

# **Manure composting: a solution to dealing with stricter environment regulations**

by Susanne J. Brown

If manure composting conjures up the idea of a simple waste disposal system, think again.

"Composting is not a recycling system. It's a natural cycling system. It's a nutrient enhancing process, and a resource management tool," said Larry Breech, a Pennsylvania grain and livestock farmer, who made a conscientious decision 10 years ago to switch to composting manure rather than continue to conventionally spread it raw on his fields.

A rule of thumb farmers need to follow when handling manure is: "if it smells bad, it is bad," Breech told a group of farmers, researchers, and agronomists attending an Advanced Biological Composting Seminar held near St. Jacobs in late January. The composting seminar was sponsored by Canadian Organic Growers, stone meal product manufacturers, and distributors of compost turners and covers for compost windrows.

## **Why compost ?**

To put it simply, "when farmers spread manure they don't have friends," Breech said.

Urban encroachment and stricter environmental and municipal regulations in both Canada and the U.S. are now dictating when, where, and how farmers can spread their raw manure.

There is also the environment, itself, to be considered. Over 70 per cent of the value of raw manure is lost when it is spread, he said.

In fact, "one application of raw manure may affect soil to the extent it may take Mother Nature to do in 50 years," said Breech.

Raw manure can physically degrade soil. It can easily reduce soil volume by 10 - 15 per cent, he said.

A good quality compost, however, will eliminate heat, drought and excess moisture stress. It also helps control weeds, pests and protects against crop diseases like nematodes, he said.

Weeds are in a crop field to correct an imbalance or upset in the nutrient system. "Composting can correct that balance in the system," said Breech.

So farmers need "to look at the big picture if they don't think compost will be good for their bottom line," he said.

In terms of crop production alone, compost will provide fertility over several years unlike commercial fertilizers.

"I have people tell me that on 2,000 acres of corn compost increased production by 30 bushels/acre. The potentials are out there," he said. "We just haven't explored its full value."

### **Not created equal**

Another area where compost is much more valuable than raw manure is that "you can put good compost on any crop stage growth, at any time, without an adverse effect," he said. This cannot be done with raw manure.

A more lucrative way of looking at compost worth is, for instance, in Breech's rural area of Bloomsburg, Pennsylvania, regular compost sells for \$10.00/ton (U.S.) while really good compost sells for \$65.00 - \$100.00/ton.

The point is "all compost is not created equal," Breech emphasized. "Good compost is always greater than the sum of its parts."

Breech defined good compost as having:

- water soluble nutrients;
- no phytotoxins;
- a high humus quality;
- an earthy smell;
- and biologically active.

On the more technical side, Breech's standards for a good finished compost are:

- an ERGS (energy release per gram of soil) less than 1500;
- a pH between 6.5 and 8.0;
- it has no nitrites or sulfides (zero parts per million);
- it has nitrates of 300 parts per million in the summer and 100 -150 parts per million in the winter. (Microbes are not as active in cold weather);
- and a temperature of ten degrees warmer than air.

As Breech sees it, it's "quality versus quantity."

The true value of composting will be seen when a crop analysis comes back because "if we give bacteria half a chance, they'll help us," he figures.

### **Ignored consequences**

Judy Kipe-Nolt, a soil microbiologist, who worked in the tropics for several years and is now an assistant professor at Bloomsburg University in Pennsylvania was also a featured speaker at the Advanced Biological Composting Seminar.

Kipe-Nolt knows the critical importance of maintaining soil organic matter through composting because when organic matter is ignored in the tropics "the results and consequences are seen far quicker than here in the temperate zone," she said.

However, despite the slower rate of organic matter losses in Canada and the U.S., Kipe-Nolt's is a strong advocate of applying compost on all agricultural soils.

The argument that composting is too labour intensive, time consuming, expensive in terms of equipment and land, needs added hay to get the structure right, and that only 15 per cent of the nutrients are available in the first year, is entirely off-set by a multitude of composting benefits, she said.

For instance, in terms of volume, composting greatly reduces manure amounts by 50 to 60 per cent. "A lot is lost as water, and some as organic matter as it is released as carbon dioxide," she explained.

### **Flies and odour eliminated**

Another point in favour of composting is the high temperatures (60°C+) in a good quality compost pile will kill weed seeds, plant diseases, and pathogens that can cause sicknesses in animals and humans. Also, fly larvae cannot reproduce in compost, said Kipe-Nolt.

"Compost micro-organisms will out compete plant pathogens. The bacteria and fungi in the composting process will produce natural antibiotics against foliar diseases," she noted.

In terms of nutrient stability, in raw manure about 50 per cent of nitrogen is in the mineral form which will wash out when it is put on a field. In compost, however, 95 to 97 per cent of nitrogen is in the organic form when spread on a field. So, it will be slowly released and not wash out. This provides farmers with some flexibility when spreading because compost nitrogen won't leach out, she said.