University of Guelph Puts Compost to Use on Turf

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The Ontario Agricultural College and the Ontario Veterinary College at the University of Guelph generate large amounts of animal wastes. In the ages past this material was utilized on adjacent farm land but today the University is surrounded by urban development. It became economical to dispose of the wastes in the municipal land fill site but in 1982 the city refused to continue the practice.

Prof. Jack Pos of the Engineering Department designed an 'in vessel' high-speed aerobic composter to process the waste. The unit is 110 feet long and 16 feet wide. A flail mechanism of farm cultivator teeth attached to 3-foot pieces of flat steel slowly moves along parallel railway lines mounted 4 feet above the base. The flail mechanism makes one pass in one direction only over the bed of composting material each day. This propels the material slowly toward the exit which takes approximately 10 days from the time the waste is dropped at the entrance. An elevator system deposits the material on a concrete pad or loads the material directly into a truck. Additional aeration is obtained by forcing air through 6-inch pipes located below the base.

No objectional aroma is noticeable from the facility which is located near several academic buildings. Aroma is also not detected when the material is used in the grounds maintenance on the campus.

Approximately 5,000 tonnes of material are fed into the composter each year, generating 2,500 tonnes of useable material. Chemical analysis is performed every six months. The material has a fairly constant C:N ratio of 30:1, which makes it ideal for our uses.

We use the finished compost as a mulch, as a soil additive and as a top-dressing material for our 30 acres of athletic fields. These include space for football, lacrosse, field hockey, soccer, rugger and baseball. There is intramural schedules, inter university schedules and a yearly six-week practice session by the Toronto Argonauts.

The application to our fields is made using a commercial, high capacity top dresser which does a superior job of uniform application and is much preferred to the manure spreader we originally employed. In 1982 we replaced our program of topdressing with a soil mix with the compost.

To date our results have been:

1) We do not have the thatch problems we had prior to the start of this program. We only dethatch about every three years.
2) Each year we core cultivate with removal of the plugs, overseed and then topdress. This procedure gives us a good seedbed.
3) The topdressing and core cultivation program has provided a more resilient surface for the athlete.
4) We do not require as much fertilizer as before. We now only fertilize twice each year.
5) Drainage and infiltration of water has improved since we began the program.
6) Due to the heat generated in the composter weed seeds are killed and have not been a problem on our fields.
7) The compost is very fine and filters down through the leaf blades. We have not had to screen the material before use.

Some other observations we have made in the use of the material may be of interest to the reader.

We have found the material will cause foliar burn of the turf if used fresh from the composter. Thus our topdressing program involves material which has been stored for a few months.

The material is applied at a rate of 1/2 inch, so 146 -160 cubic yards are required for an average field. The material is light and easy to handle, except after heavy rains. There is no problem with the topdresser applying the wet material.

In order to maintain the temperature of 55 C for microbial activity in the winter months we have to insulate the walls of the composter with processed compost to prevent freezing on the inside of the cement walls.

Although the manure bins are clearly marked, plastic garbage bags and other foreign material still find their way into the system and must be removed manually.

In conclusion we are pleased with the material as a topdressing material. In addition we are utilizing a material which a decade ago was treated as a waste.