

Forage production in organic farming

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Introduction

The general principle of livestock feeding in organic systems is that the animals have to be fed a species specific diet in a way 'suited to their physiology'. Nutrient supply must be based on the animal's requirements to avoid 'metabolic disturbances' and to maintain fertility and overall health. The Organic Food and Farming Standards in Ireland (Council Regulation EC 834/2007 as amended) to which all Irish organic producers farm, permits a maximum daily allowance of 40% of DM (dry matter) intake in a ruminants diet post weaning to contain grain. Therefore the objective of feeding organic beef cattle should be the provision of predominantly forage based diets supplied by the farm itself. This will normally be based on grass/clover grazing and quality conserved forages such as red clover/grass leys. Most organic beef producers feed grain during the finishing stage of the animal. This will increase the weight gain of the animals; it also gives the meat the fat content required by the market. The level of feed supplement offered, and for what length of time, varies from farm to farm depending on the type and age of animal, and the required market weight. Forage quality contributes significantly to the efficiency of the system from both a cost and a performance perspective, and the lower the quality of the forage then the greater the requirement for supplementation with grain. Overall the aims of organic beef production systems are based on providing an overall balanced diet of energy, protein and vitamins, primarily from grazed and conserved forages, with the management option of incorporating grain as an additional source of energy.



Organically sourced seaweed minerals and cereals

At farm level two key components of achieving this are:

- Forage Management
- Forage Quality

Forage Management

Grazing perennial ryegrass and white clover swards

The management of grazing swards is divided into three distinct periods according to studies carried out by Teagasc, which are:

1. Autumn / Winter
2. Spring
3. Main Grazing Season

1. Autumn / Winter Management

The main aims are to maximise grass-clover intake and prepare the sward for Spring grazing.

For organic farmers in particular, it is important to keep grazed covers low over the Winter as the carrying of high covers over the Winter may have a detrimental effect on white clover the following Spring

- From August onwards rotation length should be increased from 30 (August) to 40 (Sept.) to 50 (October) days.
- The last rotation should start around 1st October, with the first fields closed identified for grazing first in early Spring.

- Swards should be grazed down to a 4.0 cm stubble height to enable light to reach the clover stolons. This encourages budding and future growth the following Spring
- It is essential to avoid poaching at all costs as this has a detrimental effects. On swards and especially clover persistency.

Bloat:

White clover may contribute over 40% of the DM (dry matter) in the sward from August onwards. While bloat is not normally a problem on organic farms (for cattle are accustomed to grazing clover pastures), be cautious about the risk of bloat especially later in the grazing season and use preventative measures to minimise bloat risk. Cattle most at risk are those which are not accustomed to clover in their diet. Some preventative measures are as follows:

- For animals not accustomed to clover, feed them to fill with hay/straw immediately before putting them onto a clover-rich pasture.
- Move 'at-risk' cattle to a high clover pasture when the herbage is dry rather than wet.
- Adding pluronic agents to drinking water may be allowed. Consult with your relevant Organic Certification Body.

2. Spring Management

The aim of this period is to get animals to commence grazing as early as feasible to minimise the cost of production and maximise animal performance from grass.

- The main aim during this period is to maximise intake and prepare the sward for Summer grazing/silage.
- Commence grazing as early as feasible as late turnout to a high grass cover can lead to poor grass utilisation and quality later in the season. Start grazing early (target mid-Feb., ground permitting). Use on/off grazing, strip-grazing, back-fencing, multiple entrances to paddocks, etc., as needed.
- Rotation 1 will be about 50-60 days duration. Fields intended for first-cut silage can make up 30-40% of the grazing area for the first rotation. The aim should be to finish this rotation by the middle of April.
- Graze to a 4.5cm stubble height. At most 10-15 % clover will be present at this stage of the year. It will be important to prevent it being swamped by grass
- Slurry is an important source of nitrogen (N) for spring growth:
 - aim in mid/late January to spread slurry on final paddocks closed pre-Winter.
 - after grazing in the first rotation, spread slurry on the paddocks being closed for first-cut silage.

3. Main Grazing Season Management

The aim during this period is to maximise animal performance from a complete forage diet. This is achieved by providing a consistent supply to the animals on a daily basis. With good grassland management it is possible to have a long grazing season

- Rotation length should be maintained at 28 to 30 days to allow swards to re-grow.
- Heavily stocked farm targets: pre-grazing sward height of 8 - 10 cm. Avoid grazing higher covers as this will affect animal performance.
- The quality of the pasture should be maintained by topping pastures to a 4cm stubble height. Topping should take place from mid-May rather than waiting until later in the season.
- Walk the grazing area weekly to identify surpluses/deficits and take remedial action e.g. remove surplus grass as bales.

Grass-white clover silage swards

As conserved forage contributes approximately 40% of the animal's annual diet and organic farmers can only source it from fellow in-conversion or organic farmers (if required), it is especially important for organic farmers to produce adequate quantities of conserved silage/hay of the required quality. The following are some of the management techniques required to achieve this:

- Avoid a carryover of dead vegetation at the base of the sward during the Winter as this will decrease the energy value of the silage sward. High grass covers over the Winter also detrimentally affect clover development.
- In Spring, graze the paddocks intended for first-cut silage to an even stubble height of 4cm if ground conditions allow. This will help increase the quality of the silage sward and further encourage clover growth during the season.
- Ensure the P, K and pH status of the soil is adequate by providing required input of P, K and lime, based on soil analyses taken within the last five years.
- Apply slurry as early in the season as possible.
- Avoid compacting soil during organic manure spreading and silage making.
- Measure the grass yield prior to cutting. One of the benefits of this is that poorly performing fields can be identified and necessary action can be taken to correct this.
- Make an inventory of silage stocks to calculate that you have enough feed for your animals over the Winter period.

Forage Quality

Grazing Swards

Due to the considerably lower cost of grazed grass as a feedstuff compared to silage or grain, one of the objectives of organic beef producers should be to optimally exploit this by providing a highly digestible leafy sward over an extended grazing season.

On organic farms, the incorporation of white clover in grass swards is widely recognised as the driver of grassland production in the system and with good grassland management it is possible to have a long grazing season of high quality feed. To ensure that the grazing swards are of good quality, the following practises should be considered:

- Use a rotational grazing system to help maintain grass-clover quality throughout the year.
- Walk the farm on a weekly basis, measuring grass growth and assess the supply of grass
- Spread slurry in Spring when both crop demand and the N availability of slurry is highest. Early application provides nitrogen for grass growth before clover starts to fixate atmospheric nitrogen.

Silage swards

There is a wide range in silage quality on Irish farms. The level of dry matter digestibility (DMD) achieved has a major effect on the cost of the silage and the performance of the animals being fed. The DMD is most frequently used as an index of the feed value of silages. Highly digestible silages must be fed when high rates of performance are required from housed animals. This would be the case for an organic beef farmer finishing animals for slaughter over the winter housing period. Highly digestible silages are produced from swards that have a high content of leaf, relatively little stem or seed heads and a low content of dead herbage, docks and other less digestible plants.

Ensuring that the silage is well preserved is also essential if the nutritive value of the silage is to be fully realised. Preservation is a process that takes place under air free conditions. Good preservation will result in the cattle eating more and therefore performing better. Preservation can be judged by the general appearance and smell of the silage, while laboratory analysis can determine its pH and ammonia-N values.

The potential of white and red clover silages can be clearly seen from an experiment at Teagasc Grange where a comparison was made between silages made from swards of grass, lucerne (aka alfalfa), red clover and grass/white clover (Table 1). Both red clover and particularly lucerne were more difficult to preserve satisfactorily, however the mean liveweight gains were higher for silages containing clover or lucerne.

Table 1: Comparison of average daily live-weight gains between 4 different silage diets

Silage crop	Average daily liveweight gain (LWG) kg
Grass silage	0.59
Lucerne	0.72
Red clover	1.04
Grass/white clover	0.83

Source: Teagasc Grange Beef Research Centre

Key Points

- A low cost home-produced forage-based diet is the foundation stone of organic beef production.
- A requirement of organic beef systems is the production of quality grazing and silage swards.
- To provide a balanced diet in organic beef production systems, dynamic and timely use of modern grassland management techniques are necessary.
- With appropriate grassland management in place, good quality grazing and silage swards will be produced and maintained within the system.
- Grass-clover silage offers the potential to produce a very high quality forage for the Winter diet.



The dry matter digestibility (DMD) has a major effect on the performance of the animal being fed