Appendix A. NNY 2011-2013 Trial Results

Table 1. Successfully completed NNY trials.

NNY 2011-2013				Sidedress N (lb N/ac)				Yields (bu/ac or T/ac)						
Trial ID	Year	Extension/ Consultant Collab. Name	Grower or Farm Name	Adapt-N	Grower	Other N	N diff. A-G	Adapt-N	Grower	Other	Yield units	P*	Profit diff. $/ac (A-G)	Notes
1	2013	Peg Cook, Joe Lawrence	Bernie Gohlert	NA	50	0	NA	NA	72.5	56.5	bu/ac	0.005	NA (no A-rate in place)	Applicator unable to apply recommended 30 lb N/ac rate. Adapt-N successfully identified that more N was needed, recommended amount likely would have been enough. Given a yield increase of 16bu/ac, it is unlikely that 50 lb/ac were needed. Note low yield due to early harvest of silage variety. Other stresses present.
5	2013	Mike Davis	Willsboro (D1)	129	110	NA	19	14.8	14.3		T/ac	0.18	$14.28	Variable rate N by plot, Adapt-N rate is average
6	2013	Mike Davis	Willsboro (D5)	107	110	NA	-3	15.2	16.3		T/ac	0.32	NA (no diff between N treatments)	N rate difference of 3lb negligible. Variable rate N by plot, Adapt-N rate is average
14	2012	Eric Bever, Heather Robinson	Bruce Dimock	45	35	NA	10	15.8	16.7		T/ac	0.6	-$50.00	Field variability is primary determinant of the apparent non-statistically significant yield loss with 10lb/ac N rate increase
15	2012	Bever, Robinson	Ed Carter	80	69	NA	11	11.3	12.2		T/ac	0.41	-$50.95	Field variability is primary determinant of the apparent non-statistically significant yield loss with 11lb/ac N rate increase
16	2012	Eric Young	Eric Young	0	50	NA	-50	21.9	21.5		T/ac	na	$53.00	
17	2012	Mike Davis	Willsboro (D1)	81	110	NA	-29	17.9	18.7		T/ac	0.37	-$28.96	Variable rate N by plot, Adapt-N rate is average. Weather data changed after late season error correction, and A rate increased.
18	2012	Mike Davis	Willsboro (D5)	88	110	NA	-22	20.6	21.3		T/ac	0.35	-$25.25	Variable rate N by plot, Adapt-N rate is average. Weather data changed after late season error correction, and A rate increased.
35	2012	Cook, Lawrence	Bernie Gohlert	0	50	NA	-50	12.2	12.0		T/ac	0.87	$43.00	
7	2011	Eric Young	Miner Institute	0	50	25	-50	11.5	12.0	11.9	T/ac	0.26	$9.00	
21	2011	Bever, Robinson, Deming	Bruce Dimock	45	88	NA	-43	15.3	15.7		T/ac	0.41	$1.17	
25	2011	Mike Davis	Willsboro (D1)	91	125	NA	-34	10.3	9.2		T/ac	0.08	$71.90	Variable rate N by plot, Adapt-N rate is average
26	2011	Mike Davis	Willsboro (D5)	104	125	NA	-21	16.5	15.6		T/ac	0.17	$58.33	Variable rate N by plot, Adapt-N rate is average

*p = statistical significance of the yield comparison between Adapt-N and Grower-N.

Table 2. Summary of NNY trial results.

Overall Adapt-N Performance 2011-2013, NNY

Treatment comparison (Adapt-N) – (Grower-N)	NNY Trials with treatment differences > 15lb N/ac	All NNY Trials*
	(n=9)	(n=11)
N fertilizer input (lb/ac)	-37	-24
Yield (T/ac)	0	-0.1
Profit ($ ac^{-1})	+$23	+$9
Trials with greater profit	78%	64%

* Includes trials in which the treatment difference was less 3, 10, and 11lb/ac, and apparent but non-statistically significant yield losses could only be explained by field variability, thus these were not deemed useful for this analysis.

Table 3. Concentrations in leachate by treatment

Treatments		Average NO3 and NO2 (mg/L) in leachate by sampling date					
		9/30/2011	10/4/2011	10/17/2011	5/11/2012	Average after 2011 season	After 2012 growing season 5/23 or 5/28/2013*
Sandy	***Adapt-N***	5.68	7.48	5.62	14.84	8.41	18.1
	Grower-N	7.15	10.4	7.45	17.61	10.65	23.35
	p	*0.28*	*0.14*	*0.29*	*0.49*	*0.15*	*0.15*
Clayey	***Adapt-N***	1.36	1.48	1.28	2.33	1.61	6.98
	Grower-N	2.16	2.22	1.5	2.64	2.13	7
	p	*0.02*	*0.02*	*0.45*	*0.48*	*0.008*	*0.99*

Appendix B. Overall Adapt-N performance

Overall Adapt-N Performance 2011-2012, IA and NY

Treatment comparison (Adapt-N) – (Grower-N)	Iowa	New York	Grand Mean

Table 4. Overall performance of Adapt-N was evaluated across 84 trials in New York (n=56) and Iowa (n=28) during the 2011-2012 growing seasons. A paired t-test (A-G) to test the hypothesis that N rate applied and Yield do not differ showed that Marginal profits were on the average $27/ac higher ($p < 0.0001$) and N inputs 54 lb/ac lower ($p < 0.0001$) when Adapt-N was used, with higher profits and N savings in New York than in Iowa. Adapt-N reduced N applications in over 90% of trials, and increased grower profits in 79% of trials. With the updated 2012 version of the tool, and optimal use (such as basing expected yields on past years of yield history by management unit), grower profits would likely have increased in about 88% of trials.

Preliminary 2013 Results – New York

Treatment comparison (Adapt-N) – (Grower-N)			
Trial	Δ Applied N (lb/ac)	Δ Yield (bu/ac)	Δ Profit Gain ($/ac)
5	19	4	$14
9	40	30	$132

(82%) 90% of trials increased profits

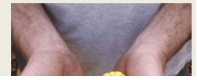

Table 5. Preliminary results for 2013 NY trials show that with increased spring rainfall, higher N rates were necessary to maintain yields. These results suggest that in a wet year Adapt-N will increase N application rates over grower practice where needed (24 bu/ac yield gain with 28 lb N/ac in increased N application). Grower profits increased in 90% of cases, by an average of $106/ac (if not counting one non-replicated volunteer trial with multiple problems; #26 in green). Photo of corn ears is from a trial in Western NY where Adapt-N called for additional N, and yield increases resulted. Trials from other states indicate clearly that the model needs improvements in modeling field drainage problems, particularly where perched water tables may form. Additional data are being compiled and analyzed over the coming months, and results will continue to inform model adjustments as needed.