# QUALITY PASTURE SILAGE FOR OFF PADDOCK SELF-FEEDING OF BEEF CATTLE

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## INTRODUCTION

Our property is made up of two blocks of land run as one unit. Firstly, the home farm of 628 ha (587 effective) comprising 61 ha of flat land, largely Manawatu silt loam, 101 ha of easy hill country of loess soils and the remainder steep, clear limestone hill country rising to 370 m with occasional rocky outcrops. The second block, 13 km away, of 146 ha (130 effective) is all Manawatu silt loam.

The average rainfall is 890 mm, with a high of 1220 mm and a low of 560 mm, and each of these extremes has been reached twice during the last 16 years. Two-thirds of our hill country is open to the westerly winds which in some years can burn off most of the clover in the sward before the end of November. Because of this, it is our policy to wean all lambs at 12 weeks and to draft as many as will grade, usually giving average weights of between 12.5 and 13.5 kg.

This year 3,500 perendale ewes and 410 beef cows were mated. Last spring 61 ha were planted in wheat, barley and peas. Thirty-nine ha of red clover were entered for seed production, but because of our very wet winter last year we ended up by taking only one paddock of 14 ha. As a further result of that bad winter, 9 ha were planted in oats, and another 8 ha in maize for silage. This gives us an effective stocking rate of 13.5 s.u. per ha.

Our management today is based on shutting our cows onto sacrifice areas each year for 3 months from May to July where they have access to self-feed silage. This gives us mature pasture for the cows to calve onto; it stops the bad pugging that we would normally associate with supplementary feeding of cattle in the winter on our soil types, and also gives us free weekends for social or family relaxation.

## PAST MANAGEMENT

Some 15 years ago, stock numbers were not high enough to cause much trouble in the winter. Some hay was made, straw from barley crops was pressed and if things became tight, we could always send the cows away to graze the roadsides. This situation could not continue, however, and we got to the stage where we were feeding many thousands of bales of straw and hay to our cattle. For 2 years we even fed grain to a large portion of our ewes in an endeavour to maintain a reasonable body weight during the autumn. Also for 2 years, we had planted maize and very successfully break-fed it as a standing crop provided the conditions were dry underfoot. In the second year, however, we had a lot of rain and as a result had very bad pugging. There are also limits to the number of cows that can be fed in this way on any one block.

Self-feed silage appeared to have several advantages as a technique for overcoming these problems.

– Silage is cut earlier than hay (early November), so pasture recovery is much quicker at a time when we still have good moisture in the soil.

– Cut pasture is on the ground for one or two days to wilt compared with 6 or 7 days for hay, so there is a much greater chance of making a consistently good product.

– Silage making is one area that can properly employ large tractors for the mowing-crimping and chopping operations, so we get the benefits of scale in the form of lower costs. Hay has always been, and still is double the price of silage, possibly because all the machinery used to harvest hay is still relatively small.

– Harvesting of silage is more predictable, so we can more accurately assess yields in those paddocks that are closed up. If we see a shortage looming, we can then sow either oats or maize to supplement total production.

## INTRODUCTION OF PASTURE SILAGE

In 1972 we decided we would try silage, and made just over 1000 tonnes. This was put into two pits, each made against a bank. The stacks were approximately 30 m long, 12 m wide and 2 m high. One site was an old river bed so there were no problems underfoot, but the second was bulldozed out of a hillside and needed 150 $m^2$ of metal to supply a base. This site has proved very successful and a concrete pad has since been put down.

We had frames made from railway iron which consisted of 1.5 m uprights with a 3 m stay welded to them. These were bolted to two parallel rails 3.3 m long, placed at 1 m and 1.5 m above the ground. A 20 x 5 cm board was clamped to the bottom of the uprights to keep the silage and dung separate. Car cases were laid against this barrier when the silage was being made. In May the pits are opened down the whole length of the stack by lifting the car cases out. With at least 200 cows on any one pit at a time, we need a long feeding face.

Our control over the feed intake of the cows is governed by how often we shift the barriers. Obviously we make the cattle work harder in May than we do in July, but this has been a matter for experiment. In 1972 we were too kind to the cows. With silage in front of them the whole time, and one day in seven out in a bare paddock, the cows put on 0.91 kg per day which was far too much. We then shifted the barriers less frequently and gave the cattle one day in fourteen off the silage, and as a result

found that too many were losing weight. We have now come to a pattern of one day in ten on grass – a bare paddock. We also found that 5-8% of the cows do not like silage, frequently the younger ones. Normally we put the young cattle on a pit by themselves, otherwise the older, heavier cows tend to bully them.

Each pit has been fenced off with a 2-4 ha paddock, which as the winter progresses becomes a sacrifice area. Magnesium salt blocks are scattered through the sacrifice area and these are well used. With last year's very wet winter, these areas really did turn into "sacrifice areas", but one can only imagine what would have happened to the farm as a whole if the cows had been roaming through all the paddocks.

Most of the time the cows were standing in at least a foot of mud and the approaches to the silage were almost belly deep. We were very lucky to have gone into the winter with an extra 210 tonnes of silage on hand because it was certainly needed.

We did lose about 2 or 3% of our cows, but this was minor compared to the losses suffered by many other farmers. I understand that these losses plus the problems of wintering beef cows generally has caused a 20% reduction in the Wairarapa beef herd this year.

## PRESENT MANAGEMENT

Today we make no hay, but we bale all our crop residues. Barley and pea straw amounted to 160 big bales this year and this was fed out to the cows in March and April after weaning while ground conditions were still dry. The threshed clover straw is the nearest we get to hay and for this we use our own old conventional press for the few hundred bales per year.

Today we make 1590 tonnes of silage annually. Usually half of this is from permanent pasture, and the other half is the rye/red clover mixture from paddocks which are later closed for clover seed production. Fertilizer at 100 kg $ha^{-1}$ of diammonium phosphate is applied in early September when the paddocks are first shut for silage. All silage is made by contract. We have neither the machinery nor the time to do the job properly ourselves. For example, this year there was a 105 hp tractor driving a 3.3 m mower-crimper, a 150 hp tractor driving the fine chop forage harvester, and a 90 hp 4 wheel drive tractor building the stack. Normally, two tractors towing unloading trailers can keep up with this operation, but if the haul is further than half a mile, then a third vehicle is needed. We cover the stacks when the job is finished.

Our yields for the pasture averaged only 21 tonnes $ha^{-1}$ last spring because of the very wet winter. Normally we would expect to obtain around 25 tonnes $ha^{-1}$. The oats sown specially to make up the shortfall yielded 25 tonnes $ha^{-1}$ and the maize yield was 52 tonnes $ha^{-1}$. All these yields are given as fresh weight into storage. The pasture and oat silage averaged \$4.4 $tonne^{-1}$ and the maize costs averaged \$5.34 $tonne^{-1}$, with an overall average of \$4.83 $tonne^{-1}$. Polythene cover costs amount to approximately 30 cents per tonne stored. We use .003 inch, which is the thinnest available, as we never seem to be able to save a cover from one year to the other without many holes and tears appearing in it.

As a matter of comparison, hay made on a contract basis in the Wairarapa last season cost 85 cents per bale in the shed, or \$212 $ha^{-1}$ for a 250 bale $ha^{-1}$ crop. This equates with 26 tonnes $ha^{-1}$ of silage so that the comparison on a per tonne basis would be:

Silage – \$4.4 $tonne^{-1}$
Hay – \$8.0 $tonne^{-1}$

There has always been this difference in costs and it is more than likely to continue. Also to be taken into account is the very large difference in time taken to feed 400 cows self-feed silage by shifting a couple of sets of frames every second or third day, and the time it would take to maintain 400 cows on a hay diet for 3 months.

I have dealt here only with maintaining cows on a self-feed diet for prolonged periods, because they are the class of stock that can be fed most easily in this way. It would, I feel, need to be looked at from a totally different point of view if the feed programme was aimed at putting weight on 1 or 2 year steers. It is doubtful that feed intake would be high enough to give acceptable weight gains and even if this was overcome there would be the problem of muddy bodies which are not wanted by the freezing industry. One year we did winter weaners behind an electrified barb wire on self-feed maize silage, with a liquid supplement of molasses and urea, and a bite of grass. We managed a weight increase of nearly 0.45 kg per day with two-thirds of the cattle, while the other third barely maintained condition. Here again I felt that the muddy conditions greatly contributed to their relatively slow growth.

With the drought conditions we experienced this autumn, we very nearly opened up a pit to feed our breeding ewes. Two of my neighbours have self-unloading silage trailers, and one was prepared to feed out for me on a contract basis. The rains came, however, so the final decision did not have to be made.

One of the reasons we run so many cows is because I believe that we can more easily and cheaply winter 200 cows than say an extra 1,200 ewes.

## LOOKING AHEAD

Costs, more than any other single factor, have forced many farmers in the Wairarapa to move to silage from hay as their main supplementary stock food. The big bale is becoming accepted because it is cheaper than conventional bales, but many people still have not developed suitable techniques for feeding out, but this should come. One of our problems in the Wairarapa is that we have a relatively short growing season, with very little hay or silage being made after Christmas in a normal year. This causes intense pressure on contractors and machinery to conserve as much product as possible, and in as good a condition as possible.

We are satisfied with our methods at present. Self-feed silage is efficient, cheap and allows the men free weekends. The only problem that may make us rethink our set-up of close confinement would be a big TB or Brucellosis outbreak, but I hope that it will never eventuate.