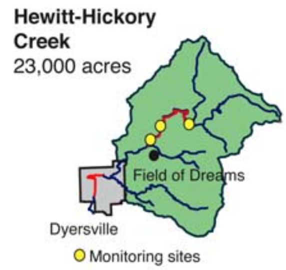
Hewitt Creek Watershed Project – Final Report



Hewitt Creek Watershed project accomplishments include improved macro-invertebrate and fish populations, widespread watershed resident participation and development of a watershed community, and significant reductions in sediment and nutrient delivery.

All project cooperators responding to a survey summarized by Iowa State University Sociologists responded that computer modeling indexes of agricultural and environmental performance are a conservation systems approach to improving water quality. Ninety-four percent of survey respondents said the performance index program encourages production and environmental management changes and 100 percent said the program has had a positive effect on the environment. All survey respondents said the performance program made their farming operations more profitable. Increased watershed and stream quality awareness prompted 56 of 84 farm operators and owners to become project participants and recipients of financial performance incentives. Peer pressure that led to second and third-year new enrollments also impacted those who chose not to enroll in the project.

Environmental Accountability

Dr. Rick Klann, Biology Department, Upper Iowa University, was contracted to evaluate water quality at three stream sites during base flow and following snow melt and significant rainfall events. May and September macro-invertebrate evaluations were conducted each year at three monitoring sites. Variability in chemical analyses, nutrient concentrations and turbidity were often due to changes in stream flow resulting from rain events. The general trend was improved nutrient and suspended solids analyses and improved late summer dissolved oxygen levels likely a result of less nutrients, stream erosion and organic matter decomposition in the stream. The improved dissolved oxygen condition was identified by Dr. Klann as the major contributor to the recolonization of and improved diversity and quantity of macro-invertebrates. Watershed residents and project leaders observed children and families once again fishing in Hewitt Creek and increased populations of aquatic life and birds. IDNR fishery staff observed an improved diversity and quantity of fish during an assessment that was part of a project field day demonstration. To evaluate long-term project performance outcomes, Farm Bureau left $3,474 of unused monitoring and incentive resources to be used for post-project benthic macroinvertebrate and water monitoring by Upper Iowa University.

A key to project success was 67 percent participation (project goal 60%) of watershed farm operators and/or landowners listed here:

Don Besler	Ken Bockenstedt	Mike Bockenstedt	Dale Boge	Jim Boge
Gary Burkle	Jim & Jay Daly	Tim & Matt Daly	Allen Demmer	John Demmer
Merlin Demmer	Bob Donovan	Jack Friedman	Richard Funke	Craig Gaul
Judy A. Gaul	Mark Gaul	Pat Haggerty	Doug Hoefler	Steve Hoeger
Don Kass	Jack Klostermann	Ambrose & Gerald Klosterman		Joe & Neal Kluesner
Robert Kluesner	Todd Kluesner	Mike Knipper	John A. Kramer	Wayne Kramer
Dave Kronlage	Gary Kruse	Henry A. Kruse Jr.	Ron L. Kruse	Dale Langel
Shirley Nadermann	Richard Ostwinkle	Jeff Pape	Oran Pape	John Rahe
Craig Recker	David Recker	Dale Ries	John Rubly	John W. Smith
Jason Steffensmeier	Wilfred Steffensmeier	Jerome Tauke	Larry Thier	John Vondehaar
Wayne Vorwald	Al Wente	Neil Wente	Ralph Wente	Gary Wessels
Laverne Wilwert				

Monthly meetings held during the winter and summer regularly included 12 to 25 watershed residents and project cooperators. The regular agenda included reviewing the most recent water monitoring data, evaluating project progress, and fine-tuning the project to improve the watershed and water quality. Over the three years an ownership of the impairment issues, development of remediation efforts and celebration of project successes resulted in leadership development and a very large commitment of watershed residents' time and effort. This development of "watershed community" is a major project outcome that will provide project sustainability. Neighbor-to-neighbor exchange of information was identified in the pre-project survey as the most important source of resident information and was very evident and useful to attain participation and dissemination of information. The cooperator in-kind contribution to the project is estimated at $80,937 or 21% of project total cost.

The Hewitt Creek project goal was to improve management resulting in water quality improvements that would discontinue regulatory (IDNR) water impairment finger-pointing. Knowing most if not all residents contribute contaminants, a project priority was an inclusive program that welcomed new farmers and low-resource farm operators. A confidential gathering of computer modeling index data from 47 farms provided the environmental performance status of 396 fields and 9,893 acres. Twenty-one fields on 16 farms had a high risk of phosphorus (P-index > 5) delivery to nearby water resources. Eleven farms with field-average weighted indexes over 3 did not receive performance incentives per contracts adopted by the watershed council-determined performance program. Bonus incentives were established for management changes resulting in improved science-based computer modeling indexes. All fields and farms received performance scores, providing a challenge to add a cost share practice or change one or more management actions to improve index scores. The changes were recognized with small whole-farm performance incentives and not based on acres. Cooperators determined management changes based on behavior learned and implemented made their operation more profitable, thus not requiring large acre-based payments.

High environmental risk fields with P-index scores greater than 5 received the most attention by cooperators resulting in 39% improvement in P-index scores. All three-year cooperators improved their P indexes by 14% and two-year cooperators 13%. The Soil Conditioning Index, SCI (trend in soil organic matter management) on the 16 high risk of P loss fields improved by 91% compared to 10% improvement on all fields operated by the three-year cooperators. Fields with significant slopes and near streams have the greatest risk of sediment and nutrient delivery. The performance indexes identified the level of potential contaminant delivery and the numerical value provided a target for progressive improvement in environmental performance. WIRB and Farm Bureau incentivized project activities that followed the 2005 Farm Bureau initiated funding included for 2006 through 2008:

Activity	Farms	Acres	Activity	Farms
P-index and SCI	47	9,893	Feedlot improvement	13
Cornstalk nitrate	36	8,537	Farmstead assessment	13
Waterways	32	131	Cover crops	13
Grid sampling	25	2,787	Stream fencing	4
Manure testing	15	4,931	Managed grazing	3

The most effective project activity was cornstalk nitrate sampling that encouraged cooperators to conduct their own on-farm strip trials of manure and/or nitrogen rates. Some cooperators developed replicated trials, however most used two to four strip trial variables resulting in information that was shared at winter cooperator meetings. Coupled with the indexes and phosphorus soil sampling, refined manure distribution and nutrient credits reduced commercial nitrogen use often by 25 pounds per acre and over 100 pounds per acre on several fields. Manure bartering between cooperators with livestock and those without occurred between cooperator farms. The average reduction in N application was 44 pounds per acre, a 22% reduction, reducing potential N loss to Hewitt Creek and if extended to all watershed corn acres an estimated savings of 220 tons of nitrogen valued at nearly $240,000 annually. The residual nitrate reduction measured using the cornstalk nitrate nitrogen analyses was 2,498 ppm, a decline of 51%.

The cornstalk nitrate program included approximately 30 cooperators per year sampling 80 nitrogen management treatments at a cost of less than $40.00 per sample. Nearly half of the cooperators received N performance rewards totaling $5,600 in 2007, bringing the total cost of the 2007 cornstalk nitrate program including sample collection, analyses and postage to $8,270.00. The performance rewards were reduced in 2008 due to expiration of the Farm Bureau grant.

Thirty-two farms (including 2005 pre-WIRB grant cooperators) planted row crop acres to grassed waterways, targeting over 0.06% of the 19,181 acres of cropland. Larger waterway projects were often cost-shared using NRCS technical assistance while waterway “finger” extensions were added using Hewitt Creek project incentives. The P-index and SCI project incentives encouraged cooperators to reduce tillage passes, add cover crops, contour plant and no-till plant to reduce soil erosion and extend waterway life.

The performance indexes effectively gather many contributing factors of soil and phosphorus management into a single value for each field. The various factors for each field that project cooperators added during the 2006 to 2008 years of the WIRB project were also evaluated using the Sediment Delivery Calculator to estimate cumulative loading reductions of 4,033 tons of sediment per year and 5,054 pounds of phosphorus per year. Incentives of $26.95/ton of soil and $20.96/lb of phosphorus not delivered were paid for P-index, SCI, grid sampling, manure management, cover crops and waterways or headlands. This compares favorably with project structures installed at costs typically exceeding $80.00 per ton of sediment loss reduction.

Program Accountability

Project impact was presented at field days; by watershed leaders through Farm Bureau statewide TV public service advertising; local, regional and state print media feature articles; presentation at a Senator Harkin Farm Bill listening session; an Iowa Senate Agriculture and Natural Resources Committee presentation at the State Legislature; a presentation to the Minnesota Governor and Legislature-appointed Clean Water Council Civic Engagement subcommittee; and several county, regional, state and national education meetings and environmental management conferences. As a result of the Minnesota presentation a proposal will be made to fund 10 performance watersheds like the Iowa model. Kansas has used the Hewitt Creek model for watershed programs in their TMDL management. The need to involve and challenge watershed residents to take ownership of their watershed improvement issues and ownership of the solutions are attractive project features recognized by water quality leaders in Minnesota, Kansas, Missouri and Nebraska. This ownership provides sustainable results in an efficient cost-effective program by engaging pro-active local leadership rather than costly one-on-one contacts made by watershed project employees.

Financial Accountability

Summary: Watershed Improvement Funds

Grant Agreement Budget Line Item	Total Funds Available ($)	Total Funds Expended ($)	Available Funds ($)
Personnel – Contracted with ISU	27,969	27,969.00	0
Information/Education (Incentives)	120,000	119,764.50	235.50
Contractual – monitoring (UIU)	5,700	5,400	300
Supplies	3,750	3,730.95	19.05
Travel	1,875	1,875.00	0
Totals	159,294	158,739.45	554.55
Difference		554.55	

Summary: Total Project Funding

Funding Source	Cash		In-Kind Contributions		Total	
	Approved Application Budget ($)	Actual ($)	Approved Application Budget ($)	Actual ($)	Approved Application Budget ($)	Actual ($)
WIRB	159,294	158,739	0	0	159,294	158,739[1]
Farm Bureau	60,000	56,827	0	0	60,000	56,827
ISU	50,460	50,460	0	0	50,460	50,460
Dubuque Co.			4,500	2,700	4,500	2,700[2]
Upper Iowa U.			5,400	7,200	5,400	7,200[3]
ICGA			310	325	310	325
Participants		23,113	47,625	80,937	47,625	104,050[4]
Totals	269,754	289,139	57,835	91,162	327,589	380,301

Watershed Improvement Fund contribution:	Approved application budget:	49%
	Actual	42%

Explain differences between the approved application budget and the actual amounts contributed by the various funding sources.

1. In March of 2006 it appeared the number of new enrollees and activities if completed as contracted by project cooperators would exceed the WIRB and Farm Bureau incentive budget. The watershed council decision was to continue new enrollment because broader participation is beneficial to remediate nonpoint source contaminant issues. The watershed council decided the year-end payment would be 55% of the contracted amount for the Soil Conditioning Index. Only one of 37 cooperators was disgruntled to the point of dropping out of the program in 2007.
2. Watershed meetings were held in New Vienna for less room rental than anticipated. The project benefited from Extension service news releases and coverage in regular news columns of Dubuque County Extension.
3. The cost of travel and water analyses increased during the project and the number of rain event samplings were slightly greater than anticipated, all covered by generous support of Upper Iowa University staff.
4. Project participation goal of 60% was exceeded (67%), the number of nutrient and tillage strip trials, waterways completed and participation at watershed council meetings was greater than pre-project plans resulting in a robust, effective project.

Case Studies – Hewitt Creek Watershed

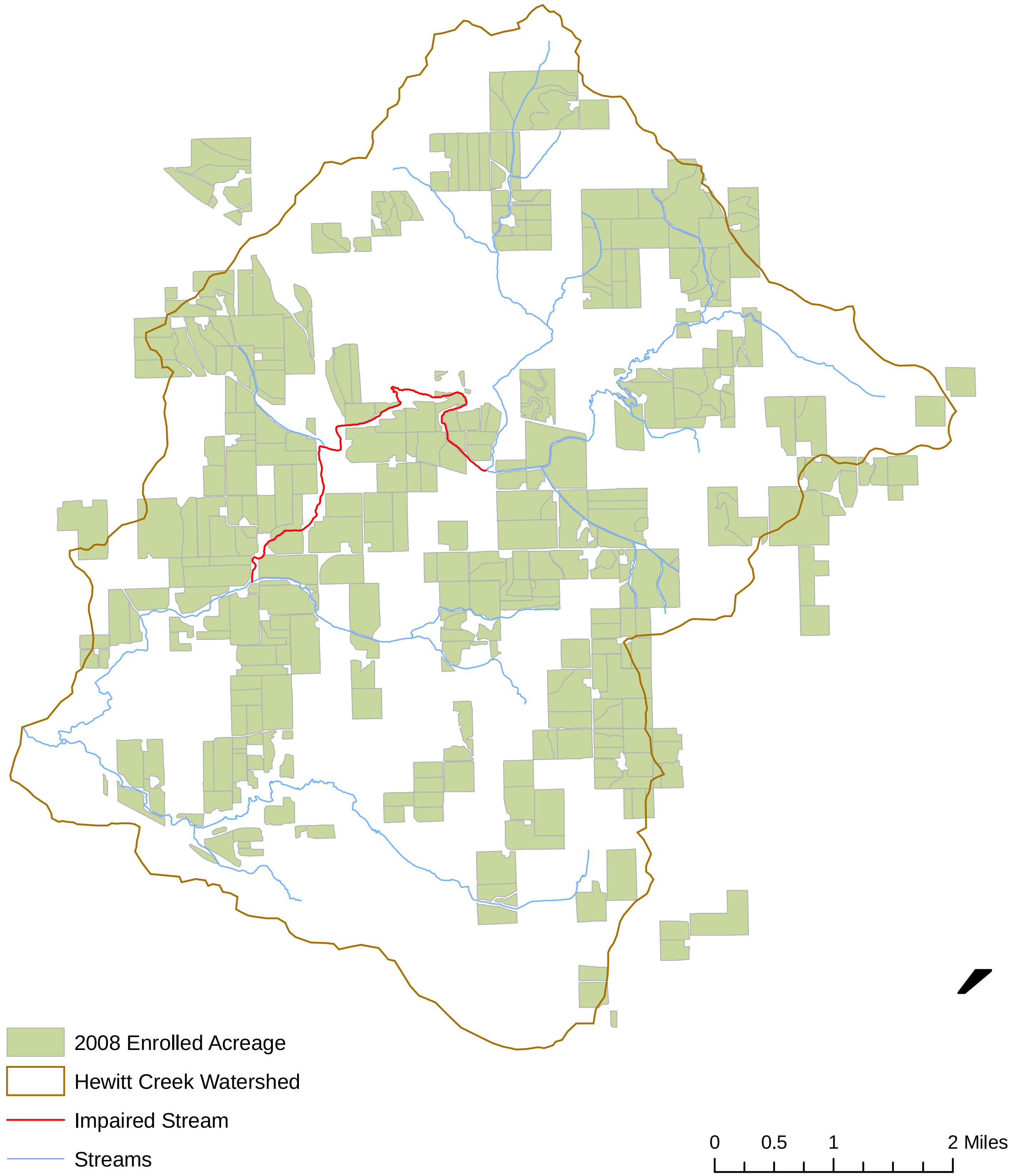
1. A low-resource cooperator with a dairy herd and cropland on very-highly-erodible soils had visited with county USDA staff on multiple occasions to obtain cost-share for feedlot runoff issues. He could not afford the cost-share required for the proposed "Cadillac" feedlot manure control structure that was designed, therefore he continued to deliver substantial contaminants to Hickory Creek, a short distance below the farmstead. He did some fencing to exclude his cattle from the stream. As one of the first watershed project cooperators he constructed an earthen berm below the feedlot to direct runoff to a grass filter and further improved the stream fencing. He had a high risk of phosphorus delivery from field application of dairy manure resulting in a baseline farm field-weighted average P-index of 3.74 and a Soil Conditioning Index (SCI) score of 0.44. To improve his soil and nutrient loss potential he received project incentives to complete a tillage trial that demonstrated the reduction of nutrient and soil losses while maintaining yield performance. He extended perennial rotations on critical fields, added waterways and now uses no-till on most of his fields. His improved P-index is 2.48 and the SCI has improved to 0.63. Annual sediment delivery reduction from 112 cropland acres in 2007 was 126T and phosphorus reduction was 163.8 pounds and in 2008 an additional reduction of 82T of sediment and 106.6 pounds of phosphorus.

2. The most problematic contaminant delivery farm located a distance from Hewitt Creek was a grower with swine confinement manure, planting rows up and down slope following extensive tillage. His 2006 project-high P-index was 6.80 and a project-low SCI of 0.12. He received no incentive for P-index and was among a group of 25% of the project cooperators who had P-index weighted farm averages over 3.0. He received a project low incentive of $120 for revealing his records and cooperating to obtain his SCI performance score. While continuing to lack high level management skills he recorded in 2008 a P-index score of 5.21 and a SCI score of 0.29 by adding waterways and improving manure and tillage management.

3. Some cooperators wait to see how the performance program works before enrolling. This cooperator entered the program late in 2006 by participating in the cornstalk nitrate test. His samples averaged 2,295 ppm residual nitrate. He did volunteer his tillage and nutrient records for performance index computer modeling late in 2006. His swine finishing operation and aggressive tillage to mix manure into the soil resulted in a baseline P-index of 6.24 and a project-low SCI of -0.13 (tillage practices reducing soil organic matter). He reduced his tillage passes including multiple passes with a disc thereby reducing soil carbon loss and leaving more residue to reduce erosion. His 2008 P-index was 3.75 and SCI was 0.39. His Sediment Delivery Reduction on the 142-acre farm was 39T of sediment and 50.7 pounds of phosphorus in 2007 and additional improvement in tillage management in 2008 reduced annual sediment loss by 126T and phosphorus loss by 163.8 pounds.

4. An early project cooperator with significant dairy manure resources accepted the challenge to not apply commercial nitrogen to an alfalfa field that had manure applied at modest rates as determined by project staff assisting with manure spreader calibration and manure testing. The corn yield from the field was the highest in the local ag-coop annual yield contest resulting in considerable community discussion of a high yield with no commercial nitrogen application. This grower had been using 125 pounds of commercial N on corn following alfalfa.

Hewitt Creek Watershed
Land Impacted by Project Activities



Hewitt Creek Sediment Delivery Reductions 2008

ID	Name	Field ID	Practice	SDR	Total SDR	PR	Total PR	Pre SL	Av Pre SL	Post SL	Av Pos SL	Acres	Total A
2	Jack Friedman	B4	NT-tillage	7	**7**	9.1	**9.1**	4.2	**4.2**	3.9	**3.9**	79.1	**79.1**
3	Mike Knipper	6Ha	rotation-tillage	1		1.3		2.0		1.7		8.1	
		2H	rotation-tillage	12	**13**	15.6	**16.9**	5.0	**3.5**	3.1	**2.4**	13.7	**21.8**
5	Tim Daly	1	NT-tillage	8		10.4		4.7		4.0		39.9	
		4	tillage	6		7.8		5.3		4.8		39.2	
		6	NT-tillage	0		0		5.3		5.2		18.1	
		11	tillage	1		1.3		4.5		4.4		55.0	
		14	tillage	3	**18**	3.9	**23.4**	4.1	**4.8**	3.9	**4.5**	52.6	**204.8**
6	Craig Recker	B3	waterway	157		204.1		4.6		4.6		210.0	
		B3a	buffer	60		78		4.6		4.6		22.0	
		B3b	buffer	46		59.8		4.6		4.6		15.0	
		B4	buffer	62	**325**	80.6	**422.5**	7.8	**5.4**	7.8	**5.4**	14.0	**261**
7	John Rahe	5LF	rotation-tillage	7		9.1		3.0		2.5		25.7	
		7Ae	rotation-tillage	3		3.9		5.5		4.9		13.3	
		7As	rotation-tillage	6		7.8		5.5		4.9		21.8	
		3AKS	rotation-tillage	1		1.3		1.4		1.2		10.5	
		6LF	rotation-tillage	2		2.6		5.9		5.5		12.3	
		3AKM	rotation-tillage	1	**20**	1.3	**26**	1.4	**3.8**	1.2	**3.4**	13.4	**97**
8	Steve Hoeger	H4	contour	33		42.9		3.3		1.8		42.7	
		H6	rotation-tillage	15	**48**	19.5	**62.4**	4.5	**3.9**	3.3	**2.6**	21.2	**63.9**
9	Don Kass	13	waterway	15	**15**	19.5	**19.5**	4.2	**4.2**	4.2	**4.2**	6.0	**6**
11	Gary Wessels	N1	NT-tillage	1		1.3		2.6		2.4		20.3	
		N2	NT-tillage	4		5.2		5.1		4.6		27.3	
		N3	NT-tillage	11		14.3		7.8		5.8		18.9	
		N4	NT-tillage	4		5.2		8.3		7.6		20.5	
		S3	NT-tillage	1	**21**	1.3	**27.3**	6.6	**6.1**	6.5	**5.4**	23.2	**110.2**
12	Don Besler	2	NT-tillage	23		29.9		7.1		5.0		36.6	
		4	NT-tillage	13		16.9		7.1		5.0		18.4	
		1	NT-tillage	23		29.9		7.1		5.0		36.0	
		3	NT-tillage	9		11.7		7.1		5.0		12.8	
		4	waterway	28	**96**	36.4	**124.8**	7.1	**7.1**	7.1	**5.4**	6.0	**109.8**
15	Dale Langel	1	NT-tillage	47		61.1		6.1		2.0		16.9	
		2B	NT-tillage	35		45.5		5.8		1.6		12.2	
		4	NT-tillage	0	**82**	0	**106.6**	0.4	**4.1**	0.1	**1.2**	2.2	**31.3**
17	Mike Bockenstedt	S	buffer	18	**18**	23.4	**23.4**	1.0	**1**	1.0	**1**	36.0	**36**
25	Ron Kruse	1	tillage	11		14.3		3.7		2.0		13.9	
		2	tillage	7		9.1		3.7		2.0		8.2	
		3	tillage	29		37.7		7.5		4.2		18.4	
		4	tillage	69		89.7		7.5		4.2		48.7	
		5	tillage	8		10.4		4.4		4.0		36.7	
		6	tillage	2	**126**	2.6	**163.8**	4.4	**5.2**	4.2	**3.4**	16.0	**141.9**
28	Oran Pape	Bo1	NT-tillage	12		15.6		2.2		1.1		35.0	
		Bo2	NT-tillage	1		1.3		4.4		2.9		48.6	
		E3	Pasture	8		10.4		3.1		1.1		11.8	
		E4	NT-tillage	17		22.1		1.9		1.3		59.6	
		W2	Covercrop	31	**69**	40.3	**89.7**	5.9	**3.5**	2.9	**1.9**	29.1	**184.1**
29	Doug Hoefler	H1	tillage	5		6.5		5.2		3.8		11.0	
		H1	waterway	22		28.6		6.2		6.3		6.9	
		H2	waterway	24	**51**	31.2	**66.3**	3.8	**5.1**	3.8	**4.6**	17.6	**35.5**
30	J & J Daly	S1	Covercrop	6	**6**	7.8	**7.8**	7.1	**7.1**	6.3	**6.3**	12.0	**12**
32	Ralph Wente	3S	NT-tillage	54		70.2		6.7		0.8		25.0	
		2	NT-tillage	95	**149**	123.5	**193.7**	3.7	**5.2**	0.4	**0.6**	39.1	**64.1**
33	Neil Wente	B1	tillage	10		13		1.5		0.2		12.7	
		B2	tillage	5	**15**	6.5	**19.5**	3.8	**2.7**	3.3	**1.7**	17.6	**30.3**
40	Todd Kluesner	N	waterway	20		26		1.6		1.6		57.0	
		S	buffer	44	**64**	57.2	**83.2**	1.7	**1.7**	1.7	**1.7**	19.0	**76**
43	Joe Kluesner	1	tillage	19	**19**	24.7	**24.7**	11.0	**11**	9.4	**9.4**	32.4	**32.4**
44	Merlin Demmer	K2	NT-tillage	41		53.3		6.5		0.8		18.4	
		K3	NT-tillage	37	**78**	48.1	**101.4**	16.0	**11.3**	3.2	**2.0**	7.9	**26.3**
45	Al Demmer	K1	NT-tillage	33		42.9		3.8		0.4		35.4	
		K2	tillage	6		7.8		4.0		2.8		17.0	
		K3	tillage	12		15.6		3.8		2.7		41.2	
		V1	NT-tillage	26		33.8		11.0		9.0		20.8	
		V2	NT-tillage	25		32.5		7.7		6.4		35.9	
		V3	NT-tillage	24	**126**	31.2	**163.8**	11.0	**6.9**	9.0	**5.1**	22.9	**173.2**
				TOTAL	**1366**		**1775.8**		**5.1**		**3.6**		**1797**

Hewitt Creek Watershed

Phosphorus Index Listing - 2008

Farm ID	Field ID	Acres	P Index	SCI	Soiltest P	Stream Dis	Rotation	Contour	Notill
9	11	4.4	8.88	0.82	535	200	CCOHH	N	
19	H6	10.0	8.84	0.14	248	3230	CCCOMMM	N	
9	12	7.9	8.39	0.54	311	320	CCOHH	Y	
41	4A	20.3	7.20	-0.04	145	800	CC	Y	
44	H-2	36.5	6.45	0.00	125	940	CS	Y	
9	10	1.1	6.36	0.72	224	630	CCOHH	N	
48	middle	43.4	6.34	-0.04	105	1290	CCCOAA	N	
45	V-1	20.8	5.99	-0.06	23	260	CS	Y	
9	13	13.8	5.92	0.54	201	440	CCOHH	Y	
13	1	38.3	5.90	0.30	105	330	CC	N	
31	5	6.6	5.84	0.56	148	480	CCOMMM	Y	
41	4B	9.5	5.82	0.42	145	185	CC	Y	
26	2	8.8	5.55	0.14	46	380	CCCOHHH	Y	
26	8	5.8	5.42	0.49	45	280	CCCOHHH	N	
30	N4	20.7	5.26	0.06	22	220	CS	Y	
23	H-east	67.6	5.14	0.43	277	1550	CC	N	
48	south	39.9	5.09	0.10	78	1180	CCCOAA	N	
35	W4	12.4	5.09	0.23	58	670	CCCOHHH	Y	
13	2	117.0	4.99	0.29	145	1090	CC	N	
26	7	8.4	4.96	0.35	58	990	CCCOHHH	N	
6	R3	19.9	4.92	0.49	99	600	CCCOHHH	Y	
28	W2	28.9	4.91	0.32	62	900	CCCOHHH	N	
34	3	4.6	4.86	0.62	204	400	CCCOAAA	Y	
44	H-10	10.6	4.82	0.49	133	340	CS	N	
15	6	3.2	4.63	0.42	50	430	CCOHHH	Y	
15	7	2.6	4.62	0.42	90	1420	CCOHHH	Y	
6	R5	14.0	4.58	0.29	59	1110	CCCOHHH	N	
43	1	32.4	4.53	0.00	32	1080	CC	Y	
26	4	17.0	4.53	0.20	42	1770	CCCOHHH	N	
44	H-6	21.3	4.52	0.00	56	760	CS	Y	
29	H2	15.8	4.49	0.45	54	800	CCOHHHH	N	
18	4A	13.5	4.48	0.50	39	150	CCOHHH	N	
25	3	18.3	4.38	0.34	107	1360	CCB	N	
31	4	19.4	4.36	0.56	92	330	CCOMMM	Y	
37	2	20.4	4.30	0.51	99	1530	CCCOHHH	N	
19	H4	28.9	4.29	0.55	219	4740	CCCOMMM	N	
44	H-8	20.1	4.24	0.21	80	1930	CCS	N	
18	5A1	11.1	4.23	0.36	56	610	CCOHHH	N	
48	north	32.9	4.23	0.44	126	1220	CCCOAA	N	
35	W2	18.4	4.22	0.35	23	340	CCCOHHH	Y	
30	S1	12.0	4.20	0.03	20	340	CS	Y	
11	S1	16.2	4.20	0.19	86	1200	CCS	Y	
41	1-2	50.0	4.19	-0.04	49	450	CC	Y	
26	1	9.8	4.18	0.72	111	325	CCCOHHH	N	
6	R2	16.8	4.16	0.49	115	990	CCCOHHH	Y	
11	N4	20.5	4.14	0.11	82	3780	CCS	N	
24	5	15.9	4.13	-0.07	102	5200	CCS	Y	
25	2	8.2	4.13	0.57	119	560	CCB	N	
9	17	3.0	4.09	0.82	245	220	CCOHH	N	
25	5	37.0	4.00	0.38	65	610	CCB	N	
12	2	36.6	3.96	0.31	126	2120	CS	Y	
44	H-4/5	37.1	3.95	0.00	40	1150	CS	Y	
28	E2	4.6	3.94	0.52	143	1550	CCCOHHH	N	
26	6	20.6	3.87	0.49	41	760	CCCOHHH	Y	
24	2	18.0	3.86	-0.07	68	3010	CCS	Y	
11	S2	19.9	3.86	0.19	70	1820	CCS	Y	
8	JM1	13.2	3.86	0.61	153	600	CCCOHHH	Y	
2	south	20.8	3.85	0.08	27	370	CS	Y	Y
6	B4	11.4	3.84	-0.02	73	740	CC	Y	
11	S3	23.2	3.84	0.17	82	600	CCS	Y	
6	R6	13.4	3.84	0.66	94	810	CCCOHHH	N	
23	H-west	42.7	3.83	0.67	165	990	CC	N	
8	JM6	48.8	3.82	0.08	34	720	CC	Y	
38	F-m	16.3	3.80	-0.07	17	1440	CS	Y	
7	3-Akn	12.8	3.78	0.22	85	2160	CCS	N	
26	3	16.7	3.78	0.42	65	1100	CCCOHHH	N	
18	6A	5.8	3.77	0.53	66	290	CCOHHH	N	
19	H2	8.4	3.77	0.57	204	4915	CCCOMMM	N	
8	H5	6.5	3.76	0.43	51	1130	CC	Y	
33	b2	21.1	3.76	0.44	121	570	CS	Y	
41	5-7	59.1	3.74	-0.04	39	580	CC	Y	

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Farm ID	Field ID	Acres	P Index	SCI	Soiltest P	Stream Dis	Rotation	Contour	Notill
9	15	11.7	3.73	0.84	207	400	CCOHH	N	
25	6	16.0	3.71	0.34	83	420	CCB	N	
48	east	33.3	3.71	0.56	151	700	CCCOAA	Y	
15	8A	17.0	3.70	0.44	74	700	CS	N	
37	3	20.2	3.67	0.51	70	1400	CCCOHHH	N	
25	4	48.7	3.66	0.34	93	1010	CCB	N	
7	6-LF	12.3	3.63	0.34	31	620	CCOMMMM	N	
6	R1	35.8	3.63	0.49	78	1290	CCCOHHH	Y	
28	E1	29.0	3.63	0.52	85	1230	CCCOHHH	N	
43	S2	2.8	3.62	-0.02	56	3720	CC	Y	
12	4	18.4	3.61	0.31	93	1075	CS	Y	
19	H7	20.7	3.60	0.55	105	3940	CCCOMMM	N	
5	9	16.9	3.58	0.53	72	515	CCCAAA	Y	
7	4-LFs	11.3	3.57	0.34	45	760	CCOMMMM	Y	
30	N2	17.3	3.56	0.25	12	300	CS	N	
23	80	78.5	3.53	0.49	165	1940	CC	N	
45	V-3	22.9	3.50	-0.06	17	1960	CS	Y	
43	S1	6.9	3.50	-0.02	27	3500	CC	Y	
11	N3	18.8	3.47	0.25	97	3070	CCS	Y	
10	5	14.8	3.46	0.73	169	1130	CCOMMM	N	
29	H3	27.3	3.43	0.24	26	2650	CCOHHHH	N	
3	10H	6.3	3.42	0.56	75	580	CCOHHHH	N	
8	B1	65.1	3.41	0.26	42	650	CCCS	N	
8	JM7	30.3	3.38	0.43	42	560	CCCOHHH	Y	
29	H1	11.4	3.34	0.53	54	2900	CCOHHHH	N	
10	6	18.3	3.34	0.72	118	750	CCOMMM	N	
45	V-2	35.9	3.31	0.20	20	840	CS	Y	
10	1	20.1	3.27	0.80	227	2160	CCOMMM	N	
6	W5	10.1	3.25	0.49	51	880	CCCOHHH	Y	
19	H3	32.0	3.23	0.74	169	6620	CCCOMMM	N	
50	T7	4.3	3.21	0.31	34	250	CS	N	Y
4	H1	101.0	3.21	0.45	104	1990	CCS	Y	Y
32	r1	82.3	3.20	0.13	38	1590	CS	Y	
44	H-3	11.6	3.18	0.52	97	1660	CS	N	
50	T3	19.9	3.15	0.31	34	500	CS	N	Y
31	P	6.8	3.14	0.39	68	850	Pasture	N	Y
5	6	18.1	3.13	0.30	52	1770	CCCCS	Y	
29	P2	18.4	3.09	0.47	11	510	CCOHHHH	Y	
19	H5	22.0	3.09	0.55	109	4130	CCCOMMM	N	
30	N3	11.7	3.08	0.25	17	360	CS	N	
26	5	17.2	3.08	0.42	52	3000	CCCOHHH	N	
28	W1	24.9	3.08	0.52	62	490	CCCOHHH	N	
29	H5	29.2	3.07	0.45	27	1770	CCOHHHH	N	
30	S8	6.8	3.06	0.68	37	190	CCOHH	Y	
10	2	18.1	3.05	0.75	140	2850	CCOMMM	N	
15	9A	8.2	3.02	0.43	93	1030	CS	Y	
19	S2	8.9	3.00	0.55	87	3040	CCCOMMM	N	
12	1	36.0	2.99	0.31	72	3160	CS	Y	
38	F-n	27.4	2.99	0.39	24	620	CC	Y	
8	B2	6.0	2.97	0.24	41	180	CCCS	N	
12	3	12.8	2.97	0.31	66	1430	CS	Y	
29	P3	10.8	2.97	0.39	18	490	CCOHHHH	Y	
9	14	63.6	2.97	0.76	129	600	CCOHH	Y	
44	K-1	25.2	2.96	0.34	41	2000	CCOAAAA	N	
6	W3	10.4	2.95	0.49	28	1230	CCCOHHH	Y	
35	W3	24.7	2.95	0.57	36	410	CCCOHHH	Y	
34	4	5.5	2.93	0.62	97	630	CCCOAAA	Y	
7	2-4Ak	63.4	2.92	0.29	88	1060	CC	N	
6	R4	72.8	2.92	0.49	66	1510	CCCOHHH	Y	
29	P9A	2.8	2.92	0.51	17	600	CCOHHHH	Y	
8	JM8	13.8	2.91	0.43	60	900	CC	Y	
6	W4	41.8	2.91	0.48	42	2000	CCCOHHH	Y	
43	2b	30.7	2.90	0.27	49	2030	CCCS	Y	
29	H4	25.4	2.88	0.39	26	2200	CCOHHHH	N	
8	JM3	33.5	2.88	0.43	57	880	CC	Y	
3	6Hc	19.0	2.86	0.24	68	1750	CCCS	N	
30	S5	8.6	2.84	0.68	37	270	CCOHH	Y	
8	JM4	38.4	2.82	0.39	56	1740	CC	N	
8	H3	44.4	2.81	0.38	50	910	CCCS	Y	
35	W5	22.1	2.79	0.58	70	1270	CCCOHHH	Y	
35	W6	20.4	2.78	0.49	30	920	CCCOHHH	N	

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3	1H	19.9	2.77	0.43	35	2300	CCCS	Y	
26	10	37.5	2.77	0.49	23	1300	CCCOHHH	Y	
2	NW34 east	15.6	2.76	0.08	10	2770	CS	N	Y
11	N2	27.0	2.76	0.38	83	2730	CCS	Y	
30	S7	33.7	2.74	0.67	37	430	CCOHH	Y	
35	W1	32.1	2.72	0.57	57	460	CCCOHHH	Y	
6	W2	28.7	2.71	0.49	38	2150	CCCOHHH	Y	
6	R9	3.7	2.70	0.88	176	160	CCCOHHH	N	
29	P8	16.9	2.69	0.39	20	1300	CCOHHHH	Y	
6	W6	29.6	2.69	0.49	32	1420	CCCOHHH	Y	
8	JM5	40.7	2.69	0.63	75	600	CCCOHHH	Y	
29	P9	14.8	2.68	0.34	17	1450	CCOHHHH	Y	
5	7	14.6	2.67	0.61	52	1670	CCCAAA	Y	
34	1A-3	8.8	2.67	0.62	60	550	CCCOAAA	Y	
37	4B	38.0	2.67	0.71	133	5100	CCCOHHH	N	
38	H-w	49.4	2.66	0.43	126	860	CCS	N	
29	P4	5.7	2.66	0.69	35	960	CCOHHHH	N	
50	T5	14.7	2.65	0.33	21	670	CS	N	Y
43	2a	44.3	2.65	0.36	45	1480	CC	Y	
35	W7	17.3	2.65	0.49	45	1820	CCCOHHH	N	
18	5A2	12.7	2.65	0.53	48	1310	CCOHHH	N	
2	east	9.9	2.64	0.44	43	1650	CS	Y	Y
29	H6	26.4	2.64	0.54	27	1280	CCOHHHH	N	
8	JM2	49.9	2.64	0.61	84	860	CCCOHHH	Y	
44	K-5	20.3	2.63	0.38	25	450	CS	N	
44	K-4	16.6	2.63	0.53	38	1070	CCOAAAA	Y	
35	E1	19.7	2.62	0.15	14	1800	CCCOHHH	Y	
7	2Aw	11.3	2.60	0.42	65	1400	CC	Y	
7	9A	4.4	2.60	0.45	78	260	CC	N	
34	2	13.5	2.60	0.62	52	320	CCCOAAA	Y	
37	4A	38.0	2.60	0.71	95	2810	CCCOHHH	N	
10	4	20.4	2.60	0.82	143	2700	CCOMMM	N	
2	NW34 west	3.9	2.58	0.12	10	2980	CS	N	Y
5	11	55.0	2.58	0.44	46	1540	CCCCS	Y	
8	H6	21.2	2.58	0.63	58	770	CCCOHHH	Y	
15	8B	16.7	2.57	0.56	80	550	CS	N	
5	2	36.3	2.55	0.46	45	2300	CCCCS	Y	
45	Home	26.5	2.46	0.22	15	1670	CS	Y	
30	S4	25.2	2.46	0.60	18	760	CCOHH	N	
5	4	39.2	2.45	0.35	52	5060	CCCCS	Y	
24	6	22.8	2.44	0.26	75	5190	CCS	Y	
6	B3	59.4	2.43	0.41	73	1540	CC	Y	
8	H1	17.9	2.42	0.78	68	1730	CCCOHHH	N	
6	W1	6.3	2.41	0.77	38	1220	CCCOHHH	Y	
2	B4	79.1	2.38	0.46	68	2350	CS	Y	Y
25	1	13.9	2.38	0.57	119	990	CCB	N	
10	3	19.6	2.38	0.73	109	3480	CCOMMM	N	
19	H1A	16.4	2.38	0.74	123	4920	CCCOMMM	N	
5	13	56.6	2.35	0.39	37	2420	CCCCS	Y	
19	H1B	13.2	2.35	0.87	123	5260	CCCOMMM	N	
38	H-se	19.3	2.33	0.46	119	480	CCS	Y	
8	R2	19.6	2.33	0.69	88	330	CCCOHHH	N	
31	3	59.2	2.33	0.72	66	650	CCOMMM	Y	
38	P-e	44.9	2.32	-0.09	42	4600	CS	N	
38	P-s	25.1	2.32	0.39	61	800	CS	N	Y
3	9H	5.9	2.32	0.69	106	780	CCOHHHH	N	
7	5-LF	25.7	2.31	0.40	0	630	CC	N	
5	8	25.2	2.30	0.60	45	960	CCCAAA	Y	
38	H-ne	34.7	2.30	0.62	113	1710	CCS	N	
28	Bo2	48.6	2.29	0.52	64	1180	CCCOHHH	N	
43	4	3.0	2.29	0.67	32	2270	CCOAAA	Y	
30	N5	37.4	2.28	0.68	22	630	CCOHH	Y	
18	3B	10.7	2.27	0.75	42	160	CCOHHH	N	
7	4-LFn	13.3	2.26	0.30	45	760	CCCS	Y	
7	5-6A	34.7	2.26	0.34	59	3010	CCS	N	
9	16	32.5	2.26	0.75	67	530	CCOHH	Y	
19	S1	23.7	2.24	0.65	66	2930	CCCOMMM	N	
7	7Ae	13.3	2.20	0.36	17	2660	CSOMMMM	Y	
31	1	31.5	2.19	0.82	74	1630	CCOMMM	N	
24	3	61.1	2.18	0.26	38	3120	CCS	Y	
35	E4	27.0	2.18	0.57	29	1150	CCCOHHH	Y	

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Farm ID	Field ID	Acres	P Index	SCI	Soiltest P	Stream Dis	Rotation	Contour	Notill
28	E3	11.8	2.17	0.56	100	1800	Pasture	N	Y
7	7As	21.8	2.16	0.36	26	3450	CSOMMMM	Y	
15	2A	18.4	2.14	0.73	61	695	CCOHHH	Y	
8	W1	74.7	2.13	0.40	31	1440	CCCS	N	
18	1A	12.0	2.12	0.74	34	480	CCOHHH	N	
15	2B	12.2	2.11	0.61	61	450	CC	Y	
28	Bo1	34.8	2.10	0.65	64	530	CCCOHHH	N	
35	E5	39.9	2.09	0.49	17	750	CCCOHHH	N	
6	R8	8.1	2.09	0.86	114	700	CCCOHHH	Y	
2	west	27.5	2.08	0.42	19	990	CS	Y	Y
38	H-s	27.9	2.08	0.45	80	470	CCS	Y	
5	5	10.0	2.08	0.63	52	4590	CCCAAA	Y	
34	5	3.8	2.08	0.75	88	640	CCCOAAA	Y	
35	E6	31.8	2.07	0.49	11	2120	CCCOHHH	N	
5	12	6.6	2.07	0.70	74	6410	CCCCS	N	
24	4	32.5	2.05	0.26	49	3250	CCS	Y	
35	E3	18.2	2.04	0.57	58	700	CCCOHHH	Y	
43	3	34.8	2.03	0.45	45	2640	CC	Y	
45	K-2	17.0	2.03	0.62	36	1830	CC	N	
30	S6	6.7	2.03	0.67	37	370	CCOHH	Y	
19	S3	45.9	2.03	0.87	69	3820	CCCOMMM	N	
18	2A	12.6	2.02	0.74	24	400	CCOHHH	N	
6	R7	32.9	2.01	0.75	57	700	CCCOHHH	Y	
2	north	37.1	2.00	0.44	29	2610	CS	Y	Y
34	1A-1	33.8	2.00	0.68	86	920	CC	Y	
15	1	16.9	2.00	0.76	50	320	CC	Y	
38	F-s	40.1	1.99	0.33	28	2520	CS	N	
3	6Ha	8.1	1.99	0.58	68	1750	CCCS	N	
2	center	88.0	1.96	0.44	41	1280	CS	Y	Y
44	H-9	18.1	1.94	0.55	66	4380	CCS	N	
16	6	8.4	1.94	0.76	54	1160	CS	Y	Y
30	S3	12.2	1.93	0.50	18	1700	CCOHH	Y	
4	S2	17.1	1.92	0.40	30	590	CS	N	Y
3	3H	22.2	1.90	0.46	32	3140	CCCS	Y	
5	3	39.0	1.90	0.47	46	4870	CCCCS	Y	
38	P-w	23.1	1.89	0.20	29	4320	CS	N	
24	1	36.6	1.88	0.26	42	4280	CCS	Y	
34	1A-4	25.7	1.88	0.85	112	1900	CC	Y	
34	6	12.0	1.88	1.10	238	1060	CC	Y	
35	E2	16.9	1.86	0.52	24	980	CCCOHHH	Y	
37	5	18.0	1.86	0.71	74	2690	CCCOHHH	N	
34	7	6.0	1.85	0.75	65	560	CCCOAAA	Y	
7	8A	65.4	1.83	0.56	83	1410	CCS	N	
32	r3 n	36.8	1.82	0.42	50	3120	CS	N	
27	SW-1	10.9	1.81	0.56	47	3400	CSOHHHH	N	
30	S2	7.6	1.81	0.68	20	350	CCOHH	Y	
15	5	1.0	1.81	0.87	90	310	Past	Y	
28	E4	59.6	1.80	0.75	105	3900	CCCOHHH	N	
3	7H	6.9	1.77	0.68	42	1330	CCOHHH	N	
33	n3	13.0	1.76	0.85	46	520	CS	N	Y
5	1	39.9	1.75	0.47	33	4080	CCCCS	Y	
34	1A-2	32.0	1.75	0.68	82	2010	CC	Y	
30	N1	46.2	1.73	0.68	12	1140	CCOHH	Y	
18	3A	22.3	1.73	0.74	43	690	CCOHHH	N	
3	5H	20.0	1.72	0.58	50	2060	CCCS	N	
29	P6	12.7	1.72	0.63	16	590	CCOHHHH	Y	
11	N1	20.2	1.70	0.58	79	2910	CCS	Y	
3	8H	10.1	1.69	0.67	53	990	CCOHHH	N	
26	9	2.7	1.69	0.72	48	165	CCCOHHH	N	
50	R1	9.0	1.67	0.48	27	300	CS	Y	Y
7	2Ae	17.2	1.67	0.57	65	1400	CCOMMM	Y	
44	H-1	26.7	1.67	0.71	121	510	CC	N	
5	10	144.4	1.66	0.64	65	5860	CC	Y	
44	K-3	7.9	1.65	0.42	23	1610	CS	Y	
29	P1	26.7	1.64	0.63	16	1280	CCOHHHH	Y	
7	3-Aks	10.5	1.64	0.68	48	2720	CSOMMMM	Y	
8	H4	42.7	1.64	0.76	64	1720	CCCOHHH	Y	
3	4H	20.6	1.61	0.50	42	4520	CCCS	Y	
45	K-3	41.2	1.61	0.65	30	1940	CC	N	
16	5	6.6	1.61	0.85	54	1160	CS	Y	Y
8	H2	18.5	1.58	0.78	60	2390	CCCOHHH	N	

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Farm ID	Field ID	Acres	P Index	SCI	Soiltest P	Stream Dis	Rotation	Contour	Notill
21	4A	6.4	1.56	0.74	45	180	CCCGraze	N	N
5	14	52.6	1.55	0.52	17	4200	CCCCS	Y	
7	3-Akm	13.4	1.55	0.68	80	2620	CSOMMMM	Y	
16	1	14.2	1.55	0.76	87	900	CS	Y	Y
7	5-Aks	3.3	1.55	0.88	41	200	CC	N	
50	P3	16.8	1.54	0.48	26	840	CS	Y	Y
31	2	22.3	1.54	0.82	62	1230	CCOMMM	N	
49	South	43.2	1.45	0.58	20	3890	CS	N	
49	North	35.3	1.42	0.58	16	2950	CS	N	
7	1A	19.0	1.41	0.72	33	350	CC	N	
4	S1	74.5	1.36	0.64	61	2510	CS	N	Y
7	3-4A	61.3	1.36	0.72	65	960	CC	N	
50	T2	47.5	1.33	0.55	18	1040	CS	N	Y
8	R1	66.9	1.32	0.70	21	1180	CCCOHHH	N	
29	P5	9.6	1.29	0.64	18	2040	CCOHHHH	Y	
15	9B	13.7	1.28	0.82	63	530	CCOHHH	Y	
40	North	61.9	1.27	0.62	25	3810	CS	N	
16	2	4.6	1.26	0.85	74	1200	CS	Y	Y
2	Dodge S	31.3	1.25	0.52	12	5030	CS	N	Y
40	South	55.2	1.25	0.57	24	2880	CS	N	
37	1A	38.8	1.23	0.71	43	2530	CCCOHHH	N	
33	b1	12.7	1.23	0.87	121	300	CS		
4	S3	3.8	1.22	0.53	33	560	CS	N	Y
38	D-n	55.6	1.22	0.79	42	1570	CC	N	
36	H1	24.4	1.21	0.69	40	4700	CS	Y	Y
32	r3 s	39.1	1.20	0.83	110	3620	CS	N	Y
11	S4	4.2	1.15	0.65	51	1200	CCS	Y	
43	5	25.0	1.15	0.71	32	3070	CCOAAA	Y	
22	1	62.4	1.14	0.71	30	1820	CS	N	Y
36	N2	22.4	1.14	0.72	17	480	CS	Y	Y
38	D-m2	6.3	1.13	0.40	50	320	CS	N	
1	I	61.1	1.12	0.83	89	2690	CS	Y	Y
17	south	21.4	1.09	0.95	28	380	CCOHHHH	N	Y
4	S4	11.8	1.09	1.10	38	430	CC	N	Y
2	Dodge N	18.0	1.07	0.75	12	4490	CS	N	Y
3	6Hb	3.1	1.06	0.71	68	1750	CCOHHH	N	
44	H-7	6.4	1.05	0.52	43	250	CS	N	
36	H2	71.6	1.05	0.76	40	6700	CS	N	Y
37	1B	38.8	1.03	0.68	25	2820	CCCOHHH	N	
1	II	50.5	1.03	0.74	54	2300	CS	Y	Y
33	n1	78.5	1.02	0.88	33	780	CS	N	Y
4	N1	76.8	1.01	0.58	28	1670	CS	Y	Y
29	P7	10.7	1.01	0.74	19	1500	CCOHHHH	N	
4	R5	28.8	1.00	0.70	32	490	CS	Y	Y
44	T-2	75.6	0.98	0.83	13	1200	CS	N	Y
32	r2	25.0	0.97	0.75	50	540	CS	Y	Y
22	2	8.6	0.96	0.71	23	1120	CS	Y	Y
38	D-m1	23.6	0.95	0.45	47	560	CS	N	
4	N2	80.6	0.92	0.58	28	1360	CS	N	Y
14	a7	47.3	0.92	0.71	15	750	CS	Y	Y
2	Dodge SE	4.3	0.91	0.75	12	5020	CS	N	Y
33	n2	59.8	0.89	0.75	30	540	CS	Y	Y
16	3	21.1	0.89	0.85	61	2500	CS	Y	Y
38	D-s	29.5	0.88	0.46	26	520	CS	N	
50	P2	27.9	0.88	0.58	25	1000	CS	Y	Y
16	4	21.1	0.87	0.85	49	1440	CS	Y	Y
27	NE-2	25.8	0.86	0.84	12	4070	COHHH	N	
44	T-1	37.7	0.85	0.85	7	1040	CS	N	Y
14	a2	16.8	0.84	0.71	13	400	CS	Y	Y
44	T-3	52.8	0.83	0.82	10	1760	CS	N	Y
15	4	2.2	0.83	1.10	90	310	CC	Y	
50	P4	3.8	0.81	0.48	8	1250	CS	Y	Y
21	4C	17.5	0.81	0.98	8	1080	RGraze	N	Y
50	P5	7.9	0.80	0.48	11	1640	CS	Y	Y
11	S5	1.7	0.80	1.10	56	1650	Hay	Y	
17	north	5.7	0.79	0.95	25	520	CCOHHHH	N	Y
14	a3	4.0	0.77	0.75	13	200	CS	Y	Y
7	1-2-LF	39.1	0.73	0.67	36	620	CC	N	
4	R4	33.1	0.73	0.81	31	1200	CS	N	Y
45	K-1	35.4	0.73	0.85	26	3270	CS	N	Y
27	SW-2	18.7	0.72	0.75	12	3260	CS	N	Y

Hewitt Creek Watershed
Phosphorus Index Listing - 2008

Farm ID	Field ID	Acres	P Index	SCI	Soiltest P	Stream Dis	Rotation	Contour	Notill
36	H3	40.1	0.72	0.76	40	6300	CS	N	Y
27	Sch-S	24.6	0.72	0.78	9	1270	CS	N	Y
14	a4	2.4	0.71	0.73	13	440	CS	Y	Y
27	NE-4	24.1	0.69	0.72	9	2800	CS	Y	Y
50	T6	5.4	0.69	0.74	21	500	CS	N	Y
27	NE-3	8.8	0.68	0.72	12	6400	CS	Y	Y
44	K-2	18.4	0.67	0.74	24	1320	CS	Y	
50	T1	37.0	0.67	0.82	19	730	CS	N	Y
21	4B	12.7	0.66	0.98	8	750	RGraze	N	Y
14	a1	70.4	0.65	0.75	15	1130	CS	Y	Y
4	R7	37.3	0.64	0.74	32	2700	CS	N	Y
27	NE-1	15.6	0.64	0.75	20	2820	CS	N	Y
7	5-Akn	3.1	0.62	0.88	34	310	CC	N	
21	8	2.8	0.62	0.98	21	760	RGraze	N	Y
36	N1	44.2	0.61	0.74	17	800	CS	N	Y
4	R1	28.8	0.61	0.81	42	1030	CS	N	Y
27	Sch-N	24.4	0.60	0.79	5	1850	CS	N	Y
4	S5	27.8	0.57	1.10	39	710	CC	N	Y
50	P1	6.9	0.55	0.52	500	1160	CS	Y	Y
27	SW-3	10.1	0.55	0.80	5	5170	CSOHHHH	N	
4	R2	47.7	0.53	0.83	36	1610	CS	N	Y
4	R3	22.3	0.51	0.86	42	250	CS	N	Y
4	R6	36.6	0.44	0.83	32	2980	CS	N	Y
14	a6	6.4	0.43	0.89	19	260	CS	N	Y
14	a5	5.6	0.30	0.86	13	240	CS	N	Y
38	H-fsw	3.2		0.63		720	CS	N	Y
38	P-fs	3.0		0.64		380	CS	N	Y
23	Bog	40.1		0.65		2880	CC	N	

PI Category	# of fields	total acres	avg. PI	avg. SCI	avg. soil P	avg. distance	% hay/graze	% contour	% no till
>5	18	368	5.94	0.20	144	929	61	56	0
3 to 5	100	2245	3.80	0.34	85	1423	53	45	5
2 to 3	121	3151	2.49	0.50	57	1696	58	60	7
1 to 2	89	2596	1.48	0.65	47	2526	34	46	29
0 to 1	52	1290	0.76	0.76	27	1601	12	37	83
No PI	3	46		0.65	0	2569			
	383	9696							
2008 Watershed Weighted Average			**2.42**	**0.53**	**60**	**1818**	**44**	**49**	**22**
>5	26	513	6.24	0.13	150	958	35	62	0
3 to 5	98	2236	3.83	0.34	79	1488	52	48	2
2 to 3	112	3039	2.51	0.50	55	1693	65	57	5
1 to 2	83	2351	1.54	0.62	48	2534	34	48	30
0 to 1	50	1319	0.74	0.79	26	1569	28	22	80
No PI	3	59	0	0.48	0	3816			
	372	9516							
2007 Watershed Weighted Average			**2.54**	**0.51**	**60**	**1785**	**47**	**48**	**19**
>5	20	413	6.62	0.15	181	1054	45	40	0
3 to 5	84	1692	3.72	0.41	86	1661	58	52	1
2 to 3	106	2828	2.48	0.54	57	1572	67	57	7
1 to 2	70	2169	1.61	0.59	49	2336	47	50	27
0 to 1	36	1085	0.72	0.76	29	1380	24	26	91
	316	8187							
2006 Watershed Weighted Average			**2.48**	**0.54**	**63**	**1741**	**54**	**50**	**19**

HEWITT CORNSTALK NITRATE TEST RESULTS -- 2008

ID	Sample #	Stalk NO3-N (ppm)	Nitrogen application	Estimated N (lbs/a)	Rotation	Yield (bu/a)
15	1	6,040	Planter 45# as 32%, 40t Free Stall manure	445	B-C	153
5	3	4,736	Spring 90# as NH3, Winter 7t shed pack 19-9-16	160	C-C	165
40	1	4,657	Spring 130# as Urea	130	B-C	199
26	2	4,579	Spring 92# urea, Seasonal 11t dairy shed Man.	202	C-C	155
12	2	3,801	Fall 120# as NH3	120	B-C	154
5	2	3,743	Spring 100# as NH3, Starter 3#, Fall '06 392# as M	181	C-C	175
38	1	3,615	Spring 100# as NH3, Spring 3,500gal liquid hog	100+175 as manure	B-C	199
34	1	3,611	Planter 50# as 28%, Seasonal 8t manure	50 + manure	C-C	155
38	2	3,586	Spring 175# as NH3	175	C-C	170
35	2	3,468	Spring 125# as Urea	125	C-C	190
30	1	3,467	Spring 130 as NH3, Seasonal 7t shed manure	200	C-C	158
18	2	3,449	Planter 50# liquid N + bedding pack & gutter Man.	50 + manure	C-C	182
4	2	3,426	Planter 80# as 32%	80	B-C	238
4	4	3,375	Planter 140# as 32%,Late June 80# as 32%	240	C-C	128
4	3	3,325	Planter 40# as 28%,Seasonal 10t manure	40	B-C	229
35	1	3,323	Spring 125# as Urea	125	B-C	158
43	1	3,207	Spring 150# as 28%, Fall 3,000gal liquid swine	150+150 as manure	C-C	186
3	1	3,198	Sidedress 60# as ESN, + Spr & Fall 3,000 Nursery	60+80 as manure	B-C	186
34	3	3,119	Planter 40# as 28%,Seasonal 10t manure	40 + manure	Sod-C	163
48	2	3,044	Spring 100# as NH3, Fall 3,500gal liquid hog	100 + manure	C-C	149
18	3	2,992	Planter 50# liquid N + bedding pack & gutter Man.	50 + less manure	Sod-C	193
3	3	2,911	Sidedress 60# as ESN, Fall 3,000gal hog nursery	60+ 45 as manure	B-C	155
15	2	2,747	Spring 100# as ESN, 45# as 32% at planting	145	C-C	175
3	2	2,691	Fall 3,000gal and Spring 3,000gal swine nursery	80 as manure	B-C	157
40	2	2,680	Spring 130# as Urea	130	B-C	204
48	1	2,619	Spring 160# as NH3	160	C-C	140
30	2	2,561	Seasonal 7t shed manure	70	Sod-C	177
18	1	2,358	Planter 50# liquid N + bedding pack & gutter Man.	50 + manure	Sod-C	171
10	2	2,324	Spring 60# as Urea + Seasonal 40t gutter & shed	60 + manure	C-C	144
5	4	2,322	Sidedress 150#, 0-0-46 W/Nutri-sphere	150	C-C	187
4	1	2,295	Shed manure at 10t	manure only	B-C	163
5	1	2,290	Planter 3#, 14,000g liquid 32-12-24 in fall	227	C-C	160
3	4	2,204	Sidedress 60# as ESN	60	Sod-C	168
12	1	2,195	Fall 120# as NH3	120	B-C	174
43	2	2,112	Spring 150# as 28%, Seasonal 5t shed manure	150 + manure	C-C	153
10	1	1,844	No commercial N or manure	0	Sod-C	138
10	3	1,678	Seasonal 40t gutter and shed manure	manure only	C-C	120
38	3	1,510	Spring 150# as NH3, Spring 3,500gal liquid hog	150+175 as manure	C-C	111
43	3	1,445	Spring 150# as 28%	150	C-C	170
2	2	1,260	Spring 160# as NH3, + 40# as UAN	200	C-C	169
26	1	905	Spring 92# urea, Seasonal 11t dairy shed Man.	202	C-C	160
34	2	596	Planter 50# as 28%, Winter lot for cows	50 + manure	C-C	178
45	3	482	Spring 140# as 28%	140	B-C	
45	2	94	Spring 180# as 28%, 1/2 surface 1/2 sidedress	180	C-C	
45	1	20	Spring 140# as 28%	140	B-C	
2	1	16	Fall 100# as NH3, Spring 40# as UAN	140	B-C	204
		2,650	Average 46 samples from 17 cooperators			169

Please correct us if we incorrectly reported your N application.

2007 - 30 cooperators had 80 samples that averaged 2,856ppm

HEWITT CREEK CORNSTALK NITRATE TEST RESULTS – 2007

ID	Sample #	Stalk NO3-N (ppm)	Nitrogen application	Estimated N (lb/a)	Rotation	Yield (bu/a)
26	3	9,900	Spring - 92# as urea + 10T/A season Bed Pk	142	C-C	198
26	2	9,087	Spring - 92# as urea + 10T/A season Bed Pk	142	C-C-C	189
34	1	8,893	Fall - surface 3,000 hog + 30# as 28% W/plant	130	C-Rye -C	224
33	1	6,741	Spring - 100# as 28% + 20T/A shed manure	200	C-C	150
18	2 (3B)	6,719	Fall - 92# as urea + Seasonal 14.4T/A Bed Pk	164	H-C	171
28	3	6,705	Spring - 90# as 32% + 15,000 liquid dairy	390	C-C	197
18	4 (8A)	6,256	Fall - 148# as urea + 20T/A (6.4-4.2-9.0) Bedding Pk	248	C-C	170
28	2	5,997	Spring - 90# as 32% + 15,000 liquid dairy	390	HHHH-C	204
28	1	5,842	Spring - 90# as 32% + 15,000 liquid dairy	390	HHHH-C	204
9	14	5,791	Spring - 60# as Am S + Fall-Spring 22T/A Dairy	170	C-C	206
10	2	5,544	Fall-Spring 60T/A Dairy	300	H-C	175
3	1	5,316	Spring - 64# as 28% + 5T/A (20-17-14) Bed Pk in fall	164	C-C	175
29	3	5,028	Fall - 12,000 gal liquid dairy	240	C-C	198
35	1	5,004	Spring - 103# as 46% + 5T/A seasonal bedding pack	128	B-C	176
10	1	4,440	Fall-Spring 50T/A Dairy	250	C-C	175
9	11	4,262	Spring - 60# as Am S + Fall-Spring 22T/A Dairy	170	C-C	206
34	4	4,167	W/planter - 50# as 28% + 10T/A seasonal Bed Pack	100	C-C	169
6	2	4,082	Spring - 165# as urea	165	C-C	189
37	1	3,960	Spring - 140# N + Fall 15T/A cow pit	365	C-C	
18	1 (2A)	3,950	Fall - 148# as urea + 14.4T/A (6.4-4.4-9.0) Bed Pack	220	C-C	154
6	1	3,686	Spring - 140# as urea + 10T/A (12-7-7) dairy gutter	260	C-C	166
29	1	3,271	Spring - 15,000 gal liquid dairy	300	C-C	163
5	D E 1	3,262	Fall - 15,584 Gal 56-23-36	434	C-C	195
18	3 (4A)	3,249	Fall - 148# as urea + 20T/A (6.4-4.2-9.0) Bedding Pk	248	C-C	209
1	1	3,215	Spring - 120# as 28%	120	C-C	188
37	2	2,995	Spring - 100# + 15T/A pen pack	175	H-C	
28	4	2,984	Spring - 90# as 32% + 15,000 liquid dairy	390	C-C	197
34	2	2,859	W/planter - 50# as 28% + 8-10T/A seasonal Bed Pk	95	C-C	182
5	Du 1	2,710	Spring - 75# as NH3 - 8,500 gal 34-22-38 in 2005	75	C-C	175
32	2	2,340	Spring - 100# as 28%	100	B-C	176
35	2	2,324	Spring - 103# as 46% + 5T/A seasonal bedding pack	128	B-C	180
26	1	2,209	Spring - 92# as urea + 10T/A seasonal beddng pack	142	C-C-C-C	189
26	4	2,179	Spring - 92# as urea + 10T/A seasonal beddng pack	142	C-C-C-C	161
19	1	2,100	Fall - 20T/A Dairy liquid	200	H-C	215
19	3	2,000	Spring - 50# as 28% + 20T/A Dairy liquid	250	C-C	175
19	4	2,000	Spring - 50# as 28% + 20T/A Dairy liquid	250	C-O cov-C	200
33	2	1,865	Spring - 100# as 28%	100	H-C	131
34	3	1,767	W/planter - 30# as 28% + 5,000 liquid hog	280	H-C	152
15	1	1,667	Planting - 45# as 28% + Seasonal 15T/A free stall	225	B-C	180
32	1	1,485	Spring - 100# as 28%	100	B-C	170
12	1	1,404	Post-plant - 120# as 28%	120	B-C	220
3	3	1,261	Spring - 180# as 28%	180	C-C	159
38	2	1,190	Spring - 165# as NH3	165	C-C	182
29	2	1,178	Spring - 15,000 gal liquid dairy	300	C-C	164
4	1 (H)	1,043	W/planter - 120# as 32% = Sp 3,000G/A (69-64-92)	120	C-C-C-C-C	170
15	2	1,006	Spring - 100# as ESN + 45# with planter as 28%	145	C-C	161
4	3-R	1,050	W/planter - 120# as 32% = Sp 3,000G/A (69-64-92)	120	B-C	187
3	2	957	Spring - 64# as 28% + Spring Bed Pk (20-17-14)	164	C-C	175
1	2	934	Spring - 120# as 28%	120	B-C	199
4	2 (H)	730	W/planter - 120# as 32% = Sp 3,000G/A (69-64-92)	120	Sod-C	167
11	1	600	Spring - 120#	120	B-C	214
13	4	599	Spring - 42# as A. Sulfate + Fall 2,700 Gal liquid hog	177	C-C	169
12	2	586	Post-plant - 120# as 28%	120	B-C	181
13	3	544	Spring - 42# as Ammonium Sulfate	42	C-C	142
4	2-R	540	W/planter - 150# as 32%	150	B-C	189
38	1	457	Sidedress 85# as 28% + Fall 2,650gal Hog 19.6#N	137	B-C	170
4	1-R	349	W/planter 80# as 32%	80	B-C	198
11	2	340	Spring - 90#	90	B-C	206
13	2	303	Spring - 42# as Ammonium Sulfate	42	C-C	125
3	4	289	Spring - 36# as 28% + 3,000 fall + 1,000 Sp (20 N)	116	B-C	175
13	1	228	Spring - 42# as A. Sulfate + Spring 2,700 G liquid hog	177	C-C	171
38	3	218	Spring - 110# as NH# + 3,500 gal liquid hog	179	C-C	182
38	4	192	Spring - 85# as 28% + Fall 2,650 gal hog 19.6#/1000	137	B-C	141
14	2	188	Spring - 100# as 28%	100	B-C	198
14	1	131	Spring - 100# as 28%	100	B-C	170
8	1	68				235
		2,791	Average of 66 samples from 23 multi-year cooperators	182		181

21	2	6625	Spring - 42# as A.S. + 95# as liquid pop-up	137	Past/H-C	154
30	1	5487	Spring - 140# as NH3	140	C-C	192
21	1	4945	Spring - 42# as A.S. + 95# as liquid pop-up	137	Past/H-C	153
23	2 - S	3995	Spring - 140 N + Fall 15T/A pen pack	175	C-C	
23	1 - E	3750	Spring - 140# N + 15,000 pig pit	515	C-C	
43	1	3272	Spring - 150# as 28%	150	C-C	185
30	2	3106	Winter - >20T/A Beef cattle dry manure	100	H-C	186
40	1	2897	Pre-emerge - 180# as liquid 32%	180	C-C	193
45	2	2150	Spring - 157 as 28% and starter Fertilizer	157	B-C	208
43	3	2062	Spring - 150# as 28%	150	C-C	196
43	2	1633	Spring - 150# as 28%	150	Grass-C	150
45	1	1600	Spring - 129# as 28% and starter fertilizer	129	B-C	180
40	2	1567	Pre-emerge - 120# as liquid 32%	120	B-C	190
45	3	1190	Spring - 129# as 28% and starter fertilizer	129	B-C	175
		3163	Average of 14 samples from 6 new 2007 cooperators	169		180

HEWITT CREEK CORNSTALK NITRATE TEST RESULTS - 2006

ID	Sample #	Stalk NO3-N (ppm)	Nitrogen Application	Estimated N (lb/a)	Rotation	Yield (bu/a)
34	1	11,600	50# as 28% PP + 50# with Pla + Winter Cows	100+	CC	
31	BLNK	10,514				
10	2	9,889	1/2 Spring & 1/2 Fall 18T/A (6.4-3.2-11.2)	115	HHHC	LSNT 39
18	3	9,210	10 T/Ac dairy bedding dairy pack + 28%	?	HC	
10	1 SE	8,530	Fall manure (6.4-3.2-11.2) 26T/A	166	HHHC	10 B< 10 1&2
33	1	8,500	100# as 28% after planting	100	SC	
10	1	7,720	Spring manure (6.4-3.2-11.2) 18T/A	115	HHHC	LSNT 36
37	1	7,548				
34	2	7,400	50# W/Planter + 3,000 fall hog + 6T/A pack	Approx 250+	HHC	
20	1-H	7,110	150# as Spr 28% + Stab + 15 T/A man	213	CC	
20	2-B	7,020	150# as Spr 28% + Stab + 15 T/A man	213	CC	
9	14	6,500	50# as NH4SO4 + 30 T/A manure	158	HHCC	
3	1	6,440	65# as Spr 28% + 12 T/A hog cattle pack	Approx 165+	HCC	203
18	4	6,280	10 T/Ac dairy bedding dairy pack + 28%	?	CC	
29	2 field 3	5,950	315# as spring injected liquid dairy	315	CC	
14	1	5,920	100# as 28% after planting	100	SC	
1	2	5,860	140# as 28% pre-emergence, No-till	140	SC	
19	1	5,591	Pit man on H in 2005 + 21 T/A, No N	100	HC	244
26	1	5,010	92# as spring urea plus 10 T/Ac manure	128	HCC	
18	2	5,000	28%	?	HC	
28	2	4,950	80# as 32% No-till plant + 20T/A Dairy Man	175	SC	
32	2	4,570	100# as 28% after planting + bedding pack	195	SC	
28	1	4,470	100# as 32% No-till plant + 20t/A Dairy Ma	195	SC	
19	2	4,395	50# N with herb. + 21 T/A dairy man	150	CC	230
18	1	4,220	4T/Ac dairy bedding dairy pack + 28%	?	CC	
15	3 field 6	4,140	150# as 28% with No-till planter	150	SCC	207
37	2	3,915				
6	1-H	3,770	140# as Spr Urea + 20 T/A Liq Dairy	224	CC	
26	2	3,540	92# as spring urea plus 10 T/Ac manure	128	HCC	
16	2	3,500	170# as 28% no-till plant + 3,000 (Apx150N	320	SC	
3	2	3,290	11T/A hog steer pack spring 2006	Approx 100+	CC	196
5	1	3,070	120# Spring NH3 Late Spring NO3 - 39	120	CCCSC	195
38	2-D	3,050	170# as Spring Anhydrous	170	CC	
38	1-H	3,010	100# as Side-dress + 4,000 G Liq hog	235	CC	
28	3	3,010	60# as 32% No-till plant + 20T/A Dairy Man	155	SC	
32	1	2,990	100# as 28% after planting + bedding pack	195	SC	
25	2	2,930	100# in June as 28% + 15 T/A man	163	SC	
35	1	2,860	11# as 11-52-0 + 92# as urea	103	SC	
4	1-R	2,770	120# as 32% no-till plant + 3,000 (180# N)	300	SC	213
35	2	2,670	11# as 11-52-0 + 115# as urea	126	CC	
33	2	2,560	100# as 28% after planting	100	SC	
9	11	2,522	50# as NH4SO4 + 10 T/A manure	86	CCCC	
5	3	2,420	90# Sp NH3 + 8 T/A 18-9-15 ma LSNT 43	162	AAACC	204
4	3-H	2,290	120# as 32% with no-till planter	120	SC	178
5	2	2,170	90# Spring NH3 + 15,000 G/A ma LSNT 40	90+	SCCCC	192
5	6	2,140	190# Spring NH3 LSNT 26	190	CCSCC	199
16	1	2,030	170# as 28% with no-till planter	170	SC	
6	2-W	1,840	140# as Spr Urea + 20 T/A Liq Dairy	224	CC	
25	1	1,660	50# preplant + 100# in June as 28%	150	CC	
15	1 field 4	1,630	100# as 28% at planting + heavy man pack	195	CCC	179
4	2-R	1,620	60# as 32% no-till plant + 3,000 (180# N)	240	SC	213
29	1 field 1	1,510	315# as spring injected liquid dairy	315	CC	
11	2	1,370	150# as 28% at plant&SD + 3,000 hog Fins.	270	CC	186
7	24AK-2	1,300	100# Sp NH3 + 14,000 Gal Sp 24-22-13	422	CC	206
15	4 field 7	1,110	30# as 28% with No-till planter	30	HHHHHC	154
4	2-H	978	60# as 32% with no-till planter	60	SC	209
5	5	977	8,000 G/A 34-23-38 Fall LSNT 29	272	CCCCC	199
7	24AK-1	959	100# Sp NH3 + 14,000 Gal Sp 24-22-13	422	CC	206
12	1	821	90# as 28% after planting no-till	90	SC	
9	16f	798	30 T/A manure, no commercial N	108	HHHC	
4	1-H	779	80# as 32% with no-till planter	80	SC	201
7	24AK-3	759	100# Sp NH3 + 14,000 Gal Sp 24-22-13	422	CC	206
1	1	708	140# as 28% pre-emergence, No-till	140	CC	
14	2	642	100# as 28% after planting	100	SC	
5	4	561	90# Sp NH3 + 8T/A 18-9-15 ma pk LSNT27	162	CCCCC	220
4	3-R	461	30# as 32% no-till plant + 3,000 (180# N)	210	SC	208
7	24AK-4	400	100# Sp NH3 + 14,000 Gal Sp 24-22-13	422	CC	206
8	1	340	110# urea + 10# 28%	120	SC	
15	2 field 5	133	75# as 28% at planting + bedding pack	170	CCC	160
3	3	95	90# as 28% Spr + 3,000 fall liq hog, No-till	150	SC	209
8	2	45	160# urea + 10# 28% + 20T/A manure	?	CC	
12	2	37	90# as 28% after planting no-till	90	SC	
11	1	20	150# as 28% at plant&SD, rye cover crop	150	SC	196
		3,512		**180**		**201**

Hickory Creek Monitoring — 2005

Rick Klann, Upper Iowa University, Fayette, Iowa

Site 1 (Ken Boeckenstedt pasture)

Date (month-day)	3/18	4/9	4/12	5/9	5/13	5/19	6/1
	6/27	7/6	7/26	8/18	9/2	10/5	
24-hour rainfall	0	0	1.4	0	1.6*	1.4	0
(inches)	2.75**	0	1.25	2.50	0	0	
Water temperature (°F)	44	52	51	60	53	60	58
	67	60	63	68	61	65	
pH (acid < 7.0 normal > basic)	7.8	8.2	8.3	7.6	7.4	7.3	7.5
	7.3	7.5	7.2	7.2	7.1	7.3	
Conductivity (OK 400 to1,000)	627	588	567	646	673	575	641
(ions, minerals, salts)	564	660	638	439	668	681	
Dissolved oxygen	14.3	12.1	9.7	9.4	9.0	8.2	9.6
(mg/L)	6.5	7.2	5.6	5.1	8.7	7.2	
Turbidity	4	8	33	4	24	36	9
(water clarity)	25	11	42	133	11	62	
Suspended solids	1.0	7.0	38	7.8	32.7	36.0	6.8
(mg/L) (<20 is good)	20.7	10.2	44.5	75.0	11.7	57.0	
Total phosphorus	1.16	1.11	2.09	0.98	1.68	1.59	1.38
(mg/L)	1.68	1.00	1.53	5.02	1.05	0.26	
Total nitrogen	11.7	10.1	9.2	11.7	11.2	7.9	NA
(mg/L)	NA	9.2	11.7	12.6	8.9	8.2	
Fecal coliform (cfu/100ml)	26	1,240	107,000	210	29,000	9,900	480
(<400 is good)	10,400	2,900	3,800	257,000	390	880	

Site 2 (Craig Gaul pasture)

Date (month-day)	3/18	4/9	4/12	5/9	5/13	5/19	6/1
	6/27	7/6	7/26	8/18	9/2	10/5	
24-hour rainfall	0	0	1.4	0	1.6*	1.4	0
(inches)	2.75**	0	1.25	2.50	0	0	
Water temperature (°F)	44	54	52	62	51	61	62
	71	65	70	73	64	69	
pH (acid < 7.0 normal > basic)	7.5	8.1	8.0	7.6	7.4	7.2	7.4
	7.4	7.7	7.3	7.3	7.4	7.6	
Conductivity (OK 400 to1,000)	626	603	650	644	643	557	652
(ions, minerals, salts)	567	663	603	436	646	673	
Dissolved oxygen	15.8	13.0	8.4	9.4	9.3	5.4	9.2
(mg/L)	5.7	7.3	5.6	5.4	10.0	8.2	
Turbidity	4	7	43	4	16	450	18
(water clarity)	31	16	31	227	12	14	
Suspended solids	1.2	7.8	36.5	7.0	24.8	260	220
(mg/L) (<20 is good)	46.0	20.8	32.3	138.0	12.8	19.2	
Total phosphorus	1.19	1.19	3.88	1.43	2.84	5.34	1.27
(mg/L)	2.23	1.32	1.74	4.32	1.03	0.89	
Total nitrogen	6.8	9.3	12.2	7.3	13.7	11.0	NA
(mg/L)	NA	8.0	8.9	10.1	8.3	7.9	
Fecal coliform (cfu/100ml)	15	550	560,000	1,130	46,000	398,000	1,800
(<400 is good)	24,300	5,800	18,000	989,000	1,060	4,100	

Site 3 (John Rubly field)

Date (month-day)	3/18	4/9	4/12	5/9	5/13	5/19	6/1
	6/27	7/6	7/26	8/18	9/2	10/5	
24-hour rainfall	0	0	1.4	0	1.6*	1.4	0
(inches)	2.75**	0	1.25	2.50	0	0	
Water temperature (°F)	46	58	52	66	55	62	65
	75	65	68	75	69	71	
pH (acid < 7.0 normal > basic)	7.9	8.3	8.2	7.9	7.6	7.4	7.8
	7.6	7.7	7.4	7.4	7.8	7.8	
Conductivity (OK 400 to1,000)	612	594	614	614	662	592	641
(ions, minerals, salts)	566	658	633	562	616	671	
Dissolved oxygen	15.1	15.2	11.2	12.3	11.8	6.7	13.4
(mg/L)	6.7	8.5	3.6	2.0	10.0	8.7	
Turbidity	4	7	17	4	9	131	5
(water clarity)	19	9	31	329	6	8	
Suspended solids	1.0	8.6	20.5	6.8	12.5	50.0	6.8
(mg/L) (<20 is good)	19.3	11.6	34.6	220.0	10.0	11.8	
Total phosphorus	0.92	1.37	2.37	1.44	1.88	3.47	1.16
(mg/L)	1.96	1.17	2.25	<5.5***	1.22	0.77	
Total nitrogen	12.9	8.5	8.8	5.7	13.1	9.5	NA
(mg/L)	NA	5.2	12.1	13.5	6.3	6.9	
Fecal coliform (cfu/100ml)	0	80	38,000	1,280	28,000	1,000	1,300
(<400 is good)	18,700	5,400	574,000	1,034,000	230	2,200	

Hewitt Creek – Maquoketa Alliance/IDNR monitoring – Rainfall events - high flow monitoring:

1996 - 2002 Average Total Phosphorus 1.93 mg/L (Range 0.64 to 2.95) — EPA benchmark is 0.05 mg/L

1996 - 2002 Average Total Nitrogen 12.79 mg/L (Range 7.5 to 15.9) — EPA benchmark is 2.18 mg/L

2001 - 2002 Average Fecal Coliform 206,400 CFU/100ml (Range 4,400 to 610,000 – June to August)

* Rainfall over 72 hours.

** Rainfall over 24 hours

***Maximum detection limit is 5.5

Hickory Creek Monitoring — 2006

Rick Klann, Upper Iowa University, Fayette, Iowa

	Site 1 (Merlin Demmer field)							Site 2 (Craig Gaul pasture)							Site 3 (John Rubly field)						
Date (month-day)	3/7	3/13	3/31	5/3	6/5	6/6	6/28	3/7	3/13	3/31	5/3	6/5	6/6	6/28	3/7	3/13	3/31	5/3	6/5	6/6	6/28
	8/1	9/4	9/11	10/6				8/1	9/4	9/11	10/6				8/1	9/4	9/11	10/6			
24-hour rainfall	0	1.1	0.7	0		1.2	0	0	1.1	0.7	0		1.2	0	0	1.1	0.7	0		1.2	0
(inches)	0	0	2.0	0				0	0	2.0	0				0	0	2.0	0			
Water temperature (°F)	40	40	48	54		64	60	39	42	49	55		63	64	42	41	48	56		56	66
	78	64	59	48				81	62	58	49				83	63	58	48			
pH (acid < 7.0 normal >	7.0	7.1	7.5	7.2		7.2	7.3	6.5	7.3	7.4	7.3		7.3	7.4	7.6	7.4	7.7	7.4		7.5	7.8
basic)	8.0	7.8	7.7	7.8				8.2	7.8	7.8	7.9				8.3	8.2	7.7	8.4			
Conductivity (OK 400 to1,000)	608	595	642	650		649	670	610	636	666	653		583	676	602	652	621	656		618	649
(ions, minerals, salts)	716	668	614	713				690	679	631	711				675	646	584	703			
Dissolved oxygen	14.0	13.3	14.5	9.8		7.1	10.6	14.8	13.2	10.9	9.3		**6.3**	8.6	17.1	12.9	14.2	9.8		9.5	10.4
(mg/L)	10.7	8.0	4.9	7.8				10.4	6.7	5.5	7.9				11.9	12.3	5.7	8.9			
Turbidity	5	24	9	8	8	23	4	4	21	22	7	7	**68**	6	3	24	12	5	3	8	3
(water clarity)	7	14	74	12				6	23	68	10				6	9	87	6			
Suspended solids	6.2	35.0	23.4	9.6	11.8	35.0	3.6	8.2	21.0	28.67	11.0	10.6	80.5	8.0	8.2	22.3	19.8	7.4	4.4	7.6	4.0
(mg/L) (<20 is good)	11.0	11.0	55.0	15.2				11.2	28.0	60.0	12.8				11.6	9.8	85.0	9.6			
Total phosphorus	0.26	0.98	0.63	0.59	0.61	0.98	0.43	0.36	1.08	1.69	0.60	0.53	**1.3**	0.38	0.26	1.47	0.66	0.62	0.47	0.86	0.38
(mg/L)	1.19	1.19	**	0.51				1.10	1.95	5.33	0.42				0.95	0.66	**	0.46			
Total nitrogen	5.4	9.0	7.7	12.9	12.1	5.4	8.8	0.4	3.3	5.3	16.1	6.7	7.2	7.2	1.4	14.2	7.5	11.0	8.5	4.7	9.3
(mg/L)	10.7	8.5	14.2	7.8				7.0	9.3	10.5	5.6				6.8	7.6	11.1	8.4			
Fecal coliform (cfu/100ml)	0	900	500	2,300	2,000	9,700	480	118	2,500	2,800	2,500	900	45,000	980	113	10,900	1,700	3,400	200	5,100	380
(<400 is good)	2,900	204,000	736,000	3,200				3,200	127,000	629,000	500				2,500	1,400	756,000	500			

Hewitt Creek – Maquoketa Alliance/IDNR monitoring – Rainfall events - high flow monitoring:

1996 - 2002 Average Total Phosphorus 1.93 mg/L (Range 0.64 to 2.95) — EPA benchmark is 0.05 mg/L

1996 - 2002 Average Total Nitrogen 12.79 mg/L (Range 7.5 to 15.9) — EPA benchmark is 2.18 mg/L

2001 - 2002 Average Fecal Coliform 206,400 CFU/100ml (Range 4,400 to 610,000 – June to August)

** Over range

Hickory Creek Monitoring — 2007

Rick Klann, Upper Iowa University, Fayette, Iowa

Site 1 (**Merlin Demmer** field)

Date (month-day)	3/22	4/3	4/26	5/29	6/4	6/27	7/18
	7/31	8/23	10/5				
24-hour rainfall	0	2	1.5	0	1.5	0	2-3
(inches)	0	>5*	0				
Water temperature (^oF)	53	49	47	70	60	71	70
	68	67	64				
pH (acid < 7.0 normal >	7.8	8.1	7.9	8.3	7.8	8.0	7.6
basic)	8.1	7.5	7.8				
Conductivity (OK 400 to1,000)	618	430	574	698	724	714	189
(ions, minerals, salts)	725	598	711				
Dissolved oxygen	10.4	9.2	9.8	15.0	7.8	11.1	5
(mg/L)	13.0	6.7	8.7				
Turbidity	14	342	30	4	21	5	854
(water clarity)	5	36	8				
Suspended solids	17.25	370.0	45	7.0	22.33	3.0	1304
(mg/L) (<20 is good)	11.6	57.0	9.8				
Total phosphorus	1.13	2.11	1.51	0.5	1.67	0.65	3.37
(mg/L)	0.63	1.69	0.45				
Total nitrogen	12.2	14.7	15.0	10.5	14.9	10.1	4.2
(mg/L)	10.0	11.1	11.6				
Fecal coliform (cfu/100ml)	0	1,200	72,000	4,000	410,000	2,600	364,000
(<400 is good)	1,500	5,000	93,000				

Site 2 (**Craig Gaul** pasture)

Date (month-day)	3/22	4/3	4/26	5/29	6/4	6/27	7/18
	7/31	8/23	10/5				
24-hour rainfall	0	2	1.5	0	1.5	0	2-3
(inches)	0	>5*	0				
Water temperature (^oF)	54	49	47	71	61	72	70
	69	68	64				
pH (acid < 7.0 normal >	7.9	7.7	7.7	8.5	7.9	8.1	7.2
basic)	8.1	8.0	7.9				
Conductivity (OK 400 to1,000)	635	405	589	694	722	714	194
(ions, minerals, salts)	723	576	713				
Dissolved oxygen	11.1	9.2	9.8	15.0	8.0	**11.5**	5.5
(mg/L)	10.9	6.7	9.2				
Turbidity	20	624	49	4	20	**5**	1208
(water clarity)	4	57	15				
Suspended solids	25.25	546.0	71.5	7.6	24.67	7.4	1232
(mg/L) (<20 is good)	9.4	84.0	22.8				
Total phosphorus	1.09	2.67	1.89	0.47	1.66	**0.62**	4.65
(mg/L)	0.31	1.75	0.46				
Total nitrogen	12.6	13.6	14.4	10.3	11.7	8.5	5.3
(mg/L)	8.7	9.9	9.2				
Fecal coliform (cfu/100ml)	0	4,900	84,000	5,000	283,000	1,200	405,000
(<400 is good)	2,200	12,000	384,000				

Site 3 (**John Rubly** field)

Date (month-day)	3/22	4/3	4/26	5/29	6/4	6/27	7/18
	7/31	8/23	10/5				
24-hour rainfall	0	2	1.5	0	1.5	0	2-3
(inches)	0	>5*	0				
Water temperature (^oF)	56	49	47	73	62	74	71
	71	68	65				
pH (acid < 7.0 normal >	8.0	7.7	7.8	8.4	8.0	8.2	7.5
basic)	8.2	7.7	8.0				
Conductivity (OK 400 to1,000)	640	405	604	689	723	712	207
(ions, minerals, salts)	703	581	721				
Dissolved oxygen	10.3	9.3	9.8	13.2	8.5	12.6	4.6
(mg/L)	13.7	6.7	9.1				
Turbidity	18	607	45	3	22	4	1382
(water clarity)	4	72	15				
Suspended solids	29	646	66.5	8.4	26.33	5.8	1208
(mg/L) (<20 is good)	10.2	102.0	28.2				
Total phosphorus	2.01	2.94	1.78	0.42	2.16	0.59	4.99
(mg/L)	0.29	2.14	0.44				
Total nitrogen	12.1	12.3	14.5	7.1	19.7	8.8	5.3
(mg/L)	12.5	9.8	11.3				
Fecal coliform (cfu/100ml)	0	1,100	53,000	1,000	177,000	1,000	528,000
(<400 is good)	600	18,000	77,000				

* During 4 days

** Over range

Hickory Creek Monitoring — 2008

Rick Klann, Upper Iowa University, Fayette, Iowa

Site 1 (Merlin Demmer field)

Date (month-day)	4/11	4/25	5/7	5/27	6/4	6/9	6/26	7/10
	7/25	8/1	8/5	8/12	8/26	9/5	9/26	10/10
24-hour rainfall	?	2.3	0.7	2.5**	?	3.6		***
(inches)		0.34	0.65			0.7		
Water temperature (^oF)	44	62	55	55	55	59	61	61
	61	64	63	59	63	62	62	59
pH (acid < 7.0 normal >	8.1	7.4	7.6	7.7	8.0	7.5	7.7	7.7
basic)	7.9	7.6	7.6	7.6	7.9	7.8	7.9	7.8
Conductivity (OK 400 to1,000)	509	283	567	593	591	493	639	622
(ions, minerals, salts)	687	672	668	675	667	689	667	671
Dissolved oxygen	11.5	8.4	9.7	10.7	9.7	9.1	9.9	8.7
(mg/L)	8.7	8.7	8.4	9.4	13.1	12.2	12.4	12.6
Turbidity	30	780	52	14	42	144	6	117
(water clarity)	17	15	17	11	5	6	3	3
Suspended solids	56	1510	60.5	34	13	141	11.2	148
(mg/L) (<20 is good)	24.7	9.7	20.8	13.5	3.4	6.8	3.6	4
Total phosphorus	1.78	1.59	1.11	1.21	0.55	0.72	0.36	0.98
(mg/L)	0.26	0.50	0.66	0.36	0.29	0.79	0.43	0.32
Total nitrogen	12.7	9.8	14.7	12.3	12.3	11.8	13.1	13.2
(mg/L)	12.3	12.5	11.8	11.8	11.9	11.8	10.9	12.4
Fecal coliform (cfu/100ml)	12,000	34,000	87,000	7,000	41,000	4,000	1,800	7,200
(<400 is good)	34,000	19,000	3,000	1,400	200	76,000	800	600

Site 2 (Craig Gaul pasture)

Date (month-day)	4/11	4/25	5/7	5/27	6/4	6/9	6/26	7/10
	7/25	8/1	8/5	8/12	8/26	9/5	9/26	10/10
24-hour rainfall	?	2.3	0.7	2.5**	?	3.5		***
(inches)		0.34	0.65			0.7		
Water temperature (^oF)	44	62	56	55	55	60	62	62
	62	67	65	60	64	62	62	54
pH (acid < 7.0 normal >	8.3	7.4	7.8	7.7	8.0	7.6	7.8	7.6
basic)	7.7	7.7	7.7	7.7	7.9	8.0	8.0	8.0
Conductivity (OK 400 to1,000)	500	249	588	577	582	438	633	603
(ions, minerals, salts)	681	650	654	675	663	677	664	658
Dissolved oxygen	11.4	8.1	9.9	10.5	9.7	8.7	11.3	8.9
(mg/L)	9.5	9.3	8.5	9.7	13.6	12.4	13.4	14.7
Turbidity	49	1172	45	59	77	403	6	272
(water clarity)	18	22	26	13	5	7	4	3
Suspended solids	88	1600	56.5	71	106	314	7.6	220
(mg/L) (<20 is good)	26	30	33	7.5	5.6	9.25	3.6	3.4
Total phosphorus	1.87	2.52	1.5	1.17	1.01	0.89	0.26	1.3
(mg/L)	0.6	0.53	0.77	0.37	0.5	0.74	0.37	0.28
Total nitrogen	11.2	11.8	15.2	14.1	10.3	11.7	12.2	11.9
(mg/L)	11.1	9.2	10.3	10.8	10.3	9.8	10.5	9.4
Fecal coliform (cfu/100ml)	9000	31,000	108,000	3,000	43,000	43,000	2,600	8,300
(<400 is good)	1,000	13,000	0	700	10,100	72,000	1,400	400

Site 3 (John Rubly field)

Date (month-day)	4/11	4/25	5/7	5/27	6/4	6/9	6/26	7/10
	7/25	8/1	8/5	8/12	8/26	9/5	9/26	10/10
24-hour rainfall	?	2.3	0.7	2.5**	?	3.5		***
(inches)		0	1			0.7		
Water temperature (^oF)	44	62	57	55	55	61	63	62
	63	68	66	60	67	66	67	59
pH (acid < 7.0 normal >	7.7	7.4	7.8	7.6	7.7	7.3	7.9	8.1
basic)	7.8	7.9	7.8	7.9	8.2	8.3	8.3	8.27
Conductivity (OK 400 to1,000)	513	247	594	591	587	472	631	616
(ions, minerals, salts)	675	636	654	675	657	666	646	632
Dissolved oxygen	11.2	8	10	10.5	9.5	8.6	11	8.8
(mg/L)	10.0	10.3	7.5	10.2	14.8	14.1	15.0	15.7
Turbidity	46	1,384	45	51	88	427	6	158
(water clarity)	11	19	22	7	4	7	3	3
Suspended solids	94	1300	57	60	149	386	9	168
(mg/L) (<20 is good)	19.67	29	31	12.2	2.6	9.8	4.4	4.5
Total phosphorus	2.26	2.4	1.72	1.23	0.82	1.03	0.31	1.13
(mg/L)	0.42	0.56	0.64	0.4	0.31	0.65	0.32	0.17
Total nitrogen	11.9	11.1	16.4	10.5	11.2	11.1	12.2	12.0
(mg/L)	11.6	11	10.1	10.7	11.1	9.5	9.5	10.6
Fecal coliform (cfu/100ml)	14,000	28,000	112,000	9,000	37,000	1,000	1,000	24,000
(<400 is good)	1,000	27,000	3,000	300	500	65,000	200	300

* equipment failure

** sampled 48 hours later

*** sampled during 2-inch rain