

The Composting Council of Canada **Le Conseil canadien du compostage**

~ Testing compost for agricultural application ~

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The Composting Council of Canada is a forum to advance and promote the use of composting to government, industry and the public as a means of reducing Canada's waste stream while reclaiming the organic fraction for beneficial purposes. Council efforts focus on information and communication, representation on expert multi-stakeholder committees of impact to the development of the composting industry and coordination of research initiatives. The Council's membership encompasses representation from all levels of government, industry (organic waste generators, compost system manufacturers and designers, facility operators, compost marketers) and academia.

Upcoming events of importance to the composting industry in Canada are:

- National Composting Conference and Exhibits (September 27 - 30, 2000; Edmonton, Alberta).
- International Composting Awareness Week 2000 to be held from April 30 - May 6, 2000.

Mark your calendars now!

For more information, visit The Council's website: www.compost.org or call (416) 535-0240.

As compost production expands in Canada, it is important that the compost industry develop end use markets for compost. The use of compost in agricultural production is seen as a high potential market for significant compost volume. The key to tapping into this potential, though, is to demonstrate the specific benefits of compost usage for the agricultural market and to relate these to the end users.

Over the past few years, the dialogue between compost producers and the agricultural community has increased reflective of the interest in determining compost's many applications. Generally, compost as a soil amendment is known to provide many benefits including improved soil structure, increased water-holding capacity, improved root and plant growth and reduced wind and water erosion. However, the specific

production benefits of compost on yield and product quality need to be demonstrated to move from “dialogue” to usage.

To maximize market potential, government and industry have joined together to establish a national research program to study the impact of municipal and industrial waste-derived compost in agricultural applications. Originally designed by Environment Canada with support from The Composting Council of Canada, the National Agricultural Compost Trials (NACT) is being carried out through the leadership of Agriculture and Agri-Food Canada (AAFC) and their research stations across the country.

Industry is contributing to these trials through both cash and in-kind support. The program is managed through Agriculture and Agri-Food Canada’s Matched Investment Initiative (MII) fund, a program designed to increase collaborative research efforts between the private sector and AAFC scientists at AAFC research centres. The MII fund matches industry contributions on a one-for-one basis, effectively doubling available research funds.

The purpose of NACT is to study the benefits and impact of compost applied to agricultural and horticultural soils. The studies utilized compost produced from municipal and industrial source-separated solid wastes.

AAFC research scientists have initiated a series of multi-year, site-specific studies of interest to the agricultural and horticultural communities and compost producers. While each research study focused on the local opportunity, the scientists collaborated nationally to standardize protocols, methodology and analysis as much as possible to maximize the relevance of the results nationally. Compost’s impact on yields, plant nutrient levels, trace metal content, changes in soil chemical properties, and disease suppression performance are among the items being evaluated in the research.

Included amongst the studies were:

- **comparing source-separated municipal solid waste compost and solid manure on barley and wheat production (Nova Scotia);**
- **testing compost's effectiveness in a range of perennial cropping systems including vineyard, ginseng gardens and specialty horticultural crop plantings including Echinacea as well as high density apple orchards (British Columbia);**
- **determining compost's value in potato rotation (Prince Edward Island);**
- **measuring compost's impact on potatoes, squash and sweet corn production (Nova Scotia);**
- **testing compost usage on turf grass on golf courses (Manitoba);**
- **assessing the use of paper-mill residue compost in potato production (Quebec); and**
- **evaluating municipal source separated waste compost's impact as a component of a container medium for the production of ornamental trees, shrubs and perennial plants (Nova Scotia).**

i. Comparing source-separated municipal solid waste compost and solid manure with and without fertilizer nitrogen

Conducted in Nova Scotia with barley and wheat cereal crops with varying rates of compost and manure, the study results indicated that the addition of compost helped to improve soil physical properties and increased the macro-biota. There did not appear to be any deleterious effect from an environmental and food safety viewpoint of using source-separated solid waste compost. While the compost did not seem to be able to supply the nitrogen nutritional requirements of barley and wheat when applied in the seeding year, it was recommended that the study continue to determine nitrogen and other minerals' availability to plants in years subsequent to application.

ii. Testing compost's effectiveness in a range of horticultural production systems

In an earlier phase of this research in British Columbia, field trials demonstrated a potential for the effective use of various composts to improve the growth of annual vegetable crops while enhancing soil quality. The subsequent research focused on the effectiveness of various composts in a range of perennial cropping systems including vineyards, ginseng gardens, specialty horticultural crop plantings including Echinacea as well as high-density apple orchards. Preliminary results from these trials indicate potentials and limitations of compost use in horticultural production systems. The study noted that the composts could alter plant nutrient levels and modify levels. It recommended that it would be important to define what key soil properties need to be modified to optimize production of various crops as well as to determine the implications of long term metal additions to soil.

iii. Determining compost's value in potato rotation

This study in Prince Edward Island was based on the interest that intensive potato production systems may benefit from organic matter and nutrients contributed by compost application. Results of this work to-date indicate that municipal compost has the potential to supply valuable amounts of major and micro nutrients for crop production. While crop yields increased, the study indicated that the economic benefits of these increases need to be quantified to be able to determine the value of compost in commercial crop production.

iv. Measuring compost's impact on vegetable crop growth and soil properties

The objectives of this research in Nova Scotia have been to evaluate the effect of municipal solid waste compost upon the yield, plant nutrient and trace metal content of three vegetables crops (potatoes, squash, sweet corn) grown in a three-year rotation and to measure changes in soil chemical properties throughout the

rotation period. The study compared the affect of the various compost and/or fertilizer treatments. The highest crop yields were realized by the fertilizer treatment. The study also documented the significant treatment effects on essential nutrient content or nutrient uptake were realized on the three crops tested. Soil physical and biochemical properties are being evaluated.

v. Assessing the use of paper-mill residue compost in potato production

This Quebec study indicates that paper sludge compost may be an efficient way to improve yields as well as the nutrient status and biochemical and physical properties of coarse-textures soils devotes to intensive potato production. It noted that, similar to other soil amendments, care should be also taken to apply the right amount. Developing specific compost "recipes" using various feedstocks could be highly beneficial to address production needs.

vi. Evaluating the effectiveness and consistency of municipal solid waste compost as a component in container growing media

A potential problem with the use of municipal solid waste (MSW) compost is variability in composting depending on the initial composition of the feedstock. This Nova Scotia study determined that this variability has relatively little impact on plant performance when they are used in combination with peat in container media. It noted that MSW compost contributed insignificant quantities of macronutrients to the plants and must be used in combination with controlled release, or liquid fertilization. It may, however, act as an important source of micronutrients.

vii. Effect of Compost Use on Turf Grass

The primary goals of this study at the Clear Lake Golf Course, located in Riding Mountain National Park, Manitoba, were to assess the solid waste management system in use at the golf course and to investigate various compost use strategies

on turfgrass. Major findings include: 90% of the solid waste produced at the golf course is compostable, including approximately 40 tonnes of greens clippings per year; while the compost was found to have a low nitrogen content, turfgrass had positive growth responses (clipping yield and plant tissue nitrogen content) to compost topdressings. Further trials are on-going to determine disease suppression characteristics.

Updates on these studies and other research initiatives are an important aspect of The Composting Council of Canada' annual national conference (to be held this year in Toronto from November 3rd to 5th). And now, with the support of Resource Recycling, the details of each study's current status and findings are available through The Composting Council of Canada's website (www.compost.org).

These and the other studies included in the National Agricultural Compost Trials complement the many other initiatives being conducted by the compost research community throughout Canada, the United States and globally. Their efforts and findings are of high importance to our industry as we establish our long-term position in the agricultural and horticultural marketplace.

To maximize our potential as product manufacturers, compost producers must be able to meet the needs and demands of our end users. Understanding our end users requirements and assessing the performance potential of our compost products are key to designing specific compost products for particular market opportunities and product sales success.

Written by Susan Antler, Executive Director, The Composting Council of Canada with notes from the National Agricultural Compost Trials research team.