

In-Season N Applications for Corn: Pros and Cons

MI SWCS Seminar

March 2, 2018

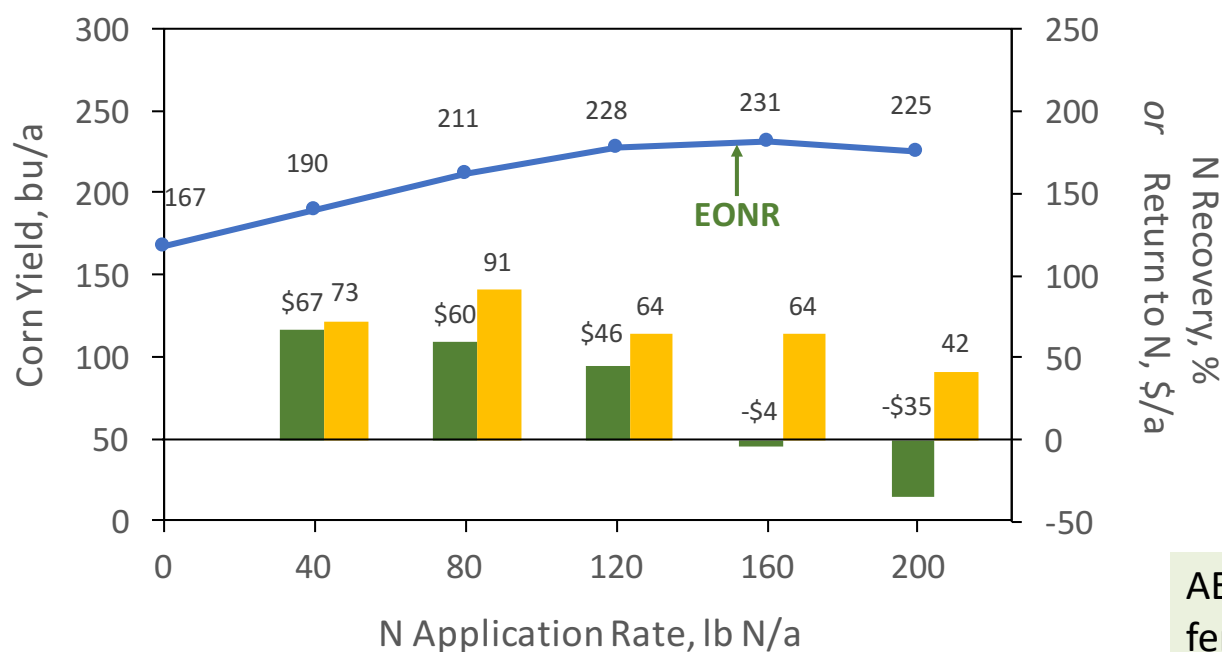


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Effect of N application rate on corn grain yield along with return to N and N recovery in the whole plant at R6 for each 40 lb/a increment of N fertilizer at Arlington, 2014

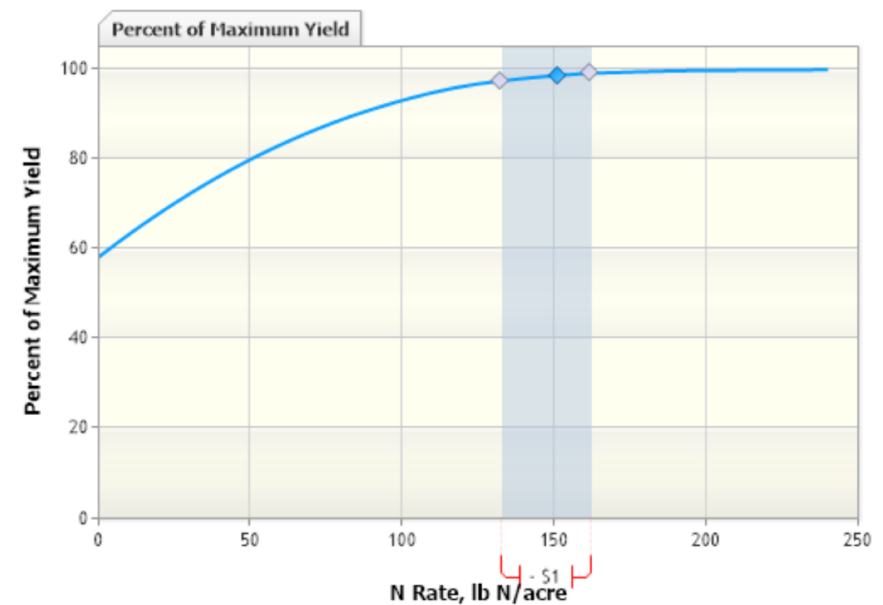
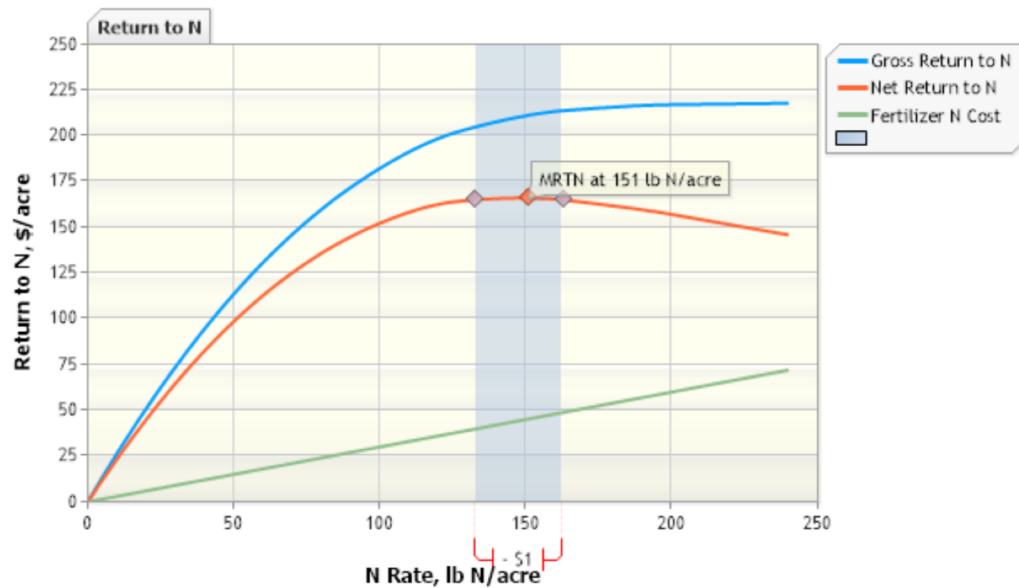


N use efficiency

PFP, bu/lb N	4.8	2.6	1.9	1.4	1.1
lb N/bu	0.21	0.38	0.53	0.69	0.89
AE, Δbu/lb N	0.58	0.55	0.51	0.40	0.29

AE a true measure of fertilizer NUE, accounts for soil N supply

Corn yield response in MI previous crop = soybean



Split/Late Applications To Corn: Should I Be Using Them?



Study Background

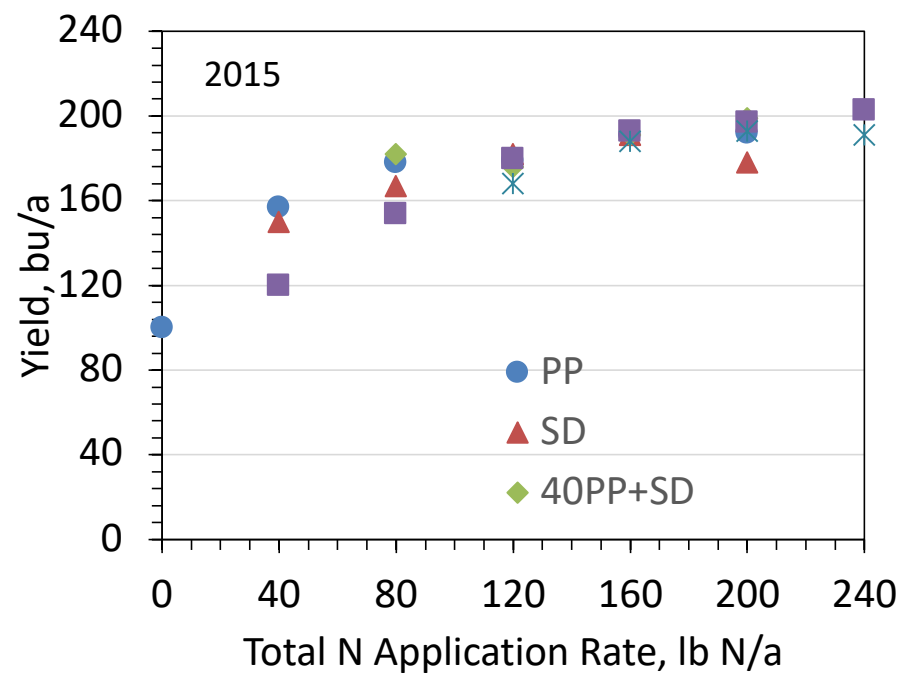
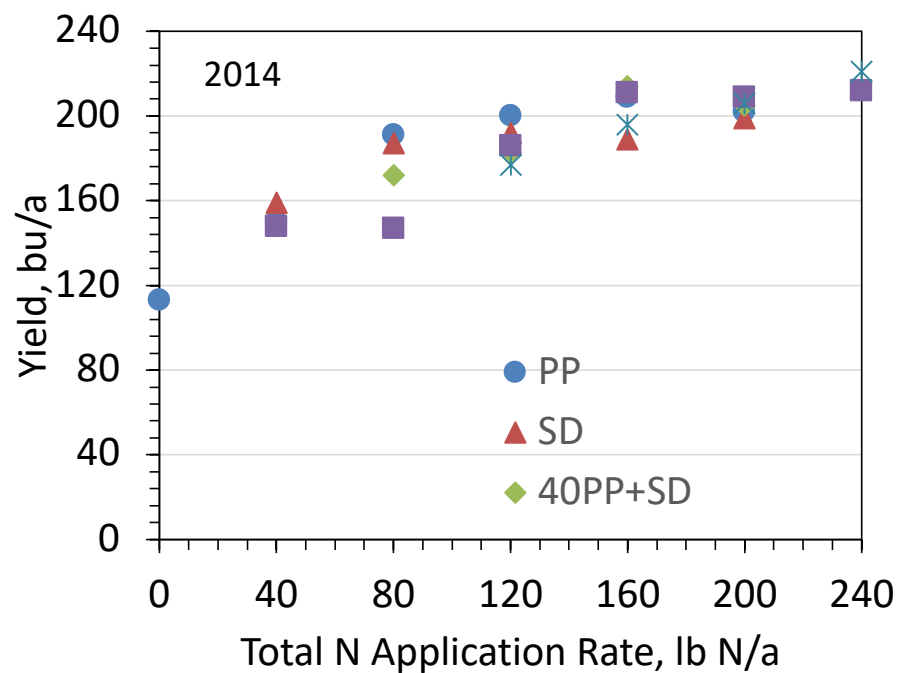
N Timing

- Preplant: PP
- Sidedress: SD
 - V6, ~18"
- Split: 40PP + SD
- Preplant + Late: PP +40L
 - Late = 10 d before VT
- Triple split: 40PP + SD + 40L

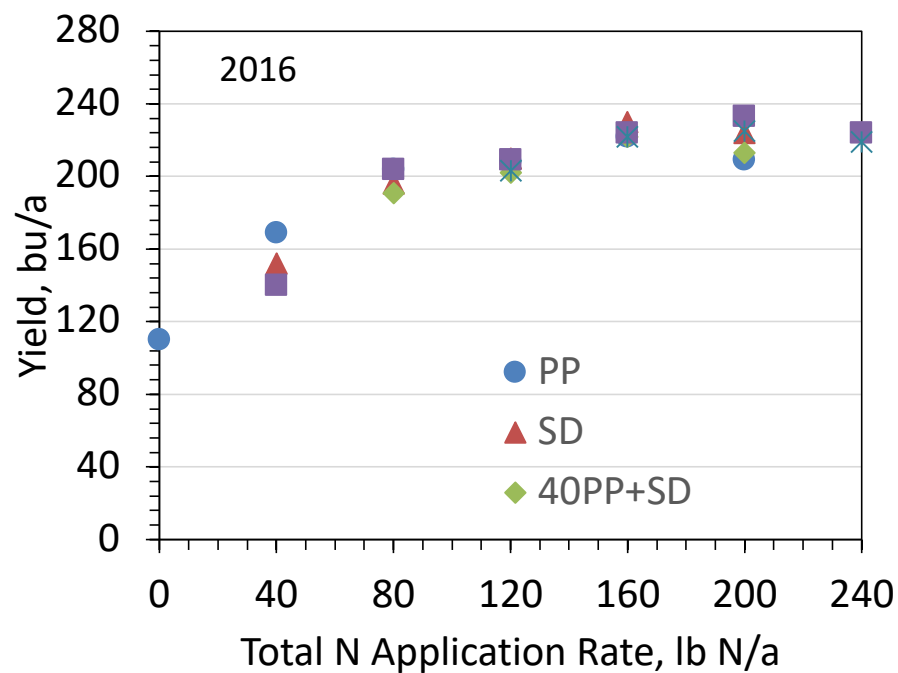
N Sources

- Preplant: urea broadcast, incorporated
- Sidedress: UAN sub-surface band between rows
- Late: UAN with Agrotain surface band between rows
- **Locations**
 - Lancaster, well drained
 - Marshfield, somewhat poorly drained
- **Previous crop** = corn

Lancaster

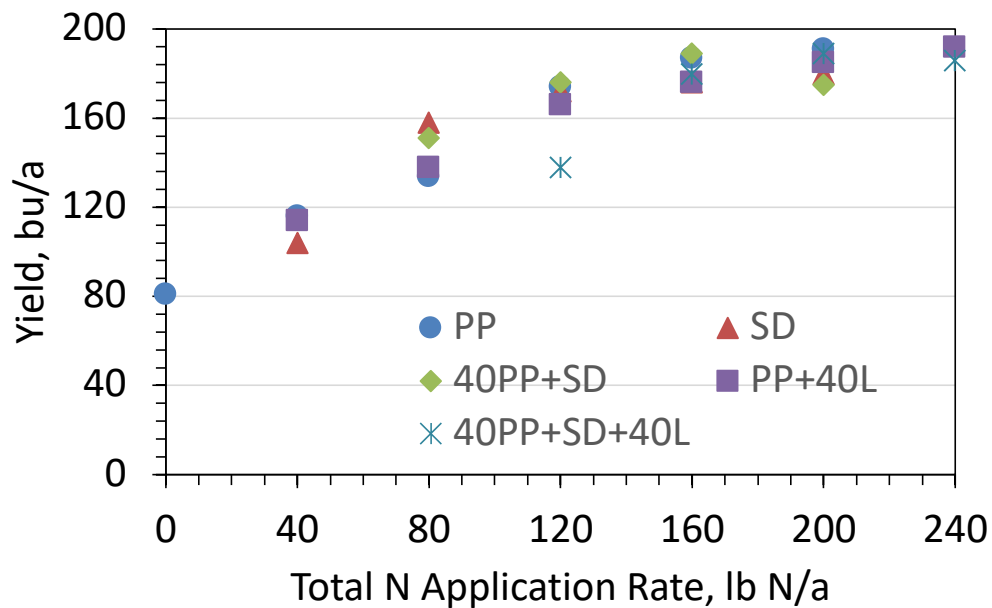


Lancaster



Year	EONR, lb/a	Yield, bu/a	NUE @EONR, Δ bu/lb N	Return to N, \$/a
2014	181	203	0.49	252
2015	116	185	0.73	257
2016	162	219	0.67	325

Marshfield, 2014

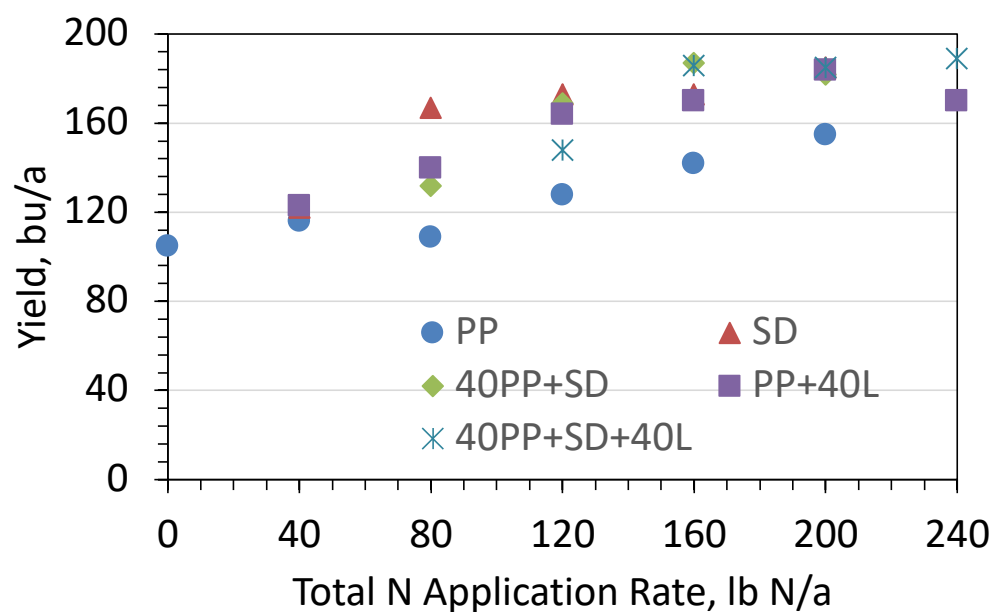


Timing	EONR, lb/a	Yield, bu/a	NUE @EONR, Δ bu/lb N	Return to N, \$/a
All	179	185	0.58	301

- 40PP+SD+40L sig. less yield at 120 lb/a
- Otherwise no yield difference between timings

- wet May-June, dry July, wet Aug

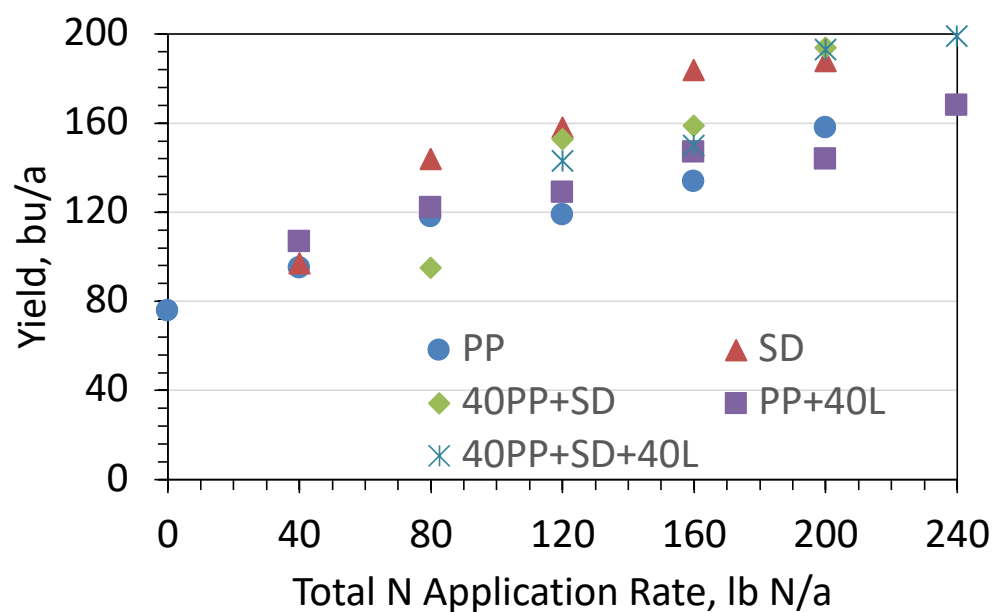
Marshfield, 2015



Timing	EONR, lb/a	Yield, bu/a	NUE @EONR, Δ bu/lb N	Return to N, \$/a
PP	210	151	0.22	88
SD	109	177	0.66	214
40PP+SD	170	184	0.46	217
PP+40L	176	177	0.41	190

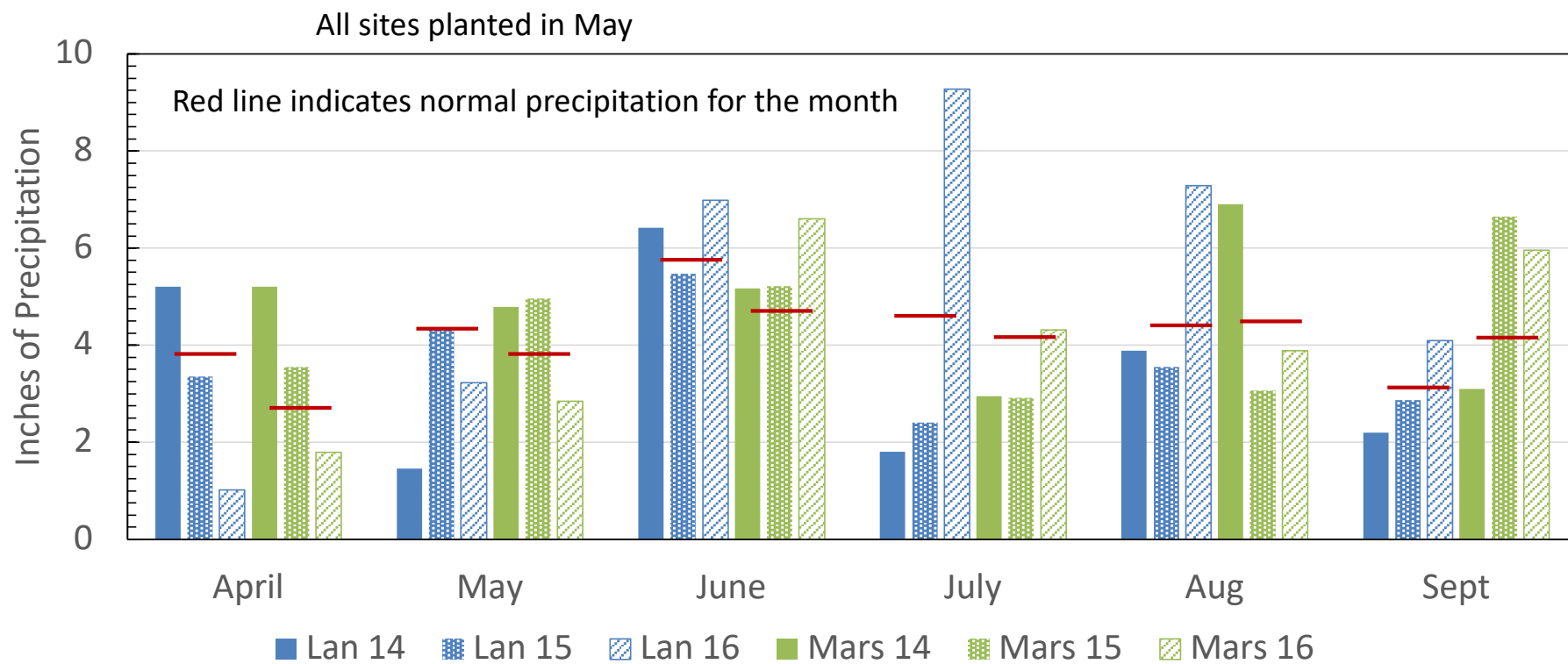
Rescue N applications 1 wk before VT were effective if recouping yield loss.

Marshfield, 2016



Timing	EONR, lb/a	Yield, bu/a	NUE @EONR, Δ bu/lb N	Return to N, \$/a
PP	≥ 210	≥ 154	0.37	200
SD	≥ 210	≥ 191	0.55	329
40PP+SD	≥ 210	≥ 189	0.54	322
PP+40L	≥ 250	≥ 168	0.37	235

Monthly Rainfall



Conclusions

- Waiting to apply N until 1 week before VT may cause yield loss
- On well drained soils, in-season N application,
 - Do not necessarily produce more yield
 - Are not always more profitable
- On somewhat poorly drained soils,
 - PP resulted in significant yield reductions
 - SD greatest profitability
 - Rescue N application 1 week before VT can recoup yield loss
 - How much yield can be regained will vary based on weather/site conditions

Thank You!



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