Soil Organic Matter & Soil Nutrient Analysis

Mark Plunkett, Teagasc,
Johnstown Castle
Soil Organic Matter

New for 2010
• Soil Organic Matter Analysis

• Now *must* for farm Cross Compliance

• GAEC Requires that farmers
  "Maintain soil organic matter levels through appropriate practices"
Benefits of Soil Organic Matter

- Enhanced Soil fertility
- Improved in soil structure
- Ease of workability
- More active soil
- Yield benefits
Soil Organic Matter Levels

- **3.4% SOM threshold value**
- 2% Soil Carbon
- Soils above 3.4% - OK
- Soil below 3.4% - Take Action
Requirements

- Monitor soil organic matter
- Continuous tillage soils must be sampled (≥ 6 years)
- 50% of soil by 31st December 2010
- 50% of soil by 31st December 2011
Soil Sampling

- Soil sample once every 10 years
- Take sample as for nutrient analysis
- Sample every 4ha or where similar soil type / rotation increase to 8ha
- Check SPS form & Map farm sampling areas
- Link soil samples to LPIS numbers / Map
Soil Sampling

- Best time to sample is directly after harvest
- Include SOM as part of nutrient analysis where required *(Best value)*
- Soil Service No.8 (pH, LR, P, K, Mg & SOM)
- Soil Service No.9 (pH, LR, P, K, Mg, Cu, Mn, Zn & SOM)
Action Required

- **SOM >3.4% No Action Required**
  - Maintain soil sampling plan & Soil results as part of CC records

- **SOM <3.4% Actions Required**
  - Contact Cross Compliance Farm Advisory System (FAS) Advisor
  - Check soil conditions

- Where conditions are **Good**
  - Good soil structure
  - No problems with cultivations
  - Productive soil / good yields
  - No action required
Action Required

- Where conditions are **Poor**
  - Poor soil structure - Compaction
  - Problems with soil cultivations
  - Poor crop yields / response to fertilisers
- Consider appropriate remedial actions
  1. Minimum tillage
  2. The incorporation crop residues **"Straw"**
  3. Over winter cover crops **"Brassica Crops"**
  4. Organic manures applications **"Manures"**
  5. Crop Rotation **"Inc Grass"**

"Building Soil Organic Matter is a Very Slow Process & Takes Decades Rather Than Years"
What’s Required Now!!

• 2009
  – Some farmers written to
  – Implement remedial actions where required in 2010

• 2010
  – 50% of land to be tested
  – Implement remedial actions where required in 2011

• 2011
  – Remaining 50% of land to be tested
  – Implement remedial actions where required in 2012
In Conclusion

• Increasing SOM generally beneficial
• 50% of continuous soil need to be tested by 31st Dec 2010
• Sample soils over the coming months
• Keep records on CC file in the event of a CC inspection
• Take the necessary action where required
Soil Analysis

• Fertiliser make up to 50% of total variable costs

• P & K holidays!!

• Now is a good time to check soil fertility levels

• Good Soil Fertility = Good Crop Yields
Soil Test Result

- 2\textsuperscript{nd} Winter Wheat
- Medium Soil type
- Soil P Low
  - Poor Rooting
  - High Take risk
  - Apply P at sowing time
  - Freshly applied P will help reduce take all severity

<table>
<thead>
<tr>
<th>Soil Test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.3</td>
</tr>
<tr>
<td>P</td>
<td>2.2ppm</td>
</tr>
<tr>
<td>K</td>
<td>45ppm</td>
</tr>
<tr>
<td>Mg</td>
<td>100</td>
</tr>
<tr>
<td>Mn</td>
<td>50ppm</td>
</tr>
<tr>
<td>Cu</td>
<td>4.5ppm</td>
</tr>
<tr>
<td>Zn</td>
<td>2.0ppm</td>
</tr>
</tbody>
</table>
Soil Test Result

- Soil Mn low
  - Reduce rooting / tillering
  - Reduced nutrient uptake
  - Increased Take all risk
  - Consider Mn dressed seed
  - In addition Correct K, S

<table>
<thead>
<tr>
<th>Soil Test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.0</td>
</tr>
<tr>
<td>P</td>
<td>2.2ppm</td>
</tr>
<tr>
<td>K</td>
<td>56ppm</td>
</tr>
<tr>
<td>Mg</td>
<td>100</td>
</tr>
<tr>
<td>Mn</td>
<td>45ppm</td>
</tr>
<tr>
<td>Cu</td>
<td>4.5ppm</td>
</tr>
<tr>
<td>Zn</td>
<td>2.0ppm</td>
</tr>
</tbody>
</table>
## Fertiliser Costs & Timing of Application

### 10t/ha Winter Wheat

**P & K Costs/ha**

<table>
<thead>
<tr>
<th>Soil Index</th>
<th>Cost /ha (€)</th>
<th>Timing of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>215</td>
<td>Definite req., Apply &amp; incorporate at sowing time</td>
</tr>
<tr>
<td>2</td>
<td>170</td>
<td>Apply in spring time</td>
</tr>
<tr>
<td>3</td>
<td>145</td>
<td>Maintenance app., Apply in spring time</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>Sufficient to satisfy crop requirements / monitor soil fertility</td>
</tr>
</tbody>
</table>

*Assuming 0-10-20 @ €400/ton, MOP (50%) @ €480/ton*
In Conclusion

• Don’t take a chance on renting land where soil fertility information is not available
• Re invest some of this years profits in soil rather than metal
• Re new soil sample results
• Plan fertiliser applications to maximise crop yield potential & profitability
Thank You For Your Attention