



The Silage Investment

When we think about silage making there are two foundational principles we must keep foremost in our minds. Firstly, making silage is only a tool for maintaining pasture quality and yield. Secondly, conserving forage as silage, although by far the best way, is also quite an expensive exercise.

Maintaining pasture quality is essential; for any forage's value is directly determined by its capacity to be converted to milk or meat (live weight gain). My definition of pasture quality is reduced to simply NDF (Neutral Detergent Fibre). Other parameters, energy, protein and digestibility, diminish rapidly as NDF increases from an optimum of 35-40%. NDF lower than 32% causes losses in quantity harvested and feed conversion efficiency.

When pasture growth rates exceed our herd's capacity to eat it we must harvest the surplus as high quality silage (NDF 45%). The real benefit here is that when we do harvest surpluses within days of it being perfect grazing feed, we not only conserve valuable forage with high milk conversion capacity, but also by default optimise pasture harvested per Ha. At an average annual yield of 4 tonne dry matter harvested per Ha (dryland farming), either by cows and or by machine, that pasture has cost about \$150/tonne DM. At 10 tonne DM harvested per Ha, the cost of pasture has dropped very considerably, and presents a major source of farm profit.

The second principle, silage making is a very expensive operation, despite its necessity as described above. To cut, tedder, rake and bale/cart/wrap or forage/cover the cost of the operation can vary from \$110/tonne DM for baled silage (based on 700 kg wet bale @45% DM and 3.5 tonne DM/Ha) or \$99/tonne DM chopped for pit silage (again on 3.5 tonne DM/Ha @30% DM) to \$150+/tonne DM depending on yield. These costs are real even when we own our own equipment if we are truly honest in our calculations. Add this to pasture at \$150/tonne DM and we are commonly conserving forage at a cost of around \$260+/tonne DM. There are some who might dispute these figures, but all would agree that silage is a considerable investment. (Cost calculations available on request.)

Having agreed on that it becomes obvious quality, or more correctly, silage's capacity to be converted to milk, is a major issue. We can conserve forages with large quality differences, however the cost remains the same for high quality or poor quality with its inherent low milk conversion capacity. Let's get it right!

Cutting within days of pasture being perfect grazing quality is the first and most important silage decision. NDF (fibre level). All else hangs on this. Tedding within two hours of cutting reduces drying time dramatically. Time between all other operations is then the critical factor. Field losses are significant. Pack is also a major cause of silage losses, either in bales or pits. Pack tractor weight is directly related to flow rates of silage coming into the pit or stack. Baler tension plays the same role in baled silage.

Having now invested considerable money in growing and harvesting pasture for silage, the remaining threat to our investment is fermentation. To have invested heavily as described above and have a poor fermentation is disaster! A final good investment in a quality inoculant is like hedging your bets.

In the words of Keith Bolson, Professor of Ruminant Nutrition and Forage Conservation for 30 years at Kansas State University USA, "Effective bacterial inoculants promote a faster and more efficient fermentation of ensiled crop, which increases both the quality and quantity of silage. They represent good value for money." And again, "Our recommendation is that every tonne of silage you make should have an inoculant added because it will add to profitability of your operation." (www.oznet.ksu.edu/pr-silage) Bolsen goes on to say from trial work in NZ, "...you will get between \$3 and \$6 back in more DM retained and better animal performance for every \$1 you spend on a good inoculant." Now that's 'return on investment'!

Ensiling losses, upon which inoculant impacts on, are: fermentation 3-8%, effluent losses 0-7%, surface wastage 1-10% and aerobic deterioration 1-10%. (Ref. Zimmer 1988, Bolsen 1995)

Dr G Steen, Hillsborough Research Institute, N Ireland, reports the positive impacts of inoculant on silage quality and animal performance as "increase due to inoculant: energy + 4%, silage palatability/intake + 9%, animal performance (dairy) + 10% (beef) +15%."

Dr Raymond Jones, IGER, N Wales reports, of protein in fresh grass 90.5% is 'bound' protein (available for digestion), uninoculated silage has 45.5%, and inoculated silage contains 73.5% 'bound' or digestible protein. When protein is worth around \$1000/tonne, this is a very significant cost difference between inoculated and uninoculated silage.

Having been personally involved with inoculating silages for a number of years, many farmers have reported to me, that despite 'less than optimal conditions or operations' by inoculating they still managed to produce good silage. Palatability is often sighted as justification alone to inoculate silage. Cows love inoculated silage due to its sweet lactic acid fermentation and hence eat more. The key to profitable dairy farming is DM intake. In view of the substantial capital investment in silage, inoculant represents a very small cost in sound risk management.