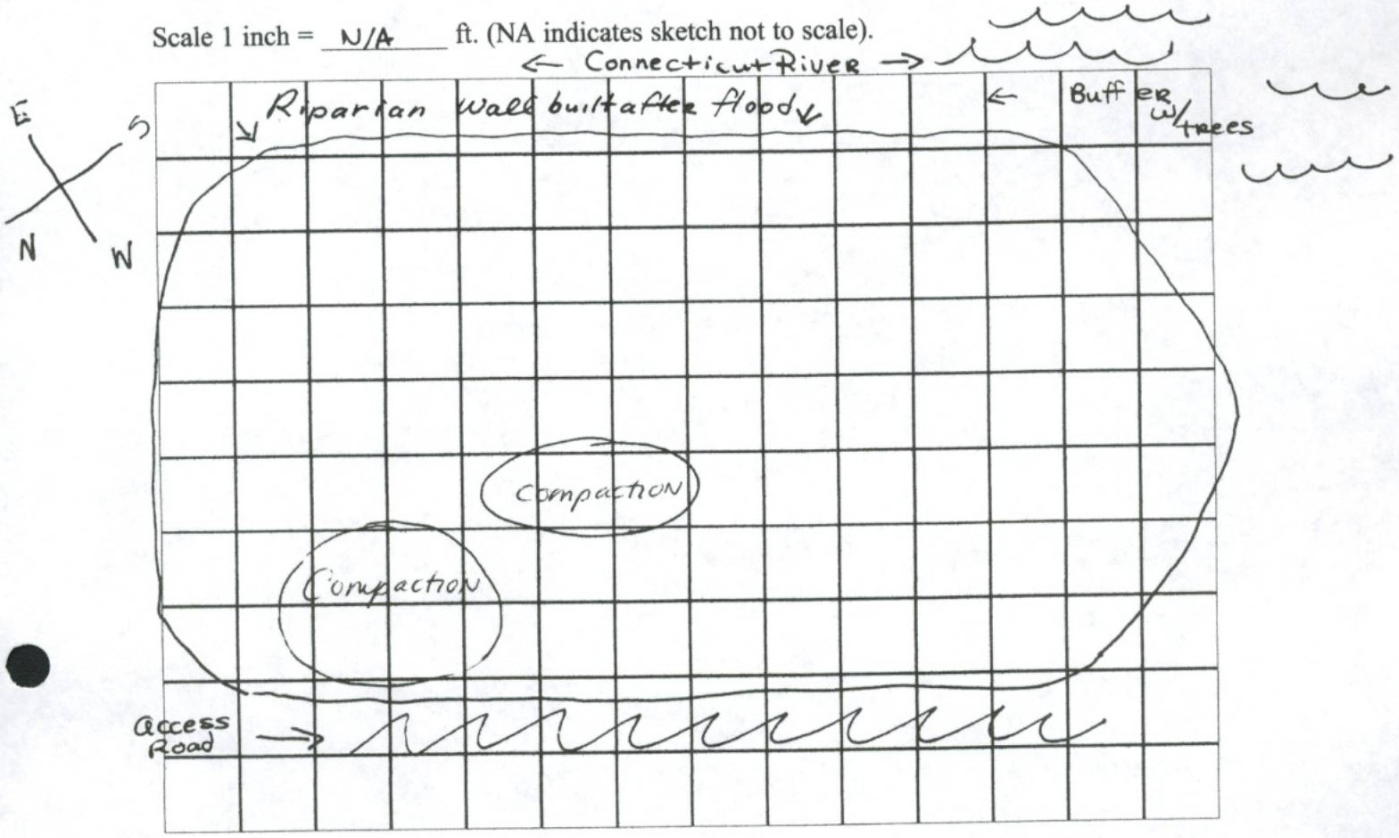
Soil Quality Evaluation Site Description

Site Description		DATE: 4-29-04
Map Location	State: Vermont	County: Orange
Geographic Location	Longitude: 72:09:45.130W	Latitude: 43:53:46.014N
Field or site location	8A - Birch Meadow Farms - Fairlee	
Landowner	Steve Stocking	
Soil Information		
Soil Series	Ha - Hadley	
Slope %	Nearly level - 5%	
Erosion	Flooding - from Connecticut River	
Mean Annual Temp.	41.8 °F - yearly	56.1 °F/Sept.
Mean Annual Precip.	36.19 In. - yearly	3.55 In./Sept.
Present Management		
Cropping System (Rotations, cover crops, etc)	EMI Field Corn - 2nd yr - Experimental Interseed cover crop	
Fertilizers/Pesticides (N inputs, pesticide use, etc)	Manure - 20 t/ac; 50 lbs DAP; 50 lbs K_2O	Pursuit 1.44 oz/ac; Callisto .5 oz/ac ingress; Pursuit; Python 1 oz/ac imaz.
Tillage/Residue Cover (Type, depth, frequency, timing, % cover, etc)	Field Cultivator - pefecta - plow	
Irrigation (Pivot, gravity, amount and timing, etc)	N/A	
Other	Experimental Legume/Grass Interseed on entire field	
Past Management History		
Cropping System (Rotation/fallow history, etc)	Field Corn for silage, 5 yrs.	
Fertilizers/Pesticides (N inputs, pesticide use, etc)	Manure app. last 2 years, prior to that none in 2001; 200 2 - Typical herbicide Bicep II / Callisto in Conventional corn.	
Tillage/Residue Cover (Past tillage, frequency and type)	Corn for past 5 years. Major flooding	
Irrigation (past irrigation, how long?)	N/A	
Unusual Events (Floods, fires, land-leveling)	Flooded spring 2004, back from Conn. River -	

Aerial view of field showing sampling sites and location of environmentally sensitive areas, such as ponds, creeks, wetlands, and other fragile sites adjacent to the field.

Scale 1 inch = N/A ft. (NA indicates sketch not to scale).



Additional Specifications and Notes:
Problematic field with a lot of sand on top of soil. Prone to flooding frequently. See problem areas above. Compaction in these areas. Little to no slope on field, full sun, next to Connecticut River, lower meadow Ha - Hadley soil - loamy sand with a lot of sand, silt on top of topsoil due to flooding.

Infiltration (for 1 inch of water) DATE: 10-6-04

	Sample site	1st inch of water		(W) 1st Infiltration time (minutes)	* 1st Infiltration (in/hr)	2nd inch of water		(W) 2nd Infiltration time (minutes)	* 2nd Infiltration (in/hr)
		Start time	End time			Start time	End time		
1	8A - orch. grass plot	11:00 AM	11:14 A.M	14:29	4.143	11:15 AM	11:41 AM	27:25	2.19
2	8A - Field clover	11:45 AM	12:00 PM	14:41	4.09	12:02 PM	12:30 PM	30:02	2.00
3	8A - rye control	12:15 PM	12:20	4:45	12.63	12:22 PM	12:29 PM	6:56	8.65
4	8B -	12:32 PM	12:34	2:15	26.67	12:34 PM	12:37 PM	2:18	26.09

* Conversion of infiltration time to inches per hour (in/hr); in/hr = (1/W) x 60

NOTES: First test in Orchardgrass testplot from this year.
Second test in Clover - midway up The field to reach a site with a good stand for testing
Third test in freshly tilled former control edge nowseeded with winter rye.

Test in 8B was 1/5 way up the field - about 30ft. in from access road - freshly tilled, seeded w/ winter rye.

	10-19-04	1st inch of water 1st		1st infiltration (in/hr)	2nd in water		inf. time	2nd Infiltration (in/hr)
5	Buffer-	9:10 am	9:22 am	11:39	5.1502	9:23 am	9:45 am	18:21	3.2403

Buffer is an established clover, 3yrs established, per NRCS/USDA regs.

Soil Respiration (at Initial Field Water Content)

DATE: 10-6-04

	Sample site	(H) Date Start	Start time	End time	(A) Soil temp.	(B) Date Finish	* Soil Respiration lbs CO_2-C/acre/day	(B) App. N Release per year	* Notes
1	8A	10-6-04	2:13 PM	3:05 PM	Room temp 70-75F	10-7-04	5.03 - 8.39	20 lbs/ac.	Moderately low soil activity
2	8B	10-7-04	5:36 PM	8:30 PM	room temp 70-75°F	10-8-04	8.39 - 16.8	40 lbs/ac	Medium soil activity
3									
4									

Soil Respiration (at least 6 hours after irrigation or soil wetting)

1									
2									
3									
4									

* Soil respiration = PF x ((**A** + 273)/273) x (**B** - 0.035) x 22.91 x **H** = lbs CO_2-C/acre/day **H** = 5.08 cm (if not measured)

PF = Pressure Factor = 'raw' barometric pressure in inches Hg/29.9 inches.
Note: This adjustment is necessary at elevations > 3,000 ft.; otherwise PF = 1

Conversion: Degrees Celsius = 5/9 x (Degrees Fahrenheit - 32)

NOTES: Solvita Soil Life Test - Alternative to traditional. - Notes -

8A - Soil is in a somewhat depleted state of organic matter and biological activity is low. Soil is not likely to provide adequate nitrogen for most crops and requires medium to heavy applications of organic matter. May have poor structure

8B - Soil is in a moderately balanced condition and has been receiving organic matter additions. Soil is approaching or declining from an ideal state of soil life. Soil may provide adequate nitrogen for light feeders but requires continued applications of microbially active organic matter.

Bulk Density and Soil Water Status (core method)

DATE: 10-6-04

	Sample site	(h) Height of ring above soil (cm)	(E) Weight of field moist soil + bag (grams)	(F) Weight of bag (grams)	Subsample for determinng soil water content				** (M) Soil H_2O content (g/g)	*** Soil bulk density (g/cm^3)
					(G) Weight of paper cup (grams)	(I) Weight of paper cup + soil (g)	(K) Dry weight of soil + cup	* (L) Dry weight of soil (grams)		
1	8A - Orchard	5.39	619.3	4.5	5.1	41.2	38.5	33.4	.080	1.83
2	8A - Clover	6.03	549.8	5.1	5.1	41.0	38.5	33.4	.074	1.78
3	8A Rye	5.39	525.2	5.1	5.1	40.2	37.6	32.5	.080	1.54
4	8B Rye	5.39	403.2	5.1	5.1	34.2	32.2	27.1	.073	1.19

*Dry wt. of soil subsample = (K - G)

**Soil H_2O content = (I - K)/L

***Soil bulk density = [(E - F)/(1 + M)]/[(12.7 - h) x 42.52] h = 5.08 cm (2 inches) if not measured; volume of soil = 324 cm^3

Bulk Density and Soil Water Status for Gravelly Soils (excavation method)

	Sample site	(n) Volume of water (cm^3)	(E) Weight of field moist soil + bag (grams)	(F) Weight of bag (grams)	Subsample for determinng soil water content				** (M) Soil H_2O content (g/g)	*** Soil bulk density (g/cm^3)
					(G) Weight of paper cup (grams)	(I) Weight of paper cup + soil (g)	(K) Dry weight of soil + cup	* (L) Dry weight of soil (grams)		
1										
2										
3										
4										

*Dry wt. of soil subsample = (K - G)

**Soil H_2O content = (I - K)/L

***Soil bulk density = [(E - F)/(1 + M)]/(n) n = volume of soil in cm^3

Soil Electrical Conductivity, pH, and Nitrate (NO_3)						DATE: 10-13-04	
	Sample site	(X) Weight of field moist soil (grams)	Readings for 1:1 soil:water mix.			* Estimated Soil NO_3-N (lb NO_3-N/acre)	** Exact Soil NO_3-N (lb NO_3-N/acre)
			EC (dS/m)	pH	(Y) Soil NO_3-N ppm (est.)		
1	8A	39.2	.22 mS/cm	8.64	0	0	0
2							
3							
4							

*Estimated: lb NO_3-N/acre = **Y** x [depth of soil in cm /10] x soil bulk density x 0.89
Depth of soil = depth of soil sampled in centimeters; for kit it is 0 to 3 inches = 7.6 cm

Exact: lb NO_3-N/acre = **Y x C.F. x [depth of soil in cm /10] x soil bulk density x 0.89
C.F. = [30 mL + ((X/(1 + M)) x M)]/[X/(1 + M)] M = decimal soil water content (g/g)
Depth of soil = depth of soil sampled in centimeters; for kit it is 0 to 3 inches = 7.6 cm

Water Quality Measurements			DATE:		
	Sample site	Salinity (dS/m)	Water Nitrite (ppm)	Water Nitrate (ppm)	← N/A
1					Water won't puddle on this field. No results.
2					
3					
4					

NOTES: Soil temp - pH - 22.0c
Nitrite results on soil:water mix - Nitrite Nitrogen ppm - 1.0
0.22mS/cm 21.4°C. 10-19-04

Aggregate Stability

DATE: 10-7-04

	Sample site	(A) Weight of sieve (grams)	(B) Weight of sieve + aggregates (grams)	(C) Weight of sieve + dry aggregates (grams)	(D) Weight of sieve + dry sand (grams)	* Percent water stable aggregates (% of soil > 0.25mm)
1	8A-Clover & Grass	57.2	67.2	59.3	55.2	34.1
2	8B-Winter Rye	57.2	65.4	58.7	54.0	41.2
3						
4						

* % Water stable aggregates = (C - D)/(B - D) x 100

Slake Test

DATE: 10-7-04

	Sample site	Individual Soil Slake Ratings								* Average Soil Slake Rating
1	8A Legume	3	3	5	5	5	5	5	5	4.31
		4	4	3	5	4	3	5	5	
2	8A Grass	3	3	4	5	5	5	5	5	4.37
		4	4	3	3	5	4	3	4	
3	8A Rye tilled area	2	1	1	2	2	2	3	2	2.12
		2	2	1	3	3	2	3	3	
4	8B	2	1	1	2	2	2	3	2	2
		2	1	2	2	3	2	3	2	

* Soil Slake Rating = (add all of the individual ratings and divide by the total number)

Earthworms

DATE: 9-29-04

	Sample site	Surface dwelling earthworms	Deep dwelling earthworms	Total Earthworms (no. per square foot)
1	Problem area #1	1	0	1
2	1/4 way up Field, Legume	0	2	2
3	1/3 way up in middle	0	0	0
4	8B	0	0	0

NOTES: Done Right after silage harvest, about 5 days.

8A	Legume area compaction
8A	Legume area non-compacted
8A	Grass area - mid field
8B	Freshly tilled planted in W. Rye

Soil Observations and Estimations

DATE: 9-29-04

	Description
Top soil depth (inches)	Can't find any change in color to determine top soil depth. Went down 18"
Plant roots #1	Roots well branched appear normal
Plant roots #2	Corn roots well branched Legume; grass well branched
Compaction layer #1	6" +/-
Compaction layer #2	4" +/-
Soil texture – by feel test	Loamy sand - sand will remain in a ball when squeezed, makes a weak, gritty ribbon less than 1".

Shaker test – Percent of material less 3" passing sieve no. 100 gram	4	10	40	200	depth
	100	85	5	<1	

Classes for Structure Index

Structure			Class[a]
Type	Size	Grade	
Granular	Fine, Medium, Coarse	Weak	2
Granular	Fine, Medium, Coarse	Moderate	4
Granular	Fine, Medium, Coarse	Strong	5
Blocky	Very fine, Fine, Med.	Weak	1
Blocky	Very fine, Fine	Moderate	4
Blocky	Very fine, Fine, Med.	Strong	5
Blocky	Medium	Moderate	3
Platy	Thin, Medium, Thick	Very friable[b]	3
Platy	Thin, Medium, Thick	Friable[b]	2
Platy	Thin, Medium, Thick	Firm or Stronger[b]	1
Massive			1
Single Grain			1

Note: [a] Class 5 is the best. [b] Substitute horizontal moist rupture resistance.

Soil Structure

DATE: 9-29-04

Depth (inches)	Type	Size	Grade	(A) Class	(B)	(A) x (B)	Structure index*
0 - 4	Single grain	—	—	1	3	3	
4 - 8	Single grain	—	—	1	2	2	
8 - 12	Single grain	—	—	1	1	1	
*Structure index = ((Total - 6)/24) x 100				Total =		6	0

NOTES:

Initial determinations done by sight and feel.

According to sieve test - soil is 15% Very Coarse Sand, 80% Med to Coarse Sand and 5% Very fine to fine sand. Small dusting passed the 200 sieve - very little silt.

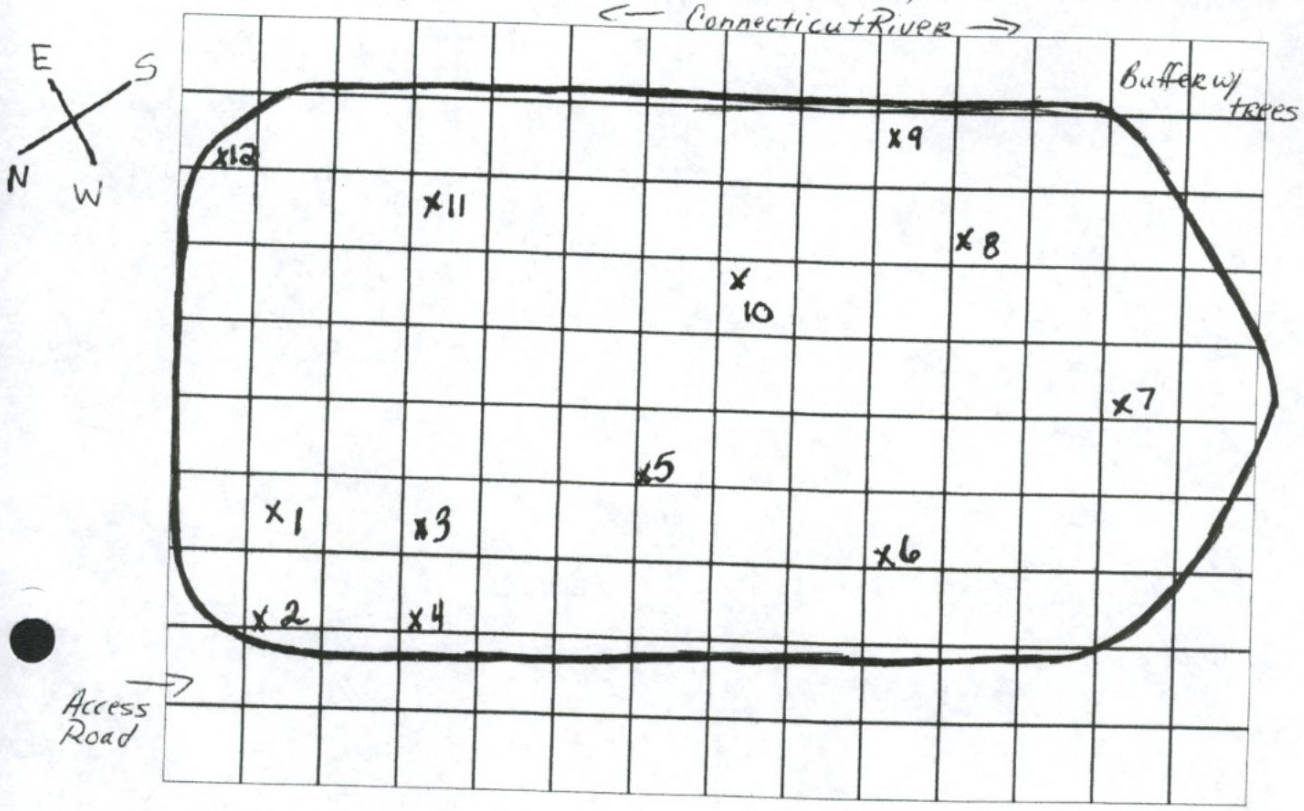
10-13-04

Compaction Test

Aerial view of field showing sampling sites and location of environmentally sensitive areas, such as ponds, creeks, wetlands, and other fragile sites adjacent to the field.

Field 8A
Birch Meadow Farm

Scale 1 inch = N/A ft. (NA indicates sketch not to scale).



Additional Specifications and Notes:

#	3"	6"	9"	12"
1	75	150	175	
2	125	175	110	220 at 10"
3	145	175	115	200
4	0	100	110	225 at 10"
5	140	200	210	← at 8"
6	40	110	150	220 at 10"
7	175	200	← at 4"	
8	95	150	200	← at 8"

#	3"	6"	9"	12"
9	0	180	220	← at 8"
10	120	150	100	190
11	110	175	175	
12	175	200	← at 4"	

Notes: Compaction layer, site #1 between 6-9". Compaction layer between 3-6" & 9-12" at site #2. Stopped measuring when I could no longer push down penetrometer.

3/4" sand tip

From L to R: Rachael and Cody Facteau—05-29-04

Steve Stocking—05-29-04

Corn—06-16-04

07-08-04

Corn Ear—09-21-04

Juanita Facteau -
Corn Yields—09-24-04

Cody Facteau -
Earthworm Test—09-29-04

From L to R: Paul Salon (USDA/NRCS)
and Steve Stocking—09-29-04

Clover—10-20-04

Juanita Facteau -
Quality Test—10-20-04

Root Structure—10-20-04

Grass—10-20-04

Birch Meadow Farms
Corn Yield Analysis-September 17, 2004

	Yield(tons/ac)				Plant Pop.
Treatment	**%DM**	**"As Is"**	**DM**	**Silage Equivalent**	**Plants/acre**
IMI Corn w/ Clover	41.09%	27.76	11.41	32.59	33,759
IMI Corn Control	41.09%	28.3	11.63	33.23	34,849

*Silage equivalent=Silage at 35% dry matter content

Project Supply Cost Sheet: Birch Meadow Farm-2004

Supplies	Price	Cost/ac	Cost/project
Pioneer 34B28 Clearfield	$165/bag	$63	$165.00
Red Fescue/Orchardgrass Blend 5:3 ratio	$57.55/40 lbs	$29	$57.55
Red Clover/White Clover Mix 2:1 ratio	$50.98	$21	$50.98
DAP	$338.80/ton	$8.47	$67.76
Pursuit-DG	$13.63/oz	$19.62	$157.00
Python-WDG	$11.92/oz	$11.92	$47.68
Callisto	$648.70/gal.	$27.87	$111.49

Prices for 2004 growing season courtesy of Twin-State Fertilizer of Bradford, VT.

Herbicide Description Sheet-Birch Meadow Farms

Pursuit W DG-herbicide ECO-PAK; BASF Corp.
Active Ingredient: Imazethapyr (±) -2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imadazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid
Synonyms: imazethapyr, AC 263,499, BAS 685 H
Formula: C15 H19 N3 O3
Chemical Family: imidazolinone
Mol Wt: 289.300
For use in Alfalfa, Field Corn (Apply only on Clearfield corn hybrids), and edible legume vegetables. Pursuit W DG kills weeds by root and/or foliage uptake and rapid translocation to the growing points. Adequate soil moisture is important for optimum activity. Apply Pursuit W DG herbicide only on selected field corn hybrids warranted by the seed company to possess resistance/tolerance to direct application. Pursuit provides good to excellent control in Shattercane, Foxtail, Fall Panicum, Barnyardgrass, Velvetleaf and Pigweed; fair to poor control in Nutsedge, Quackgrass, Crabgrass, Common Ragweed, Lambsquarters, Jimsonweed and Burcucumber.

Python WDG-herbicide; Dow AgroSciences LLC.
Active Ingredient: Flumetsulam N-(2,6-Difluorophenyl)-5-Methyl(1,2,4)Triazolo(1,5-A)Pyrimidine-2-Sulfonamide
Python WDG herbicide is a selective product for broadleaf weed control in field corn and soybeans, and may be applied as a preplant surface, preplant incorporated, or preemergence treatment. Absorption of Python WDG occurs through both shoot and root uptake. When applications are made under adverse (dry or cold) conditions reduced activity may be observed and weeds may be suppressed and not controlled. Python provides good to excellent control in Jimsonweed, Lambsquarters, Pigweed, and Velvetleaf; fair to poor control in Burcucumber & Common Ragweed; and no control in Barnyardgrass, Crabgrass, Fall Panicum, Foxtail, Shattercane, Quackgrass and Nutsedge. Other Flumestsulam containing herbicides: Hornet, Scorpion III, Accent Gold, Broadstrike +Dual, Bicep Magnum TR, Broadstrike SF +Dual and Broadstrike +Treflan.

Callisto-herbicide; Syngenta Crop Protection.
Active Ingredient: Mesotrione
A Preemergence and Postemergence herbicide for control of annual broadleaf weeds in field corn. Callisto is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn, production seed field corn, field corn grown for silage and yellow popcorn. When used preemergence, weeds take up the product through the soil during emergence. Dry conditions following application may reduce the preemergence activity of Callisto. Callisto is not effective for the control of most grass weeds. Callisto provides control in Crabgrass, Galinsoga, Jimsonweed, Lambsquarters, Pigweed, Ragweed and Velvetleaf; and partial control in Cocklebur, Kochia & Morningglory.

SAMPLE DESCRIPTION

SOIL TEST REPORT

AGRICULTURAL & ENVIRONMENTAL TESTING LABORATORY
AND UVM EXTENSION
UNIVERSITY OF VERMONT

LAB NUMBER B 40350 DATE received 04/20/04 complete 05/04/04

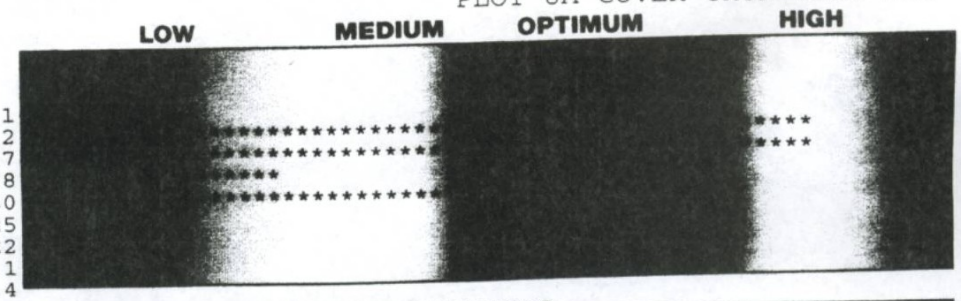
REPORT FOR:

BIRCH MEADOW FARM
143 BIRCH MEADOE RD
FAIRLEE VT 05045

COUNTY ORANGE

FIELD NAME PLOT 8A COVER CROP TEST PLO

SOIL TEST RESULTS



pH		6.1
Avail. Phosphorus	(ppm P)	11.2
Reserve Phosphorus	(ppm P)	77
Potassium	(ppm K)	48
Magnesium	(ppm Mg)	50
Aluminum	(ppm Al)	25
Calcium	(ppm Ca)	522
Effective CEC	(meq/100g)	3.1
Zinc (high)	(ppm Zn)	1.4

LIME AND FERTILIZER RECOMMENDATIONS

(1) Corn, Yield of 20 tons/A (120 bu) expected
Dairy manure at 20 tons per acre

	LIME TONS/ACRE	NITROGEN (N) lbs./ACRE	PHOSPHATE (P_2O_5) lbs./ACRE	POTASH (K_2O) lbs./ACRE	MAGNESIUM (MG) lbs./ACRE
LIME & NUTRIENTS NEEDED:	1.0	100	0	160	0
CONTRIBUTION FROM MANURE:		75	70	150	40
BALANCE NEEDED FROM FERTILIZER:	1.0	25	0 **	10	0

Rate of lime recommended is to raise soil pH to 6.2
Broadcast lime before or during seedbed preparation and harrow in.

Manure credit is based on average values. Actual values can vary greatly, so sampling and analysis is recommended. Contact this Lab or your Ag. Extension Agent for more information.
N rate given above is an estimate. For a more accurate recommendation, use Presidedress Nitr soil test when corn is 8-12 inches tall. Contact your Ag.Extension agent for more informati
Nitrogen is most effective side or top dressed when crop is 12 to 24 inches tall.
To prevent fertilizer burn, limit combined N + K2O to 80 lb/A applied using a planter with sideband fertilizer placement (2" x 2"). Limit N + K2O to 40 lb/A with split-boot planter.
To avoid ammonia toxicity, Limit N in planter to 25 lb/acre when using urea or DAP blend.
CAUTION: NEVER APPLY BORON, UREA, OR DIAMMONIUM PHOSPHATE IN DIRECT CONTACT WITH SEED!
** No broadcast P is needed. However, a low rate of N-P-K row or starter fertilizer is recommended, especially with limited drainage, cool soil temperatures, or reduced tillage.

FOR ADDITIONAL INFORMATION ABOUT THIS TEST, CONTACT YOUR UVM EXTENSION AGENT → Heather Darby 1-800-639-2130

FIELD INFORMATION FROM QUESTIONNAIRE

1. Well-drained [2]
2. Minimum tillage (chisel or disk) [2]
3. Dairy manure [1]
4. Amount this crop: 20 tons Past year: 20 tons 2 years: 0 tons Semi-solid [4]
5. Soil sampled before manure spread [2]
6. Spread in spring (after snow melt) [3]
7. Manure incorporated 1 day after spread [2]
8. Book value manure analysis used
10. Crop to be used for silage [1]
11. Yield of 20 tons/A (120 bu) expected [2]
12. Sod not plowed down within the last year [1]
13. (Previous crop info is not used in this case)
14. (Legume information is not used in this case)
15. Will not be seeding alfalfa within 2 years [2]

N

2004
UVM SOIL NITRATE TEST
for FIELD CORN

Birch Meadow Farm
143 Birch Meadow Rd
Fairlee VT 05045

samples processed 06/28/04
ORANGE county

NITROGEN FERTILIZER RECOMMENDATION

LAB #	NITRATE-N LEVEL FROM SOILTEST (ppm)	FIELD SAMPLE IDENTIFICATION	=> choose your yield goal: 15 90	20 120	25 tons/acre or more 150 bu/acre or more
			- - lbs/acre of N to apply - -		
335	8	**Plot 8A**	75	100	125

** Field Plot 8A had a higher N fertilizer recommendation (lower nitrate test level) than expected given that soil drainage is not poor and the field received 20 tons/acre of manure

.... Please check the above information. If the information is correct, the recommended N rat may be higher than expected because of poor manure management, very poor plowed down sod, or unusually high rainfall, or wet soil conditions that reduced or delayed the availability of N from manure or other sources. Contact the Extension Soils Specialist (656-2630) or Extension Agronomy Agent WILLIE GIBSON (223-2389) about possible adjustment of the recommended N rate.

UVM Agricultural Testing Lab, 06/28/04
Customer Copy

SOIL FACT SHEET

Ha Hadley very fine sandy loam

HADLEY SOILS formed in loamy alluvium on flood plains, that are frequently flooded for brief duration from Mid-Winter through early Spring. They are very deep to bedrock and well drained. These soils have a water table at depths of 4.0 to 6.0 feet below the surface from late Fall through early Spring. Permeability is moderate or moderately rapid.

This map unit is well suited to cultivated crops, hay and pasture. Flooding is of short duration and usually occurs in the spring which may delay tillage. Stubble mulching and cover cropping are practices that help control erosion by flood waters. Land shaping, to provide good surface drainage, will allow the soil to be tilled soon after flooding. Streambanks should be maintained in permanent protective cover to help control streambank erosion. Proper stocking rates and rotational grazing will help to maintain a good stand of pasture plants and help to control erosion caused by flood water.

This map unit is composed of soils that flood and not suitable for use as septic tank absorption fields.

PHYSICAL/CHEMICAL PROPERTIES

Name	Depth (inches)	pH	Permeability / hour (inches)	Clay (%)	Organic Matter (%)	Bedrock Depth (inches)
Hadley	0 - 11	5 - 7.3	0.6 - 2	4 - 10	2 - 5	>60
	11 - 28	5 - 7.8	0.6 - 6	2 - 10	0.5 - 2	
	28 - 64	5 - 7.8	0.6 - 6	1 - 8	0 - .5	

SOIL FEATURES

Hydric Soil?	Farmland Rating
No	Prime

WATER FEATURES

Name	FLOODING Frequency	Duration	From		Depth to Water Table
Hadley	OCCAS	BRIEF	FEB	APR	4 to >6 Feet

RARE = 1 to 5 % chance / year
OCCAS = 5 to 50 % chance / year
FREQ = >50 % chance / year
BRIEF = 2 to 7 days
LONG = 7 to 30 days

LAND USE LIMITATIONS

Name	Land Use	Rating	Reason**
Hadley	Pond reservoir area	Severe	seepage
	Dwellings with basements	Severe	flooding

AGRICULTURAL YIELD DATA

Crop Name	Yield / acre
ALFALFA HAY	5 TONS
CORN SILAGE	28 TONS
GRASS-CLOVER	8 AUM

WOODLAND MANAGEMENT

Name	Equipment Limitation	Windthrow Hazard
Hadley	SLIGHT	SLIGHT

Name	Common Trees	Site Index
Hadley	eastern white pine	70
	red pine	70
	sugar maple	63

1 AUM = Enough forage to feed one 1,000 pound cow for 1 month on 1 acre. Site Index = Height of Tree in 50 years

** The reason listed is the most limiting restriction; there may be others that contribute to the particular rating.

Soil Associations-Birch Meadow Farms-Fairlee, VT
Birch Meadow Farms has soil in two major soil associations.

Hadley-Winooski-Limerick-Saco association

Level, well drained to poorly drained, medium textured soils subject to flooding; on bottom lands.

This association is next to the major streams in Orange county. The largest areas are adjacent to the Connecticut River. Other areas of the soils in this association are adjacent to small streams and brooks throughout the county.

The Hadley soils are well drained and medium textured. They are on higher natural levees and rises near present stream channels. Hadley soils are flooded less frequently than the other major soils, because they are higher above stream level. Some areas of Hadley soils are above normal overflow and are seldom flooded.

The Winooski soils are moderately well drained and medium textured. They are in broad, intermediate positions between Hadley and Limerick soils.

The Limerick soils are poorly drained and medium textured. They are in old stream channels and depressions. Because of their low position, Limerick soils are flooded more frequently than the higher soils in the association.

Soils of minor extent in this association are the very poorly drained Saco soils, the well drained Merrimac and Agawam soils the excessively drained Windsor soils, and a few small areas of Muck.

Most areas of this association have been cleared of trees and are farmed. The main crops are corn for silage, hay, and pasture. The most poorly drained and inaccessible areas are idle or are in trees. The major limitation for farming is the hazard of flooding during spring and in other wet periods. The Limerick soils have a high water table and are excessively wet unless artificially drained. Flooding and excess wetness also are limitations for houses, septic tank absorption fields, highways, recreational facilities, and other community developments.

Merrimac-Agawam-Windsor-Winooski association

Level to steep, excessively drained to well drained, moderately coarse textured and coarse textured soils on stream terraces, and moderately well drained, medium textured soils on bottom lands subject to flooding.

Merrimac soils are somewhat excessively drained and moderately coarse textured. They formed in water-deposited sand and gravel. They are level to steep and are on stream terraces.

Agawam soils are well drained and moderately coarse textured. They formed in water-deposited fine sandy loam over sand and gravel. They are level to steep and are on stream terraces.

Windsor soils are excessively drained and coarse textured. They formed in water-deposited sand. They are level to steep and are on stream terraces.

Winooski soils are moderately well drained and medium textured. They are in broad depressions on bottom lands that are subject to flooding.

Soils of minor extent in this association are the well drained Hadley and Hartland soils; the moderately well drained Belgrade and Ninigret soils; and the poorly drained Limerick, Raynham Variant, the Walpole soils. Ninigret and Walpole soils are on terraces that are underlain by sand and gravel. Hadley and Limerick soils are along streams and are subject to flooding. Hartland, Belgrade, and Raynham Variant soils are medium textured soils on dissected stream terraces.

The soils in this association are used primarily for farming. The main crops are hay, pasture, and corn for silage. Steep areas and inaccessible areas are in trees or are idle. Soils in this association are the main source of sand and gravel in the county. Many villages and roads are within this association. Merrimac, Agawam, and Windsor soils have few limitations for community developments where slope is not a consideration. Flooding limits the use of Winooski soils for community developments.

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Station: CHELSEA, VT **COOP ID: 431360**

Climate Division: VT 1 **NWS Call Sign:** **Elevation: 800 Feet** **Lat: 43°59N** **Lon: 72°27W**

Temperature (°F)

Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	26.7	1.1	13.9	66	1950	4	23.7	1990	-37	1957	15	3.4	1982	1584	0	.0	.0	.7	20.2	30.7	15.2
Feb	30.7	2.1	16.4	62	1997	23	26.3	1981	-34+	1962	2	6.8	1979	1361	0	.0	.0	1.2	15.2	27.9	14.1
Mar	40.1	14.3	27.2	79	1977	31	34.3	1973	-32	1950	4	21.5	1984	1172	0	.0	.0	5.5	6.9	29.5	5.3
Apr	52.8	27.1	40.0	90	1990	29	45.5	1987	-5	1954	1	33.6	1975	751	0	.0	@	16.6	.5	22.0	.0
May	66.9	37.8	52.4	93+	1977	23	57.5	1975	16	1956	9	46.5	1997	394	2	.0	.3	29.2	.0	9.1	.0
Jun	75.5	46.9	61.2	95+	1953	22	65.7	1976	25	1964	6	57.9	1985	134	19	.0	.7	30.0	.0	1.0	.0
Jul	80.1	51.5	65.8	98+	1953	19	69.1	1994	32+	1962	6	61.9	1992	49	73	.0	1.9	31.0	.0	.0	.0
Aug	77.7	50.0	63.9	99	1975	3	68.0	1973	27	1965	31	60.4	1982	82	47	.0	.8	31.0	.0	.3	.0
Sep	68.8	41.8	55.3	93	1953	3	59.9	1999	15+	1963	24	50.0	1978	294	3	.0	.1	29.9	.0	5.3	.0
Oct	56.8	31.1	44.0	85	1951	6	51.1	1971	10	1972	20	38.2	1974	654	0	.0	.0	23.5	.0	18.3	.0
Nov	43.4	23.5	33.5	77	1950	3	38.6	1999	-10	1951	28	29.1	1976	948	0	.0	.0	8.0	3.5	24.4	.2
Dec	31.2	9.6	20.4	68	1998	8	28.4	1996	-32	1980	26	2.4	1989	1382	0	.0	.0	1.1	15.5	30.2	7.7
Ann	54.2	28.1	41.2	99	Aug 1975	3	69.1	Jul 1994	-37	Jan 1957	15	2.4	Dec 1989	8805	144	.0	3.8	207.7	61.8	198.7	42.5

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2000

(3) Derived from 1971-2000 serially complete daily data

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COOP ID: 431360

Climate Division: VT 1 **NWS Call Sign:** **Elevation: 800 Feet** **Lat: 43°59N** **Lon: 72°27W**

Precipitation (inches)

Precipitation Totals

Month	Means/ Medians(1) Mean	Means/ Medians(1) Median	Extremes: Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	3.08	2.79	2.13	1986	27	6.67	1978	.31	1981
Feb	2.15	2.08	2.04	1974	23	6.26	1981	.23	1987
Mar	2.79	3.00	1.93	1984	14	4.27	1999	.79	1981
Apr	2.91	2.81	2.24	1988	29	5.48	1973	.60	1999
May	3.49	3.35	2.36	1999	20	8.55	1984	.79	1977
Jun	3.50	3.24	3.05	1952	2	9.19	1998	.77+	1995
Jul	3.81	3.64	3.32	1973	1	9.48	1996	1.04	1977
Aug	4.01	3.73	2.65	1993	17	8.97	1983	1.71	1980
Sep	3.54	3.19	4.71	1999	17	8.28	1999	.88	1972
Oct	3.37	3.22	2.58	1996	21	6.76	1995	.42	1994
Nov	3.30	3.01	2.39	1983	5	8.31	1983	1.46	1978
Dec	2.81	2.57	2.25	1952	12	6.99	1973	.94	1989
Ann	38.76	37.88	4.71	Sep 1999	17	9.48	Jul 1996	.23	Feb 1987

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.3	6.6	2.3	.6
Feb	9.4	5.1	1.4	.3
Mar	10.6	6.5	1.6	.4
Apr	11.1	6.8	1.5	.5
May	12.0	7.5	2.1	.5
Jun	12.6	8.5	2.2	.5
Jul	12.2	7.5	2.7	.7
Aug	11.8	7.7	2.7	1.2
Sep	11.0	6.7	2.2	.7
Oct	11.4	6.9	2.4	.7
Nov	11.8	7.1	2.0	.5
Dec	12.4	6.8	1.8	.3
Ann	137.6	83.7	24.9	6.9

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.78	1.07	1.52	1.91	2.30	2.72	3.18	3.72	4.44	5.56	6.62
Feb	.62	.83	1.13	1.40	1.66	1.93	2.23	2.58	3.04	3.76	4.42
Mar	1.29	1.53	1.87	2.15	2.40	2.66	2.93	3.24	3.63	4.23	4.76
Apr	1.16	1.43	1.81	2.13	2.42	2.72	3.05	3.42	3.90	4.63	5.29
May	.98	1.32	1.82	2.25	2.68	3.12	3.61	4.19	4.95	6.13	7.23
Jun	1.03	1.36	1.86	2.29	2.71	3.15	3.63	4.20	4.93	6.08	7.14
Jul	1.60	1.95	2.43	2.83	3.21	3.58	3.99	4.46	5.06	5.96	6.79
Aug	1.64	2.00	2.52	2.95	3.36	3.76	4.21	4.72	5.36	6.35	7.24
Sep	1.18	1.52	2.01	2.43	2.83	3.24	3.69	4.22	4.90	5.95	6.92
Oct	.92	1.24	1.73	2.15	2.57	3.01	3.49	4.06	4.81	5.97	7.07
Nov	1.54	1.82	2.22	2.54	2.84	3.14	3.46	3.82	4.28	4.97	5.60
Dec	.87	1.13	1.53	1.87	2.20	2.55	2.93	3.37	3.94	4.83	5.66
Ann	29.85	31.63	33.88	35.56	37.05	38.48	39.94	41.54	43.48	46.25	48.63

\+ Also occurred on an earlier date(s)
\# Denotes amounts of a trace
@ Denotes mean number of days greater than 0 but less than .05
** Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals
(2) Derived from station's available digital record: 1948-2000
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Climate Division: VT 1 **NWS Call Sign:** **Elevation: 800 Feet** **Lat: 43°59N** **Lon: 72°27W**

Snow (inches)

Snow Totals

Means/Medians (1)					Extremes (2)										Mean Number of Days (1)								
															Snow Fall >= Thresholds					Snow Depth >= Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	20.6	18.4	11	12	13.0	1990	30	43.8	1978	34	1979	21	23	1979	9.9	5.9	2.3	1.1	.2	26.6	24.6	22.4	13.5
Feb	15.2	14.2	14	16	15.0	1988	13	35.9	1993	33	1971	8	27+	1979	7.7	4.3	1.6	.6	.2	26.4	23.4	19.8	13.1
Mar	15.2	13.3	11	11	22.0	1984	14	46.1	1971	47	1971	8	36	1971	6.5	3.9	1.5	.7	.3	24.0	21.5	17.1	9.7
Apr	4.9	3.0	2	#	11.0	1974	10	16.5	1975	28	1971	1	15	1971	2.6	1.4	.7	.2	@	4.2	2.4	1.4	.3
May	.0	.0	#	0	.6	1977	10	1.1	1977	1	1977	9	#+	1986	.1	.0	.0	.0	.0	@	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	#	0	.0	0	0	.0	0	12	1976	27	#	1976	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.2	.0	#	0	2.0	1987	5	2.0	1987	2	1987	5	#+	1997	.2	.1	.0	.0	.0	.2	.0	.0	.0
Nov	6.3	5.0	1	#	16.0	1971	26	31.4	1971	20	1971	30	7	1971	3.5	2.1	.6	.3	@	6.5	2.6	1.0	.0
Dec	16.8	16.1	6	6	16.0	1996	8	46.3	1972	23	1972	23	16	1972	9.1	5.2	2.0	1.0	.1	23.6	18.3	13.6	5.3
Ann	79.2	70.0	N/A	N/A	22.0	Mar 1984	14	46.3	Dec 1972	47	Mar 1971	8	36	Mar 1971	39.6	22.9	8.7	3.9	.8	111.5	92.8	75.3	41.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values
Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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Freeze Data

Spring Freeze Dates (Month/Day)

Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	7/06	6/30	6/25	6/21	6/17	6/13	6/09	6/05	5/29
32	6/18	6/12	6/08	6/05	6/02	5/29	5/26	5/22	5/16
28	5/28	5/24	5/20	5/18	5/15	5/13	5/10	5/06	5/02
24	5/14	5/10	5/07	5/04	5/02	4/29	4/27	4/24	4/20
20	4/29	4/25	4/22	4/19	4/17	4/14	4/12	4/08	4/04
16	4/19	4/14	4/11	4/09	4/06	4/04	4/01	3/29	3/25

Fall Freeze Dates (Month/Day)

Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	8/15	8/21	8/26	8/30	9/02	9/06	9/10	9/14	9/20
32	8/29	9/03	9/06	9/09	9/12	9/15	9/18	9/21	9/26
28	9/20	9/24	9/26	9/28	9/30	10/02	10/04	10/07	10/10
24	9/23	9/29	10/03	10/07	10/10	10/13	10/17	10/21	10/27
20	10/05	10/11	10/14	10/18	10/21	10/24	10/27	10/31	11/05
16	10/18	10/25	10/30	11/03	11/07	11/11	11/15	11/20	11/26

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	107	97	89	83	76	70	64	56	46
32	125	117	111	106	102	97	92	87	79
28	152	147	144	140	137	134	131	127	122
24	184	176	170	165	161	156	151	145	137
20	206	199	194	190	186	182	178	173	167
16	238	229	224	219	214	209	204	198	190

* Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.
Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Degree Days to Selected Base Temperatures (°F)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1584	1361	1172	751	394	134	49	82	294	654	948	1382	8805
60	1429	1221	1017	601	253	46	7	19	163	499	798	1227	7280
57	1336	1137	924	512	180	19	0	5	102	409	708	1134	6466
55	1274	1081	862	454	139	9	0	2	70	351	648	1072	5962
50	1119	941	707	315	63	1	0	0	22	219	498	917	4802
32	578	451	212	25	0	0	0	0	0	5	76	409	1756

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	17	14	64	263	631	875	1047	988	699	375	118	50	5141
55	0	0	0	3	57	194	334	277	79	7	0	0	951
57	0	0	0	1	36	144	272	218	51	4	0	0	726
60	0	0	0	0	16	81	186	139	22	1	0	0	445
65	0	0	0	0	2	19	73	47	3	0	0	0	144
70	0	0	0	0	0	1	14	7	0	0	0	0	22

Growing Degree Units (2)

Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	0	0	11	107	398	642	808	751	474	185	43	2	0	0	11	118	516	1158	1966	2717	3191	3376	3419	3421
45	0	0	4	51	261	492	653	596	329	94	16	0	0	0	4	55	316	808	1461	2057	2386	2480	2496	2496
50	0	0	0	19	145	347	498	442	200	40	4	0	0	0	0	19	164	511	1009	1451	1651	1691	1695	1695
55	0	0	0	8	69	212	344	294	108	10	0	0	0	0	0	8	77	289	633	927	1035	1045	1045	1045
60	0	0	0	0	27	105	206	164	43	0	0	0	0	0	0	0	27	132	338	502	545	545	545	545
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	20	94	272	415	523	487	308	134	32	1	0	0	20	114	386	801	1324	1811	2119	2253	2285	2286

(1) Derived from the 1971-2000 Monthly Normals
(2) Derived from 1971-2000 serially complete daily data
Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Notes

a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.

b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.

c. Only observed validated values were used to select the extreme daily values.

d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.

e. Degree Days were derived using the same techniques as the 1971-2000 normals.
Compete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set .
Documentation of the serially complete data set is available from the link below:

g. Snowfall and snow depth statistics were derived from the Snow Climatology.
Documentation for the Snow Climatology project is available from the link under references.

Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were are for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

a. Temperature/ Precipitation Tables
   1. 1971-2000 Monthly Normals
   2. Cooperative Summary of the Day
   3. National Weather Service station records
   4. 1971-2000 serially complete daily data

b. Degree Day Table
   1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
   2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data

c. Snow Tables
   1. Snow Climatology
   2. Cooperative Summary of the Day

d. Freeze Data Table
   1971-2000 serially complete daily data

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html
Snow Climatology Project Description, www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,
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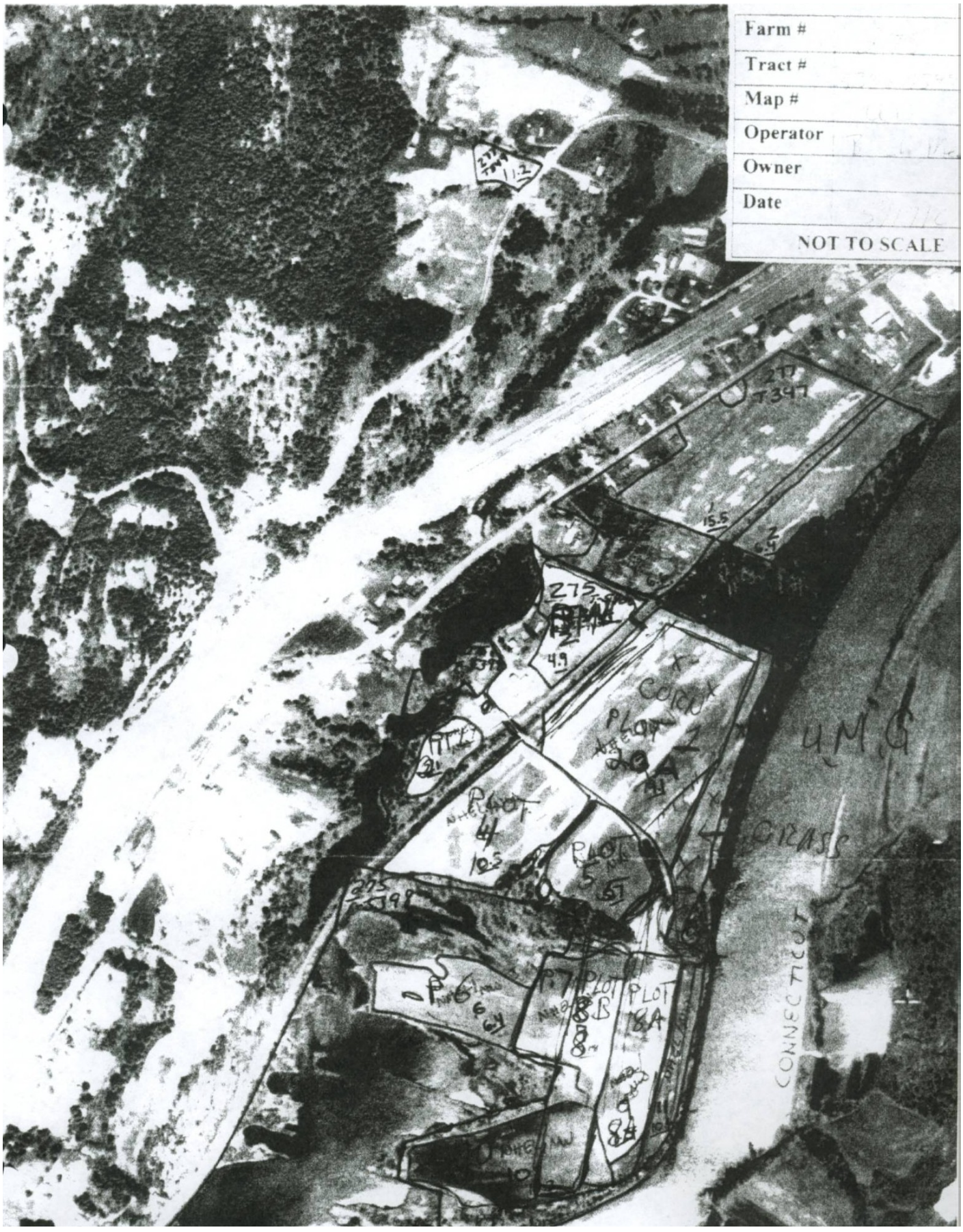
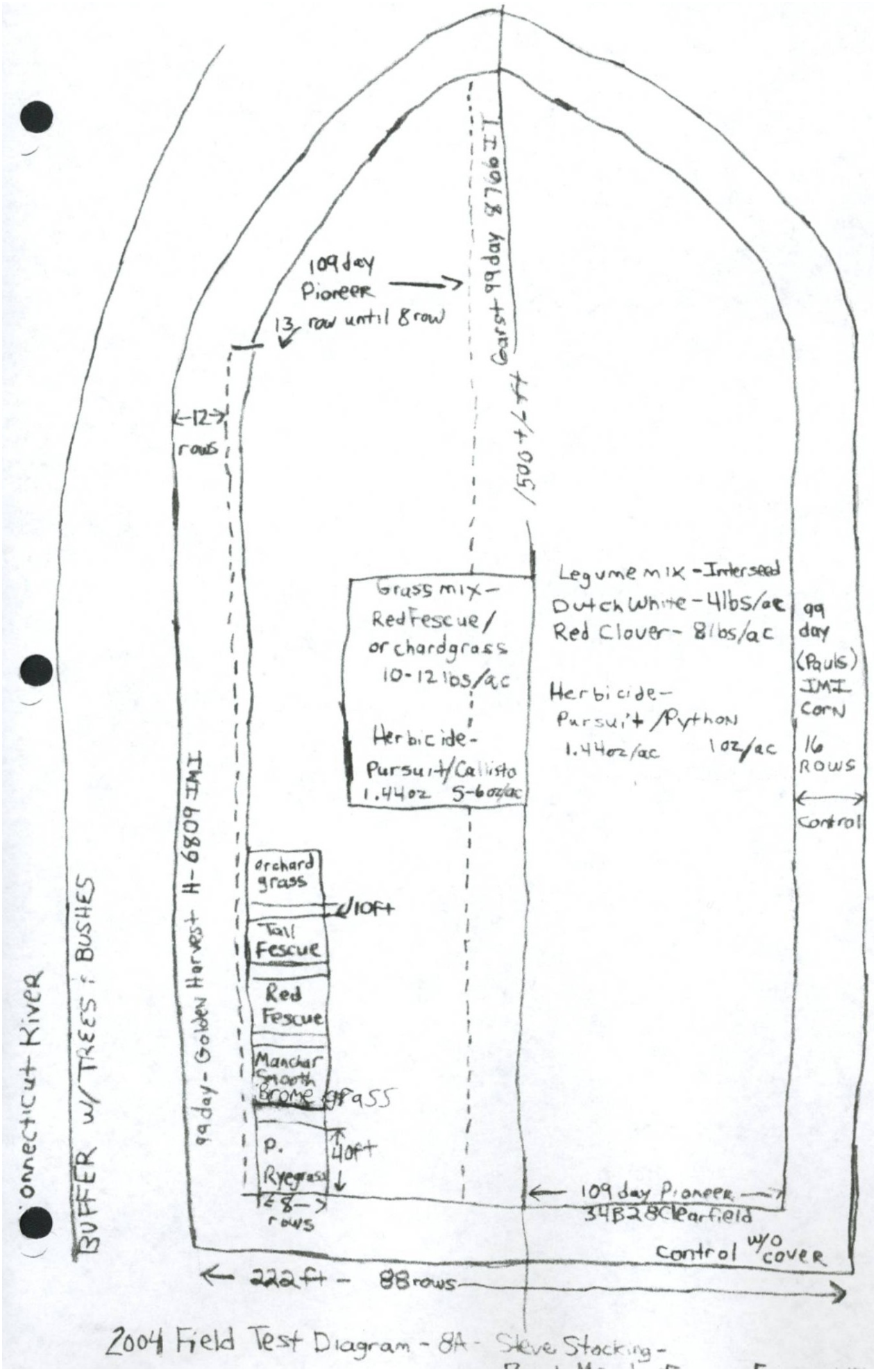
WnB
HdC
AgB
BeB
AgE
Wo
Sa
Le
Ha
TrD
Wo
Sa
RIVER
NEW HAMPSHIRE
GRAFTON COUNTY


Farm #
Tract #
Map #
Operator
Owner
Date
NOT TO SCALE
PLOT 4
PLOT 5
PLOT 6
PLOT 7
PLOT 8
PLOT 8A
PLOT 8B
UMG
CONNECTICUT



2004 Field Test Diagram - 8A - Steve Stocking -