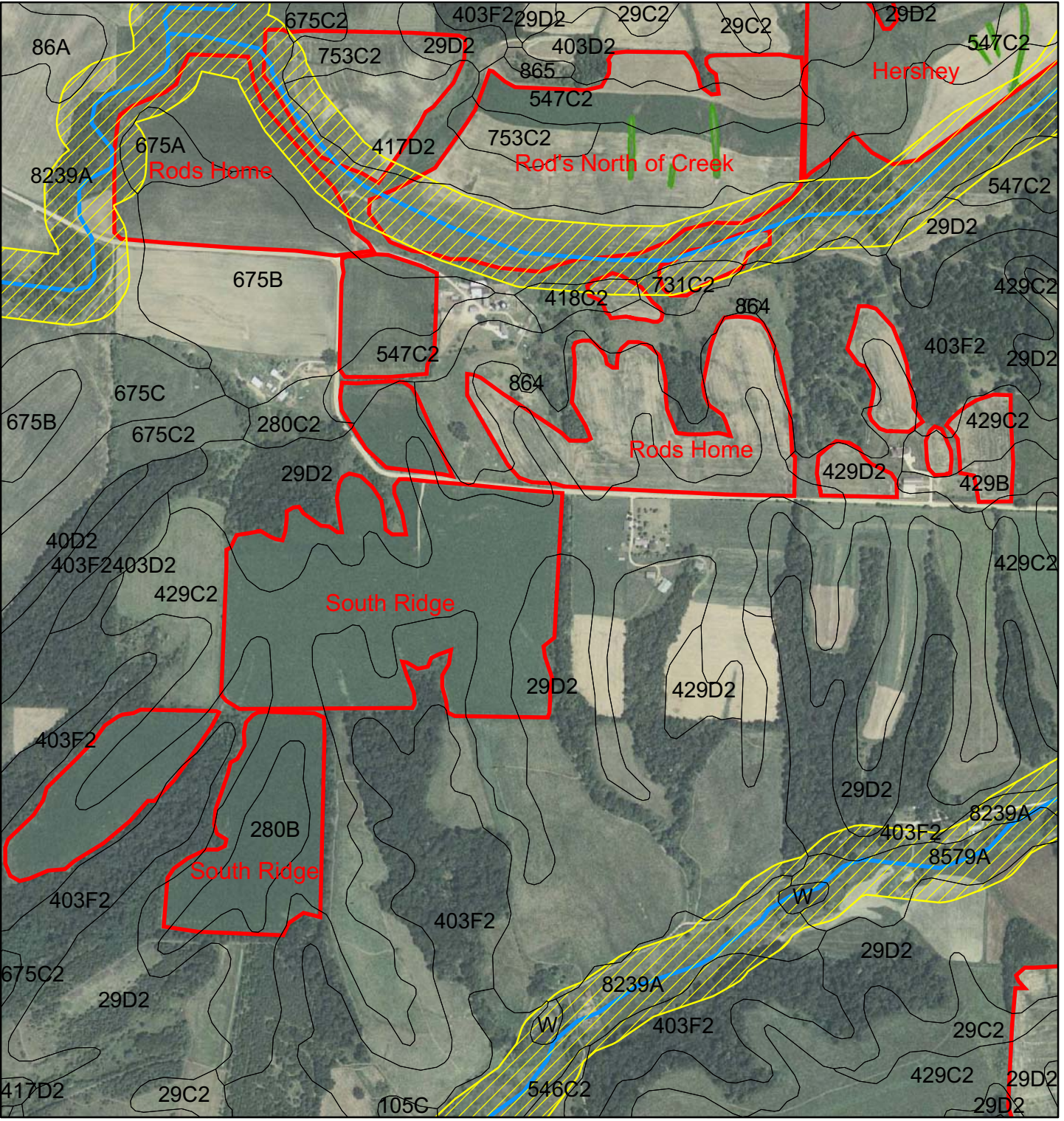


Birchen Farms

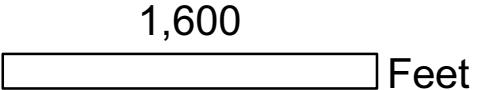
Individual Fields

Soil Map



Legend

- Fields
- Water
- Water Buffer
- Wells
- Well Buffer
- Water Way
- Livestock Facilities
- Livestock Waste Storage



Frank & West
 Environmental Engineers, Inc.
 7226 N. State Route 29 Phone: 217/487-7686
 Springfield, IL 62707 Fax: 217/487-7687

Birchen Farms

Individual Fields

Soil Map

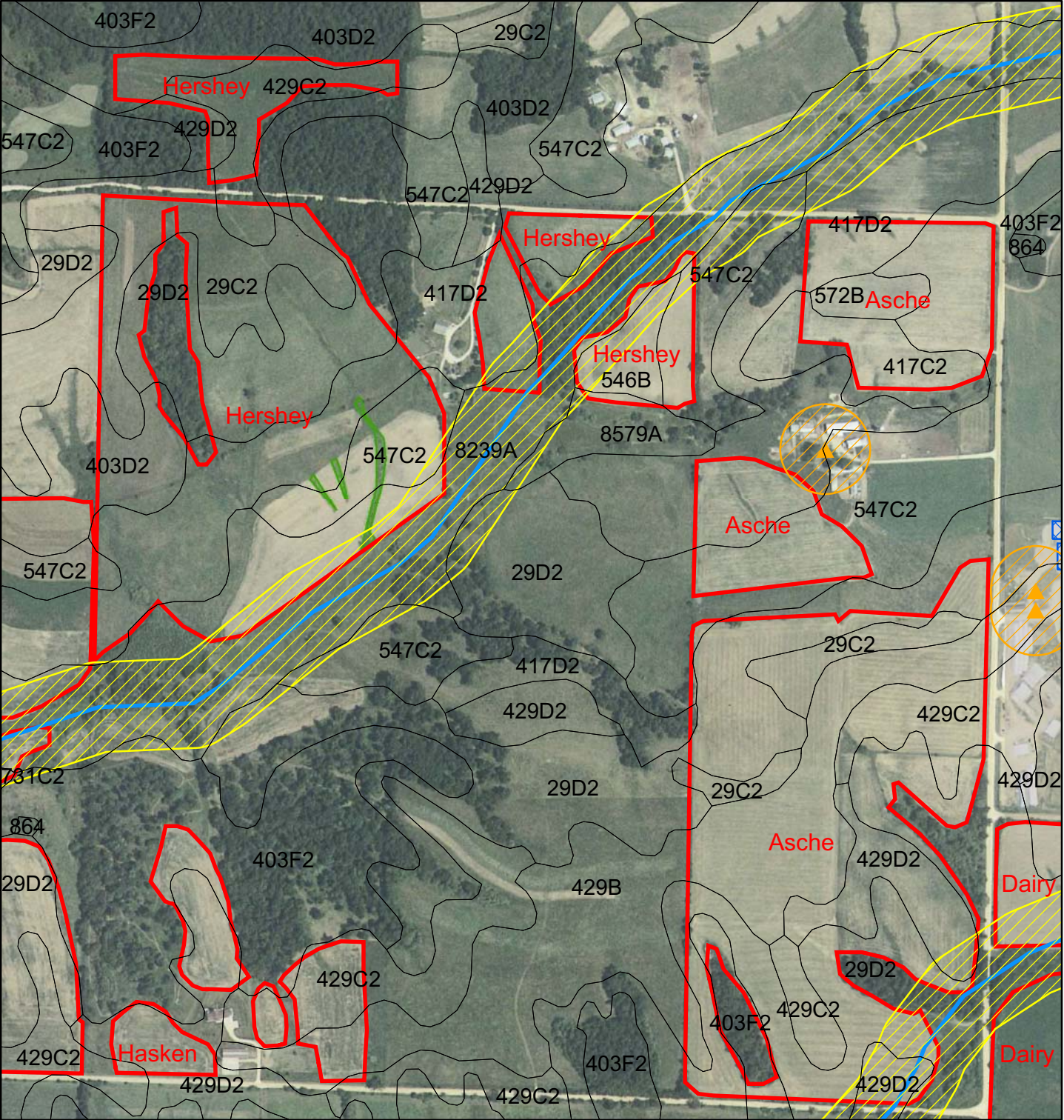


Legend

- Fields
- Water
- Water Buffer
- Wells
- Well Buffer
- Water Way
- Livestock Facilities
- Livestock Waste Storage

1,250 Feet

 **Frank & West**
Environmental Engineers, Inc.
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Springfield, IL 62707 Fax: 217/487-7687



Individual Field Information**Birchen Farms INC.**

Field Name:	<u>Hershey</u>	Total Acres	73.9
		Non-Spreadable Acres	7.0
Township	Jefferson	Total Spreadable Acres	66.9
Section	23		
FSA Farm #	7080	Predominant Soil Type:	29D2 Debuque silt loam, 10-18% slopes, eroded
FSA Tract #	4572	P test	26
FSA Field #'s	1-9	K test	306

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa	Alfalfa
Yield	(bu/acre OR ton/acre)		180	60	7	7	7
N needed (lbs/ac)	lbs/ac		216	60	0	0	0
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		10.5	23.4	18.5	9.3	4.0
Total N Credits	(lb/acre)		10.5	23.4	18.5	9.3	4.0
Crop N Need Minus Credits	(lb/acre)		205.5	36.6	-18.5	-9.3	-4.0
Maintenance P needed *	(lb/acre)		77.4	23.0	84.0	84.0	84.0
Maintenance K needed *	(lb/acre)		50.4	12.0	350.0	350.0	350.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
Hershey		2009	2010	2011	2012	2013	2014
Manure Application		Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa	Alfalfa
Storage		Liquid	Liquid	Solid			Liquid
Application Method		Inject	Inject	Broadcast			Broadcast
Storage/Application Method			LINE1	LINE2			LINE1
1st Year Available N (<i>Am-N * N retention due to app method</i>) + (<i>OrgN * .35</i>)	(lb/1000 gal)		11.90	5.67			11.90
N App Rate (<i>Crop N Need / 1st Yr Av N</i>)	(1000 gal/acre)		17.3	6.5			-0.3
P App Rate (<i>Maintenance P / P in analysis</i>)	(1000 gal/acre)		9.80	7.67			10.63
Apply at Prate or Nrate?			Nrate	Nrate			Prate
Application Rate to Use	(1000 gal)	10.0	17.3	6.5	0.0	0.0	10.6
Total application (<i>App Rate * Spreadable Acres</i>)	(gallons)		1,154,772	400			711,023
N applied (<i>1st Year AvN * App rate</i>)	(lb/acre)		206	37			127
P applied (<i>P in manure * App rate</i>)	(lb/acre)		206	20			84
K applied (<i>K in manure * App rate</i>)	(lb/acre)		136	39			191
Additional N Needed	(lb/acre)		0	0	-19	-9	-131
Acres Covered	(acres)		66.9	61.5	0.0	0.0	66.9

Individual Field Information

Birchen Farms INC.

Field Name:	<u>Hasken</u>	Total Acres	11.1
		Non-Spreadable Acres	0.0
Township	Jefferson	Total Spreadable Acres	11.1
Section	26		
FSA Farm #	5149	Predominant Soil Type:	429D2 Palsgrove silt loam, 10-18% slopes, eroded
FSA Tract #	4459	P test	0
FSA Field #'s	1, 7, & 12	K test	0

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Silage	Oat/ Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
Yield	(bu/acre OR ton/acre)		60	7	7	7	7
N needed (lbs/ac)	lbs/ac		60	0	0	0	0
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		10.5	5.3	2.6	1.3	0.0
Total N Credits	(lb/acre)		10.5	5.3	2.6	1.3	0.0
Crop N Need Minus Credits	(lb/acre)		49.5	-5.3	-2.6	-1.3	0.0
Maintenance P needed *	(lb/acre)		23.0	84.0	84.0	84.0	84.0
Maintenance K needed *	(lb/acre)		12.0	350.0	350.0	350.0	350.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
Hasken		2009	2010	2011	2012	2013	2014
Manure Application		Silage	Oat/ Alfalfa	Alfalfa	Alfalfa	Alfalfa	Alfalfa
Storage							Liquid
Application Method							Broadcast
Storage/Application Method							LINE1
1st Year Available N (<i>Am-N * N retention due to app method</i>) + (<i>OrgN * .35</i>)	(lb/1000 gal)						11.90
N App Rate (<i>Crop N Need / 1st Yr Av N</i>)	(1000 gal/acre)						0.0
P App Rate (<i>Maintenance P / P in analysis</i>)	(1000 gal/acre)						10.63
Apply at Prate or Nrate?							Prate
Application Rate to Use	(1000 gal)	10.0	0.0	0.0	0.0	0.0	10.6
Total application (<i>App Rate * Spreadable Acres</i>)	(gallons)						117,706
N applied (<i>1st Year AvN * App rate</i>)	(lb/acre)						127
P applied (<i>P in manure * App rate</i>)	(lb/acre)						84
K applied (<i>K in manure * App rate</i>)	(lb/acre)						191
Additional N Needed	(lb/acre)		50	-5	-3	-1	-127
Acres Covered	(acres)		0.0	0.0	0.0	0.0	11.1

Individual Field Information**Birchen Farms INC.**

Field Name:	<u>Asche</u>	Total Acres	80.0
		Non-Spreadable Acres	3.4
Township	Jefferson	Total Spreadable Acres	76.6
Section	23		
FSA Farm #	5345	Predominant Soil Type:	429B Palsgrove silt loam, 2-5% slopes
FSA Tract #	1700	P test	59
FSA Field #'s	1-11	K test	229

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Alfalfa	Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa
Yield	(bu/acre OR ton/acre)		30	180	60	7	7
N needed (lbs/ac)	lbs/ac		180	216	60	0	0
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	15.9	25.6	12.8	17.6
Total N Credits	(lb/acre)		0.0	15.9	25.6	12.8	17.6
Crop N Need Minus Credits	(lb/acre)		180.0	200.1	34.4	-12.8	-17.6
Maintenance P needed *	(lb/acre)		78.0	77.4	23.0	84.0	84.0
Maintenance K needed *	(lb/acre)		210.0	50.4	12.0	350.0	350.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
Asche		2009	2010	2011	2012	2013	2014
Manure Application		Alfalfa	Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa
Storage			Liquid	Liquid		Liquid	
Application Method			Inject	Inject		Broadcast	
Storage/Application Method			LINE1	LINE1		LINE1	
1st Year Available N ($Am-N * N$ <i>retention due to app method</i>) + ($OrgN$ $* .35$)	(lb/1000 gal)		11.90	11.90		11.90	
N App Rate ($Crop N Need / 1st Yr Av N$)	(1000 gal/acre)		15.1	16.8		-1.1	
P App Rate ($Maintenance P / P in analysis$)	(1000 gal/acre)		9.87	9.80		10.63	
Apply at Prate or Nrate?			Nrate	Nrate		Prate	
Application Rate to Use	(1000 gal)	0.0	15.1	16.8	0.0	10.6	0.0
Total application ($App Rate * Spreadable Acres$)	(gallons)		1,158,958	1,288,489		814,471	
N applied ($1st Year AvN * App rate$)	(lb/acre)		180	200		126	
P applied ($P in manure * App rate$)	(lb/acre)		180	133		84	
K applied ($K in manure * App rate$)	(lb/acre)		119	303		191	
Additional N Needed	(lb/acre)		0	0	34	-139	-18
Acres Covered	(acres)		76.6	76.6	0.0	76.6	0.0

Individual Field Information**Birchen Farms INC.**

Field Name:	<u>South Ridge</u>	Total Acres	83.7
		Non-Spreadable Acres	0.0
Township	Jefferson	Total Spreadable Acres	83.7
Section	27		
FSA Farm #	7315	Predominant Soil Type:	429C2 Palsgrove silt loam, 5-10% slopes, eroded
	3578		
	3951		
FSA Tract #	1713	P test	58
	1 & 2		
	4		
FSA Field #'s	11	K test	237

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Alfalfa	Alfalfa	Silage	Corn	Oat/ Alfalfa	Alfalfa
Yield	(bu/acre OR ton/acre)		7	30	180	60	7
N needed (lbs/ac)	lbs/ac		0	180	216	60	0
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	0.0	15.9	25.6	12.8
Total N Credits	(lb/acre)		0.0	0.0	15.9	25.6	12.8
Crop N Need Minus Credits	(lb/acre)		0.0	180.0	200.1	34.4	-12.8
Maintenance P needed *	(lb/acre)		84.0	78.0	77.4	23.0	84.0
Maintenance K needed *	(lb/acre)		350.0	210.0	50.4	12.0	350.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
South Ridge		2009	2010	2011	2012	2013	2014
Manure Application		Alfalfa	Alfalfa	Silage	Corn	Oat/ Alfalfa	Alfalfa
Storage				Liquid	Liquid		
Application Method				Inject	Inject		
Storage/Application Method				LINE1	LINE1		
1st Year Available N ($Am-N * N$ retention due to app method) + (OrgN * .35)	(lb/1000 gal)			11.90	11.90		
N App Rate (Crop N Need / 1st Yr Av N)	(1000 gal/acre)			15.1	16.8		
P App Rate (Maintenance P / P in analysis)	(1000 gal/acre)			9.87	9.80		
Apply at Prate or Nrate?				Nrate	Nrate		
Application Rate to Use	(1000 gal)	0.0	0.0	15.1	16.8	0.0	0.0
Total application (App Rate * Spreadable Acres)	(gallons)			1,266,353	1,407,887		
N applied (1st Year AvN * App rate)	(lb/acre)			180	200		
P applied (P in manure * App rate)	(lb/acre)			119	133		
K applied (K in manure * App rate)	(lb/acre)			272	303		
Additional N Needed	(lb/acre)		0	0	0	34	-13
Acres Covered	(acres)		0.0	83.7	83.7	0.0	0.0

Individual Field Information

Birchen Farms INC.

Field Name:	<u>Rod's Home East</u>	Total Acres	45.0
		Non-Spreadable Acres	9.0
Township	Jefferson	Total Spreadable Acres	36.0
Section	22 & 27		
FSA Farm #	7315	Predominant Soil Type:	429C2 Palsgrove silt loam, 5-10% slopes, eroded
FSA Tract #	1713	P test	142
FSA Field #'s	1, 4-9	K test	468

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Alfalfa	Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa
Yield	(bu/acre OR ton/acre)		30	180	60	7	7
N needed (lbs/ac)	lbs/ac		180	216	60	0	0
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	15.9	25.6	12.8	6.4
Total N Credits	(lb/acre)		0.0	15.9	25.6	12.8	6.4
Crop N Need Minus Credits	(lb/acre)		180.0	200.1	34.4	-12.8	-6.4
Maintenance P needed *	(lb/acre)		78.0	77.4	23.0	84.0	84.0
Maintenance K needed *	(lb/acre)		210.0	50.4	12.0	350.0	350.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
Rod's Home East		2009	2010	2011	2012	2013	2014
Manure Application		Alfalfa	Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa
Storage			Liquid	Liquid			Liquid
Application Method			Inject	Inject			Broadcast
Storage/Application Method			LINE1	LINE1			LINE1
1st Year Available N (<i>Am-N * N retention due to app method</i>) + (<i>OrgN * .35</i>)	(lb/1000 gal)		11.90	11.90			11.90
N App Rate (<i>Crop N Need / 1st Yr Av N</i>)	(1000 gal/acre)		15.1	16.8			-0.5
P App Rate (<i>Maintenance P / P in analysis</i>)	(1000 gal/acre)		9.87	9.80			10.63
Apply at Prate or Nrate?			Nrate	Nrate			Prate
Application Rate to Use	(1000 gal)	0.0	15.1	16.8	0.0	0.0	10.6
Total application (<i>App Rate * Spreadable Acres</i>)	(gallons)		544,538	605,398			382,680
N applied (<i>1st Year AvN * App rate</i>)	(lb/acre)		180	200			126
P applied (<i>P in manure * App rate</i>)	(lb/acre)		180	133			84
K applied (<i>K in manure * App rate</i>)	(lb/acre)		119	303			191
Additional N Needed	(lb/acre)		0	0	34	-13	-133
Acres Covered	(acres)		36.0	36.0	0.0	0.0	36.0

Individual Field Information**Birchen Farms INC.**

Field Name:	<u>Rod's Home West</u>	Total Acres	25.0
		Non-Spreadable Acres	9.0
Township	Jefferson	Total Spreadable Acres	16.0
Section	22 & 27		
FSA Farm #	7315	Predominant Soil Type:	675B Greenbush silt loam, 2-5% slopes
FSA Tract #	1713	P test	142
FSA Field #'s	1, 4-9	K test	468

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Silage	Silage	Silage	Silage	Silage	Silage
Yield	(bu/acre OR ton/acre)		30	30	30	30	30
N needed (lbs/ac)	lbs/ac		180	180	180	180	180
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		0.0	15.9	22.4	25.1	26.2
Total N Credits	(lb/acre)		0.0	15.9	22.4	25.1	26.2
Crop N Need Minus Credits	(lb/acre)		180.0	164.1	157.6	154.9	153.8
Maintenance P needed *	(lb/acre)		78.0	78.0	78.0	78.0	78.0
Maintenance K needed *	(lb/acre)		210.0	210.0	210.0	210.0	210.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
Rod's Home West		2009	2010	2011	2012	2013	2014
Manure Application		Silage	Silage	Silage	Silage	Silage	Silage
Storage			Liquid	Liquid	Liquid	Liquid	Liquid
Application Method			Inject	Inject	Inject	Inject	Inject
Storage/Application Method			LINE1	LINE1	LINE1	LINE1	LINE1
1st Year Available N (<i>Am-N * N retention due to app method</i>) + (<i>OrgN * .35</i>)	(lb/1000 gal)		11.90	11.90	11.90	11.90	11.90
N App Rate (<i>Crop N Need / 1st Yr Av N</i>)	(1000 gal/acre)		15.1	13.8	13.2	13.0	12.9
P App Rate (<i>Maintenance P / P in analysis</i>)	(1000 gal/acre)		9.87	9.87	9.87	9.87	9.87
Apply at Prate or Nrate?		0.0	Nrate	Nrate	Nrate	Nrate	Nrate
Application Rate to Use	(1000 gal)		15.1	13.8	13.2	13.0	12.9
Total application (<i>App Rate * Spreadable Acres</i>)	(gallons)		242,017	220,662	211,869	208,249	206,758
N applied (<i>1st Year AvN * App rate</i>)	(lb/acre)		180	164	158	155	154
P applied (<i>P in manure * App rate</i>)	(lb/acre)		180	109	105	103	102
K applied (<i>K in manure * App rate</i>)	(lb/acre)		119	248	238	234	233
Additional N Needed	(lb/acre)		0	0	0	0	0
Acres Covered	(acres)		16.0	16.0	16.0	16.0	16.0

Individual Field Information**Birchen Farms INC.**

Field Name:	<u>Rod's North of Creek</u>	Total Acres	66.4
		Non-Spreadable Acres	18.0
Township	Jefferson	Total Spreadable Acres	48.4
Section	22 & 27		
FSA Farm #	7315	Predominant Soil Type:	417D2 Derinda silt loam, 10-18% slopes, eroded
FSA Tract #	1713	P test	142
FSA Field #'s	2 & 3	K test	468

Individual Field Application & Nutrients

Crop needs	Year	2009	2010	2011	2012	2013	2014
Crop		Silage	Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa
Yield	(bu/acre OR ton/acre)		30	180	60	7	7
N needed (lbs/ac)	lbs/ac		180	216	60	0	0
- Legume N credits	(lb/acre)		0	0	0	0	0
- Commercial fertilizer N credits	(lb/acre)						
- Manure N carryover credit **	(lb/acre)		10.5	20.2	27.4	13.7	6.2
Total N Credits	(lb/acre)		10.5	20.2	27.4	13.7	6.2
Crop N Need Minus Credits	(lb/acre)		169.5	195.8	32.6	-13.7	-6.2
Maintenance P needed *	(lb/acre)		78.0	77.4	23.0	84.0	84.0
Maintenance K needed *	(lb/acre)		210.0	50.4	12.0	350.0	350.0

* Maintenance P & K needed are listed for calculation & uptake purposes only

** Manure N carryover credit = Previous years' apps * Org N * Mineralization factor

Birchen Farms INC.							
Rod's North of Creek		2009	2010	2011	2012	2013	2014
Manure Application		Silage	Silage	Corn	Oat/ Alfalfa	Alfalfa	Alfalfa
Storage			Liquid	Liquid			Liquid
Application Method			Inject	Inject			Broadcast
Storage/Application Method			LINE1	LINE1			LINE1
1st Year Available N (<i>Am-N * N retention due to app method</i>) + (<i>OrgN * .35</i>)	(lb/1000 gal)		11.90	11.90			11.90
N App Rate (<i>Crop N Need / 1st Yr Av N</i>)	(1000 gal/acre)		14.2	16.5			-0.5
P App Rate (<i>Maintenance P / P in analysis</i>)	(1000 gal/acre)		9.87	9.80			10.63
Apply at Prate or Nrate?			Nrate	Nrate			Prate
Application Rate to Use	(1000 gal)	10.0	14.2	16.5	0.0	0.0	10.6
Total application (<i>App Rate * Spreadable Acres</i>)	(gallons)		689,253	796,175			514,527
N applied (<i>1st Year AvN * App rate</i>)	(lb/acre)		170	196			127
P applied (<i>P in manure * App rate</i>)	(lb/acre)		170	130			84
K applied (<i>K in manure * App rate</i>)	(lb/acre)		113	296			191
Additional N Needed	(lb/acre)		0	0	33	-14	-133
Acres Covered	(acres)		48.4	48.4	0.0	0.0	48.4