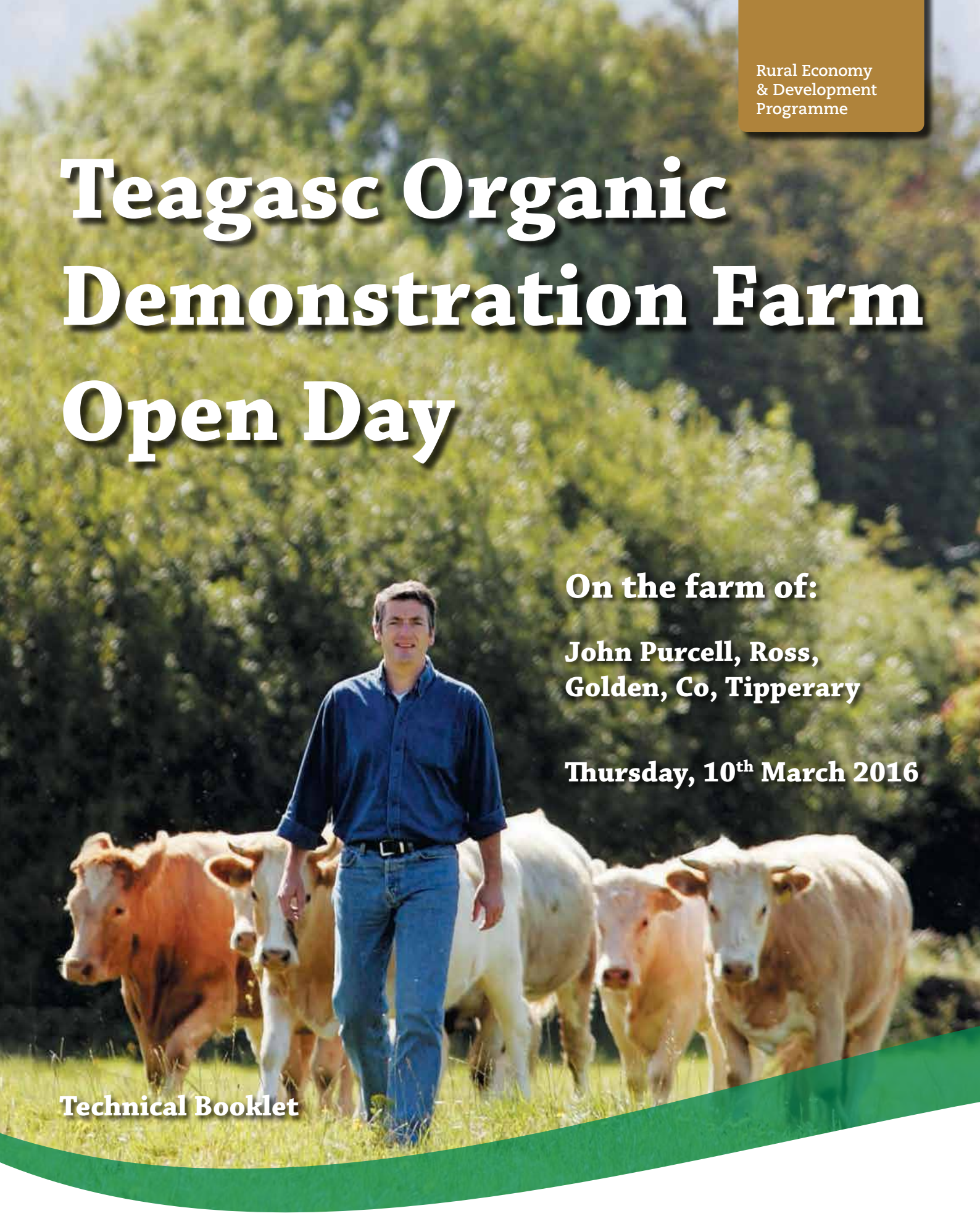
Rural Economy
& Development
Programme

Teagasc Organic Demonstration Farm Open Day



On the farm of:

**John Purcell, Ross,
Golden, Co, Tipperary**

Thursday, 10th March 2016

Technical Booklet

teagasc
Agriculture and Food Development Authority

Department of
Agriculture,
Food and the Marine
An Roinn
Talmhaíochta,
Bia agus Mara

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Welcome

It is my pleasure to welcome you to today's farm walk.

There has been a large increase in the number of organic farmers last year. While the Organic Farming Scheme has been important in facilitating this growth, enhancing the underlining profitability of the system will be vital if this is to be maintained.

We will need markets for our product and the signals are good regarding demand for beef in export markets. Teagasc has a role in promoting organic farming but this only makes sense if it is profitable for farmers. To make a successful organic farmer you must be more technically efficient than your conventional counterpart as the pressure release valve of chemical fertiliser is not available to you if grass is poorly managed. The most valuable asset to drive efficiency is the health of the soil – this will deliver good crops of forage and grass which when managed well will support good stocking rates. Today you will see examples of good efficiency on an organic farm that you may be able to implement on your own farm to deliver greater returns.

I hope you enjoy the walk today and learn something from it by asking plenty of questions. I wish you every success in your farming endeavours.

Fintan Phelan,
Head of Farm Management and Rural Development Knowledge Transfer Department, Teagasc

Foreword

I would like to welcome you all here today to this Organic Demonstration Farm Walk. I would particularly like to thank our host farmer today, Mr John Purcell, and indeed all the organic farmers who are providing us with access to their farms as part of this Programme.

The Demonstration Farm Programme, which is funded by the Department, commenced on a pilot basis in 2004 and has proved its worth since then. The objective is to provide an opportunity for both existing and potential organic operators to visit first-class facilities and see production and management techniques at first hand. However, and very importantly, it also allows the organic consumer an opportunity to visit these farms as well, and learn more about how organic food is produced, why its production costs are higher, and how their confidence in the authenticity of organic products can be assured.

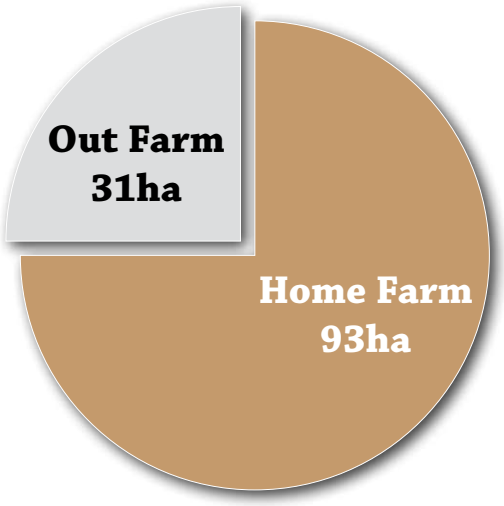
On behalf of the Department, I would like to take this opportunity to express my gratitude to Teagasc for its ongoing commitment to the growth of the Organic Sector in Ireland and to the development of the Farm Walk Programme.

Finally I hope that today will be of value to you and that you will be encouraged to explore and fully avail of the very real opportunities that exist for you, your families and your customers.

Ronan O'Flaherty
Principal Officer, Department of Agriculture, Food and the Marine

Introduction

Farming Background
John Purcell has been farming organically since 1999. He owns 124ha separated up into 2 parts, with (93 ha) including wintering facilities located at the townland of Ross and the other part (31 ha) located at Ballinree, 12 miles away. The whole farm consists of permanent grassland pasture used for cattle grazing and silage production (red-clover-perennial ryegrass) for winter feed.



In recent years John's has purchased approx. 700 organic cattle/ year both directly from other organic farms and through dedicated organic mart sales. He rears these to slaughter to supply the organic beef market through his own company Good Herdsmen Ltd.

In addition, John operates a B & B system with 7 other organic farmers whereby stock are transferred onto other organic holdings for feeding and/or finishing prior to slaughter and supply to the organic market.

Housing facilities
John's housing facilities are a combination of old traditional style slatted/loose houses and new solid floor sheds. The traditional slatted/loose sheds are used for younger stock with 3 very large solid floor /straw lie back sheds used for older stock.

John uses approx. 2,000 bales of straw (150kg weight average) to bed cattle. Bedding is carried with the aid of a straw chopper which was purchased with the aid of DAFM on-farm organic capital grant support.

Stock Numbers
Presently stock numbers on the farm are as follows:

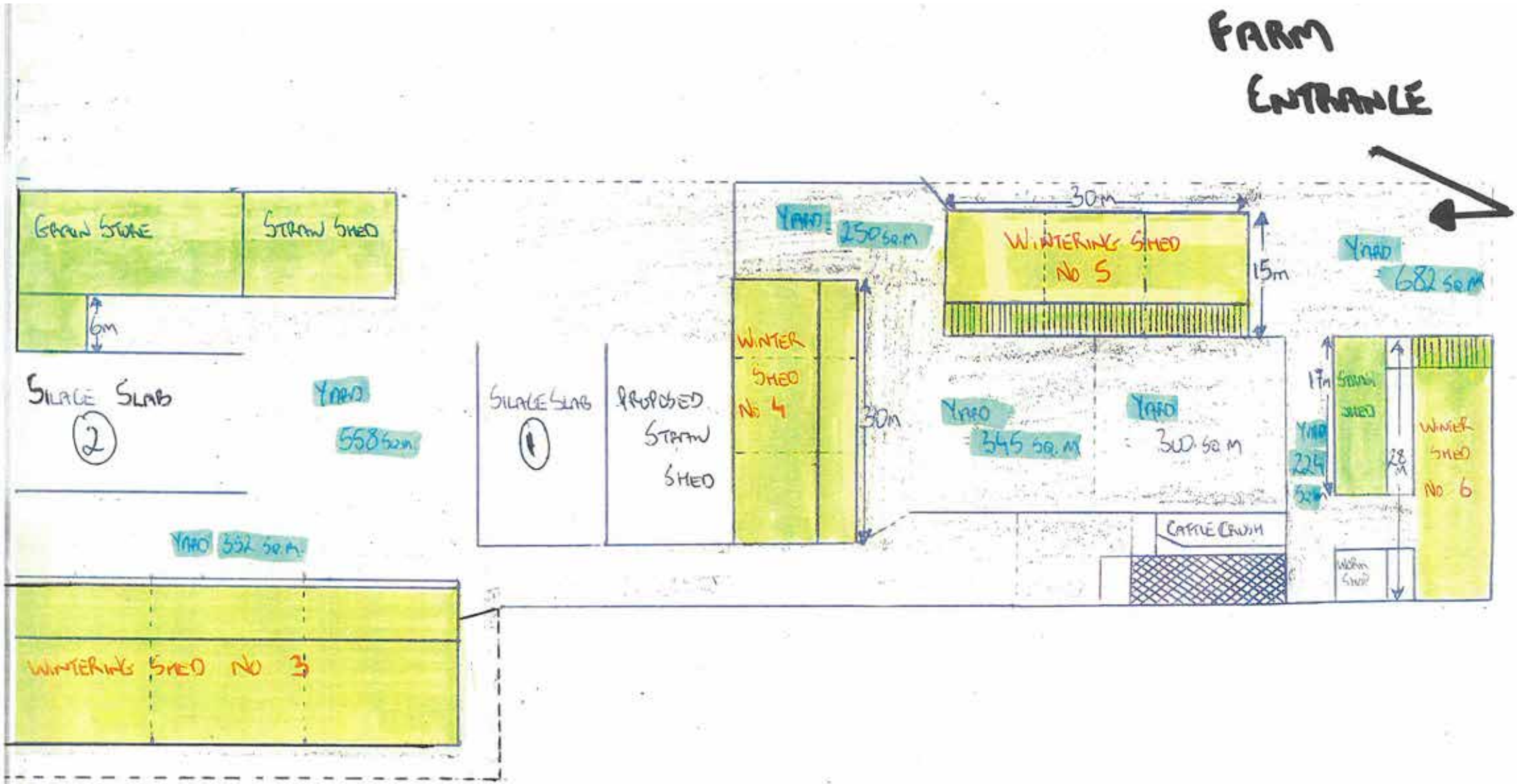
Age	Bullocks	Heifers
0-1 year old	94	72
18 - 24 months	243	228
> 24 months	31	43
Total	**368**	**343**

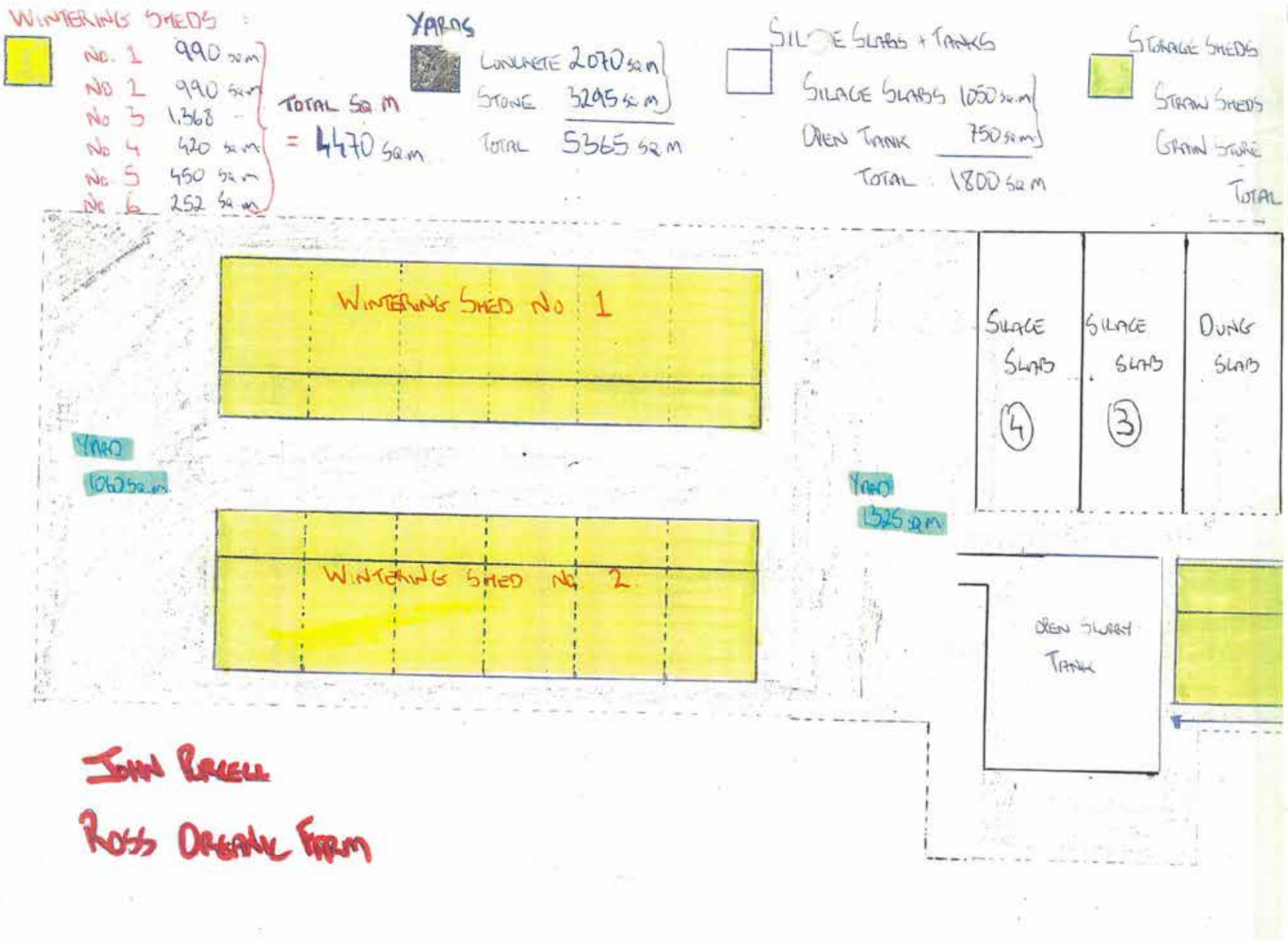
(on average there are usually between 700 animals on the holding at any one time with a further 300 approx. on other organic B and B farms).

Animal Diet
Animals are fed a predominantly grass-clover based diet with a modest level of organic cereals fed at the finishing stage. Winter feeding is done with the aid of a diet feeder. Cereals are purchased from organic cereal farmer (approx. 130 tonnes/year). In addition organic seaweed minerals are fed to all animals during the winter housing period.

The ideal beef animal:
In 2015, approximately 7,000 animals including veal calves, heifers and steers were supplied to the organic beef market through Good Herdsmen Ltd. The table below shows the type of heifer/steer that fits into all Good Herdsmen Ltd. jobs so that's what makes it the ideal animal at slaughter and boning plants.

Sex	Age	Weight	Residency	Fat	Grade
Heifer/Steer	912 days	220-350kg	90 days	2, 3, 4	E,U,R,O


FARM ENTRANCE
GRAIN STORE
STRAW SHED
6m
SILAGE SLAB (2)
YARD 558 sq.m
SILAGE SLAB (1)
PROPOSED STRAW SHED
YARD 250 sq.m
WINTER SHED No 4
30m
30m
WINTERING SHED No 5
15m
YARD 682 sq.m
YARD 345 sq.m
YARD 300 sq.m
17m
STRAW SHED
YARD 224
28m
WINTER SHED No 6
CATTLE CRUSH
YARD 332 sq.m
WINTERING SHED No 3


WINTERING SHEDS
No. 1 990 sq m
No 2 990 sq m
No 3 1,368 "
No 4 420 sq m
No 5 450 sq m
No 6 252 sq m
TOTAL Sq M = 4470 Sq M
YARDS
CONCRETE 2070 sq m
STONE 3295 sq m
TOTAL 5365 SQ M
SILAGE SLABS + TANKS
SILAGE SLABS 1050 sq m
OPEN TANK 750 sq m
TOTAL 1800 SQ M
STORAGE SHEDS
STRAW SHEDS
GRAIN STORE
TOTAL
WINTERING SHED No 1
WINTERING SHED No 2
YARD
1060 Sq m
YARD
1525 sq m
SILAGE SLAB 4
SILAGE SLAB 3
DUNG SLAB
OPEN SLURRY TANK
John Rafell
Ross Organic Farm

Organic beef farming in Ireland: structure and steps towards successful conversion

DAN CLAVIN[1], ***Teagasc Farm Management and Rural Development Department, Athenry, Co. Galway***
ERIKA FITZPATRICK[2], ***Teagasc Advisory Services, Clonmel, Co. Tipperary***

Introduction

Organic production is defined as "an overall system of farm management and food production that combines best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the preference of certain consumers for products produced using natural substances and processes".

Consumers purchase organic food for a number of reasons including:

- concerns about the build-up of chemicals in the body,
- taste,
- a return to traditional food values,
- animal welfare and
- impact on the environment.

After recession related decline, the organic market in Ireland and the UK has stabilized and has returned to growth. Irish organic food enjoys an excellent reputation both at home and especially across Europe. Latest figures show the organic retail food market in Ireland is now worth over €106 million annually (source: Bord Bia) which represents approximately 1% of all food sales. In the European Union, the market for organic food is worth €24 billion (2014) a doubling in size over the last 10 years. The largest markets exist in Germany (€7.6 billion euro), France (€4.8 billion), the UK (€2.3 billion) and Italy (€2.1 billion). This growth represents an opportunity for Irish farmers to supply more organic food, especially organic beef.

At farm level in Ireland, the organic sector has experienced of late a large influx of new farmers with 1,800 farmers now farming organically including approximately 600 who entered conversion in 2015. About 70% of these are cattle farmers. Organically managed land now occupies 2 % approx. of the total utilizable agricultural area (UAA) in the country, over a doubling in area in the previous decade. This compares with 5.7% UAA average across the European Union.

Organic Beef Farming in Ireland

According to DAFM, in mid-2015 there were over 1,300 organic cattle farms in Ireland, most of who were suckler farms (~900). In total there were over 59,000 cattle including 19,000 suckler cows. This represents an increase of 65% in cattle farms and 100% increase in cattle numbers since 2008. Figure 1 shows the location of all organic famers in Ireland per county and figure 2 shows organic suckler cow and 12-24 month organic cattle numbers in Ireland on a county basis (latest figures from 2012 available).

Figure 1: Location of all organic producers in Ireland - December 2015

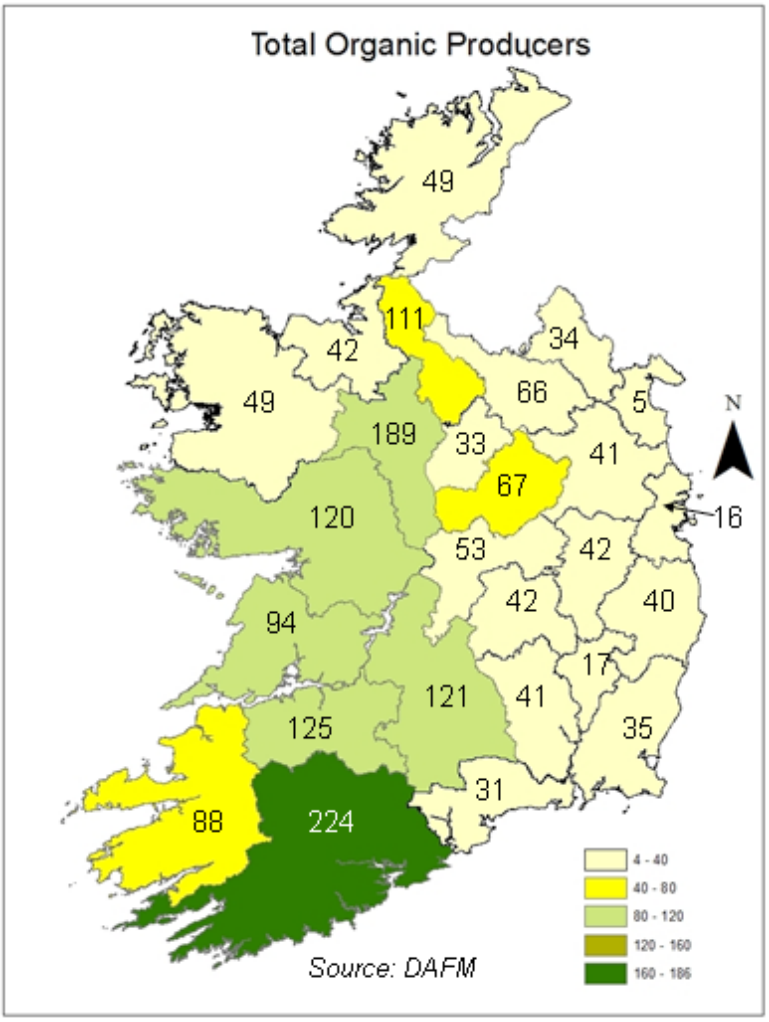
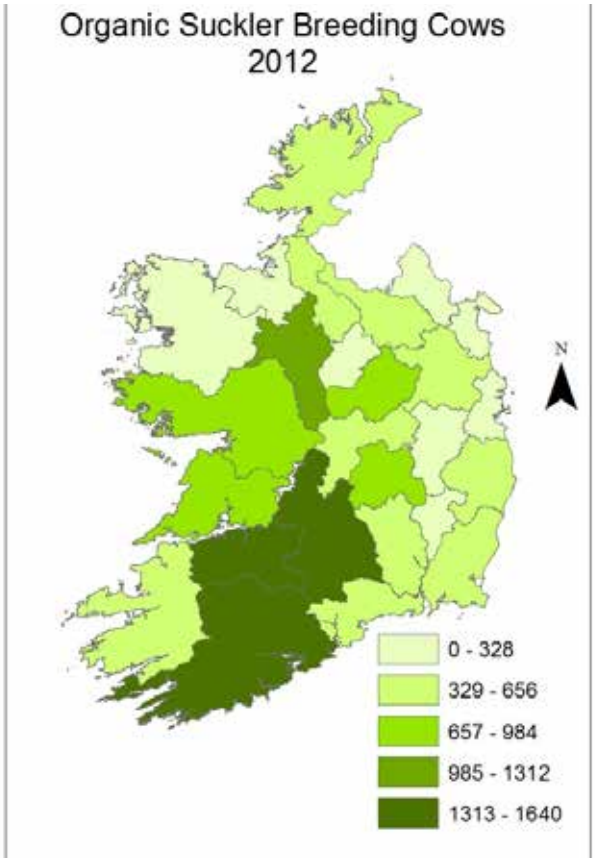
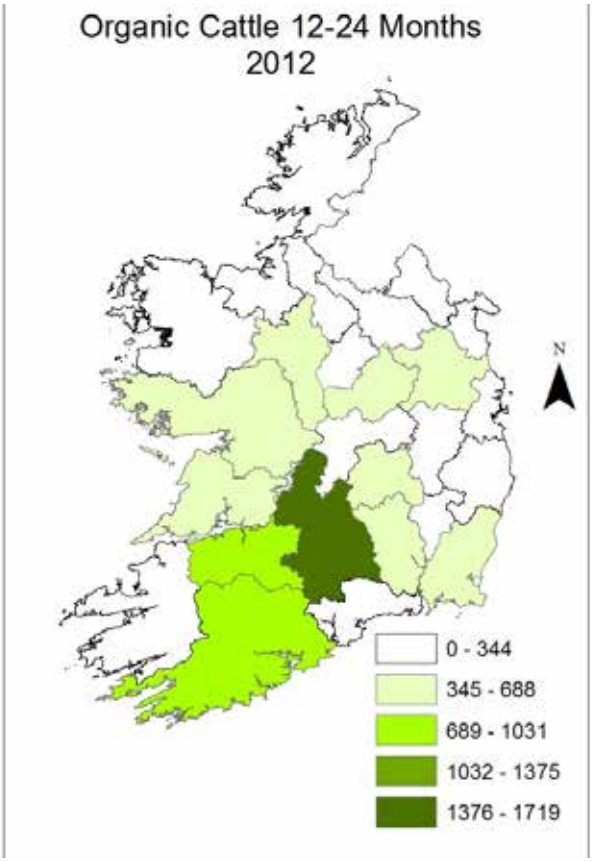


Figure 2: Location on a county basis of organic suckler cows and 12-24 month old cattle in Ireland (2012)





Market Demand for Organic Beef

In 2012, there were over 9,000 organic cattle slaughtered in Ireland by approximately 500 farmers (source; DAFM). With the relatively large influx of new organic farmers entering conversion in 2015, it is expected that these figures will rise by about 40 - 50%. Beef farmers interested in organic conversion should speak with other organic farmers, processors and wholesalers about potential markets. The major factory outlets at present for organic beef are Goodherdsmen, Slaney Meats, AIBP and Jennings, Ballinrobe. Premium prices of +15 to +25% have generally been achievable for organic beef in recent years. According to processors the demand for Irish organic beef will continue to rise especially in the UK and Europe.

Steps to Successful Organic Beef Production

The switch to organic production methods can be made smoother by following a number of basic steps:

1. **Getting the Information:**
   Perspective organic farmers should first consult with their agricultural consultant or advisor to determine suitability. This should be followed by attending some of the Organic Demonstration Farm Open Days to see organic production systems at first hand and to meet with other organic farmers, staff from the Organic Certification Bodies, the organic unit of the DAFM and Teagasc. Teagasc run a series of 25-hour courses entitled "Organic Production Principles" which is a mandatory requirement for qualification to the Organic Farming Scheme (OFS) and gives the basic training for organic farmers. Teagasc and the Organic Certification bodies have a range of publications available together with on-line material containing technical information for the organic sector.

2. **Assess the Market**
   For organic farming to be profitable a premium price must be achieved for produce sold. Speak with other organic farmers, wholesalers and processors about potential markets. The Teagasc Organic Farming Demonstration Open Days are an excellent means of gathering this information.

3. **Maximise Organic Farming Scheme and other payments**
   Consult your agricultural consultant or advisor or the DAFM website (www.agriculture.gov.ie) about grant schemes available for organic farming. An organic farming scheme scheme (OFS) which is an area based payment and both an on - farm and an off-farm capital investment scheme (OCIS) is funded under the new Rural Development Programme (2015-2012) and opens up at various stages throughout the programme.

4. **Complete an organic course**
   A 25 hour 'Introduction to Organic Production' course has to be completed before acceptance into the DAFM Organic Farming Scheme (OFS).

5. **Complete an organic conversion plan**
   This involves a detailed description of management practices on the farm, the changes required on the farm, faecal analysis, soil analysis, livestock housing plan, animal health plan (in consultation with your veterinary surgeon) and land/crop rotation plan. The plan can be drawn up by the farmer in consultation with the farm advisor. Attending a FETAC accredited "Organic Introduction Principles Course" is an excellent way of learning how to complete the conversion plan. It is essential that the plan is well thought out and that it covers the changes in management practices as well as addressing any nutrient deficiencies on the farm and how these will be corrected.

6. **Choose an organic certification body (OCB)**
   In Ireland, there are three certification bodies which certify organic operators involved in land based farming under the auspices of the DAFM. The farmer initially applies to one of the three certification bodies (Demeter, IOFGA or Organic Trust) with the application form, conversion plan and fee payable. The proposal is then reviewed by the certification manager and the file forwarded to an inspector who arranges a visit to the farm or holding. The inspector's report is then assessed by the certification panel who decide if the licence can be awarded to the holding. If there are no outstanding issues, an in-conversion licence is then issued to the successful applicant.

The conversion period for land based enterprises is normally two years with some enterprises allowed a conversion period of one year.

7. Provision of quality forage

To maintain productivity, stocking rate must be maintained as high as possible. In the absence of artificial nitrogen, white clover may be introduced into pastures to maintain production levels. White clover is the engine that drives productivity on organic farms and can fix in excess of 100kg N/ha. Organic concentrates are more expensive than conventional ration. Prices for organic ration for ruminants generally costs around €500/tonne. Maximising use of grass, using home grown grain, purchasing grain from other organic producers and having the correct breed and system can reduce feed costs significantly. Organic straights can be purchased from a variety of organic farmers for between €300 and €350 per tonne with combi-crop mixes of peas and a cereal available for between €380 and €400/tonne approx.

Regular topping is necessary to maintain grass quality particularly in mid-season. High quality silages can also be produced using red clovers and enough silage must be produced to meet winter feed requirements.

8. Animal health

Ensuring high animal health and welfare standards is a fundamental ethos of organic principles. The farmer must be aware that the level of stocksmanship required with animals is very high on organic farms. Routine treatment of animals with anthelmintics is prohibited, and a clean grazing rotational system must be in place to minimise worm burden. If a problem occurs faecal analysis is recommended and the vet must sign off the appropriate treatment on the organic farmer's record book. Early detection of animal health problems is essential. Remember good animal husbandry is paramount. If an animal is suffering it must be treated and the necessary permission must be sought from the vet. The animal health plan, produced as part of the conversion plan, will deal with mineral deficiencies and vaccination issues and how these will be treated.

9. Animal housing

Many farmers find that the greatest change that needs to be made at farm level are changes to winter housing. More generous space allowances are required - the rule of thumb is that $1m^2$ is required for every 100kg live-weight for bovines. All stock must have access to a dry bedded lying area. Up to 50% of this area can be slatted but the rest must be solid and not slatted. Conventional straw may be used for bedding.

10. Nutrient recycling

The maintenance of soil fertility levels depends on the creation of a sustainable system which balances inputs and outputs without relying on external inputs. Good clover swards, crop rotation and targeted use of FYM and slurry mean that coping without artificial fertiliser can effectively be managed. Farmyard manure needs to be put back onto silage ground which is rotated around the farm and slurries should be applied at the most appropriate time using methods that ensure maximum recovery of the nutrients. Certain slow releasing natural mineral sources of fertilisers are also permitted. Ground limestone and certain commercial bagged - lime products are also permitted.

11. A helping hand

Whether you are thinking about converting, a recent organic convert or an experienced organic farmer there is no end to the learning involved in organic production methods. It is important that you get as much information as possible about best practices that suit your own farm situation.

There is a wide variety of publications, advisory guidelines, research updates, videos, event/course details along with links to other relevant organic bodies and organisations available on ***www.teagasc.ie/organics***

Optimising animal health on organic beef farms

DAN CLAVIN, ***Teagasc Farm Management and Rural Development Department, Athenry, Co. Galway***
PADDY FENTON, MRCVS, ***The Paddock, Ventry, Tralee, Co. Kerry***

Introduction

Organic livestock production is a food production system that is governed by EU Legislation with production protocols delivering a high status of animal welfare, care for the environment, restricted use of medicines and the production of a healthy product without residues.

The organic certification system as it is currently implemented under the EU Council Regulations is based on assuring standards which mainly describe resources, such as stocking densities, provision of quality forage and restricted use of conventional products. The organic system is designed to and aspires to guarantee various outcomes such as:

- More effective immunity,
- Improved animal welfare,
- Minimisation of residues in milk and meat and
- Reduced damage to flora and fauna

The certification system does not take any legal responsibility over these outcomes. However these outcomes are an integral part of organic farming objectives and a major reason for continued consumer interest in organic products.

The standards for organic livestock production emphasise preventative strategies based on the principles that an animal is allowed to exhibit natural behaviour, is not subject to stress and is fed high quality feed to meet its nutritional requirements so that the animal has optimal natural resistance to combat disease.

Animal welfare

The principles of organic animal welfare are largely based on Professor Roger Brambell's 5 principles of animal welfare which are under human control:

- ***Freedom from hunger or thirst*** by ready access to fresh water and a diet to maintain full health and vigour
- ***Freedom from discomfort*** by providing an appropriate environment including shelter and a comfortable resting area
- ***Freedom from pain, injury or disease*** by prevention or rapid diagnosis and treatment
- ***Freedom to express normal behaviour*** by providing sufficient space, proper facilities and company of the animal's own kind
- ***Freedom from fear and distress*** by ensuring conditions and treatment which avoid mental suffering.

Prevention of disease

Disease prevention on organic farms is based on:

- High levels of biosecurity on the holding.
- Selection of appropriate breeds and strains of animals.
- Use of animal husbandry practises appropriate to the requirements of each species, encouraging strong resistance to disease and the prevention of infections.
- Provision of high quality feed together with regular access to grazing areas encouraging the natural immunological defence of the animal.
- Appropriate stocking densities both during the housed period and at grass reducing stress on animals.

In organic systems, animal health is seen not simply as the absence of disease; it is seen as a positive characteristic which is to be achieved through the application of biological and animal husbandry principles rather than the routine use of conventional veterinary medicines. Where medicines are required, the use of complementary methods both for the prevention and treatment of disease is encouraged.

The development and management of organic livestock production systems requires special care in nurturing positive health and vitality, ensuring the proper control of the disease and the encouragement of positive animal welfare i.e. the satisfaction of the animal's needs, including behavioural needs and not merely the avoidance of cruelty.

In essence the aspirations of organic farmers should be:

1. To have healthy and productive livestock
2. To develop organic systems which deliver positive health and welfare.
3. To continually improve the health and welfare of livestock.
4. To progressively reduce dependence on medicines

Herd Health Plan

When a farmer undergoes conversion to organic status an Animal Health Plan is recommended to be drawn up by the vet, which specifies the current animal health issues on the farm and how the farmer will tackle these issues into the future while conforming to the requirements of organic certification standards.

The Herd Health Plan ultimately needs to address issues such as:

1. What diseases are currently issues on the farm.
2. How can these be controlled or prevented.
3. What modifications can be made at farm level to reduce the risk of disease.

Faeces testing for your present livestock can help to identify the level and type of internal parasites which you have to plan to reduce. Keeping the herd health plan up to date is an on-going process. Whenever an animal needs treating you must treat it, but do think about what could be done to avoid having to treat again in the future.

Steps to developing an animal herd health plan:

1. It is recommended that the animal herd health plan is drawn up by the vet.
2. Identify the disease organism or health problem
3. Learn about the organism's life cycle and/or health problem.
4. Identify the current veterinary or other treatments used.
5. Think about management/husbandry practices that could be used to break the organism's lifecycle or improve the animal's health whilst reducing reliance on veterinary treatments.
6. Identify management husbandry practices or alternative therapies that could be used to minimise or reduce the problem.
7. Identify in advance the alternative veterinary medicines that can be used should the management practices not be successful
8. Identify the specified withdrawal periods for the treatments and calculate the longer withdrawal periods required for organic management.

Complying with organic certification requirements

Under organic livestock management, preventative husbandry and management practices must be introduced to avoid and minimise pest and disease problems - and reliance on chemical treatments. However, the standards do permit the use of synthetic chemical medicines in order to avoid suffering and distress, and where homeopathic and herbal preparations would not be effective.

Detection of problems needs to be early, and timely veterinary advice is invaluable - when an animal is ill the organic farmer reacts in the same manner as their conventional neighbour and veterinary assistance is sought immediately. Failure to treat sick animals may result in the withdrawal of organic status for the entire farm (ie. treatment must be administered even if the result would mean an animal losing it's organic status).

In the case of the clean grazing system, if it breaks down and individual animals become infected (showing clinical symptoms) then it is permitted to use certain wormers to treat individual animals. Permission may be granted base on veterinary advice to use avermectin products if evidence of need is demonstrated - for example resistance to other wormers. Consult with your vet to select the right wormer for the job.

If a significant number of animals require treatment, the use of wormers on a whole-herd basis may be allowed. You will be required to get veterinary advice and/or evidence to support the treatment, such as faecal egg counts.

Withdrawal periods
The withdrawal periods for allopathic medicines are longer for organic animals than for conventional animals. Use products with shorter withdrawal periods where possible, paying special attention as to when the animal will enter the organic market. Treated animals which are sold to other organic farms and which have existing withdrawal periods yet to elapse must complete the withdrawal period on the buyers farm.

The following withdrawal periods must be adhered to for the production of organic beef production.

- For legal withdrawal period - 3 times the legal withdrawal period eg. a legal withdrawal period of 6 days would then result in an organic withdrawal period of 18 days.
- For legal withdrawal periods of between 19 - 28 days - organic withdrawal period of 56 days.
- For legal withdrawal periods of 29+ days - twice the legal withdrawal period applies.

Products with the active ingredients listed below must not be used in the production of organic beef:

Product Name	Active Ingredient
Tetracycline	Tetracycline (This may have to be used - if used inform the processor)
Benastermycin	Bebethamin-Penicillin
Fatroximin	Rifaximin
Buscopan	Buthylscopolamin
Cydectin	Moxidectin
Source: I.O.F.G.A	

Number of antibiotic treatments permitted
The use of antibiotics in clinical cases only is a restricted practice where no other remedy would be effective or after a major trauma as a result of surgery or accident. In other words they should be used only where necessary. The organic standards set out the number of antibiotic treatments permitted per animal:

- Animals for meat consumption: One course of antibiotics is allowed within a 12 month period.
- Animals for breeding: Two courses of antibiotics are allowed within a 12 month period.
- Dairy Mastitis: Two courses of antibiotics are allowed within a 12 month period.

A course of treatment means all necessary measures taken to restore the animal to health following a particular disease episode. If the number of treatments permitted are exceeded, the animal should then be sold conventionally or undergo a further fifteen month conversion period.

Use of vaccines
Vaccination is permitted only in cases where there is a known disease risk (confirmed in writing by the vet) on a farm or neighbouring land which cannot be controlled by any other means.

Single vaccines (monovalent) are preferred, unless a multiple problem exists. A vaccination programme should be developed as part of the animal health plan, following advice from your vet.

Use of alternative therapies
Organic management encourages the use of alternative therapies, such as homeopathy that improve the animal's ability to resist disease rather than treating the disease specifically. It is important to remember that there is a danger of misuse of alternative therapies as much as with conventional (allopathic) medicines.

Mineral supplementation
The inclusion of forage legumes in the diet of cattle improves the nutritive value of the diet and improves individual performance. Animals which are fed a high quality forage are less likely to succumb to disease pressures.

Features of organic farming such as improved soil biological activity, more balanced crop rotations, less production pressure on livestock enterprises, more diverse swards and a prohibition of artificial fertilizers are expected to reduce problems of micro-nutrient deficiency relative to conventional systems.

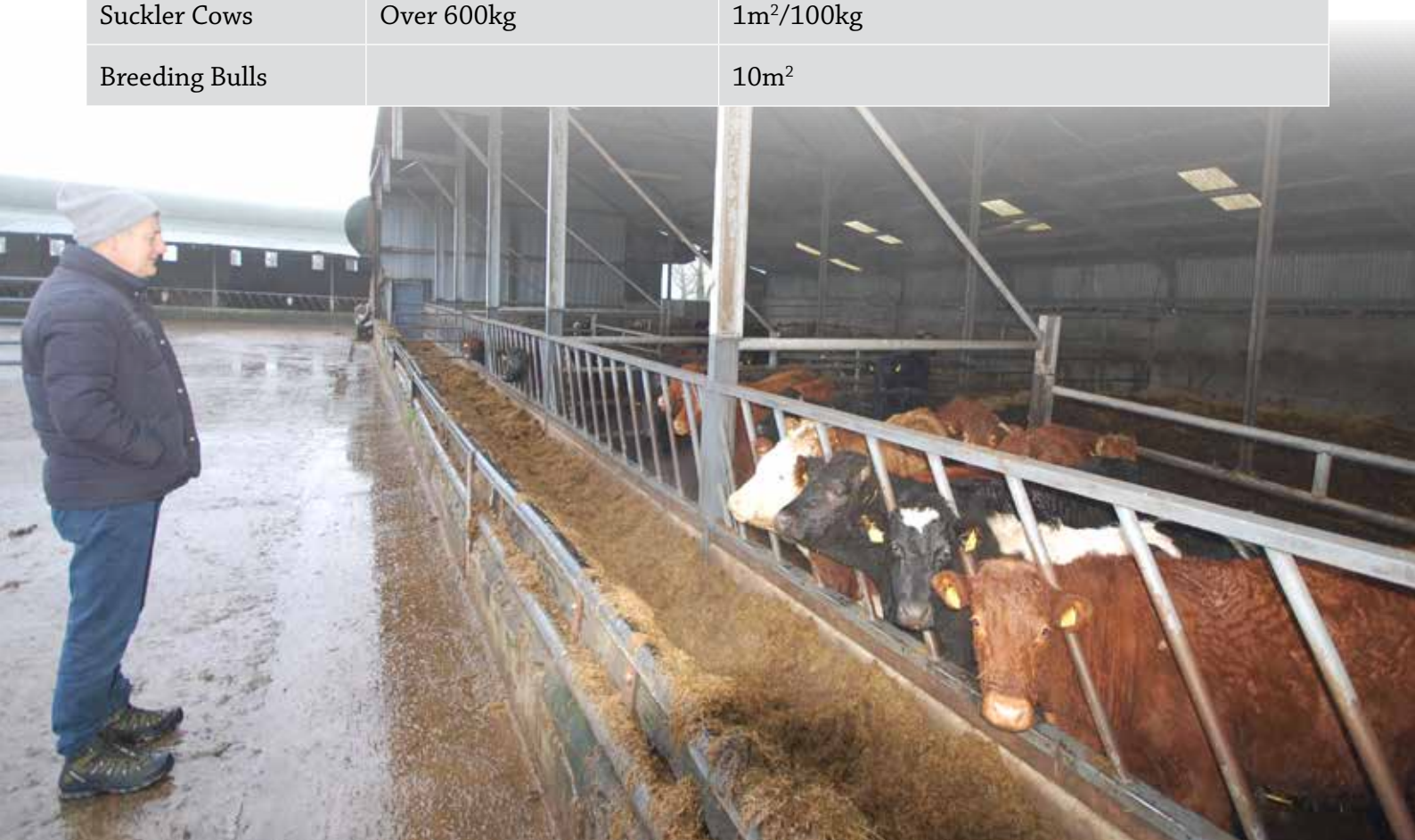
There is a need to be aware of nutritional deficiencies when solely home-grown feed is used, particularly in areas where inherent soil deficiencies are known to be prevalent. The need for supplementation is based on a veterinary recommendation following interpretation of a blood or herbage sample. Treatment may be in the form of organic seaweed based minerals or conventional licks, bolus or injection.

Animal Housing

- Adjustments to meet organic standards may be necessary – depends on farm situation.
- Housing is not compulsory.
- Livestock housing must have a smooth but non-slippery floor and must be provided with a comfortable, clean and dry lying area. At least 50% of the total floor areas must be solid, that is, not of slatted or grid construction.
- Straw, rushes or untreated wood shavings are acceptable bedding materials and these need not be organic.
- All animal housing is subject to inspection and approval by the Organic Certification Body (OCB).

Minimum housing area per head and by weight

Animal	**Minimum Indoor Areas** *(net area available to each animal)*	
	Live-weight Minimum (kg)	**m^2/head**
Calves	Up to 100kg	1.5
Beef Cattle	Up to 200kg	2.5
	Up to 350kg	4.0
	Up to 500kg	5.0
	Over 500kg	Min. 1m^2/100kg
Dairy Cows	Up to 600kg	6.0 min.
Suckler Cows	Over 600kg	1m^2/100kg
Breeding Bulls		10m^2



Forage Production in Organic Cattle Farming

ELAINE LEAVY, *Teagasc, Farm Management and Rural Development Department, Grange, Co. Meath*

Introduction

The general principle of livestock feeding in organic systems is that animals have to be fed species specific diet in a way 'suited to their physiology'. Nutrient supply must be based on the animal's requirement in order 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) which all Irish organic producers farm to, allows a maximum daily allowance of 40% DM (dry matter) 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 processor. The level of feed supplemented, and for what length of time varies from farm to farm depending on the type and age of animal and the required market weight. The forage quality contributes significantly here when focusing on the efficiency of the system from a cost and performance basis i.e. the lower the quality forage the greater the grain requirements. Overall the aim of organic beef production systems is to provide an overall balanced diet with the grazed and conserved forages supplying energy and with the protein and grain supllying an extra energy source.

At farm level two key components of achieving this are

- Forage Management
- Forage Quality

Forage Management

Grazing Swards

For the purposes of managing grazing swards there are three distinct periods during the year according to studies carried out by Teagasc;

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

Autumn / Winter management (late August to December)

The aim of this period is to finish out the season, by making the maximum use of grass available and also to set up the farm for early spring let out. However the carrying of high covers of grass over the winter has a detrimental effect on clover the following spring.

- From August onwards rotation length increased from 28 to 35 days.
- The last rotation should start around 1st October with the first fields closed used for early spring grazing.
- Swards should be grazed down to 4.0 cm 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 detrimental effects on sward production.
- The closing grass wedge should range from 400 to 750kgs DM/ha.

Spring Management

The aim of this period is to get animals out as early as possible to minimise costs of production and maximise animal performance from grass.

- The first rotation should be timed to finish around the end of April.
- Avoid grazing below 4.5cm as it will slow down re-growths

- Get animals out on time as late turnout to a high farm cover can lead to poor utilisation and grass quality later in the season.

Main Grazing Season

The aim of 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 clover re-growths.
- If grass is in short supply supplements should be fed to stock.
- Farm grass covers should be maintained at 200-240 kgs grass per livestock unit
- The quality of the pasture should be maintained by topping pastures to 4cm. Topping should take place from mid-May rather than later in the season.
- Measure the farm grass cover weekly to identify surpluses/ deficits and take remedial action.
- Avoid grazing high covers as this will affect animal performance.

Silage Swards

As conserved forage generally makes up 40% of the animal's annual diet, the supply management of this is crucial for maintaining adequate quantities required for the system. The following are some of the management techniques required in achieving this.

- Ensure the P, K and pH status of the soil are adequate by providing required P, K and lime, based on soil analysis at least every five years.
- Avoid compacting soil during slurry nutrient spreading and silage making.
- Measure the grass yield prior to cutting. One of the benefits of this is that poorly performing fields will be identified and necessary action can be taken to correct this.

Forage Quality

Grazing Swards

Due to the considerably lower cost of producing grazing swards as a feedstuff compared to silage or grain, one of the objectives of organic beef producers should be to maximise animal performance by producing a highly digestible leafy sward extended over a long

grazing season. In Ireland when a calf is weaned from the cow, there is a potential to deliver 80% of it's liveweight gain from weaning to slaughter from grazed grass.

On organic farms, the incorporation of 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 maintain grass quality throughout the year.
- Walk the farm on a weekly basis to measure grass growth and to assess the supply of grass. This will help maintain a highly digestible leafy sward.
- Soil fertility is the foundation of grass production and plays a key role during spring growth. Spreading slurry in spring will aid this growth.

Silage Quality

There is a wide range in silage quality on Irish farms. The level of quality dry matter (DM) achieved has a major effect on the cost of the silage and the performance of the animals being fed. The dry matter digestibility (DMD) is most frequently used as an index of the feed value of silages. Table 1 summarises results from research undertaken with beef cattle at the Teagasc research centre at Grange where well preserved silages of DMD were compared. It clearly shows that high digestibility silage must be fed to livestock 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.

Table 1: Silage dry matter (DM) digestibility (DMD) and corresponding intakes and growth rates by finishing beef cattle (consuming no concentrates)

Silage DMD%	75	70	65	60
Silage DM Intake (kg/day)	9.0	8.3	7.6	7.0
Liveweight gain (kg/day)	0.83	0.66	0.49	0.31

Source: Teagasc Grange Beef Research Centre

Highly digestible silages are produced from swards that have a high content of leaf, relatively little stem or seed heads, low content of dead herbage, docks and other poorly digestible plants.

In addition, the potential of white and red clover silages can be clearly shown from an experiment at Teagasc Research Centre, Grange where a comparison was made between silages made from swards of grass, lucerne, red clover and grass/white clover. Both red clover and particularly lucerne were more difficult to preserve satisfactorily, however the mean liveweight gains were grass silage 0.59kg/day, lucerne 0.72kg/day, red clover 1.04kg/day and grass/white clover 0.83kg/day.

Key Points

- The lower cost home produced forage based diet is an important principle of organic beef production.
- A requirement of organic beef systems is the production of quality grazing and silage swards.
- To achieve an overall aim of a balanced diet in organic beef production systems, grassland management techniques are a necessity.
- With proper management techniques in place on farm, quality grazing and silage swards will be achievable in the system.
- Red clover silage offers the potential to produce a very high quality forage for the winter diet.

Red clover – Agronomy and Management

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Clover is the cornerstone of organic farming and the engine that drives productivity. White clover (Trifolium repens L.) and red clover (Trifolium pratense L.) are the main clover species used in Ireland. However, there are several significant differences between the two species particularly in morphology and physiology. In contrast to white clover, red clover has an upright growth habit and a strong deep root from which finer roots arise. The crown, located at the base of the stem, acts as a store of nutrients. Stems of red clover grow upwards from the crown. The optimum management and use of red clover is significantly different from that of white clover. The main role of red clover is for silage production.

Uses of red clover

- The main role of red clover is for silage production, although it is often grazed by cattle or sheep after the final silage cut in the autumn.
- Red clover will not persist if continuously grazed or cut more frequently than every 30 days due to a combination of excessive foliage removal and plant crown damage by hoof trampling.

Benefits of red clover

- Red clover is high yielding with yields of 12 to 15 t DM/ha achievable when grown with ryegrass.
- It converts atmospheric Nitrogen into a plant usable form. An annual Nitrogen fixation of 150-200 kg/ha is achievable from swards with a high red clover content.
- Red clover is suitable as a break crop to improve soil structure and fertility and as a supplier of organic matter. It can also be used as a green manure crop. It is particularly valuable for building soil fertility once organic conversion has begun.
- Red clover is relatively drought tolerant due to its deep tap root. It offers superior production to white clover in dry summers.
- It has a high protein content of 16 to 20%. The feeding value of red clover silage is higher than grass silage resulting in greater animal intakes and higher levels of animal performance in terms of milk and protein yields, and liveweight gain. Results from an experiment conducted by Dr. Padraig O'Kiely at Teagasc Grange found the mean liveweight gain in beef cattle offered different types of silage were grass silage 0.59 kg/day, grass/white clover silage 0.83 kg/day and red clover silage 1.04 kg/day.

Concerns with red clover

- Red clover is a short term crop with a lifespan of typically 2 to 4 years at farm level.
- The main role of red clover is for silage production. Continuous grazing reduces it's yield and lifespan.
- The yield and persistency of red clover decrease with increased cutting or grazing frequency and any damage to the plant crown.
- To maximise its persistence: (i) do not cut or graze more frequently than every 30 days, (ii) cut silage crops at 7-8 cm height above ground level, (iii) ensure optimum grazing height of aftermaths is 6 cm above ground level, (iv) ensure over wintering height is 4-6 cm above ground level, (v) avoid heavy machinery in wet weather, poaching and severe winter grazing that will damage the plant crowns directly by physical damage and indirectly through soil compaction.

- Red clover can contain up to 1% of oestrogenic compounds. Oestrogen levels can lower ewe fertility. Therefore, do not allow breeding ewes to graze red clover swards or eat red clover silage for a period of 6 weeks before and after mating to avoid any adverse effect of red clover oestrogens on lambing percentage. Store lambs can be offered red clover swards and silage at any time. Reports of red clover affecting cattle fertility are rare.
- In terms of grazing, the risk of bloat is reportedly higher with red clover than white clover. The risk is highest in cold, wet weather and when the animals are particularly hungry. The risk can be reduced by feeding roughage, such as straw or hay, before turning out and if necessary during grazing. Red clover should be introduced slowly and once introduced it should be a consistent component of the diet. Avoid daily fluctuations in the quality and quantity of clover offered. Never allow hungry stock to gorge themselves on clover-rich pastures. Moving stock onto dry rather than wet pasture also reduces the risk. Affected animals may be treated with anti-foaming agents. In severe cases remove animals from clover swards and seek veterinary advice immediately. The risk of bloat from red clover silage is negligible.
- Red clover is susceptible to a number of pests and diseases although incidences in Ireland are rare, probably due to the relatively low amount of the crop grown.Stem eelworm is the major pest of red clover. At first, patches of red clover appear with poor growth and stunted plants. These patches die out and then progressively enlarge and merge. Clover rot (Sclerotinia) is the most serious disease affecting red clover. This fungal disease is typically seen in the winter. The clover leaves become peppered with brown spots and there is a generalised rot of the crown, leaves and stems from which the plant rarely recovers. Pests and diseases can be spread between fields by infected plant material or soil on machinery. A 5 year break between red clover crops is recommended to combat pests and diseases. This should be extended to 7 years if clover rot or stem eelworm is known to be present. Also select more resistant varieties and avoid machinery movements between old and new crops.

- Choose red clover varieties on the Northern Ireland or England/ Wales Recommended Lists www.eservices.afbini.gov.uk/recommendedvarieties/herbage/ www.britishgrassland.com/page/recommended-grass-and-clover-lists-0
- Varieties are classified by ploidy (diploid or tetraploid) and flowering date (early or late).
- Tetraploid varieties are often larger plants with larger leaves and may smother commonly used companion ryegrasses. However, tetraploid have varieties tended to be more persistent and disease resistant than diploid varieties; although this may not be true of modern varieties.
- Early varieties flower towards the end of May and late varieties 10-14 days later. Early flowering varieties start

growth earlier in the spring and giving approximately 40% of annual yield for the first cut with progressively lighter yields in subsequent cuts. Late flowering varieties give a greater proportion of their yield at the first cut and tend to be more grazing tolerant and persistent than early flowering varieties since they produce more buds from the plant crown.

- Red clover can be sown in a monoculture at 12-15 kg/ha.
- Red clover sown in a mixture with a companion grass offers a number of advantages including: (i) higher total forage yield, (ii) easier to obtain satisfactory silage fermentation as higher dry matter and water soluble carbohydrate concentrations are present in the total forage, (iii) reduced impact of poaching and (iv) utilisation of fixed Nitrogen by the companion grass. The species of companion grass should be selected based on the expected duration of the sward within the crop rotation. For 2 years duration, use Italian ryegrass or hybrid ryegrass. For 3 or more years duration, use perennial ryegrass or hybrid ryegrass. Tetraploid perennial ryegrass varieties are highly suitable as they generally have a more open growth habit and are less competitive than diploid perennial ryegrass varieties. The grass heading date should be matched with the flowering date of the red clover. If the grass heads before crop harvest, silage quality will be compromised. If the grass is too immature before crop harvest, total forage yield will be compromised. White clover can also be added to the seed mix and may become dominant when the red clover becomes less persistent after 2 to 3 years. Large leaf size white clover varieties should be used in silage swards. It is recommended to use grass and white clover varieties included on the Grass and Clover Recommended List for Ireland. The Recommended List may be found at the following link /www.agriculture.gov.ie/publications
- A typical seed rate for a red clover dominant sward is 15 kg/ha of red clover and 10 kg/ha of grass. A typical seed rate for a grass dominant sward is 7.5 kg/ha of red clover and 22 kg/ha of grass. An additional 2.5 kg/ha of white clover may be added to the seed mix, if required.
- Red clover swards may be established by direct reseeding, under-sowing in an arable silage crop.
- Red clover performs best on well drained, fertile soils.
- Conduct a soil test and target soil pH of 6.0-6.5 and Index 3 for P and K for successful establishment.
- Sow from April to July.
- Ensure a fine, firm and level seedbed, rolling before and after sowing.
- Optimum sowing depth is 0.5 to 1.0 cm, and should never exceed 1.5 cm.

Red clover management

- In the establishment year, red clover should be allowed to flower before harvesting the first silage cut. This is to help root development and the growth of the bacteria that fix Nitrogen.
- In subsequent years, harvest at intervals of 6 to 8 weeks re-growth at any time between bud development and early flowering.
- 3 - 4 cuts can be taken each year. About 80-90% of the annual yield will be obtained from silage cuts completed by late July-early August. Cut or graze off the herbage in October, if this can be achieved without poaching, soil compaction and physical damage to the plant crowns.
- The final cut should be taken no later than mid-October.
- Cut silage crops at 7-8 cm height above ground level.
- Optimum grazing height of aftermaths is 6 cm above ground level.
- Optimum over wintering height is 4-6 cm above ground level.
- P and K removed by the conserved crops will need to be replaced using slurry, farmyard manure or other fertiliser sources, weather and ground conditions permitting.
- Annual P & K replacement requirements will be 100-150 kg/ha phosphate (P2O5) and 250-300 kg/ha Potash (K2O).
- Farm yard manure contains about 2.3 kg phosphate and 8.2 kg potash per tonne.
- Cattle slurry contains about 1.4 kg phosphate and 5.2 kg potash per 1000 L.

- Slurry and FYM can be applied throughout the year including between cuts. Avoid applying slurry or cutting silage in wet weather as damage to the plant crowns directly by wheel damage and indirectly through soil compaction will reduce red clover yield and persistency.
- In a mixed grass-red clover sward, red clover will contribute 150-200 kg of N/ha

Red clover conservation

- Red clover is characterised by low dry matter and low water soluble carbohydrate concentrations and a high buffering capacity. As a result, it is more difficult to obtain a satisfactory fermentation with red clover than with all-grass silage.
- It is advisable to wilt for 24 to 48 hours in dry conditions to achieve 25-35% dry matter concentration. This will also concentrate sugars to encourage a desirable fermentation and reduce silage effluent production. Leaf is prone to shatter and it is advised not to use a conditioner mower. Avoid overwilting and excessive handling that can result in substantial leaf shatter and loss. It can also be difficult to consolidate very dry material in the silo.
- Red clover wilted to 25% dry matter will often ensile effectively without an additive. However, where herbage is wet or where there is a very high proportion of red clover, an effective additive can be used to ensure a stable fermentation.

Profitable Organic Beef Production

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Introduction

In order for any farm enterprise to be profitable, the returns from the enterprise must be greater than the costs of production. Organic beef farming systems are no different to any other farm enterprise. This paper will show the key components that lead to profitable organic beef production.

There are two elements to profitable production:

1. High Output
2. Efficient systems of production

This is a very simplistic view of making a profit; many farmers do not know their costs of production and may not know what a high output is. The Teagasc Drystock E Profit Monitor is a farm efficiency measurement tool. It is used to measure your efficiency and help increase farm profitability.

High Output

Achieving high output (maximising sales income) in an organic beef system is about selling a decent carcase size for a premium price and producing a high number of finished cattle per ha. The key components of this are:

- Market returns
- Carcase weight
- Stocking rate
- Sward management

Market returns

The key to getting the maximum returns form the market is to produce a product that the market demands. Organic beef is in demand at present. The organic beef market has always returned a premium price to the farmer. Typically this has been 15 and 25% above conventional prices. Ireland is relatively self-sufficient in organic beef at present; the export market for Irish organic beef has been growing for the last few years and this is expected to continue. The sector is small and because of this it is important to be in constant contact with processors to ensure that your animals can be slaughtered when they are fit, without any delays.

Carcase weight

In organic beef production, achieving decent carcase weights will be a problem if you are not working with the right type of stock. With the high cost of organic concentrates, the aim is to finish cattle on as little concentrates as possible. The traditional breeds of Hereford and Aberdeen Angus are early maturing breeds and will finish easily however carcase weights can be low. In general, a continental type cow is recommended using a traditional breed of bull. The higher the weight of the carcase produced, the greater the output of beef leading to a potentially greater profit. It is imperative that carcase weights are maximised and a target dead weight of 350kg should be achievable with good management.

Stocking rate
Stocking rate is one of the key drivers of farm profit. The area of land that an individual farms is generally limited, so stocking rate is seen as another way of increasing output. At higher stocking rates there is a greater throughput of animals. If each animal is leaving a profit, then there should be a greater profit. Another element to stocking rate is getting animals finished off the farm as young as possible; this also increases the throughput of animals. The average stocking rate in Ireland is less than 1 LU per ha. With excellent grassland management on good land it is possible to achieve up to 2 LU per ha on organic farms. Clover swards are key to achieving this target.

Support Payments
Like all farming systems, scheme support payments are an integral part of farming in the EU. Organics has been well supported in the past with it's own support payment. The current five year scheme delivers €220 per ha up to 60ha in conversion for 2 years which reverts to €170 for the remaining three years. The average organic farm in Ireland is approximately 37ha. Support payment for such a sized farm amount to a total of €35,150 over the five years. This is a decent payment and when combined with a Basic Payment and GLAS, is a very attractive option for Irish beef farmers.

Efficient systems of production
In an organic system of production, the main costs of production are different. The use of conventional fertilisers are not permitted, but it is imperative that soil fertility is managed to both maintain and increase production of herbage. Straw and concentrates costs may be higher in this system; their use needs to be correctly managed for efficient production. Good animal husbandry techniques are essential to minimise the need for veterinary treatments.

Good grassland management is essential to minimise the requirement for additional purchased concentrate/ cereal feed. Forward planning and budgeting is a key to managing this cost. Many organic farmers (beef finishers and dairy) have started growing their own cereals and pulses, this may not suit all farms due to land type, skills and machinery required.

Making the best use of pastures involves growing as much grass as possible from a hectare of land, and extending the grazing season using grass budgeting and other decision support tools. Performance is achieved by keeping the quality of the grass high and minimising the levels of parasites in the animals.

Grazing clean pastures with young animals, leader follower systems and grazing silage aftermaths are some methods of reducing costs on organic farms.

The inclusion of clover in all organic grassland sward increases the productivity of grassland and animals, and the management of this is a key to efficient production.

Summary
Organic beef production can be a very profitable enterprise with some of the most profitable beef farmers in the country farming organically. The key components to achieving this are a decent level of production, premium price coupled with an efficient system of production which includes good grassland management, herd health and soil fertility plans. The use of the Teagasc E Profit Monitor financial tool is important component to plan for the future, control costs, increase output and should be part of profitable organic beef production.

White clover - the driver of production on organic grassland farms

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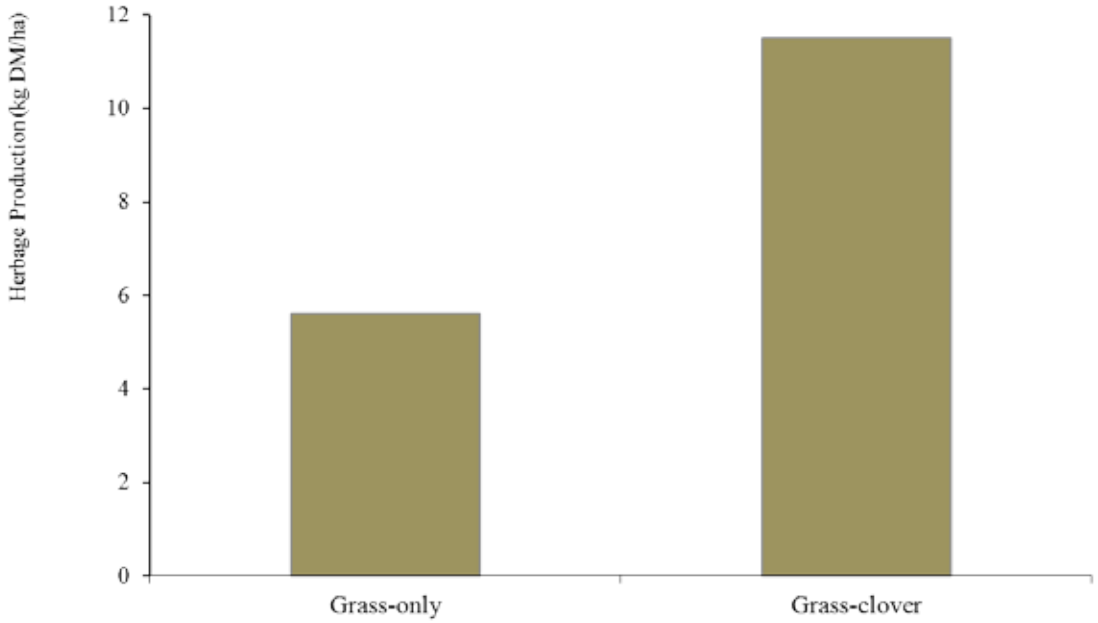
Introduction

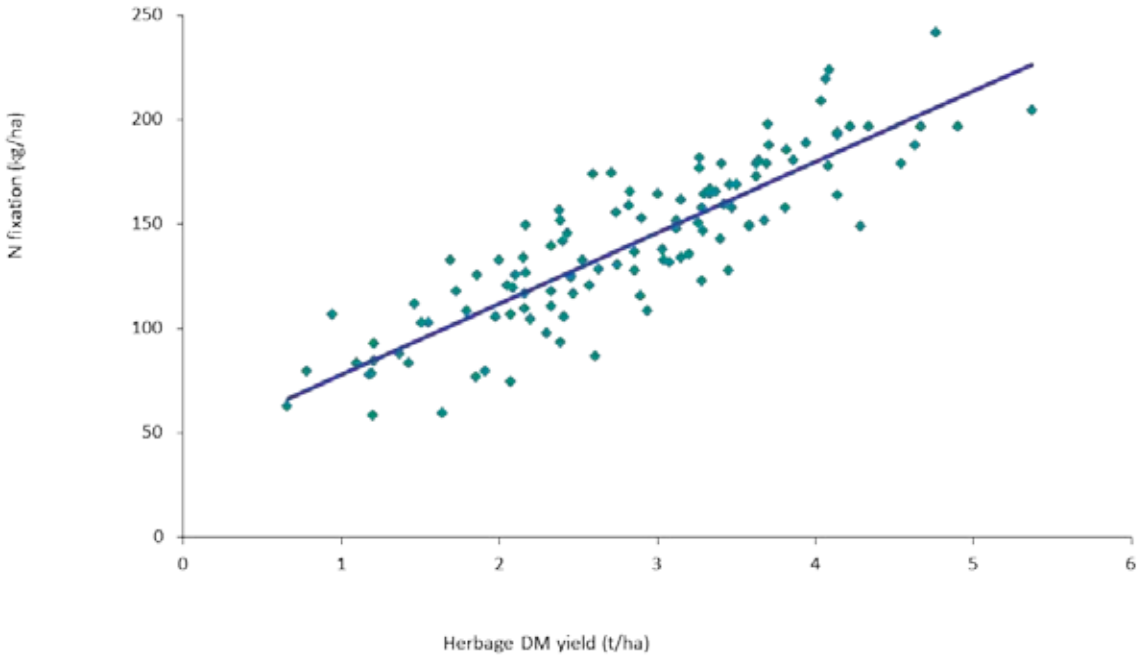
Grazed pasture makes up between 60 and 75% of the diet of cattle on Irish farms. This reliance on grazed pasture results in lower production costs compared with other countries in Europe. On organic cattle farms, the very high cost of concentrates create a strong incentive to maximise the proportion of grazed pasture in the diet of cattle. White clover is a key component of organic pastures because swards that contain white clover can have twice the productivity of swards that don't (Figure 1).

Figure 1: Herbage dry matter (DM) production of grass-only and grass-clover swards receiving no inputs of synthetic fertilizer N.



The reason for this is that clover forms a symbiotic relationship with N-fixing Rhizobium bacteria that can supply up to 200 kg N per ha per year under Irish conditions (figure 2).

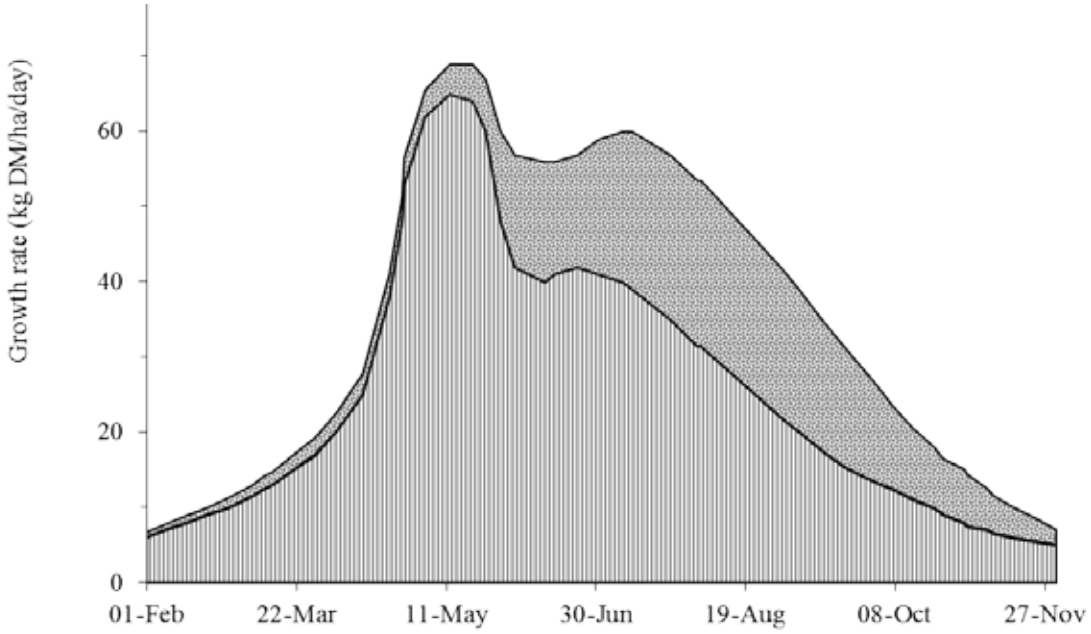
Figure 2: The relationship between white clover herbage yield and N fixation at Solohead Research Farm, Co. Tipperary.



Pasture supply during the year

Growth rates of white clover are quite low until late March and this is associated with a low clover content of swards (Figure 3). In general clover likes warm temperatures and does not begin to grow and fix N until soil temperatures reach around 9°C in April. However, the grass component of the sward will start growing from early March onwards. On organic farms, the growing season is curtailed in spring unless slurry or farmyard manure (FYM) is used to increase spring growth. In many instances the availability of slurry FYM is unlikely to be sufficient to entirely meet this requirement. Slower pasture production in spring raises the question of calving date on organic dairy and suckler farms. The clover makes a small direct contribution to pasture production in spring accounting for 5% or 15% of sward DM during February and March. Clover makes an increasing contribution to pasture production during April and May. There is usually a peak in grass production during late May followed by a sharp reduction due to the death of reproductive grass tillers during this time of year. During mid-summer, depression of grass growth clover becomes prominent in the sward because (i) high soil temperatures during this time of the year favours clover growth and (ii) the dip in grass growth rates means that it is less competitive with the clover.

Figure 3: Changes in the grass and white clover content of swards during the year



From mid-summer onwards, approximately 50% of the sward is composed of clover and it is during this time of the year that most N fixation takes place. Some of this fixed N becomes directly available for pasture production and the remainder is tied up in the clover stolons at the base of the sward. During the summer and early autumn there can be a four-fold increase in the amount of clover stolon per ha. During the winter much of the clover stolons die back releasing N for pasture production when soil temperatures rise during the following spring and early summer. Hence, some N fixed in one year is carried over the winter and released for growth during the early part of the following year.

While the rate of pasture accumulation of grass-clover swards is relatively low in spring, high soil temperatures and a high clover content of the sward means that rates of pasture production from grass-clover swards can be very high during the summer and autumn, matching the production of perennial ryegrass swards receiving high inputs of fertilizer N. These grass-clover swards also have high nutritive value because white clover has one of the highest nutritive value of any grassland species. It also has a high crude protein content and high digestibility. Furthermore, research has shown that a grass-clover sward being grazed on a 42-day rotation had similar nutritive value to a grass-only sward on a 28-day rotation during the autumn. The clover content of the sward is at it's highest during the autumn and this contributes to maintaining sward nutritive value under long rotations. Progressively increasing rotation lengths in a planned way during the late summer and autumn facilitates extending the grazing season into the winter. Hence, while growth of organic grass-clover swards during the spring is relatively low, there is substantial potential to extend the grazing season into the

winter by extending out rotation lengths from the late summer onwards. This combined with intermediate stocking densities (1.6-2.0 LU per ha) on organic farms means that long grazing seasons can be achieved on grass-clover swards despite relatively low growth rates on spring.

Maintaining the clover content and productivity of swards

Maintaining the clover content of swards is a key component of maintaining productivity from year to year. Experience at Teagasc Solohead has shown that there are two key components in achieving this objective:

1. Tight grazing during the year and particularly during the autumn and winter;
2. Regular renovation of the clover plants in the sward

Tight grazing during the year

Clover does not compete as aggressively and can be shaded out by the grass component of the sward. Clover is most vulnerable to shading during the winter and early spring because, as pointed out above, it needs higher soil temperatures for growth than grass. At Solohead, cows graze down to a post-grazing height (PGH) of 4 cm from turnout in spring. Tight grazing during the late autumn and winter allows light down to the clover stolons at the base of the sward. The amount of light penetrating to the base of the sward directly influences the survival of stolons over the winter and the more stolon that survives the winter, the higher will be the clover content of the sward and a doubling of N fixation during the following growing season.

Regular renovation of the clover plants in the sward

White clover has a reputation for inconsistent production from year to year. Part of the reason for this is differences in weather conditions from year to year. Fixation of N is a biological process dependent on conditions such as soil temperature and moisture availability. Cold soil conditions and too little or an excess of water can impede N fixation and these are factors that vary from year to year. Nevertheless, the main reason for inconsistent production is the interaction between grass and clover. In newly established re-seeded swards receiving no fertilizer N, the clover usually has an advantage because it can fix its own independent supply of N. However, over time the N content of the soil builds up as clover stolons increase and die back from year to year. Greater availability of N in the soil favours the grass, which increasingly shades out the clover. The clover goes into decline and the rate of N fixation drops off. This is often seen happening after a period of four or five years. In the next year the productivity of the sward can be relatively high although the clover content of the sward is quite low because grass growth is fuelled by the residual N in the soil. However, in the following year pasture production can be very low because the residual N has been used up and there is little clover remaining in the sward.

Freed from competition from the grass due to declining grass growth, the clover content of the sward will again increase during the following year or two and remain productive for another couple of years before competition from the grass again drives the clover into decline and the cycle is repeated. Often it is adverse weather conditions in a particular year that can trigger the decline in the clover content of swards and this has consequences for maintaining pasture growth rates across the entire farm. Hoof damage by grazing cattle is another factor that can lead to the sudden loss of clover from a sward. Hooves penetrating down thought the soil surface can bury and break up stolons and this is detrimental to clover survival. This inconsistency of pasture production from year to year can make it difficult to operate an efficient production system with consistent output from year to year.

At Solohead methods of maintaining consistent supply of clover from year to year have been investigated. Tight grazing is important as pointed out above. Over-sowing 20% of the farm each year is also an important component. On organic farms, clover seed must be untreated (naked) and can be over-sown using a slug pellet applicator, or mixed with lime, an approved granulated liming agent or other permitted mineral fertiliser. 20% of the farm should be over-sown each year on a five-year rotation to ensure that there are swards of different ages distributed across the farm. Each sward is in a different stage of development which acts as a hedge against swards with declining clover contents. Swards with low clover contents due to competition

from grass or due to hoof damage should be identified and then over-sown in the following year. Hence, these swards can be brought quickly back into production. When managing clover swards it is necessary to accept that not all parts of the farm will be fully productive all the time; some will have declining clover contents whereas others which have been recently over-sown will take around a year to become fully productive again. On the other hand, using a planned approach to maintaining the clover content of swards avoids the boom and bust cycles usually associated with clover swards.

Although, it is recommended that 20% of the farm is over-sown each year it may not always the same paddocks that are over-sown every five years. This is because the clover content of some swards can go into decline after three years whereas it can be as long as seven years in other paddocks, with an average of five years across all paddocks. Therefore, the clover content of swards should be examined and recorded each year and paddocks with declining clover contents should be identified for over-sowing in the following year.

Grassland management calendar for a white clover-based grassland system (based on experience at Teagasc Solohead Research Centre, Co. Tipperary)	
Late January	2,500 gallons slurry per acre to 60% of farm – applied to swards with lightest covers that were grazed last in the previous autumn.
First week February	Calved cows out to grass (post grazing height = 3 to 4 cm) graze approximately 40% of farm that did not get slurry until mid-March. Graze the remaining 60% until early April.
Last week March	3,000 gallons slurry per acre applied to the silage ground that has been grazed at this stage. Slurry tanks are virtually empty.
April	End of first rotation in early April. 50% of farm closed for silage from mid-April. Stocking density on the grazing area is approximately 3.6 livestock units (LU) per ha from mid-April to mid-June. Clover content of swards is 10 to 15%. Clover starts supplying nitrogen in the soil.
May	Target post grazing height is 4 cm. Any surplus pasture harvested as bales before 10 May. First cut silage harvested last week of May.
Late May	20% of the farm area over-sown with white clover seed – 5 kg per ha broadcast onto silage stubble. Mixture of remaining slurry and dirty water applied to silage stubble. Slurry and dirty water tanks are empty.
June	Area harvested for bales in early May is back in the grazing rotation. Stocking density on the grazing area is approximately 3.3 LU per ha.
July	First cut silage area is back in the grazing rotation. Stocking density is approximately 2.0 LU per ha. Surplus pasture is harvested as bales from approximately 10% of farm before 15 July. No bales harvested after this date. Commence building covers for the autumn.
August	Stocking density is approximately 1.8 LU per ha. Length of the grazing rotation increases to 30 days. Clover content of swards is approximately 40% - very high quality herbage available for grazing. Area harvested for bales in mid-July is back in the grazing rotation by end August. Target post grazing height is 4 cm.
September	Length of the grazing rotation increases to 40 days. Highest pasture covers on the farm in late September. Long intervals between grazing allow dirty water to be applied immediately after grazing with little fear of contamination and rejection by cattle in the following grazing rotation.
October	Rotation length is approximately 50 days. Commence the final grazing rotation in mid-October. All paddocks grazed to less than 4 cm in the last rotation. Clover content of swards starts to decline (winter dormancy).
November	Cattle are housed in late November or early December.

Summary and Conclusions

Relatively high levels of output are possible from organic clover-based grassland. Although clover-based swards receiving no fertilizer have relatively low growth in spring, a long grazing season can be achieved by extending the grazing season during the autumn and winter. High growth rates during the summer and autumn and stocking rates of less than 2 L.U. on organic farms facilitate this. Maintaining the clover content of swards is important to maintain productivity. Tight grazing to 4 cm throughout the year and particularly during the late autumn and winter is important. Identifying swards with declining clover contents due to competition from the grass component of the sward or due to hoof damage is also important. These swards need to be over-sown the following year with the target of over-sowing or re-seeding no less than 20% of the farm each year.

Appendix

Organic Certification in Ireland

A major factor that distinguishes organic farming from other approaches to sustainable farming is the existence of internationally acknowledged standards and certification procedures. The standards for organic production within the European Union are defined and enshrined in law by Council Regulation EC 834/2007 as amended.

In Ireland, the Department of Agriculture, Food and the Marine is the competent authority (i.e. - the Department's Organic Unit is based at Johnstown Castle Estate Wexford) for regulating the organic sector and ensuring that the obligations and requirements of Council Regulation (EC) No. 834/2007 as amended are adhered to.

The Organic Unit of the Department of Agriculture, Food and the Marine have designated Official Certification Bodies (OCB) whose role is to certify organic producers, farmers and processors through and inspection process of each individual's unit or farm. Further information can be sourced from these organic certification bodies:

IOFGA (Irish Organic Farmers and Growers Association)
16A InishCarraig, Golden Island, Athlone
Tel: 090 6433680
www.iofga.org

Organic Trust
2 Vernon Avenue, Clontarf, Dublin 3
Tel: 01 8530271
www.organictrust.ie

Demeter
40/11 Woodhall Rd, Edinburgh EH13 ODU Scotland
.UK. 00 44 131 4781201
www.demeter.net

Institute of Marketecology (IMO),
4 Lough Owel Village, Tullaghan, Mullingar, Co Westmeath
Mob: (087) 2517291

Global Trust Certificate Ltd.
3rd floor, Block 3, Quayside Business Park, Mill Street, Dundalk, Co Louth.
Phone no: (042) 9320912 Fax no: (042) 938686 email info@gtcert.com

BDA Certification - Organic and Demeter
The Painswick Inn Project, Gloucester, Gloucestershire, GLS 1QS, United Kingdom.
Phone: 0044 1453 766 296 Fax: 00441453 75950

Grant Aid and Scheme Support

Under the E.U. Rural Development Programme (2015 - 2020) the Department of Agriculture, Food and the Marine offer support to organic farmers through both an Organic Farming Scheme (OFS) and an Organic Capital Investments Scheme (OCIS). Please consult with Department Agriculture Food and the Marine (DAFM) www.agriculture.gov.ie regarding opening periods for these schemes.

Information on organic farming

Teagasc Organic Website: www.teagasc.ie/organics

Department of Agriculture, Food and Marine
Department of Agriculture, Food and Marine
Dept of Agriculture Food& Marine, Organic Unit, Johnstown Castle Est, Wexford
053-9163400
organicunit@agriculture.gov.ie; www.agriculture.gov.ie

Teagasc/DAFM Organic Farm Walk

John Purcell, Ross, Golden, Co. Tipperary

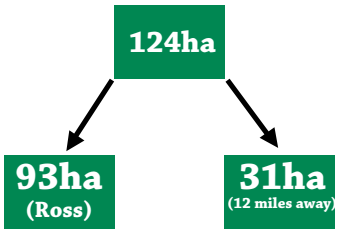
Walk Stops	Topic
1	Profile of Farm
2	Animal Health
3	Organic Cattle Diets
4	Red Clover and Silage Production
5	Farm Financial Performance
6	Organic Grassland Management

Information Stands

Organic Certification Bodies, Teagasc, DAFM

Farm Profile

Area owned



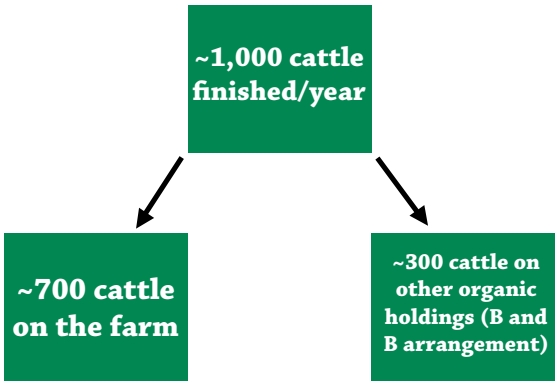
Land Use:

- **Permanent pasture** **79ha**
- **Traditional old pasture** **5ha**
- **Silage - red clover ryegrass** **40ha**

Present stock numbers:

Age	Bullocks	Heifers
0 - 1 year old	94	72
1 - 2 year olds	243	228
> 24 months	31	43
Total	**368**	**343**

Cattle Output per Year



The ideal heifer/steer:

Sex	Age	Weight
Heifer/Steer	912 days	220-350kg
Residency	**Fat**	**Grade**
90 days	2, 3, 4	E,U,R,O

Profitable Organic Beef Production

Maximising Income

- Sward management
- Stocking rate
- Carcase weight
- Market returns

Controlling Costs

- Organic straights
- Sward management
- Organic manures
- Herd health

White Clover

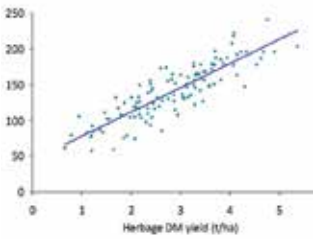
Over-Sowing Clover




Reseed or over-sow 20% of the farm each year

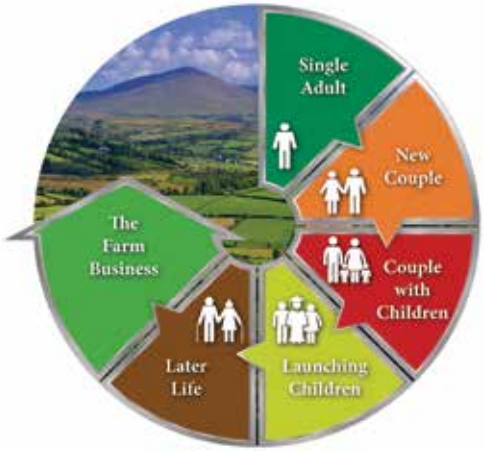
White Clover

White clover herbage yield and N fixation


- Graze to 4cm especially in winter and spring
- 21-day rotation in May and 42-day in Autumn

Getting Farm Financially Fit



- Analysis of current financial situation
- Land quality
- Management skills
- Skill before scale
- What resources/changes do you need to achieve targets

Red Clover

High yield (12 - 15 t DM/ha)

Increase soil fertility & structure

Drought tolerant

Benefits

High animal intakes vs grass

High Protein (16 - 20%)

Persistence >4 years?

Silage conservation - may require extra wilt or additive

Challenges

Silage > Grazing

Oestrogenic compounds - ewe fertility

Pests and Diseases

Red Clover

Establishment

- **Sow April to July**
- **Fine -firm seedbed avoid seed burial >1 cm deep**
- **Monoculture vs mix with grass +/-white clover - enterprise dependent**

Management

- **Year 1 - allow to flower prior to harvesting for root development**
- **3-4 cuts per year thereafter, 6-8 weeks between cuts**
- **Cut silage crop 7-8 height above ground level**

Annual recommended P and K (nutrient replacement

P (P_2O_5)	K (K_2O)
100-150 kg/ha	250 - 300 kg/ha

or equivalent in cattle slurry and/or FYM

Animal Health

Cow at calving

Cow Condition

Bio-security

Hygiene

Safety

Colostrum

Animal Health

Cattle on pasture

Clean Grazing -leader - follower -paddocks

Weaning- avoid stress

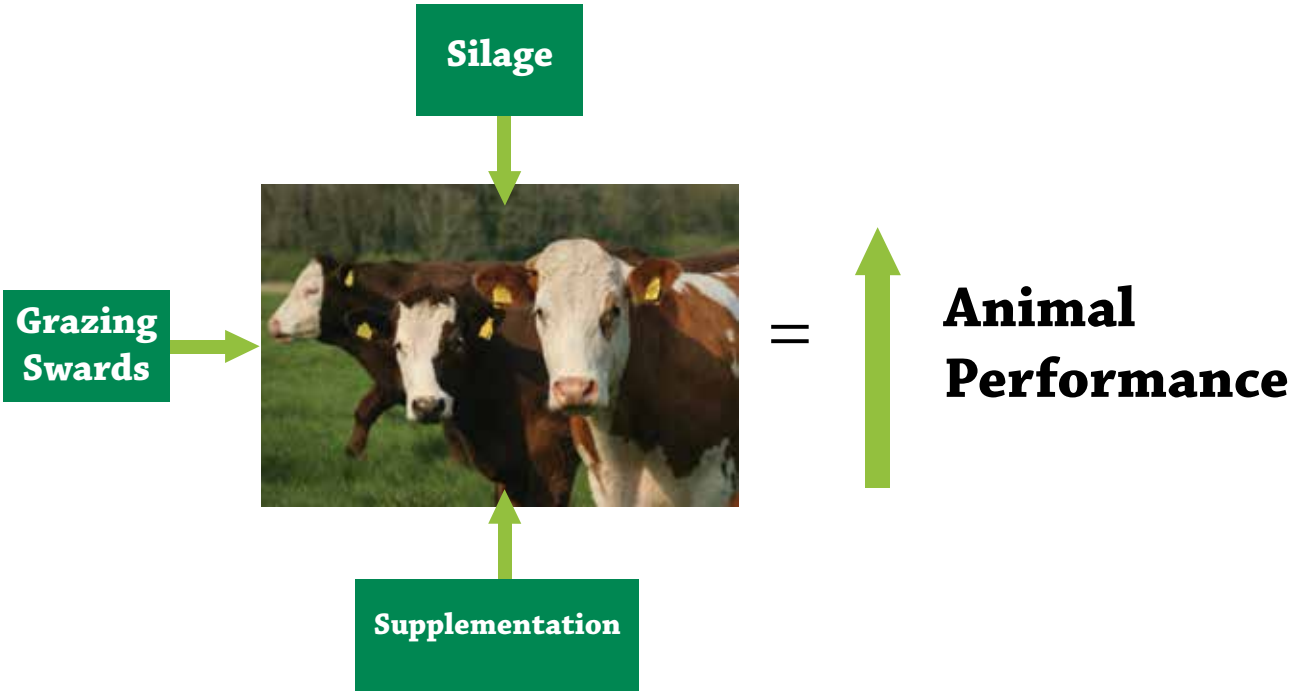
Alternate silage and grazing

Dosing justification

Mixing sheep with cattle?

Faecal dung samples

Organic Beef Production System



Value of Quality Silage

Silage DMD %	75	70	65	60
Silage DM Intake (kg/day)	9.0	8.3	7.6	7.0
Liveweight gain (kg/day)	0.83	0.66	0.49	0.31

Source: *Teagasc Grange Beef Research Centre*

Notes

Notes

eagasc

Agriculture and Food Development Authority

Department of Agriculture, Food and the Marine

An Roinn Talmhaíochta, Bia agus Mara