

WHATCOM COUNTY

Manure Compost Marketing Guide



...From Waste To Abundance...

This handbook is intended as a guide for composters seeking to market their product. It provides an overview of potential consumers, qualitative and quantitative requirements unique to each market, and effective ways of promoting your product to a number of different markets. Although much of the compost marketing material presented is general in nature, this guide also presents information specifically targeting compost markets here in Whatcom County. Included is a list of local agricultural businesses interested in buying compost and a reference section for publications concerning agricultural composting, compost marketing and related subjects. It is our hope that you will find this handbook both useful and informative. If, however, you have any unanswered questions, feel free to contact the Conservation District or Cooperative Extension for further assistance.

Prepared by:

Allen W. Cramer, WSU Cooperative Extension

Editors:

Craig MaConnell, WSU Cooperative Extension / Wayne Chaudiere, Whatcom Conservation District

Presented by:

Whatcom Conservation District, Washington State University Cooperative Extension,
Washington State Department of Ecology Centennial Clean Water Fund

Table of Contents

SUBJECT	PAGE
Introduction	3
The Benefits of Compost	5
The Importance of Perception	5
Environmental Concerns	5
Helping the Environment	6
Dairy Benefits	6
Soil Benefits	7
Beneficial Organisms	7
Effects on Crops	8
Capitalizing on the Benefits	9
Marketing Fundamentals	10
General Marketing Strategy	10
Marketing Compost	11
Identifying the Local Markets	11
Active Market Development	13
Product Development	15
Pricing	16
Assessing Profitability	17
Promotional Considerations	17
Bagging Considerations	19
Factors for Failure	19
Whatcom Compost Markets	21
Local Market Identification	21
Local Volume Demand	22
Local Demand Price	23
Local Quality Requirements	24
Local Promotional Considerations	25
Regulatory Requirements	27
Feedstock Tiers and Permitting	27
Compost Quality Registration	28
Equipment, Labor, and Space	29
Composting Methods	29
Passive Windrow	29
Turned Windrow	30
Aerated Static Pile	30
In-vessel/Channel Composting	30
Vermicomposting	31
Financial Considerations	31
Appendix A: Compost Use Guidelines	33
Application Guidelines	33
Potting Soil Mixes	33
Appendix B: List of Local Businesses Interested in Buying Compost	35
Appendix C: List of Local Feedstock Providers	37
Appendix D: Local Contacts & Agencies	39
Appendix E: Literature Cited	40

Introduction

In Whatcom County, there are over 240 dairy farms and more than 80,000 cows. This large number of cows generates millions of tons of manure annually. Handling and applying this manure costs the farmer money. Furthermore, economics have forced many farmers to increase their herd size while the high cost of land has prevented them from increasing their land base as well.

This situation may lead to excessive nutrient loading on some farms. The over application of manure has been implicated in nitrate contamination of ground water, fecal coliform contamination of shellfish beds, and nutrient loading of our streams. Fortunately, this manure, which is often seen as nuisance or worthless by-product, is also the source of a valuable product: compost.

When commercial fertilizers became available in the first half of this century, increases to plant yields seemed limitless. Unfortunately, nutrient levels reach a point beyond which any additional increase is useless and may inhibit growth. In response to these limitations, agricultural scientists have begun to explore alternative ways to promote plant growth and health. This has led many scientists to reexamine the role compost plays in agricultural systems. Although compost has been utilized for many millennia, little is known as to how or in what ways compost benefits plants. Recent inquiries into these questions have led to some surprising answers.



It has long been known that soil organisms help plants absorb nutrients and condition the soil. In fact, over 90% of all plants live in association with mycorrhizae, small fungal filaments that aid plants with nutrient and water uptake in exchange for carbohydrates (Raven et al 1992). Scientists have found that compost, in addition to providing nutrients, increases organic matter, humic acids, beneficial bacteria, and fungi which are vital to a plants health and growth. It is the hope of these researchers that we may use these soil organisms to further increase crop yields. Compost, a long ignored factor in agriculture is experiencing a resurgence of interest.

Along with this scientific interest, compost is also becoming a profitable commodity. In the last three decades there has been a slow, but steady move towards sustainable agricultural methods (there are over a dozen organic farms in Whatcom County alone!). Organic produce is one of the fastest growing markets in the United States today with sales increasing by 20% annually. One requirement of certified organic growing is the use of natural fertilizers and compost. As the sale of organic goods increases, the demand for compost will likewise increase. Moreover, the USDA has ruled that organic farms may no longer use biosolid-based compost if they wish to retain their organic certification. This means a greater demand for manure based compost.

Compost is also gaining popularity with the horticulture industry. It makes a great amendment to potting soils and can inhibit plant diseases. Furthermore, recent EPA wetland regulations may reduce the availability of peat, driving up the price (Extension Circular 425, 1996). It is likely that compost will become a more economical alternative to peat.

Finally, more and more commercial growers are amending their crop soils with compost. According to Ralph Jurgens, a commercial composter for the last twenty years, compost use by crop farmers has tripled over the last five years. He also noted that over a three-year period, two tons of compost per acre yields more benefit than five tons of raw manure (A Watershed Manager's Guide to Organics).

Furthermore, composting has a value beyond that as a commodity. Composting can be an integral part of a farm's nutrient management program, and the product can be used to amend the dairy farmer's own

soil. Composting converts nutrients into forms that don't leach, kills weed seeds and pathogens (like fecal coliform), makes nutrients more available to plants, and may increase plant health. It also reduces the volume of material by as much two-thirds, and it can be spread year-round. Finally, the EPA has concluded that composting can reduce nonpoint source pollution of our waterways and reduce nutrient loading (Managing Nonpoint Source Pollution, USEPA 1992).

The need for compost is real, the potential for growth in the market is large, and the means to composting are available. However, demand is not enough. While composting is fairly simple, successful marketing requires forethought, creativity, and a lot of work.

This guide has been written to help local farmers market their product. Within these pages, you will find specific information on the potential for marketing compost here in Whatcom County. Through surveys and intensive investigations, we have collected information that we hope will aid the potential composteer in selling his or her product. This guide provides information on what markets exist, who to contact, how to present your material, and what qualitative requirements must be met to insure your customers will be satisfied.

Success in the compost business is not easy (and rarely quick), but the rewards are a cleaner, safer environment, the means to better manage your manure, and the ability to augment your income. So read on, and happy composting.



Composted dairy manure, a potential source of revenue.

The Benefits of Compost

The Importance of Perception

An important factor in selling compost is consumer perception. The advantages must be evident for the consumer to choose compost over other, possibly less expensive, alternatives. To successfully promote and sell your compost, you should be knowledgeable about the benefits of using compost. In addition, your compost must live up to your claims. Therefore, you should strive to maintain a consistently high quality product. One batch of poor quality compost can undo years of marketing work and drive customers away indefinitely.

The importance of perception cannot be overstressed. A product that has a reputation of excellence will have a high demand, regardless of whether this reputation is warranted. Moreover, a high quality product that is perceived as a waste product will be difficult to sell. Consumers may overlook a superior product because they are unaware of its value or have been sold on another product.

The effect of perception is very evident in Whatcom County. Mushroom compost has a great reputation and is in high demand. This is in spite of the fact that it may often demonstrate serious shortcomings (such as high salt and pathogen levels and unpleasant odor). Conversely, properly composted dairy manure is unlikely to experience any of these problems, yet it is often viewed as little more than a waste product. Furthermore, weed-seed problems that arise from applying raw manure solids (but are killed by proper composting) has created a reluctance to invest in dairy manure compost by many berry farmers.

To be successful, you will need to change consumer perceptions. You must demonstrate that properly composted dairy manure is completely different than raw manure. The objective of your sales campaign should clearly demonstrate how your compost overcomes the disadvantages of applying raw manure as well as the other benefits compost conveys. The information presented here can be used to educate the public about these benefits, help generate greater interest in using compost as a soil amendment, and aid you in marketing your product.



The application of manure during rainy periods can increase the likelihood of nutrient leaching, including nitrates.

Environmental Concerns

To begin with, we shall examine some environmental concerns that composting may help alleviate. Until 1940, human activity added almost no fixed nitrogen to the environment. Since then, according to an Ecological Society of America study (Baril 1997) fossil fuel combustion, synthetic fertilizer production, industrial farming, and manure waste from animal husbandry have introduced huge amounts of fixed nitrogen into the environment (over half the nitrogen fixed by human activity has occurred since 1980).

Currently over 140 million metric tons (MMT) are added each year by human activity, including 10 MMT from fertilizers and 32 MMT from animal waste. This is equal to or greater than all the nitrogen fixed by natural processes. The results of this increase in fixed nitrogen are elevated greenhouse gases, ozone depletion, acid rain (from nitric acid formation), nitrate contamination of aquifers, and the eutrophication (stagnation due to an increase in decaying organic matter) of rivers and estuaries (Vitousek et al 1997). Furthermore, the increase in available nitrogen has been implicated in a change in plant distributions and a decrease in biodiversity by propagating the growth of those species that thrive in high nitrogen environments.

Helping Protect the Environment

Composting can help alleviate some of these problems. It helps reduce reliance on synthetic fertilizers, and thus, the amount being generated and entering the ecosystem. Composting also converts nutrients into forms that are more stable and less likely to leach or volatilize (Jurgens 1997, Rynk 1992). Many of the nutrients are incorporated into the bodies of microorganisms that release the nutrients slowly as they die. Nutrients are also converted to chelated forms that bind with humic acids (another by-product of composting). These acids hold 3-5 times more nutrients than inorganic soil alone, keeping them at the surface near the roots. This prevents leaching and increases availability.

Composting reduces the carbon to nitrogen ratio in manure. A high carbon content promotes the growth of soil microorganisms, but these same organisms also require nitrogen for growth and cell maintenance. When there is not enough nitrogen available, these organisms will “steal” nitrogen from plants and desired crops. A low C: N ratio can prevent the immobilization of nitrogen by soil microorganisms, a problem that can occur when applying raw manure.

In addition, the improper application of raw manure has been implicated in groundwater and surface water contamination involving fecal coliforms and nitrates. Composting can help reduce the amount that is spread, and converts raw solids into a form that is easily exported off the farm.

Finally, compost can be used as a peat substitute, reducing the need to dig up wetlands. Compost has nearly the same physical and chemical properties as peat (Inbar et al 1993). Moreover, a recent study by WSU researchers has demonstrated no significant difference in plant growth when compost was substituted for peat in growing media (paper forthcoming). With the increase in federal wetland protection, compost may become a viable alternative to peat.

Fecal Coliform Counts

Media Type	Coliform Count
Separated Solids	>70,000
Liquid Slurry	1,900,000
Maternity Waste Straw	>6,300
Mushroom Compost	980
Mushroom/Sep. Solid	1700
Passive Static Pile	1100
Aerated Static Pile	1100
Turned Windrow	<11
Turned Windrow/Worms	<12

Table 1. Comparison of typical fecal coliform counts (Most Probable Number) for raw dairy manure and compost. Note the reduction with composting. Data collected by Theresa Cramer, WSU Cooperative Extension Nutrient Management Project, 1998.

Common Weeds in Manure

Weed Name	Horse	Cattle	Swine	Sheep
Canada Thistle	N/A	No	Yes	Yes
Chickweed	Yes	Yes	Yes	Yes
Curly Dock	Yes	Yes	Yes	Yes
Dandelion	No	No	Yes	Yes
Green Foxtail	Yes	Yes	Yes	Yes
Lady's Thumb	N/a	N/a	Yes	No
Lamb's-Quarters	Yes	Yes	Yes	Yes
Quackgrass	Yes	Yes	No	No
Tall Buttercup	Yes	Yes	Yes	Yes

Table 2. A list of common weeds that remain viable after passage through the intestinal tract.

Dairy Benefits

There are benefits for the dairy farmer as well. Composting can reduce manure volume by 50-60%, reduce the moisture content, and alter consistency to a more spreadable form (Rynk 1992). These effects can improve manure handling and decrease spreading cost.

Other advantages to composting (when properly done) include odor reduction, which is particularly important as residential homes encroach upon agricultural areas. The process (when appropriate temperatures are achieved) also kills weed seeds, and pathogens such as fecal coliform.

Composting can reduce nonpoint source pollution of streams and rivers, nutrient loading, and nitrate leaching (Managing Nonpoint Source Pollution, 1992). Finally, compost can be dried and reused as bedding, reducing the cost of buying new bedding. Recycling bedding will likely become more economical as logging decreases and the price of wood chips increase.

As consumers become more ecologically conscious, they are likely to seek out products that benefit the

environment. The very act of composting does much to improve the public's perception of the dairy industry. To increase sales, you should capitalize on this perception. Make it known that you are doing your best to protect our resources.

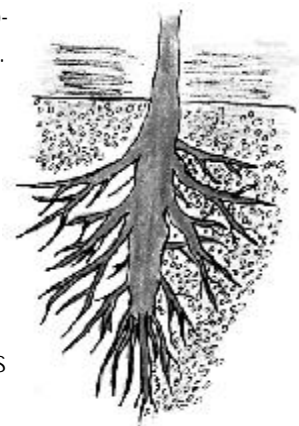
Soil Benefits

Using compost as a soil amendment conveys numerous benefits that can go a long way in promoting your product. These benefits fall under three broad categories: improvement of soil structure and chemistry, contributions of soil organisms, and effects on plant health and quality.

Let us now examine how compost affects the physical and chemical properties of soil. To begin with, it improves soil tilth and aeration. This not only improves the living conditions for soil organisms, but it also aids in root penetration. It loosens clay soils and binds sandy soils together. All of these factors create a more fertile soil and reduce erosion.

Compost also increases water retention, reducing the need to irrigate. In addition, it alters the chemical structure of nutrients to forms more conducive to plant up-take (chelated forms that stay at the surface), and by nature of its dark color, absorbs more radiant energy, warming the soil. The organic matter in compost also binds with many heavy metals and pollutants, rendering them biologically unavailable (National Research Council 1993). Finally, compost can be used in landscaping as mulch, which is particularly beneficial to shrubs and trees. As mulch, it creates a thicker boundary layer, which protects against frost, and provides a cover that inhibits the growth of nutrient robbing grasses and weeds.

What may be surprising is that nutrient value is not one of the benefits listed. This is because compost is typically low in nutrients (about 1-3% for N-P-K, though micronutrients fair better). Relative nutrient values are about the same as manure, but the volume is reduced by 50-60%. The overall nutrient content is therefore lower. This may be a drawback if your soil is nutrient deficient, but can be a benefit on farms where nutrient loading is evident. It is for this reason that many companies amend their product with fertilizer. If you choose to do this, keep in mind that natural fertilizers (horn meal, bone meal, kelp, etc.) make a more attractive product to some consumers. Compost or other products sold as a fertilizer come under other regulations - contact Washington State Department of Agriculture, or WSU Cooperative Extension for more information.



Compost increases soil porosity, aiding root penetration.

Beneficial Organisms

Beneficial organisms stimulated by the use of compost fall into three categories: macro-organisms (bugs, worms, and such), bacteria, and fungi. Algae may also play a minor role, but their contribution, if any, is small and short-term.

Macro-organisms aid composting by their ability to mechanically breakdown of materials into small fragments. This creates a greater surface area on which bacteria and fungi can feed. In addition, some macro-organisms are predatory and may feed on harmful organisms. How effective they reduce pest populations is currently unknown.

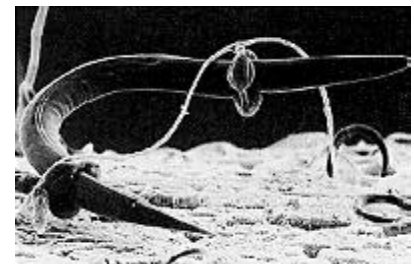
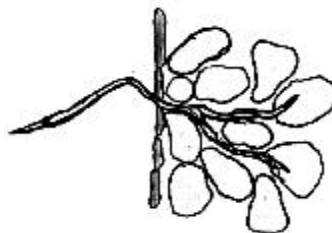
Our second group of soil organisms is bacteria. These microbes serve a variety of roles that directly



Bacteria form nodules on roots that increase nitrogen availability to plants.



Fungal mycorrhizae penetrating root cells in a symbiotic relationship that aids water and nutrient uptake.



A fungal hyphae ("root") ensnaring a nematode. © N. Allin and G. L. Barron, University of Guelph

benefit plants. Like fungi, they degrade organic matter into forms available to plants. Many can also fix atmospheric nitrogen. These nitrogen-fixing bacteria take nitrogen from the air (which is unavailable to plants) and convert it to forms the plants can use. This process can help decrease the amount of synthetic fertilizer that must be applied.

Recent research has also shown that the bacteria in compost are effective in suppressing plant diseases like Pythium, a cause of root-rot (Hoitink et al 1991, 1996, and 1997). They do this by competing for resources, by secreting antibiotics, and by elevating the plant's own resistance. According to studies, the proper use of compost can eliminate or reduce the use of pesticides, and may even be effective against diseases for which there is currently no treatment (Hoitink et al 1991, 1996, 1997).

The last group of beneficial organisms is fungi. They are essential in the breakdown of organic matter, particularly cellulose and lignins (Jurgens 1997, Raven et al 1992). In fact fungi and bacteria are the primary decomposers of the biosphere. In compost, fungi are responsible for creating humic acids, which (along with bacteria) give soil and mature compost their "earthy" smell. These humic acids, as mentioned before, are important for retaining nutrients at the surface and preventing leaching.

Fungi are also essential to plant growth and health. They form symbiotic relationships with plant roots and aid in the uptake of water and nutrients. Fungi also liberate nitrogen and carbon for use by plants. Their importance is evident by the fact that fungal mycorrhizae are found in association with over 90% of all terrestrial plants (Raven et al 1992).

Finally, some fungi secrete antibiotic compounds that can kill disease-causing bacteria. A few even kill and consume larger pests such as nematodes. They do this by ensnaring the organism when it enters a specialized ring. The ring swells up, containing the pest. The fungi then consume the organism.

Effects on Crops

It would seem that the increased nutrient uptake, resulting from fungal and bacterial associations, would increase plant yields. Indeed, many product testimonials make such claims. Unfortunately, there have been few studies, to date, that prove this claim.

Those few that exist are of mixed results.

A recent WSU study with apple orchards demonstrated no significant increase in tree growth when fertilizers were replaced by compost (Smith 1997). Yields may actually decrease for the first couple years in fields that are nutrient deficient, but will usually rebound after 2-3 years, once a reservoir of nutrients is built up.

Do not be discouraged though. Compost has been shown to significantly increase the survival rate of young apple trees following transplanting.

It should be noted that compost might improve a plant's health (Hoitink et al 1997). This is likely to translate into greater yields, but more studies are needed to confirm this.

On a brighter note, a few recent studies do seem to support the claim that compost can increase crop yields. An Ohio State University study (Subler et al 1998) found that raspberries treated with hog manure vermicompost had slightly greater growth than raspberries grown with commercial fertilizer. Unfortunately, other compost types, including yard waste, leaf litter, bark, and chicken did not do as well and even suppressed growth. It is believed that this anomaly may be due to the compost being immature and thus, containing phytotoxins (compounds poisonous to plants).

In this same study (Subler et al 1998), Marigolds and tomatoes grown in a potting mix amended with compost had significantly higher chlorophyll levels and greater growth than those grown in the potting mix alone did. This increase was noted for all compost types in the study except leaf compost. They also noted



Corn purpling, once believed to result solely from low phosphorus levels in the soil, may really be linked to a lack of fungi in the soil. Mycorrhizal associations with plant roots aid in the uptake of phosphorus.

that the best results occurred when only small amounts of compost were added (as little as 5%).

In an Idaho study on potatoes, significant increases were noted when compost was used in conjunction with fertilizer (Kimberly & Westermann 1997). When compost was added, potato yields increased by 8%, resulting in an additional \$146 per acre of marketable potatoes.

Finally, we address the question of whether compost enhances quality and nutrition. Organic growers would answer with a definitive yes. However, such conclusions usually lack verifiable evidence. The soil mineral content is the greatest factor in determining nutrition and taste.

Still, one study does seem to indicate a link between quality and compost use (Vogtmann et al). Although this German study showed higher tomato and cabbage yields with commercial fertilizers (as compared with compost alone), this was predominately due to increased water content. Moreover, carrots and potatoes showed no difference in yields when compost (amended with small amounts of organic fertilizer) and commercial fertilizers were compared.

The use of compost fared better in the matter of taste and quality. Two of the three tomato varieties grown in compost were noted as having a better flavor in a blind taste test. There was no difference in taste with the third variety. Qualitatively, the potatoes had a higher starch content when grown in compost, and the compost treated cabbage had a higher ascorbic acid (Vitamin C) content. The crops treated with commercial fertilizers resulted in dramatic decreases of ascorbic acid. Also, the degradation of carrots, cabbage and potatoes were lower when grown in compost, resulting in better storability. Finally, all crops grown in compost were significantly lower in nitrates than their counterparts grown using synthetic fertilizer.

Capitalizing on the Benefits

As you can see, there are many benefits that can be realized using compost. The key to success is informing your potential customers on the merits of using compost. One way is to provide an abbreviated list of these benefits. You can even provide them with copies of the studies.

To further promote your product, you might sponsor field tests with one of the local growers. When they realize the benefits of using compost, they will return for more. Happy customers are likely to tell their friends, and word-of-mouth advertising is often the most effective means of penetrating the compost market.

Finally, and most important, you should become familiar with these studies yourself. You'll not only become more knowledgeable, you will become more confident in your product. Remember that perception can be the key to successful marketing, and confidence in a product will create a perception of value.

An Outline of Compost Benefits

- **Converts nutrients to a more stable form**
 - Less likely to leach
 - More available to plants
- **Adds humic acid to the soil**
 - Holds 3-5 times more nutrients than soil
 - Holds nutrients in the root zone
- **Makes nitrogen more available.**
- **Increases beneficial soil organisms**
 - Bacteria can increase available nitrogen and help suppress plant diseases
 - Fungi kill pests, aid in the uptake of nutrients, and may improve product quality and yields
- **Increases water retention**
 - Reduces the need to irrigate
- **Improves soil tilth and aeration**
 - Aids root penetration
- **Reduces non point-source source pollution of surface and ground water.**
- **Substantially reduces dangerous fecal coliform bacteria.**
- **Reduces nutrient over-loading of soil**
- **Reduces volume and moisture content**
 - Easier and less costly to spread than manure
- **Can be used to amend soil, as mulch, or as a peat substitute**
- **Reduces raw manure odors**
- **Kills weed seeds and pathogens**
- **Reduces reliance on synthetic fertilizers**
- **Fungi kill pests, aid in the uptake of nutrients, and may improve product quality and yields**

Marketing Fundamentals

Although marketing can be a time-consuming process, the concepts of marketing are relatively simple. Furthermore, there is a lot of help available to those unfamiliar with this subject. Go to any public library and you will be overwhelmed by the number of books dedicated to marketing.

Unfortunately, most of the available books address marketing strategies in a very general sense. They are useful for learning the basics of marketing, but are typically lacking when it comes to addressing the compost market. Moreover, they do not provide information that is specific to a particular area. The key to successful marketing is knowing what strategies to apply to a specific product in a specific locale.

This handbook is designed to aid you in applying marketing strategies toward the compost industry. Much of the general information contained in this section has been derived from the Compost/Organics Reference Book (Downing & Associates, 1997).

In addition, it provides specific information on marketing compost in Whatcom County, which was previously non-existent. What this handbook cannot do is generate the business you seek. It can provide guidance, but success will ultimately depend on your €



General Marketing Strategy

Marketing begins with a vision. This vision is a conceptual idea of what you want to produce, how you would like to produce it, who your target market is going to be, and how your production will fit into your currently existing business plan. Once you have conceived a clear vision of what you hope to achieve, work toward that end. It is important to note that your approach should not be haphazard. Your vision must have direction, and this is achieved by setting and accomplishing a series of predetermined goals.

Setting goals can be the most pivotal factor in success. Take great care in establishing goals. Goals must have distinct purposes that are designed to facilitate the realization of your vision. For instance, it is not enough to set a vague goal like making compost. You must determine what quality and quantity is feasible, what method you will use, what equipment will be needed, and so forth (see the Equipment, Labor and Space section).

Do not make your goals too broad in scope. Keep them manageable. It is better to divide one large goal into a set of smaller goals. This makes it easier for the producer to focus on each goal individually and decreases the likelihood he/she will become overwhelmed and discouraged. Make finding/building the necessary slab-space one goal, determining the equipment necessary another, and so on.

You should also make your goals realistic. Do not over-extend your abilities. Unrealistic goals will go unachieved and discourage you. Again, limiting the scope of each goal will help in this.

Finally, your goals should be measurable. Quantify what you want to achieve and set a timeline for completion. Instead of setting a vague goal (like selling as much compost as possible), set a specific goal (produce 100 cubic yards in a year or secure one buyer a month). This allows you to measure your progress and will help in motivating you to achieve your goals.

After you have established a set of specific goals, you must identify the action steps necessary in reach-



Marketing is like a pyramid with each step building on the previous one. Build your pyramid in the wrong order and it will fall.

ing these goals. Action steps are a set of clearly defined actions you must take to achieve each particular goal. The steps should be sequential, with one leading into the next. For example, if your goal is to gain one customer a month, you might establish the following action steps: contact 10 businesses each month, provide the interested businesses with information on your product and perhaps a sample, establish a price, make one sale, and follow up the sale to see if the customer is satisfied. By setting action steps, you can better organize your approach to achieving goals and better evaluate your success.

Throughout this marketing process, there are several things to keep in mind. First, you should begin simple. Don't get bogged down with complex schemes. They will only make achieving your goals more difficult, and will discourage you when your vision fails to materialize. As your enterprise grows, complexity will come on its own.

Second, you need to remember that marketing takes time. Breaking into the agricultural market could take years. Don't get discouraged, and more important, don't let your production outpace your demand. If you do, you will end up stockpiling unsold compost (of course this is not a problem for farmers that have crop and/or grass land on which they can apply their unsold product). Start small, produce only what you can sell, and increase production as your sales increase.

Finally, you must be knowledgeable about the industry before you begin marketing and production. Insure you fully understand the composting process. This is essential. It will guide you in nearly all of your decisions, from feedstock type, process type, and market targets. You should also be familiar with local and federal regulations. If you fail to know the regulations, your product may not be up to standard and thus, unmarketable. Worse, it could involve you in legal problems and fines. Finally, you need to know your own production potential. This will aid you in determining how much you can sell, what process will be most efficient, and what equipment you will need.

Marketing Compost

There are three major steps involved in compost marketing. Although these steps may share a number of common features, they are distinct. The order in which they are pursued is also essential to successful marketing. For this reason, we shall examine each step separately and in their proper order. These steps are market identification, active market development, and product development.

Identifying the Local Markets

Developing a sales strategy begins with identifying all the potential markets, determining the product requirements for each, and evaluating which markets you can produce for. Developing a sales strategy after you have begun production can undermine your success. You may end up investing in the production of a high quality product, but find no buyers. Failure to consider the market demand before production can result in stockpiling a large volume of unsold compost. It is essential that you identify and develop the market first.

One easy way to identify potential customers is by looking through phone books and agricultural business listings. Talking to local businesses, social groups, and government agencies that deal with the agricultural community is also helpful.

Identifying the local markets provides insight into market demands. Knowing the markets will guide you in decision making and is essential for success. Market demands will influence nearly every aspect of your operation, including feedstock selections, process type, facility design, equipment used, volume produced, and

POTENTIAL MARKETS

- **Agriculture**

Orchards, Row-crop or vegetable Farms, Organic Farms, Berry Farms and Vineyards

- **Horticulture**

Landscaping/Lawn Services, Nurseries/Greenhouses, Turf Companies, Home Gardeners

- **Silviculture**

Christmas Tree Farms, Forestry

- **Land Reclamation**

Erosion Control, Roadbed Fill and Stabilization, Wetland Reclamation, Landfill Cover

- **Retail Sales**

Garden Centers, Direct Sale to Home Gardeners, Farmers' Markets

- **Other Markets**

Government Agencies (Parks, Highway, etc.), Golf Courses, Schools/Universities, Cemeteries

Typical Qualitative Requirements By Market

PRODUCT REQUIREMENTS	RECOMMENDED TEST METHOD	AGRICULTURE	EROSION CONTROL
Color	Visually Check	Brown	Brown
Odor	Sample @ 1 ft.	Low Odor	Low Odor
pH	pH Meter/Lab	5.0 to 8.0	5.5 to 8.0
Salinity (ds/m)	Cond. Meter/Lab	Less than 6.0	Varies
Nutrients	Lab Testing	N, P, K, Mg, Ca	N, P, K, Mg, Ca
Water Retention	Saturate Dry Sample & Measure Difference	>100% (200% preferred)	>100% (200% preferred)
Bulk Density	Lab Testing	Must Report	Must Report
%Moisture	Dry Sample & Measure Difference	35-55%	<55% (dry)
Organic Matter	Lab Testing	Must Report	Must Report
Particle Size	Screening	1/2" to 1"	1"
Stability	Respirometry (Lab)	Highly Stable	Mod. To High
Maturity	Germination Test	Must Pass	Not Required
Weed Seeds	Germination Test	None	Low
Inerts	Weigh Separated Inerts & Divide by Sample Weight	<1%	<1%
Pathogens (MPN)	Lab Testing	Coliform: <1000 Salmonella: <3	Coliform: <1000 Salmonella: <3
Metals/Trace Elements	Lab Testing	Must Pass	Must Pass

PRODUCT REQUIREMENTS	HORTICULTURE	MULCH	ORCHARDS/ SILVICULTURE	SOD/TURF
Color	Dark Brown	Dark Brown	Brown	Dark Brown
Odor	No Offensive Odor	No Offensive Odor	Low Odor	No Offensive Odor
pH	5.5 to 8.0	5.5 to 8.0	5.5 to 8.0	5.5 to 8.0
Salinity (ds/m)	Less than 3.0	Varies	Less than 3.0	Less than 4.0
Nutrients	N, P, K, Mg, Ca	N, P, K, Mg, Ca	N, P, K, Mg, Ca	N, P, K, Mg, Ca
Water Retention	>100% (200% preferred)	>100% (200% preferred)	>100% (200% preferred)	>100% (200% preferred)
Bulk Density	Must Report	Must Report	Must Report	Must Report
%Moisture	35-55%	35-55%	35-55%	35-55%
Organic Matter	Must Report	Must Report	Must Report	Must Report
Particle Size	1/2"	1" to 2"	Less than 1"	3/8" to 1"
Stability	Highly Stable	Mod. To High	Highly Stable	Highly Stable
Maturity	Must Pass	Must Pass	Must Pass	Must Pass
Weed Seeds	None	None	None	None
Inerts	<1%	<1%	<1%	<1%
Pathogens (MPN)	Coliform: <1000 Salmonella: <3	Coliform: <1000 Salmonella: <3	Coliform: <1000 Salmonella: <3	Coliform: <1000 Salmonella: <3
*Metals/Trace Elements	Must Pass	Must Pass	Must Pass	Must Pass

Table 3. Typical qualitative requirements by market. Requirements may vary for each business.

packaging. Tailoring your product to higher end markets may require you to invest in screening, bagging, and mixing equipment. You may even need to invest in other amendment materials and mixing equipment if you desire to enter the potting soil markets. Finally, expansion into other markets may force operational changes as your business progresses.

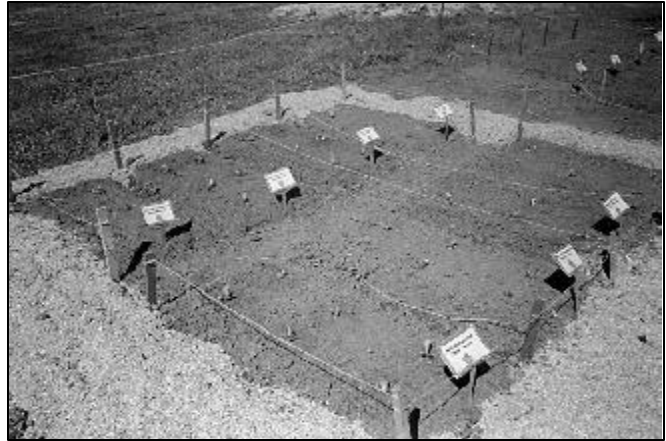
Careful attention should be given to the qualitative and quantitative requirements of each market. It is not enough to simply determine who uses compost. Different markets demonstrate different needs, and each product must be tailored to those needs. For instance, commercial nurseries rely heavily on high quality compost blended to make potting soils, while farmers require large volumes of cheap, lower quality, nutrient rich compost as a soil amendment and organic growers will have specific requirements.

For each market, you must determine the volume demand, quality level (including nutrient requirements, particle size, moisture holding capacity, etc.), packaging requirements, and distribution options. It is also beneficial to familiarize yourself with competing products, market prices, promotional strategies, and consumer concerns. This information will allow you to know your markets.

By knowing the markets, you can concentrate your efforts on those businesses for which your envisioned product is best suited. Alternatively, you can customize your product for those markets that are most attractive. Essentially, market awareness helps by insuring that your compost meets the market needs, and at a price that the consumer is willing to pay. It allows you to focus on those potential customers most interested in your product and develop a sales strategy customized for that market.

Furthermore, assessing the potential markets before beginning production can aid you in identifying market biases and pitfalls that may inhibit sales. By identifying these problems early on, you can devise better strategies for overcoming consumer resistance before investing in product development. Market feedback is an important source of information throughout the production process. It will not only identify problems; it will continually allow you to adjust your product according to the customer's needs. Listening to the customer is the beginning of a productive client relationship.

Finally, market knowledge can help you determine whether it is economically feasible to enter the local compost market.



Demonstration plots

Active Market Development

Once you have identified a number of potential markets that are interested in using compost, the next step is developing a customer base. When starting out, concerns over pricing and profits should be secondary to securing customers. There is no point in demanding a high price for your product (even if it is worth it) if that product goes unsold. Unsold compost will accumulate and devour the space that you need to produce compost. Your production will come to a halt like a clogged artery.

Begin with a fair market price, and then adjust accordingly. Because your product is new and untested, you may have to under-bid the competition until you build a solid reputation. Once you have gained customer confidence, you will be able to raise your prices. Again, it is best to start out small and slowly expand your business as demand, abilities, and finances allow.

To break into a market where customers are used to a wide selection of choices, you must carve out a niche of your own. You must demonstrate that your product provides unique advantages over competing products. Show the customer that you can provide a superior product (tailored to meet their needs) at a competitive price. Win them over by providing services that are unavailable with other suppliers. Most important, change the way they perceive compost; they must believe they are investing in a quality product.

If perception is the key to sales, education is the key to perception. As with many products, education is necessary to develop the compost market. You must educate consumers concerning the benefits of using compost, and more specifically, using your compost. More importantly, you must remember that education is an on-going process. Continue informing customers and potential customers of the benefits of using compost even after you begin making sales.

Some markets will take longer to convince. Landscapers tend to be the easiest to win over, followed by nurseries. On the other hand, farms with small profit margins, are resistant to investing money in a product unless you can prove that product will benefit them. They need to see a good return on their investment. Time, effort, and continued education will be necessary to expand into these markets.

The marketability of compost is influenced by several factors. The first is perceived value. The customer must believe he or she is purchasing a quality product. Although dairy manure has an age-old reputation as a respected soil amendment product, many people in dairy saturated counties like Whatcom County will see dairy manure as a waste product of little value. This perception must be changed. Dairy manure compost is completely different than manure itself. It provides benefits, such as humic acids, stable nutrients, and microorganisms, which cannot be realized using manure. The public needs to become aware of this if they are to perceive compost for what it is.

This brings us to a second perception that influences marketing: the substitute effect. You want consumers to view your product as unique. If they perceive your product as a substitute for other products, they will be less inclined to seek out your product. Moreover, the price you can charge is often determined by the price of the substitute. If consumers see dairy compost as a substitute for dairy manure, they are unlikely to pay more than the hauling cost. You must show that your compost is not a substitute for other products, or at least, it is a better substitute of higher value.

The next factor is the unique value effect. If you can show that your product has properties unavailable in other products, consumers will be less price-sensitive. This allows you to promote your product more effectively and command a higher price.

The unique value effect ties in nicely with the comparison effect. If consumers have no product with which they can compare yours to, price will have less of an influence on their decision. Unfortunately, there are a number of soil amendment products available. You will have to pay careful attention to the way your compost is promoted if you are to take advantage of this effect.

Finally, consumers are more willing to purchase a product if you can show that the benefits outweigh the cost of the product. This effect can be very useful, particularly when trying to sell in the agricultural market. However, few studies exist that clearly demonstrate using compost increases yields and profitability. Those studies that have indicated increased yields are cited in the Benefits section of this handbook (these are available at the WSU Cooperative Extension Office). It would be to your advantage if you became familiar with these studies or even sponsored studies locally.

By now, you should have an idea what the customer wants. Make an assessment of the market requirements before contacting potential customers. These requirements may include low prices and high quality (compost that is consistent, stable, low in salts, and free of weed seeds and pathogens). They may also include a target range for nutrient values and particle size limitations. General information concerning market requirements has been provided in Table 3. Information, specifically concerning Whatcom County markets, is provided in the next chapter.

Once you have assessed the customer's needs in a general sense, contact the perspective buyer. Reaffirm whether they use/sell soil amendment products and determine whether they would consider buying locally produced compost. Find out what it will take for them to buy your product. You can then determine whether it is technically and financially feasible to serve that business.

If you can satisfy the product requirements, try to arrange a meeting with the perspective customer. Use this meeting to sell your product. Show them that your compost will satisfy their needs at a price they are



Although the berry industry is large in Whatcom County, berry growers are reluctant to use compost unless they can see a return on their investment.

able to pay. Reassure the perspective customer of your ability to provide the required volume during the period of peak demand (usually early spring to mid summer). Convince the buyer that you can produce what they want, when they want it, at a price they can afford.

When you meet with the buyer, demonstrate the advantages of selling/using your product (whether the product is better, cheaper, easier to use, etc.). Provide the buyer with any information concerning your compost. This can include research studies, testimonials, literature, and the lab results for your compost. While addressing these issues, stress the unique benefits your product provides, tell them what makes your product different from the rest.

A product flyer that summarizes the lab analysis and beneficial uses of your product is an effective way to present this information. It is also useful to provide the perspective buyer with a sample of your product. Your confidence in the compost will go a long way in convincing the customer.

Now available. An all-natural compost produced right here on our farm. Environmentally friendly and good for your plants. Add life back into your soil or make your own potting mixes. Comes in 1 cu. ft. bags or by the yard. Delivery available. For more information or a copy of the nutrient analysis, call us at: (360) 555-1212.

When advertising or selling your compost, there are a number ways you can approach the buyer. Point out compost's uses as a peat substitute, a potting mix ingredient, and a soil amendment. Stress the benefits microorganisms provide concerning nutrient uptake, disease resistance, and overall soil health. Emphasize that your compost is an earth-friendly product that can help alleviate some of the ecological concerns currently facing the county. In a progressive, environmentally conscious county like Whatcom, such advantages can do much to sell your product.

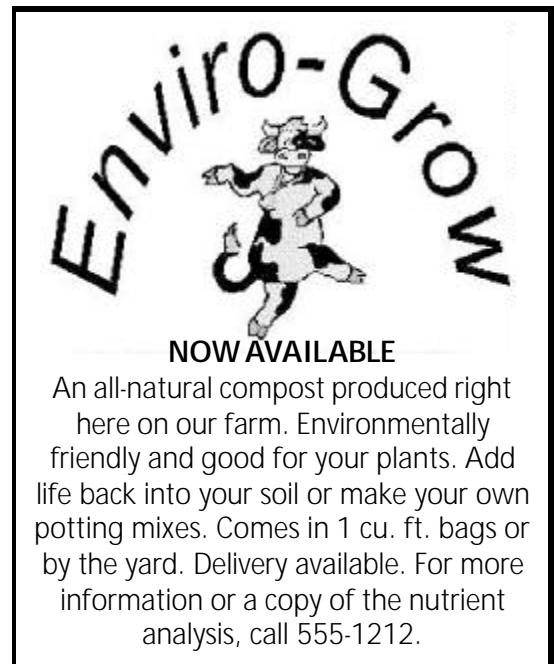
Lastly, you can provide an added incentive by offering additional services. These include free delivery for large orders, payment plans, convenient hours, and technical assistance on compost use and application. Friendly and reliable service can be the decisive factor in securing new sales and insuring repeat business.

Product Development

Product development is the last step in marketing a product. By the time you begin any large-scale production, you should have a good idea of the local market demands and be well on your way to developing those markets. You also need to have a thorough understanding of your own production potential and government regulations. Finally, you must have an intimate knowledge of the composting process. Assuming you are familiar with the process, our examination of product development will focus only on those points that affect the sale of compost.

When beginning production, your first priority is to ensure that the compost meets the consumer's requirements. This may involve amending your feedstock selection, investing in additional equipment (such as screening equipment), and/or adding extra steps to your process (such as mixing potting soils). The adjustments you make will depend on your buyer's needs. Investigating the markets and their needs provides the foreknowledge necessary to make these decisions.

When you enter production, initiate a quality control program. Consumers expect a product that is consistent in quality. Customers that are satisfied with both the product and the service are likely to become repeat customers. Sell a bad batch of compost and you are likely to lose a number of customers. If your



An example of a promotional flyer. On a normal sized flyer, you will have room to include additional information.

compost harms the user's plants, the damage to your reputation may be irreparable.

The major causes of customer dissatisfaction are poor or inconsistent quality and poor customer service. Improper planning, over-extended production capabilities, and lack of quality control are the usual sources of substandard product quality. To help avoid these problems you must do three things.

1) Plan out your production carefully. Identify any potential pit-falls (feedstock supply, delivery scheduling, process scheduling, etc.) before starting. You can then correct any conflicts before they affect your product and service quality.

2) Work within the confines of your financial and technical capabilities. Do not take orders unless you can fulfill them. Produce only the volume you can sell in a season unless you have enough covered space to store your product over the winter.

3) Initiate and maintain a quality control program. This begins by carefully monitoring the process at each step and keeping accurate records of feedstock, temperatures, moisture, and other production parameters. Keeping accurate records is particularly important in demonstrating that you achieved and sustained high temperatures. This is essential to show that you have followed the procedures for the reduction of pathogens (PFRP). In addition, regular testing by an independent lab can do much to alleviate customer concerns and instill confidence in your product. This not only provides valuable information that buyers will want, but can be used to market your product.



Customers demand a stable, weed-free product that is suitably dry for use. Moreover, the product must be available when they need it. Fulfill any commitments you make. Use customer response as a means to gauge your success. Take customer comments seriously and work with them to ensure they are satisfied. If a problem arises, correct it immediately and reassure the customer that the source has been eliminated. Happy customers are repeat customers. Moreover, happy customers will tell their friends, and word-of-mouth is the most effective means of promoting your product.

An estimate of repeat business based on the customer's product and service satisfaction.

PRODUCT EXPERIENCE	SERVICE EXPERIENCE	REPEAT BUSINESS
Positive	Positive	85%
Negative	Positive	35%
Positive	Negative	12%
Negative	Negative	1%

Pricing

Once you have secured customers, your pricing will be determined by your own production costs, customer demand, and the price of competing products. Price your product competitively, but be flexible to adjust for changes in the market.

Only the producer can determine production costs. Factors to consider are labor, capital investments in equipment, feedstock materials, packaging and promotional materials, and fuel to name a few. Transportation cost alone can account for up to 35% of your expenditures. If you consider bagging your compost, you can expect a 30% increase in costs.

To help reduce transportation costs, there are several pricing strategies at your disposal. You can provide free loading to customers that haul their own compost. You can also employ zone pricing wherein your delivery area is divided up into geographical zones. Delivery costs are then charged by which zone the customer lives in. Finally, the most popular method is base point pricing. This method assesses costs according to the distance (mileage) between the delivery site and the production site.

Investigating the local market will help you determine the customer demand and establish competitive pricing for your area. Keep in mind though, products are typically marked up 40 to 100%. If your goal is selling to retail stores and nurseries, you should expect a buying price of about one-half of what they are charging. On the other hand, retail prices are a good estimate when engaging in direct sales (which garner a higher price, but may entail greater marketing effort and lower volumes sold).

Assessing Profitability

Profitability is determined by production and selling costs. Because pricing is such an integral part in determining profitability, we will briefly examine a quick method used to determine profitability and set prices.

Profitability is estimated using the break-even point. The break-even point indicates the volume of compost you must sell at a given price to have zero profit or loss. This is achieved by dividing the fixed costs (including equipment depreciation, rent, etc.) by the difference of sale price minus variable costs (labor, etc.). The resultant number is the volume of compost you must sell at the given price to break even. The following is an example of this method:

Fixed Costs = \$10,000
Sale Price (per unit) = \$30
Variable Costs (per unit) = \$20

$$\frac{\$10,000}{\$30 - \$20} = \mathbf{1000 \text{ units that must be sold}}$$

An alternative method may be used to determine the sale price given a known volume that will be sold. In this method, the fixed costs are divided by the number of units being sold. The resultant number is then added to the variable costs to determine the price that must be charged to break even.

$$\frac{\$10,000}{1000 \text{ units}} = \$10 + \$20 \text{ (variable)} = \mathbf{\$30 \text{ (sale price)}}$$

Using the above method allows you to determine the price you must charge to break even. Any price above the one calculated represents profits.

Promotional Considerations

Once you have developed a high quality product, there are numerous steps you can take to effectively promote your compost and increase sales. These steps include pricing strategies, customer services, advertisement, displays, and product demonstrations. We shall look at a few ways to promote your product, but remember promotions are only limited by your imagination.

Promotional Pricing

Promotional pricing and discounts are effective ways to secure new customers and increase sales. However, you should not use them indiscriminately. This can cut into your profits unnecessarily. Let circumstances determine which, if any discounts to use.

The simplest promotional strategy is to offer reduced prices for first time buyers. Just be sure the price is not too low and that the customer understands this is a one-time deal. Otherwise the customer may underestimate the value of your compost and be reluctant to pay the normal price. Another method is to sell your compost at special events, such as gardening shows and grand openings, at reduced prices. This helps increase the name recognition of your compost and brings you into contact with a number of potential new customers.

Discounts may also be used to increase sales and maintain your cash flow. Offer reduced prices and financial terms for large volume sales. Provide functional discounts to your high profile customers. These entail offering reduced prices to distributors and retailers. In exchange, the retailer promotes your compost through advertisement, eye-catching displays, and/or use in special events. Offer seasonal discounts. Sales

will greatly decrease after early summer. Reducing the price in the off season can bolster lagging sales during this slow period. To improve your cash flow and keep your finances balanced, give discounts for cash payments.

Finally, you can engage in product line pricing wherein you offer a number of products. The products are priced according to their quality. This provides customers with a choice of products and prices.

Customer Service

Quality service is another excellent means of promoting your compost. You are not only selling a product; you are selling an image. Quality service demonstrates your concern for the customers and their experiences using your compost.

Customer service begins with listening to your clients and producing the appropriate product. It continues with convenient hours, prompt and reliable assistance, and technical support in using your compost. Insure all paperwork is neat and professional. Provide product information and application instructions with every delivery. You might even consider free delivery for first time buyers or for large orders.

Advertisement and Displays

There are several activities that can increase the perceived value of your product, and subsequently, the price you can command. These include demonstrations, advertisements, and displays. Finally, testimonials by satisfied customers may also increase the perceived value of your compost. Nurturing a good perception is the key to sales.

Take advantage of high-profile events in promoting your compost. Selling your product at farmers' markets, garden shows, and other agricultural events will help inform the public about the benefits of using compost. More importantly, it promotes name recognition for your compost. You can also donate (or sell at reduced cost) material to high-visibility activities, such as community gardens, field demonstrations, test-plots, and public parks. This free advertisement can go a long way in familiarizing the public with your compost.

When designing a label or product flyer, select a name that conveys a positive environmental image. This is particularly important in an area where consumers are ecologically aware. Emphasize that your compost is locally produced and creates jobs locally. It will demonstrate that you are concerned for your community ("Think globally, act locally").

In addition, your product's name and design should grab the attention of the customer. In a saturated market, customers are inclined to buy the first product that draws their attention. To catch their eye, use colors and imagery that are distinct, but not gaudy. Use a name and design that separates your product from the competition.

It is also a good idea to include product information on your label or advertisement fliers. Keep in mind, any claims concerning nutrient content and product abilities must be substantiated by a certified lab. Furthermore, if you make such claims, your product must be registered (at a nominal fee) with the Washington State Department of Agriculture. This is done to prevent deceptive advertising and insure the product adheres to the claims made.

If you chose to promote your product through conventional



Crops growing at a local Community Garden.



Selling or donating compost to high profile sites can provide free advertisement.

advertisements (newspapers, etc.), the first line should grab their attention. Any graphics should, again, be eye-catching without being gaudy. Once more, include the ecological benefits of using your compost.

It should be noted that conventional advertisement is usually not very effective in promoting compost. When is the last time you saw an ad for compost? Don't invest too much money in newspaper ads and the like. Using on-site signs and locally distributed flyers (at garden centers, farmers' markets, etc.) are good alternatives to expensive advertisements.

Instead of conventional advertisement, your time and money will be better used in promoting your product at special events and ensuring customer satisfaction. Customers are more responsive to third-party testimonials and articles. Involve yourself with local gardening clubs. One complimentary article in a gardening newsletter will do more to increase your customer base, than a dozen newspaper articles. And satisfied customers will tell their friends. Word-of-mouth advertisement is the most effective type in the composting industry.

Bagging Considerations

There are several things to consider before investing in bagging. First of all, you will have no need to bag your compost if you are selling to high-volume, bulk-sale markets. If you want to move into the retail markets, you will want to provide a bagged product.

Keep in mind that bagged sales are usually small in volume compared to bulk sales. Many large retailers buy only from distributors. This practice effectively bars you from selling to them. Furthermore, the profitability of bagged compost is small. The primary reason for bagging is to expand your market and to increase product acceptance. Bagging is more of a promotional device than a revenue maker is.

Nonetheless, there are a large number of retailers in Whatcom County that do sell bagged compost and would consider buying a locally produced product. If a producer could secure a number of these businesses, bagging might be worth the money and effort. Even if you make no profit selling bagged compost locally, you will increase customer awareness and your bulk sales should improve.

If you consider bagging, you will need a system for filling and sealing the bags. Bagging and sealing by hand is the cheapest route (you will only need a bag sealer). Unfortunately, this method is labor intensive, and many large-scale operations use bagging equipment to cut labor costs. The price of commercially available bagging equipment ranges between \$10,000-60,000. To save money, you may be able to build your own equipment by salvaging components that are available on your farm.

The cost of the bags will also increase your overhead costs (about 10 to 30 cents per bag). Overall, bagging will increase your capital costs by as much as 30%. Therefore, careful financial consideration should be made before investing in this marketing route.

Finally, if you consider bagging, 1-2 cubic foot bags are most common. There are 27 cubic feet in a cubic yard. Selling 27 one-cubic foot bags for \$1.00, you will give a \$27.00 return (as opposed to the \$10-15 you can get for a cubic yard in bulk form). After considering the cost of labor and equipment, you may be able to increase your profit by about \$1.00 per cubic yard. It is not much, but the added promotional value may make it worth your effort, provided you have the capital finances and a buyer.



LABELING INFORMATION

- Company Name
- Company Address
- Company Phone Number
- Nutrient Content (NPK)
- pH
- %Moisture
- Salinity
- %Organic Matter
- C:N Ratio
- %Humic Acid
- PFRP
- Application Information
- Certification Information

Factors for Failure

If you follow the advice provided in this chapter, you should find marketing and selling your product much easier. Keep in mind, it is essential that you know your markets first and that you secure buyers before

you enter large-scale production. Even so, there is no guarantee for success. Numerous difficulties can arise that will inhibit your sales and lead to losses.

When determining the feasibility of entering the composting business, do not underestimate the costs of labor and transportation. These can be relatively high, and failure to make an accurate estimate of their costs can lead to financial difficulties. If you underestimate these costs, you may find that you are unable to produce compost at a competitive price.

Second, low public awareness can inhibit sales. You can overcome this problem by actively educating the public about compost use and benefits. Get involved with local activities and gardening groups. The more you educate the public, the easier it will be to garner sales.

Third, poor quality of product and/or service will drive away customers. You must develop and maintain a quality control program. Customer confidence is the most important part of product development. Never sell a substandard product.

Finally, you must never cease in promoting your product. In the end, success depends on your marketing skills and your ability to nurture a positive perception toward your product. It is an on going process and can be tedious, but don't give up. As more people become familiar with your product, the job will become easier.



Whatcom Compost Markets

Once you have become familiar with marketing techniques, it is time to begin investigating the local markets. Fortunately, the WSU Cooperative Extension office has already made a survey of the compost market in Whatcom County. Thus, much of the work has already been done for you.

The goal of this survey was to identify local businesses interested in buying compost, estimate the volume of demand, and determine some of the qualitative requirements local users have concerning compost. This section will present the information gained from the survey, and provide helpful ideas for promoting your product locally. However, this information is subject to change; do not let it be a substitute for your own market research. Rather, let it be a starting point and guide for your market investigation. You will still need to contact potential customers and pitch the sale of your compost. In the end, your ability as a salesperson will be the decisive factor in success.

Local Market Identification

Using local market listings and phone books, 117 potential customers in 14 markets were identified. Surveys were sent to 89 of these potential customers (51 surveys were returned). Of those surveys returned, 34 businesses (38% of those surveyed or 66% of those that replied) expressed an interest in purchasing locally produced compost. It has been estimated that only 70% of the potential users (not including home gardeners) were contacted. Those that replied represent no more than 30% of the total number of businesses that use/sell compost. It can be assumed that the total demand for compost is appreciably higher than that determined by the survey.

It should be noted that the homeowner market would contribute a significant increase to the local demand. Over half of the sales, made by one local dairy compost producer, were to homeowners, through word-of-mouth advertising. In addition, two other dairies that produce compost make most of their sales to home gardeners.

The greatest interest in locally produced compost, besides homeowners, is from the nursery and landscaping markets. There is also considerable interest from topsoil and erosion control companies, which use large volumes of compost. Indeed, one topsoil company has expressed interest in purchasing a local producer's entire supply. They have even considered starting their own compost operation. Such interest confirms the potential for compost sales in Whatcom County.

Other local markets, including the agricultural sectors, are more resistant to purchasing compost. This is

A listing of the local markets identified and surveyed.			
BUSINESS TYPE	#SURVEYED	#REPLIED	#INTERESTED
Erosion Control	2	2	2
Garden Supplies	7	2	2
Govt., Parks & Landfill	3	2	0
Land Clearing	6	3	1
Landscaping	32	11	10
Lawn Services	8	1	1
Nurseries	24	12	9
Orchard, Apple	2	2	0
Orchard, Berry	8	2	2*
Orchard, Hazelnut	1	1	1*
Produce/Organic Farms	18	11	8
Topsoil Company	4	1	1
Tree Service	1	1	0
Turf Grower	1	0	0
TOTAL	117	51	34

unfortunate because the agricultural markets (particularly produce farms, organic farms, and orchards) represent high volume, bulk sales. In fact, it is their need for high volumes that contributes to their reluctance.

Unlike homeowners, farms would have to invest a considerable amount of money into compost. Most of these farms have limited financial resources and are reluctant to make such investments. The compost would have to be very inexpensive for them to consider buying it; the price they can afford will likely be lower than the production cost of most operations.

Moreover, farmers want proof that they will benefit from using compost. They need to see a return on their investment, such as higher yields and disease suppression. In addition, many farmers are convinced that mushroom compost is a superior product. If you want to expand into these markets, you will need to overcome these market biases and demonstrate that using your compost will be worth their money. Consider working with the farmer to establish an on-farm trial, but keep in mind that some results of compost take multiple years to become apparent.



Bulk compost sales at a local nursery.

Local Volume Demand

An estimated 40,000 cubic yards of compost is sold each year in Whatcom County. Another 40,000 cubic yards of potting soil and mulch is sold annually. The largest markets are garden centers, nurseries, topsoil companies, and erosion control companies. It should be noted that the demand by erosion control companies fluctuates from year to year. For instance, one company expects to use 10,000 cubic yards in the coming year (for road repair work). Thus, the estimated demand could be substantially higher.

With demand for organic goods increasing annually, organic farms should become another viable market, provided you can overcome the product biases and price barriers. Local orchard markets may also become profitable, if you can show they will get a return on their investment. However, breaking into these markets will take time and considerable effort.

Even without the organic farm and orchard markets, there is still a considerable demand for compost in Whatcom County. The current volume demand is sufficient to support at least a few, relatively large operations. Unfortunately, most of the businesses contacted already have a supplier. This is not to say they are opposed to buying from a new, local supplier; many of them are excited at the prospect. But you will still need to convince them that you can produce compost that meets their demands, at a competitive price. Success will depend on your skills as a salesman and educator. A list of local businesses potentially interested in buying locally has been included in Appendix B.

Volume demand by local markets. Values given represent only those business which responded to the survey.

BUSINESS TYPE	MANURE	LOCAL VOLUME COMPOST	DEMAND MULCH	AMENDED
Erosion Control	0	1500+ cy	1500+ cy	0
Garden Supplies	0	3700+ cy	2000+ cy	1500
Land Clearing	0	Unsure	0	0
Landscaping	115 cy	540+ cy	310 cy	0
Lawn Services	0	Unsure	Unk.	Unk.
Nurseries	2150 cy	2750 cy	50 cy	630 cy
Orchard, Berry	0	0*	0	0
Orchard, Hazelnut	0	0*	0	0
Produce/Organic Farms	3 mil. Gal.	170+ cy	0	0
Topsoil Company	1200 cy	3500 cy	0	0
Total	3465+ cy	12160+ cy	3860+ cy	2130+ cy

Local Demand Price

Although it appears there is enough interest to sustain a moderate composting industry in Whatcom County, price is a decisive factor for many of the potential customers. The less you charge, the more likely you are to find a buyer. Yet, you must be able to cover your operational costs. Because price is so important, the WSU Cooperative Extension survey included questions to help determine what the market value is for compost.

The survey found a considerable range in what customers were willing to pay. In general, customers that use large volumes of compost require lower prices. This can limit production opportunities unless you keep operational costs at minimum. Even then, your break-even price may still be too high for some customers. The reluctance of many to pay a higher price is because they perceive compost as a low value waste product. Only when this perception is changed will they pay more.

Even with all the variance in prices, a price range between \$8.00 to \$13.00 should satisfy most of the markets. As the markets develop and your reputation builds, producers should be able to command a higher price. Until then, you will have to watch your production costs closely.

It should be pointed out that the survey primarily concentrated on bulk sales. Bulk compost operations are the easiest with which to enter the industry. Moreover, they require less start-up investment (most dairy farms have the necessary equipment), and the majority of compost sold (by volume) is in bulk form.

Nevertheless, the survey did make a perfunctory inquiry into the bagged retail market. It found a substantial market for bagged products. If you consider the majority of homeowner purchases, this market could rival the bulk sales markets. In addition, the profit margin may actually be higher, depending on the cost of bagging equipment, supplies, and the additional labor.

These characteristics can make the retail market appear very inviting, but there are several obstacles that inhibit success. The additional investments and labor required often negate any added profits. Local retailers may be unwilling to pay as high a price for a new, untried, and unknown product. Most of the sales involve mixes and blends, so you will have to expand your product line and invest in extra ingredients. Finally, the larger retail chains buy from distributors and are unwilling to buy locally (though there are a number of local retailers that might be interested in buying locally).

With all the limitations, one should not rush blindly into the retail market. Establish a product name first. Once you have the confidence of your clients, they will be more receptive to carrying your bagged products.

Listed in Table #8 are the retail price ranges for bagged compost. Before you become



A local produce farm that regularly amends their soil with compost.

Overview of the price ranges local markets are willing to pay for bulk compost.

BUSINESS TYPE	DEMAND PRICE RANGE (BULK)				MEAN PRICE COMPOST
	MANURE	COMPOST	MULCH	AMENDED	
Erosion Control	0	\$11-15	\$11-15	0	\$13.00
Garden Supplies	0	\$5.00	0	0	\$5.00
Land Clearing	0	Unsure	0	0	Unk.
Landscaping	0	\$6-25	\$11-20	0	\$13.55
Lawn Services	0	Unsure	Unk.	Unk.	Unk.
Nurseries	0	\$6-20	\$6-20	\$43	\$10.80
Orchard, Berry	0	0*	0	0	Unk.
Orchard, Hazelnut	0	0*	0	0	Unk.
Produce/Organic Farms	0	\$1-12.50	0	0	\$7.80
Topsoil Company	0	\$6-10	0	0	\$8.00
Total	0*	\$1-25	\$6-20	\$43	
Est. Mean Price (cy)	0*	\$11.50	\$14.00	\$43.00	\$11.50

exited at these values, you should be reminded that retailers typically mark up their products by 40-100%. If you are seriously considering the retail market, you will need to contact potential buyers first.

Price ranges retailers charge for bagged soil amendment products.					
Product Type (Bagged)	Retail Price Range	Sales Pricing Mean Price	Annual Volume Demand*	Buying Price*	Revenue cy Bagged
Chicken Manure (cft)	\$2.29-3.49	\$2.83	Unk.	Unk.	
Steer Manure (cft)	\$1.09-2.19	\$1.52	Unk.	Unk.	
Steer Manure (1.5 cft)	\$2.99	\$2.99	Unk.	Unk.	
Bedding Mix (cft)	\$2.99	\$2.99	Unk.	Unk.	
Bedding Mix (1.5 cft)	\$3.49	\$3.49	Unk.	Unk.	
Cow Manure Compost (cft)	\$1.99-2.99	\$2.49	200 bags	\$1.30	\$35.10
Garden Compost Mix (cft)	\$2.99-3.99	\$3.61	Unk.	Unk.	
Garden Compost Mix (1.5 cft)	\$3.99-5.99	\$5.67	Unk.	Unk.	
Mushroom Compost (cft)	\$2.99-3.49	\$3.24	Unk.	Unk.	
Org. Compost Mix (cft)	\$1.99-4.99	\$3.49	Unk.	Unk.	
Org. Compost Mix (1.5 cft)	\$2.99-6.99	\$4.99	Unk.	Unk.	
Potting Soil Mix (cft)	\$2.49-4.99	\$3.92	Unk.	Unk.	
Potting Soil Mix (1.5cft)	\$2.99-6.99	\$5.09	1000 bags	\$5.40	\$145.80
Potting Soil Mix (2 cft)	\$5.39-8.49	\$6.79	Unk.	Unk.	
Peat (cft)	\$5.99-6.99	\$6.32	Unk.	Unk.	
Peat (3.8 cft)	\$8.99-10.99	\$9.99	100 bags	\$7.00	\$189.00
Mulch, Bark (2 cft)	\$3.49-3.89	\$3.69	Unk.	Unk.	

Local Quality Requirements

The qualitative requirements demanded by potential customers vary greatly, both between each market and within. Nonetheless, the survey was able to provide some general information concerning quality concerns. These are listed in Table #9, along with those factors market respondents considered most important in determining whether they would buy.

Qualitative concerns local markets have concerning compost.						
Product Quality Concerns based on Local Market Survey (WSU-Whatcom County, A. Cramer)						
PRODUCT CONCERNS	AGRICULTURE	EROSION CONTROL	LANDSCAPING	NURSERIES	RETAIL	TOPSOIL COMPANIES
Particle Size (inch)	1/8" to 1/2"	1/2"	1/8" to 1/2"	1/8" (coarse)	1/8" to 1"	1/8" to 1/2"
Moisture Content	Low-Moderate	Low	Moderate	Low	Low-Moderate	Low-Moderate
Moisture Retention	Mod.-High	High	Moderate	High	Mod.-High	Mod.-High
Color	Unimportant	Unimportant	Dark	Unimportant	Unimportant	Unimportant
Odor	Unimportant	Unimportant	Low/No Odor	Low Odor	No Odor	Low Odor
Consistency	Fairly Important	Important	Very Important	Very Important	Very Important	Very Important
Nutrient Content	Very Important	Very Important	Very Important	Very Important	Important	Very Important
pH	Very Important	Very Important	Very Important	Very Important	Important	Very Important
Low Salinity	Very Important	Very Important	Very Important	Very Important	Very Important	Very Important
Decisive Factors	Price Quality	Price	Quality Consistency	Availability Price Quality	Quality	Price Consistency

An overview of the local markets

including volume demand and market potential.

MARKETS	COMMENTS
Agriculture	
Orchards Produce Farms Organic Farms Viniculture	Large volumes; quality standards high; can be no weed seeds or pathogens; cost is a decisive factor; moderate to high potential locally; orchard markets reluctant unless benefits can be demonstrated
Horticulture	
Landscaping/Lawn Services Nurseries/Greenhouses Sod Production Turf Companies Home Gardeners	Small to large volumes; most require high quality; no weed seeds or pathogens; most have current source and be reluctant to change, but potential is good locally; quality, price and consistency are decisive factors
Silviculture	
Tree Farms Forestry Field Nurseries	Moderate to large volumes; cost and quality are decisive; currently little local interest
Land Reclamation	
Erosion Control Roadbed Fill and Stabilization Wetland Reclamation Landfill Cover	Large volumes; slightly lower quality may be acceptable; must be registered; price is decisive; large potential, though demand is sporadic
Retail Sales	
Garden Centers Hardware Stores Drug Stores/Markets Nurseries Home Gardeners Farmers' Markets	Small to large volumes; require highest quality; retailers typically require product be bagged (though there is a significant demand for bulk compost); large potential with homeowners and farmers' markets; retail market fairly saturated, requiring aggressive marketing, retail chains do not buy locally; price and quality are decisive
Other Markets	
Govt. Agencies (Parks, DNR, etc.) Golf Courses Schools/Universities Cemeteries	Small to moderate volumes; price is an issue; currently no interest locally

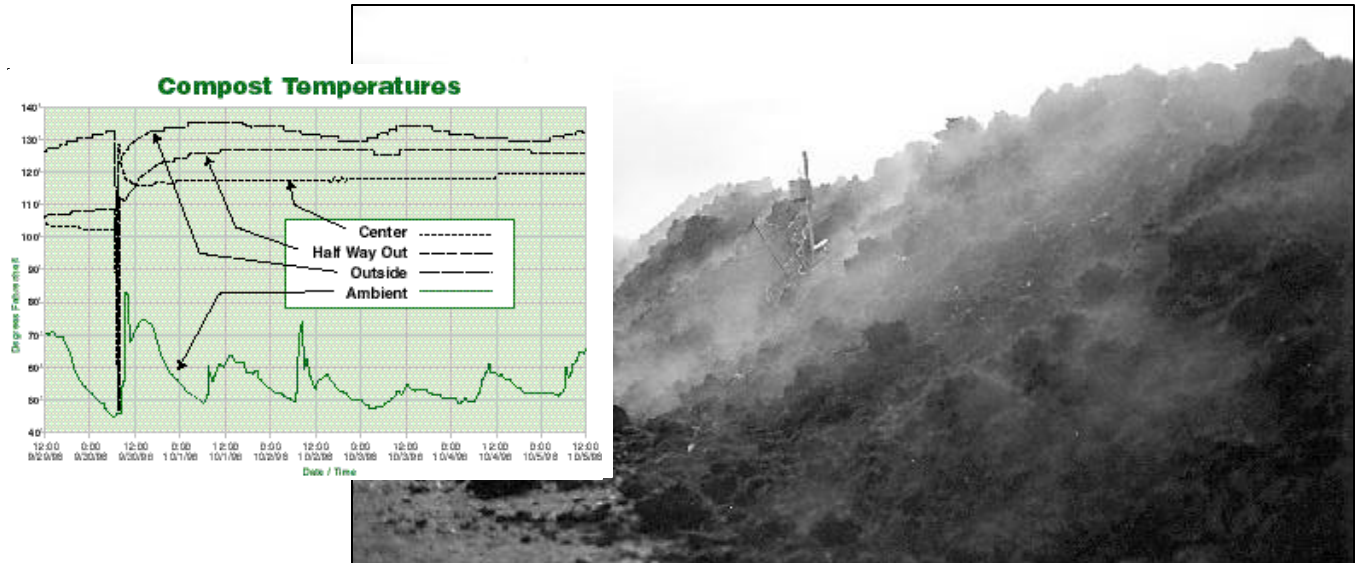
Local Promotional Considerations

Manure compost can be promoted as a biologically active amendment that will benefit the soil and plants. This may help to overcome the perception that manure is merely a waste by-product of livestock keeping. To help you secure sales, use the strategies mentioned in the General Marketing section. Educate perspective buyers on the benefits of using compost and provide exemplary services and high quality.

One market competitor in Whatcom County is spent mushroom compost, which often sells at a lower price. The superior qualities of manure compost should be pointed out, that it is lower in salts, usually more stable, and not likely to burn plants.

The compost market in Whatcom County has great potential. The key to your success will be education, quality control, developing and nurturing close relationships with your clients, and ultimately, your skill as a salesperson. Developing the local markets will require a good deal of work, and more importantly, time. If you choose to make a try at it, be patient and don't give in quickly. The reward for you can be added income; the reward for everyone is a healthier environment.

On-Farm Composting



Temperature monitoring in compost piles provides a means of demonstrating to potential customers that temperatures have reached sufficient levels for pathogen reduction and weed seed kill.

Regulatory Requirements

The US Environmental Protection Agency, the Washington State Department of Ecology, and the Whatcom County Department of Health and Human Services (HHS) have all established guidelines concerning compost production. The final authority, however, rests locally with the HHS.

HHS has established rules based on a tiered system of feedstock qualities.

- On-farm operations that compost Tier 1 feedstocks on the property of origin are exempt from solid waste regulation.
- Compost produced from Imported Tier 1 and Tier 2 feedstocks will require HHS review of farm/nutrient management plans. HHS will determine permitting requirements on a case-by-case basis.
- Compost derived from Tier 3 feedstocks will require a solid waste permit.

Feedstock Tiers

- Agricultural crop residues
- Culled plants (including nurseries)
- Orchard waste (including apple/berry pulp, windfall apples, berry canes, leaves, prunings, weeds, grass)
- Waste straw and hay
- Silage spoilage
- Herbivorous animal manures

Tier 2

- Wood waste
- Source separated yard/garden waste

Tier 3

- Source separated (meat/dairy free) food waste
- Brewery waste (possibly tier 2, depending on waste)
- Culled animals
- "Large" volumes of yard waste
- Fisheries processing waste
- Paper pulp

Compost Quality Registration

All regulated compost must be registered with the Whatcom County Health Department. Registration requires that the compost be tested during the first year of production. Further testing will be required at period intervals. The testing schedule will be determined by the Health Department, and will be based on history of compliance, feedstock used, and other criteria. For operations that require a solid-waste handling permit, registration and compliance testing will be built into the permit.

Finally, any producer may voluntarily apply for compost registration, even if their product is exempt from regulation (Tier 1 and some Tier 2). Although this entails process sampling and lab analysis, Tier 1 compost should easily meet the registration standards. More importantly, registration may be advantageous in promoting your compost. It provides a certified grade for your product. This will instill confidence in your product by demonstrating adherence to a strict quality-control program.

In addition, some consumers may require proof that your product meets federal regulations. For example, the erosion control industry usually requires that the compost they buy be Grade AA certified. If you desire further information concerning Whatcom County compost regulations and registration, contact the Whatcom County Health Department.



Equipment, Space, & Labor

The size, scope and sophistication of composting facilities vary greatly. To provide any reasonable estimate of operating costs for a facility requires detailed, site-specific information. Such details and estimations are beyond the scope of this manual. However, it is possible to present some general information concerning capital investment requirements, land requirements, and labor expenditures. For a more detailed breakdown of estimated labor and equipment costs, refer to the On-Farm Composting Handbook (Rynk 1992).

Composting Methods

One of the largest factors determining operational costs is the method employed. This largely dictates your capital investment, labor, and space requirements. It will also influence your production rate and the quality of your end product. Because method selection is such an important factor, we will briefly examine several of the most common types: passive windrow, turned windrow, aerated static pile, in-vessel, and vermicomposting.

• Passive Windrow

This method is by far the simplest and cheapest. It also produces the poorest quality compost, and from a commercial standpoint, it has the least value. The method entails little more than piling up your waste and letting nature take its course. The



A typical compost windrow.

A comparison of the requirements demanded by each method

Evaluation Of The Five Composting Methods		(adapted with permission from the B.C. Agricultural Composting Handbook)			
	Passive Windrow	Turned Windrow	Aerated Static Pile	In-Vessel/ Channel	Vermi-composting
General	Low Technology Low Quality	Low to Moderate Technology Moderate to High Quality	Moderate to High Technology Moderate to High Quality	High Technology High Quality	Low Technology High Quality
Labor	Low	Moderate to High	Moderate	Moderate (close monitoring)	Low
Equipment	Loader	Loader/Turner	Loader, Pump, Aeration Pipes	Extensive & Expensive	Low (substantial building req.)
Land	Moderate	Moderate	Low to	Low	Large
Requirements	to Large	to Large	Moderate		
Bulking Agents	Required to Increase Porosity	Flexible	Required to Increase Porosity	Flexible	Flexible
Active Period	6-24 months	21-40 days	21-40 days	21-35 days	Variable
Curing Period	Not Applicable	30+ days	30+ days	30+ days	Not Applicable
Size: Height Width	1-4 meters 3-7 meters	1-2.8 meters 3-6 meters	3-4.5 meters Variable	Dependent on Vessel Size	<1 meter Variable
Aeration System	Natural Convection	Mechanical Turning	Forced Aeration	Mechanical Turning	Natural & Worm Assisted
Process Control	Initial Mixing Only	Initial Mixing Turning	Initial Mixing, Aeration & Temperature	Initial Mix, Aeration, Temp., & Turning	Initial Mix & Added Feed-stock
Odor	Odor Can Be Substantial	Low Odor	Low to Moderate	Low Odor (if well monitored)	Odor Can Be Substantia

biggest drawbacks include poor quality, odor production, and the substantial amount of space and time it requires. Considering its low market value, this method is best used only if the farmer is applying the compost to his own land.

• Turned Windrow

Turned windrow composting requires more capital and labor than the static pile, but the expenditures are still reasonable because most dairy farmers already own the necessary equipment. Final product quality is high, while the composting period is short (freeing up space). For these reasons, the turned windrow method is the most popular method for on-farm composting.

For smaller operations (250-400 head), turned windrow composting can be carried out with little more than a front-end loader and a free slab of cement (with proper drainage). For creating a more uniform, higher quality product, a manure spreader is useful. Keep in mind that turning requires a moderate amount of labor. For larger operations, a windrow turner can greatly reduce labor costs. This piece of equipment can run from around \$10,000 (for one that is pulled by your tractor) to \$200,000 (for a fully integrated, self-contained unit).



• Aerated Static Pile

This method reduces labor, but requires a greater capital expenditure. It also requires close process monitoring, or the product quality will suffer. Essentially, an aerated static pile is a windrow piled up over aeration pipes (perforated PVC pipes). Air is blown into the pile by a fan. To be effective, the system should have a monitoring system that measures temperature and oxygen levels. This system, which can be moderately expensive, regulates the aeration to insure optimal conditions.

One major drawback is that aeration is often not uniform throughout the pile. The forced air tends to take the path of least resistance, forming channels through the pile and leaving areas deprived of oxygen. Adjusting the porosity of the pile with bulking agents can reduce this effect, but these can create additional costs of their own. Overall, quality control can be problematic using this method. Therefore close monitoring is necessary.



The formation of an aerated windrow. Note the straw that is placed over the pipe to increase porosity.

• In-vessel / Channel Composting

Although labor expenditure is usually low, the product quality is high, and the space requirements are small, this method is usually beyond the means for most on-farm operations. It requires investment in very expensive equipment, skilled labor, and extensive computerized monitoring systems. This system is management intensive and requires close supervision. And although the system itself does not require as much space as the other methods, it requires just as much space as the other methods for curing the compost.

This process uses mechanical devices to actively mix or aerate the compost. These devices can be one of three types: a large, rotating drum into which the feedstock is placed and turned; horizontal or vertical silos with built in augurs that mix the compost; and walled channels that are



A prototype in-vessel composting operation. This method involves considerable equipment and investment.

aerated from below and have a mechanized turner that moves along tracks. In addition to the capital investments required, these systems are automated and incur additional costs for complex computer systems and repairs.

• Vermicomposting

This is perhaps the least expensive method. It requires little in the way of equipment and labor. The only major requirement is a large amount of covered space, the means to move the materials (a turner or Bobcat), and screening equipment. Once the piles are formed, the worms (which can generate revenue themselves) do most of the work. The process has many variations, but we'll only consider the two most popular.



The first involves building small windrows of waste (less than three feet high) and then introducing the worms. As the worms consume the material, new feedstock is added onto one side of the windrow. The worms will move into the fresh "food," leaving the casting rich material to be collected and screened.

The second method involves spreading the feedstock over raised beds that are made with a fine screen on the bottom. New material is added on top, allowing the composter to scrape the castings free from the bottom. A mechanized scraper, which moves across the bottom, is often employed.

Both of these processes produce a product that is high in demand. There are a few drawbacks to point out though. First, vermicomposting tends to be of a smaller scale (though capital investments in more elaborate systems can increase the size of the operation). Second, the worms must be enclosed within a roofed area for best results. This modifies the temperature (cold worms aren't very active and don't eat much) and prevents the pile from becoming saturated. Enclosure also requires that water be periodically added to the pile to insure optimal conditions. Finally, vermicomposting requires screening equipment to separate the worms from the castings. This last issue is inconsequential when you consider that all composting methods require screening to produce the highest quality products.



A drum type screening system.

Financial Considerations

There are many publications that provide an overview of production costs associated with composting (for instance, the [B.C Agricultural Composting Handbook](#), and the [On-Farm Composting Handbook](#)). However, these estimates serve only as examples in a very general sense.

Composting operations are highly variable and depend on a number of factors. These include, the system used, the type of feedstock used (importing material from off the farm incurs large transportation cost that may or may not be offset by tipping fees), the scale of the operation, and the amount of space, buildings and equipment that is already in place.

To determine any realistic estimate would require information particular to your operation. Again such estimates are beyond the scope of this handbook, but following should be considered: current equipment and infrastructure available, scale, fuel, transportation, and labor. Depending on these factors, capital costs could range anywhere from a few hundred to several hundred thousand dollars. To be cost effective, you want to incorporate the resources you already have and minimize additional expenditure. Fortunately, dairy farmers are at an advantage in this sense and with some careful planning, you can begin operations with little capital investment.

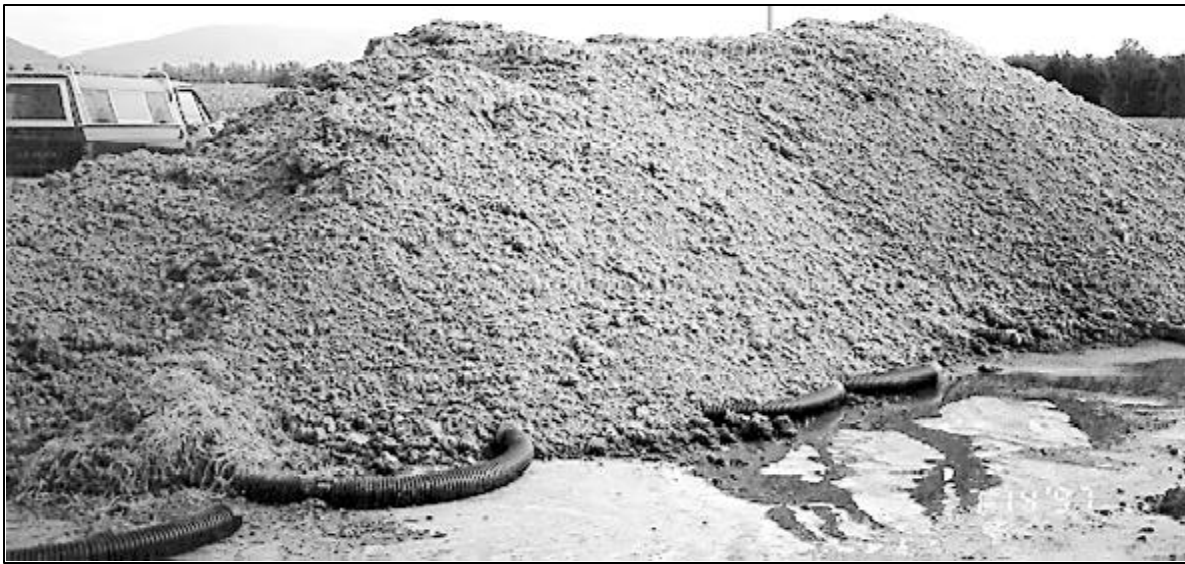
Begin by determining what scale of operation is feasible for you. Identify and assess the costs for operating the equipment you have. Keep in mind fuel costs, repairs, and equipment depreciation. Determine the amount of labor you can invest. Once you've made these estimates, you can develop an operating budget.

Next you what to create a cash flow budget. This budget identifies income and expenditures that affect

the operation. You should make note of when expenditures will be necessary and when you can expect revenues. This way you can better coordinate your finances.

Finally, you need to assess the capital investments required for purchasing additional equipment and infrastructures that may be needed. This is your capital expenditure budget, and for many farmers can be a limiting factor. For additional help in budgeting your operation, you might consider reading the On-Farm Processing handbook or the Preparing a Business Plan handbook (both are from the Canadian Farm Business Management Council). Also, the On-Farm Composting Handbook (Rynk 1992) offers a list of suggested prices for a variety of necessary equipment.

If you are considering financial aid, there are several avenues for you to approach. These include banks, loan agencies, and even grants. It is imperative that you develop a strong business plan before seeking financial assistance. You want to demonstrate that you have carefully thought out this venture and have a competent knowledge of the field. Learn all you can about the technical, social, and political aspects of composting. Know what the federal and state requirements are for setting up a composting facility (there are several guidebooks included in the publications listing at the end of this book). Most importantly, become familiar with the market. You'll need to convince them that you can not only produce a quality product, but that you can sell that product as well. The Compost Facility Financing Guide, put out by The Composting Council may help you prepare in this matter.



Appendix A

Compost Use Guidelines

To help promote your compost, it is useful to provide your customers with application guidelines. This section will provide information on applying compost and a number potting soil mixes that you or your client can blend.

Application Guidelines

There are three important things the user must know to properly apply compost: soil type and characteristics, plant species with which the compost is to be used, and the compost characteristics. For instance, soils that are high in clay content may prove problematic. Adding many types of compost will only increase the water retaining ability of the soil. In this case, you may want to add compost that contains coarse particles. It is also important to remember that increasing the organic matter of soil (by adding compost for example) will raise the pH tolerance of plants that prefer acidic conditions. Thus, although compost may slightly elevate the pH, acid-loving plants will still thrive due to the increased organic matter.

Unfortunately, the variables influencing compost application are too numerous to cover in this handbook. It is best if you consult a gardening book to guide you in the application of soil amendment products. In addition, there are several guidebooks that provide general information on application rates (The Field Guide to Compost Use 1996, A Farmer's Field Guide to Compost Production and Use 1996). Typically, 145 cubic yards of compost (50% organic matter) will raise the organic matter for one acre of silt loam soil by 2%. For most soil types, the application of 1/2 to 1 inch should suffice. Again though, you need to know your soil and compost characteristics to be sure.

Potting Soil Mixes

The following potting mixes incorporate compost in their blends. These recipes may help provide your customers with ideas for using compost other than land application. Note: mixes may provide inadequate plant nutrients in which case a fertilizer supplement should be used.

Starting Mix

- 6 gallons sphagnum peat moss
- 4.5 gallons compost
- 4.5 gallons vermiculite
- 1/4 cup lime
- 3/4 cup colloidal phosphate
- 3/4 cup greensand
- 1/4 cup bone meal
- 1/8 cup kelp meal

Potting Mixes

Mix#1

1 part compost
1 part topsoil
1 part sharp sand

Mix#2

10 gallons sphagnum peat moss
5 gallons sharp sand
2.5 gallons topsoil
2.5 gallons compost
1/2 cup ground limestone
1 cup blood meal
1 cup rock phosphate
1 cup wood ash

Mix#3

6 gallons compost
3 gallons topsoil
2 gallon sand
1 gallon aged manure
1 gallon sphagnum peat moss
2 cups bone meal
2 tablespoons lime

Mix#4

2 parts compost
1 part sphagnum peat moss
1 part vermiculite

Mix#5

5 gallons garden soil
5 gallons sphagnum peat moss
5 gallons compost
5 gallons vermiculite
1 cup bone meal
1 cup blood meal
1 cup greensand
1 cup limestone

Mix#6

1 gallon compost
3 gallons sphagnum peat moss
6 gallons sand
3/4 gallon calcium carbonate
1/2 gallon rock phosphate
1/4 gallon pine fines

Mix#7

9 quarts compost
3 quarts garden soil
3 quarts sharp sand 3 quarts
vermiculite
1 cup greensand
1/2 cup blood meal
1/2 cup bone meal

Appendix B

Interested Local Users

The businesses listed below have expressed interest in buying locally produced compost. The quality requirements, volumes, and prices vary for each business. It is, therefore, suggested that you contact any potential customer prior to production to determine their particular needs and whether you can produce compost at the price they are willing to pay. It should also be pointed out that this list is not all-inclusive, but only represents those businesses that completed our survey and agreed to be included in this list.

Diversified Farms

Alm Hill Garden

Contact: Ben Craft, Ph.# 966-4157
3550 Alm Rd.
Everson, WA 98247
Bulk

Erosion Control

A-Total Service

2727 Jensen Rd.
Bellingham, WA 98226
Ph.# 676-0885
Bulk

Matia Contractors Inc.

Contact: Chris, Ph.# 384-4771
P.O. Box 595
Ferndale, WA 98248
Bulk

Garden Supply

Farmers Cooperative (CENEX)

3500 Guide-Meridian Rd.
Bellingham, WA 98225
8353 Guide-Meridian Rd.
Bagged & Bulk

Westside Building Supply

Contact: Ken Rose Ph.# 671-3003
Lynden, WA 98264
Bagged (Bulk?)

Land Clearing

Barker's Wood Chipping Service

Contact: Herb Barker Ph.# 734-7814
4135 Hannegan Rd.
Bellingham, WA 98226
Bulk

Landscaping

Cloud Mountain Nursery & Landscape

Contact: Tom Thorton
6906 Goodwin Rd.
Everson, WA 98247
Ph.# 966-5859
Bulk

Coast Landscape Service

109 N. 34th St.
Bellingham, WA 98225
Ph.# 671-8613
Bulk (mulch)

Dexter Landscape

Contact: Craig Dexter
5652 Chestnut Ct.
Ferndale, WA 98248
Ph.# 384-0581
Bulk

Ecological Solutions

Contact: John Haggerty
P.O. Box 2295
Bellingham, WA 98227
Ph.# 647-8603
Bulk

Green Thumb Landscaping

Contact: Amy
P.O. Box 5414
Bellingham, WA 98227
Ph.# 671-5296
Bulk

Northwest Mowing & Gardening

Contact: Debra Johnson
P.O. Box 28092
Bellingham, WA 98227
Ph.# 739-1416
Bulk

Landscaping continued

Private Gardens
4402 Y Rd.
Bellingham, WA 98226
Ph.# 592-2223
Bulk

Turftenders
Contact: Larry Stock
Ph.# 398-1710
Fax# 398-8649
Bulk

Valley View Landscaping
Contact: Mike Gellum
7237 Valley View Rd.
Ferndale, WA 98248
Ph.# 366-4340
Bulk

Nurseries

DeLancey's Garden Center Inc.
Contact: Mike DeLancey
1951 Main St.
Ferndale, WA 98248
Ph.# 384-1043
Bagged

Delta Nursery
Contact: Jim Johnston
8269 Bobhall Rd.
Lynden, WA 98264
354-4223
Bagged & Bulk

DeWilde's Nurseries Inc.
Contact: Larry Rudy
3410 Northwest Ave
Bellingham, WA 98225
Ph.# 733-8190
Bulk

Guide Nursery
Contact: Gerry Vrieling
.6090 Guide-Meridian Rd.
Bellingham, WA 98226
Ph.# 398-7706
Bulk

Sunbreak Nursery Inc.
Contact: Rick Wright
5192 Aldrich Rd.
Bellingham, WA 98226
Ph.# 384-3763
Bulk

Organic Farms

Cedarville Farm
Contact: Mike Finger
3081 Goshen Rd.
Bellingham, WA 98226
Ph.# 592-5594
Bulk

Cornerstone Farms, Inc.
Contact: Jerry Scholten
8508 Van Buren Rd.
Everson, WA 98247
Ph.# 966-4895
Bulk

Growing Garden
Contact: Brent
6063 Medcalf Rd.
Bellingham, WA 98226
Ph.# 398-7509
Bulk

Produce

Joe's Garden
Contact: Carl Weston
3100 Taylor Rd.
Bellingham, WA 98225
Ph.# 671-7639
Bulk

Topsoil

Arnold Finkbonner & Sons Inc.
Contact: Tom Finkbonner
5391 La Bounty Dr.
Ferndale, WA 98248
Ph.# 384-3232

Starkenbug & Wiersma Excavating
Contact: Stephanie Starkenburg
774 Meadowlark Rd.
Lynden, WA 98264
Ph.# 354-4936

Appendix C

Local Feedstock Suppliers

The following table provides a list of local businesses that are willing to provide feedstock materials to compost producers. Estimated volumes are given where available.

Material Type	C:N Ratio	Moisture %	Local Supplier	Estimated Volume
Alpaca manure	9:1	73%	Alta Luna Alpaca 3629 Grandview Rd., Ferndale, WA 98248	69 CY
Apple, Windfall	48:1	88%	Applewood Farm 3711 Cabrant Rd., Everson, WA 98247	10 CY
Apple, Sludge	3:1	59%	Applewood Farm 3711 Cabrant Rd., Everson, WA 98247	6 CY
Bark, Fir	496:1	19%	Delta Nursery 8269 Bobhall Rd., Lynden, WA 98264	4 CY
Chicken manure	6:1	69%	On the Spot Horse Training 1680 Pine Needle Ln., Ferndale, WA 98248	1 TON
Culled plants & prunings	19:1	30%	Delta Nursery 8269 Bobhall Rd., Lynden, WA 98264	4 CY
			DeWilde's Nursery 3410 Northwest Ave., Bellingham, WA 98225	Inquire
			Ecological Solutions P.O. Box 2295, Bellingham, WA 98227	20 CY
			Guide Nursery 6090 Guide-Meridian Rd., Bellingham, WA 98226	22 CY
			Private Gardens 4402 Y Rd., Bellingham, WA 98226	1 TON
Grass Clippings	17:1	82%	Coast Landscape Services 109 N. 34th St., Bellingham, WA 98225	14 CY
			DeWilde's Nursery 3410 Northwest Ave., Bellingham, WA 98225	INQUIRE
			Ecological Solutions P.O. Box 2295, Bellingham, WA 98227	50 CY
			Green Thumb Landscaping P.O. Box 5414, Bellingham, WA 98227	INQUIRE
			Guide Nursery 6090 Guide-Meridian Rd., Bellingham, WA 98226	3 CY
			Turftenders 398-1710	1,500 CY
			Valley View Landscaping 7237 Valley View Rd., Ferndale, WA 98248	50 CY
			Private Gardens 4402 Y Rd., Bellingham, WA 98226	1 TON

Material Type	C:N Ratio	Moisture %	Local Supplier	Estimated Volume
Hay, Waste	16:1	9%	On the Spot Horse Training 1680 Pine Needle Ln., Ferndale, WA 98248	1/4 TON
Horse Manure (straw)	29:1	72%	On the Spot Horse Training 1680 Pine Needle Ln., Ferndale WA 98248	2 TON
			The Horse & Tack Outlet 3401 Cornwall Ave., Bellingham, 98225	Lots available
Horse Manure (Woodchip)	65:1	72%	Kelly Park Stables 983 E. Kelly Rd., Bellingham, WA 98226	54 TONS
Leaves, Hazelnut	25:1	70%	Holmquist Hazelnut Orchards 9821 Holmquist Rd., Lynden WA 98264	6 TONS
Leaves, Other	54:1	38%	Coast Landscape Services 109 N. 34th St., Bellingham, WA 98225	10 CY
			Green Thumb Landscaping P.O. Box 5414, Bellingham, WA 98227	Lots available
Ostrich Bedding	< 20:1	< 60%	Dakota Creek Ostrich Ranch 1401 Marietta Ave., Bellingham WA 98226	32 CY
Sawdust/Woodchip	442:1	39%	Coast Landscape Services 109 N. 34th St., Bellingham, WA 98225	10 CY
Shrub Prunings (stumps)	53:1	15%	Private Gardens 4402 Y Rd., Bellingham, WA 98226	1.5 TONS
			Alm Hill Garden 3550 Alm Rd., Everson, WA 98247	270 CY
			Broad Horizon Landscaping 520 Mission Rd., Everson, WA 98247	20 CY
			DeWilde's Nursery 3410 Northwest Ave., Bellingham, WA 98225	INQUIRE
			Ecological Solutions P.O. Box 2295, Bellingham, WA 98227	15 CY
			Green Thumb Landscaping P.O. Box 5414, Bellingham, WA 98227	LOTS
			Private Gardens 4402 Y Rd., Bellingham, WA 98226	6 TONS
			Turfenders 398-1710 Valley View Landscaping 7237 Valley View Rd., Ferndale , WA 98248	300 CY 50 CY
Straw, Waste	80:1	12%	Hoksbergen Hay 8971 Guide-Meridian Rd., Lynden, Wa 98264	Lots available
Tree Prunings	Varies	Varies	Applewood Farm 3711 Cabrant Rd., Everson, WA 98247	15 CY
			Green Thumb Landscaping P.O. Box 5414, Bellingham, WA 98227	Lots available
			Holmquist Hazelnut Orchards 9821 Holmquist Rd., Lynden, WA 98264	6 TONS

Appendix D

Local Contacts and Agencies

The following is a list of local and government agencies involved with compost production, regulation and packaging.

US Department of Ecology

Northwest Regional Office
3190 160th Ave., SE
Bellevue, WA 98008
(425) 649-7000

USDA Natural Resource Conservation Service

Whatcom County
6975 Hannegan Rd.
Lynden, WA 98264
(360) 354-2035

Washington State University

Cooperative Extension Office
1000 N. Forest St., Suite 201
Bellingham, WA 98225
(360) 676-6736

Whatcom Conservation District

6975 Hannegan Rd.
Lynden, WA 98264
(360) 354-2035

Whatcom County Health Department

Environmental Health Division
509 Girard St.
Bellingham, WA 98225
(360) 676-6724

Appendix E

Literature Cited

- A Watershed Manager's Guide to Organics: The Soil & Water Connection, 1997. Composting Council Research & Education Foundation.
- Baril, Katherine, 1997. A New Global Problem. Environmental Research Foundation.
- Downing, Rick, 1997. Compost/Organics Reference Book. Downing & Associates. Mentor, OH.
- Extension Circular 425, 1996. Marketing On-Farm Compost. Penn State, College of Agricultural Sciences.
- Gunner, A., Barbara Brennan and Howard Joynt, 1995. Preparing a Business Plan: A Guide for Agricultural Producers. British Columbia Ministry of Agriculture, Fisheries and Food.
- Hoitink, H.A.J., Y. Inbar, and M.J. Boehm, 1991. Status of Compost-Amended Potting Mixes Naturally Suppressive to Soilborne Diseases of Floricultural Crops. *Plant Diseases*, Sept. 1991.
- Hoitink, H.A.J., A.G. Stone, and D.Y. Han, 1997. Suppression of Plant Diseases by Compost. *HortScience*, Vol. 32(2).
- Hoitink, H.A.J., David Y. Han, Matthew S. Krause, Wiezheng Zhang, Alexandra G. Stone, and Warren A. Dick, 1997. How to Optimize Disease Control Induced by Compost. Educational Update, Ohio Agricultural Research and Development Center, Ohio State University. Wooster, OH.
- Hughes-Games, G., J. Luymes and R. Van Kleeck, 1996. B.C. Agricultural Composting Handbook, 2nd Ed. British Columbia Ministry of Agriculture, Fisheries and Food.
- Inbar, Yossi, Yitzhak Hadar, and Yona Chen, 1993. Recycling of Cattle Manure: The Composting Process and Characterization of Maturity. *J. Environ. Qual.*, Vol. 22.
- Jurgens, Ralph. New Era Compost. New Era Farm Service. Tulane, CA.
- Kimberly, I.D. and Dale Westermann, 1997. Compost Study. Magic Valley Ag Weekly.
- Lindeberg, J.D. and Sharon Barnes. Composting Facility Financing Guide. Composting Council. Alexandria, VA.
- National Composting Program, 1994. Compost Facility Request For Qualifications/Proposals Development Guide.
- National Composting Program, 1994. Compost Marketing: A Planning Guide for Local Governments.
- National Research Council, 1993. Soil And Water Quality.
- Raven, P.H., Ray F. Evert, and Susan E. Eichhorn, 1992. *Biology of Plants*, 5th Ed. Worth Publishing, New York.
- Rynk, R., 1992. On-Farm Composting Handbook. Northeast Regional Agricultural Engineering Service. Ithaca, NY.
- Smith, Tim, 1997. Compost Trials in Orchards. Washington State University Extension Office, Wenatchee, WA.
- Subler, Scott, C. Edwards, and James Metzger, 1998. Comparing the effects of Vermicompost and compost on Plant Growth in Soil and Container Media. *Biocycle*, June 1998.
- USEPA, 1992. Managing Nonpoint Source Pollution.
- Vitonsek, P. M. et al, 1997. Human Alterations of the Global Nitrogen Cycle: Sources and Consequences. *Ecological Applications*, Vol. 7 (No. 3). Pps. 737-750.
- Vogtmann, H., K. Matthies, B. Kehres, and A. Meier-Ploeger. Enhanced Food Quality Induced by Compost Application. *Science and Engineering of Compost*.