

Pot of Gold at the End of the Barn

To spread or not to spread:

Pros

- * source of nutrients
- * increased forage yields
- * water quality
- * dryer pens

Cons

- * expense
- * time
- * weeds

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Manure Management in the Peace Country

Manure management is not a new idea, livestock producers have long known the value of manure application. What has changed is:

- * expanding operations,
- * resulting in greater accumulation of manure,
- * technology developed to test nutrient composition of the manure and recommend application rates,
- * and development of equipment to efficiently and effectively apply the manure to crop and forage fields.

For forage producers in the Peace, manure management is about the big picture. Cattle in barns and corrals are producing manure, which has the potential to be a valuable source of field nutrients.

Without planning and strategies, too much of a good thing can be problematic. However, stock piled manure when applied on fields, can increase forage yields and nutrition. This forage, when fed to cattle results in increases in beef and dairy yields.



The Gold Producers.

Manure Management Benefits

- * Dryer pens result in reduced disease rates (for example, foot rot)
- * More space in corrals or yard as the pile is reduced
- * Decreased risk of contaminating streams or ground water
- * Nutrients made available for future forage crops rather than being lost to the atmosphere
- * Water conservation on the field, soils with greater organic matter are more resistant to evaporation
- * Increased forage yields and nutrition, which results in increased beef and dairy production

Considerations

- * Time – labor investment can be considerable and other land management activities may take priority
- * Capital – to have custom spreading or to purchase equipment
- * Weeds – can be a problem
- * Odor – a manure pile upwind of the neighbors can result in tension
- * Distance – traveled from the pile increases so does the cost, in terms of labor and fuel

Peace River Forage Association
of British Columbia



“My problem is having enough cows and feed, to generate enough manure to make enough of a difference to justify the expense.”

Chuck Sutherland

Keeping Your Manure Spreading Costs Manageable



Loading the custom spreader truck

The greatest challenge for operators is to keeping the operation efficient and economically beneficial. Wayne Kettner offers some tips on how to keep the costs down.

1. Piling manure in the early spring facilitates pen drying, thus, helps prevent foot rot, and assists in efficient feeding.
2. Piling of manure outside the pens can reduce custom spreading costs by 40 to 60% because it reduces volume, facilitates more cost-effective use of equipment.
3. When piling outside is not feasible, a pile inside can still reduce costs, by reducing volume by 20 to 30%. It also facilitates pen drying
4. Dry pens and yards are a key component in managing custom spreading costs, so that trucks can get closer to the pile, shortening loading times.
5. Smooth, dry field approaches and roads improve the cycle times.
6. Twine in the manure increases costs in terms of time and wear on equipment. Twine can decrease truck production by 40% when the beaters plug up.
7. Composting manure reduces volume, reduces weed seed loading, and releases more nutrients from the organic matter.

Weed seed problems:

Weed seeds
+ manure nutrients
= weed problem.

Solutions =

1. compost piling, with occasional turning.
2. growing silage crop in first year after application. Silage is cut early, so weed seeds are usually immature, preventing germination the following year.
3. spraying a herbicide.

Distance

Regardless of whether forage producers hire a custom operator or spread their manure themselves, the economic threshold distance is about one mile. Brian Clarke of Sunrise Stock Farms states “a field any more than a mile from the pile doesn’t get manure.”

Wayne Kettner found custom spreading costs increased substantially with distance. After reviewing his clients, he found, average costs per load increased by 35%, for every kilometer the trucks had to travel further from the pile. While spreading on the home quarter might be \$35.00 per load, hauling to a field 3 kilometers from the pile was \$75.00 per load.

Twine

Sisal versus plastic twine is a carefully considered decision. In terms of the spreading equipment, sisal rots in the manure and creates less plugging of the beaters. However, the Clarkes and Lehmanns, found breakage with sisal twine was a problem. Breakage was attributed to mice and their taste for sisal and high biodegradability. Plastic twine is less expensive, more durable, but plugs the beaters on the spreader.

The Clarkes use plastic twine, but are diligent in cutting the twine and collecting it. They have feed bags on every tractor and a 45 gallon barrel in the barnyard to collect the twine in. Disciplined twine disposal is vital manure management and preventing cattle losses.

Time

Forage producers are unanimous that finding time for manure management is essential. Spreading is a labor-intensive task that has to be fit into hectic schedules. Their hectic schedule (seeding, silaging, haying, harvesting and milking) does not leave the Clarkes a lot of time for manure spreading. They are contemplating using a custom spreader. They estimate a custom spreader would take two days to do what they currently need three week to complete themselves.

For many farm businesses, custom manure spreading may qualify as a full tax credit.

“We decided to hire out the job.

Start up cost for the liquid manure spraying equipment was high and spraying would have to be fit in around milking”.

Madeleine Lehmann

Yields from Kettners' manure plots near Doe River

Wayne and Don Kettner have been conducting some field size forage and grain comparisons.

A forage plot began in spring of 2000. Manure was applied at a rate of 2 to 3 loads per acre. The manure was immediately worked into the soil, to conserve nitrogen. The field was underseeded with a clover and grass mix with a nurse crop of barley.

Increased yields of both hay and grain crops were evident due to manure application.



One of Wayne Kettner's custom spreading trucks blowing out the good stuff.

Manuring Forage Results 50 ac field

2000 green feed:
175 X 1500 lbs bales

2001 hay yields:
198 X 1500 lbs bales

Manuring Grain Plot Yields in bu/ac

Control – no manure	75
Green manure	102
Rotted black Manure	145

Note: application rate was 2-3 loads/ac

Economic value of applying manure to land

Kettners have examined the economics of applying manure in 2 ways:

1. comparing nutrients in manure with alternate fertilizers.
2. comparing rejuvenation of an old pasture by ploughing and reseeding to rejuvenation by aerating and manuring.

Based on analysis of manure samples sent to Norwest Labs, 3 to 5 year old manure had the higher nutrient content than 1 or 2 year old manure. The value of the nutrients contained in the manure was compared to chemical fertilizer (prices as of June, 2001).

Nutrient analysis	% wet	% dry	kg/t	lb/load	\$/lb	\$/load
Moisture	55.9					
Total N	.87	1.98	8.7	153	\$0.45	\$69
Total S	.13	.30	1.3	23	\$0.23	\$5
K ₂ O	.65	1.48	6.5	115	\$0.16	\$18
P ₂ O ₅	.41	.93	4.1	72	\$0.38	\$27
Phosphorus	.18	.40	1.8	32		
Potassium	.54	1.23	5.4	95		
Total Value						\$119

Plough & reseed	\$/ac	Aerate & manure	\$/ac
fall plough	\$25	manure spreading	\$60
other tillage	\$18	aerating	\$6
harrow (X2)	\$6	harrow & roll	\$3
roll rocks & pack	\$3		
seed with floater	\$4		
grass/ grain seeds	\$21		
starter fertilizer	\$15		
total cost/ac	\$92	total cost/ac	\$69

Two loads per acre of 2 year old manure was spread on 50 acres of land. It was then fall aerated with an AerWay and harrowed. A 50% improvement in grass growth was seen at low cost. This was compared to the traditional ploughing and reseeding method.

Applying manure to your fields can bring economic gains by reducing rejuvenation costs or by reducing cost of fertilizer nutrients.

“My brother Don and I have found higher beef weights and lower mortality in the calf crop, when we fed the better quality forage, grown on fields that had benefited from manure spreading”.

Wayne Kettner

Wayne's rule of thumb: manure from 250 cattle = nutrients for improving 50 ac/yr at a rate of 2 loads/ac.

5 year Research Study in Lethbridge by Olson & Papworth found in 1999 & 2000 that:

- * both alfalfa and timothy yields responded to manure
- * alfalfa yields were similar for all 4 rates of manure
- * timothy yields increased as manure rates increased
- * timothy yields decreased at 269 kg/ha because of lodging
- * manure type had no significant effect on yields
- * application time had no effect on alfalfa yield
- * timothy yields responded equally to fall and spring applications of manure in 1999.

For more detail about the Lethbridge study contact:

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Effects of Manure Application on Forage Production

Forage producers and researchers are in agreement. Field application of manure resolves the problems associated with accumulating manure and benefits forage production. With solid manure, greatest benefits were realized in the year of application, by spreading well-rotted (composted) manure, onto to a grass or silage mix and immediately working it into the soil. Composting of the manure breaks down some of the organic material making nutrients more available for uptake by the forage crops. If the manure is not worked in, some nitrogen is lost to the atmosphere. According to Wayne Kettner, "the secret is to work the manure in as quick as possible". Clarkes agree, recommending manure be worked into the soil within hours of application for greatest nitrogen conservation.

Less ideal conditions, green manure or surface spreading still reap benefits. Surface spreading of solid manure and spraying of liquid manure results in the loss of a portion of the nitrogen but some is retained and the other nutrients (for example: phosphates, potassium, sulfur and organics) contribute to significant improvements in forage yields. Brian Clarke noted that manure application makes a big difference on a field in a dry year. The soil holds the moisture better. In a dry year the field with a fresh application of manure will do better than a chemically fertilized field. The benefit of the chemical fertilizer may be delayed, it seems to stay in the soil and he has observed the benefit in a subsequent wet year.

With forage crops the greatest increased yields, due to manure application, is usually observed in the first year. The second year still has increased yields and in the third year the production begins to taper. A common practice is to reapply in the fourth year.



Bill Clarke cautions:

"In the Peace Country we have the land base to do the spreading and gain soil benefits.

In Alberta's feed lot alley there's too much.

Too much and it gets in the water and burns the fields."

The end of the barn ...

The variable climate, short growing season, and costly fertilizers challenge Peace Country forage producers to manage their soil resource carefully. Manure is a significant environmental challenge for the livestock industry. Effective manure management involves addressing the following challenges: odor, surface and groundwater quality, and human health and safety.

However, with careful management, manure can become the source of valuable nutrients... the pot of gold at the end of the rainbow... whoops... barn!

Compiled by: Joy Sather, Wayne Kettner and Sandra Burton in Winter 2002

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