



## PHASE 2 - FARM WALK

24 April 2014

Charles Crawford,  
Alt,  
Castlefinn,  
Co Donegal

Business, Environment Technology through  
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The Teagasc/Irish Farmers Journal BETTER Farm Phase 2 management team (clockwise, from top left): Adam Woods, Paul Crosson and Paul Maher, Teagasc, Darren Carty and Kieran Mailey, Irish Farmers Journal, and programme advisers Catherine Egan, Peter Lawrence and Alan Dillon.

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Irish Farmers Journal  
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**O**n behalf of Teagasc and the management team of the Teagasc/*Irish Farmers Journal* **BETTER** Farm beef programme, I would like to welcome you to today's event on Charles Crawford's farm. This is the fourth in a series of 10 open days taking place on programme farms in 2014.

I would like to acknowledge the support of our sponsors, in particular the *Irish Farmers Journal* who have been instrumental to the success of the programme. We hope that you will find today's walk both informative and practical and can take home some messages to improve profitability on your own farm.

Increasing output is a major focus of the farm plan as it is very important in a drystock system. Achieving this output cheaply is equally important and Charles

has paid extra attention to implementing changes that improve grassland management. Increasing the volume of grass grown and utilised will be instrumental in carrying a higher stocking rate, helping to keep costs in check and increase gross margin.

Finally, can I thank Charles and his family for opening up their farm to public view. Since joining the programme, Charles has been very open to new ideas and advice and we commend him for this.

With his management ability and commitment, along with support from his programme adviser Catherine Egan and B&T advisers Gary Fisher and John Cannon, we have no doubt that he will continue to improve his business.

**Adam Woods,**  
**BETTER Farm beef**  
**programme manager**

## PHYSICAL SYSTEM

Measure	Baseline 2012	Target 2015
Stocking rate (LU/ha)	1.59	2.06
Land base (adj. ha)	45.8	45.8
Cows calving	36	45
Calving spread	25 spring and 11 autumn	All calving mid-Dec to mid-March
Ewes lambing	120	150

## PHYSICAL OUTPUT

Liveweight output (kg/ha)	523	694
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## FINANCIAL SYSTEM

Output value (€/ha)	€1,188	€1,527
Variable costs (% output)	€685 (58%)	€600 (40%)
Gross margin (€/ha)	€503	€927





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## Increasing stock and farm output

**C**harles Crawford is married to Ann-marie and they have three children Caolan, Matthew and Darragh. Charles joined the BETTER Farm Programme in 2012 and operates a mixed farm suckler to weanling enterprise and a mid-season lambing flock.

The farm is located about 8km from the village of Castlefinn in Co Donegal. It extends to 48ha and is in one location, separated by a public road.

The Department of Agriculture use one hectare of the land for seed potato trials.

The suckler herd has increased from 35 cows in 2012 to 40 cows in 2014. It consists of Hereford cross, Limousin cross and Simmental cross cows that calve from December to March.

The background breeding in the herd is Hereford cross cows with a good source of milk. In recent years, maternal Limousin and Simmental AI sires were used on the best quality cows to breed suitable replacement stock.

The remainder of the cows are bred to a high-quality terminal Charolais sire.

The male calves are sold as bull weanlings at 10 months, at an average weight of 400kg. Heifers that are not retained as replacements are sold between 15 and 16 months of age, at an average weight of 450kg, in May/June.

A flock of 140 Suffolk and Texel cross ewes lambed from 20 March



Charles, Darragh and Matthew Crawford.

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The main aim of the farm plan is to increase output while controlling costs of production, by focusing on a grass-based system

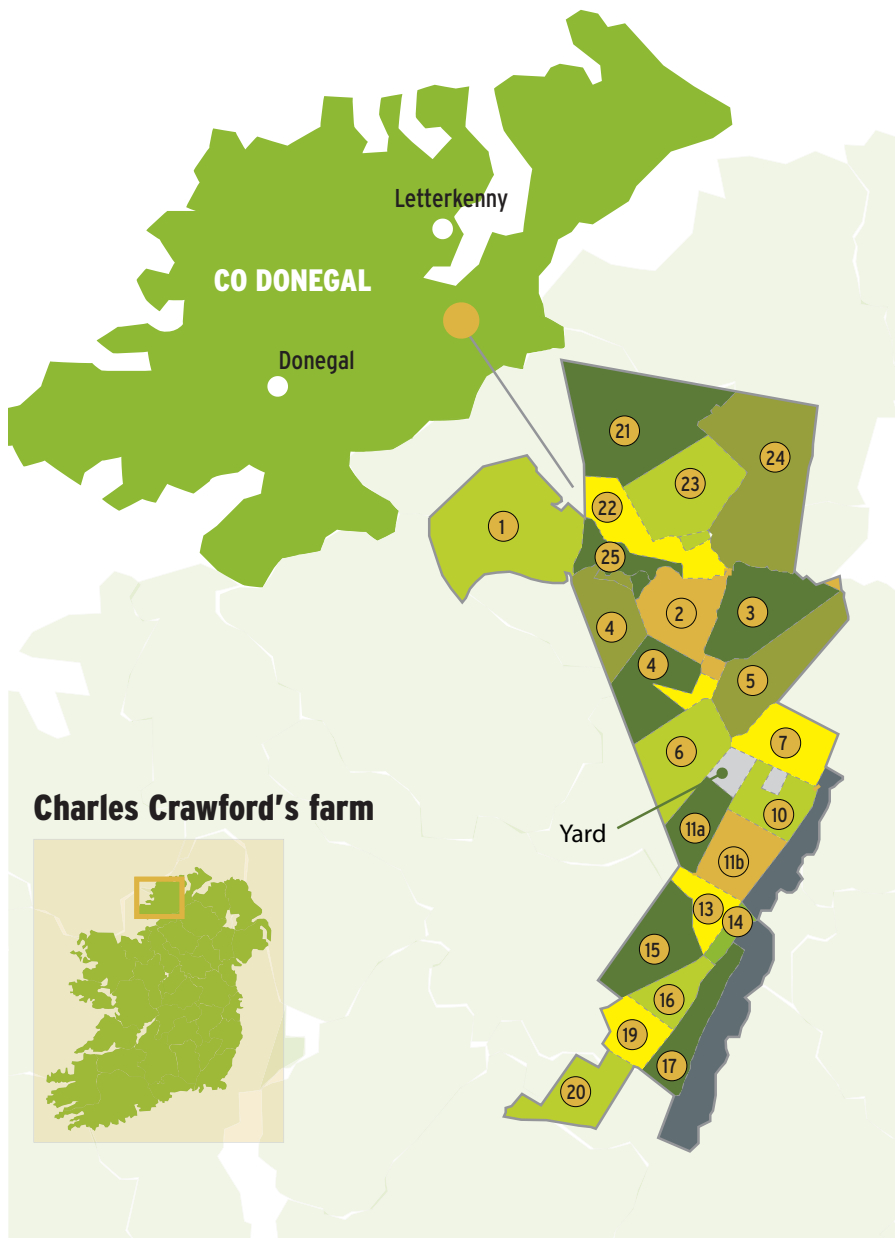
this year. Ewes scanned 1.86 lambs per ewe let to the ram.

The sheep enterprise combines favourably with the suckler system as it increases farm output and lifts stocking rate at grass, which in turn aids the improvement in grass utilisation and contributes to an increase in the farm's gross margin.

Improvements carried out on the farm include better grassland management – which involves measuring grass on a weekly basis, using more paddocks and moving stock more regularly.

Charles has measured grass on an Excel programme for the past two years, but has now begun using PastureBase Ireland, which accurately records weekly and annual growth data for individual paddocks on the farm.







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# Investing for increased output

**C**harles's profit monitor results have shown a steady increase in output since joining the BETTER farm programme. The farm has increased its stocking rate by 12% and liveweight output by 14% since 2011. While the increase is minimal from 2012, it has to be remembered that 2012 and 2013 were extremely difficult years weather-wise. However, the value of output increased by 19% since 2011, to €1,325 in 2013.

In 2013, the gross margin was €674/ha. This represents a 34% increase since 2012 and is due to a rise in value of output and controlling variable costs.

Charles's variable costs decreased by 5% in 2013. This is partially due to the fact that he had a reserve of silage and avoided the fodder shortage, with surplus silage actually sold off the farm. Feed costs were 10% lower in 2013

“

Correcting soil pH with lime applications has contributed to fertilizer costs but will deliver increased output potential

than in 2012. However, fertilizer costs increased by 33% from €163/ha in 2012 to €217/ha in 2013. This is largely due to the delayed spring as extra fertilizer was applied to kick-start growth for the second rotation.

Significant costs were involved in rectifying soil fertility issues. Correcting soil pH with lime applications also contributed to the rise in fertilizer costs.

Other costs, eg veterinary bills, have reduced by a fifth, but they may increase slightly in the future as stocking rate rises due to higher requirements for slurry spreading and silage harvesting, along with larger amounts of stock for dosing, testing, etc.

Programme  
adviser  
Catherine Egan



**Table 1: Target performance by end of 2015**

	2012	2013	2015 (target)
Stocking rate	1.59	1.77	2.06
Output kg/ha	523	524	694
Output €/ha	1,188	1,325	1,527
Gross margin €/ha	503	674	927

**Table 2: Profit monitor yearly comparison**

Year	Area farmed (ha)	Stocking rate LU/ha	Lwt output kg/ha	Value of output €/ha	
2011	45.75	1.59	458	1113	
2012	48.33	1.59	523	1188	
2013	45.32	1.77	524	1325	

## Adding value to weanling bulls

**C**ows calve from December to February with an average calving date of 1 January. The calves are achieving weight gains of 1.25kg/day, from birth to weaning, with milk yield and good quality grass driving performance in well-bred animals.

Weaning takes place in September. The financial analysis of selling weanlings at this stage or

retaining until November, to add extra value, is outlined in Table 3. Selling the weanling bulls later allows Charles to make maximum use of available grass and greatly benefits animal performance – with weight gains of 1.3kg/day.

There is potential margin over costs of €212/weanling bull from retaining, feeding and increasing sale weight. The cow also has her job done in September and weaning helps allocate the highest quality grass to weanlings, while allowing cows to maintain/recover body condition before housing.

**Table 3: Financial analysis of retaining bull weanlings to heavier weights**

Value at weaning (Sept)	345kg liveweight at €2.40/kg	€828
Post weaning costs	Grazed grass: 90 days (7.6kg/day at €0.53/day is €48)	€111
	Concentrates: 90 days (2.5kg/day at €280/t is €63)	
	Veterinary (dosing)	€5
Total costs		€116
<b>Value at sale (30 Nov)</b>	<b>462kg liveweight at €2.25/kg</b>	<b>€1,040</b>
Potential margin		€212

### 20 WEANLING BULLS AT €212 IS €4,240/YEAR EXTRA

#### KEY POINTS

- ☛ Calving date is compact, leading to a more uniform group of bulls to sell.
- ☛ Good milk yield contributing to daily liveweight gain of 1.25kg/day.
- ☛ Good grassland management is key.
- ☛ Positive animal performance in the autumn from quality grass.
- ☛ Targeted use of concentrates to deliver cost returns and achieve target sale weight.

	Feed €/ha	Fert/lime €/ha	Vet €/ha	Contractor €/ha	Other €/ha	Gross margin €/ha
	88	239	176	0	40	555
	217	163	110	101	96	503
	195	217	86	82	72	674





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All owned grassland was tested in 2013. Table 1 gives a breakdown of soil sample results by paddock. Soil pH on this farm ranges from 5.57 to 7.04 (average pH 6.1). The pH status of the soil has a significant influence on the availability and uptake of both soil nutrients in the form of either artificial fertilizers or organic manure by the plant.

It will be important for Charles to monitor and maintain pH levels as grassland soils maintained between pH 6.3 to 6.5 will release between 60 and 80kg more nitrogen (N) per hectare than soils with a pH of 5.0. This represents a saving of between €60 and €80/ha.

As can be seen from Figure 1, approximately 82% of the farm is index 2 for phosphorus (P) with 9% at index 1. Phosphorus is very important for crop establishment and root development. It also

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Grassland soils maintained between pH 6.3 to 6.5 will release 60kg to 80 kg more N/ha than soils with a pH of 5.0

plays an important role in the nutrition of livestock. Soils at a P index 1 will produce approximately 1.5 t/ha less of grass dry matter compared with soils at index 3.

Soil potassium (K) levels are low on the farm with 64% of the results at index 2. Potassium is particularly important for increasing stem strength, improving drought resistance and cold tolerance and, most importantly, for increasing yield.

Potassium fertilization is especially important in autumn and on older grass. If adequate amounts of potassium are not available the rate of growth and yield will be restricted.

There is also a relationship between nitrogen and potassium, as the response of grass to nitrogen is dependent on an available supply of potassium to allow N uptake as nitrate and conversion into proteins.

**Table 1: 2013 Grassland soil sample results**

Paddocks	Area (ha)	pH	P index	K index
1	4.80	6.48	2	2
2	2.78	5.76	2	3
3	2.80	5.52	3	3
4	1.70	5.82	3	3
5	2.62	6.30	2	2
6	2.43	6.18	3	2
7	1.70	5.82	3	3
10	1.19	5.78	2	4
11A	1.2	6.24	3	3
11B	1.5	6.15	2	3
13	1.19	6.36	4	4
14	0.3	6.46	3	3
15	1.85	6.13	2	2
16	1.00	6.46	2	2
17	1.50	6.15	2	3
19	1.06	6.32	2	2
20	1.27	6.01	2	2
21	4.62	6.17	1	2
22+25	2.72	7.07	3	2
23	3.05	6.90	3	2
24	5.20	6.22	2	3

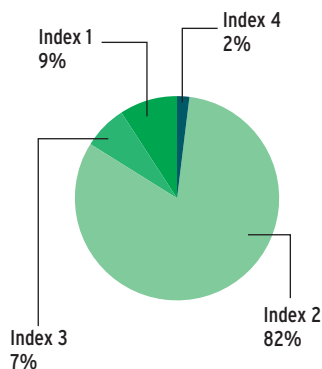
**Table 2: Planned fertilizer usage in 2014**

Fertilizer	Quantity (t)	Units N	Units P
CAN (27% N)	9	4860	0
Urea	1.5	1380	0
18-6-12	9.0	3240	1080
10-10-20	4.0	800	800
25-4-0	0.6	300	48



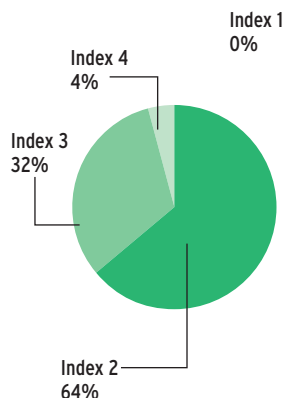
**Figure 1**

P index of farm



**Figure 2**

K index of farm





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## The sheep enterprise

**T**he sheep enterprise is a mid-season lambing flock. Around 140 Suffolk cross and Texel cross ewes were mated in 2013 to Texel rams, with lambing commencing on 20 March 2014. Scanning results for 2014 are shown in Table 1.

The overall scan was 1.86 lambs/ewe mated, with a litter size of 1.91/ewe in-lamb. If one allows for a mortality post scanning of 13%, then the projected weaning rate in 2014 is 1.62 lambs/ewe mated.

In the past, low body condition scores (BCS) at mating and toxoplasma abortion were two major issues. In 2013 Toxovax was administered to the flock and the flock was managed to have a higher BCS at mating. The results to date are very encouraging. It is planned to increase flock size

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It is hoped the advantages of having sheep and cattle mixed will allow the majority of lambs to finish off grass in future years

over the next three to five years to 200 ewes, as the farm is suited to a mixed grazing regime, with available housing also restricting expansion on the suckler side.

In 2013 Charles applied for grant aid under the Targeted Agricultural Modernisation Scheme (TAMS). He will use this to ensure that more of his fields are fenced properly for sheep, which will also aid in improved grassland management.

The aim is to lamb to grass and avoid any meal feeding to ewes after turnout. The flock will be grouped when closing for silage and rotationally grazed until weaning. There has been a considerable level of meal fed to lambs in the past to bring them from 38kg liveweight to finish. However, Charles hopes the advantages of mixing sheep and cattle will allow



the majority of lambs to finish off grass in future years.

### Parasite Control

Charles doses his ewes for liver fluke in September/October (pre-mating), in January (scanning) and again in mid-May (when lambs are being dosed).

Flukiver (Closantel) was used in September and January and he hopes to use Zanyl (Oxyclosanide) in mid-May as it will also kill any rumen fluke that may be present. The mature ewes are not given a worm dose as this is the current advice from Teagasc Research.

In 2013, the lambs were dosed in mid-May for nematodirus, pre-weaning in June for worms and not again until 24 August.

Faecal samples were taken post-weaning to monitor the worm burden in the lambs. Noramec-



tin (Ivermectin) was the product used.

Charles just used one maggot dip in 2013 and Zearl (Doramectin) was used against sheep scab. Table 2 below gives a breakdown of the products used on the farm in 2013/2014.

**Table 1: 2014 Scanning Data (based on 140 ewes mated)**

Litter size	Number	Percentage of ewes
Barren	4	2.9%
Singles	31	22.1%
Doubles*	86	61.4%
Triplets	19	13.6%

\*includes 4 ewes too heavy to scan

**Table 2: Products used in the Sheep Flock 2013/2014**

Trade Name	Active Ingredient	Company	Treats
Albex	Albendazole	Chanelle	Stomach worms
Flukiver	Closantel	Janssen	Liver fluke
Noramectin	Ivermectin	Norbrook	Stomach worms
Toxovax		MSD	Toxoplasma abortion
Zanyl	Oxyclosanide	MSD	Liver fluke adults and rumen fluke
Zearl	Doramectin	Elanco	Ectoparasites incl. scab



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## Taking the guesswork out of slurry spreading

**There are three variables which affect the rate that slurry is spread:**

- Discharge rate - how fast the slurry leaves the tank when spreading.
- Spread width - how wide the slurry is spread behind the tank.
- Forward speed - how fast or slow you drive.

### Step 1. Discharge rate

Discharge rate ( $\text{m}^3$  per minute) =  
tanker size ( $\text{m}^3$ ) / time taken to empty tank (mins)

Typical tank sizes	$\text{m}^3$
1,600 gallon	7.2
2,000 gallon	9.0
2,250 gallon	10.1
2,500 gallon	11.3

### Step 2. Slurry spread width (m)



### Step 3. Forward speed

**Table 1: Forward speed to spread 2,000gal/ac**

Spreading width (m)	Discharge rate ( $\text{m}^3$ per min)	Forward speed	
Six metres	1.5	6.8km/h	4.0mph
	2.0	9.1km/h	5.5mph
	2.5	11.4km/h	6.8mph
Eight metres	1.5	5.1km/h	3.0mph
	2.0	6.8km/h	4.0mph
	2.5	8.5km/h	5.1mph
10 metres	1.5	4.1km/h	2.4mph
	2.0	5.5km/h	3.3mph
	2.5	6.8km/h	4.0mph
12 Metres	1.5	3.4km/h	2.0mph
	2.0	4.5km/h	2.7mph
	2.5	5.7km/h	3.4mph

### EXAMPLE: BETTER Farm programme

The 2,050gal tanker

If 1,000gal =  $4.5\text{m}^3$   
then, 2,050gal =  
 $4.5 \times 2.050 = 9.2\text{m}^3$



### Discharge rate

Tanker took 4.5  
minutes to empty

Discharge ( $\text{m}^3/\text{min}$ ) =  $9.2/4.5\text{mins}$   
=  $2\text{m}^3/\text{min}$

### Spread width (m)

Tanker spreads 8m wide

### Forward speed

**ANSWER = 6.8KM/H (4.0MPH)**

### Slurry spreading tip

It is important to note that the nutrient value of slurry can also vary depending on the diet of animals. For example, meal feeding will increase P content in slurry.

# Maximising nutrient uptake

**T**he typical nutrient value of slurry per 1,000 gallons is equivalent to a 50kg bag of 6-5-38 if spread in the spring, or a 50kg bag of 3-5-38 if spread in the summer. Using a trailing shoe instead of a splash plate application increases the nitrogen value by three units of N/1,000 gallons in spring/summer.

## Fertilizer efficiency

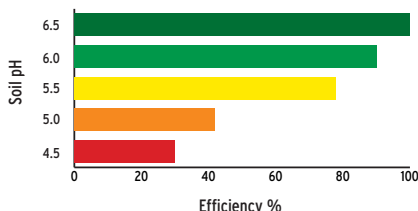
Good fertilizer efficiency can be achieved by having correct soil pH. This allows you to get the best use of organic manures and artificial fertilizers. As the graphs (Figure 1-3) illustrate, having soils below optimum pH reduces efficiency of nutrients.

At a reasonable pH of six, any phosphorus (P) applied will only give 52% of the potential response. Hence, it would cost almost twice as much to supply the correct amount of P to a field with a pH of 6.0 versus a field with a pH of 6.5. P applied at pH 6.5 will give 92% of the potential response.

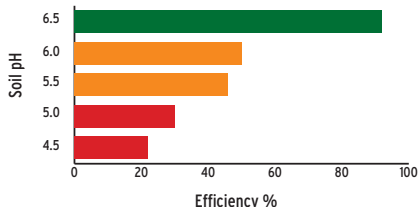
## If you spread

- ☞ Lime – don't cut silage for six months or apply urea/slurry for three to six months after lime.
- ☞ Urea or slurry – leave one week before spreading lime.
- ☞ Slurry – leave one week before applying any N fertilizer (urea, CAN or NPK).
- ☞ Lime followed by CAN, or CAN followed by lime – there is no issue.

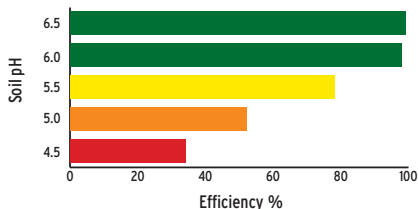
**Figure 1**  
Nitrogen (N)



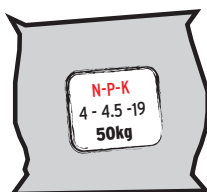
**Figure 2**  
Phosphorus (P)



**Figure 3**  
Potassium (K)



**Figure 4**  
Nutrient value of  
slurry sample



Two samples of slurry were taken on the farm and analysed for N, P and K content. The results, seen in Figure 1, show that the N, P and K content of the slurry on the farm was lower than expected. It is important not to over assume the value of your slurry and to take steps to ensure any crop requirement deficits are accounted for with chemical fertilizer.





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## Five tips for BETTER silage

### 1. Plan

- ➔ Decide on fields to harvest
- ➔ The amount and timing of fertilizer and slurry to be spread
  - ➔ The approximate harvest date
  - ➔ Contractor to avoid delays in harvesting
- ➔ Prepare silos and effluent tanks in advance

### 2. Target high yields

- ➔ Harvesting large yields of grass dilutes production costs
- ➔ Soil tests should be carried out to determine optimal rates of P, K and lime to be applied
  - ➔ Timely removal of livestock will allow permitted N application to promote high yields

### 3. Graze tight

- ➔ Graze off to remove dead herbage in spring
- ➔ Graze to 4cm to 5cm prior to applying fertilizer/slurry
  - ➔ Harvest at appropriate growth stage

### 4. Work fast

- ➔ Fast filling and perfect sealing from air are essential for good preservation
  - ➔ Harvesting a clean, dry crop enhances preservation

### 5. Minimise exposure to air

- ➔ Careful management of silo/bales and feed trough during feedout
  - ➔ Remove silage at a reasonably fast rate from feed face
  - ➔ Ensure that feed face is kept even and clean

#### Characteristics of good quality silage

Variable	Ranges
Dry matter	20% +
pH	3.8 to 4.2
DMD	70% +
Crude Protein	12 to 16%
Ammonia	<10%
Ash	<10%

#### DMD\* ranges of different forages

Forage type	DMD ranges
Grazed grass	72% to 82%
Leafy silage	74% to 76%
Stemmy silage	60% to 65%
Hay	55% to 60%
Straw	45% to 50%

\*Dry matter digestibility

# Five steps to BETTER soil fertility

## 1. Soil testing

- ⇒ Provides vital information about your soils
- ⇒ Is a foundation for your fertilizer plan
- ⇒ A standard test will give fertility status on pH, lime requirement, P and K

## 2. Soil pH and lime

- ⇒ Lime improves the availability of N, P, K, sulphur, calcium and magnesium
  - ⇒ Lime at least every five years
- ⇒ Ground limestone can be spread at any time
  - ⇒ Apply lime as per soil test report

## 3. Target Index 3 for P and K

- ⇒ Index 3 is optimum for crop growth
- ⇒ Only a soil test will determine P and K status
- ⇒ Index 4 soils (high fertility) are a resource - use them to save money on fertilizer costs
  - ⇒ Index 1 & 2 (low fertility) need additional nutrients

## 4. Slurry and manures

- ⇒ Plan when and where slurry/manure will be best utilised
- ⇒ Aim to apply slurry in spring during moist, cool conditions

## 5. Nutrient balance

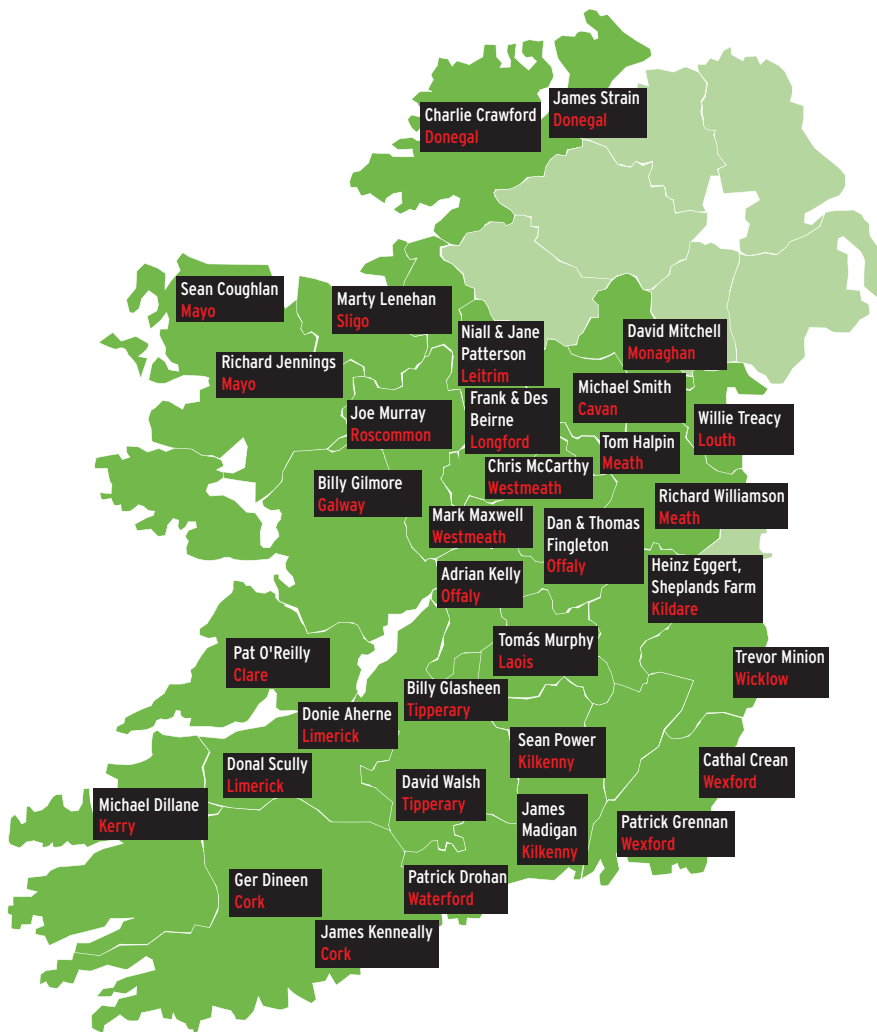
- ⇒ Develop a fertilizer plan for your farm
- ⇒ Get the best value from fertilizer and organic manure
  - ⇒ Enhance crop yield and animal performance
- ⇒ Reduce environmental risks due to field loss of excess nutrients

The P index system		
	Soil P ranges (mg/l)	
Soil P index	Grassland crops	Other crops
1	0.0 - 3.0	0.0 - 3.0
2	3.1 - 5.0	3.1 - 6.0
3	5.1 - 8.0	6.1 - 10.0
4	Above 8.0	Above 10.0

The K index system	
Soil K Index	Soil K ranges (mg/l)
1	0 - 50
2	51 - 100
3	101 - 150
4	Above 150



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Published by the Irish Farmers Journal. Printed by Johnswood Press (info@johnswoodpress.ie)