FIELD FACTS

Managing Forage Inventories

by Robert Larmer[1] and Laura Sharpe[2]

Introduction

2012 is shaping up to be a very difficult year for forage producers. The warm weather in March across Eastern Canada caused the alfalfa to break dormancy much earlier than normal and the ensuing April frosts have set the crop back significantly. Given the condition of many fields and the accounts from producers who have already harvested, it appears that yields may be 65 to 70% of the normal range. Joel Bagg, forage lead for OMAFRA has seen the same results in his travels.

Moving forward, Environment Canada is calling for a summer that is above average in temperature with below average precipitation. This will be positive for forage quality, but has the potential to hurt yields in 2nd and 3rd cuts. This will be particularly evident in fields with high grass content. Haylage inventories could become a major issue for dairy producers, and hay prices are certain to be high as a result.

First cutting forage yields have been below average this spring. The crop may also be facing hot, dry conditions going forward.

Taking Forage Inventories

Managing forage inventory and acreage will be extremely important this year. Producers need to know how much feed is currently in storage as well as expected yields for the hay crop this summer. This will allow them to take steps to ensure that ample forages are on the farm for the next 12 to18 months. Appendix 1 and 2 (on pages 4 and 5) can help producers determine current inventories for concrete and steel silos.

For bunker silos, simply multiply the width of the silo, by the height of the silage by the length remaining in the silo to get the area. Then, multiply the area by the dry matter density (use 13lbs/ft^3 if you are unsure of your density). This will give you the total pounds of dry matter in the bunk. Divide this by 2200 to get to Tonnes, and then divide by the %DM to get to wet weight. For example, for a 30 foot wide bunk that is packed 10 feet high with 50 feet remaining of corn silage at 35% DM:

30 x 10 x 50 = 15,000 ft^3 x 13lbs/ft^3 = 195,000 lbs of silage / 2200 lbs/T = 88.64T of DM / 0.35 = <u>253.25T</u>

Forage inventories remaining in bunker silos can be estimated using the formula above.

Estimating New Crop Potential Yield

Once calculations on current inventory have been completed, it is important to estimate the crop that will be harvested in 2012. 1st cut yields look to be about 2/3 of normal, and if the hot dry weather persists, 2nd and 3rd cut will certainly be affected also. If you find that your calculations leave you short on forages for the next 12 to 18 months, it is time to take action now while there is still an opportunity to compensate.

Alfalfa stands must be evaluated now to determine the best course of action moving forward. Many of the stands seeded in 2010, 2011 and new 2012 seedings are still holding on well. Stands that were seeded in 2009 and 2008 seem to be the hardest hit, particularly those in 4-cut systems. With these stands, it may be worthwhile to look at some alternatives. Spraying out the stand after first cut and planting some additional corn silage is likely the best option to ensure there is enough forage on the farm.

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Planting Corn after First Cut to Supplement Forage Inventories

Chemical control of the sod and other weeds is critical. Apply a recommended pre-harvest treatment to the hay crop and/or herbicides during pre-emerge or early post-emerge windows of the corn crop. Mike Cowbrough, provincial weed specialist, recommends a burndown of glyphosate + 2,4-D ester when going into corn. This consistently provides the best control of alfalfa, according to Mike. To deal with any potential volunteer alfalfa plants, tank-mixing Marksman® or the Galaxy® / Galaxy II co-packs probably provides the best long-term control. Always read and follow label instructions.

Tillage is Important for Corn Stand Establishment and Yield

If you are determined to plant corn following a hay harvest in early June and rain has been limiting, it is advised to include some tillage prior to planting. Greg Stewart, provincial corn specialist, says, “Given the soil moisture status, plow, cultipack and plant all within a few hours is the way to go”. This tillage does nothing to conserve moisture or soil structure but it may be essential for good seed-to-soil contact and early corn root exploration in these relatively hard, dry soils, which often happens here in Ontario. We can measure higher soil moisture in no-till soils compared to plowed ground, but if dry weather comes early the corn plants cannot establish a root system that allows for exploration of the soil profile. In these cases no-till performs poorer than plowed ground. Even though no-till ground has conserved more moisture, the roots cannot get at it.

Table 3 shows the yield difference between tillage practices from research conducted by the University of Guelph near Woodstock in 1988 and 1989. Rainfall was 7% of normal during June of 1988 and this resulted in no-till planting conditions that caused low plant stands and poor early growth. Success of the no-till corn planting following hay harvest in 1989 was attributed to adequate soil moisture during and after the planting operation.

Table 3. Effect of corn planting systems following early June hay harvest on corn silage yields. Woodstock, Ontario.

Corn planting system	Corn silage yields (tonnes/acre @ 65% moisture)	
	1988	1989
Conventional tillage (following hay harvest)	17.0	16.6
No-till (following hay harvest)	8.9	16.8
Planting date	June 2	June 8

Adapted from Aflakpui, T. Vyn, G. Anderson, D. Clements, M. Hall and C. Swanton. University of Guelph.

Despite potential yield losses, with time and heat unit accumulation being limiting factors, this corn crop needs to be planted as quickly as possible following hay harvest. Therefore no-tilling the corn crop into the hay stubble is often the choice. However, without adequate rainfall before and after planting in the month of June, corn is challenged to establish in a no-till system, which can result in yield loss.

However, **if soil moisture is adequate** it appears that no-till corn can do well in these sod fields providing we can get it established and off to a good start. Here are some suggestions:

- This operation will require above average planter unit down pressure and overall planter mass. No light weights recommended.
- Some tight sods, especially those with a lot of grass in them cannot be suitably worked with a three coulter system common to many no-till planters. The resulting strip is clumpy, air filled and not conducive to germination or early plant growth. Consider trying a single coulter along with trash-removing wheels for a firmer, cleaner seedbed.
- Chemical control of the sod and other weeds is critical. Apply a recommended pre-harvest treatment to the hay crop and/or herbicides during pre-emerge or post-emerge windows of the corn crop.
- Select a hybrid with a heat unit rating suitable for the delayed planting date and intended use (silage or grain). Late planted corn may be at greater risk to corn borer damage so a Bt hybrid is recommended.

Hybrid Selection and Harvest Management

When selecting a silage hybrid to plant after 1st cut, lower the CHU from what you planted in early May by 200 to 300. Past that, making the silage is no different than normal production. Ensure that the crop reaches ½ milkline and monitor moisture this fall to put up high quality corn silage at 60 to 68% moisture depending on your storage structure.

Kernel processing is also a critical step to ensure the cows can get to the high quality energy provided in the ration.

Finally, with crop and forage prices where they are, producers need to do everything in their power to both protect and improve their forage investment. Using Sila-Bac® brand 11GFT forage inoculant on your haylage and 11CFT on your corn silage allows you to do just that. Each of these inoculants is designed with three strains of bacteria to do three very specific jobs. First and foremost they are designed to drive a fast and efficient fermentation to store the crop. Once fermentation is complete, our patented strains of *L. buchneri* bacteria kick in to help provide significant advantages in bunklife and eliminate secondary heating both in the silo and in front of the cows during feedout. Finally, these products have a strain of bacteria that produces enzymes to break digestible fibre away from the lignin in the crop. This allows the cow to digest more of the fibre while it is in the rumen to get more energy from every bite of forage.

Managing forage inventories and ensuring we are getting the most out of every last bit of forage that we are storing may be more important than ever this year. Many of the true experts in the industry, the producers, have stated that they have rarely seen such low inventory levels being followed by a potentially poor production year. Now is the time to take action and ensure your farm is ready for the next year.

Feeding Higher Levels of Corn Silage

If producers are forced to move to higher levels of corn silage as compared to haylage in their rations this year due to a shortage of haylage, there are some factors to take into consideration:

- High corn silage rations can be and have been fed very effectively for many years. Herds feeding upwards of 80% of the forage in the ration as corn silage are not uncommon. When properly managed, high corn silage rations produce as much or more milk, butterfat and protein without sacrificing cow health.
- Ensure adequate particle length. With an increase in corn silage, it is important to ensure that there is adequate effective fibre in the ration to form a good rumen mat. Chopping somewhere between 17mm and 19mm is recommended and aggressive kernel processing is a must. Herds that do not end up with adequate particle length may be forced to incorporate dry hay or straw into the ration.
- Reduce the amount of additional energy in the ration. Nutritionists know very well how to work with high corn silage rations. Ensure that your nutritionist is aware that you will be moving to a higher corn silage diet prior to making the change. Re-balancing will be necessary from both an energy and protein perspective. Higher corn silage rations will result in feeding less other energy such as dry corn or high moisture corn and will tend to increase the need for protein supplementation slightly.

Resources:

http://www.omafra.gov.on.ca/english/crops/field/forages/corn_earlyhay.htm

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Appendix 1. Estimated concrete silo capacities for forages, in tonnes.[a]

Silo Diameter x Settled Depth		Alfalfa Silage				Corn Silage				
(m)	(ft)	40%	50%[b]	60%	70%	55%	60%	65%	70%	
3.7 x 9.1	12 x 30	32	40	52	75	43	49	56	67	12 x 30
3.7 x 12.2	12 x 40	45	56	73	105	60	68	79	93	12 x 40
3.7 x 15.2	12 x 50	57	71	94	136	77	88	101	120	12 x 50
4.3 x 12.2	14 x 40	63	78	103	148	84	96	110	130	14 x 40
4.3 x 15.2	14 x 50	81	101	134	193	110	124	143	168	14 x 50
4.3 x 16.8	14 x 55	90	113	149	215	122	139	159	187	14 x 55
4.9 x 15.2	16 x 50	109	137	181	261	148	167	191	224	16 x 50
4.9 x 18.3	16 x 60	135	169	224	323	182	206	235	275	16 x 60
4.9 x 19.8	16 x 65	147	185	245	354	200	225	258	300	16 x 65
5.5 x 15.2	18 x 50	142	178	236	339	191	216	247	288	18 x 50
5.5 x 18.3	18 x 60	176	221	293	421	237	266	304	353	18 x 60
5.5 x 21.3	18 x 70	211	264	351	504	283	317	361	419	18 x 70
6.1 x 18.3	20 x 60	224	281	372	533	298	335	381	442	20 x 60
6.1 x 21.3	20 x 70	268	337	446	639	357	399	453	524	20 x 70
6.1 x 24.4	20 x 80	314	394	522	746	415	464	526	607	20 x 80
7.3 x 18.3	24 x 60	338	423	559	796	442	494	560	647	24 x 60
7.3 x 21.3	24 x 70	407	511	674	956	529	590	667	767	24 x 70
7.3 x 24.4	24 x 80	479	600	790	1118	616	685	773	888	24 x 80
7.3 x 27.4	24 x 90	551	690	908	1281	704	782	880	1009	24 x 90
9.1 x 24.4	30 x 80	796	993	1297	1813	989	1164	1343	1480	30 x 80
9.1 x 27.4	30 x 90	920	1146	1494	2079	1129	1341	1547	1706	30 x 90
9.1 x 30.5	30 x 100	1046	1301	1692	2346	1270	1520	1754	1934	30 x 100
9.1 x 33.5	30 x 110	1173	1457	1891	2614	1411	1701	1962	2165	30 x 110

[a] 1 tonne = 1000 kg; the capacity in tons (2000 lb) can be obtained by multiplying the capacities in the table by 1.1
[b] moisture content in percent (wet basis)

Appendix 2. Estimated steel silo capacities for forages, in tonnes.[a]

Silo Diameter x Settled Depth		Alfalfa Silage				Corn Silage				
(m)	(ft)	40%	50%[b]	60%	70%	55%	60%	65%	70%	
3.7 x 9.1	12 x 30	34	43	56	81	46	52	60	70	12 x 30
3.7 x 12.1	12 x 40	49	61	80	115	65	74	84	99	12 x 40
3.7 x 15.2	12 x 50	63	79	105	151	85	96	110	128	12 x 50
4.3 x 12.2	14 x 40	68	85	112	161	91	102	117	137	14 x 40
4.3 x 15.2	14 x 50	89	112	148	212	119	134	152	177	14 x 50
4.3 x 16.8	14 x 55	100	125	166	238	133	149	170	197	14 x 55
4.9 x 15.2	16 x 50	120	150	198	283	158	177	202	234	16 x 50
4.9 x 18.3	16 x 60	150	188	248	354	196	220	249	287	16 x 60
4.9 x 19.8	16 x 65	166	207	274	389	216	241	273	314	16 x 65
5.5 x 15.2	18 x 50	155	195	256	365	203	227	258	299	18 x 50
5.5 x 18.3	18 x 60	176	221	293	421	252	281	318	367	18 x 60
5.5 x 21.3	18 x 70	211	264	651	504	302	336	379	435	18 x 70
6.1 x 18.3	20 x 60	247	308	405	572	315	351	396	456	20 x 60
6.1 x 21.3	20 x 70	300	374	490	688	377	419	471	540	20 x 70
6.1 x 24.4	20 x 80	354	441	576	806	439	487	547	625	20 x 80
7.3 x 18.3	24 x 60	368	459	600	842	461	512	577	662	24 x 60
7.3 x 21.3	24 x 70	449	558	727	1013	551	611	686	784	24 x 70
7.3 x 24.4	24 x 80	432	660	857	1187	642	710	795	907	24 x 80
7.3 x 27.4	24 x 90	616	764	988	1361	734	809	905	1031	24 x 90
9.1 x 24.4	30 x 80	867	1070	1379	1892	1033	1269	1459	1606	30 x 80
9.1 x 27.4	30 x 90	1007	1240	1590	2169	1202	1472	1690	1860	30 x 90
9.1 x 30.5	30 x 100	1150	1411	1803	2447	1374	1678	1923	2116	30 x 100
9.1 x 33.5	30 x 110	1294	1584	2017	2726	1549	1886	2159	2374	30 x 110

[a] 1 tonne = 1000 kg; the capacity in tons (2000 lb) can be obtained by multiplying the capacities in the table by 1.1
[b] moisture content in percent (wet basis)