

QUALITY PASTURE SILAGE AND MAIZE SILAGE ON A LARGE FACTORY SUPPLY DAIRY FARM

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INTRODUCTION

The company dairy farm consists of three herds on 216 ha. There is one 200 cow Jersey herd and two 180 cow Friesian herds. The farms are on deep peat, which is all in permanent ryegrass/white clover pasture. A continual programme of pasture renewal is required because paddocks become rough and ryegrass in particular is progressively lost from the sward. Seasonal feed problems are compounded by young peat pastures having low winter production and by older peat pastures developing a tendency to dry out badly in summer.

PAST MANAGEMENT

Our feeding programme about nine years ago involved both hay and direct cut, long chop silage. Hay, however, had its problems. Our clover dominant spring pastures lost a lot of leaf during wilting and tedding and were extremely difficult to dry because of moisture transfer from the peat soil after 4 p.m. We tended, therefore, to make hay in mid/late January, but this led to poor pasture recovery. Hay making was also very labour intensive and physically exhausting. A comparison of our labour inputs into hay and into our present wilted silage system is given below assuming an area of 8 ha producing 1500 bales.

- Man days used in hay making would be $\frac{1}{2}$ for mowing, 1 for conditioning and raking, $\frac{1}{2}$ for baling and 3 for picking up, giving a total of 5.
- Man days used to make wilted silage off the same area would be $\frac{1}{2}$ for mowing, 1 for chopping, 1 for cartage and $\frac{1}{2}$ for storage in the pit, giving a total of 3 with nobody exhausted.

The direct cut, long chop silage that we made in the past also had its problems. It was heavy and therefore difficult to cart over soft paddocks and the cost of cartage was double that of our present wilted material. The silage itself lost soluble nutrients through seepage and was unpleasant to handle. Getting material from the pit and mechanically feeding it out was very difficult, although there are some wagons today that will feed it out. Finally, the silage was less palatable to cows than the wilted material we now make.

PRESENT MANAGEMENT

We now grow maize and a little greenfeed millet largely as a drought insurance and as a first step in pasture renewal. Some of the maize can be sold as grain depending on our feed supply situation, while the ensiled portion of the crop can be fed in early lactation or as a summer supplement during very dry spells. Pasture is conserved early as wilted, fine chop silage and this forms the main summer supplement. This change in our pasture conservation methodology

arose largely from advice given by D. W. Tulloch's of Masterton.

Maize varieties sown last year were PX 442 and W 415. Early cultivars are used so they can be harvested while the ground is firm and the paddock then sown to pasture. A flat seed bed is produced by hoeing followed by disc ploughing, rolling, two spikings and a rollatilling. Seed at $92,500 \text{ ha}^{-1}$ is sown onto small ridges 76 cm apart left by a Lilliston rolling inter-row cultivator. Lime at 12.5 t ha^{-1} and 30% potassic superphosphate at 2.5 t ha^{-1} is worked into the seedbed before planting – some of the cost of this is put down to capital. The young crop is sidedressed with the equivalent of $200 \text{ kg urea ha}^{-1}$ in liquid form. Leaf tissue testing done by a Cambridge company is being used to supplement soil testing and build a better overall picture for future fertilizer programmes. Weed control is by a combination of herbicides and inter-row cultivation. The crop is finally chopped finely with a Gehl CB600, rolled well in the stack and then covered with 20 cm of lime.

Costs Maize silage costs us around \$490 per ha to grow, harvest and store. At an average yield of around $14,800 \text{ kg DM ha}^{-1}$ the cost becomes $3.3\text{c kg}^{-1} \text{ DM}$. Feeding out costs around 0.7c kg^{-1} , making a final cost of close to $4.0\text{c kg}^{-1} \text{ DM}$ at the cow.

Pasture silage is somewhat more difficult to cost, but if we assume a harvestable yield of $3260 \text{ kg DM ha}^{-1}$ (equivalent to 60 bales per acre) and a value based on standing hay of 22c per bale – then the value is $1\text{c kg}^{-1} \text{ DM}$. Harvesting and storage costs are around $\$75 \text{ ha}^{-1}$, producing a cost of $3.25\text{c kg}^{-1} \text{ DM}$ for wilted pasture silage in storage.

Feeding out

We feed out with a forage wagon mounted on a truck, and one man can feed 1500 cows in 4 hours. We feed out in paddocks because of the large numbers of stock and our desire to improve soil fertility. Low fertility is a basic problem in peat country. We have not found a practical way to feed in troughs, so both the maize and pasture silages are spread onto the ground. This makes it somewhat difficult for the cattle to pick up, especially the very finely chopped maize silage. We intend reducing the fineness of chop of pasture silage from the present 3-4 cm this year in an attempt to reduce cost and improve pick-up by the cows.

Other ways to minimize wastage are to:

- feed under a hot wire or alongside a fence;
 - feed on longer grass, such as a new break;
 - or by feeding only hay in extremely wet weather.
- Maize silage is often used to supplement herds in early lactation in addition to its use in summer. We

are currently (mid August) feeding 3 kg DM head⁻¹ day⁻¹ of maize silage to milking cows in the Jersey herd. Calcined magnesite is frequently fed with the maize silage at this time to combat staggers.

Herd production

Last season we had a very dry summer with insufficient soil moisture for effective pasture growth from mid January onwards. Supplementary feeding of the herds began on 1st March using pasture silage alone. From 20th March onwards, pasture and maize silages were fed in roughly equal proportions.

During this March/April drought, 470 tonnes of silage were fed to the herds at a cost of \$6,800. Production by the herds over these two months was 8,882 kg of fat, which at 178c kg⁻¹ returned \$15,809. This means that our supplementary feeding returned a gross profit of around \$9,000, if one assumes that cows would have been dried off had no supplements been used. Supplementary feeding during this period amounted to around 6 kg DM cow⁻¹ day⁻¹ or approximately half their ration for the Jersey and No. 1 Friesian herds.

Grazing available to the No. 2 Friesian herd was even less during the drought and supplementary feeding reached 9 kg cow⁻¹ day⁻¹ in late March.

These relatively high levels of supplementation did maintain cow condition and have a sparing effect on already bare pastures, but even so, some did open up badly and 32 ha of undersowing was done at the end of April.

Capital equipment

A Gehl CB600 chopper with grass pick-up and maize head and a Krone (2.13 m) mower, crimper and windrower were purchased for the present operation. The rest of the equipment was already on the farm and consists of two 4 wheel trailers with silage boxes on them. We use a County tractor to shuttle trailers to and from the pit and sometimes have to cart up to one mile, which is not desirable.

We built our 2500 tonne concrete bunker for \$18,000 eight years ago. This is a capital cost of \$7.20 per tonne of silage, or the equivalent of 40c per bale of hay. Today a cheap hay barn costs over \$1.00 per bale stored, so an efficient concrete bunker must be a good investment.

SUMMARY

Wilted grass silage is here to stay. It is the most efficient feed conservation we have ever done. We talk of farmers not taking up new technology available to them, yet we do not see advisory people advocating wilted fine-chop pasture silage. Despite this, Waikato farmers are wilting more and more and chopping as finely as conventional forage harvesters will allow.

Maize silage is part of a pasture renewal plan. If all of our pastures were good I doubt if we would do any cropping at all – but that will probably never happen.

Major differences of opinion are still being expressed about the economics of feeding supplements to dairy cows late in their lactation. Short term feeding trials by Dr Arnold Bryant of Ruakura suggest that it takes 66 kg of DM to produce 1 kg of fat in late summer. Bob Linton, however, says

that his cows would have to be dried off to maintain condition if supplements were not available and suggests a "total system" figure of around 17 kg of DM per kg of fat. Detailed whole farm and whole season trials are obviously required to provide better advice on the costs and benefits of this widely practised use of conserved forage.