

The price of winter manure

Studies are showing there is too much risk of soil compaction By Lilian Schaer

AS SOIL HEALTH CONTINUES to become more and more of a priority for farmers, soil compaction is one of the issues of concern that comes to the forefront.

It can reduce the soil's water absorption capacity, as well as root penetration, crop emergence and plant nutrient and water uptake – all of which ultimately impact yield – as well as increase the risk of soil erosion.

Heavy field equipment is one of the leading causes of soil compaction, particularly in wet spring or fall field conditions when farmers are trying to get manure applied either ahead of planting or before the ground freezes. The amount of compaction depends on the size and weight of the equipment, the moisture level of the soil, and the type of soil – but the wetter the conditions, the more damage will occur. And if the weather isn't cooperating, that ideal window for application can become pretty small or disappear altogether.

To avoid the risk of wet conditions or the seasonal time crunch, some farmers have gotten into the habit of spreading manure on frozen or snow covered ground during the winter months. The ground is harder when frozen, so the argument goes, reducing the potential for soil compaction by heavy manure spreaders or liquid tankers.

But that isn't actually the case, says Ian McDonald, Crop Innovation Specialist with the Ontario Ministry of Agriculture, Food and Rural Affairs.

“The issue is, is that ground really frozen and to what depth – can it really bear that weight?” he asks. “How deep is the frost vs the weight of the equipment, the frequency of passes and the time of day?”

The cost of compaction hasn't been calculated in Ontario, but data gathered by Dr. Scott Shearer from Ohio State University has been used to estimate the cost of compaction at six bushels per acre yield difference from wheel traffic in soils with normal moisture and 27 bushels per acre from wheel traffic in wet soils.

There are other negatives to winter application too.

Frozen ground can't absorb nutrients and they can't be incorporated so winter rains and thawing events will quickly wash that manure away into nearby water courses. That means not only does the soil not benefit from that manure application, it's also having a negative impact on water quality.

Finally, roads can often be icy and farm equipment tires aren't the best in cold weather, creating possible safety issues.

According to McDonald, there are other ways to deal with compaction issues stemming from manure application weight than winter application given all the negatives associated with that practice.

Drag hoses, tire inflation/deflation systems, wider spread patterns for manure application equipment, smaller spreaders or even bigger and/or better tires can make a difference.



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OMAFRA Field Crop Sustainability Specialist Christine Brown suggests adding wheat to a rotation which, among other things, creates another window of opportunity for application when conditions are usually drier.

According to Brown, compaction risk is lowest when manure is applied after the July wheat harvest, and farmers have the opportunity to add cover crops that will help keep the ground covered and minimize erosion as well as add additional diversity and soil health benefits.

It also offers the opportunity to spread both workload and equipment costs out over the entire growing season compared to a few short weeks in spring and fall when weather can be challenging. And there are demonstrated yield increases in the subsequent corn and soybean crops.

“Many producers do not consider wheat to be an economical crop in the rotation, but if the economics of crop production were not just based on the highest yield, but rather on the economics (including long term soil health) across the whole rotation, it would escalate the value of wheat in the rotation,” she says. ¹

More information about manure stewardship and long-term nutrient management options is available at <https://www.farmfoodcareon.org/timing-matters/>.

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