NITROGEN MANAGEMENT

2013 YWTG

Outline

- Background
- University Data
- ACSC field trials
- Summary

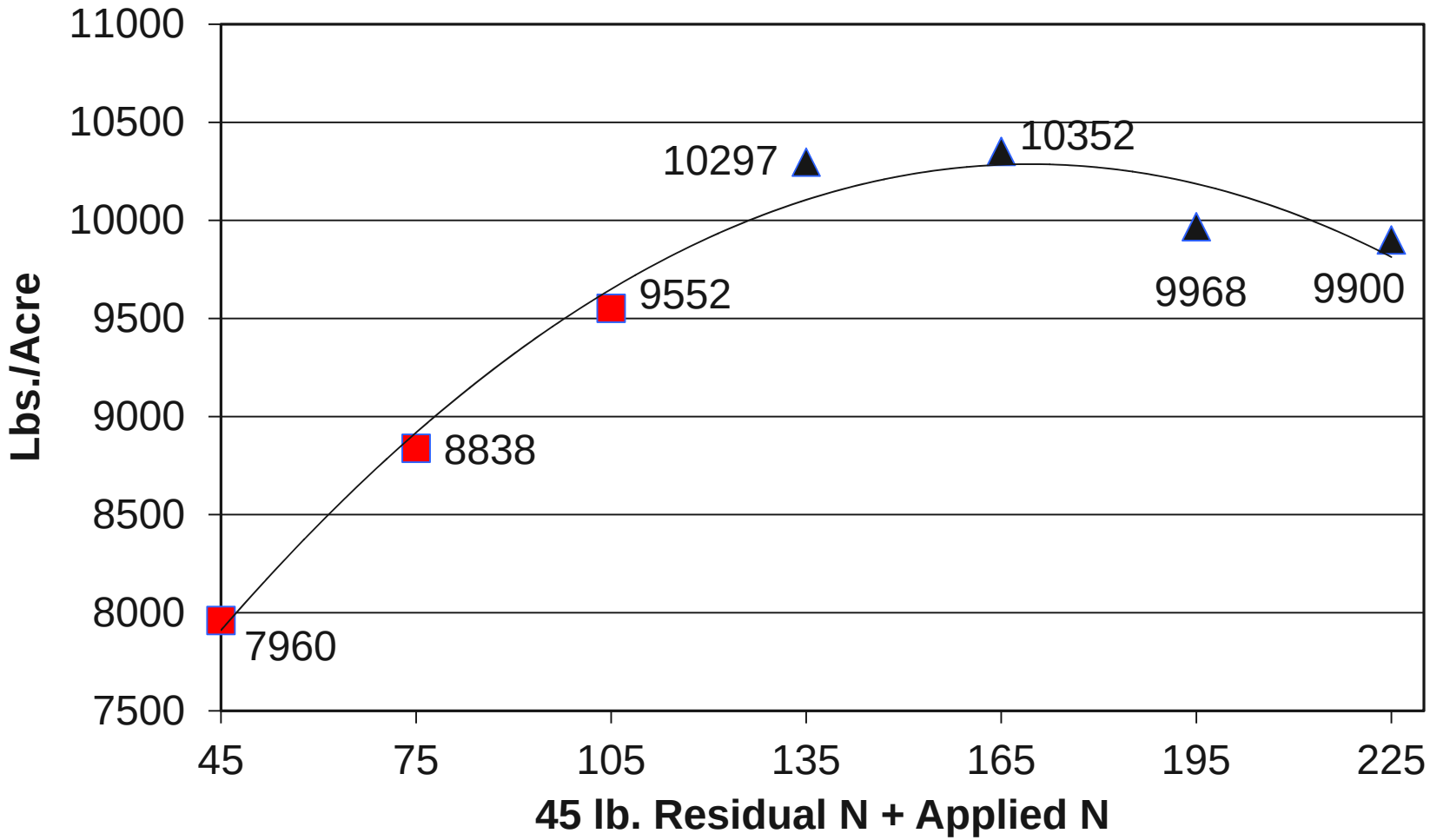
NITROGEN MANAGEMENT

- Current N recommendation
  - 4’ sample rec= 130 lb. soil N + applied
  - 2’ sample rec= 100 lb. soil N + applied
    - Minimum of 65 lb. needed in top 2’
- 2012 ACSC soil test encoded acres
  - 131,000 acres received (31%)
  - 80% of these acres avg. 136 lbs. total N
- Growers following recommendation closely

NITROGEN MANAGEMENT

- Is a 20 ton yield potential realistic anymore?
  - Nope
  - 2012 crop = 27.1 T/A
  - Nitrogen use efficiency
- Are their times we need to supplement more N for the crop? Side dressing?
  - U of M Crookston (Smith & Sims data)

RSA by TOTAL N



Smith & Nielsen

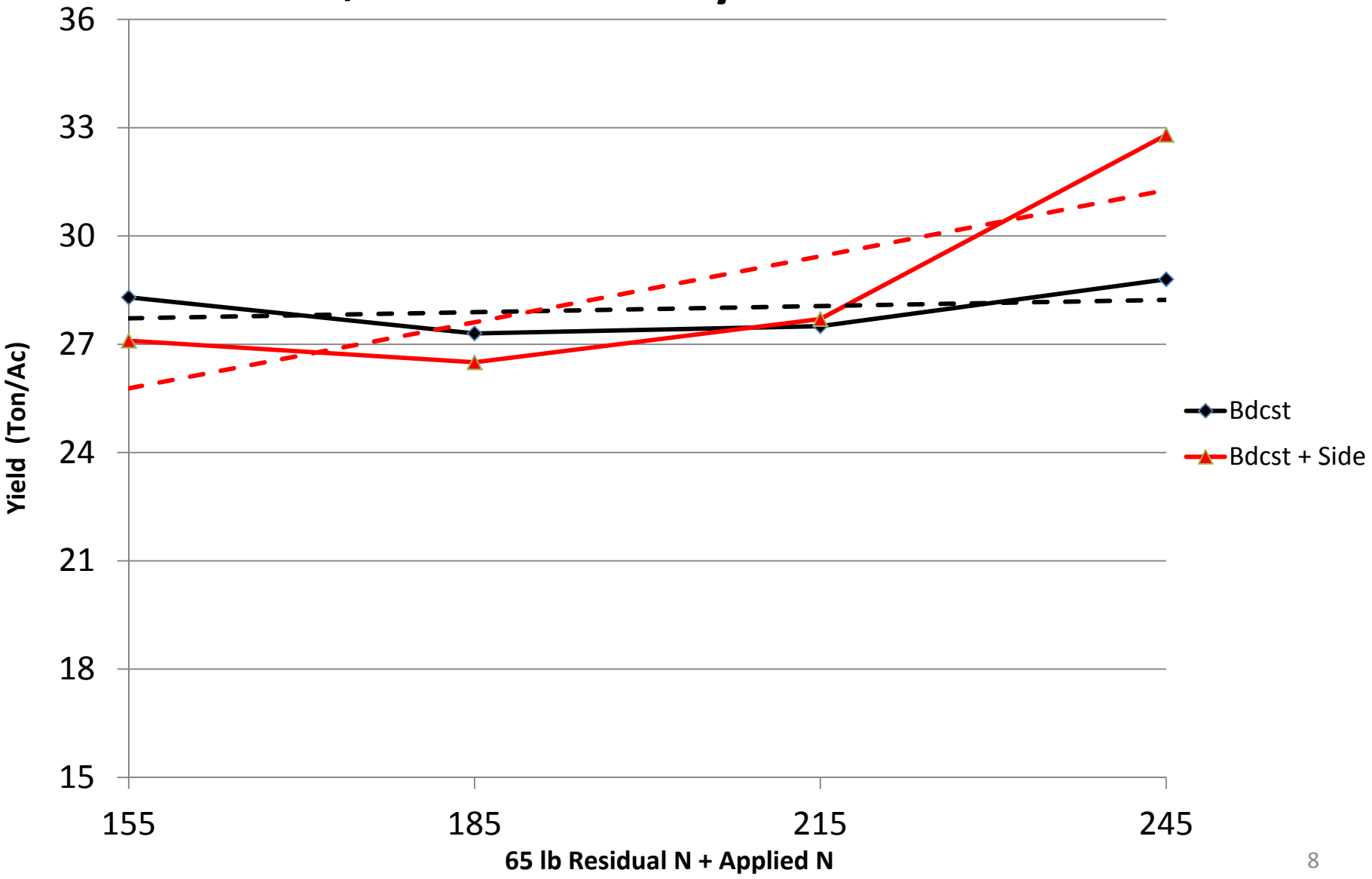
Why Side Dress then???

- Climatic conditions
  - wet/dry
  - cool/warm
- N efficiency
  - mineralization (OM%)
  - nitrification (warm, moist soils)
  - denitrification (water logged) (80+ lb./A losses can occur)
- Other crops
  - residue, previous crop credits
- Environmental concerns
  - leaching, runoff

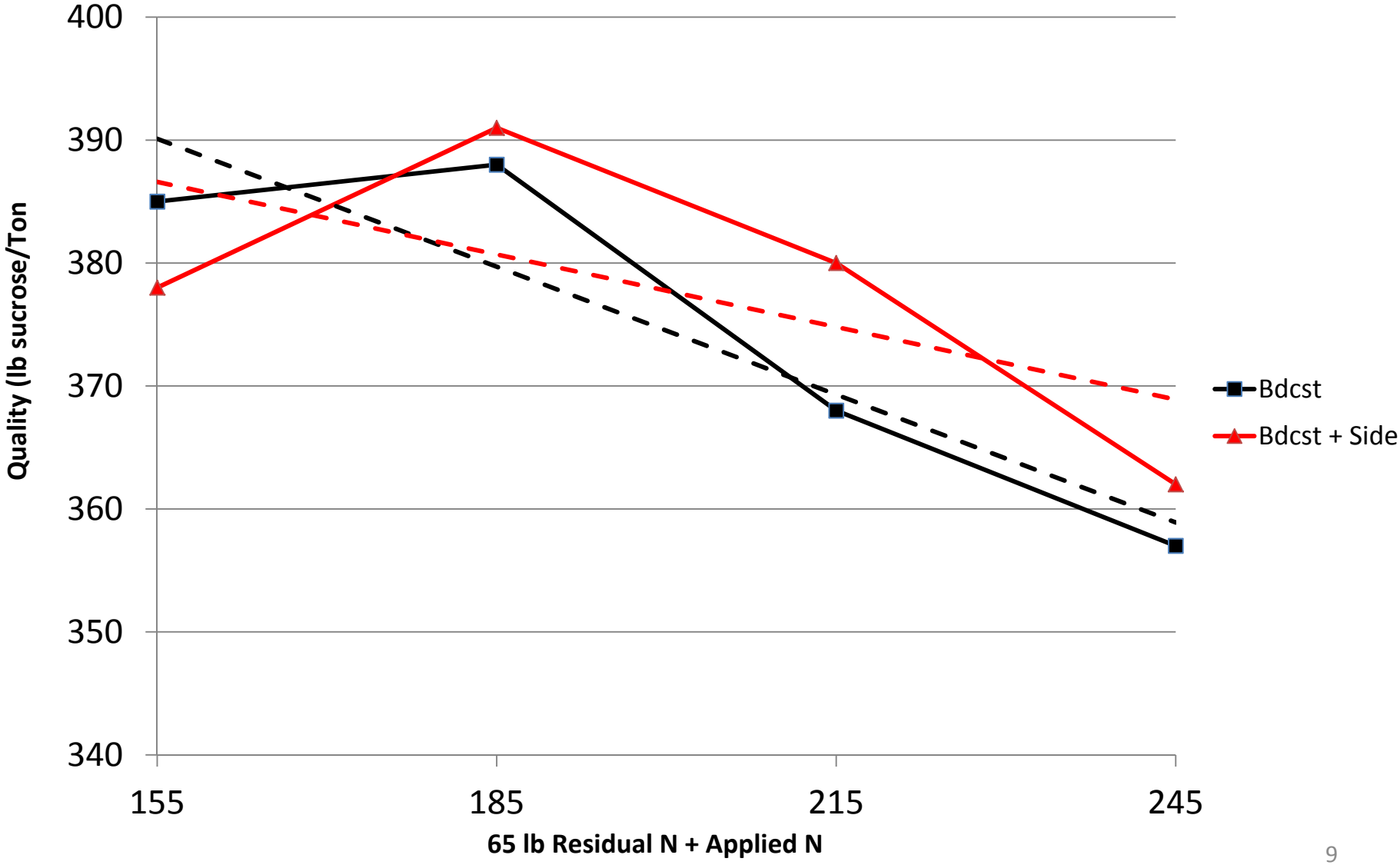
University- Sims 2012

- Determine if N placement and timing can improve availability and utilization in sugar beet production on finer textured soils in the RRV.
- Compare traditional broadcast methods to broadcast + side dress
- 2 sites - North of Alvarado, NWROC
- Band application was at the 10-12 leaf stage
- Residual N was 65 lb./A

Yield, University – Sims 2012



Quality, University – Sims 2012



Summary – Sims 2012

- Side dress N had little effect on root yield.
- Side dress N had less negative effect on root quality than broadcast
  - Later applied side dress N did not seem to reduce quality.
- One year of data

Objectives- Smith, Cymbaluk

- To Determine the best method of Correcting an in-season nitrogen deficiency.
- Does timing Nitrogen matter.
- What rate of Nitrogen should be applied

Trial- Smith, Cymbaluk

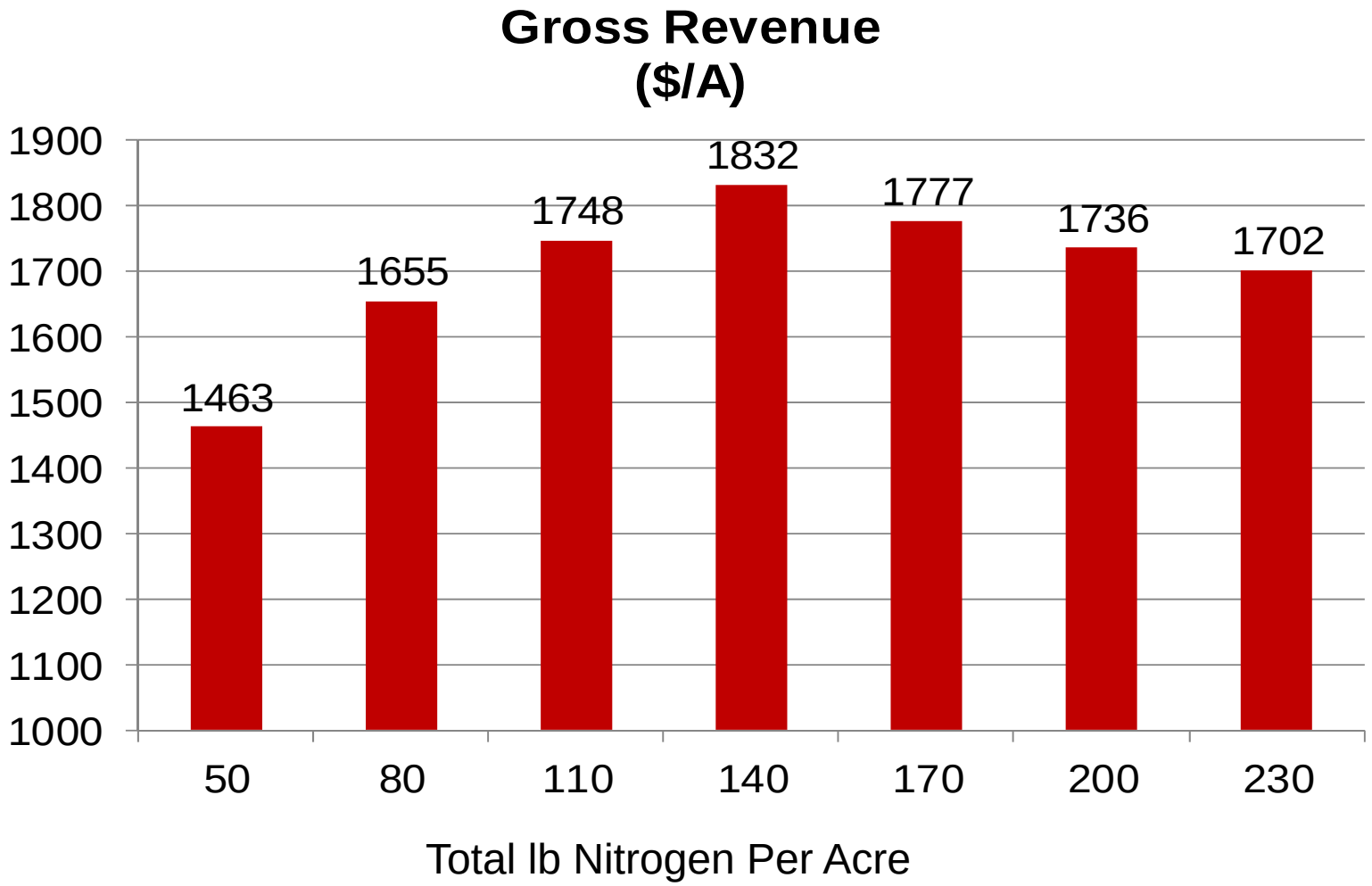
- Trial was conducted at the NWROC in Crookston, Wheatville loam
- Residual Nitrogen was 50 lb N per acre
- Nitrogen treatments were fall applied with Urea at 30, 60, 90, 120, 150, and 180 lb. N/acre on October 21, 2010
- 28-0-0, UAN fertilizer was used for the in-season treatments at 30 and 60 lb N/acre at two different times: T1 June 8 (6 leaf), T2 July 6 (row closer)


Yetter
farm equipment


PAT. PEND.
PAT. PEND.
Yetter
farm equipment
Yetter MFG. CO. COLCHESTER, ILL. U.S.A.
PAT. PEND.
Yetter
farm equipment

Fall Applied Nitrogen

University of Minnesota (Smith, Cymbaluk)



Yield and Sucrose Effects with 140 lb N per acre applied at different times

2011 University Of Minnesota (Smith, Cymbaluk)

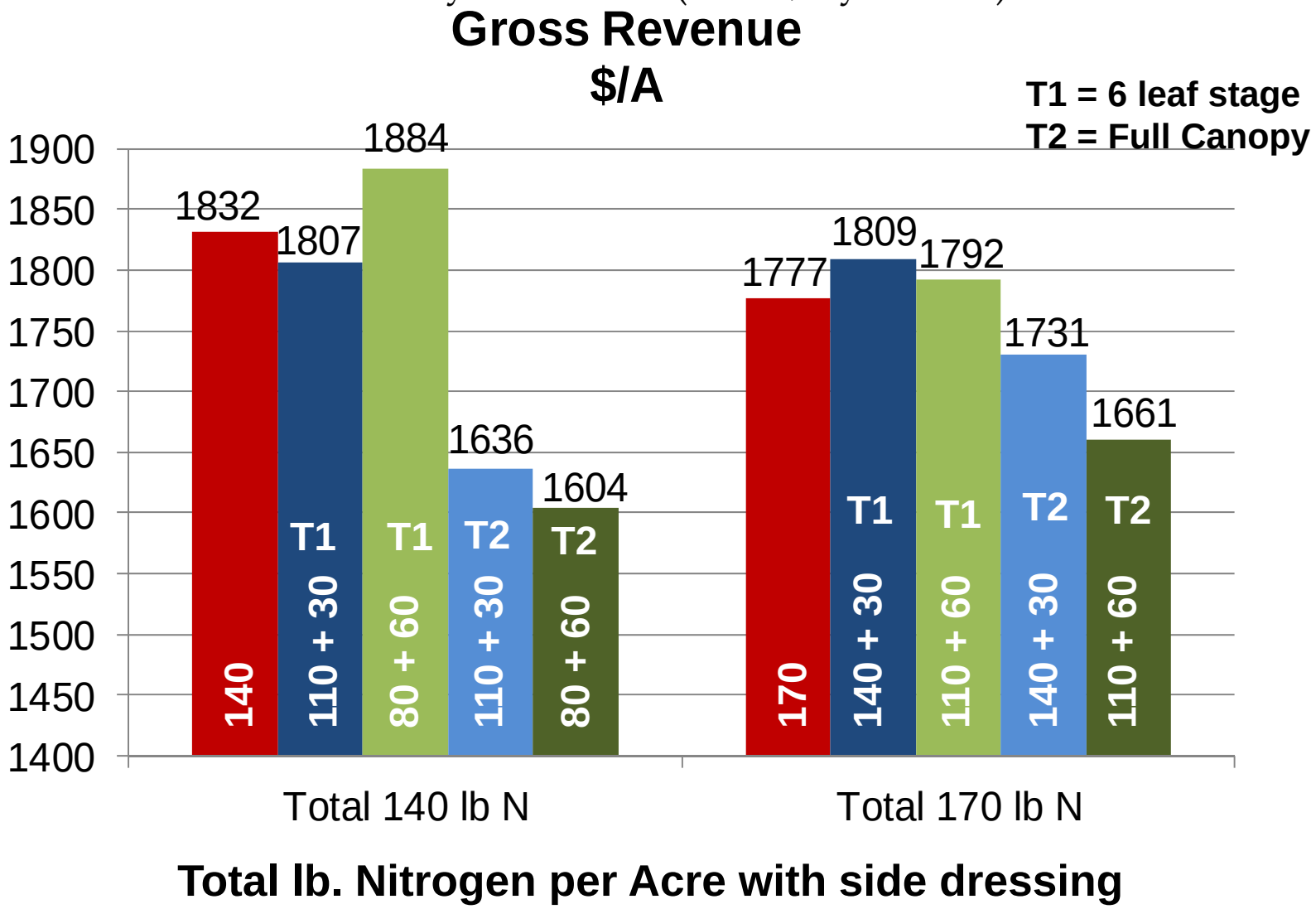
Applied Nitrogen								
Residual +Fall N (lb/A)	Post N (lb/A) T1	Post N (lb/A) T2	Total Residual+ Applied	RSA (lb/A)	RST (lb/T)	Yield (T/A)	Net Sucrose (%)	Gross Returns** ($/A)
170	-	-	170	10084	346	30.0	16.84	1777
140	-	-	140	10172	344	29.6	17.25	1832
110	30	-	140	10099	342	29.6	17.10	1807
80	60	-	140	10459	344	30.4	17.21	1884
110	-	30	140	9305	335	27.8	16.74	1636
80	-	60	140	9137	335	27.3	16.78	1604

Yield and Sucrose Effects with 170 lb N per acre applied at different times

2011 University of Minnesota (Smith, Cymbaluk)

Applied Nitrogen								
Residual +Fall N (lb/A)	Post N (lb/A) T1	Post N (lb/A) T2	Total Residual+ Applied	RSA (lb/A)	RST (lb/T)	Yield (T/A)	Net Sucrose (%)	Gross Returns** ($/A)
140	-	-	140	10172	344	29.6	17.25	1832
170	-	-	170	10084	346	30.0	16.84	1777
140	30	-	170	10233	337	30.4	16.85	1809
110	60	-	170	9945	344	28.9	17.17	1792
140	-	30	170	9877	334	29.6	16.67	1731
110	-	60	170	9474	334	28.4	16.72	1661

2011 University Minnesota (Smith, Cymbaluk)



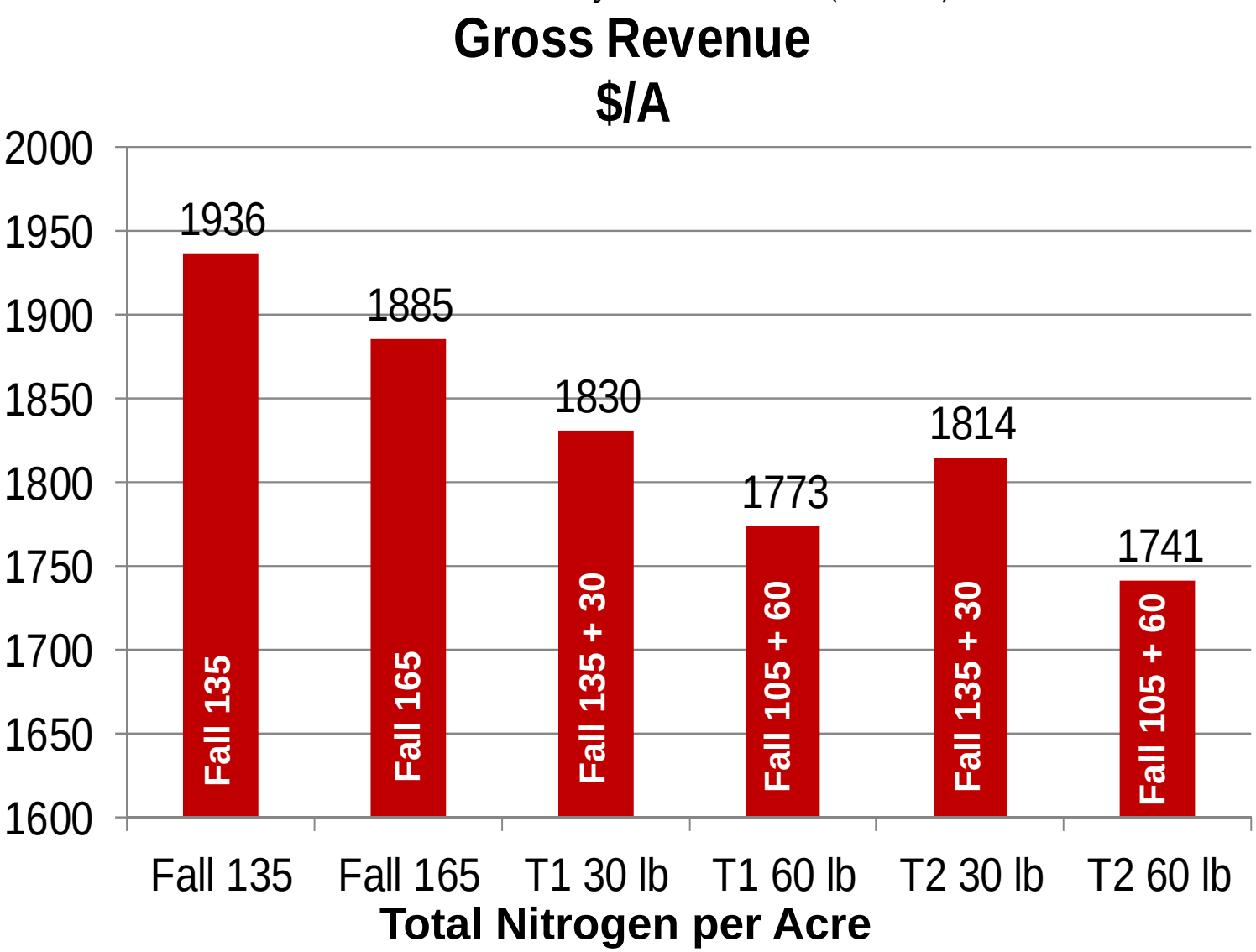
Total lb. Nitrogen per Acre with side dressing

Applied Nitrogen (lb/A)

2012 University of Minnesota (Smith)

Fall N	Post N T1	Post N T2	Total (Res+ App)	RSA (lb/A)	Yield (T/A)	Net Sugar (%)	Gross ($/A)
90	-	-	135	10297	27.7	18.6	1936
120	-	-	165	10352	29.0	17.8	1885
90	30	-	165	10079	28.4	17.8	1830
60	60	-	165	9882	27.4	18.0	1814
90	-	30	165	9664	27.2	17.9	1773
60	-	60	165	9519	26.6	18.0	1741

2012 University Minnesota (Smith)



- Fall applied N at 140 lb per acre maximized tonnage and gross return.
- With no Nitrogen loss, timing of Nitrogen did not improve tonnage or sugar.
- If there is a N deficiency, application of nitrogen at the 6 leaf stage was more beneficial than at row closure.
  - At row closure, yield reduction has already occurred.
  - Late application of N will usually give you a reduction in sugar.
  - Lack of rain fall in August may have contributed to less nitrogen uptake from late application of Nitrogen.

ACSC- ADA,MN

- Grower had field prepared with 0# N applied
  - Soil Test= 15 units avail. (0-2')
  - Dry soil cond. led him to plant and fert. in-season
  - Waited for forecasted rain and made fert. app.
    - Timing #1= 6-8lf beets, 100 units urea applied
      - Rained .7" 2 days after
    - Timing #2= row closure, 20 and 60 units urea applied
      - Rained .4" immediately after
  - Field harvested 10/15/12
    - Prepiled 10 loads 8/28/12 (175#)

ACSC- ADA,MN

- August 28th prepile results (sugar, SLM)

Prepile Avg.	SLM %	Sugar %
175# N	1.98	16.42
Daily piling site	1.63	18.04
	+.35%	**-1.62%**

- Recommend Not to Prepile side dressed fields, when possible

- Stockpile results?

ACSC- ADA,MN

N Residual 0-2’	N Fall Applied	N Side Dressed (6-8 lf)	N Side Dressed (Row Closure)	Total N	SLM (%)	Sugar (%)	Yield (T/A)	RST (Lb/T)	RSA (Lb/A)	Rev/A ($)
15	0	80	20	**115**	1.24	19.70	25.9	369	9562	1788
15	0	100	20	**135**	1.38	19.57	26.9	364	9786	1813
15	0	100	60	**175**	1.43	19.74	28.5	366	10437	1939

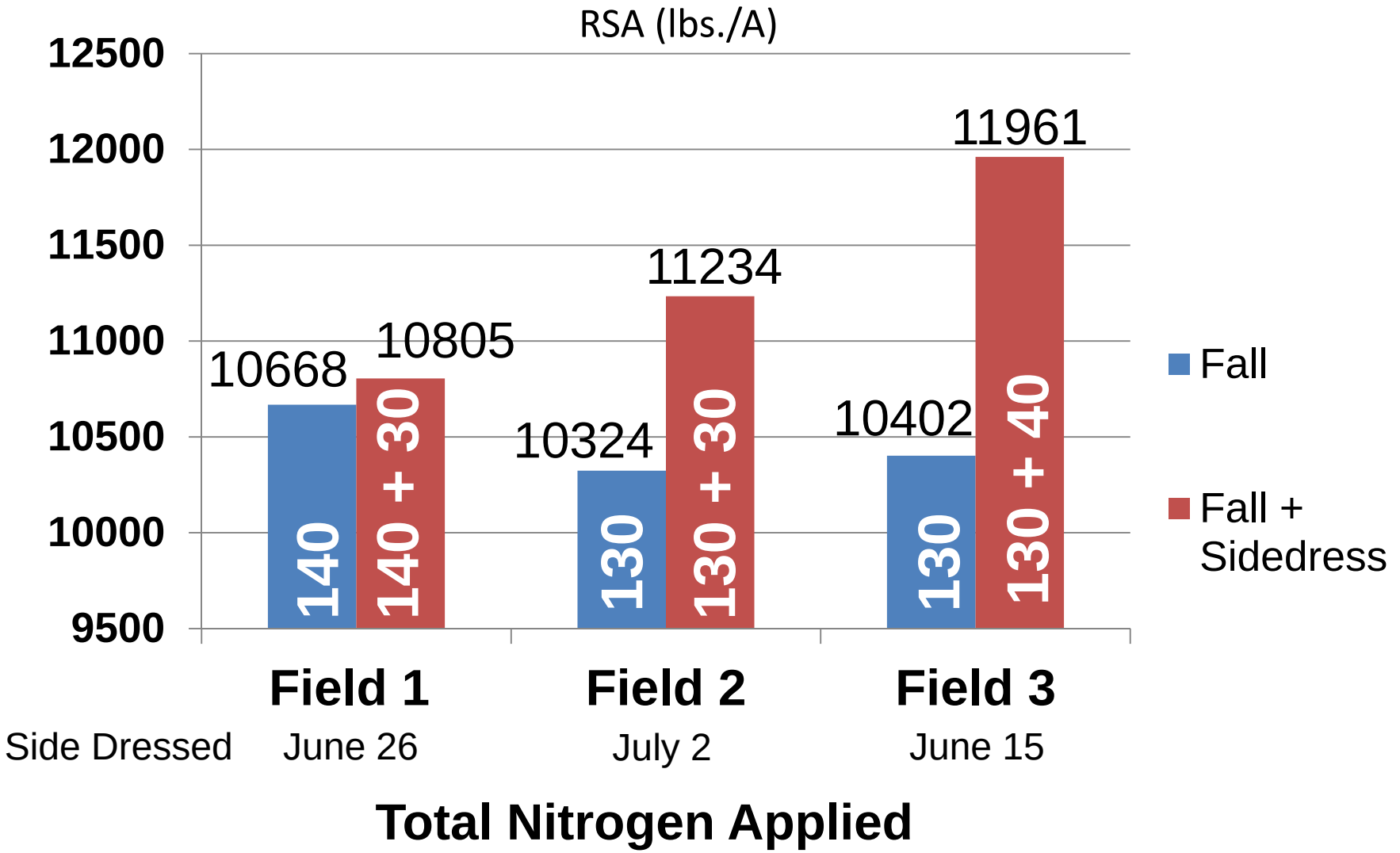
ACSC – Felton, MN

- Test plot done on tiled ground
- Planted April 20, Harvested Sept 24
- Fall soil test called for no added nitrogen
  - Re-tested in spring- same result
- 4 Reps- 0# check, 30# preplant, 30# side dress, 80# side dress
- Side dressed UAN June 6 at 8-12 leaf stage
  - 2 N rates- 30# and 80#

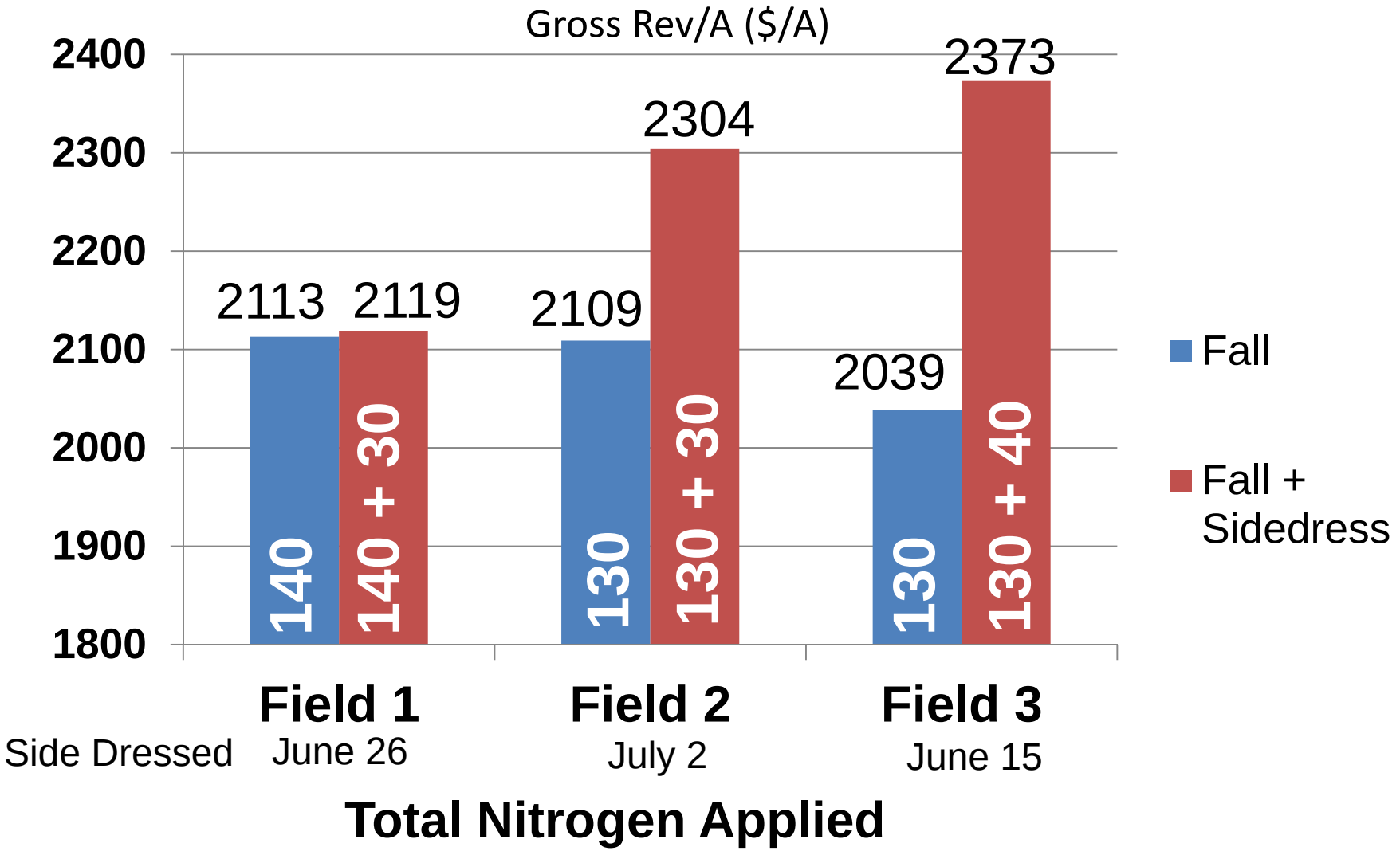
ACSC – Felton, MN

Residual N 0-2'	N Spring Applied	N Side Dressed	Total N	SLM %	Sugar %	Yield (T/A)	RST (Lb/T)	RSA (Lb/A)	Rev/A ($)
87	0		**87**	1.15%	19.00%	26.3	357	9373	$1,709.95
87	30		**117**	1.15%	19.28%	27.9	363	10119	$1,869.25
87		30	**117**	1.23%	19.47%	25.8	365	9417	$1,747.67
87		80	**167**	1.14%	19.20%	31.3	361	11311	$2,082.91

ACSC- Stephen, Mn



ACSC- Stephen, Mn



Summary

ACSC Trials

- Successfully applied all nitrogen needs in season, to conserve seedbed moisture, with no effect on yield or quality
- Avg. increase of 1.8 T/A on side dressed trials
- Little to no effect on quality
- Increased Rev/A with side dress nitrogen
- Recommend not to prepile side dressed fields
- ACSC data contradicts University data
- Need more research
- Only 1yr of data

Summary

University

Sims

- Side dressed N had little effect on yield
- Side dressed N has a less negative effect on quality than high preplant broadcast applications

Smith

- Fall applied N at 140 lbs./A. maximized yield and rev/a
- With no nitrogen loss, side dressing did not improve yield or sugar
- With nitrogen loss, nitrogen applications at 6 lf sugarbeets was more beneficial than after row closure

Factors to Consider

Side Dressing

- Fall and Early Spring weather
- Planting Date
- Plant Populations
- Soil Test N
  - Low levels 2-4’, may utilize side dress N for late season growth

Conclusion

- Side dressing can improve nitrogen use efficiency
- Side dressing nitrogen in season, can reduce high rate spring preplant nitrogen applications
- Side dressing can be an effective practice to apply nitrogen in a stale seed bed planting situation
- Side dressing can remedy nitrogen loss due to environmental conditions

QUESTIONS ?