Composts and Manures?

Soil amendments: conditioners & fertilisers

Main Compost Sources:
1. Plant based farm waste
2. Food wastes
3. Municipal green wastes
4. Wood, paper and other biodegradable C – sources
5. Animal manures
6. Municipal sludges (biosolids)
   - Sources 1-5 are usually composted
   - Manures may also be used without composting
   - Biosolids are prescribed wastes used following EPA guidelines
Manures are

Animal excrement (urine, dung) which may contain various amounts of bedding such as sawdust, tree bark or straw from a range of sources.

Animal excrement mixed with water containing only small amounts of bedding is called ‘manure slurry’.

Composts are

All types of completely decomposed organic materials without a cellular structure.

During the correct active composting process, organic materials are pasteurised, microbially transformed and stabilised under aerobic and thermophilic conditions for a period of not less than 6 weeks.

The important factors are oxygen supply, moisture, temperature and **time**.

**Composts differ!**
Opportunities

Air, Water & Nutrients

Crop Health

Challenges

- Variability of composts and manures
- Using too much at once
- No or incomplete analysis (e.g., no contaminants)
- Uneven application (esp. if not screened)
- Unbalanced nutrition
  - Only a small amount of nutrients is readily available straight up
  - Uncontrolled release of N and P can occur
  - P accumulation in soils can occur
  - Lack of Ca with continued use is possible
  - Potential high C/N effects – N draw down
- Costs of transport and spreading
  - Esp. per tonne if moisture % is high
Potential problems

- Use of poorly composted materials
- Unspecified feedstocks and treatment
- Environmental side effects
  - Water quality
  - Greenhouse gases ($N_2O$, $CO_2$)
- Food safety issues (bacteria, viruses, protozoa etc.)
  - Esp. using manures on fresh produce eaten raw

Potential risks

Accumulation of contaminants

- Heavy metals
- Soluble salts
- Pesticide residues (esp. herbicides)
- Weed seeds
- Impurities (plastic, glass, rocks)
Recommendations

• Full fertility and contaminant analysis (dry matter) plus moisture content (e.g. 30% w/w)
• Ask for a detailed product specification sheet and use recommendations

• Nutrient budgeting
  - Account for N, P, K and Mg as well as C/N
  - Convert analysis results from mg/kg to kg/m³ kg/tonne wet compost or manure
  - Nutrients will become available over 2-3 years:
    » Up to 15% of total N (nitrate and ammonium will be available in year 1)
    » 20-40% of total P
    » 80-100% of total K

Recommendations

• Develop a relationship with a reliable supplier working according to Australian Standard AS 4454 (2012) - or
• Get production information on:
  - feedstocks and
  - treatment temperatures, times, # of turnings and % moisture
• Avoid prescribed wastes (e.g. biosolids)
• Avoid raw manure (or incorporate and observe withholding periods of 120 days between application and harvest for fresh produce eaten raw)

Check out http://www.recycledorganics.com/publications/
In Summary

Using compost and manures well requires an understanding of

…..but as we know, the winner takes it all

Thanks
Manures differ

<table>
<thead>
<tr>
<th>Animal</th>
<th>Hot or cold?</th>
<th>Notes</th>
<th>% N</th>
<th>% P</th>
<th>% K</th>
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<tbody>
<tr>
<td>Llama</td>
<td>Cold</td>
<td>It is very easy to collect and spread</td>
<td>1.7</td>
<td>0.69</td>
<td>0.66</td>
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<td>Chicken</td>
<td>Hot</td>
<td></td>
<td>1.0</td>
<td>0.8</td>
<td>0.4</td>
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<tr>
<td>Horse</td>
<td>Hot</td>
<td>You may get weed seeds</td>
<td>0.07</td>
<td>0.25</td>
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<tr>
<td>Sheep</td>
<td>Hot</td>
<td></td>
<td>0.95</td>
<td>0.35</td>
<td>1.0</td>
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<tr>
<td>Cow</td>
<td>Cold</td>
<td>4 stomachs so weeds are more digested</td>
<td>0.6</td>
<td>0.15</td>
<td>0.45</td>
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<tr>
<td>Pig</td>
<td>Cold</td>
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<td>0.5</td>
<td>0.35</td>
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<tr>
<td>Goat</td>
<td>Cold</td>
<td>Pellets are easy to work with</td>
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<td>0.5</td>
<td>1.21</td>
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<tr>
<td>Rabbit</td>
<td>Cold</td>
<td>Pellets are easy to spread</td>
<td>2.4</td>
<td>1.4</td>
<td>0.6</td>
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