Wet Season Silage Production at Taminmin High School

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1. Feed Resources in the Wet Tropics

The main limiting factor for ruminant production in the Tropical Top End of Australia is the lack of good quality feed throughout the year. Seasonal rainfall provides a period of abundant herbage at its peak nutritional value during the wet season, followed by a period of lower quality mature herbage in the dry season. It makes sense to try and conserve the abundance of good quality vegetation when it is available in the wet, and use it later in the dry season when plant growth is severely restricted, natural feed is in short supply, and commercially available feed is relatively expensive.

This is exactly what has been done at Taminmin High School, which is located near Humpty Doo, approximately 40 km South East of Darwin, Northern Territory, Australia. The precise location is 12° 24' S, 131° 15' E.

2. Taminmin's Silage Program

As a regular part of their farm management strategy, Taminmin makes baled silage during late January or early February each year. Making hay at this time is not an option because it is too difficult to dry the plant matter to the required 85%DM or more.

Fig 1. *Baled Silage being transported on the Taminmin Trailer*

On the other hand, wet season pasture can be baled at lower dry matter (DM) content and higher moisture than hay, wrapped in plastic film and allowed to ferment into silage.

Almost any pasture can be made into silage, but the best silage is made from the best pasture. At Taminmin, silage is regularly made from Pangola grass, Cavalcade legume, and Wynn Cassia legume.

The trick is to watch the weather, then cut only enough pasture that you can comfortably wilt, bale, wrap and stack in a single day without any rainfall.

3. A Typical Day of Making Silage

As long as we are confident of getting a rain free day we go ahead. Trial and error has taught us to process no more than 1.5 hectares.

Check with the Weather Bureau. They regularly track tropical storms by radar and are very competent predictors of storm incidence, arrival times, and intensity/duration. We have found their accuracy decreases as distance inland increases, but for the cost of a phone call they are a terrific advisory service.

Pasture is cut at 0900 hours. Sunrise is usually just after 0700, and the two hours is enough time to get most of the free water evaporated from the pasture.

A second tractor forms up the windrows almost immediately. This is usually done by 10.30. We turn the windrows over just once, starting at 11.00. This is usually done by 12.30. We sample the windrows and estimate the dry DM content. This is easily done in 10 mins using a microwave oven, but we are lucky enough to have a probe (Farmscan 2180) to do this in the field. We start baling as soon as the DM content is 40% or more. (Actually, the last two seasons the contractor has made this process much more efficient: he has used a mower/conditioner to cut, condition, and windrow in one operation. This has also allowed the cut pasture to dry out quicker.)

We get about 60 bales, and baling is normally finished by 1730. We start wrapping as soon as the bales are formed. This takes longer than baling, but is completed just before 1900.

We do not provide any additives such as molasses, urea, or lactic acid bacteria inoculant. Our research has shown that the cost of the additive cannot be justified. Weight increases of stock being fed silage with or without additives are not significantly different. However, it is extremely important to wilt the material to about 40%DM before baling. Ensiling wet material (e.g. less than 30% DM) will almost certainly result in production of poor quality silage, high amounts of wastage, and a high degree of stock rejection.

It is a very busy day that we usually repeat, weather permitting, two or three times in 7-10 days. The end result is a harvest of between 70-80 tonnes of reasonable quality feed stored away for use later in the dry season.

After baling, we spread fertiliser. Late wet season rains give us a good regrowth which can be grazed or harvested a second time. The second harvest is usually made into hay as per normal practice for our area.

4. The Benefits

- Fodder conservation from our improved pastures has increased by more than 40%.
- We get two harvests instead of one (and a grazing period).
- The same small areas previously were only lightly grazed and turned into hay during May: although it was good quality hay, it is nutritionally lower than the silage made in February.
- Weed control is improved. Small amounts of weed that are present are ensiled before they head out. Consequently we spend less time and money on weed control, whilst continually giving our pastures a competitive advantage.
- The process manages Wynn Cassia really well. Wynn Cassia makes good silage, but very poor hay (see section below).
- Our feed costs during the dry season are dramatically reduced. We still buy supplements, but the vast bulk of the feed is provided by the conserved silage.
- Conserved forage is a cash crop: we have always sold our excess hay, but also having baled silage for sale improves our management options as well as our annual income.

5. The Disadvantage

The major difficulty with the program is the need to use a contractor. The making of silage is not difficult, but the program depends on having the equipment readily available. Although late January / early February is a time of inactivity for baling contractors, most do not have wrapping machines, and anyhow it is costly to move the equipment about in order to process a relatively small amount of forage.

Hopefully, as more people try this management strategy, costs will reduce, and efficiencies due to processing larger amounts of forages can improve.

6. Special Benefit: Wynn Cassia

This vigorously growing tropical legume has a positive benefit for soil nitrogen content, and is an excellent ground cover for weed control. However,

- cattle and buffalo only eat Wynn Cassia reluctantly under normal grazing conditions, and
- it is extremely difficult to make into hay. This is because the plant is very leafy. The leaves shatter easily as they dry out. They also shatter and drop off when moving through a baler. If you are successful at all in making a bale of Wynn Cassia hay, it will be nearly all stem.

The positive benefit is that Wynn Cassia silage is easy to make: the higher moisture leaves do not shatter, and the bale is much easier to form. Silage made from a mixed Wynn Cassia / grass pasture is even easier to make, and usually better quality. Secondly, stock love Wynn Cassia silage: they accept it immediately, and eat it all when it is presented.

7. For the Technically Minded

A summary for the silage quality, including nutrition data is shown in the table.

Table 1. *Harvest Summary: Baled Silage*

	Pangola	***Cavalcade***	***Wynn Cassia***
Dry Matter (%)	42	45	52
Digestibility (%DM)	57	55	58
Metabolisable Energy (MJ kg^{-1}DM)	8.5	9.0	8.8
Crude Protein (%DM)	9.1	13.5	12.0
Mean Bale Weight (kg)	383	430	390
No Bales Produced	57	75	45
Estimated total DM conserved (kg)	9169	14513	9126
Productivity (tonnes DM ha^{-1})	6.1	7.3	6.1

Total fresh: 71.6 tonnes Total DM: 32.8 tonnes