

# Smart Farming\*

A guide to help improve farm returns with better resource management

## SOIL FERTILITY

# Save up to €23/acre – by soil testing

**B**y soil testing, you can save €23/acre on fertilizer on land with high P and K levels (index 4) and stocked at two dairy cows/ha (0.8 cows/acre).

Consider soil testing at least every five years. It's an indicator of soil fertility levels.

Soil testing can save you money by identifying what parts of your farm have low fertility and need extra fertilizer to improve productivity. Soils with higher fertility need less fertilizers.

It will also help to plan fertilizer, slurry and manure spreading.

The annual cost of soil sampling is roughly 50c/acre. This is the same cost as 0.5 units/acre of P fertilizer.

### ▶ APPLY LIME

Applying lime could save you two bags/acre of CAN each year. Low soil pH will result in:

- ▶ lower availability of the nutrients in the soil, and
- ▶ poorer response to applied fertilizers.

Lime neutralises acidity in the soil and makes nutrients available to grow crops. Spreading lime, where required, should be a priority after soil testing.

The soil test report will show a 'lime requirement' result to indicate the rate of lime required to increase the soil pH to the correct level. The optimum pH for grassland is between 6.2 and 6.3, while for tillage, it's between 6.4 and 6.5.

Don't over lime. It can lead to trace element imbalances. Don't apply more than 7.5t/ha (3t/acre) in a single application.

Avoid applying lime

on fields with a lot of grass cover. After silage harvest or grazing is an ideal time to spread lime but it can be spread all year round.

### ▶ BUILDING SOILS

Soils with P Index 3 will yield more grass DM than a soil in P Index 1 – approximately 0.6 t/acre (or 1.5t/ha). This extra grass could be worth approximately €180/acre.

Soil Index 3 is the target soil fertility for grassland and most tillage crops. Plan fertilizer and slurry applications so that all fields can be maintained in soil Index 3. Aim to replace the nutrients being removed in crops.

Know your soil index, so that the correct fertilizer rates can be applied.

### ▶ THE SOIL INDEX SYSTEM

▶ **What does 'soil index' mean?** The soil index system takes soil test results and simplifies them to show if a soil is low, medium or high in fertility for each nutrient. The soil test report shows the 'soil index' for each nutrient. The index is given as a number: either 1, 2, 3 or 4 (Table 1).

Index 1 and 2 soils (low fertility) will be underperforming and need to be improved by applying fertilizers.

Index 4 soils are a resource

## REMEMBER

Fertilizer is not just a product in a bag

Other sources of nutrients that can fertilise your grass and crops include nutrients in the soil, in manures and in slurry. These should be managed to ensure that all nutrients on the farm are recycled as efficiently as possible, and what you pay for chemical fertilizer is money well spent.

on your farm. Exploit them and save money on fertilizer.

A field might be Index 3 in one nutrient, but be low or high in another nutrient. Look at the requirements for each nutrient in each field individually.

### ▶ MANURES

Both manures and slurry are valuable sources of nutrients. Slurry spread efficiently could save you €27 per 1,000 gallons.

Think about the nutrient value of manures produced on the farm in terms of a 50kg bag of chemical fertilizer (Table 2).

If you are spreading slurry – ask yourself: "Would I be spreading bag fertilizer in this field if I wasn't spreading slurry?" If the answer is no, then the slurry is not saving you money on fertilizer!

Use slurry more effectively to save on fertilizer costs and to reduce losses to the environment. Consider sourcing manures and slurry from other farms to save on fertilizer costs.

### ▶ TWO SIMPLE QUESTIONS BEFORE SPREADING

▶ **Where to spread manure/slurry?** Eighty five per cent of the value of slurry comes from the P and K. Identify fields that have a requirement for the P and K in the manure/slurry.

▶ **When to spread?** During the open season when losses of N to air are at their lowest (lower temperatures and moist weather). Spring is ideal.

### ▶ NITROGEN

Nitrogen availability in manures is highly affected by weather conditions in the 24 hours after application.

Target cool moist conditions to reduce nitrogen losses to the air. Aim for spring application. Cattle slurry ap-



Fertile soils are essential for grass and crop growth.

Table 1: Soil index system

Index	Description	Action required
1	Very low	<b>Sub-optimal fertility:</b> Apply fertilizers to increase soil fertility levels and to feed the crop.
2	Low	
3	Medium	<b>Optimum fertility level:</b> Aim to maintain soil in Index 3. Apply fertilizers to replace the nutrients removed by crops or animal produce. Only approximately 25% of soils are currently in Index 3.
4	High	<b>High fertility level:</b> Soil has more nutrients than required to grow the crop. Additional fertilizers are usually not required, as the soil nutrients are sufficient to feed the crop. The risk of losses to water is also increased.

Table 2: Value of manures

Manure type	Units			Value
	N	P	K	
Cattle slurry (1,000 gals)	6	5	38	€ 27
Soiled water (1,000 gals)	4	0.7	5	€ 5
Pig slurry (1,000 gals)	19	7	20	€ 27
Farmyard manure (one tonne)	3	2.5	12	€ 10
Broiler litter (one tonne)	11	12	24	€ 30
Spent mushroom compost (one tonne)	3	5	18	€ 16

plied in spring is worth €1.80 more per 1,000 gallons than slurry spread in summer.

### ▶ USE COMPOUND/STRAIGHT FERTILIZERS FOR BALANCE

▶ Compound fertilizers (also called NPK fertilizers) are mixtures of nutrients, usually N, P and K. The name of the compound reflects the percentage of N, P and K in

the product. For example, 18-6-12 contains 18% N, 6% P, and 12% K. A 50kg bag of 18-6-12 will supply 18 units of N, six units of P and 12 units of K.

▶ Straight fertilizers contain only one nutrient. Examples include CAN (27% N), urea (46% N) and muriate of potash (50% K).

Fertilizers should supply

nutrients in the correct balance for the crop and the soil fertility level. The grass or crop yield will be limited by the nutrient in the shortest supply. Excess application of one nutrient is wasteful if yield is being restricted by another nutrient. It also increases the risk of run-off to water with the potential to cause water pollution.

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