

BETTER farm Beef Programme

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Maximising silage yield and quality

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Silage making should be one of the most important areas of focus on every farm. Including fertilizer and contractor costs, it can be quite an expensive crop. Silage yield and quality will have a major impact on the value of the crop for each farmer. There are several things that can be done at management level to improve silage quality. In 2014, the analysis of silage made across the BETTER farms was slightly back on the previous year, due in most cases to an uncontrollable factor – the weather.

Field selection: Farmers tend to close the same fields on an annual basis for silage, and in most cases do not measure yields on a field-by-field basis at harvest. Because newly reseeded fields and fields with higher levels of perennial ryegrass will normally have a higher yield, a greater return or yield may be achieved from these fields.

Pre-closing management: In order to maximise silage quality, swards should be grazed out to 4cm prior to closing. Studies carried out by Teagasc have shown that where swards had some dead herbage at the base of the sward and these were not grazed out prior to closing for silage, quality was 6% DMD lower than swards that were grazed to 5cm in either the spring or late autumn. Swards grazed bare prior to cutting may have a silage yield of 1.4tDM/ha to 2tDM/

ha lower than swards that are not grazed out at all.

Planned harvesting date: The date of harvest will have an effect on the DMD percentage. Most grass varieties chosen will contain intermediate-heading or late-heading varieties. These grass types will start heading out from late May.

The target should be to harvest silage with a heading rate of less than 50%. Each week harvest is delayed after this point will see the silage DMD drop by about three to five units. The length of time the crop is growing and the N application rate will also have an effect. Ideally a silage crop should be growing for no more than seven to eight weeks.

In normal growing conditions, a grass crop utilises approximately two units of nitrogen per day or 14 units per week. Applying 100 units of nitrogen/acre (124kg of N/ha) will mean that the sward cannot be cut for at least seven weeks. Cutting before this will lead to elevated levels of nitrates in the grass and will affect fermentation.

Quality or yield

In some cases farmers in the programme will stagger silage cutting dates, taking quality silage at the end of May for weanlings, autumn calvers and finishing cattle. The aim here will be to make high quality 72 +DMD silage which may be capable of growth rates of 0.7kg per day with low supplementation levels. While some silage may be allowed to bulk up until mid June. This will be fed to dry spring calving cows will a lower winter energy requirement.



Table 1: P and K requirements for silage crops

Index	1st cut		2nd cut	
	P	K	P	K
1	40kg/ha (32 units/acre)	175kg/ha (140 units/acre)	10kg/ha (8 units/acre)	70kg/ha (56 units/acre)
2	30kg/ha (24 units/acre)	150kg/ha (120 units/acre)	10kg/ha (8 units/acre)	50kg/ha (40 units/acre)
3	20kg/ha (16 units/acre)	120kg/ha (96 units/acre)	10kg/ha (8 units/acre)	35kg/ha (28 units/acre)
4	0 (0 units/acre)	0 (0 units/acre)	0 (0 units/acre)	0 (0 units/acre)

Fertilizer requirements

Applying the correct levels of fertilizer is paramount to ensure silage crops are optimised. This in turn will help reduce the cost of silage on a tonne dry matter basis.

The first step should be to have soil samples analysed to identify the P and K index and pH. Correcting soil pH should be the first port of call. The target should be to have all soils at 6.2-6.5 pH to optimise the efficiency of fertilizer use. Correcting soil P and K will also result in increased availability of im-

portant nutrients. Compound fertilizers should be used to increase P and K levels over time.

Nitrogen application: The level of chemical nitrogen applied to a silage crop is crucial. The target for perennial ryegrass swards should be a nitrogen application of about 100 units per acre, while old swards should get about 80 units per acre as they will not have the potential to utilise more than that nitrogen input. When calculating the nitrogen application, you should take account of the residual nitrogen from

early spring nitrogen and slurry applications. Assume that about 20% of nitrogen from slurry and chemical fertilizer spread earlier in the spring is available.

Phosphorus and potash: The level of P and K which can be applied depends on soil index. Table 1 shows the P and K requirements for first- and second-cut silage on various indexes. Table 2 details the estimated N and P content of cattle slurry. However, the nutrient content of slurry will vary depending on the animal type fed over the winter months and the diet type.

When applying slurry to silage fields, ensure you leave about a week between slurry application and chemical fertilizer application to avoid losses.

Table 2: Nutrient content of cattle slurry

Time of application	N kg/M ³	P kg/M ³	K kg/M ³	€/m ³ (€/1,000gals)
Spring	0.7 (6)	0.6 (5)	3.3 (30)	5.2 (24)
Summer	0.3 (3)	0.6 (5)	3.3 (30)	4.8 (22)

Choosing nitrogen type

Many farmers will use CAN or compound fertilizers to supply nitrogen for silage crops. However, cost and farm type should also be taken into account, along with weather at application. Urea, at €420/t, costs about 46c per unit N, while CAN at €335/t costs about 62c per unit N. With a 16c per unit N cost difference

between Urea and CAN, consider your options to reduce fertilizer costs. Urea requires moisture to work, and is not suitable in dry conditions. In addition, it should not be used for about six months after lime is applied. Where conditions are suitable (ie cool and damp), using Urea over CAN could reduce

fertilizer costs by up to €16/acre for the first cut. Urea may not be suitable on very dry farms, or farms liable to drought. Farmers worried about losses of N from Urea should consider splitting the nitrogen application, applying half at closing with the rest spread about three weeks later.

Satellite group focus

Cristoir Behan,
Kildare Road,
Rathangan,
Co Kildare



This farm has both spring-calving and autumn-calving herds. Cristoir is very active in the discussion group facilitated by Christy Watson and has put in a lot of grazing divisions to ensure he grazes out pastures in three days. Temporary fencing is used with reels used to quickly erect front and back fences. Both pit and baled silage are made on the farm. Because there is a herd of autumn-calvers on the farm with high energy demands after calving, there is a focus on silage quality. The silage swards are predominantly old pastures which are well fertilised. The silage area is grazed from mid-February to mid-April with the replacement heifers prior to closing. This is a very heavy farm and the practice of rolling silage ground ceased a number of years ago. Silage ground is usually closed on 10 April and receives 2,000 gallons of cattle slurry plus four bags/acre of 13-6-20 followed by 1.2 bags Sulfa CAN/acre.

Stephen Morrison,
Hartwell
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Stephen is a member of North Kildare Beef Discussion Group and has hosted meetings where grass silage yields were measured in each field in the week prior to cutting. This highlighted a wide range in silage yields between similarly fertilised fields. On further investigation, the fields with the lowest yields had very low soil pH. After application of lime, a dramatic lift in silage yields was achieved. Silage swards are fertilised with one bag/acre of 18-6-12 in first week of March and grazed from the third week in March with autumn-calved cows and their calves. In early April, fields receive three bags per acre of 13-6-20 along with two bags per acre of Sulfa CAN. The aim is to apply 100 Units of N per acre. It is estimated that six units of nitrogen remains from the early application. Silage harvesting occurs in mid-June using a forage wagon. After silage is harvested, 2,000 gallons/acre of slurry is spread and weeds are controlled in the after-grass.

Since all cattle are finished on the farm, very good grass silage is the target so as to reduce feed costs. The 2014 analysis showed silage quality to be 74DMD, with an ME of 11.5 and 12.4% protein.

Splitting fertilizer application

Farmers with high stocking rates in the BETTER farm Beef Programme will often split the fertilizer application on fields at closing. Along with helping to minimise losses, it will give added flexibility. If growth rates remain low, the fields can be grazed. If they are not required for grazing, they can be topped up with nitrogen three weeks later.