Helping farmers produce consistently better silage

volac

Cut to Clamp
A Volac initiative

Volac Interactive PDF

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What is Cut to Clamp?

Cut to Clamp is an initiative from Volac, which aims to raise the profile of good silage as a vital part of modern farming, showing how it can really make a difference to overall farm efficiency and profitability.

Benefits of better silage

- One of the most cost-effective ways to feed your cows
- Reduced reliance on bought-in feed
- Improved returns from one of your farm's main assets – your grass
- Reassurance of feeding wholesome home-produced feed
- Benefits from a more forage-based diet, for example improved cow health and fertility

Better silage in 6 simple steps

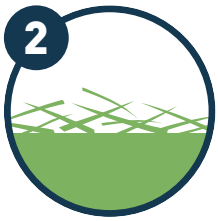
We aim to help farmers understand what they can do on their farm to improve their results.

Our step-by-step guide outlines good practice in silage production and includes top tips and video resources from independent silage expert, Dr. David Davies.

Cutting

Timing is key. Aim for optimum balance of yield and quality

Tip: *Consider crop type and maturity, weather conditions, contractor availability and farm pressures.*



Wilting

A rapid wilt will maximise silage quality, minimise fermentation losses and improve animal performance.

Tip: *Spreading the grass within the first two hours will rapidly speed up wilting.*

Harvesting

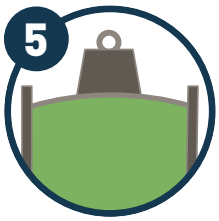
The correct chop length is crucial as it affects clamp consolidation as well as animal performance & health.

Tip: *Aim for a chop length of 15-25mm on grass above 30% DM.*

Treating

Applying a silage inoculant is quick and easy to do and will pay dividends later in improved silage quality and reduced DM losses.

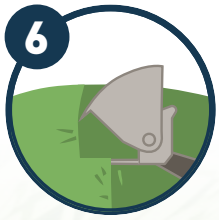
Tip: *Choose an additive that can actually improve animal performance.*



Clamping

Good consolidation and effective sealing to minimise exposure to air are key.

Tip: *Side sheets, an oxygen barrier film and plenty of sheet overlap will help ensure the clamp is air tight.*



Feeding

Good clamp management is vital to reduce aerobic spoilage and DM losses.

Tip: *Use a shear grab to keep the face tight and tidy as this helps reduce air penetration.*

Cutting – a key step in the silage production cycle

Attention at farm level is turning towards getting more production from silage and an important step, and one often forgotten about, in the whole procedure is correct cutting of the grass crop.

Decisions made prior to cutting, such as cutting date and time, can have **a major impact on the quality** of the resulting silage.

Delaying cutting date to boost yields will result in a silage crop of reduced digestibility, while cutting in less than ideal conditions can also have negative consequences on quality.

> **Consider type/stage of crop, weather conditions, contractor availability and farm pressures.**
>
> Dr. David Davies

CUTTING TOP TIP

For good quality silage at an acceptable yield, cut just before heading.

1. Cutting date

The feeding value of silage is linked to the amount of leaf and stem present in the sward – and an increase in the latter leads to a corresponding fall in quality.

Delaying cutting to boost yields has a negative impact on silage quality, as research show that the Dry Matter Digestibility (DMD) declined by 3.5 units (equivalent to 0.65ME) for every week delay in harvest between late May and mid June.

Therefore, it is advisable to monitor the growth of the sward during April, May and June and to mow just before the seed heads start to emerge.

Farmers also need to be mindful of the class of stock the silage is intended for. In cases where silage is only required for maintenance, a 'bulky' lower-quality silage may suffice.

But, if the silage is needed for high-producing animals, such as lactating dairy cows, farmers need to focus more on the quality of the silage harvested.

> **Look at the grass growth and not the calendar**

2. Cut when the sugars are highest

Another factor that needs to be considered is the sugar content of the grass. Grass sugars are highest on bright sunny days with cool nights.

A good inoculant, targeted at improving the fermentation will more efficiently use any available sugars, so requiring less sugar to achieve an efficient fermentation.

Sugar content of over 3% will not only help ensure a good fermentation but can also ensure a good fermentation when Nitrogen levels are a bit above the target of 0.001%.

3. Mow when the weather is right

The best time to mow is when the grass is dry, after the morning dew has gone off it. Grass wilts most rapidly in the first 2 hrs after mowing with the first 6 hrs being the most important in the wilting process.
If we don't mow until later in the day we risk the dew coming down before the grass has benefited from this rapid wilting period, and potentially needing to leave the grass out for two nights before reaching the desired DM.

Farmers should also **avoid soil contamination of silage.**

Mowing in wet or damp conditions increases the chances of soil contamination occurring, which can result in poor preservation and reduced feed quality.

When it comes to cutting height, it is generally recommended to mow dense swards to 5cm. But in open swards, this may need to be increased to 7.5-10cm to avoid the risk of soil contamination.

4. Book your contractor

Although dependent on the weather, most farmers will have a rough idea of when they want to mow silage.

Giving your contractor the heads up will make him/her aware that its is nearly time to cut and hopefully put you close to the top of his/her list, when conditions allow for cutting.

5. Machinery maintenance

For farmers using their own machinery, the value of maintaining all the machinery cannot be underestimated.

All equipment should be inspected or serviced well before the silage season starts. With particular attention being placed on any blades sharpening or replacing if necessary, so reducing the stress and fuel consumption on the machine.

Tyre pressures are often overlooked especially on rakes and tedders, if they are not set correctly the machine may not stay level or "bounce" dragging soil into the crop

Time spent ensuring machinery is in good working order will reduce breakdowns and stress at this critical time.

CUTTING TOP TIP

Mowing in wet or damp conditions increases the chances of soil contamination occurring, which can result in poor preservation and reduced feed quality.

"Sharpening the knives in silage wagons should be given careful consideration.

The Importance of a rapid wilt

Wilting is an important step when making grass silage as it increases the dry matter (DM) percentage and reduces the quantity of effluent produced.

Ideally aim to wilt grass to to a **DM of 28-32%** as rapidly as possible.

Wilting the grass rapidly to this dry matter concentrates the sugars to help achieve a good fermentation. Drier silages will tend not to have as low a pH and this may have animal benefits.

The importance of a rapid wilt

Weather plays a key role and farmers should avoid cutting until the weather conditions allow the entire process to be completed in the available weather window – this includes cutting, wilting and harvesting.

Aim to **wilt the grass as quickly as possible** to limit sugar losses post-cutting.

The problem is, as soon as grass is cut, sugars start declining because they are being used up by the plant, since it is still living, and by undesirable bacteria.

This is important as approximately **6% of the sugars present in grass can be lost** during a 24-36-hour wilting period. This is the reason for wilting as rapidly as possible to the 28-32% DM target.

How long should I wilt?

Farmers have two options when it comes to wilting a grass crop for silage.

The first involves wilting the grass rapidly by mowing and harvesting the crop on the same day. For this system, farmers should cut the crop once the dew has lifted, spreading it out within two hours will rapidly increase the speed of wilt concentrating the sugars, giving the potential of havesting that night if weather conditions allow

Alternatively farmers could opt to wilt the crop for up to 24 hours.

However, as well as the risk that more of the sugar will be lost, there is also a risk of the crop becoming too dry with the longer wilting period, which could have a negative impact on the aerobic stability of the silage at feed-out.

Tedding and conditioning

Grass wilts the most rapidly in the first 2 hours and certainly the first 6 hours are the most important. Moving it within this period rapidly increases wilting speed

However, tedders and rakes must be adjusted correctly to avoid contaminating the crop with soil.

If soil contamination occurs, it may have a negative impact on the preservation of the crop and, in turn, the feeding value of the silage.

Tedded swards wilted for more than 24 hours may become excessively dry and so farmers must monitor the dry matter content of the grass to avoid this occurring.

Research has shown that excessively dry silage will not improve animal performance and may have poor aerobic stability at feed-out.

Row up no more than a couple of hours ahead of the harvester as moving it will aid the wilting process. Row up just in front of the harvester if the grass has dried to over 32%.

“If you cut at 11.5ME and you have 1,000 tonnes of silage, it is the equivalent of 300,000MJ of energy extra compared to cutting at 10.5ME. This is approximately equivalent to 60,000 litres of milk.

Dr. David Davies

WILTING TOP TIP

Wilt as rapidly as possible to an ideal target DM of 28-32%.

3 HARVESTING

Three important things to remember when picking up silage

Harvesting or picking up the silage crop correctly is important and there are a number of factors farmers need to bear in mind when completing this task.

Such factors include chop length, avoiding field losses and making sure the entire process runs smoothly.

1. Chop length

The optimum chop length has a big impact on how good a consolidation you can ultimately achieve in the clamp.

The ideal chop length is be driven by the Dry Matter percentage (DM%) of the grass and, generally speaking, the drier it becomes the shorter the chop length that is required.

What chop length should I use?

GUIDELINE CHOP LENGTHS	
Dry Matter	**Chop Length**
<20%	10cm
20-30%	2.5-5.0cm
>30%	1.5-2.5cm

As a guide, if the grass is >30% DM, chop to 1.5-2.5cm to help improve consolidation.

But if it is highly-digestible grass, the chop length may need to be

increased to 5cm to ensure that there is sufficient effective fibre in the diet.

As crops become more mature, such as older grasses and whole crop, reducing chop length will help compaction in the clamp.

2. Limit field losses

Farmers and contractors often face a battle with the weather when picking up silage crops and the risk of rain may force some to overfill trailers. In addition, a shortage of trailers or long hauls can also lead to overfilling.

However, overfilling trailers can result in **1-2% of the grass crop being lost** in the field.

It may not seem like a lot, but on large acreages it can amount to a substantial amount of potential feed.

3. Sharp knives and delays at ensiling

Both farmers and contractors also need to ensure that knives on silage wagons and harvesters are sharp to ensure an even flow of material through the machine.

Keeping the knives sharp and making necessary adjustments, if needed, can have a positive impact on the amount harvested in a day.

Good silage with low DM losses is produced when beneficial bacteria ferment some of the sugars in grass to lactic acid. This 'pickles' the grass, preventing the growth of spoilage organisms and so preserving nutrients.

However, an efficient fermentation requires air-free conditions within the clamp.

HARVESTING TOP TIP

Overfilling trailers can result in losses and doing so can result in 1-2% of the grass crop being lost in the field.

It may not seem like a lot, but on large acreages it can amount to a substantial amount of potential feed.

Three reasons why farmers should use a silage additive

Waste silage is a huge drain on farm profits and one of the ways farmers can limit this is through the use of a silage additive.

For farmers aiming to make high-quality silage, the inclusion of an additive can significantly help improve silage fermentation and quality.

This is important as increasing silage quality will lead to a higher level of production on beef, dairy and sheep farms.

1. It's not just a preservative

Farmers need to be aware that a silage additive is **more than just a forage preservative.**

Using a proven additive will keep the silage made closer to what was originally harvested, with more of a higher quality silage to feed compared to an untreated silage.

Fifteen trials, using the MTD/1 strain of Lactobacillus plantarum in Ecosyl, have shown that Dry Matter recovery was **boosted by 3.7%** when compared to non-treated silage.

If 1,000t of DM silage were originally clamped, that would equate to an extra 37t back at feed-out.

2. Better quality silage

The use of silage additives has also been shown to increase silage quality.

Various trials show that using the MTD/1 strain of Lactobacillus Plantarum in Ecosyl improves digestibility, energy content and Dry Matter intakes of silage.

Key benefits of using a silage additive:

- The animal gets the extra energy from increased digestion - will not show on a Forage Analysis.
- Dry Matter intakes increased by 5% on average.

Extra production from treated silage

Given the increase in energy content, digestibility and Dry Matter intakes, the use of treated silages also leads to an increase in animal performance.

MTD/1-treated silage has been shown to improve milk yield by an average of 1.2L/cow/day in 15 independent dairy trials.

The level of live-weight gain achieved by finishing beef animals was also 9% higher on diets containing treated silage compared to untreated silages.

If farmers are aiming at high quality silage, there is no question a silage additive can significantly help.

Dr. David Davies

TREATING
TOP TIP

Choose a silage inoculant that reduces dry matter losses and enhances animal performance production, and is easy to use, liquid or dry.

Are you compacting your silage clamp enough?

Many farmers do not compact their silage clamp enough and, as a result, the quality of silage produced may be reduced.

Failing to compact or consolidate the clamp properly can lead to a poorer fermentation, more waste and increased aerobic instability at feed-out.

Therefore, squeezing as much air as possible out of the clamp and achieving the correct clamp density are important.

Why is it important to consolidate your clamp?

Consolidating the clamp is important as it removes any oxygen pockets that may be present between the layers of grass.

Removing these air pockets is necessary as an efficient fermentation and preservation process needs an oxygen-free (anaerobic) environment to occur.

Often, silage isn't consolidated enough simply because trailers are arriving at the clamp too quickly for sufficient spreading and rolling.

As a rule of thumb a 30% DM crop requires 25% of the weight of silage arriving per hour at the clamp be on the clamp compacting it. With more weight for dryer silages and less for wetter silages.

> **Avoid over-filling the clamp as once clamps are filled above the wall level the density drops.**

You can only really efficiently consolidate to a depth of 15cm. So layers should be even and no greater than this depth, to insure even consolidation.

For grass silage at 30% Dry Matter, aim for a target silage density of 250kg of Dry Matter/m^3 or 750kg/m^3 in fresh-weight terms.

Also, avoid over-filling the clamp as once clamps are filled above the wall level the density drops.

Sealing the clamp

Once the clamp has been consolidated, sealing the clamp will stop oxygen from entering the clamp. This is important for fermentation and aerobic stability.

It is advisable to use side sheets and to leave a good overlap with the top sheep of preferably 1.5m.

Once the clamp is filled, place the oxygen barrier sheet over the clamp and fold side sheets over and then fit a top sheet.

Farmers also need to ensure that as much weight is placed on top of the clamp as possible.

Special care should also be given to the front of the ramp and at least half a metre of extra silage sheet at the front of the clamp is needed.

This sheet should be weighed down to prevent any carbon dioxide from exiting the clamp or any oxygen from entering.

> **At 30% DM 25% of the weight of silage arriving at the clamp should be ontop of the clamp rolling it constantly.**
>
> Peter Smith

CLAMPING
TOP TIP

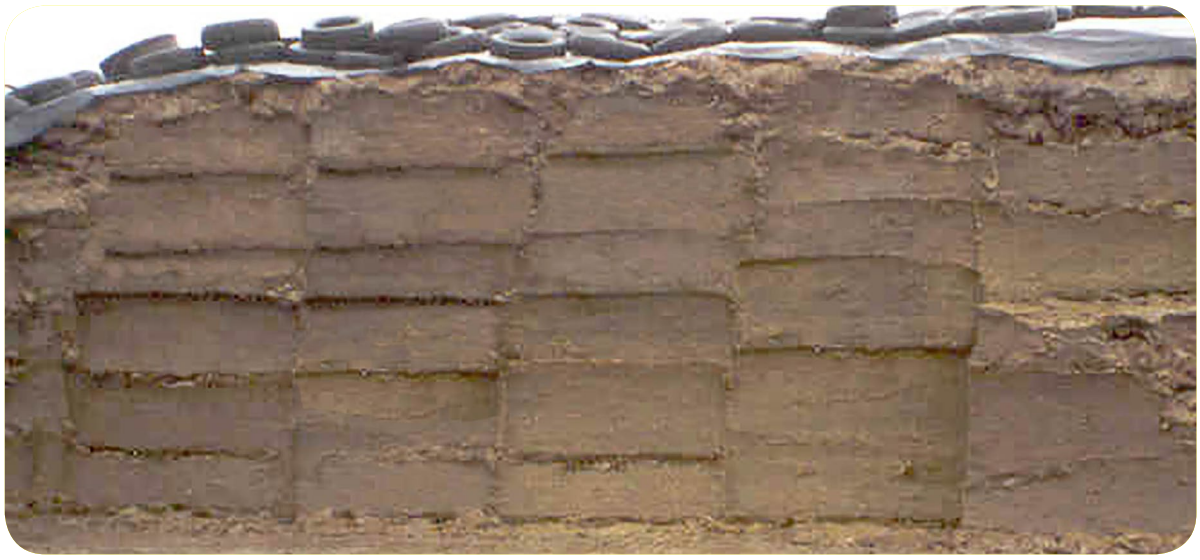
Watch video playlist

To prevent air spoiling the silage, seal the clamp with high-quality, overlapping sheets, weighed down well especially at edges.

Avoid simple errors that could spoil your silage and affect your cows

The cleaner the clamp area, the better.

Mouldy silage or dirt in front of the clamp will contaminate the silage with undesirable bacteria, reducing quality and reducing intake.



Do everything you can to avoid silage from spoiling. If you have spoiled silage, discard it. Never mix it in with good silage. As well as being of poorer quality, it also adversely affects the rumen fermentation. So it can have a much bigger negative effect than you might think.

To take silage out of the clamp, use a shear grab. This maintains a smooth clamp face with a lower surface area and a better face density than simply ripping it out. This reduces the amount of air that gets in so there is less risk of aerobic spoilage (heating) causing losses of nutrients and potentially production of mycotoxins.

For the same reason, move across the face quickly to reduce the time that silage is exposed to air. It is important to avoid pulling or cutting the top sheet back too far once the clamp is opened and to keep the front edge weighted down. It is also important to avoid pulling the sheet back down over the clamp face. This is because it creates a microclimate, which encourages yeast and mould growth, increasing the risk of spoilage and heating.

Finally get a silage analysis done and pay attention to it. It will tell you how good a job you made of silage-making last season, and help you to pinpoint ways in which this year's silage production can be improved.

"I would like to see a silage clamp that you could eat your dinner off the floor in the front of – it should be that clean!

FEEDING TOP TIP

Watch video playlist

Work across the clamp face to keep it tidy and tight and stop air getting into the clamp.

The science of fermentation

Enter the world of ensiling

The fermentation process that takes place during ensiling is a natural one, whereby some of the crop's own sugars are converted to acid to pickle the forage.

However, making good silage isn't all down to the weather; the speed and efficiency of this fermentation, and of the corresponding production of desirable lactic acid, are of vital importance – both to maximise feed value and to minimise dry matter losses.

Although bacteria that carry out fermentation may be naturally present on grass, you don't know if you have sufficient numbers, or if they are the best type for bringing about a fast, efficient fermentation.

In addition, there will be undesirable micro-organisms present – for example enterobacteria, clostridia, yeasts and moulds – which waste nutrients and can potentially result in a poor fermentation and/or encourage spoilage at feedout.

A desirable fermentation is one where you dominate the (unknown) natural microbial population with good bacteria to achieve a rapid pH fall, minimise dry matter losses and preserve as many nutrients as possible for the cow.

By adding large numbers of the right type of beneficial bacteria with a quality silage additive, it puts you in greater control once forage has been put in the clamp.

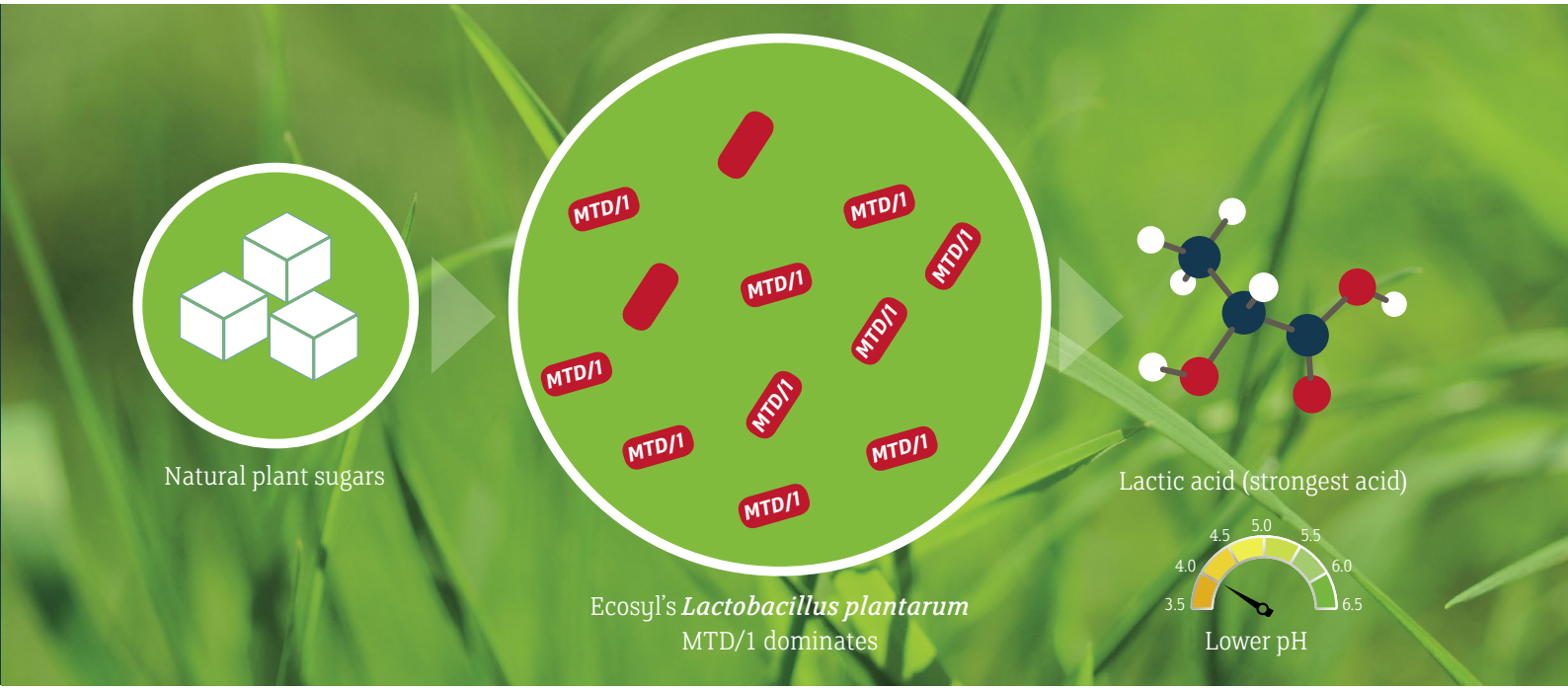
However, with so many additives to choose from, how do you know which is the right one?

The key is to choose an additive from a reputable company with sufficient independent trial evidence to show that it works and most importantly increases animal performance. Ask to see the trials.

It is better to spend a bit more and get a good return on your investment than to buy a cheap additive and find you are out of pocket.

A good quality inoculant will supply at least 1 million (1,000,000) beneficial bacteria per gram of forage treated when used correctly. It should also contain bacterial strains specially selected to be highly efficient at fermentation.

The desired fermentation process



Why is lactic acid important?

Lactic acid is the strongest silage acid and its production does not result in DM losses. An efficient fermentation makes best use of the sugars by maximising lactic acid.

Good Fermentation
(High percentage of Lactic acid)

Faster pH fall

Less protein breakdown

Lower DM losses

More palatable silage

Poor Fermentation
(Low percentage of Lactic acid)

Slower pH fall

More protein breakdown

Higher DM losses

Less palatable silage

Clamping second-cut silage

Ideally, second-cut silage should go into its own clamp. If you don't have that option or the space isn't available, it's perfectly acceptable to put it in the same clamp as first cut.

But, you need to take the appropriate precautions. The crucial thing is to prevent spoilage by minimising the quantity of air entering the clamp.

Top tips for minimising the ingress of air:

- Remove the cover from your first cut until the absolute last minute before adding the new crop.
- Keep the area of the first-cut silage exposed to the air for the shortest possible time.
- Treat plastic sheets with care and patch any holes.
- **Never travel** on the ensiled crop. Spread fresh crop over clamp and only travel on the new crop.
- Make sure you've also got enough sheeting to cover the new crop – including the top and the sides and allowing for adequate overlaps. You don't want air to sneak into the clamp after sealing.

Careful conservation

In terms of the other steps required for achieving the best conservation of your second-cut silage, the usual rules apply.

- Fill quickly and in thin layers no more than 15 cm deep. That's about the maximum that can be consolidated effectively.

Looking to make the best second cut you can?

- Achieve a good compaction to squeeze out air. This is necessary to start the fermentation process and to minimise problems with aerobic stability (spoilage).
- Cover the clamp thoroughly and quickly to keep air out.
- Remember the importance of a quality additive for maintaining better control of the whole preservation process and, subsequently, for getting the best animal performance from your silage.

Second-cut silage shouldn't be considered a second-rate crop in these days of making the most of forage.

Farmers need to keep a number of important points in mind when making second-cut silage. These are important to ensure the production of a high-quality feedstuff.

1. Quality

Second-cut grass has the potential to grow quicker than grass for first cut and, as a result, it can head much sooner.

This is important as after heading out the digestibility falls by 0.5%/day and 3.5% per week. Therefore, it is important to monitor growth regularly to ensure you cut at the optimum time.

This is normally about six weeks after first-cut, but could be sooner if you follow a multi-cut approach.

2. Wilting

Warmer and drier weather (in theory) means there's also potential for second-cut to wilt much quicker after cutting than first-cut – especially if you have a lighter crop.

This means target dry matters of 28% can be easily overshot.

Therefore, watch crop conditions carefully and regularly after mowing. In the right conditions, consider mowing and picking up on same day.

3. Packing the clamp

If you've had a lighter first-cut – for example if you cut it early – second cut could be invaluable.

So don't skimp on preserving it. Ensure you achieve effective consolidation and clamp sealing and use a quality additive to conserve maximum nutrients and avoid shrinkage (loss of quantity) in the clamp.

4. Beware of slurry

If slurry has been applied after first-cut, then beware.

Insufficient time may have elapsed between application and second cut harvest for the slurry bacteria to have disappeared fully from the sward.

The ideal target interval should be 10 weeks between application and harvest which is impractical if wanting to cut quality grass. So if slurry is to be applied between cuts, ensure it is applied as quickly as possible after harvesting.

Ensure it is applied before the grass starts any regrowth. Aim to alleviate this problem by increasing the dry matter of the crop through wilting and the use a quality additive to out-compete the slurry bacteria.

5. Using an additive

If you are concerned about the potential of producing an overly dry/ mature second-cut crop, then you need to make sure you are prepared for this in advance.

Maximise the retention of nutrients and animal performance by using a proven silage inoculant to ensure a fast and efficient fermentation. If you believe you have a high risk of aerobic instability discuss with your forage specialist the best and most proven product to use.

Remember that the risk of aerobic spoilage (heating) increases at high dry matter levels and with coarser more mature crops. So you should consider using a dual-acting additive (such as Ecocool) to cover the two possible scenarios. This will not only improve fermentation, but it also reduces the aerobic spoilage risk.

Cut to Clamp

A Volac initiative

For help with consistently better silage
and to book your free silage consultation

go to **www.cuttoclamp.com**

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