

What's the Buzz about Radishes and Brassicas?

Nitrogen Dynamics

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Cover Crop Growth

December 2006

Oat OSR+Rye No Cover Rye

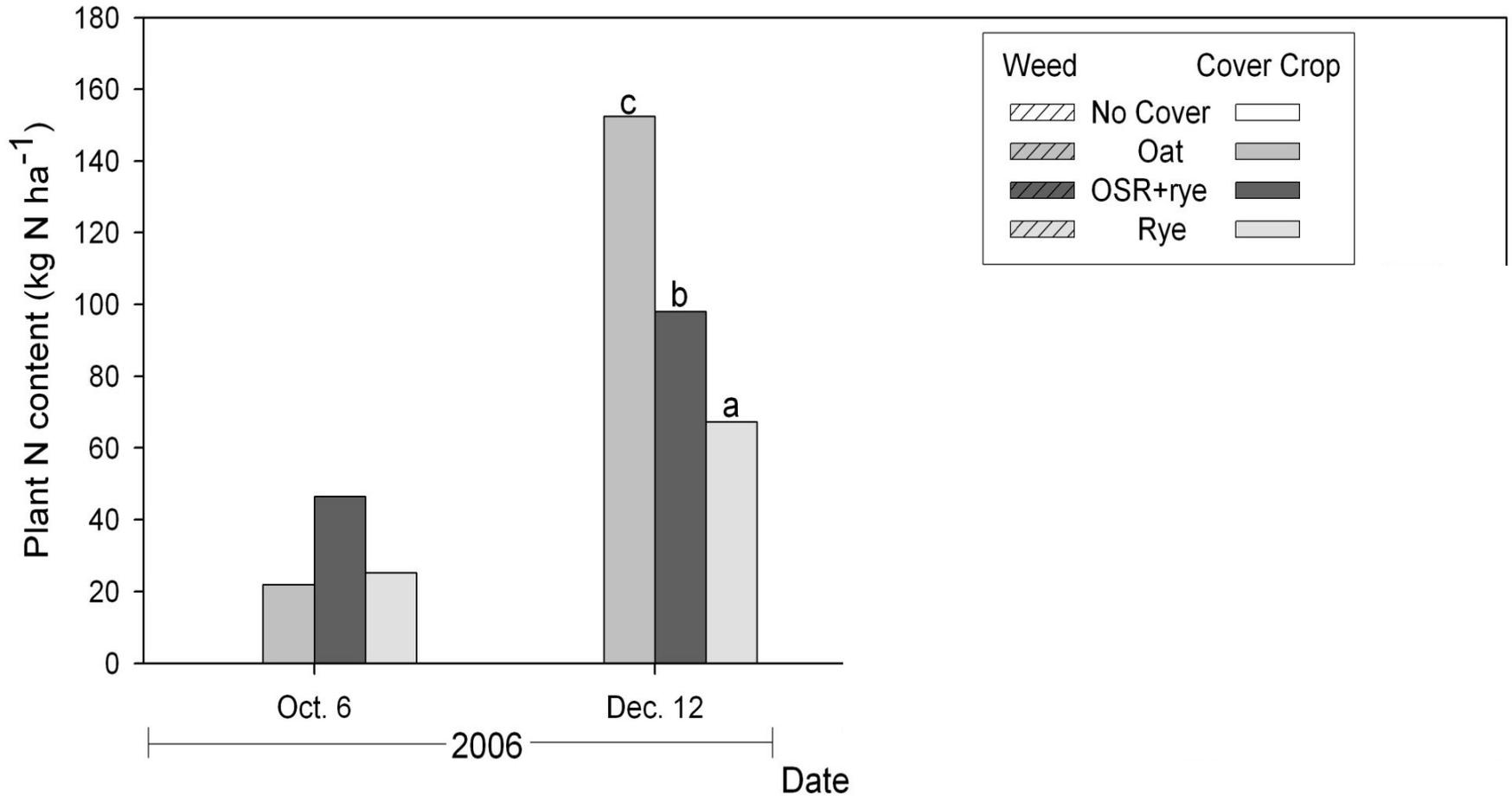


May 2007

OSR+Rye No Cover Rye Oat

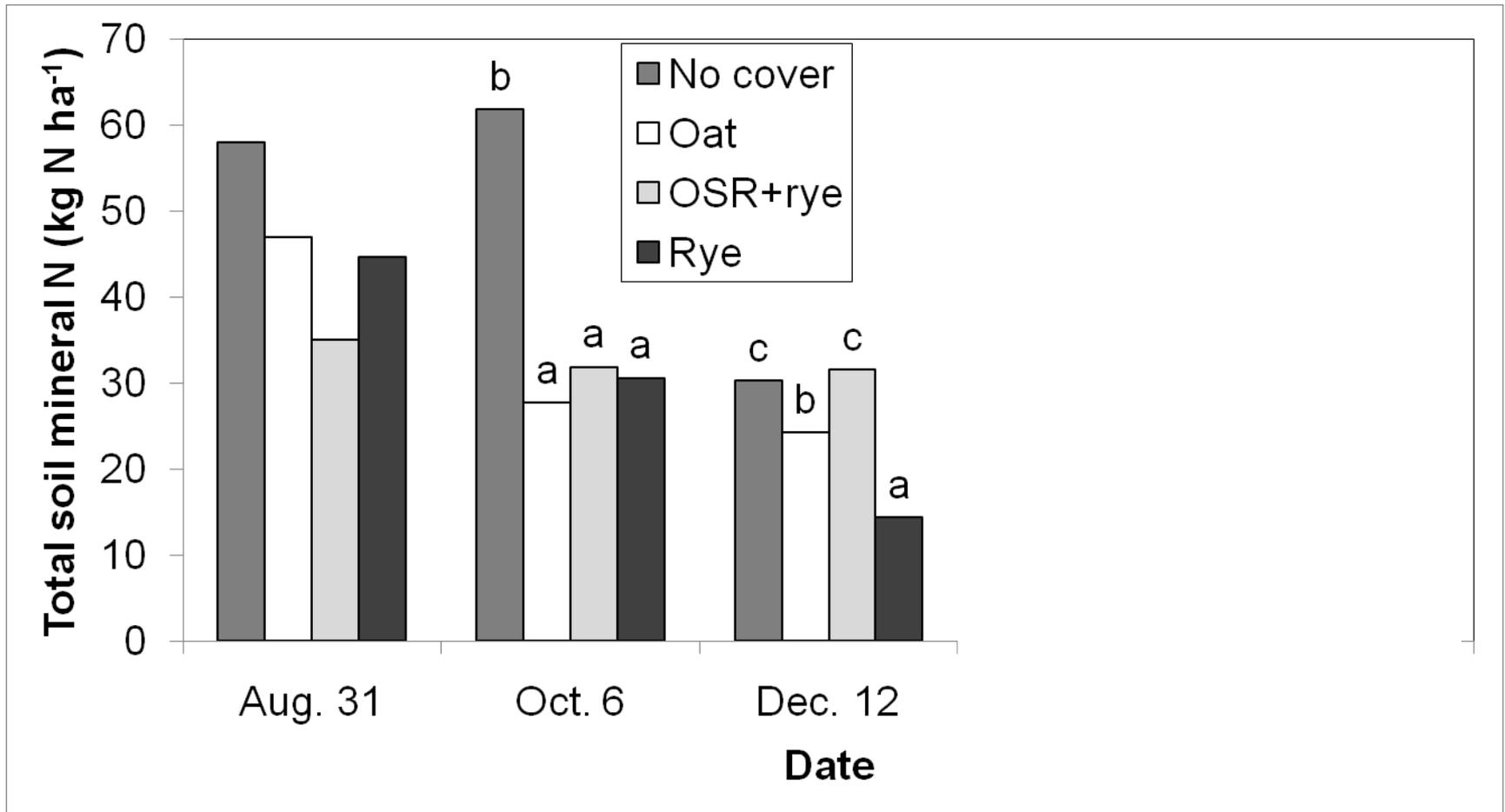


Bothwell – Cover Crops Plant N



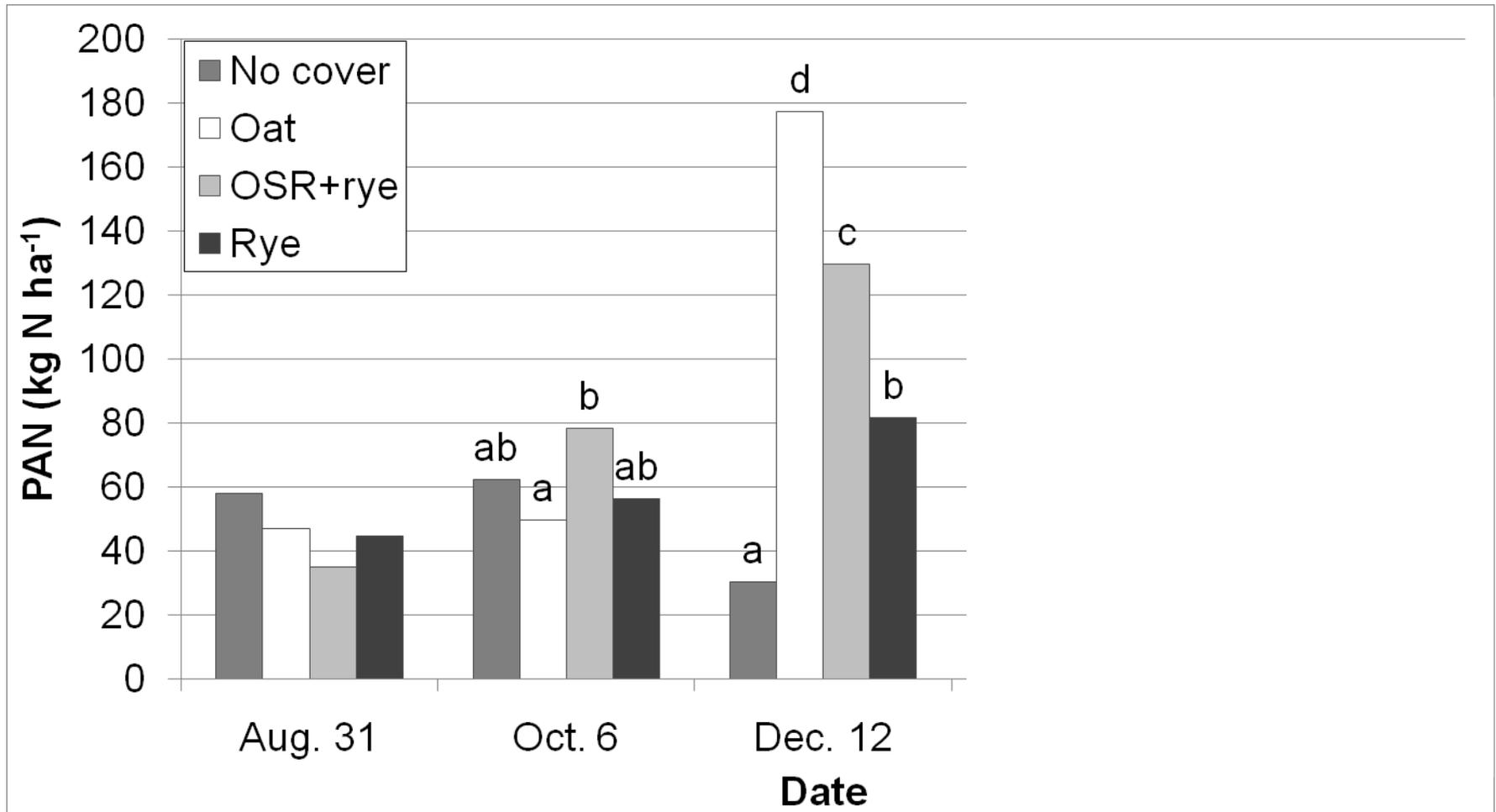
*For each date, bars labeled with the different letters are significantly different.

Bothwell – Cover Crop Soil N



*For each date, bars labeled with the different letters are significantly different.

Bothwell – Cover Crop PAN



*For each date, bars labeled with the different letters are significantly different.

Bothwell – Cover Crop Summary

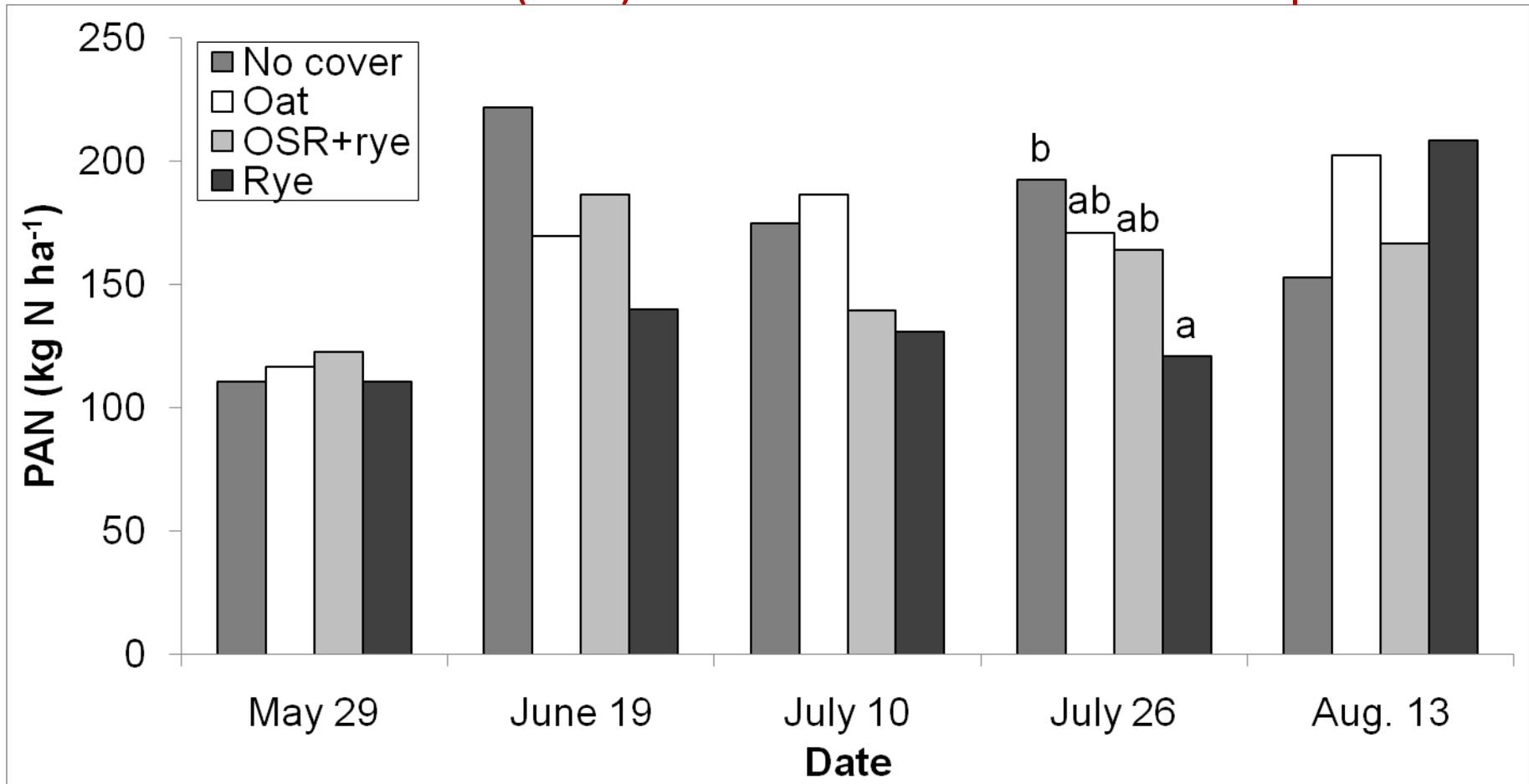
- Cover crops were effective at conserving plant available N over the fall and into the spring compared to the no cover control
- All covers were equally as effective in the spring

Is there a N credit?



Bothwell – Sweet Corn PAN

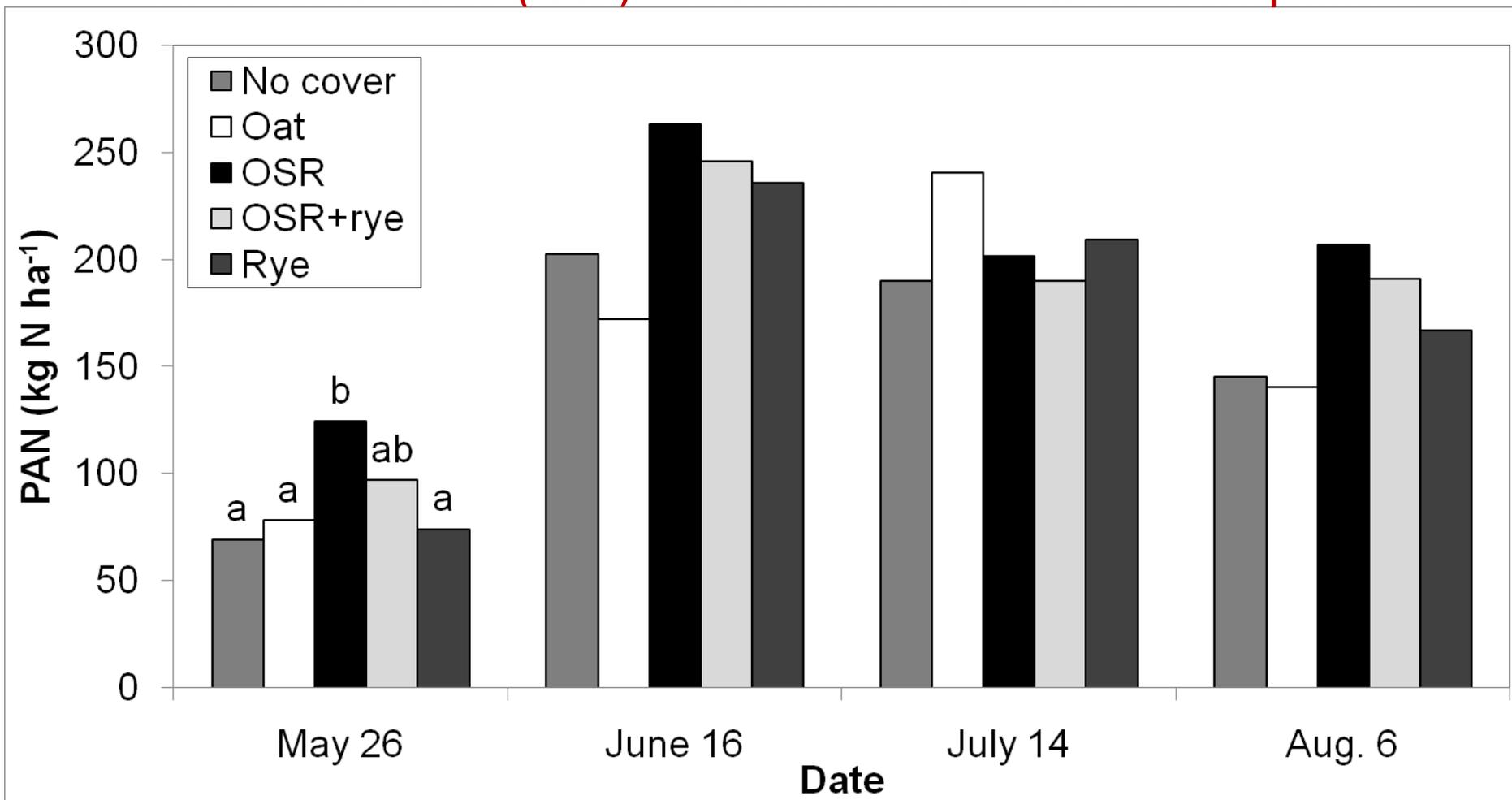
Plant available N (PAN) = soil mineral N + sweet corn plant N



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Ridgetown – Sweet Corn PAN

Plant available N (PAN) = soil mineral N + sweet corn plant N

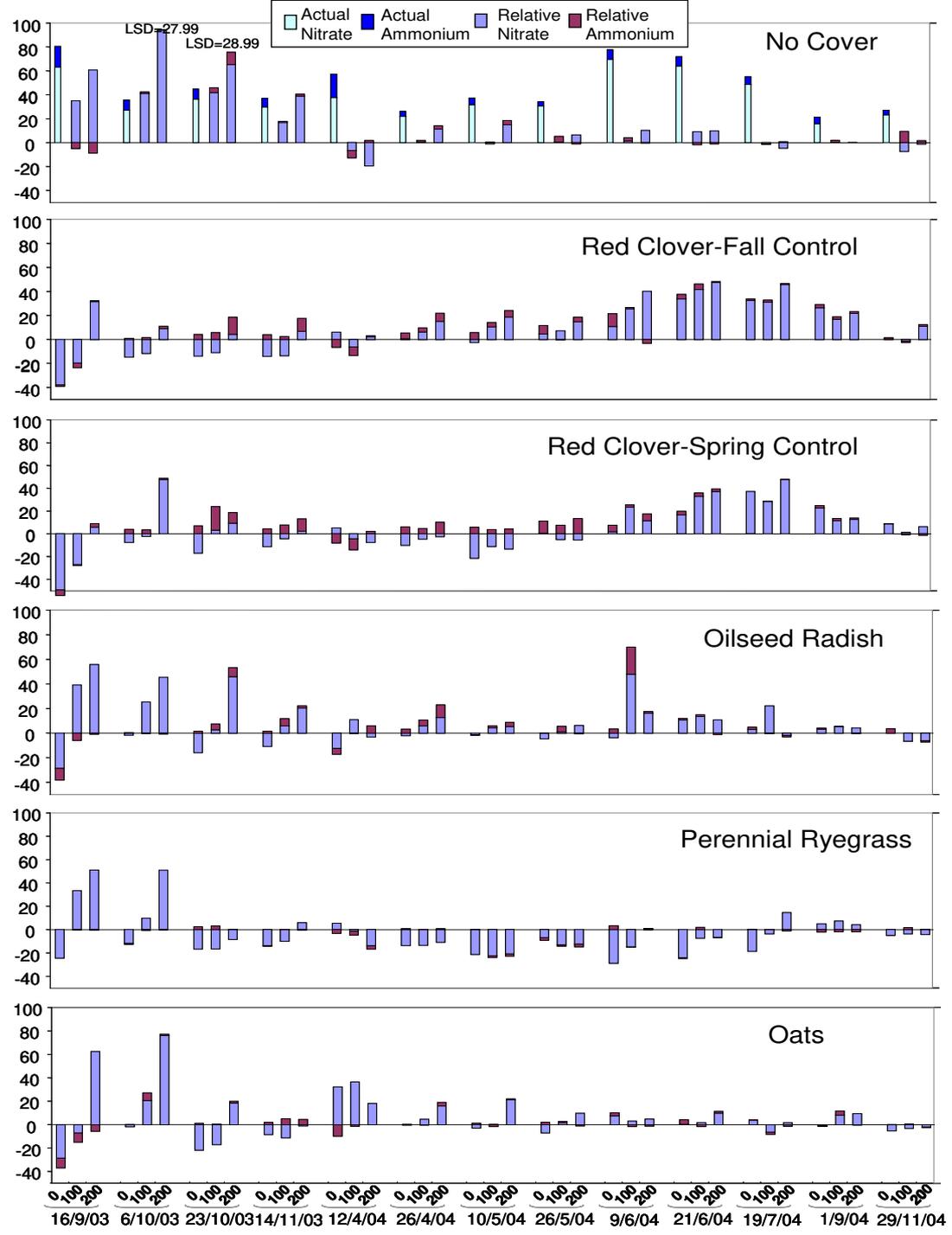


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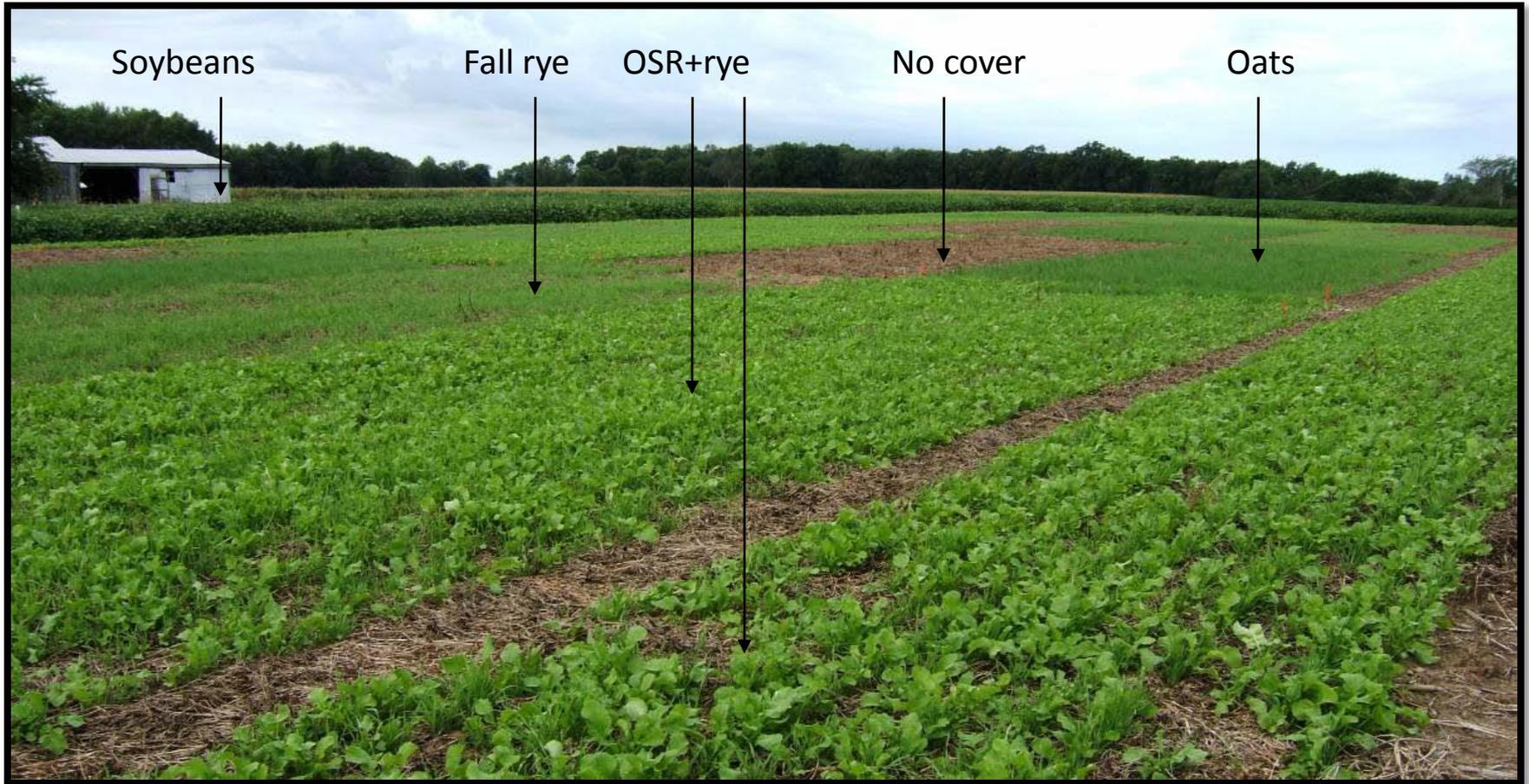
Discussion

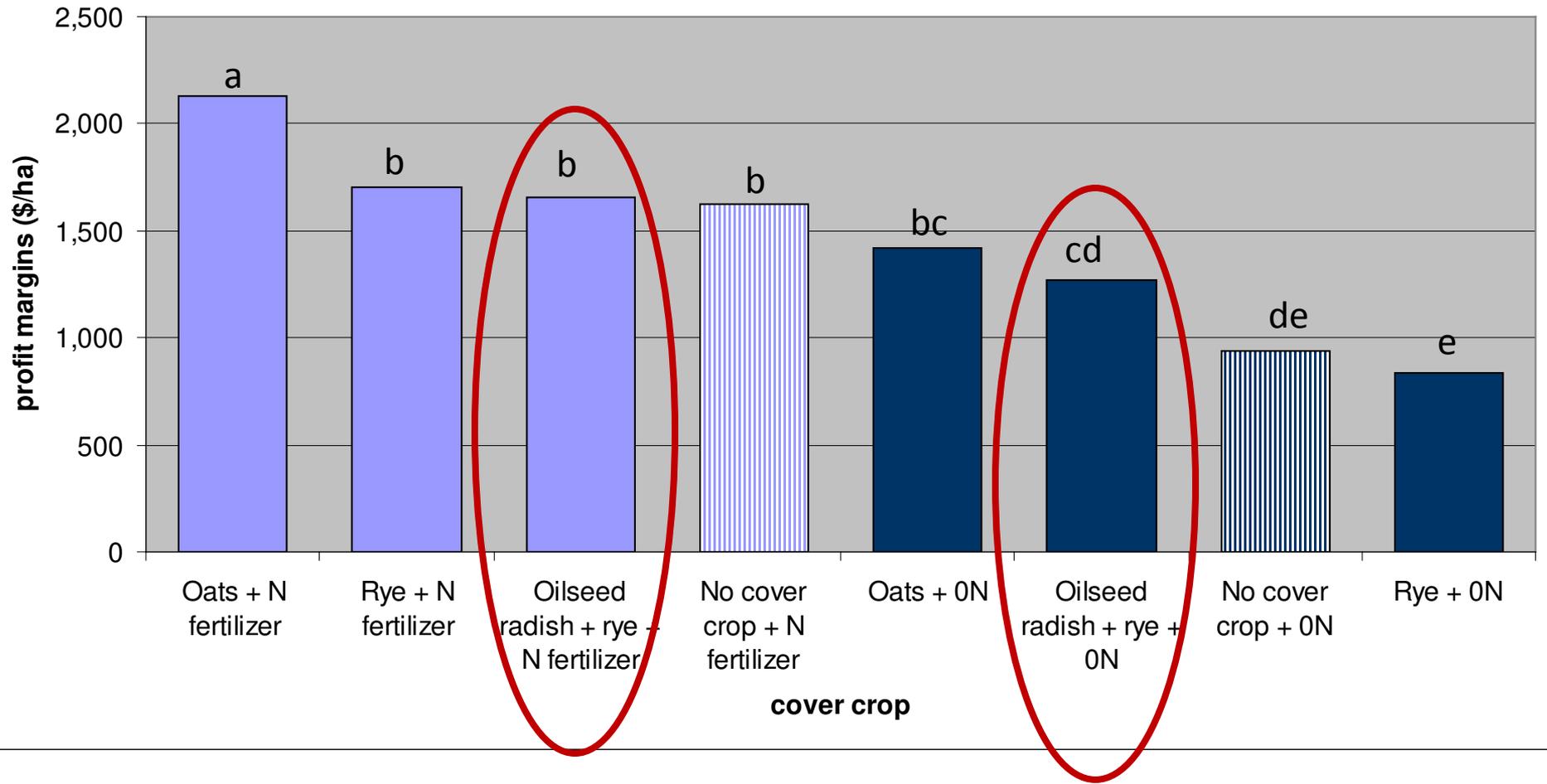
- Cover crops **may** be effective at conserving N over the cover crop growing season
- Little evidence that this translated into increased PAN for the sweet corn crop
- These cover crops do not increase or decrease N fertilizer applications to the sweet corn

Impact of cover crops on PSNT soil nitrates (data from Dr. Bill Deen U of Guelph)



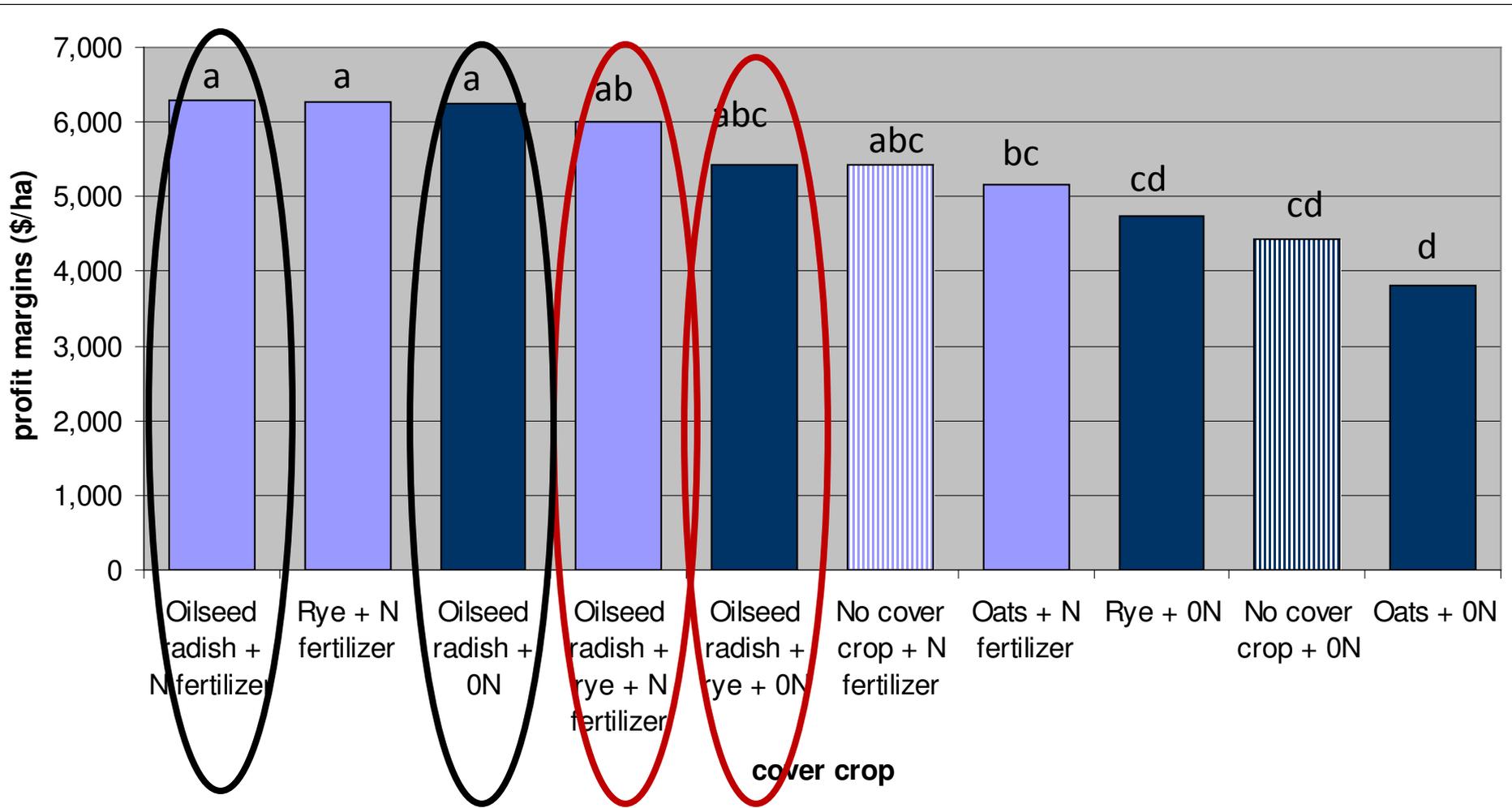
If there is no N credit, then why bother?





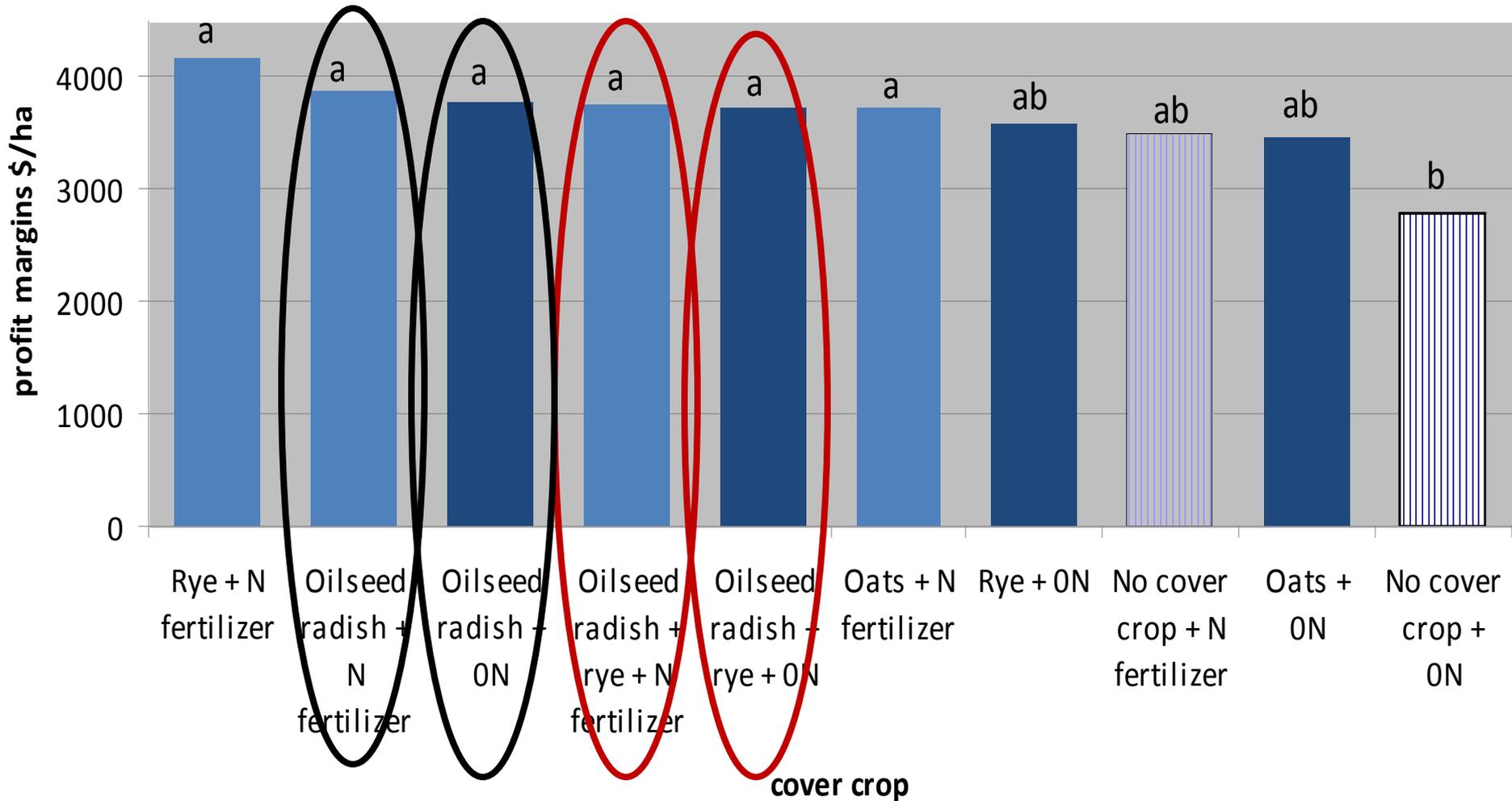
Economics

Ridgetown-2008



Economics

Ridgetown-2009



Summary on N in Brassicas

- Trap N
- No N credit
- Economics may not be a limiting factor

QUESTIONS?

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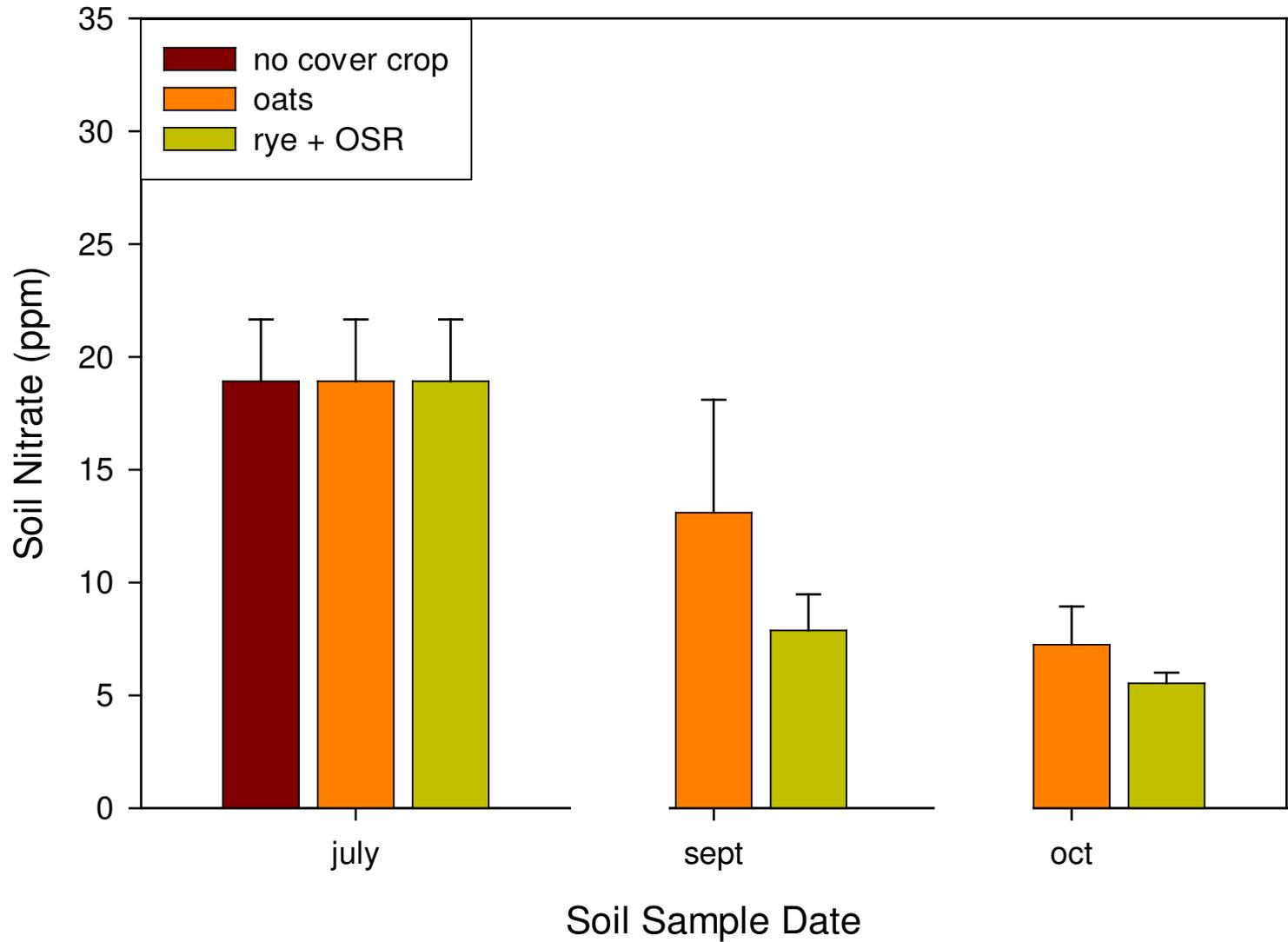
Cover Crops After Cucumbers



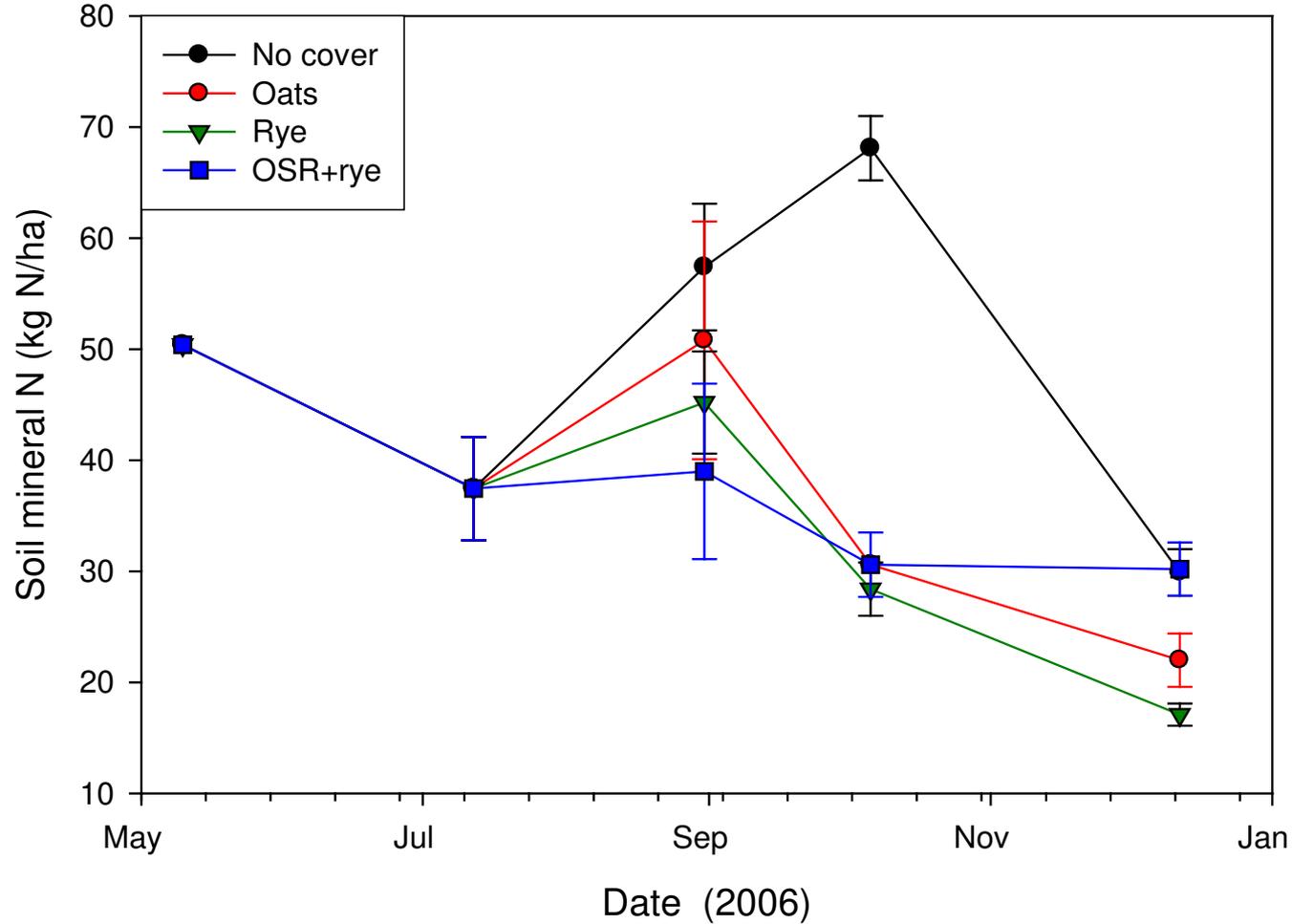
Planting date:
August 4

Photo taken:
October 21

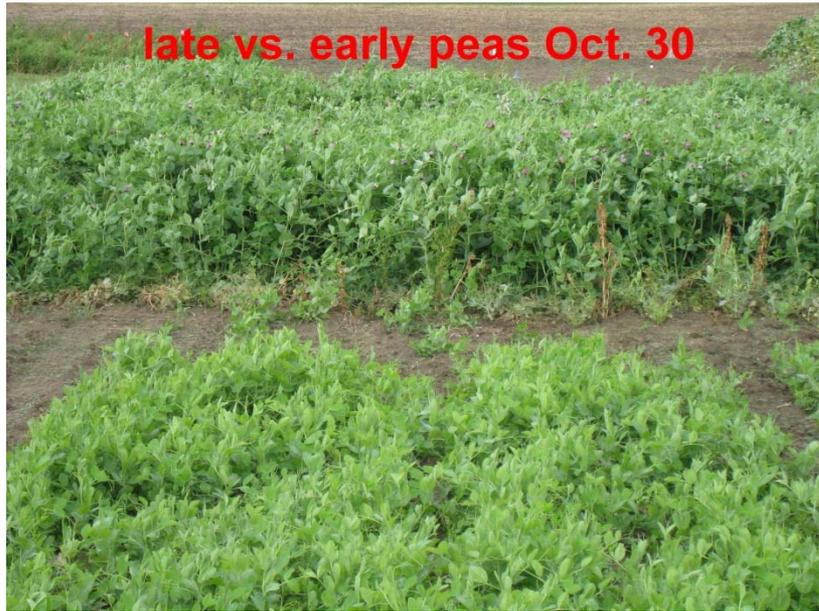
Cover Crops: Soil N



Cover crops trap N in the fall



Cover crops – cucumbers



Early planted - 1st week in August
Late planted - 1st week in September

Early v. Late Planting Dates

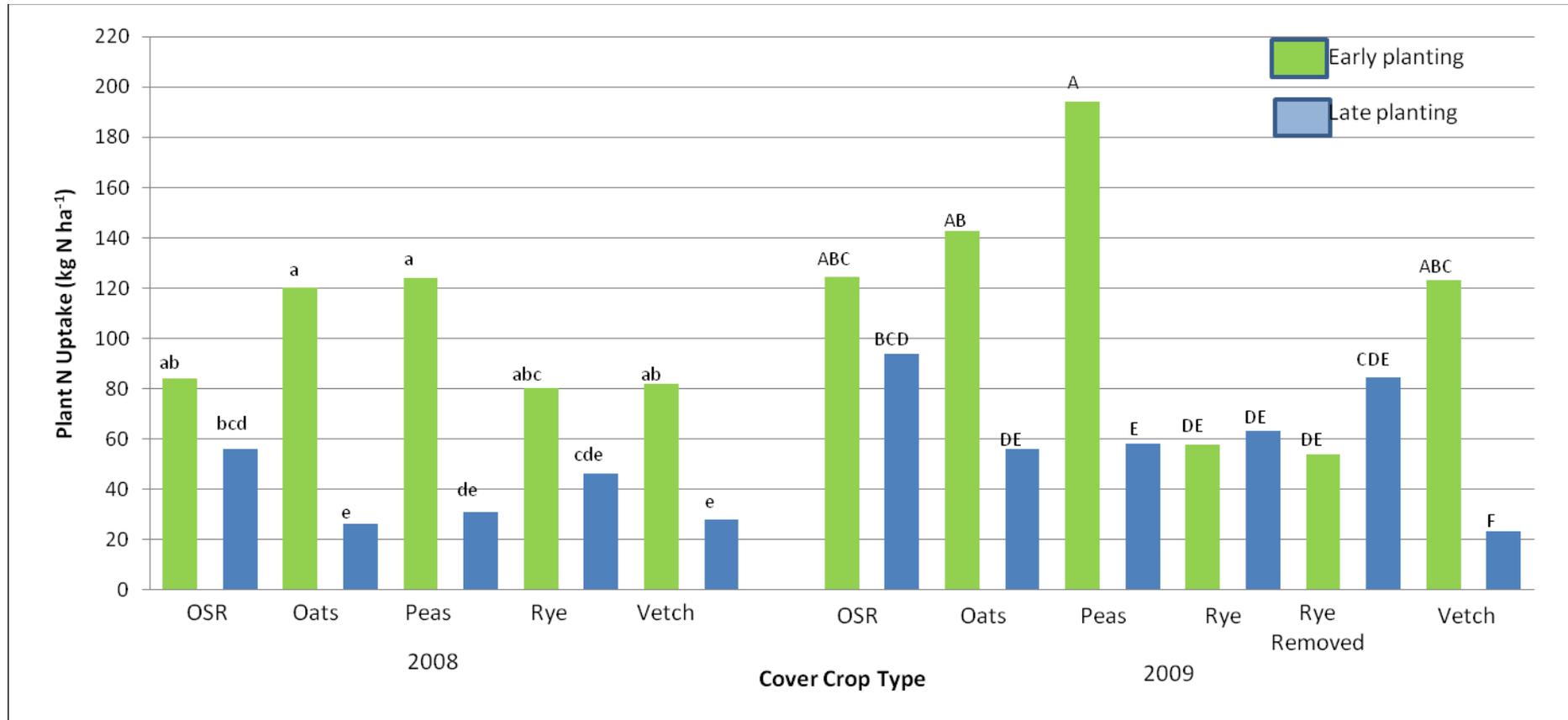
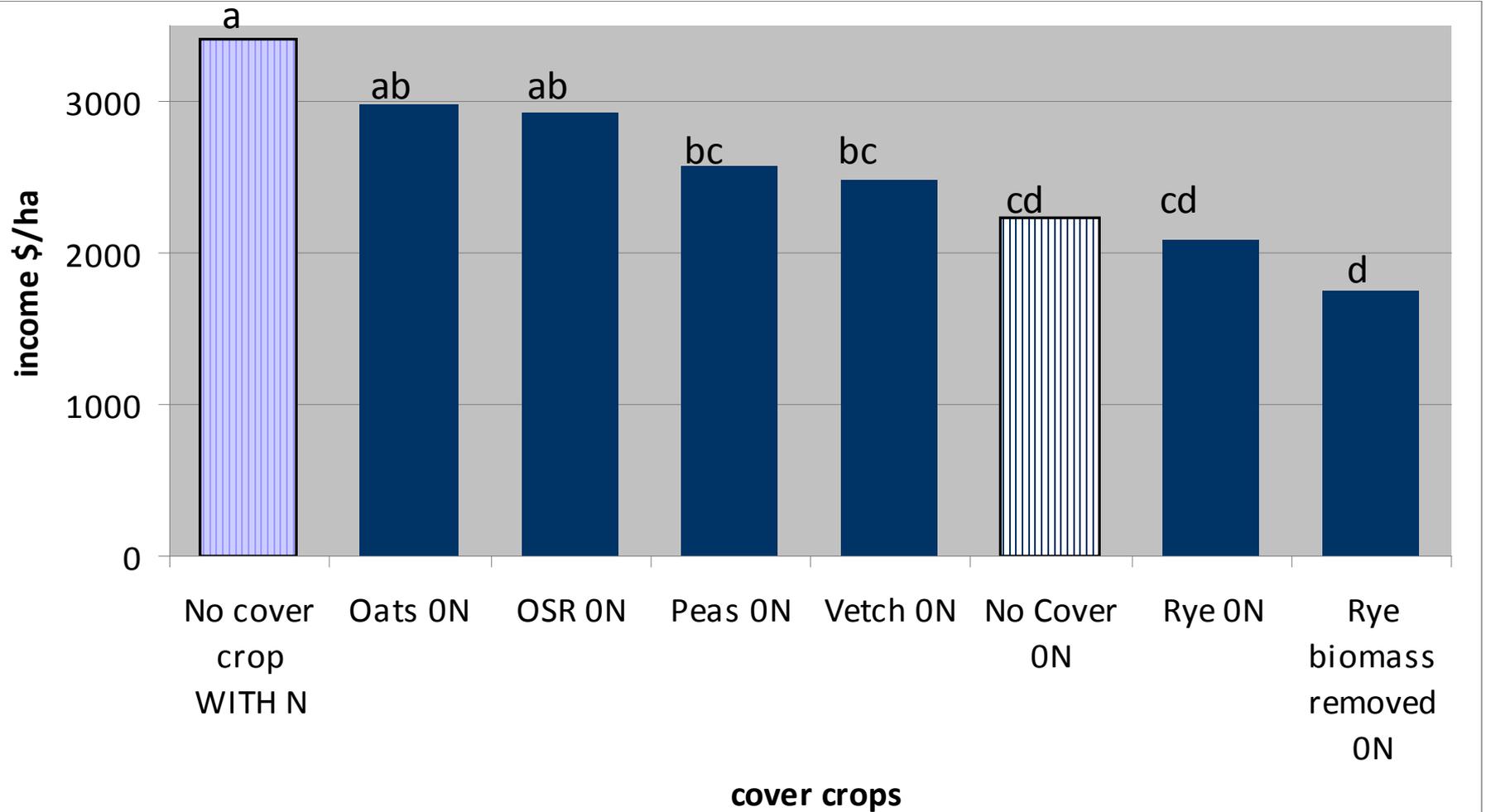


Figure 1. Quantity of nitrogen in cover crop aboveground tissues and recoverable residue collected in the fall 2008 and 2009. Different letters indicate a statistically significant difference.

Cover crops – cucumbers



Cucumber Yield

Cover Crop	Cucumber Harvest 2009	
	Marketable yield (Mg ha ⁻¹)	Marketable yield income (\$ ha ⁻¹)
No Cover	7.17 cd	2235 cde
No Cover + N	12.25 a	3405 a
OSR	10.10 ab	2933 ab
Oats	9.19 bc	2988 ab
Peas	9.89 abc	2569 bc
Rye	6.13 d	1871 e
Rye Removed	7.35 bcd	1975 de
Vetch	9.32 bc	2474 bcd

Table 2.2 Cucumber yield (Mg ha⁻¹) and yield income (\$ ha⁻¹)* in 2009. Cover crop treatments with different letters indicate a statistically significant difference.

Early v. Late Planting Dates

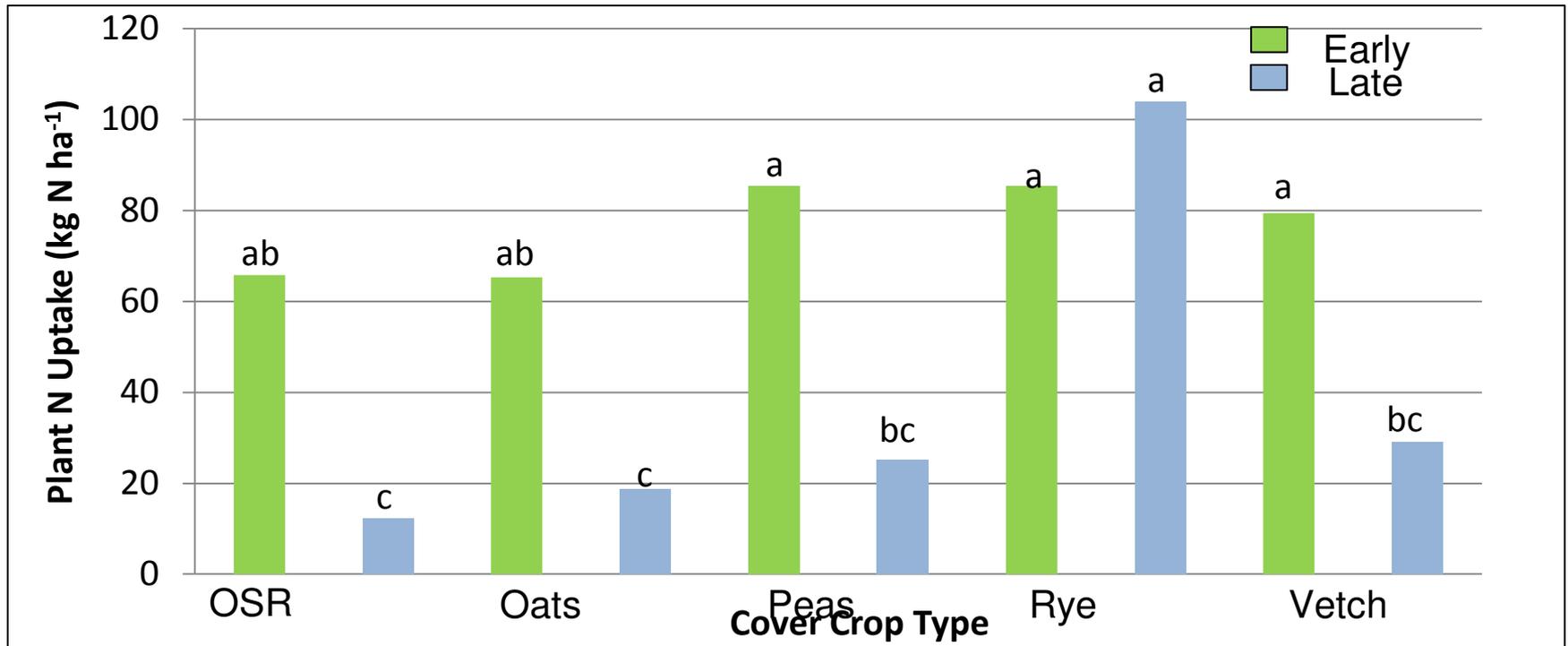


Figure 2. Quantity of nitrogen in cover crop aboveground tissues and recoverable residue collected in April, 251 and 291 DAP.

Different letters indicate a statistically significant difference.

Yields

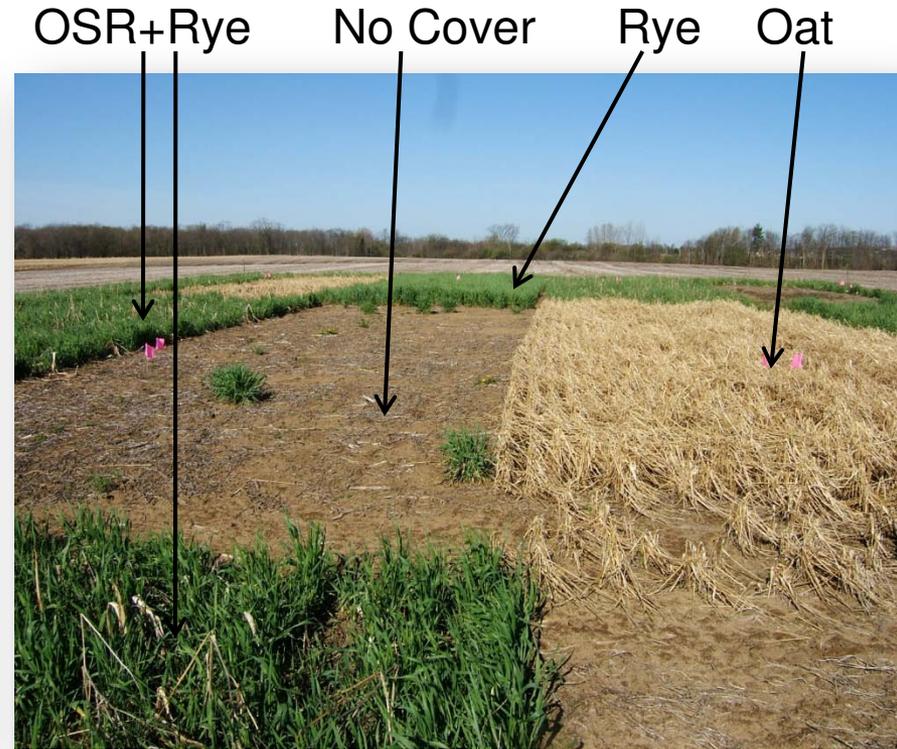
	Bothwell				Ridgetown		
	Total yield				Marketable yield	Total yield	Marketable yield
N treatment	No cover	Oat	OSR+rye	Rye			
	-----t ha ⁻¹ -----				t ha ⁻¹	t ha ⁻¹	t ha ⁻¹
0N	6.5 a	11.4 bc	11.4 bcd	6.7 ab	5.4 a	40.0 a	22.4
140N	12.2 cd	15.2 d	14.0 cd	13.7 cd	9.5 b	45.9 b	19.5
P value	0.038				0.001	0.001	0.310

Bothwell – Cover Crop Growth

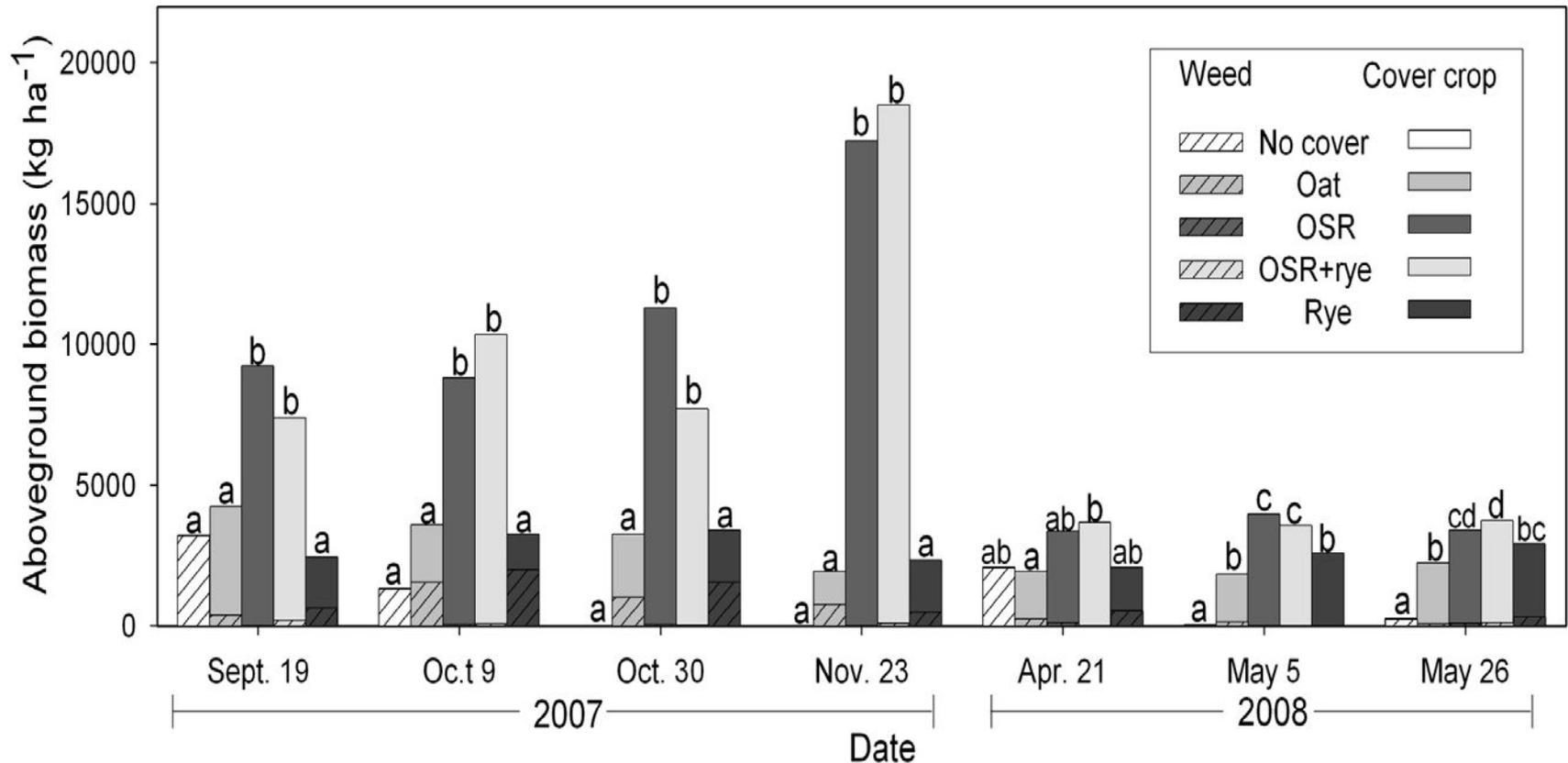
December 2006



May 2007

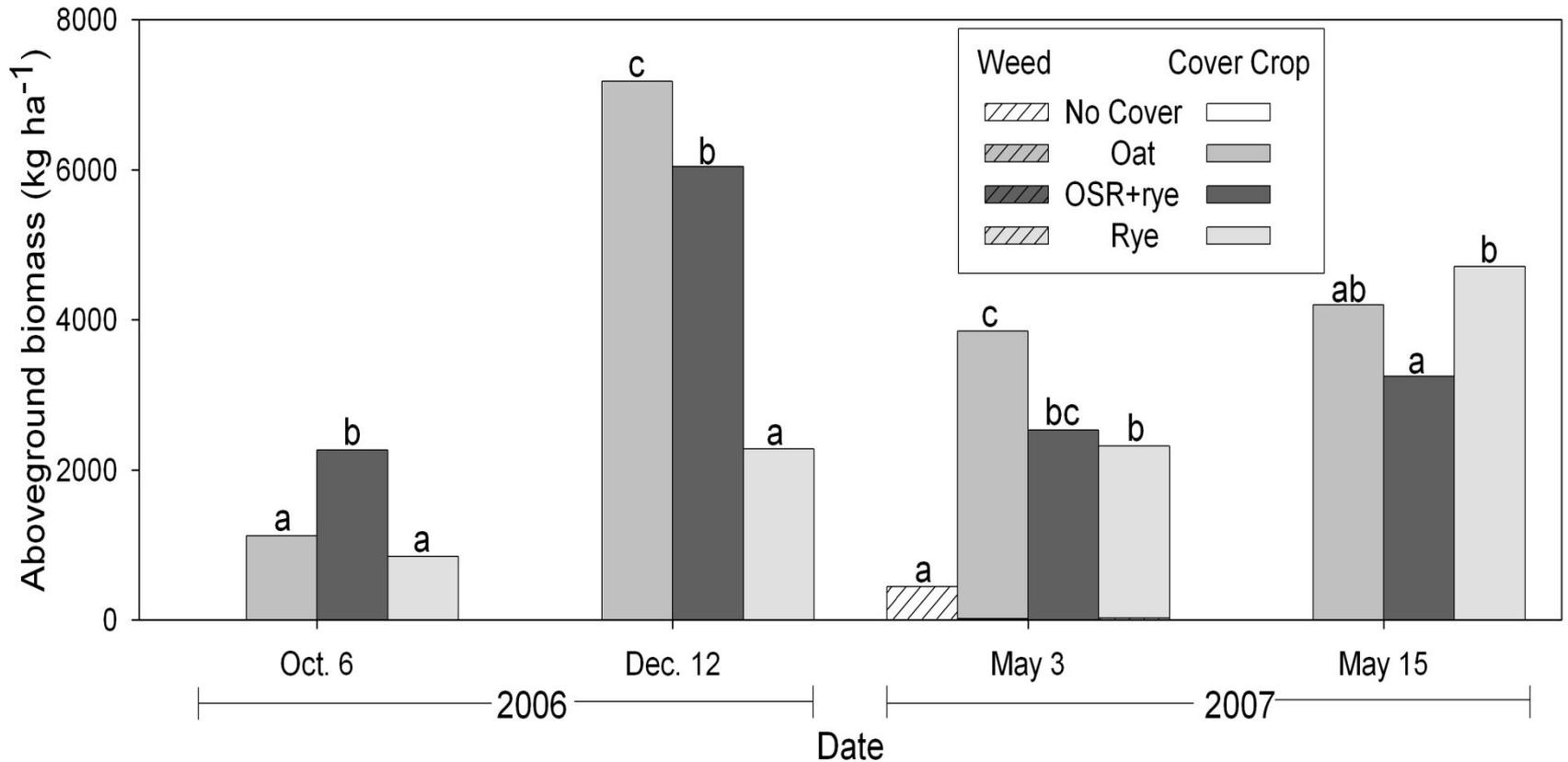


Ridgetown - Cover Crop Biomass



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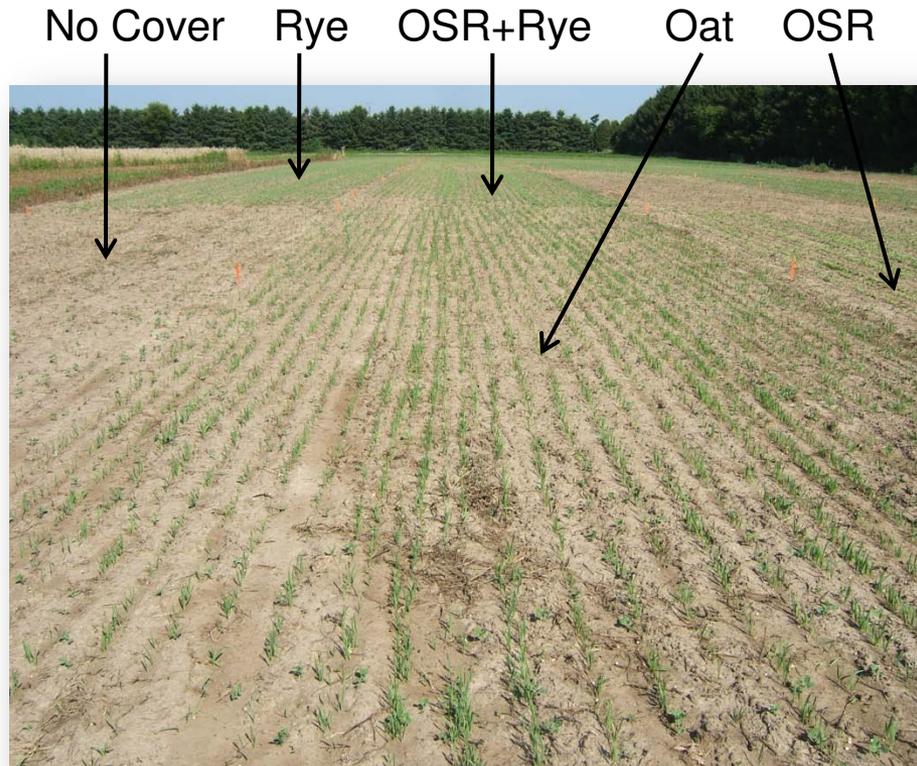
Bothwell - Cover Crop Biomass



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Cover Crop Growth

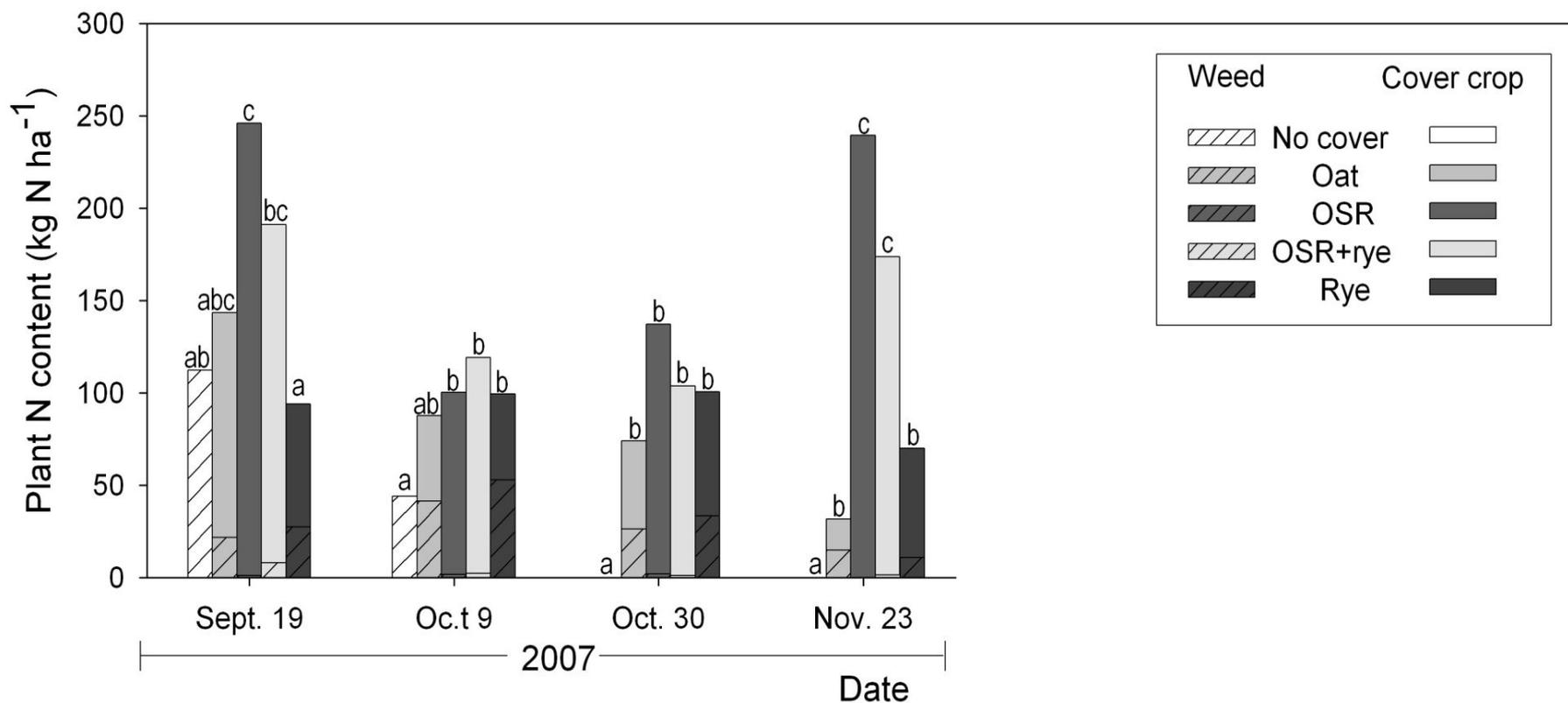
August 2007



October 2007

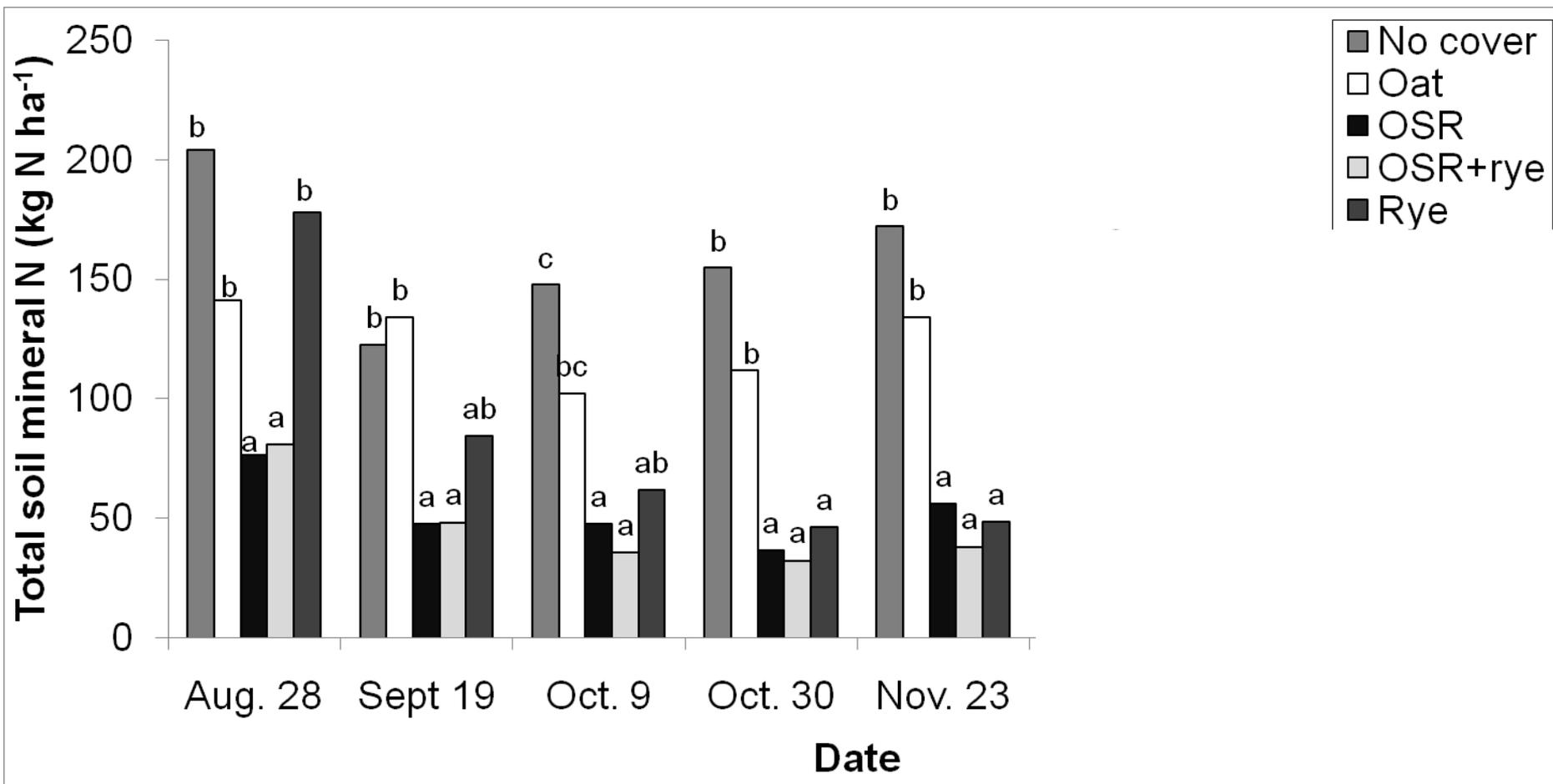


Ridgetown – Cover Crop Plant N



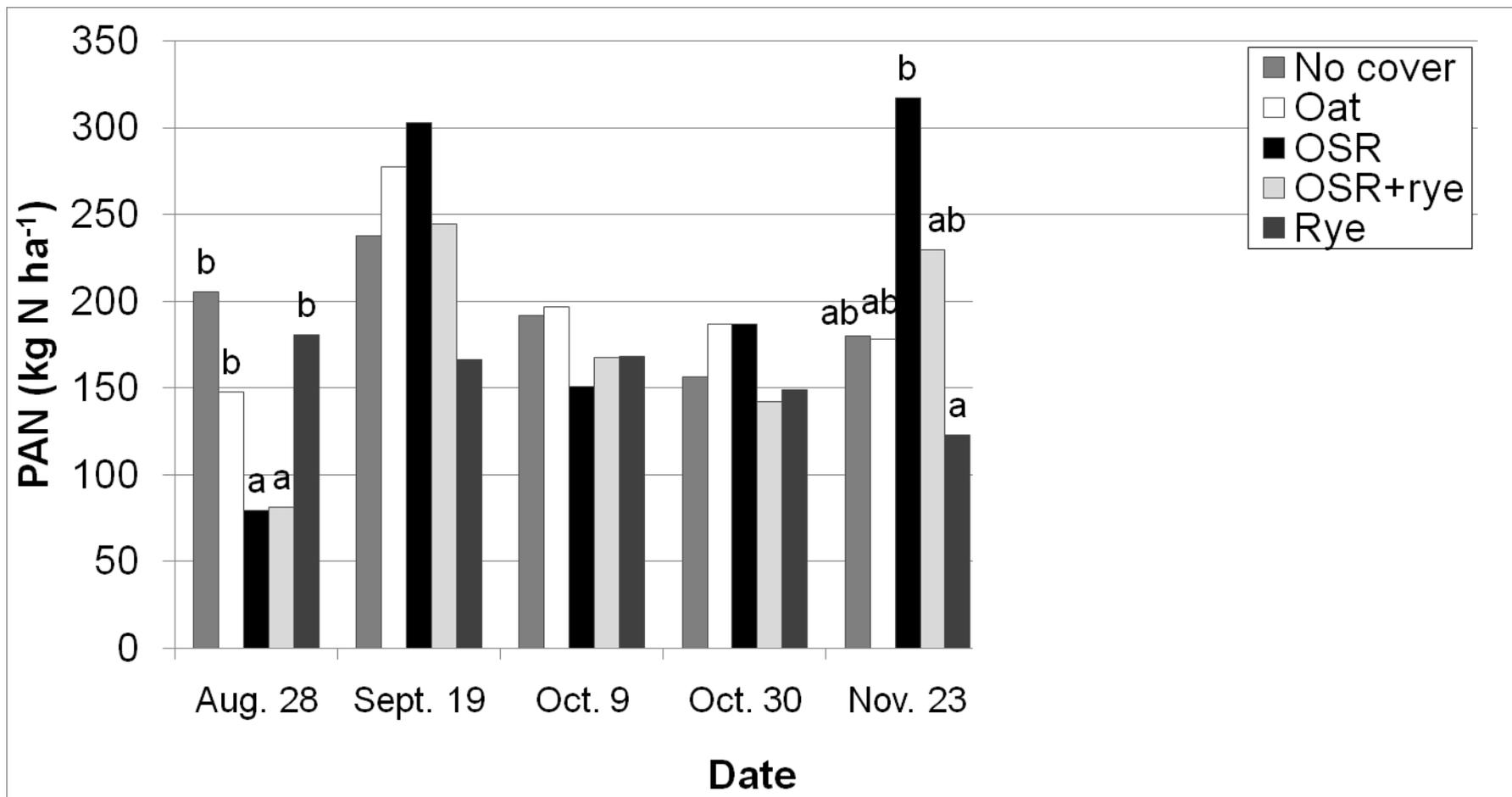
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Ridgetown – Cover Crop Soil N



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Ridgetown – Cover Crop PAN



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Ridgetown – Cover Crop Summary

- Cover crops were effective at conserving plant available N over the fall and into the spring compared to the no cover control
- Oat was most effective in the fall due to high plant N content
- All covers were equally as effective in the spring
- Cover crops generally did not affect PAN in the fall or spring compared to the no cover
- Cover crops were less effective at preventing N loss than at Bothwell, possibly due to differences in soil type and precipitation

N Credit?

- Need to compare to **NO cover crop control**
- Show fall N uptake and lower soil N but does this result in a N credit?

Cover Crops Plant N

