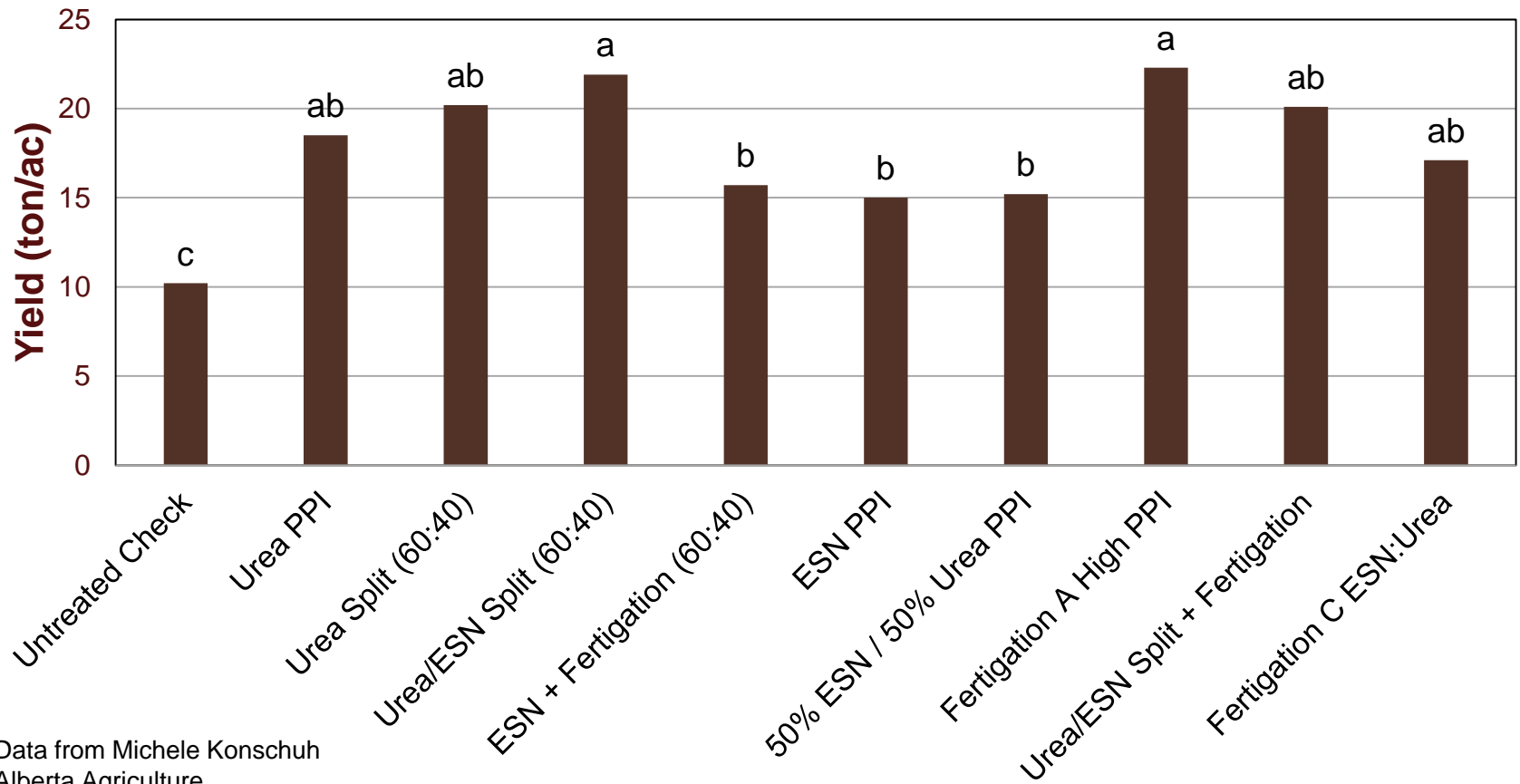
N Fertilizer X Timing



2014-2016 Seed Yield of 80 kg/ha treatments N Fertilizer X Timing



Marketable potato yield at Lethbridge in 2015



Data from Michele Konschuh
Alberta Agriculture

Conclusions/thoughts/questions

Canola and dry beans: No agronomic reason to fertigate rather than all N at seeding

Wheat: Protein increase is the agronomic reason to fertigate

Potatoes: Fertigation is not a magic bullet

Logistics, not Agronomics is the primary reason to fertigate unless substantial loss event occurs.

Conclusions/thoughts/questions

How much room is there for NUE gains over existing systems?

Keep losses and N uptake in perspective.

Do we understand denitrification?