goGraze: an innovative web and mobile based tool for grazing planning and recordkeeping

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Introduction

Thank you for taking the time at this conference to learn about an online tool that can help you create a grazing plan, keep records, and monitor the performance of your farm. goCrop[™] is a nutrient management planning web application; goGraze is a module that may be used with or without the nutrient management capabilities of goCrop[™]. The origins of goCrop[™] stemmed from an increased focus on nutrient management education and development when legislation required Vermont's medium and large farms to have nutrient management plans (NMPs). In 2006, Dr. Heather Darby, University of Vermont Extension Agronomic and Soils Specialist, created a training course in collaboration with staff from the USDA Natural Resource Conservation Service (NRCS) and the Vermont Association of Conservation Districts (VACD). The course helped farmers create their own NMPs and provided education on managing fertility for high crops yields while protecting the surrounding environment. The first NMPs were completed with pen, paper, and calculators, and later moved to excel spreadsheets. As technology advanced, it became clear that the next step was to offer an NMP tool online.

In 2011, the goCrop[™] web application was released to help farmers more efficiently create NMPs and allow for easier recordkeeping. In 2012, a mobile version of goCrop[™] was developed that allows farmers to enter records on their iOS devices. The ability to enter data in real time in the field again improved the efficiency and accuracy of record-keeping. goCrop[™] receives routine updates, adapting to changing reporting requirements and user demands. Due to a 2015 water quality bill the majority of Vermont farmers are now required to create NMPs that meet state and federal standards, including the NRCS 590 nutrient management standard. Plans require basic farm information and general management practices, field information (soil type, soil analysis results, crop rotations, etc.), crop information and fertility recommendations, manure analysis results, manure applications records and plans, the nutrient balance for each field, and multiple environmental indices (P-Index, Nitrogen Leaching Index, RUSLE2, etc.).

Since many current users of goCrop[™] are grass-based dairy farms, there was a need to integrate more specific grazing planning and recordkeeping features into goCrop[™]. Darby and her staff have worked with farmers and agricultural service providers to develop goGraze as a grazing module to goCrop[™] to meet these needs.

About goGraze

goGraze was designed as a module within goCrop[™] to help farmers build a grazing plan and keep records that may be used to help meet USDA National Organic Program (NOP) and NRCS reporting requirements for their grazing incentive programs. Most importantly, it provides the farm with a valuable data management program to allow for planning and monitoring of grazing systems. When goCrop[™] and goGraze are used together, they allow for whole farm cropping system management.

The following screen shots are provided to illustrate goGraze and the step-by-step process of creating a grazing plan and entering records.

The first step is to provide some key pieces of information, entered under the fields tab. Here, you will select all farm fields that are included in the grazing operation. For example, the farm will likely have multiple perennial forage fields with pasture, hay, and a

€ goCro	ор н	ome Farm	Fields	Grazing		e	Farms	Account 😃
Graze and Harv	est T	Info Cr	ops Nu					
	Edit Crop							
	Details							
	Field: Graze and Harves Type: Annual Cron*	t						
	Forage Oats & Peas	•						
	Purposes* ✓ Harvest ✓ Grazing Cover Crop Legume Percentage Notes		Choos and h and g	e at least one. If arvest hay from razing.	you graze this it, choose both	field harvest		
	Species Breakdow	'n						
	Name	*		Percenta	ge*	x		
	(Add anothe	•r row	Che	ck the box on the ri delet	ight to mark a row ion.	for		

combination of both. For each particular field, the farmer or a planner must choose the purpose of the crop, such as for harvest, grazing, and/or as a cover crop (Figure 1). In the nearby screen shot, an annual crop of forage oats and peas used for harvest and grazing was selected.

Figure 1. Screenshot of the Crops Details From with goGraze module addition, Species Breakdown and Species Breakdown Percentage. To the right is an example of the harvest and grazing details needed to complete crop information to be used to help calculate potential yield of each field (Figure 2).

> Figure 2. Screenshot of the Crops Details From continued, showing Harvest Details and Grazing Details.

lore than one harvest?	
Yes	
® No	
otal Anticipated Yield*	
2000.0	
ield Unit*	
lbs/acre	•
razing more than once?	
arazing more than once? Yes No	
arazing more than once? Yes No nticipated Yield (per Graze)*	
Frazing more than once? Frazing more than once? Frazing No Inticipated Yield (per Graze)* 900.0	
Frazing more than once? Frazing more than once? Frazing No Inticipated Yield (per Graze)* 900.0 Frazing Doctarias	
Frazing more than once? Yes No Inticipated Yield (per Graze)* 900.0 Field Unit* Ibs/acre	Ţ
Frazing more than once? Frazing more than once? Frazing more than once? Frazing more than once? No No Inticipated Yield (per Graze)* 900.0 Frield Unit* Ibs/acre pprox. Number of Grazes	Ţ

With the grazing feature, additional screens appear where the farmer can determine the regrowth rates for the pasture crop in that field (Figure 3). These regrowth rates or rest periods begin with defaulted book values typical for the seasonal growth rate for the type of pasture forages present in that field. The user can override these if they have their own farm data/information.

Pasture Regeneration Rates/R Ask yourself "If I graze a part of thi Fill out an aver	est Periods is field in [month], how rage for each month ye	v long would I wait before grazing it again?". ou might be grazing in.
Month		Avg Paddock Rest Period (days)
Jan	Grazing?	
Feb	Grazing?	
Mar	Grazing?	
Apr		14.0
Мау	✓ Grazing?	18.0
Jun	Grazing?	
Jul	Grazing?	
Aug		36.0
Sept	✓ Grazing?	42.0
Oct	Grazing?	
Nov	Grazing?	
Dec	Grazing?	
Add another row		Check the box on the right to mark a row for deletion.

Figure 3. Screenshot of the Crops Details From with goGraze module addition, Pasture Regeneration Rates/Rest Periods.

Once information for all fields to be included in the grazing plan is completed, the next step is creating the grazing plan in goGraze.

goGraze Grazing Planning

The grazing plan starts with creating animal groups that will be grazing on the farm. Options for animal groups appear in a drop-down menu. Default values for animal weight and daily dry matter intake (DMI) may be overridden with farm-specific information (Figure 4).

lev	v Animal Group
Name	2*
Form	ed*
Notes	
Notes	
	//
Gro	up Composition
Speci	es*
Purp	ose*
_	
Sex*	
Stage	*
	•
Domi	nant Breed*
Star	rting Information
Ba	sed on your choices above, goCrop will automatically fill in suggested values
-	below. You can use these suggestions or input your own values.
Start	ng number*
Starti	ng Weight (lbs)*
Starti	ng Daily DMI (% bodyweight)*
	Cancel Add Animal Group

Once all animal groups have been created, the grazing plan may be created from scratch or based on a previous plan. Each plan receives a unique name (Figure 5). goGraze stores multiple plans for one year so you can compare plans and choose the one that is best for you or update your plan as conditions change throughout the grazing season (Figure 6).

Figure 4. Screenshot of the New Animal Group Form.

Name*		
Crop Year*		
2016		
Based On	-	
n/a - start from scratch	•	
Notes		
		h

Figure 5. Screenshot of creating a New Grazing Plan Group Form.

G goCrop	Home	Farm	Fields	Grazing	🕂 Farms Account 🕚
		Animals	Planning	Records	
🔊 Gra	azing Plans	5 0			+ New Grazing Plan
Name <u>Test 1</u>	Based On -	Starte 9/6/16	d 5	Updated 9/6/16	Notes

Figure 6. Screenshot of Grazing Plans page, showing one plan created.

When the grazing plan is opened, it will default to the Grazing Plan Summary page to view summary details of the plan and summary land needs for the group.

goGraze can account for a variety of variables for each grazing group. For example, users can identify animal groups that graze together (Figure 7). goGraze also accounts for the specifics of each grazing group such as the grazing season, fields that animal group will have access to (Figure 8), and the starting and ending heights of forage (Figure 9).

For Plan: May 2017 (2017) Animal Group* May graze with Milkers Heifers If this group grazes with other groups (in the same paddocks or leader-follower) select them here. This will allow you to plan their rotations together. Minimum Paddock Rest Period Enter your approximate grazing season Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Add another row Check the box on the right to mark a row for deletion.	Details			
Animal Group* Animal Group* May graze with Milkers Milkers Heifers If this group grazes with other groups (in the same paddocks or leader-follower) select them here. This will allow you to plan their rotations together. Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Add another row Check the box on the right to mark a row for deletion.	For Plan: May 2017 (2017)			
May graze with Milkers Mikers Heifers Hit fthis group grazes with other groups (in the same paddocks or leader-follower) select them here. This will allow you to plan their rotations together. Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Add another row Check the box on the right to mark a row for deletion.	Animal Group*			
May graze with Milkers If this group grazes with other groups (in the same paddocks or leader-follower) select them here. This will allow you to plan their rotations together. Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Add another row Check the box on the right to mark a row for deletion.		•		
 Milkers If this group grazes with other groups (in the same paddocks or leader-follower) select them here. This will allow you to plan their rotations together. Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Check the box on the right to mark a row for deletion. 	May graze with			
 Heifers Heifers Same paddocks or leader-follower) select them here. This will allow you to plan their rotations together. Minimum Paddock Rest Period Minimum Paddock Rest Period Minimum Paddock Rest Period Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Check the box on the right to mark a row for deletion. 	Milkers	If this group grazes with other groups (in th		
Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Add another row Check the box on the right to mark a row for deletion.	Heifers	same paddocks or leader-follower) select them here. This will allow you to plan their rotations together.		
Enter your approximate grazing season start and end dates. If your grazing season has one or more breaks in it, enter the start and end dates for each period in which you will be grazing, adding as many rows as you need. First Day* Last Day* Last Day* Add another row Check the box on the right to mark a row for deletion.	Minimum Paddock Rest Period	rotations together.		
First Day* Last Day* Image: Check the box on the right to mark a row for deletion.	Minimum Paddock Rest Period	rotations together.		
Add another row Check the box on the right to mark a row for deletion.	Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season breaks in it, enter the start and end date	rotations together. start and end dates. If your grazing season has one or more s for each period in which you will be grazing, adding as many rows as you need.		
Add another row Check the box on the right to mark a row for deletion.	Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season breaks in it, enter the start and end date: First Day*	start and end dates. If your grazing season has one or more s for each period in which you will be grazing, adding as many rows as you need. Last Day*		
	Minimum Paddock Rest Period Planned Grazing Season Enter your approximate grazing season breaks in it, enter the start and end date First Day*	start and end dates. If your grazing season has one or more s for each period in which you will be grazing, adding as many rows as you need. Last Day* 2		

Figure 7. Screenshot of New Group Grazing Plan form.

and the start and end of grazing wth rates of the pastures, will be u	(in inches). This information, alc used throughout your plan.	ong with
Forage Start Height (inches)*	Forage End Height (inches)*	X
		٥
	Check the box on the right to a row for deletion.	mark
	who rates of the pastures, will be u Forage Start Height (inches)*	and the start and end or grazing (in incres), this morinatori, and the start and end or grazing (in incres), this morinatori, and Forage Start Height (inches)* Check the box on the right to a row for deletion.

Figure 8. Screenshot of Available Pasture list for each grazing group.

Choose which of your grazed field bose the average forage heights yields and regrow	ds/crops will be available to this gro and the start and end of grazing (in th rates of the pastures, will be use	oup during the season. For each pa 1 inches). This information, along v 2d throughout your plan.	sture vith th
Crop/Field*	Forage Start Height (inches)*	Forage End Height (inches)*	x
Graze and Harvest - 🔻	10.0	4.0	
Native Pasture - Past 🔻	8.0	4.0	
Small Pasture - Pastı 🔻	10.0	4.0	
Pasture Out Back - P	10.0	4.0	

Figure 9. Screenshot of Available Pasture growing details.

To plan the grazing group's diet, goGraze allows the flexibility to plan for a specific dry matter intake (DMI) and modify the percent DMI expected from pasture as well as percent DMI from rations. The size of the grazing group, animal weight, and percent daily DMI in relation to animal weight may also be modified (Figure 10).

r Plan: May 2017 (2017) r Group: Milkers azing Season: 4/15 - 10/15			Plan dietary needs: ® Per Individual Animal (lbs/day each) © As a sum for whole group (group total lbs/day)					
	When will t Wh	he group's size en will the grou	Ask yourse or dietary nee p's ration char	If: eds change duri nge during the :	ing the season' season?	?		
Diet First/Last Day (yyyy-mm-dd or use calendar)	Number in Group	Avg Weight	Daily	γ DMI	® % from pasture	OMI from ration	Total DMI from Pasture	x
Today	60	1300	3	39				
Apr ▼ 15 ▼ May ▼ 31 ▼	60 head	1300.0 Ibs	3.0	39 Ibs/day	35	25.35 Ibs/day	819 Ibs/day	
Jun Y 1 Y Aug Y 31 Y	60 head	1300.0 Ibs	3.0	39 Ibs/day	90 %	3.9 Ibs/day	2106 Ibs/day	
Sept V 1 V Oct V 15 V	50 head	1300.0 Ibs	3.0 %	39 Ibs/day	40	23.4 Ibs/day	780 Ibs/day	
+ Add another row				Check t	he box on the r	ight to mark a ro	w for deletion.	
					C	Cancel Upd	ate Planned	Die

goGraze can account for changes in diet for higher percentage of DMI from new pasture availability or differences in pasture productivity experienced throughout the year. Additions or losses of animals in the herd may also be modified and provides for quick DMI adjustments. Diets can be developed based on pounds of feed required per animal or for the group as a whole.

Figure 10. Screenshot of Planned Diet for specified grazing group.

The final step in creating a grazing plan for a particular animal group is defining land base required to meet the pasture-

based portion of the diet (Figure 11). In this section, grazing periods within the grazing season are defined and the DMI from pasture is based on input that was already recorded in the planned diet needs section. The total number of acres needed is determined by the productivity of fields and DMI required for the animal group. The user sets the occupation period (how often this animal group will be moved) and go-Graze calculates the number of paddocks needed and the size of each paddock.

Planned La	nd	Needs ⑦					÷ 💋
Grazing Period		DMI Needed from pasture*	Est. Pasture Yield	Est. Paddock Rest Period	Occupation Period	Paddocks	Acres Needed
Apr 15 -	P:	779 lbs/day	450 lbs/ac	20 days	10 days	1.6 @ 17.31 acres ea.	27.7 acres
Apr 30	A:	40 lbs/day	540 lbs/ac	20 days	5 days	3.2 @ 0.37 acres ea.	1.19 acres
May 1 -	P:	779 lbs/day	450 lbs/ac	20 days	20 days	1.55 @ 34.62 acres ea.	53.66 acres
May 31	A:	40 lbs/day	540 lbs/ac	20 days	11 days	2.82 @ 0.81 acres ea.	2.3 acres
Jun 1	P:	2066 lbs/day	450 lbs/ac	24 days	20 days	1.5 @ 91.82 acres ea.	137.73 acres
Jun 30	A:	40 lbs/day	540 lbs/ac	-	10 days	? @ 0.74 acres ea.	?
Jul 1 -	P:	2066 lbs/day	450 lbs/ac	30 days	25 days	1.24 @ 114.78 acres ea.	142.32 acres
Jul 31	A:	40 lbs/day	540 lbs/ac	-	6 days	? @ 0.44 acres ea.	?
	P:	2076 lbs/day	450 lbs/ac	36 days	20 days	1.55 @ 92.27	143.01 acres

Figure 11. Screen shot of Planned Land Needs for specified grazing group.

Milkers Plan: May 2017							
	Grazing [Details ⑦					
Planned Grazing Season: 4/ Minimum Paddock Rest Peri Notes: Available Pastures	15 - 10/15 od: 20.0 days						
Crop/Field	Forage Start Height (inches)	Forage End Height (inches)	Yield each Graze				
Graze and Harvest - Forage Oats & Peas	10.0	4.0	540 lbs/ac				
Native Pasture - Pasture	8.0	4.0	450 lbs/ac				
Small Pasture - Pasture	10.0	4.0	540 lbs/ac				
<u>Pasture Out Back - Pasture</u>	10.0	4.0	540 lbs/ac				

Figure 12. Screenshot of Grazing Details page showing Available Pastures and pasture details.

goGraze then summarizes the information for each grazing group, including length of the grazing season, number of days for minimum rest period, available pasture, and yield anticipated for each grazing event (Figure 12). The Planned Diet page includes total DMI from pasture for each recorded change in diet (Figure 13). This page also displays any changes in herd size, average weight, daily DMI, percent DMI from pasture and ration needed to meet feed demands.

Planned Die	et ⑦					÷ 💋
Diet First/Last Day	Number in Group	Avg Weight	Daily DMI	% from Pasture	DMI from Ration *	Total DMI from Pasture
Apr 15 - May 31	60 head	1,300 lbs	3%	35%	25.35 lbs/day	819 total lbs/day
Jun 1 - Aug 31	60 head	1,300 lbs	3%	90%	3.9 lbs/day	2106 total lbs/day
Sep 1 - Oct 15	50 head	1,300 lbs	3%	40%	23.4 lbs/day	780 total lbs/day
		* DMI values	shown are for a sing	le individual.		

Figure 13. Screenshot of Grazing Details page continued showing Planned Diet details.

The Planned Land Needs page shows, by each animal group, each grazing period and the DMI required for perennial forage pasture (P) and/or annual forage (A) pasture (Figure 14). goGraze calculates number of acres needed for each forage type based on pounds of DMI required by the grazing group. Based on the estimated pasture yield, estimated paddock rest period, and the user defined occupation period, goGraze calculates the number and size of paddocks.

Planned La	and	Needs ⑦					÷ 💋
Grazing Period		DMI Needed from pasture*	Est. Pasture Yield	Est. Paddock Rest Period	Occupation Period	Paddocks	Acres Needed
May 1 -	P:	779 lbs/day	503.6 lbs/ac	20 days	20 days	1.55 @ 30.94 acres ea.	47.95 acres
May 31	A:	40 lbs/day	540 lbs/ac	20 days	11 days	2.82 @ 0.81 acres ea.	2.3 acres
Jun 1 -	Ρ:	2066 lbs/day	503.6 lbs/ac	24 days	20 days	1.5 @ 82.05 acres ea.	123.07 acres
Jun 30	A:	40 lbs/day	540 lbs/ac	20 days	10 days	3 @ 0.74 acres ea.	2.22 acres
Jul 1 -	Ρ:	2066 lbs/day	503.6 lbs/ac	30 days	25 days	1.24 @ 102.56 acres ea.	127.18 acres
JUI 31	A:	40 lbs/day	540 lbs/ac	24 days	6 days	5 @ 0.44 acres ea.	2.22 acres
Aug 1 -	Ρ:	2076 lbs/day	503.6 lbs/ac	36 days	20 days	1.55 @ 82.45 acres ea.	127.79 acres
Aug 31	A:	30 lbs/day	540 lbs/ac	36 days	11 days	2.82 @ 0.61 acres ea.	1.72 acres
Sep 1 -	Ρ:	760 lbs/day	503.6 lbs/ac	42 days	25 days	1.2 @ 37.73 acres ea.	45.27 acres
Sep 30	A:	20 lbs/day	540 lbs/ac	42 days	5 days	6 @ 0.19 acres ea.	1.11 acres
			* DMI values sho	wn are totals for the	whole group.		
Total requi	ired (perennial pastı	ure: 61.87 - 230	.85 Total ı	required annua	al pasture: 1.74	- 2.61 acres

Figure 14. Screenshot of Grazing Details page continued showing Planned Land Needs details.

The information entered for each grazing group is summarized in the Grazing Plan Summary page (Figure 15). Here, an overview is given of the length of the grazing season, range of herd size, range of supplemental feed needed, and percent DMI from pasture for the grazing season for each animal group. Other grazing information includes the range of the period of occupation, paddock sizes, number of paddocks, and acres needed for each animal group throughout the season.

Plan: May 2017 Details	🕸 Grazing	j Plan		Plan: <u>May 2017 (</u>	(2017) 🗸 Set as
Summary			Summary		
Land Needs					
Group Plans	⑦ Tip! To see/edit	plan details for a group, f	follow the link with their r	name under "Group Plans	s" in the side menu.
Heifers	Diet				
Milkers	Group	Grazing Season	Number in Group	Supplemental Feed	% DMI from Pasture *
	Heifers	Sep 1 - Oct 31	20	Olbs/day ea	100 %
	Milkers	Apr 15 - Oct 15	50 - 60	3.9 - 25.35lbs/day ea	63.72 %
	* Day-weighted % D	MI from pasture from the first Gaps in the planned grazir	day of the planned grazing se og season are not considered ;	ason to the last day of the pl part of the grazing season.	anned grazing season.
	Grazing				
	Group	Period of Occupation	Paddock Size	Number of Paddocks *	Acres Needed *
	Heifers	30 - 31 days	15.89 - 16.42 acres	1	38.13 - 40.78 ac
	Milkers	P: 20 - 25 days	30.94 - 102.56 acres	1.2 - 1.55	61.87 - 230.85 a
				2.02 . 6	1.74 . 7.61

Figure 15. Screenshot of Grazing Plan Summary details.

Additional summary information is displayed in the Land Needs section. Here goGraze alerts the user if the plan falls short in number of acres needed and identifies which months may not have enough land for the planned grazing. Total land needs are summarized to show maximum number available for perennial and annual pasture and maximum number required of each.

Plan: May 2017 Details	📚 Grazing Plan		Plan: May 2017 (2017) 🗸 Set as F
Summary		Land Needs	
Land Needs Group Plans	The tables below compare land neede	d and land available across all groups	for each month of the grazing season.
Heifers Milkers	You de In the following months (whose tota your grazing livestock: Jul, Aug Add more land, reduce the number of Total Land Needed	o not have enough land to meet your n Is are in red below) you do not have e of grazing animals, and/or plan for higl	needs! nough land to meet the needs of ner rations to correct this.
		Perennial Pasture	Annual Pasture
	Maximum Available	123.64	40
	Maximum Required	271.63	2.61

Figure 16. Screenshot of Grazing Plan Land Needs summary.

Land needs are also divided into perennial and annual pasture summaries to show how much land each group needs and how many acres are available from which fields each month (Figure 17).

Perennial Pastu	re					
Acres Needed By	Month					
Group	May	Jun	Jul	Aug	Sep	Oct
Heifers	-	-	-	-	15.89	16.42
Milkers	47.95	123.07	127.18	127.79	45.27	-
Total Needed	47.95	123.07	127.18	127.79	61.16	16.42
Available Land By	/ Month					
Group	May	Jun	Jul	Aug	Sep	Oct
<u>Native Pasture -</u> <u>Pasture</u>	50	50	50	50	50	50
<u>Pasture Out</u> Back - Pasture	43.64	43.64	43.64	43.64	43.64	43.64
<u>Small Pasture -</u> <u>Pasture</u>	30	30	30	30	30	30
Total Available	123.64	123.64	123.64	123.64	123.64	123.64
Annual Pasture Acres Needed By	Month					
Group	May	Jun		Jul	Aug	Sep
Milkers	2.3	2.22		2.22	1.72	1.11
Total Needed	2.3	2.22		2.22	1.72	1.11
Available Land By	/ Month					
Group	May	Jun		Jul	Aug	Sep
<u>Graze and</u> <u>Harvest -</u> <u>Forage Oats &</u> <u>Peas</u>	40	40		40	40	40
Total Available	40	40		40	40	40

Figure 17. Screenshot of Grazing Plan Land Needs summary details for perennial and annual pasture.

Recordkeeping with goGraze

The Grazing Records page displays the current pasture location for each animal group, pounds of DMI the animals will receive from this pasture, the percent DMI from pasture the cows are receiving up to this date in the grazing season, and percent DMI from pasture for the entire year. goGraze manages a number of different records: grazing, ration change, event, forage test, forage observation, and a detailed weather record. These records are displayed in a chart format, listed in chronological order.

G goCrop	Hom	ie Farm	Fields Grazing	+ F	arms Account 😃
			lans Records		2017
Add a Record	g Record	S prage Test Fo	rage Observation We	sather	
		Today	on Pasture		
Group	Current Location	Current Ratio	DMI from pasture	% from pasture (to season year	date)
Heifers			17.88 lbs/day each		
Milkers	-	-	39 lbs/day each	-	
		R	ecords		
		You have r	no grazing records!		

Figure 18. Screenshot of available Grazing Records, grazing group summary statistics, and record activity log.

Who?*	
 Milkers Heifers 	Hold down ctrl (Windows) or command (Mac) to select multiple groups. Click again while holding ctrl or command to deselect.
Where?*	-
On*	
2017/6/5 12:32 AM	
Off	
Role*	
Full-time Pasture	•
Forage Starting Height (inches)*	
Forage Ending Height (inches)	
Notes	

The Grazing Record accounts for the date and time each animal group was grazing (Figure 19). It may be adjusted to account for grazing on full-time pasture, split a.m. pasture/p.m. pasture, or annual pasture. The starting forage height must be entered for the record to be saved; the ending forage height can be updated later.

Figure 19. Screenshot of New Grazing Record Form.

To record a ration change, the user chooses the animal group, start date, and recording the ration change as total DMI or As-Fed (Figure 20). If total DMI is chosen, the user enters the pounds fed on a per animal basis. If As-Fed is chosen, the user enters the feed type, percent dry matter, and pounds fed. goGraze calculates the pounds of dry matter each animal is fed based on information entered into the plan.

Details			
Who?*			
Choose an animal or grou	p 🔻		
Start Date*			
2017-06-05			
Record As*			
	•		
Notes			
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Notes Details about the ration (stappear in your reports. Ration Breakdown A Record information about eac Feed Type* (+ Add another row)	uch as information about co IS FECI In feed type that makes up this r calculate the total dry matter in % Dry Matter*	ntent or sourcing) included h ation. goCrop will use this informa the ration. Lbs As Fed* Check the box on the right to row for deletion.	ere will . ation to X o mark a
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Figure 20. Screenshot of New Ration Change Record Form.

The Event Record is designed to record other items of
importance not captured in the other record forms.
For example, if a fence broke and the cows had access
to a cool stream on a hot day, recording that event
may help explain why that animal group had increased
milk production.

Date*	
2017-06-05	;
What/Who?	,
	•
Where?	
	•
Description	*

The Forage Test page allows the user to record the nutrient content and test results of standing or harvested forage for a particular field in a As-Fed/Received or DM basis.

Details			
Forage*			
	•		
Sample Source*			
	•		
est Date*			
2017-06-05			
ample Date			
ample Description			
ab			
lotes			
rients (As Ead/Dec	aived)		
inclus (As i cu) kee	civedy		
on balancing should be done us	ing DM values but as fed val other purposes.	lues may also be included for ref	erence and
Nutriont	Amount*	Unit*	×
Muthent			

The Weather Record page includes temperature, cloud cover, and precipitation. The record may be applied to multiple fields at one time.

New Weather Rec	ord
Record Date*	
2017-06-05	
Temperature*	
Temperature Units*	
• Fahrenheit 🔹	
Cloud Cover*	
•	
Precipitation*	
•	
Precipitation Amount	
Leave blank if none	
Precipitation Unit	
T	
Notes	
Fields*	
Select All	
🗆 Hay	
Graze and Harvest	
Hay followed by Corn Silage	
Native Pasture	
Pasture Out Back	
Small Pasture	

Figure 22. Screenshot of Weather

The Future of goGraze

Version 1.0 of goGraze offers a modern platform for planning and recordkeeping where users may create simple grazing plans and manage records on the web. As of July 2017, goGraze is in the beta stage; we have collected and are responding to farmer-tester feedback. Future developments of goGraze include a feature that allows the user to develop plans with an interactive grazing chart and offering the ability to enter grazing records on mobile devices.

goGraze is available for a free 30-day trial and may be added to a current goCrop[™] account at no cost for a limited time. For more information, visit <u>www.gocrop.com</u> or contact <u>cropsoilvt@gmail.com</u>.