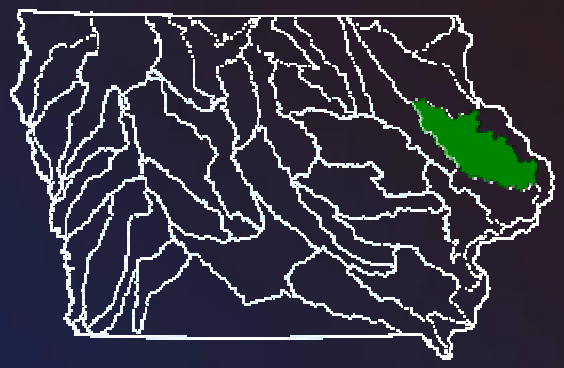
Performance-based Management to Improve Water Quality

John Rodecap, project coordinator

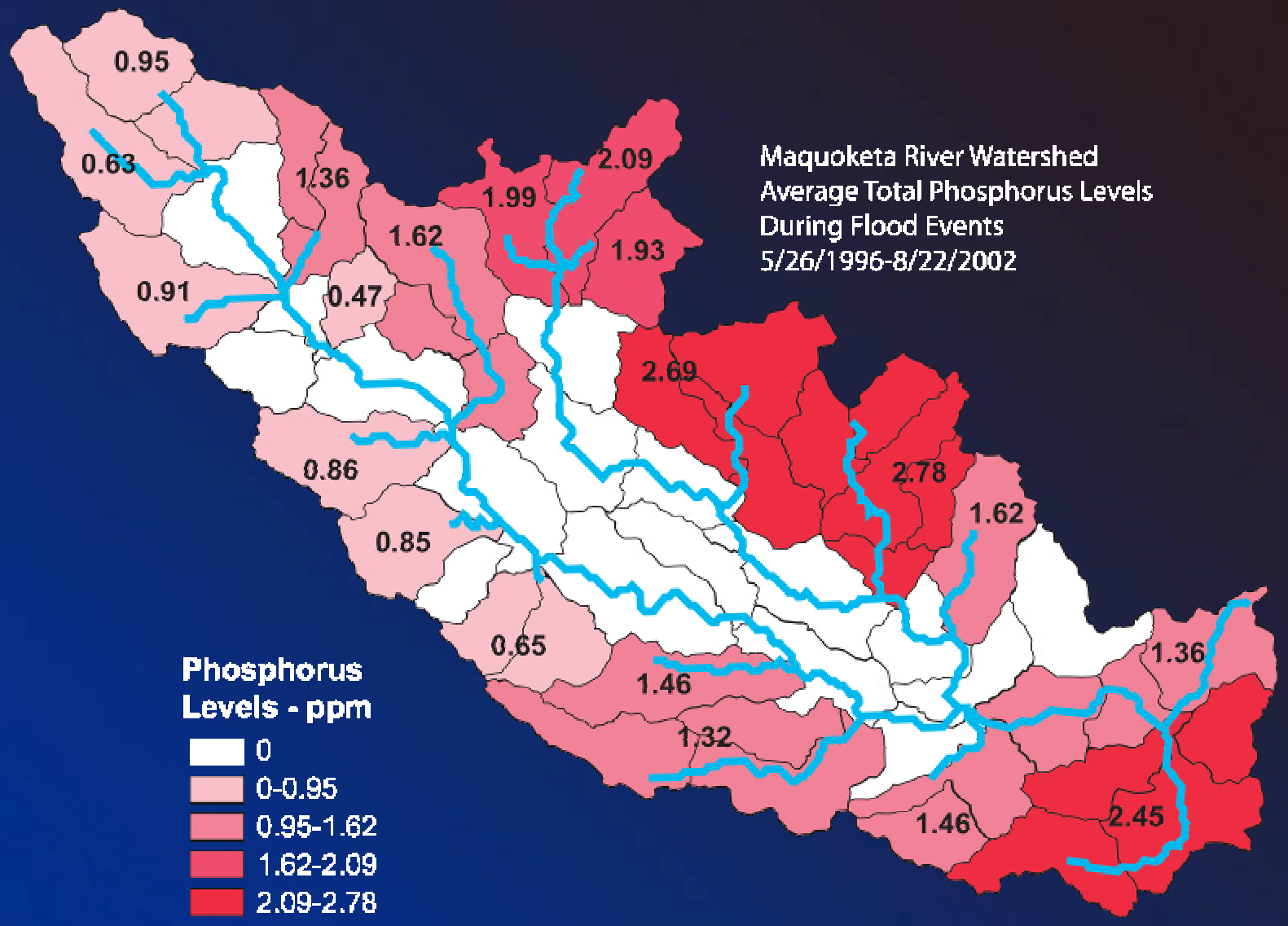
ISU Extension Water Quality Projects

Maquoketa River Subwatersheds
(12 digit Hydrologic Unit Code)



Infrared photo of the Maquoketa River entering the Mississippi River following a heavy rainfall event in the Maquoketa River basin.

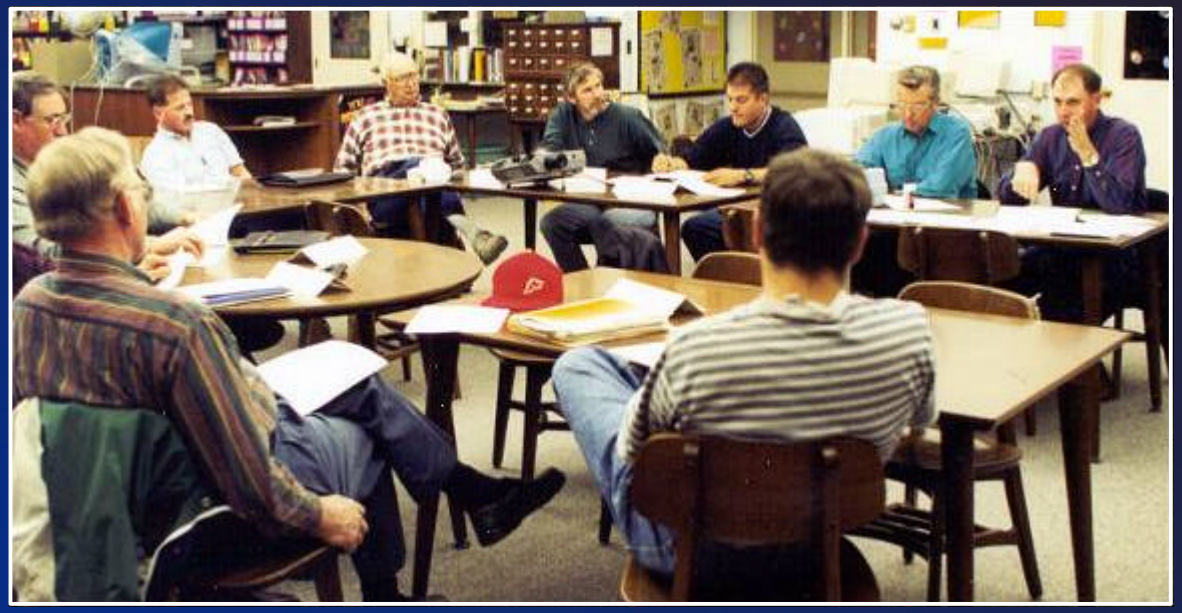
HUC 8 Watershed Assessment – IDNR/Maquoketa River Alliance coordinated



Initial Watershed Meeting

Watershed Council

Resident awareness, assessment, goal establishment, targeting, participation and performance evaluation.



Monitoring in the Maquoketa River Watershed

Research monitoring – intense, legislature-funded, ISU-IDNR managed

Resident IOWATER chemical and invertebrate volunteer monitoring

High School – Farm Bureau tile line monitoring

Hewitt-Hickory Creek Watershed
New Vienna
Hickory Creek
Hewitt Creek
Field of Dreams movie site
Dyersville
Farley
Epworth

Performance-based farm and watershed incentive outline

PERFORMANCE (outcome)-BASED FARM and WATERSHED ENVIRONMENTAL MANAGEMENT INDEXES

PHOSPHORUS INDEX (PI)

$400.00 payment if the weighted whole farm P index is less than a phosphorus loss risk of 3 (2-5 is medium risk). All field scores weighted by the field size and risk of P loss from each field.

$200.00 bonus if the P index is 2 or less (low) or for a 0.2 reduction in P-index.

$200.00 bonus if all fields test within or less than the optimum P University soil test range. Soil test incentive of $10.00 per management area or field tested.

SOIL CONDITIONING INDEX (SCI)

$300.00 payment per 0.1 SCI above 0. An average of all tracts in farming operation.

Example: a weighted farm average SCI of 0.4 will provide a payment of $1,200.00.

Major contributing practices to increase index scores include:

- Forage or small grains in rotation.
- Fall cover crop planting following whole plant removal (silage harvest).
- Reduced tillage and especially no-till planting.
- Soil Conservation practices and structures including: waterways, contouring, contour buffers, terraces, headland planting, sediment control structures, etc.

NITROGEN PERFORMANCE MANAGEMENT (Corn Stalk Nitrate-Nitrogen analysis)

$400.00 payment if the farm weighted average analyses does not exceed 1,700ppm.

$200.00 bonus if the weighted average of all analyses is less than 1,300ppm or within 200ppm of the average of all watershed samples analyzed.

$80.00 for the first two NO_3N samples analyzed and $25.00 for each additional field.

$200.00 bonus for a wetland impoundment or if drainage tile management of spacing and depth or treatment system is used to reduce N delivery.

OTHER INCENTIVES

$200.00 For manure application calibration, manure analysis and nutrient Mgt. Demo..

$200.00 Grid sampling and variable rate fertilizer application (40 acres plus per year).

$200.00 Install a manure settling basin and grass filter or pre-lot water diversion.

$200.00 Livestock Exclusion (stream fencing) (may flash graze 3 times per year).

$200.00 Managed grazing (5 or more paddocks).

$200.00 Septic system up-grade. Low interest revolving fund loans are available.

$100.00 Farmstead Assessment (self assessment).

$0.50/ft., maximum 1,200 ft., waterways, headlands, or buffers, minimum 30' width.

WATERSHED ENVIRONMENTAL PERFORMANCE (add-on bonus).

$100.00 Bonus for each 10% increase above 20% of the land in the watershed enrolled in this Performance program. Payable to cooperators earning $1,500.00 or more watershed improvement incentives per farm operation.

$500.00 Three years of monitoring showing evidence of reduced contaminant delivery.

P Index Risk Ratings

Potential risk of P loss using current P and soil conservation practices:

- **Very Low (0-1):** P delivery impacts on water quality will be small. Excellent from an ecological water quality perspective.
- **Low (1-2):** P delivery to surface water is greater but current practices keep water quality impairment low.
- **Medium (2-5):** P delivery is significant, producing some water quality impairment. New practices should be considered.
- **High (5-15):** P delivery is likely large and water quality impairment is large. New practices are necessary to reduce P loss.
- **Very High (15+):** P delivery is very high and impacts on water quality are extreme. New soil conservation and P management practices that may require no P application must be implemented.

Iowa DNR P Index-based application rates

- Very Low/Low (0-2): Apply manure at or below N-based rates
- Medium (>2-5): Manure may be applied at N-based rates if current or planned practices will result in a rating of 5 or less for the next P Index determination. Cannot apply manure greater than 2X the P removal rate.
- High (>5-15): Manure cannot be applied until practices are adopted to lower the rating into the medium category. However, prior to Dec. 31, 2008 fields between 5 and 10 may receive manure at the P-based rate.
- Very High (>15): Manure may not be applied.

Information needed for RUSLE2

Location (county, township, section)

Dominant critical area (most erosive soil map unit)

Crop rotation + Average Yields

Soil conservation practices (contouring, terraces, buffer strips)

Field operations prior to and during each crop growing season in the crop rotation:

- Manure application (rate of liquid and/or solid)
- Fall tillage (depth and speed)
- Spring tillage (depth and speed)
- Planting (row spacing)
- Number and timing of sprayer trips
- Commercial fertilizer (type and timing)
- Stalk baling

RUSLE2 field summary

USDA NRCS

Rusle Program Version: Aug 4 2004
Rusle Science Version: 3/24/2004
Data Base: moses

RUSLE2 Erosion Calculation Record

Owner name:

Location: Dubuque County, Iowa

Field name	Soil	Slope T Value	Slope length, ft	Slope steepness, %
N1	Dubuque, IA\162C DOWNS SILT LOAM, 5 TO 9 PERCENT SLOPES\DOWNS silt loam 100%	5.0	200	7.0
N2	Dubuque, IA\162D DOWNS SILT LOAM, 9 TO 14 PERCENT SLOPES\DOWNS silt loam 100%	5.0	200	12
N3	Dubuque, IA\162D DOWNS SILT LOAM, 9 TO 14 PERCENT SLOPES\DOWNS silt loam 100%	5.0	200	12
N4	Dubuque, IA\162D2 DOWNS SILT LOAM, 9 TO 14 PERCENT SLOPES, MODERATELY ERODED\DOWNS silt loam 90%	5.0	200	12
S1	Dubuque, IA\480D2 ORWOOD SILT LOAM, 9 TO 14 PERCENT SLOPES, MODERATELY ERODED\ORWOOD silt loam 95%	5.0	200	12
S2	Dubuque, IA\480D2 ORWOOD SILT LOAM, 9 TO 14 PERCENT SLOPES, MODERATELY ERODED\ORWOOD silt loam 95%	5.0	200	12
S3	Dubuque, IA\183D2 DUBUQUE SILT LOAM, 20 TO 30 INCHES TO LIMESTONE, 9 TO 14 PERCENT SLOPES, MODERATELY ERODED\DUBUQUE silt loam 95%	3.0	200	12
S4	Dubuque, IA\27B TERRIL LOAM, 2 TO 5 PERCENT SLOPES\TERRIL loam 100%	5.0	200	4.0
hay	Dubuque, IA\183D2 DUBUQUE SILT LOAM, 20 TO 30 INCHES TO LIMESTONE, 9 TO 14 PERCENT SLOPES, MODERATELY ERODED\DUBUQUE silt loam 95%	3.0	200	4.0

Results:

Field name	Description	Contouring system	Support practices	Terrace/diversion system	Cons. plan. soil loss, t/ac/yr	Sed. delivery, t/ac/yr	Soil conditioning index (SCI)	STIR value
N1	swine manure, rye covercrop, corn, corn, soybean	b. absolute row grade 2 percent	-- none --	-- none --	1.9	1.9	0.72	20
N2	swine manure, rye covercrop, corn, corn, soybean	b. absolute row grade 2 percent	-- none --	-- none --	3.3	3.3	0.61	20
						5.0	0.47	20
						5.0	0.47	20
						3.6	0.59	20
	manure, rye covercrop, corn, corn, soybean	row grade 3 percent				3.6	0.59	20
S3	swine manure, rye covercrop, corn, corn, soybean	b. absolute row grade 2 percent	-- none --	-- none --	3.8	3.8	0.57	20
S4	swine manure, rye covercrop, corn, corn, soybean	a. rows up-and-down hill	-- none --	-- none --	1.1	1.1	0.79	20

Additional Info for the P Index

Soil test for every 10 acres in a field

Presence of filter strips or field borders (width)

Phosphorus application rate (manure and commercial)

Presence of tile drainage

Distance to perennial stream

Length of recurring (ephemeral) gullies

Farm Detail Report

Iowa Phosphorous Index

Hewitt Creek Watershed

v. 7/1/2004

Credits: Iowa State University
USDA National Soil Tilth Laboratory
USDA Natural Resource Conservation Service

Field Number	Erosion							+	Runoff				+	Tile / Subsurface Recharge			=	Overall
	Gross Erosion	x Sediment Trap Factor	x SDR	x Buffer Factor	x Enrichment Factor	x STP Factor	= Erosion PI		RCN Factor	x (STP Factor	+ P App Factor	) = Runoff PI		Flow Factor	x STP Factor	= Tile/Sub PI		P Index
Field – N1	2.89	1.00	0.39	1.00	1.10	1.05	1.30		1.30	0.47	0.05	0.68		0.00	0.08	0.00		1.98
Field – N2	4.40	1.00	0.39	1.00	1.10	1.05	2.01		1.30	0.47	0.05	0.68		0.00	0.08	0.00		2.69
Field – N3	7.06	1.00	0.37	1.00	1.10	1.02	2.94		1.36	0.43	0.05	0.65		0.00	0.08	0.00		3.59
Field – N4	6.41	1.00	0.37	1.00	1.10	1.02	2.63		1.36	0.43	0.05	0.65		0.00	0.08	0.00		3.28
Field – S1	4.81	1.00	0.48	1.00	1.10	0.79	2.01		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.29
Field – S2	4.92	1.00	0.43	1.00	1.10	0.79	1.85		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.12
Field – S3	5.53	1.00	0.56	1.00	1.10	0.79	2.69		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.97
Field – S4	1.10	1.00	0.47	1.00	1.10	0.79	0.45		1.36	0.16	0.05	0.29		0.00	0.08	0.00		0.74

Weighted Average P Index and SCI

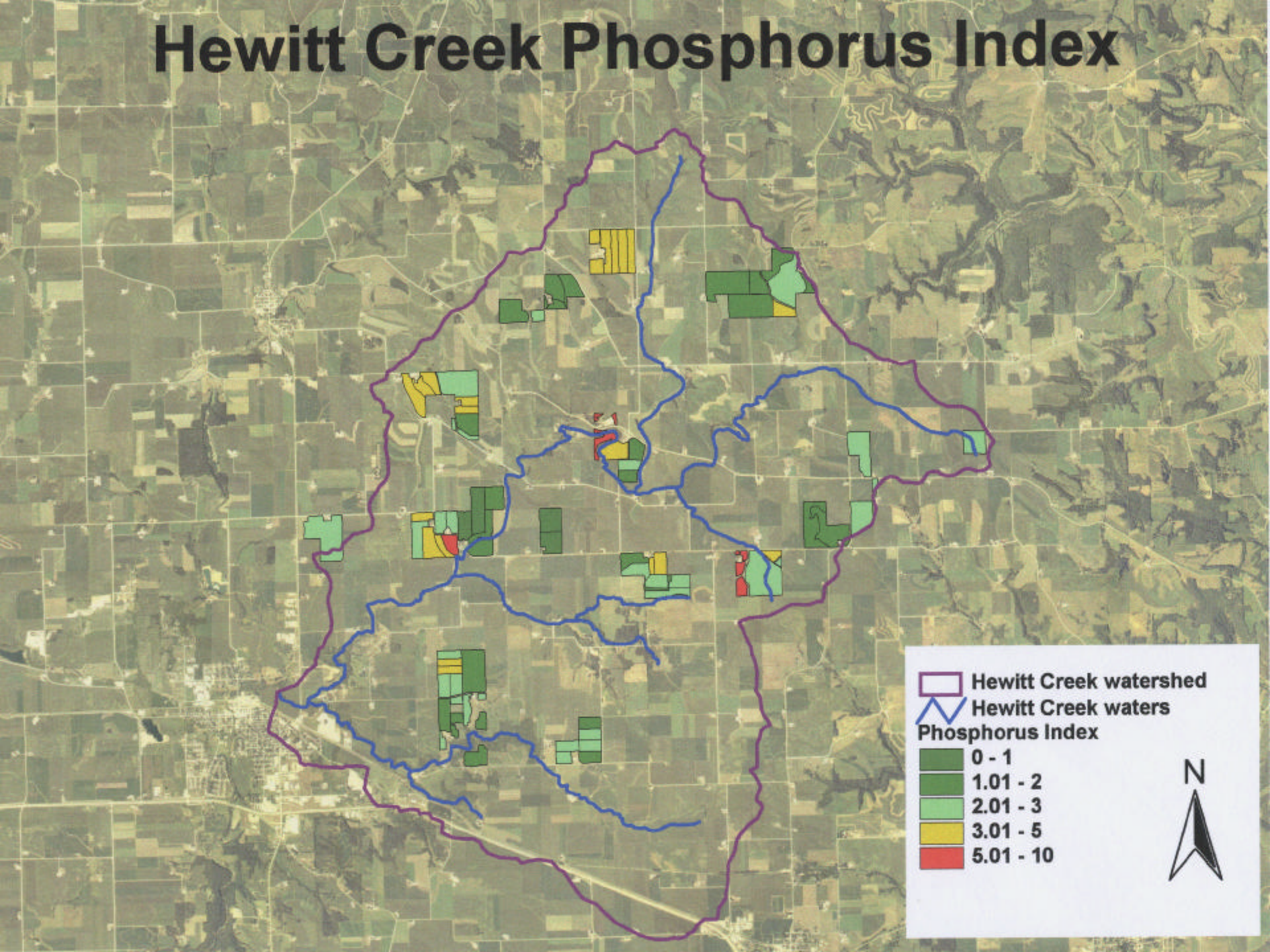
	Acres	P Index	SCI value
Field – N1	23.3	1.98	0.72
Field – N2	23.6	2.69	0.61
Field – N3	6.8	3.59	0.47
Field – N4	20.5	3.28	0.47
Field – S1	21.8	2.30	0.59
Field – S2	19.7	2.12	0.59
Field – S3	24.7	2.97	0.57
Field – S4	3.3	0.74	0.79

total acres = 143.70

weighted average P Index = 2.57

weighted average soil conditioning index = 0.59

Hewitt Creek Phosphorus Index



Soil Conditioning Index

The Soil Conditioning Index is a tool used to predict the consequences of cropping systems and tillage practices on organic matter using a scale ranging from -1 to 1.

The SCI is imbedded within the RUSLE2 soil loss model used by NRCS and has 3 main components.

- The amount of organic matter returned/removed from the soil
- The effect of tillage and field operations on OM decomposition
- The effect of predicted soil erosion associated with management

Soil Conditioning Index

A negative value predicts that the soil will have declining organic matter, while a positive value predicts that the soil will have increasing organic matter.

NRCS uses the SCI to determine basic eligibility for the Conservation Security Program.

Cropland must have a value of 0.00 or above to qualify for CSP.

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	manure, rye covercrop, corn, corn, soybean	row grade 3 percent				3.6	0.59	20
S3	swine manure, rye covercrop, corn, corn, soybean	b. absolute row grade 2 percent	-- none --	-- none --	3.8	3.8	0.57	20
S4	swine manure, rye covercrop, corn, corn, soybean	a. rows up-and-down hill	-- none --	-- none --	1.1	1.1	0.79	20

Farm Detail Report

Iowa Phosphorous Index

Hewitt Creek Watershed

v. 7/1/2004

Credits: Iowa State University
USDA National Soil Tilth Laboratory
USDA Natural Resource Conservation Service

Field Number	Erosion							+	Runoff				+	Tile / Subsurface Recharge			=	Overall
	Gross Erosion	x Sediment Trap Factor	x SDR	x Buffer Factor	x Enrichment Factor	x STP Factor	= Erosion PI		RCN Factor	x (STP Factor	+ P App Factor	) = Runoff PI		Flow Factor	x STP Factor	= Tile/Sub PI		P Index
Field – N1	2.89	1.00	0.39	1.00	1.10	1.05	1.30		1.30	0.47	0.05	0.68		0.00	0.08	0.00		1.98
Field – N2	4.40	1.00	0.39	1.00	1.10	1.05	2.01		1.30	0.47	0.05	0.68		0.00	0.08	0.00		2.69
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Field – S1	4.81	1.00	0.48	1.00	1.10	0.79	2.01		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.29
Field – S2	4.92	1.00	0.43	1.00	1.10	0.79	1.85		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.12
Field – S3	5.53	1.00	0.56	1.00	1.10	0.79	2.69		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.97
Field – S4	1.10	1.00	0.47	1.00	1.10	0.79	0.45		1.36	0.16	0.05	0.29		0.00	0.08	0.00		0.74

Weighted Average P Index and SCI

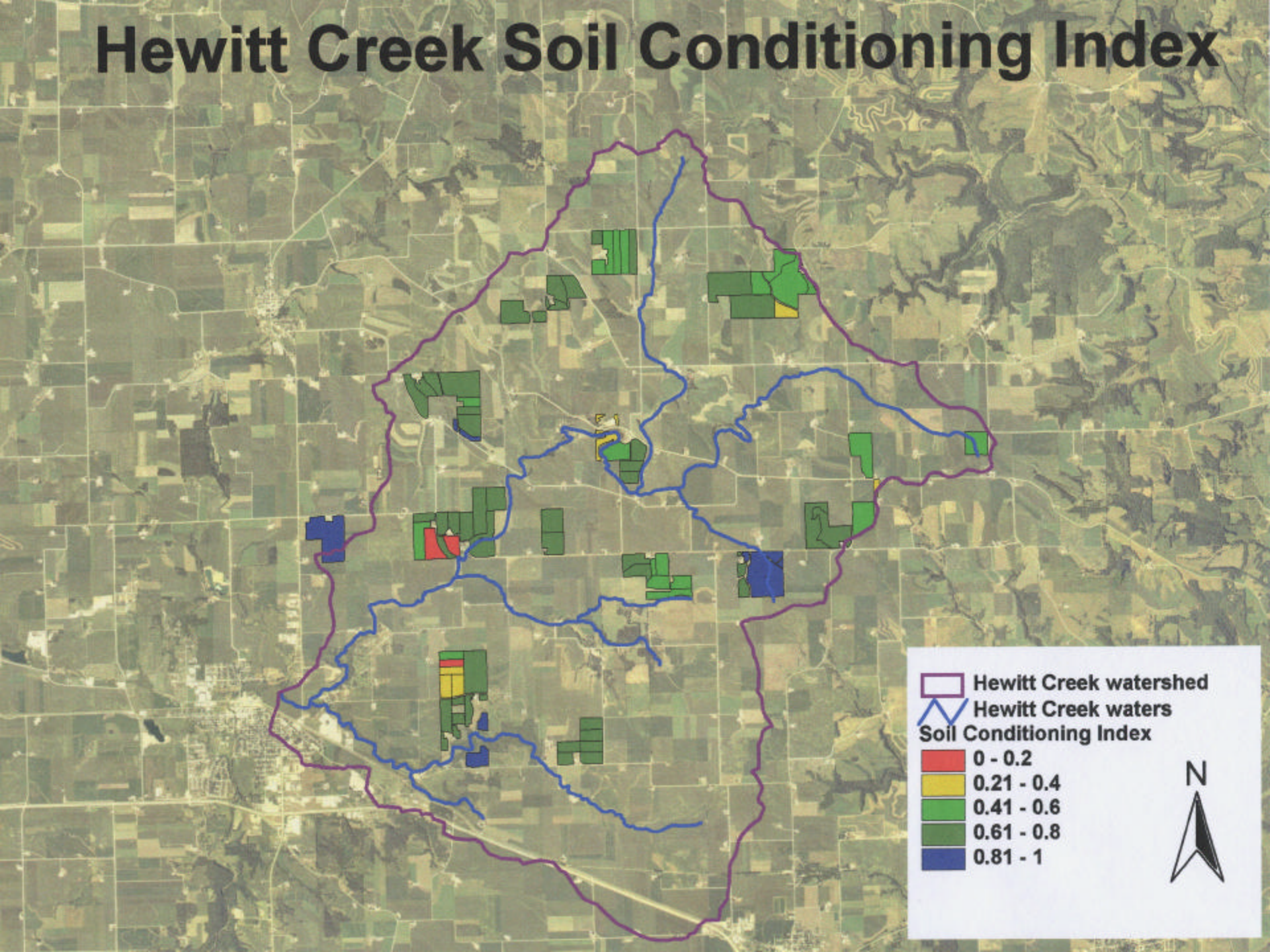
	Acres	P Index	SCI value
Field – N1	23.3	1.98	0.72
Field – N2	23.6	2.69	0.61
Field – N3	6.8	3.59	0.47
Field – N4	20.5	3.28	0.47
Field – S1	21.8	2.30	0.59
Field – S2	19.7	2.12	0.59
Field – S3	24.7	2.97	0.57
Field – S4	3.3	0.74	0.79

total acres = 143.70

weighted average P Index = 2.57

weighted average soil conditioning index = 0.59

Hewitt Creek Soil Conditioning Index

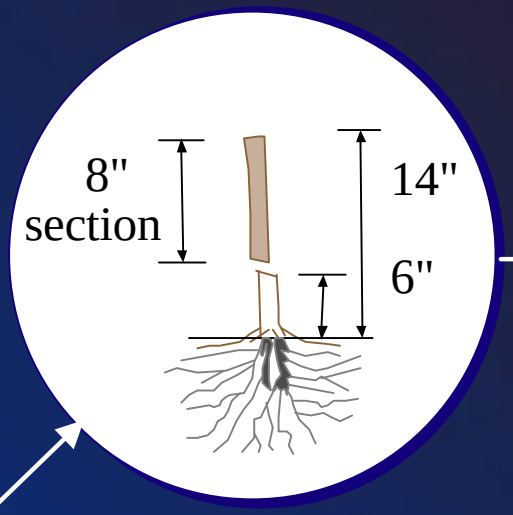


6	22.2		1.95		0.68		65		0	700	CCCOHHH	Y
8H	9.8		1.94		0.67		44		0	990	CCSCOHHH	N
6H	28.9		1.94		0.72		58		0	1750	CCSCOHHH	N
west	27.5		1.91		0.51		19		0	990	CS	Y
W3	2.5		1.91		0.75		17		0	2070	CCOHHHH	Y
W4	10.0		1.89		0.76		17		0	1570	CCOHHHH	Y
north	37.1		1.88		0.52		29		0	2610	CS	Y
8	22.5		1.87		0.63		42		0	550	CSCOHH	N
W6	29.5		1.86		0.72		17		0	2090	CCOHHHH	Y
4	25.2		1.85		0.53		43		0	2040	CSCOHH	Y
east	9.9		1.83		0.52		43		0	1650	CS	Y
8	16.7	Low 868.1 acres	1.78	Avg 1.68	0.73	Avg .70	65	Avg 46 ppm	0	550	CCCOHHH	N
9H	5.8		1.78		0.78		60		0	780	CCCOHHHH	N
S4	11.8		1.73		0.89		60		0	430	CC	N
R5	28.8		1.69		0.71		45		0	490	CS	Y
S5	27.8		1.68		0.85		60		0	710	CC	N
4	20.4		1.66		0.77		66		0	2700	CCOMMM	N
W1	45.1		1.62		0.73		17		0	2000	CCOHHHH	Y
W5	31.5		1.57		0.76		17		0	2300	CCOHHHH	Y
II	52.2		1.48		0.62		49		0	2300	CS	Y
I	59.4		1.38		0.69		87		0	2690	CS	Y
N1	76.8		1.22		0.71		35		0	1670	CS	Y
S1	74.5		1.22		0.66		60		0	2510	CS	N
R3	22.3		1.21		0.79		45		0	250	CS	N
N2	80.6		1.15		0.71		35		0	1360	CS	N
R4	33.1		1.10		0.76		45		0	1200	CS	N
R2	47.7		0.96		0.76		45		0	1610	CS	N
R1	28.8	Very Low 153.7 acres	0.87	Avg .81	0.76	Avg .76	45	Avg 40 ppm	0	1030	CS	N
R7	39.0		0.81		0.74		45		0	2700	CS	N
S4	3.3		0.74		0.79		22		0	1200	CCSR	N
R6	34.9		0.66		0.77		45		0	2980	CS	Y

13 farms - 102 fields						
Weighted avg. 102 fields	2439.8	2.33	0.63	61	0	1737

P Index category	Avg. field size	Weighted average value				
High	7.9	6.50	0.41	151	0	530
Medium	22.4	2.79	0.58	67	0	1788
Low	31.0	1.55	0.69	46	0	1698
Very Low	30.7	0.83	0.76	45	0	2080

End-of-Season Stalk NO_3-N Test



The optimum range is **700-2000 ppm N**. Results falling in the optimum range are expected to produce the most profitable return to the nitrogen/manure investment.

End-of-Season Stalk NO_3-N Test

	Excessive stalk N (>2000 ppm): N level is in excess of what the crop needed for normal development, grain yield is maximized and additional N would not be used by the crop
2000 ppm	
	Optimal stalk N (700-2000 ppm): N availability close to the rate needed to maximize yield, return to applied N was optimized, additional N would not have increased yield enough to recoup the cost of the additional N
700 ppm	
	Marginal stalk N (250-700 ppm): N level is close to the minimal amount needed, additional N may or may not have increased yield
250 ppm	
	Low stalk N (<250 ppm): additional N would have likely increased yield

Stalk NO_3-N producer summary

Hewitt Creek Stalk Nitrate Test Results

ID	Name	Sample #	Stalk NO3-N	N application	Estimated N	Crop History	Yield
1		1	1,870	107/A Cattle shed manure + 90N as 28% , LSNT 30	240 Lbs.	C-C	202
		2	1,790	107/A Cattle shed manure + 50N as 28%, LSNT 30	200 Lbs.	C-C	210
		3	2,620	15,000 gal/A cattle pit manure, LSNT 40	300 Lbs.	C-C	205
2		1	6,240	160 units N as urea	160 Lbs.	C-C	
		2	6,750	160 units N as urea	160 Lbs.	C-C	
3		1	4,400	5,000 gal hog manure at 20N/1000 +100N as 28% South	220 Lbs.	C-B	
		2	7,230	5,000 gal hog manure at 20N/1000 +100N as 28% North	220 Lbs.	C-B	
4		2	5,000	90 units N banded as 20-0-4	90 Lbs.	C-B	215
		3	5,000	100 units N as anhydrous & field finisher	100 Lbs.	C-B	211
		4	5,280	100 units N as anhydrous w/pop-up & field finisher	100 Lbs.	C-B	212
		5	6,230	80 units N banded as 20-0-4	80 Lbs.	C-B	220
		6	3,450	80 units N banded as 20-0-4	80 Lbs.	C-B	222
		8	4,260	80 units N banded as 20-0-4 + 3,000 gal hog pit manure	260 Lbs.	C-B	240
		9	3,300	No commercial N - 3,000 gal hog pit manure	180 Lbs.	C-B	228
		10	2,030	80 units N banded as 20-0-4 + 3,000 gal hog pit manure	240 Lbs.	C-B	236
		7	3,040	40 units N banded as 20-0-4	40 Lbs.	C-B	221
		11	51	90 units N banded as 28%	90 Lbs.	C-C-C	145
		12	2,330	120 units N banded as 28%	120 Lbs.	C-C-C	179
		13	3,550	150 units N banded as 28%	150 Lbs.	C-C-C	186
5		1	9,490	90 units N as 28% banded + dairy manure	215 Lbs.	C-B	237
		2	11,100	No commercial N, dairy manure only	Est 250 lbs.	C-B	232
		3	7,820	No commercial N, no manure	0 Lbs.	C-B	226
		4	13,200	150 units N as 28%	150 Lbs.	C-B	223
7		1	9,880				
		2	3,540				
		3	2,440				
		4	5,240				
		5	8,000				
		6	936				
		7	8,280				
		8	11,700				
		9	6,910				
9		1	2,200	50 units N as Am. Sulfate, 30 N as 28% + 10 T/A dairy	140 Lbs.	C-30 yrs.	
		2	5,700	50 units N as Am. Sulfate, 30 N as 28% + 30 T/A dairy	260 Lbs.	C-C	
10		4	3,583	75 units N, 101 day corn, LSNT 25 + dairy manure	172 Lbs.	C-C	172
		4	7,373	75 units N, 108 day corn, LSNT 25 + dairy manure	172 Lbs.	C-C	185
		6	4,735	85 units N, 108 day corn, LSNT 40 + dairy manure	182 Lbs.	C-C	170
		6	8,455	85 units N, 101 day corn, LSNT 40 + dairy manure	182 Lbs.	C-C	165
12		1	257	175 units N as 28%	175 Lbs.	C-B	
		2	1,430	170 units N as 28%	170 Lbs.	C-B	
13		1	51	42 units Am. Sulfate + 9 units in starter	51 Lbs.	C-C	
		2	1,080	2,750 gal hog manure + 9 units in starter	133 Lbs	C-C	
15		1	701				
		2	1,820				
16		1	7,900	160 units spring anhydrous	160 Lbs.	C-C	
		2	4,580	120 units spring anhydrous	120 Lbs.	C-B	
25		1	6,340	15 T cattle shed manure + N		C-C	
		2	1,430	No manure, commercial N only		C-C	
26		1	5,160	10-15 T shed manure, 28% N and starter		C-B	
		2	5,440	No manure, 28% N and starter		C-B	
30		1	4,730	40 N as 28% + 4,000gal hog manure	240 Lbs.	C-B	
		2	3,640	120 N as spring anhydrous	120 Lbs.	C-B	
31		1	2,050	150 units N as 28% in spring, no-till	150 Lbs.	C-B	

Farm Detail Report

Iowa Phosphorous Index

Hewitt Creek Watershed

v. 7/1/2004

Credits: Iowa State University
USDA National Soil Tilth Laboratory
USDA Natural Resource Conservation Service

Field Number	Erosion							+	Runoff				+	Tile / Subsurface Recharge			=	Overall
	Gross Erosion	x Sediment Trap Factor	x SDR	x Buffer Factor	x Enrichment Factor	x STP Factor	= Erosion PI		RCN Factor	x (STP Factor	+ P App Factor	) = Runoff PI		Flow Factor	x STP Factor	= Tile/Sub PI		P Index
Field – N1	2.89	1.00	0.39	1.00	1.10	1.05	1.30		1.30	0.47	0.05	0.68		0.00	0.08	0.00		1.98
Field – N2	4.40	1.00	0.39	1.00	1.10	1.05	2.01		1.30	0.47	0.05	0.68		0.00	0.08	0.00		2.69
Field – N3	7.06	1.00	0.37	1.00	1.10	1.02	2.94		1.36	0.43	0.05	0.65		0.00	0.08	0.00		3.59
Field – N4	6.41	1.00	0.37	1.00	1.10	1.02	2.63		1.36	0.43	0.05	0.65		0.00	0.08	0.00		3.28
Field – S1	4.81	1.00	0.48	1.00	1.10	0.79	2.01		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.29
Field – S2	4.92	1.00	0.43	1.00	1.10	0.79	1.85		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.12
Field – S3	5.53	1.00	0.56	1.00	1.10	0.79	2.69		1.30	0.16	0.05	0.28		0.00	0.08	0.00		2.97
Field – S4	1.10	1.00	0.47	1.00	1.10	0.79	0.45		1.36	0.16	0.05	0.29		0.00	0.08	0.00		0.74

Weighted Average P Index and SCI

	Acres	P Index	SCI value
Field – N1	23.3	1.98	0.72
Field – N2	23.6	2.69	0.61
Field – N3	6.8	3.59	0.47
Field – N4	20.5	3.28	0.47
Field – S1	21.8	2.30	0.59
Field – S2	19.7	2.12	0.59
Field – S3	24.7	2.97	0.57
Field – S4	3.3	0.74	0.79

total acres = 143.70

weighted average P Index = 2.57

weighted average soil conditioning index = 0.59

Performance-based farm and watershed incentive outline

PERFORMANCE (outcome)-BASED FARM and WATERSHED ENVIRONMENTAL MANAGEMENT INDEXES

PHOSPHORUS INDEX (PI)

$400.00 payment if the weighted whole farm P index is less than a phosphorus loss risk of 3 (2-5 is medium risk). All field scores weighted by the field size and risk of P loss from each field.

$200.00 bonus if the P index is 2 or less (low) or for a 0.2 reduction in P-index.

$200.00 bonus if all fields test within or less than the optimum P University soil test range. Soil test incentive of $10.00 per management area or field tested.

SOIL CONDITIONING INDEX (SCI)

$300.00 payment per 0.1 SCI above 0. An average of all tracts in farming operation.

Example: a weighted farm average SCI of 0.4 will provide a payment of $1,200.00.

Major contributing practices to increase index scores include:

- Forage or small grains in rotation.
- Fall cover crop planting following whole plant removal (silage harvest).
- Reduced tillage and especially no-till planting.
- Soil Conservation practices and structures including: waterways, contouring, contour buffers, terraces, headland planting, sediment control structures, etc.

NITROGEN PERFORMANCE MANAGEMENT (Corn Stalk Nitrate-Nitrogen analysis)

$400.00 payment if the farm weighted average analyses does not exceed 1,700ppm.

$200.00 bonus if the weighted average of all analyses is less than 1,300ppm or within 200ppm of the average of all watershed samples analyzed.

$80.00 for the first two NO_3N samples analyzed and $25.00 for each additional field.

$200.00 bonus for a wetland impoundment or if drainage tile management of spacing and depth or treatment system is used to reduce N delivery.

OTHER INCENTIVES

$200.00 For manure application calibration, manure analysis and nutrient Mgt. Demo..

$200.00 Grid sampling and variable rate fertilizer application (40 acres plus per year).

$200.00 Install a manure settling basin and grass filter or pre-lot water diversion.

$200.00 Livestock Exclusion (stream fencing) (may flash graze 3 times per year).

$200.00 Managed grazing (5 or more paddocks).

$200.00 Septic system up-grade. Low interest revolving fund loans are available.

$100.00 Farmstead Assessment (self assessment).

$0.50/ft., maximum 1,200 ft., waterways, headlands, or buffers, minimum 30' width.

WATERSHED ENVIRONMENTAL PERFORMANCE (add-on bonus).

$100.00 Bonus for each 10% increase above 20% of the land in the watershed enrolled in this Performance program. Payable to cooperators earning $1,500.00 or more watershed improvement incentives per farm operation.

$500.00 Three years of monitoring showing evidence of reduced contaminant delivery.

Watershed Incentive Summary

Performance (outcome)-based Farm and Watershed Environmental Management Indexes and Incentives, 2005 Baseline

Farm	Acres	Weighted P-index P-index	Weighted P-index Payment	Weighted SCI SCI value	Weighted SCI Payment	Weighted NO_3N NO_3N ppm	Weighted NO_3N Payment	NO_3N Sampling	Manure Management	Other Incentives	Total Incentives	Incentives Per Acre
	544	1.24	$600	0.74	$2,220	3,629	$200	$180	$200	$300	$3,700	$6.80
	112	1.43	600	0.66	1,980			80		300	2,960	26.43
	183	2.02	400	0.50	1,500			105		300	2,305	12.60
	111	2.19	400	0.73	2,190	10,402	0	130	200	100	3,020	27.21
	167	2.26	400	0.52	1,560	1,907	200	180	200	500	3,040	18.20
	153	2.27	400	0.44	1,320			130		500	2,350	15.36
	141	2.45	400	0.47	1410	5,815	0	180	200	500	2,690	19.08
	144	2.57	400	0.59	1,770			130	200	300	2,800	19.44
	265	2.72	400	0.66	1,980	844	600	180	200	500	3,860	14.57
	217	2.86	400	0.69	2,070	6,495	0	180	200	300	3,150	14.52
	138	3.35	–	0.85	2,550	3,950	200	180		500	3,430	24.86
	151	3.42	–	0.47	1,410			180	200	500	2,290	15.17
	114	3.77	–	0.52	1560	1,160	600	130		300	2,590	22.72
Average	**188**		**$338**		**$1,809**		**$138**	**$151**	**$123**	**$377**	**$2,937**	
Weighted watershed ave.		2.33		0.63		5,066	(12 farms/46 samples)					$15.65

November 21, 2005

Discussion ...

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