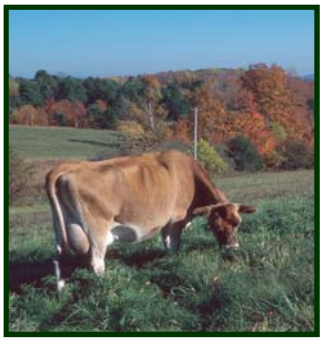

Vermont

Grazing Plan

Cover Sheet

This Grazing Plan Has Been Developed For:

1- Farm Name:	**Rick and Jane Buck**
2- Grazing Manager:	Rick Buck
Farm Contact Address:	148 Triple Junction Road Sometown, VT 05699-4740
Telephone Number:	**(802) 462-0494, Barn: (802) 462-4983**

Jane Buck Rick Buck — Customer Signature:

7/10/2018 — Date:

I have received the comleted grazing plan, details of the plan been explained by the grazing planner and I concur with the plan content.

Prepared By:

3- Planner Name:	Joan Planner
Telephone:	(802) 951-6796 x226
Email Address:	joan.planner@some.isp.net
4- Date:	July 1, 2018

Joan Planner — Grazing Planner Signature:

7/10/2018 — Delivery Date:

United States Department of Agriculture
NRCS Natural Resources Conservation Service

GRAZING PLAN

For:

Farm Name: Rick and Jane Buck Farm
Grazing Manager: Rick Buck
Contact Address: 148 Triple Junction Road, Sometown, VT 05699-4740

Planning Assistance Provided By: Joan Planner

FARM GRAZING GOALS: **"Farm smarter, not larger."** The goal of the Buck operation is to enable better plants to grow and therefore have better forage production and yield. Rick would like to provide for grass-forage feeding with minimal effort and cost. Specifically, Rick would like to clear his open land of trees and rock in order to enable him to crop certain areas of his land. At that point he could utilize that pasture better. Rick wants to install another bunk silo to store his silage and haylage, allowing for less waste of the silage that he buys and the haylage that he harvests. He would like to better utilize his available pastures for grazing, but believes that the natural barriers of his land have not allowed for this. In addition, he is concerned about his manure pit and is in the process of cost-sharing with the NRCS and implementing a new, larger pit for his milking parlor. A recommended long-term goal for the farm would be to turn the hayfields into grazing paddocks and use this land completely for grazing. The NRCS grazing specialist suggested that Rick try to convert his hayland to pasture, and pasture most or all of his land around his farm.

Paddock numbers would increase and paddock size would decrease. Rick would have more options for pasturing land in the early, wet spring. He would focus on keeping forage under control on the paddocks with no tractor access, and past that would be able to intensively graze the rest of the farm. The goals would be to increase forage value by increasing grazing management, to decrease input costs (fuel, machine upkeep, etc) by doing less haying and buying less silage and hay in the summertime, better animal health on pasture, and less manure to deal with inside the barn.

	LIVESTOCK GROUP 1
Number of Grazing Livestock:	**77**
Type of Grazing Livestock:	**Dairy (Holstein Milkers)**
Grazing Livestock Average Weight:	**1400**
Pasture Acres Available Option 1:	**22.0**
Grazing Acres Needed (Option 1):	**119.9**

	LIVESTOCK GROUP 2- Recommended Grazing Management / Plan
Number of Grazing Livestock:	**77**
Type of Grazing Livestock:	**Dairy (Holstein Milkers)**
Grazing Livestock Average Weight:	**1400**
Pasture Acres Available Option 2:	**59.8**
Grazing Acres Needed (Option 2):	**107.8**

Total Acres Needed For The Grazing Plan:	**To be determined through progressive planning.**

GRAZING PLAN

INVENTORY DATA

FARM INFRASTRUCTURE: Rick Buck is the manager of this farm. His father, Henry, works full-time off the farm and helps when he is able. Another relative works on the farm as well. The Buck's milk 65 cows at this point (5/25/06), and their short-term goal is to milk 80 cows. They hope to increase their herd to 70 by winter of 2006, and then continue to increase the herd as the 45 heifers (varying age and weights) become of age and reproduce. The milking barn is a main site of concern for Rick. The original part of the barn was built in the early 1900s, and 2 additions have been made since then. They have the potential to hold 98 cows in their barn right now. All of the runoff from the barn roof, the water from the milking system, and runoff through their barn goes to the manure pit. This overfull pit is a big concern for Rick and he is working with NRCS to get a new manure pit. They have had a closed herd for 3 years; they have produced 82 heifers since 2001 with no loss. They calve year round and have a cull rate of ~11%. Avg. peak production, 60 lbs/day, avg. milk production, 18,500 lbs/year, avg. 3.8% protein, 3.1% milkfat, and 125,000

SCC. He uses bulls over AI because he finds that it is too expensive and does not dependably work with his cows. The farm recently had an outbreak of leptospirosis; there were 10 abortions over an 8-month period (June-December) and the whole herd had to be vaccinated (oxytet). After two visits (5/26/06 and 6/8/06), grazing specialists will give advice concerning possible changes to increase efficiency and forage quality on the farm. Control of rats and racoons in feed may help control disease vectors. Fencing swampy areas and streams may also help control leptospirosis.

PADDOCK INVENTORY: There are 8 paddocks on the Buck farm that are grazed. The other paddocks are used for cropping or hay meadows. Rick started grazing in the last week in April (~5/24/18). He first grazed his cows on P1 and then will move to paddock 6. Paddock 2, P2 (divided into 2 paddocks by a stream), P3, and P4 are all used for grazing. He can usually sustain his herd on one paddock through "4 chores", so about 2 days, sometimes 2.5 days. With this system he will graze through his pastures in about 18 days and must go through at a slower rate during the second rotation. P3, paddock 3, and paddock 4 may have some soil and slope limitations, because they are on rocky, poorly drained, or very steep land. If the farm were converted to grazing-only, it could be broken up into 40 paddocks (~1A each). Cows would started grazing paddocks with limited tractor access, and then priority grazing would be given to paddocks likely to become very wet or those with forages likely to mature earlier in the season (sweet vernalgrass, meadow foxtail, reed canarygrass). Sweet vernalgrass has some antiquality factors for grazing,

however. The rocky and wet part of P3 should be fenced off. Rick rents an area of land to the east of his farm for dry cow and heifer pasture. There are about 20 acres of grazable, but marginal, land on this area; Rick would like to increase the grazable area by controlling runoff from the spring in the center of the pasture. Rick also rents 30 acres of hayland. It is recommended that Rick focus on the rented land for hay production and keeping all area on the home place in productive pasture.

GRAZING PLAN

FORAGE INVENTORY DATA: Rick feeds 1.5T/day of corn silage in the winter to the milkers. Buttercup is prevalent on the farm, especially in the overgrazed paddocks near the barn (west, northwest), in 2, and from 2 north to the road. Reed canary and sedges grow in the wet areas on 2, P2, P3, and on the middle-east part of 5. Some CA and bull thistle throughout farm. Other forage present include orchardgrass, KY bluegrass, clover, dandelion, tall fescue, and timothy. Forage quality on the current pastureland rated as good (27/40 pasture condition score). With increased management, all pastureland could probably reach quality of hayland (good: 33/40). Hayland on 5 and 7 are very productive; 7 could produce 4+Tons/A per season. 5 has very wet area in the middle-east part. Recommended to graze 7 early in the season, if dry, so the forage stays in the vegetative stage and remains palatable and nutritious longer. Recommend a rock crossing for access to 7; rock from P3 could be used. 4 could be further fenced and managed to become more productive.

The current hayland could be split into three paddocks and added to the rotation in the new grazing system. The rest of the pasture (grazed by dry cows on 6-8-18 visit) could be split into three paddocks and pastured by heifers or put into rotation for milkers. 4 is a fairly wet pasture, especially the north and east portions. The pastures on this farm range from 1,000 to 4,000+ lb/A in productivity of forages.

LIVESTOCK EXCLUSION REQUIREMENTS: Rick has CRP acres along his streams and through the wet areas of his pastures. It is important to maintain the fences in these areas. In other areas along streams (i.e. to east of HQ's), fencing out the streams is recommended to help prevent pollution of surface water. Livestock should be excluded from extremely wet paddocks to prevent degredation of the soils and forage there.

MANURE AND NUTRIENT MANAGEMENT: All of the manure produced from the barn is spread on the grazing pastures, cropland, and meadows that are accessible with a tractor and spreader. At this point, P3 is not accessible with a tractor and thus cannot be spread on. The pit from the milking parlor produces high volumes of manure, and Rick is able to spread excess manure on his neighbors meadows. The current pit used by the parlor is a major source of concern for Rick. He is in the process of cost-sharing a new pit with the NRCS.

EXISTING OR PLANNED WATER SYSTEM: There are three springs on the farm that allow for good water sources. Rick uses galvanized tubs (2 x 2 x 8) on his paddocks for providing water. Paddock 2 on the southeast corner of the paddock has a brook running through it as a water source. Recommendation: it would be possible to fence off the brook and provide a nose pump for that paddock to discourage lots of traffic and standing in or near the brook. A pipe could be run from the spring west of the paddock to provide a good source for the nose pump. One water tank near barn, galvanized tanks on west side of P3 and P2. Most of the stream banks have been turned into Conservation Reserve Program (CRP) land. Rick applies manure at 10,000 gal/acre on both his land and his neighbors land. He uses no commercial fertilizers. P2 and P3 are not very productive past July, soil tests have confirmed that they are borderline low in phosphorous. Rick would like to crop P3, but it is rocky and uneven so it is best to continue to graze P3 for now.

The NRCS grazing specialist said that the rocks on P3 were probably too numerous and it would not be economically worthwhile to remove them.

GRAZING PLAN

EXISTING OR PLANNED FENCES: The CRP program has led to the installation of fences on parts of the farm. These fences are three-wire high tensile fences. Rick plans to fence off the stream through P2; the grazing specialist suggested that single strand fencing would be sufficient for dairy cattle trained to electric temporary fence. Providing another dependable source of water here would also help keep the cattle out of the stream.

ADDITIONAL PLAN INFORMATION

DROUGHT CONTINGENCY PLAN: Rick harvests his grass and buys corn silage for his cattle in the winter. He could buy excess silage if a drought condition presented itself and he needed extra feed. A flatter, less rocky portion of P3 could be used as a "sacrifice area" for his cows. He could keep them on this paddock to avoid overgrazing and harming his regular paddocks. He could feed any extra needed silage/haylage on this sacrifice paddock. He could also continue with his rotation, but at a slower rate to better use the grass that is left in each of his paddocks.

MUD CONTINGENCY PLAN: In very wet circumstances:

- Rotate the livestock through the grazing system at a “faster” than normal pace
- Put the livestock in a “sacrifice” paddock of favorable soil type to take the brunt of the abuse to allow other paddocks a chance to avoid damage
- Avoid the muddier paddocks if possible.

There may be situations where all three of the above will be implemented during a long wet period.

WINTER PLANS: Cows will be kept inside during the winter and fed corn silage and haylage that is harvested during the summer months on the farm. Rick can get 3 cuttings/year from his meadows; he estimates that he gets 500 tons/season from his large hayfield (5). The feed is stored in 2 bunk silos across the road from the milking barn. Each of them is approximately 10 x 10 x 40 ft. Ideally, Rick and his father would like to install an additional, smaller (10 x 10 x 20) bunk silo to have just enough room to keep all of the hay that they harvest. They are having difficulty now finding a place for the excess hay that they produce; putting the feed on open ground caused a large amount of spoilage in the past, and putting the feed in front of the old piles in the silo resulted in spoilage of the old feed in the back of the silo.

Increasing feed intake from grazing (use more of the hayland) would also keep Rick from needing to feed his bought corn silage in the summer when his cows cannot get into the available paddocks because of excessive rain.

EXCESS PASTURE PLANS: Rick currently harvests any paddocks that get ahead of the grazing system. Those paddocks with limited access by tractor are the first to be grazed so that they are not wasted. Priority will be to graze the no-access paddocks, and then focus on grazing the hayland after first or second cut.

GRAZING PLAN

GRAZING SCHEDULE:

	Livestock Group 1
GRAZING DAYS / PADDOCK:	**2.5**
REST PERIOD / PADDOCK:	**42**
PLANNED PADDOCK SIZE AC:	**6.7**
PLANNED # OF PADDOCKS	**18**
	Livestock Group 2
GRAZING DAYS / PADDOCK:	**1**
REST PERIOD / PADDOCK:	**42**
PLANNED PADDOCK SIZE AC:	**2.7**
PLANNED # OF PADDOCKS:	**40**

Optimum Average Height to Graze Forage Species present: **8 inches**
Maximum Average Height to Graze (taller than this make hay)**:** **12 inches**
Minimum Average Grazing Height (do not graze lower than): **3 inches**
Note: Grazing should begin in a different paddock at the beginning of each grazing season.

MONITORING AND RECORD KEEPING PLANS: Keep records of dates-in and dates-out of paddocks. Manager will be provided with a large map and record book; manager can keep records on the map and in the record book.

PLANNED PRACTICE INFORMATION: Rick would like to continue to increase the number of milkers to 80. Implementation of new manure pit for milking parlor. Spring development for paddock 2 to avoid contamination of brook and get more water to cows on this paddock (pipe from spring west of paddock). **Long term goal** of implementing grazing-only system on this farm. Fence the farm to create +/-40 1-acre paddocks (refer to "proposed grazing" map); change fencing between 5, P2, and P3 to fence off the wettest areas and plant reed canary on dryer, less rocky part of P3.

Grazing Forage Balance and
Paddock Number Estimator Worksheet

Farm Name:	**Rick and Jane Buck Farm**
Prepared By:	Joan Planner
Date:	July 1, 2018

Recommended Grazing System Management

5- Enter the type of grazing livestock: Dairy (Holstein Milkers)

Notes: Heifers are housed and fed off the farm, and thus this section will be used for a proposed paddock system for the 75 milkers and dry cows that Rick is currently milking. All currently hayed land will be put into pasture.

6- Enter the Number of grazing livestock: 77

Notes: There are 65 milkers and 12 dry cows. This number will change often, but an average is the best that we can do here. Recommend that the dry cows follow the milkers in the grazing system, one paddock behind.

7- Enter the total acres available and planned for grazing: 59.8 Acres

Notes: There are approximately this many acres on the Buck farm. A few acres have been reduced on P2 (see "proposed fencing" map) because of the rocky nature and low quality of the soil. An acre was added to the plan for the area between 6, 3, and 4, which looks like it has been well grazed and is fairly dry compared to the rest of the farm (on 6-8-18 visit).

Dietary Data:

8- Enter average body weight of grazing livestock (Table 1): 1,400 Pounds

Notes: These are large holstein milkers. Even the dry cows are maintaining this average weight.

9- Enter estimated Dry Matter Intake (DMI) as a % of body weight) (Table 2): 3.0% DMI

Notes: This percentage could increase, especially as cows reach peak production. This number is an average.

10-Calculate Daily DMI for a single animal (8) X (9): 42.0 Pounds of Dry Matter Intake Per Animal

Notes: Dry matter intake may be closer to 52 lbs. The calculated 42 lbs is a reasonable starting point for paddock calculations.

11-Calculate Daily DMI for the herd (5) X (10): 3234.0 Total Pounds of Dry Matter Required Per Day For The Herd

Notes: More investigation is needed to determine actual DMI from pasture.

Grazing Data:

12-Enter length of desired grazing period in days (Table 3): 1.0 Days

Notes: This number will change throughout the year. In May and June this number will be 1/2 or less, as cows spend only one "chore" in one paddock (12 hours) to keep ahead of forage. As the season progresses and forage levels decrease, the time in each paddock can be increased and cattle will better utilize each paddock.

13-Enter estimated available forage dry matter in pounds per acre (Table 4): 1,200 Pounds per acre per day

Notes: The quality of grass varies across the farm. Hay meadows are very high quality (4T/A or more), while the overgrazed paddocks like P1 and 6 are very low (-1,000lb/A). Later in the summer/fall rain, forage will decrease as precip decreases.

Grazing Forage Balance and
Paddock Number Estimator Worksheet

14-Calculate estimated paddock size [(11) / (13)] X (12)	**2.7**	Acres	Notes: On highly productive land the 'estimated forage DMI' (#13) may as much as double.
15a-Enter Estimated paddock recovery period days (Table 5)	42 *Note: 42 days rest period is the default for September.*	Days	Notes:
15b-Calculate estimated number of paddocks needed [(11) / (13)] + 1	**40**	Estimated number of paddocks needed	Notes:
16-Calculate total acres needed for grazing (14) / (15b)	**107.8**	Total estimated acres needed for the grazing plan.	Notes: We still see that the need is significantly greater than the supply here. However, less acreage is required than with the current system. Hay and corn silage will be brought from outside the farm.

Estimates of Acres and Number of Paddocks Needed By Month

Paddock Acres = **2.7**

Month	Estimated Rest Days	Estimated # of Paddocks Needed / Estimated # of Acres Needed
April	***15***	**16** / **43.1**
May	***18***	**19** / **51.2**
June	***24***	**25** / **67.4**
July	***30***	**31** / **83.5**
August	***36***	**37** / **99.7**
September	***42***	**43** / **115.9**

References: "Introduction To Management Intensive Grazing" By: Bill Murphy
"Greener Pastures on Your Side of the Fence" By: Bill Murphy
"Pasture Management" By: Sarah Flack
"Pasture Condition Score Sheet" By: Jim Cropper

Grazing Forage Balance and
Paddock Number Estimator Worksheet

Farm Name:	**Rick and Jane Buck**
Prepared By:	Joan Planner
Date:	July 1, 2018

Grazing System Management Selected

5- Enter the type of grazing livestock: Dairy (Holstein Milkers)

Notes: On the 6-8-06 visit, Rick was housing about 8 dry cows on the north part of his pasture, the east part of paddock 4.

6- Enter the Number of grazing livestock: 77

Notes: This number includes the 65 milkers that are on the Buck Farm. 45 heifers (19-400 lbs, 19-500 lbs, 7-600 lbs) are grazed on a pasture away from the farm. His 12 dry cows are also housed off the farm, but for comparison with the "proposed system", we will include them here.

7- Enter the total acres available and planned for grazing: 22.0 Acres

Notes: This is an approximation, as Rick has some land that he hays, some that he crops, some that he grazes, and at some parts of the year some of his land can be under water or be otherwise unusable.

Dietary Data:

8- Enter average body weight of grazing livestock (Table 1): 1,400 Pounds

Notes:

9- Enter estimated Dry Matter Intake (DMI) as a % of body weight) (Table 2): 3.0% DMI

Notes: These cows are near their peak production (6/28/18), so they may be consuming slightly more than this right now. However, since we are trying to do an estimation and average plan, 3% will be used.

10-Calculate Daily DMI for a single animal (8) X (9): 42.0 Pounds of Dry Matter Intake Per Animal

Notes:

11-Calculate Daily DMI for the herd (5) X (10): 3234.0 Total Pounds of Dry Matter Required Per Day For The Herd

Notes:

Grazing Data:

12-Enter length of desired grazing period in days (Table 3): 2.5 Days

Notes: Rick said that his cows are usually on a paddock for about 4-5 "chores", or milkings; this is about 2 -2.5 days.

13-Enter estimated available forage dry matter in pounds per acre (Table 4): 1,200 Pounds per acre per day

Notes: The quality of grass varies across the farm. Hay meadows are very high quality (4T/A or more), while the overgrazed paddocks like P1 and 6 are very low (-1,000lb/A). Later in the summer/fall rain, forage will decrease as precipitation decreases.

14-Calculate estimated paddock size: **6.7** Acres

Notes: Paddocks are very uneven at this point. There are natural barriers on this farm that will not allow for extending these barriers (streams, wet areas, steep slopes). The sizes of paddocks range from 1 to 9 acres.

Grazing Forage Balance and
Paddock Number Estimator Worksheet

[(11) / (13)] X (12)

15a-Enter Estimated paddock recovery period days	42	Days	Notes:
	Note: 42 days rest period is the default for September.		At this point the grass is growing ahead of the average rate. We will use this value of 42 days to plan for the period of slowest growth (September). See below for estimated recovery rates, or "rest days" for each month.
(Table 5)			
15b-Calculate estimated number of paddocks	**18**	Estimated number of paddocks needed	
	Notes:		There are 8 pad's available at this time, ranging from 1-9 acres per pad. Rick would like to be able to graze his central pad, pad 5. He hays this pasture now, but if he can clear his other paddocks (rocks, etc), he may be able to further divide & pasture pad 5.
needed [(11) / (13)] + 1			
16-Calculate total acres needed for grazing	**119.9**	Total estimated acres needed for the grazing plan.	
	Notes:		This farm is short of pasture. It is advisable that Rick utilize all fields for grazing and then buy what he cannot produce himself (this proposed plan will be outlined in the "proposed system" and "plan"-the next 2 parts of this write-up).
(14) / (15b)			

Estimates of Acres and Number of Paddocks Needed By Month

Paddock Acres = **6.7**

Month	*Estimated Rest Days*	*Estimated # of Paddocks Needed*
April	***15***	**7**
		Estimated # of Acres Needed
		47.2
Month	*Estimated Rest Days*	*Estimated # of Paddocks Needed*
May	***18***	**8**
		Estimated # of Acres Needed
		55.2
Month	*Estimated Rest Days*	*Estimated # of Paddocks Needed*
June	***24***	**11**
		Estimated # of Acres Needed
		71.4
Month	*Estimated Rest Days*	*Estimated # of Paddocks Needed*
July	***30***	**13**
		Estimated # of Acres Needed
		87.6
Month	*Estimated Rest Days*	*Estimated # of Paddocks Needed*
August	***36***	**15**
		Estimated # of Acres Needed
		103.8
Month	*Estimated Rest Days*	*Estimated # of Paddocks Needed*
September	***42***	**18**
		Estimated # of Acres Needed
		119.9

References: "Introduction To Management Intensive Grazing" By: Bill Murphy
"Greener Pastures on Your Side of the Fence" By: Bill Murphy
"Pasture Management" By: Sarah Flack
"Pasture Condition Score Sheet" By: Jim Cropper

Dairy (Holstein Milkers)

Grazing Practice Implementation Schedule For:

Rick and Jane Buck Farm ***Farm***

Practice Name	*Scheduled Month / Year*	*Field / Paddock*	*Planned Amount*
Animal Trail and Walkway	practices listed in conservation Plan	P1 & see Cons plan	see Cons plan
Fence		"	""
Water Facility		"	""
Pipeline		"	""
Pasture and Hayland Planting			""
Use Exclusion			""
Prescribed Grazing	10/18	P1 thru12	66acres
Animal Trail and Walkway			""
Water Facility			""
Prescibed Grazing	10/19	P1 thru 12	66acres
Fence			""
Prescibed Grazing	10/20	P1 thru 12	66acres
Pasture and Hayland Planting	5/21	NR	12ac
Water Facility	all non cost shared	newly rented(NR)	3
Heavy Use Area Protection		NR	.1ac
Fence		NR	6400ft
Pipeline		NR	3000ft
Heavy Use Area Protection	5/2022 (winter feed area, beef)	NR	0.3
Spring Development		NR	1
Water Facility		NR	2
Prescibed Grazing	10/2022	P1 thru12, NR	78acres
Prescribed Grazing	10/2023	P1 thru12, NR	78acres
SUBJECT TO CHANGE ……	as management goals evolve		

Grazing Field / Paddock and Soils Inventory For:

Rick and Jane Buck Farm ***Farm***

Field or Paddock Names/Numbers	*Acres*	*Slope Class*	*Soil Type*	*Soil Capability or Limitation*
1	6.6	0-15%	ScA, PrC, WrA	**Scantic silt loam (ScA):** formed in clayey glaciolacustrine sediments on lake plains. Very deep to bedrock, poorly drained. Soils have perched water table at depths of 0-1.0 feet below surface from Fall-early Summer. Permeability is moderately slow in the surface layer and slow in subsoil and substratum. These soils are suited to cultivated crops if adequate drainage is provided. Well suited to hay and pasture. Working these soils when wet may result in a compacted, cloddy condition. A seasonal high water table may inhibit the establishment of some crops. Areas of this soil may be classified as wetland; drainage may be regulated. **Peru extremely stony fine sandy loam (PrC):** formed in loamy, compact glacial till on uplands. Very deep to bedrock, shallow to moderately deep to dense basal till, moderately well drained. These soils have a perched water table at depths of 1.5-2.5 feet below the surface from late Fall through late Spring. Permeability is moderate in the solum and moderately slow to slow in the substratum. Poorly suited to cultivated crops, hay and pasture because of the stones and boulders on surface and water erosion hazard. **WrA** desc
2	3.4	0-15%	MuB, ScA, CbB	**Munson silt loam (MuB):** formed in loamy over clayey glaciolacustrine deposits on lake plains. Very deep to bedrock, somewhat poorly drained. These soils have a perched water table at depths of 0.5-2.0 feet below the surface from late Fall-early Summer. Permeability is moderate in the surface layer, moderately slow in the subsoil and slow in the substratum. Suited to cultivated crops. Well suited to hay and pasture. Erosion is a hazard. Seasonal high water table may inhibit the establishment of some crops. **ScA** description above. **Cabot extremely stony fine sandy loam (CbB):** formed in loamy, compact glacial till on uplands. Very deep to bedrock, shallow or moderately deep to dense basal till; poorly drained. These soils have a perched water table at depths of 0-1.5 feet below the surface from late Fall-late Spring. Permeability is moderate in the solum and slow in the substratum. Poorly suited to cultivated crops, hay and pasture because of the stones and boulders on the surface and the seasonal high water table.

Grazing Field / Paddock and Soils Inventory For:

Rick and Jane Buck Farm ***Farm***

Field or Paddock Names/Numbers	*Acres*	*Slope Class*	*Soil Type*	*Soil Capability or Limitation*
3	4.4	3-15%	WrB, WrC	For these soils see **WrA** description above: B has 3-8% slopes, C has 8-15% slopes.
4	8.3	0-3%	ScA, Le	**ScA** description above. **Limerick silt loam (Le):** formed in loamy alluvium on flood plains that are frequently flooded for brief duration from late Fall-late Spring. Very deep to bedrock; poorly drained. These soils have a water table at depths of 0-1.5 feet below the surface from late Fall through late Spring. Permeability is moderate. These soils are suited to cultivated crops if adequate drainage is provided. They are well suited to hay and pasture. A seasonal high water table may inhibit the establishment of some crops. Flooding is a hazard, but is of short duration and usually occurs in the spring. Tillage operations may be delayed in some years. Areas of this soil may be classified as wetland and drainage may be regulated.
5	18.0	0-8%	ScA, MuB, Le	See all descriptions above.
6	1.0	15-25%	TwD, Le	**Tunbridge-Woodstock fine sandy loams (TwD):** These soils formed in loamy glacial till on uplands. TUNBRIDGE SOILS are moderately deep to bedrock and well drained.Permeability is moderate or moderately rapid. WOODSTOCK SOILS are shallow to bedrock and somewhat excessively andexcessively drained. Permeability is moderately rapid.This map unit is poorly suited to cultivated crops. It is suited to hay and pasture. Erosion is a hazard. Rock outcrops near the surface are troublesome in tillage and harvesting operations. The slope of these areas restricts the use of equipment.
7	1.4	3-15%	MuB, PrC	See all descriptions above.
P1	2.2	0-3%	ScA, Le	See all descriptions above.
P2	6.1	0-8%	MuB, ScA	See all descriptions above.
P3	9.0	0-15%	CbB, ScA, MuB	See all descriptions above.
P4	1.4	0-8%	ScA, MuB	See all descriptions above.

Implementation, Operation, & Maintenance for Rotationally Grazed Pasture Systems Consisting of Cool Season Forages (To-Do-List)

The planning procedure for your grazing plan estimates the size & number of paddocks and the amount of acres of pasture that will be required for the herd or flock during late summer and fall. In years of normal or near normal temperature and precipitation, this means that during the first 60 days (approximate) of grazing, the number of acres indicated will be nearly twice that which is needed for grazing. *Much of the lower wet areas is reed canarygrass and will be challange to manage in wet conditions.*

To ensure that this forage is not wasted and to maintain pastures at their highest quality, the following implementation procedure is recommended:

Allocate the pasture into two separate management units based on their first intended use. *In most cases the sloping pastures will be grazed first, howver, if possible try to save these areas for the unexpected rainy spell when other areas are too wet to graze. This is the mangement challenge.* Designate the land on which grazing will begin in the spring and whose primary means of harvest will be through grazing as one management unit (Management Unit I). Generally, this will be the land with the driest soil conditions and where the forage will be ready to graze the soonest or land that is too steep, rocky or otherwise not harvestable through mechanical means.

Designate the land on which the first use or harvest will be through mechanical means as another management unit (Management Unit II). *This is the land on the other side of the road.* This land is planned for, but not needed for pasture during the first ~60 days of the grazing season. Generally, this land will be flatter, further from the barn or holding facility, and offer no obstacles to mechanical harvest. As a general consideration, Management Unit I should contain about 40% of the planned acreage with Management Unit II the remaining 60%.

Grazing should begin on Management Unit I when forage heights reach approximately 3 inches. (see GRAZING SCHEDULE below). Continue moving livestock to new paddocks until one of the previously grazed paddocks has regrown to a height of approximately 6-8 inches and is ready to be grazed again. At this point, stop adding paddocks that have not been grazed once already. It is time to start the second rotation. Keep in mind, the paddock that was grazed initially the first time around may not be the paddock that will be ready to be grazed first in the second rotation. Whichever paddock recovers to a height of 6-8 inches the quickest is the next paddock to graze. The remaining ungrazed paddocks or land in the system should now be designated as part of Management Unit II.

All of the land in Management Unit II should be harvested mechanically by the end of the second rotation or the start of the third. This should generally occur around the third or fourth week of May depending on the year and location. Although taking an early cut of hay may result in a lower harvested yield, the quality of the forage is much higher. In addition, taking an early harvest allows for regrowth to occur while moisture and temperature conditions are generally more favorable than they are later in the year. Waiting longer to harvest, in order to obtain a higher yield, sacrifices the quality of feed and may also limit the regrowth potential.

Depending on the growing conditions, plant species, and management level applied, by the end of the fourth rotation, most of the land planned for use in the system will be utilized for grazing. However, in some instances, this will not be consumed through grazing, an additional harvest of some of the land in Management Unit II may be desirable.

INFRASTRUCTURE

Fencing

To ensure that both the structural integrity of the grazing system as well as management flexibility are maintained, a combination of both permanent and temporary fencing materials are recommended. The kind and amount of fencing utilized should be of sufficient high quality and durability to facilitate control of the intended livestock. See NRCS Fence Standard 382 for guidance.

Laneways

Laneways should be constructed to facilitate livestock movement to and from pasture, between paddocks, or to the water supply. Width should be no wider than necessary to expedite livestock movement or if they are to be used for both livestock and machinery passage, they should be wide enough to accommodate the largest piece of machinery anticipated. Ensure that the travel surface remains firm. Where problems with wet conditions and mud exist, geotextile filter fabric, gravel, limestone dust, or other similar materials may be required. In other situations the use of culvert pipes or bridges may be necessary. *Check the older pipes you have installed in the trails leading awy from the barn adjacent the Big field. Thes may need to be replaced*. Be aware of any wetland permits that may be required for such lane improvements

Water

Good quality water in ample quantities should be made available to livestock while in the pasture to meet their nutritional requirements and be provided in such a manner as to not cause environmental concern or degradation. As a general consideration, water for lactating dairy cattle should be provided within 200 to 300 feet of where the cows are grazing. All other livestock should have water provided within 800 to 1,000 feet. Water lines should be placed in protected areas along or beneath fences and where they cross gate openings or other unprotected areas additional protection should be provided. Water lines can be buried, as well. *Be sure to winterize your entire water system.*

SUPPLEMENTAL and CONTINGENCY FEEDING

To ensure that deficiencies in feed quality, quantity, or availability are not limiting livestock performance, it is recommended that a qualified nutritionist be consulted to evaluate your feeding program. Consult your local UVM Cooperative Extension, Natural Resources Conservation Service office, *feed dealer*, or other qualified organizations for assistance.

In the case where adverse growing conditions limit pasture yields and quality, it is recommended that an alternative feeding strategy be developed. This might include such things as planning to add additional grazing land to the system, buying additional feeds, or reducing livestock numbers.

GRAZING SCHEDULE

Timing and Frequency of Grazing

Spring
Grazing should begin in the spring on the first paddock that reaches approximately 3 inches in height and is dry enough to support livestock without undue punching of the soil.
Paddocks should be grazed again when the forage reaches 4 to 6 inches for low growing species of grasses and legumes and 6 to 8 inches in height for tall growing species. This will generally occur between 8 and 15 days from the date livestock exit the paddock.

Summer and Fall
Grazing should occur in the summer or fall on paddocks or fields that were previously grazed, clipped or mechanically harvested when the height of the forage reaches 4 to 6 inches for low growing species of grasses and legumes and 6 to 8 inches for tall growing species. This will generally occur between 15 and 40 days from the date the forage was last harvested.

Intensity of Grazing

Spring
The first grazing in the spring should leave low growing species of grasses and legumes with a 1 to 2 inches residual stubble height and tall growing species with a 2 to 2 ½ inch residual stubble height.

Summer and Fall
Residual stubble heights need to be adjusted upwards when grazing during the summer and fall, depending on temperature and moisture conditions. Generally, residual stubble heights under normal early summer conditions should be similar to those outlined for spring grazing. However, as temperatures increase and moisture levels decrease, short growing species of grasses and legumes should not be grazed lower than 2 to 3 inches and tall growing species should not be grazed to residual stubble height of less than 3 to 4 inches.

Duration of Grazing

The duration (length of time) livestock have access to an individual paddock is controlled by selecting an appropriate residency period to meet the identified management objectives. The selection of an appropriate residency period is based on livestock occupying a paddock long enough to consume the existing forage but, generally, not so long that there is time for the forage to regrow and be grazed a second time during single occupancy period. The exception to this rule occurs when severe grazing is prescribed to eliminate undesirable plant species or to regain vegetative control of pastures that have grown past their prime in quality.

Spring
Because plant growth is exceptionally fast in the spring, residency periods should be kept as short as possible.
For lactating livestock such as dairy cows, dairy goats and dairy sheep, 1/2 day to 1 day is recommended. For all other livestock 2 to 4 days should be considered maximum.

Summer
During the summer months, plant growth slows to about one half of what it is in the spring. As a result, residency periods can be extended to as long as 7 days for livestock other than the lactating livestock previously identified. In order to meet the higher nutritional demands of lactating dairy livestock, it is recommended that residency periods remain 1/2 to 1 day.

As a general consideration, for all kinds and classes of livestock, the shorter the residency period, the greater the utilization. The longer the residency period, the greater forage loss due to trampling, matting, and fouling with urine and fecal material.

MAINTENANCE

Clipping Pastures
Pastures should be clipped to control weeds and to return the forage base to a vegetative condition, when necessary. It is recommended that all pastures be clipped or mechanically harvested by the start of the third rotation. Generally around the first or second week of June under normal growing conditions. Any harvest or clipping should return the pasture to the recommended residual heights noted above.

Fertility
All pastures should be soil tested at least once in every 3 years and fertility levels adjusted to the recommended levels according to the needs of the plants.

Weed Control
While some weeds can be grazed or eliminated through grazing and clipping, others will need to be sprayed with an approved herbicide. For persistent weed problems, consult your local UVM Cooperative Extension office for site and weed specific recommendations.

Pasture Seeding
Pastures should not be seeded or renovated until there is a prescribed grazing management plan in place to facilitate the control of livestock and soil fertility has been amended to soil test recommendations. The next step is the addition of an adapted legume. Once a legume has been introduced into the pasture, generally there is a greater difference in yield, quality, and animal performance due to management than there is due to changing the grass species. If the addition of a grass is desired, ensure that it is adapted to the soil drainage class and fertility status.

ASSISTANCE
For more information and assistance regarding your grazing system or rotational grazing contact your local Natural Resources Conservation District, UVM Cooperative Extension, and/or NRCS office.