



Baling Losses of Cereal Silage

Frank Mickan
Fodder and Pasture Specialist
Project 3030
Vic DPI Ellinbank

Growing a good crop is only the first step in making a profit from a fodder crop. Don't undo all your good work with high losses during conservation and storage, says Frank Mickan, DPI Fodder and Pasture specialist.

In recent years, drought and short seasons have resulted in many farmers baling their failed crops as whole-crop cereal silage (and hay). Many others have been deliberately growing forage and dual purpose cereals with the purpose of making whole-crop cereal silage (and hay). An overseas study has some real lessons for Australian farmers.

There can be significant field and storage losses are influenced by the maturity of the crop and how the material is handled by different baler types. This can be seen from data on crop maturity where field losses ranged from 2 to 15%. Storage losses of wrapped bale silage ranged between 1 to 5%.

In general, there are greater losses when conserving drier material. So whole-crop silage is preferred over cereal hay, despite the cost of the plastic wrap. The material, having to be so dry to make hay, loses a much higher proportion of the remaining leaves and grain during the raking, picking up and actual baling operations compared to its more moist state as silage.

This article presents the results of research in Sweden that looked at the influence of crop maturity (heading, milk and dough stages) and baler type (Taarup BaleinOne with 14 knives/70 mm cut length and Welger 220 Profy, a fixed chambered baler with 23 knives/45 cm cut length) on dry matter (DM) losses in barley.

The barley was mown with a Taarup 3028 mower-conditioner (flailed type). To ensure that the fermentation process and wrapping did not confound the treatments imposed, an inoculant was used and 12 layers of white film were used.

The ratio of head to straw (stem and leaves) as a % of forage dry matter for heading was 23/77, milk stage 37/63 and dough stage 55/45. This ratio for the soft dough stage is far higher than is typical for Australian forage/dual purpose cereals, often reversed and lower, i.e. our varieties produce much less head compared to stem than the European varieties; a factor of breeding genetics and climate.

Figure 1 shows the DM losses during mower-conditioning, baling, conservation (fermentation) and storage. DM production, when expressed against the production at heading, increased by 65% to the milk stage and 120% to the soft dough stage. Recent Project 3030 research in south west Victoria and on-farm demonstration work has shown that Australian dual purpose and forage cereals also increase in yield substantially from the flag leaf/boot stage (just prior to heading) to the soft dough stage.

DM losses during mower-conditioning increased from nil at heading to 2.1% at the milk stage and 7.5% at the soft dough stage. Baling losses, averaged between the two balers, increased from 3.0% at heading to 5.0% at milk and 11.0% at the soft dough stage. The increased DM losses of the mowing and baling at the soft dough stage reflect increasing DM content at soft dough resulting in higher losses. Unfortunately these losses are mainly the nutritious grain heads.

Figure 1. Yield of whole-crop barley forage in relation to stage of maturity and baler type used

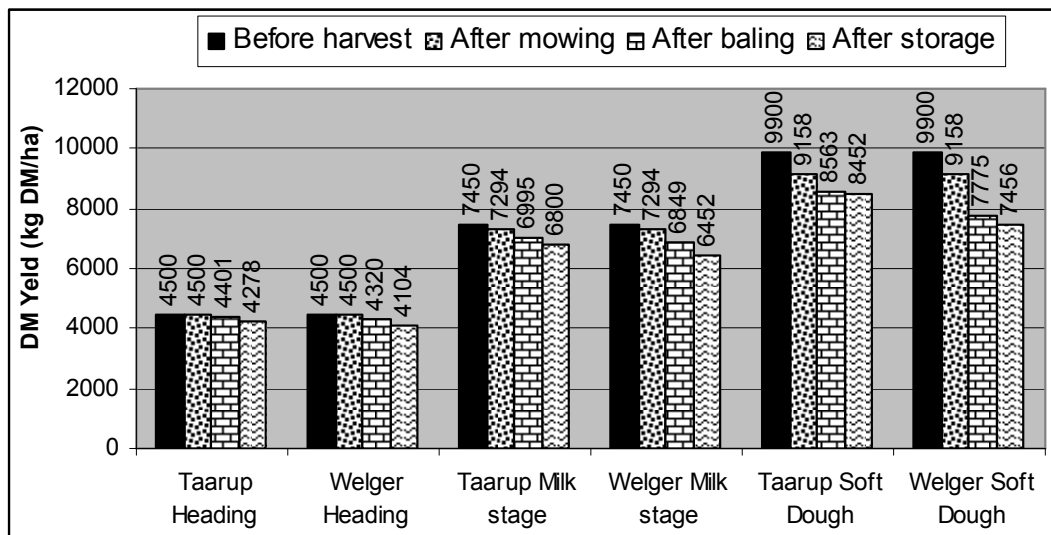


Table 1 converts the Figure 1 data into percentage losses for each baler type at each stage of maturity and fermentation and storage losses.

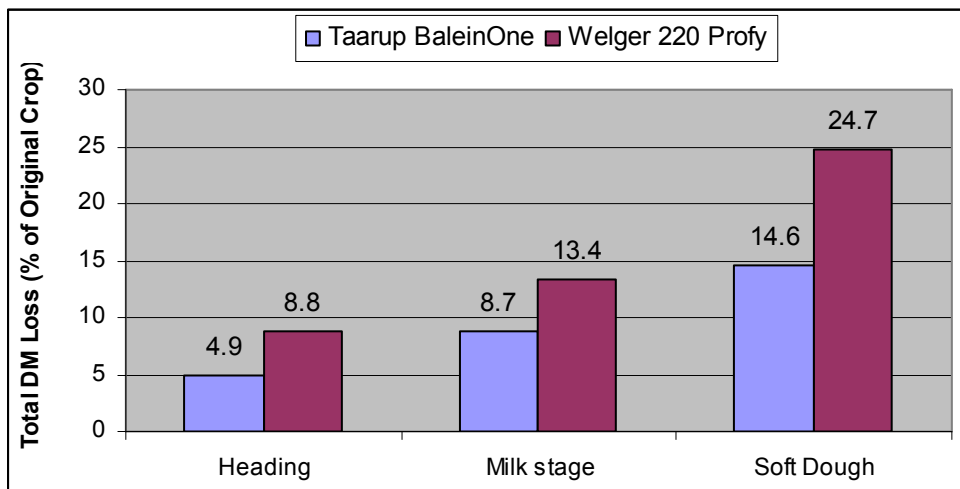
Table 1. Dry matter losses of whole-crop silages at 3 maturities and made with 2 balers types

Baler type	Baling losses (% loss)			Storage losses	
	Heading	Milk Stage	Dough stage	Fermentation	Storage
BaleinOne	2.2	4.1	6.5	2.8	1.3
Welger	4.0	6.1	15.1	4.9	4.1

During conservation (fermentation) and storage, the losses were 2.8% from both silages produced at heading and milk stage, but only 1.3% from silage at soft dough for the Taarup BaleinOne baler but 4.9 and 4.1 respectively for the Welger baler. The Welger 220 Profy baler had significantly higher losses than the Tarup BaleinOne at all stages of maturity.

Figure 2 summarises the total DM losses (After storage DM weights) expressed as a percentage of the original standing crop (Before harvest). Total DM losses increased as maturity increases and were substantially higher for the Welger. However, remember that the mower-conditioning DM losses also increased with maturity (Figure 1).

Figure 2. Total DM losses of whole-crop cereal silages for 3 maturities and 2 baler types



Comments under Australian conditions: The DM content of the standing crop at heading would need wilting and would greatly assisted by using a flailed typed mower conditioner. Crops at the soft dough stage should be approximately 38 – 40% DM and could be cut with an ordinary mower, leaving the windrow so that a baler can pick it up without raking. A flail type mower conditioner would cause needless loss of heads.

Raking the mown crop into larger windrows will also cause some loss of head, reducing yield and especially nutritive value. Ideally a precision chop forage harvester, fitted with a direct cutting front, should be used for harvest at the soft dough stage to minimise losses and to ensure tight compaction to exclude air. A silage additive from a reputable company should be used to ensure a desirable fermentation occurs in all forms of whole-crop cereal silage.



Figure 1. Taarup Balein One baler

