

# Spreading Lime

## How much lime?

- Test soils on a regular basis (every 3 to 5 years) to determine lime requirements
- Only apply lime based on a recent soil test report
- Don't exceed 7.5t/ha in a single lime application
- Application rates >7.5t/ha, apply 50% now & remainder within 2 years

## When?

- Prepare a farm liming plan
- Target fields with largest requirements first
- Ideally apply lime to ploughed / tilled soils and incorporate into the seedbed
- Where lime is applied to prevent club root (brassica crops) it should be spread at least 12 months before sowing
- In potatoes tuber skin quality (from common scab) can be reduced when lime is applied in the year preceding planting (lime & high pH close to tubers). To prevent tuber quality issues lime should be applied up to 4 years in advance of the potato crop

## How Often?

- Apply lime as per the soil test report
- On very acidic soils apply 50% to the stubble and the remainder to the ploughed soil
- Lime 2 years in advance of pH sensitive crops such as beet, barley, beans and peas

## Which Lime to Use?

- Calcium ground limestone is most common
  - Fast acting and rapid pH adjustment
- Magnesium (Dolomitic) ground limestone is available
  - Slower to react but higher liming value
  - Cost effective route to building soil Mg levels
- Granulated Limes
  - Finer lime (less than 0.1mm particle size) and very reactive
  - Apply as maintenance product where soil pH is in the optimum range
  - Consider costs (€) over a 3 to 5 year period

## Lime & Trace Elements

Take care to not over lime soils (pH>7.0) as it may reduce the availability of manganese (Mn), copper (Cu) and zinc.

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# Advice on Liming

Tillage Crops



# The Benefits of Liming

- Increase crop yields annually
- Unlock soil phosphorus (P) and potassium (K)
- Increase the response to freshly applied N, P & K

Lime is a soil conditioner and controls soil acidity by neutralising the acids generated from N fertiliser applications and following high rainfall.

Soil pH has a large influence on soil nutrient availability. Aim to maintain minerals in the range pH 6.5 to 7.0 and peat soils pH 5.5 to 5.8 to maximise nutrient supply.

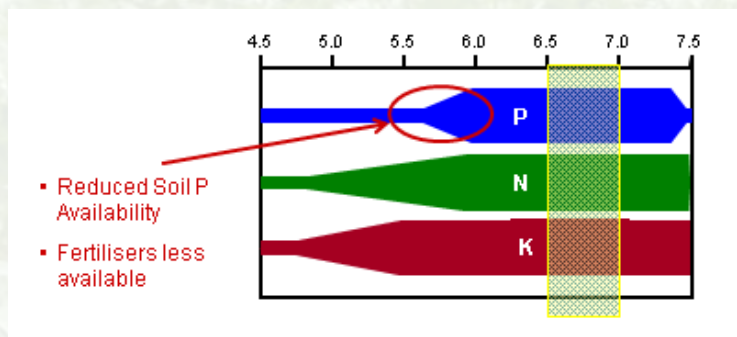


Figure 1. The Impact of soil pH on nutrient availability in mineral soils

Maintain tillage soils in the optimum pH (6.5 to 7.0) range for efficient nutrient availability over the growing season and sufficient crop uptake of plant nutrients.

## Maintenance Lime requirements

Lime Removals per year	Kg/ha
Drainage (leaching)	250-625
Spring barley 7.0t/ha or Winter wheat 10t/ha	105 - 150
150 to 250kg Nitrogen (bag)	300 - 500
<b>Total Lime Required</b>	<b>655to 1275kg/ha/year</b>

- High annual rainfall leads to a large removal of lime each year
- Typical maintenance lime requirement of 3.0 to 6.0 t/ha once every 5 years depending on regional location and rainfall.

## Target soil pH levels for tillage crops

Some tillage crops can be more sensitive to acid soil conditions than others and therefore require different target soil pH levels for optimum growth and to achieve high harvest yield production. The target soil pH for a number of important tillage crops are shown in Table 2.

Table 2. Optimum soil pH for a range of crops on mineral soils

Crop	Optimum soil pH
Beet, Beans, Peas and Oilseeds	7.0
Cereals and Maize	6.5
Potatoes	6.0
<b>Peaty soils</b>	<b>5.5 to 5.8</b>

## Effect of soil pH and lime on Soil P Availability

- Lime will to unlock stored soil P (purple bar)
- Lime will increase the efficiency of freshly applied fertiliser P (green bar) compared to applying P fertilisers alone under low soil pH conditions (red bar).
- Correcting soil pH through liming is the first step to building-up soil test P levels
- On naturally acidic soils the application of lime is essential for improved nutrient supply and restoring soil fertility

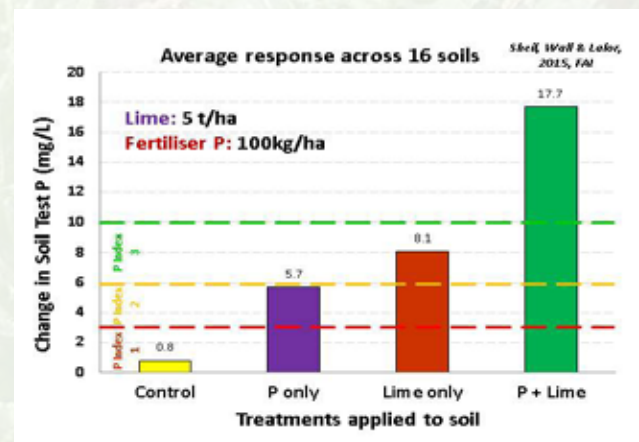


Figure 2. Average change in soil test P (Morgan's) across 16 soils (av. pH 5.2) treated with Lime (5 t/ha of lime), P fertiliser (100 kg/ha of P), and P + Lime and incubated over 12 months in controlled conditions

## Return on investment from ground limestone applications

- Research shows average cereal grain production response of at least 1.5 t/ha from lime alone
- This is worth €225/ha of extra grain (15 % DM) (assuming grain price of €150 /t)
- Return on investment - maintenance lime application costing €33/ha/yr enabling the production of at least €225/ha/yr of extra grain
- At farm level every €100 investment in lime equates to approximately €675 in extra crop production annually