Don’t Forget the Secondary or Micro-nutrients from Applied Manure or Compost.

Donna Speranzini, Horticulture Nutrient Management Specialist, OMAFRA

We use manure and compost to add organic matter to our soils. Organic matter in the soil improves water infiltration, water holding capacity, soil drainage, nutrient cycling and resilience to compaction. All very good things in their own right! We also use manure to add macro-nutrients such as nitrogen, phosphorus and potassium.

But what is often forgotten is the amount of micro-nutrients that a manure or compost application contributes to your soil. Both manure and compost contain micronutrients. This worksheet will help you calculate the amount of micronutrients supplied by your manure or compost application. Any lab analysis of manure will give you the parts per million or percentages of micronutrient content. There are several general formula to easily convert this lab value to pounds of nutrient applied to each acre of land. Below are two examples representing a typical “generic” solid cattle manure and a well composted (i.e., properly turned and heated) solid poultry manure.

General Formula

\[
\text{ppm/10,000 = } \% \\
\%
\times 20 = \text{lbs/ton} \\
\text{lbs/ton x application rate tons/ac = lbs/ac}
\]

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Lab analysis ppm/10000 = %</th>
<th>% x 20 = lbs/ton</th>
<th>Micronutrients applied in 50 ton/ac</th>
<th>Micronutrients applied in 10 ton/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron</td>
<td>4 ppm/10000 = .0004%</td>
<td>.008</td>
<td>0.4 lbs/ac</td>
<td>0.08 lbs/ac</td>
</tr>
<tr>
<td>Calcium</td>
<td>4.93%</td>
<td>98.6</td>
<td>4930 lbs/ac</td>
<td>986 lbs/ac</td>
</tr>
<tr>
<td>Copper</td>
<td>27 ppm/10000 = .0027%</td>
<td>.054</td>
<td>2.7 lbs/ac</td>
<td>0.54 lbs/ac</td>
</tr>
<tr>
<td>Iron</td>
<td>2115.6 ppm/10000 = .21%</td>
<td>4.23</td>
<td>211 lbs/ac</td>
<td>42 lbs/ac</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.77%</td>
<td>15.4</td>
<td>770 lbs/ac</td>
<td>154 lbs/ac</td>
</tr>
<tr>
<td>Manganese</td>
<td>139.7 ppm/10000 = .014%</td>
<td>.279</td>
<td>13.9 lbs/ac</td>
<td>2.8 lbs/ac</td>
</tr>
<tr>
<td>Zinc</td>
<td>47 ppm/10000 = .0047%</td>
<td>.094</td>
<td>4.7 lbs/ac</td>
<td>0.9 lbs/ac</td>
</tr>
</tbody>
</table>
### Example #2  Poultry Compost

<table>
<thead>
<tr>
<th>Micronutrient</th>
<th>Lab analysis ppm/10000 = %</th>
<th>% x 20 = lbs/ton</th>
<th>Micronutrients applied in 5 ton/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron</td>
<td>9ppm/10000 = .0009%</td>
<td>.018</td>
<td>0.09 lbs/ac</td>
</tr>
<tr>
<td>Calcium</td>
<td>7.72%</td>
<td>154</td>
<td>770 lbs/ac</td>
</tr>
<tr>
<td>Copper</td>
<td>100ppm/10000 = .01%</td>
<td>.2</td>
<td>1.0 lbs/ac</td>
</tr>
<tr>
<td>Iron</td>
<td>1526.5ppm/10000 = .15%</td>
<td>3.0</td>
<td>15 lbs/ac</td>
</tr>
<tr>
<td>Magnesium</td>
<td>2.23%</td>
<td>45</td>
<td>223 lbs/ac</td>
</tr>
<tr>
<td>Manganese</td>
<td>415.5ppm/10000 = .04%</td>
<td>.8</td>
<td>4.0 lbs/ac</td>
</tr>
<tr>
<td>Zinc</td>
<td>320ppm/10000 = .0320%</td>
<td>.6</td>
<td>3.0 lbs/ac</td>
</tr>
</tbody>
</table>

Just a note on sulfur, although it is not typically reported on a manure analysis there are still trace amounts of sulfur in manure. Environment Canada looks at sulfur deposition from rainfall across the country and is seeing a decreasing trend over time. Despite this trend, as of 2006, the Niagara Region is still reported to have sulphate sulfur deposition within the range of 6-8 kg/ha/yr.
Proper Handling and Use of Pheromone Lures

Neil Carter, Tender Fruit and Grape IPM Specialist, OMAFRA

The most common kind of pheromone lure is a small rubber “septa” (see photo) impregnated with a species specific pheromone blend. They are used to attract insects to a trap - usually a sticky trap of some sort – for monitoring purposes. Some comments about the use and handling of pheromone lures:

- The best lures come individually in air tight packets. Bulk bags of loose lures are likely to be less effective or completely ineffective if stored for any length of time. If you buy lures from an open bulk bag, you are wasting your time and money, unless the bag has just been opened and had previously been stored properly.
- Lures that come in a clear plastic strip (each lure in its own air pocket) should be checked carefully before purchase to ensure that the air pockets are sealed properly.
- Lures should never be handled with bare hands. Use new clean vinyl gloves or have dedicated (one pair per type of lure) forceps to transfer the lures into traps. Incredibly small amounts of contaminants from other species lures can make the difference between attractiveness and repellency for your target pest.
- Lures should be refrigerated or frozen until the day before use.
- Only lures in individually sealed packages that are bagged securely and refrigerated or frozen can be used the following year with any reliability.
- Lures are species specific. There are no lures generally in use that cover more than one pest species.
- Only one type of lure can be used per trap.
- Lures do not last all season in most cases. Most lures are good for about 6 weeks.
- Traps should be 40 m apart in the field. Traps for other species should also be kept separated.
- Except under special circumstances, obtaining accurate trapping numbers requires 3 to 5 traps in a field, orchard, or vineyard.

- Pheromone lures are not the same as pheromone dispensers for mating disruption.

Part 3: Improving Weed Management in Young Trees (Spring/early summer)

Leslie Huffman, Weed Management Specialist (Horticultural Crops), OMAFRA

In the last issue, we talked about ways to prepare your orchard site before planting and things to do at planting time. Now that your trees have just been planted, there are some important things to do in their first month in the ground. Here are 4 more suggestions to help reduce and manage weeds in young trees:

- **For soils with < 2% OM:** Devrinol can be applied after planting, but requires incorporation by irrigation or rainfall (1/2”) within 5-7 days to protect it from sunlight degradation. This is the only soil applied herbicide that is safe on low OM soils.
- **For soils with > 2% OM:** A residual herbicide can be applied (if Sencor, Treflan or a tank-mix was not used PPI). In Ontario, Casoron, Devrinol, Dual II Magnum, Princep or Sinbar are registered. Tank-mixes of grass products like Dual II Magnum with a broadleaf herbicide like Princep are preferred. Using a soil applied herbicide right after planting ensures that weeds will be controlled during the Critical Weed-free Period (see above).
- **Irrigate if it doesn’t rain:** Soil applied herbicides require ½” of rain to be activated. In dry years, weeds may germinate before this
activation occurs – so be prepared to irrigate in 7-10 days.

- **Check for weed emergence starting 3 to 4 weeks after planting:** A glass pane laid on the ground under the tree will give you a heads up when weeds will start to escape (usually a 3 to 5 day advance). Identifying these weeds at the cotyledon stage will help you decide what to do, so buy some good identification books on seedling weeds.

Remember that reducing weeds early will result in improved growth, early yield and better fruit size, and that makes it worth the expense and effort. Keep up the good work targeting those weeds.

Use a pane of glass laid on the bare ground as a first signal that weeds are ready to emerge

### Patience with Perennial Weeds

*Leslie Huffman, Weed Management Specialist (Horticultural Crops), OMAFRA*

Many perennial weeds like quackgrass, Canada thistles, and milkweed are now emerging, and it’s very tempting to want to knock them back right now. However, hasty action will only give temporary satisfaction now, as their extensive root systems will help them recover and regrow very quickly.

The best approach is to let them grow to their most sensitive stage before applying a systemic herbicide like glyphosate.

Quackgrass will likely reach its sensitive stage the earliest. Three to four leaves is the stage when quackgrass is most sensitive, but the trick is to have actively growing grass that will absorb the herbicide. If temperatures turn cold, the best advice is to wait until the quackgrass has returned to growth after a couple of warm days.

For broadleaf perennial weeds, the sensitive stages will be in late May, June and some should even wait until July. Wait until your weeds reach these stages:

- Canada Thistle – early flower bud
- Milkweed – flower bud
- Bindweed – full flower
- Nut sedge – first flower
- Vetch – full flower

![Figure 1. Quackgrass at sensitive stage for glyphosate](image1)

![Figure 2. Canada thistle at early flower bud](image2)
Check the rates on the label for the weed you are controlling. There are 3 rate ranges for glyphosate: the lowest is for annual weeds, the mid-range is for Canada thistle and quackgrass, and the highest range is for other broadleaf perennials.

Apple & highbush blueberry growers can also use Lontrel for vetch control. Apply at the early flowering stage of vetch as a spot treatment.

Caution: Avoid contact with crops or valuable trees like windbreaks when systemic herbicides are applied. Remember that these chemicals may circulate in your trees for several years if absorbed, and there is some research evidence that low levels of glyphosate in a plant makes it susceptible to disease. The best strategy is to avoid getting the herbicide on your trees. An alternative is to wick wipe with a 2% solution of Roundup to minimize both the amount of product used, and contact with trees.

Windbreaks and farm woodlots that are located along major highways and rural roads can be damaged or killed by salt spray from winter applications of road salt on highways. Passing cars and trucks lift water and road salt residue into a fine mist that can travel with wind into adjacent farm fields and coat trees. Major four-lane highways are worse for producing drifting salt than smaller highways or rural roads due to faster vehicle speeds and frequent large trucks that create larger amounts of salted mist.
Many species of trees and shrubs that are often used for windbreaks are susceptible to desiccation injury by drifting road salt spray. Research shows that susceptible tree and shrub species are more easily damaged by road salt near the end of winter than exposure to salt spray in early or mid-winter. As trees overcome winter dormancy and prepare for spring growth, they become more susceptible to the effects of road salt residue.

**Figure 1.** A farm windbreak of blue spruce along a highway is tolerant to road salt spray drift. Good growth, healthy dark green or greenish-blue foliage and no needle browning indicates no salt injury is occurring.

Orchard trees, such as peaches, apricots, plums and apples are also easily damaged by drifting road salt spray along highways. Pears are somewhat less sensitive to road salt drift from highways. Commercial fruit orchards located downwind of highways have been damaged previously by winter road salt where studies have found high concentrations of sodium chloride on fruit wood and on dormant buds more than 100 meters downwind of highway properties.

Research surveys previously conducted by the University of Guelph, Horticulture Sciences have identified a number of tree and shrub species that can tolerate the effects of road salt along highways. Farm properties located along highways will have healthier windbreaks if they select trees and shrubs that are known to have tolerance to salt. Landowners can avoid species that have been identified as susceptible to road salt injury.

**Figure 2.** Eastern white cedar is susceptible to road salt injury downwind of highways. Lower branches are dead or dying off from several winters of salt spray. Green foliage at the tops of trees indicates where salt spray concentration declines and suggests that large mature hardwoods or large conifers would be less affected by road salt drift where the main canopy has grown above most drifting salt spray.

Fruit orchards located along highways can be protected by windbreaks consisting of trees that are tolerant to road salt, to catch and reduce the amount of road salt that is in the air before it enters the orchard. Some orchard producers have had good results where Colorado blue spruce and Austrian pine have been planted in mixed windbreaks adjacent to highways. Along highways, eastern white cedar and white spruce are not tolerant to road salt and often die back or show foliage burning as a result of road salt spray.
**Figure 3.** Conifers blue spruce, Austrian pine and Norway spruce are more tolerant to drifting road salt mist along highways during winter and can help protect sensitive orchards by catching road salt spray before it enters the orchard.

Healthy conifer windbreaks also help to catch drifting fungicide and insecticide spray material that may come from orchards, vineyards, small fruit or vegetable fields during spring and summer. The trees also create a visual barrier to passing motorists and can reduce noise significantly from orchard airblast sprayers and other noisy jobs.

To keep windbreaks functioning properly, it is important to renovate ineffective old windbreaks that are missing lower branches or windbreaks full of holes due to missing trees. Trees are entirely renewable.

The following is a list of tree and shrub species that have been observed in research surveys that tolerate road salt spray (ref. G. Lumis, University of Guelph). These species can be used on farms located along highways and rural roads where windbreaks are desired. A rating of 1 is most tolerant to road salt, while a 2 rating is mildly sensitive to road salt and is still useful along highways. The final grouping lists conifers that are very sensitive to damage by road salt spray drift and should not be planted along roads.

**Tolerant conifers**
- Blue spruce, *Picea pungens* 1
- Jack pine, *Pinus banksiana* 1
- Mugho pine, *Pinus mugo* 1
- Austrian pine, *Pinus nigra* 1
- Red cedar, *Juniperus virginiana* 1
- Juniper, *Juniperus sp.* 2
- Norway spruce, *Picea abies* 2

**Tolerant deciduous trees**
- Norway maple, *Acer platanoides* 1
- Horse-chestnut, *Aesculus hippocastanum* 1
- Tree of Heaven, *Ailanthus altissima* 1
- Honey locust, *Gleditsia triacanthos* 1
- Cottonwood, *Populus deltoids* 1
- Black locust, *Robinia pseudoacacia* 1
- Shagbark hickory, *Carya ovata* 2
- Russian-olive, *Elaeagnus angustifolia* 2
- White ash, *Fraxinus americana* 2
- Largetooth aspen, *Populus grandidentata* 2
- Lombardy poplar, *Populus nigra* 2
- Trembling aspen, *Populus tremuloides* 2
- Choke cherry, *Prunus virginiana* 2
- Pear, *Pyrus sp.* 2
- Red oak, *Quercus rubra* 2
- European mountain ash, *Sorbus aucuparia* 2

**Tolerant deciduous shrubs**
- Siberian peashrub, *Caragana arborescens* 1
- Sea-buckthorn, *Hippophae rhamnoides* 1
- Staghorn sumac, *Rhus typhina* 2
- Burningbush, *Euonymus atropurpureus* 2
- Honeysuckle, *Lonicera sp.* 2
- Japanese lilac, *Syringa amurensis japonica* 2

**Conifers very sensitive to road salt**
- (do not plant near salted winter roads)
- Yew, *Taxus sp.*
- White spruce, *Picea glauca*
- Red pine, *Pinus resinosa*
- Scots pine, *Pinus sylvestris*
- Eastern white cedar, *Thuja occidentalis*
- White pine, *Pinus strobus*
- Eastern hemlock, *Tsuga canadensis*