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From Lemons to Lemonade: Carlton's Composting Program©

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INTRODUCTION

Carlton Plants' composting program began as a basic, small-scale program directed toward waste management. A decade later it has become a large-scale, intensely managed supply of microbe-packed compost utilized for soil building and crop enhancement. The program addresses the negative aspect of burning and disposal of nursery waste from an environmental and economical standpoint. The process has led us to a better understanding and appreciation of the value of the finished product and the impact it can have on soil enhancement and product quality. Efficiency and cost control has been gained by fine tuning the process and by utilizing the finished product to replace traditional products like bark and sawdust in our operation.

CONSIDERATIONS IN COMPOSTING

Feedstocks are the primary component of a composting program. They are either carbon or nitrogen-based and are available as byproducts from many agricultural operations. Carlton's carbon source consists of culled trees, trimmings, landscape maintenance debris, and unsold nurserystock.

Our nitrogen source consists of cow, horse, and chicken manure from local operations. We strive for a 3 to 1 ratio of carbon to nitrogen by volume. A suitable area for compost is needed with consideration given to:

- Storage of raw feedstocks.
- Adequate size of area for windrowing and turning.
- A firm surface to support equipment.
- Issues of drainage and runoff.

One must also plan for final use and distribution onto fields or into potting media.

Equipment needs include:

- A tractor with a loader bucket.
- Compost turner.
- Temperature and moisture probes.
- Tarps, possibly.

Other resources that are critical to the process include water and a distribution system for applying it. Good books and magazines will explain both the basics of the process and the finer points of the biological science involved. My suggestions are:

- *On-Farm Composting Handbook* (NRAES-54).
- *Composting: A Tool for Western Agriculture.*
- *Bio Cycle: Journal of Composting & Recycling.*
- *Teaming with Microbes — A Gardener's Guide to the Soil Food Web.*

The utilization of laboratories for definitive analysis will assist you in determining biological and nutritional values of the finished product.

The A & L Western Labs and Soil Food Web are excellent resources in this area. It is also critical to establish relationships with companies capable of grinding debris as well as someone to spread the finished compost if that is your goal.

ABOUT THE PROCESS

Grinding of the debris is primary to the process and can be accomplished by contracting with companies that operate large tub-and-belt feed grinders. Price is usually by the hour plus move-in and covers all labor, fuel, etc.

A loader is then used to layer the feedstocks into a windrow at a 3 to 1 carbon to nitrogen ratio. Carlton uses a Frontier 12-ft PTO-driven compost turner (manufactured by GK Machine in Donald, Oregon) to mix the dry feedstocks for consistency and uniformity of the pile. It's now time to add water into the pile. A regular regimen of turning the piles two times a week for the first month begins. All along, temperature and moisture readings are made with water added, if necessary. For the next 3 months the piles are turned once each week. During the next 4-winter months turning is reduced to once or twice a month. Rains usually provide needed moisture and also regulate the operation of equipment. Final turns of once a month in spring finishes and matures the compost.

The turning process accomplishes:

- Aeration, for exchange of oxygen for carbon dioxide.
- Mixing of the feedstocks as well as breaking up course particles.
- Distribution of moisture and temperature for consistency within the pile.

Desired moisture is about 50%–60% and temperature of 120–145 °F throughout is optimum. These levels allow maximum biological activity the elimination of weed seed and disease. Compost that has been handled properly will finish out cool, odorless, and with a fine, even texture. Expect an overall volume reduction of 40% of the material from start to finish. Samples of the compost are taken and sent to labs for analysis of nutrient values and biological assessment.

THE FINAL PRODUCT: USE, COST, AND BENEFITS

Carlton utilizes the finished product in numerous ways. Most compost is spread over our fallow fields at about 50 yd^3 per acre, equal to about 25 tons/acre. It is then worked into the soil and a cover crop is grown on the field 1 year prior to replanting with nursery stock. Other use is as a top-dressing over seedbeds in place of fir sawdust. We also use it as a replacement for bark dust in the landscape.

Costs include feedstocks, equipment, contract services (grinding and haul/spread), operators time, fuel, tools and supplies, water, lab analysis, and supervisory time. We feel that our cost to produce and spread the compost is about \$9.00/yd^3. Commercially produced compost sells for about \$18.00/yd^3, plus transportation.

Value and benefits, priceless! Through this process we have:

- Reduced disposal costs.
- Reduced greenhouse gases by eliminating burning.
- Obtained positive feedback from the community.

At the same time, offset the purchase of fir sawdust, biologically enhanced the soil, and obtained greater growth and better quality nursery stock.

FINAL NOTES

We do not place obviously diseased plants or highly susceptible species into the grind pile. Annual production has been 2,500 yd^3 per year, but has recently been increased to 5,000 yd^3 by special circumstances.

Distribution and use of the final product is determined by evaluating where the need is the most and return will be the greatest.

Time, experience, observation, and education have brought about change in how we view the process and the value of the end product. Through patience and persistence, composting can provide both short-term results through waste reduction as well as long-term gains in enhanced crop production.