



Extra film layers bring extra benefits

When it comes to bale wrapping film it now seems that the more you use the more you get. This shift in thinking comes following recent research by the Institute of Grassland and Environmental Research (IGER) which highlighted the fact that choosing to wrap silage bales with 6 – instead of the more usual 4 – layers of film delivers significant benefits.

Recently released findings from a scientific experiment undertaken at IGER clearly demonstrate the very real benefits of using additional layers of bale wrap on silage bales. The experimental data has shown that increasing the layers of bale wrap from 4 to 6 improved fermentation, reduced moulds, improved the oxygen barrier and reduced dry matter losses. IGER report that the differences observed are highly-statistically significant. This is the first comprehensive experiment of its kind evaluating film layering at different dry matter contents that has given conclusive evidence that increasing film layers result in significant improvements. Grass was ensiled at 30%DM, 40%DM and 50%DM (24 hour, 48 hour and 72 hour wilt respectively), and at each stage bales were wrapped in either 4, 6, or 8 layers of film. Film seal, mould coverage, silage chemical analysis and dry matter recovery were all assessed following the 180 day storage period.

Reduced surface mould

As expected, silage pH was higher in response to increased wilting, as was residual sugar content, whereas ammonia N levels decreased.

Applying 6 layers of film significantly reduced mould coverage on the bales compared with applying 4 layers but applying 8 layers resulted only in a small reduction when compared with applying 6 layers.



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More efficient fermentation

Increasing the number of film layers applied resulted in significantly more dry matter being recovered after the ensiling period.

The residual sugar content of the silage was greater with increased wilting, and also in response to the application of more film layers. This was due to the better seal which was achieved, reducing oxygen ingress into the bale and improving the protection of the bale from physical damage. Less sugar was therefore utilized during the fermentation process.

The dramatically improved sugar content was particularly interesting as previous work at IGER has shown that higher sugar levels improve the way the rumen works enabling better conversion of forage protein into meat and milk. This more efficient utilisation of protein in the silage means not only more production but also gives environmental benefits by reducing nitrogen excretion.

Why 6 layers and not 8?

IGER assessed the financial returns of applying both 6 layers and 8 layers of film when wrapping. The extra cost which includes the film, its application and disposal was calculated at £0.71 per bale for 6 layers and £1.43 for 8 layers. The cost saving achieved in terms of the value of the extra dry matter recovered and sugar recovered was calculated at £1.37 and £2.52 respectively which means that the applications of 6 layers gives a return on cost of 92% for 6 layers and 76% for 8 layers. In summary:

LAYERS	ADDITIONAL COST £	SAVING ACHIEVED £	RETURN ON COST %
6	0.71	1.37	92
8	1.43	2.52	76

Extra milk yield under farm conditions

A further experiment under farm conditions where 300 bales were ensiled with either 4 or 6 layers of film confirmed the importance of applying six layers of film, giving a predicted milk yield gain of 0.45 litres a day when 6 layers of film were used. To summarise applying 6 layers offers all the benefits of achieving a better seal around the bale (in turn improving fermentation, minimising mould and reducing dry matter losses) with a very respectable return on costs. These additional results, together with the findings of the 2005 experiment, make the case for using extra film layers more compelling and conclusive than ever before.

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