



## COMPOST FACTS

- Compost contains microorganisms that help prevent damping off disease. The microorganisms in the compost are competitors of the pathogens such as Pythium and Rhizoctonia.
- Compost is a 100% organic fertilizer containing primary nutrients as well as trace minerals, humus and humic acids, in a proportion that almost exactly matches plant requirements, and in a slow release form that does not burn plants.
- Compost encourages the development of healthy populations of earthworms, beneficial insects and microorganisms.
- Increases moisture holding capacity of soils. One estimate indicates that a 5% increase in organic matter (compost) Quadruples the soils ability to hold and store water. Compost will retain ten times its weight in water yet excess water drains off easily.
- Compost helps clay soil become more friable and allows air to reach plant roots better thus improving plant growth.
- Compost helps buffer soils against extremes in acidity or alkalinity (high or low pH).
- Contains growth promoting hormones. Experiments on wheat, barley, potatoes, grapes, tomatoes, beets, etc. show that even when in very low concentrations (0.01%), humic acids in compost act to stimulate plant growth. Composting, Rodale Press, 1992.
- Compost contains Nematode destroying fungus.
- Compost helps unlock minerals present in existing soil.
- Compost helps increase air spaces, drainage and aeration of soils and resists compaction.
- Compost acts as a buffer against chemicals and absorption of dangerous heavy metals by plants.



- Compost helps maintain the soil base exchange capacity (CEC).
- Compost releases nutrients over a long period of time (up to 5 years)
- Growth hormones in compost encourage plants to develop large healthy root zones (wider and deeper) which help plants tolerate drought conditions.
- Compost is better than pine bark and peat moss- because it is alive, contains mineral nutrients (including trace minerals) and loaded with beneficial microorganisms. Pine bark and peat moss are lifeless and have little nutrient value.
- Compost is an excellent slow release fertilizer containing nitrogen, phosphorus, potassium, trace minerals, humic acids, and other needed nutrients. Compost in the soil releases its nutrients exactly when plants need them most...when they are actively growing. Note: This slow release prevents loss of nutrients to runoff and it does not pollute our waterways as compared to synthetic chemical fertilizers.
- Compost is used as a treatment for many plant diseases such as "Brown Patch".
- Compost increases the available nitrogen for plants far in excess of its own contents. Compost contains about 2-4% nitrogen. However, compost stimulates the growth of microorganisms (they use compost as a food source) and these microorganisms absorb nitrogen from the air to grow. When they die (some microorganisms have lifetimes of less than 1 hour) the nitrogen is then released to the soil for plants to use. Thus some compost's can have an effective nitrogen content of 12-18% in the best form for plants to use.
- Research at Cornell University has indicated that well aged or mature composts successfully suppress a number of turf grass diseases. Agronomy Abstracts, 1991.
- "Similarly, the application of composts or other well decomposed sources of organic matter to the turf provides substrates on which disease suppressive soil microorganisms can grow. At the same time this introduces populations of microorganisms that may reduce disease severity by interfering with the



activities of pathogenic fungi." The Biological Control Of Turfgrass Diseases" by Eric B. Nelson, Ph.D. Golf Course Management, March 1992.

- "In a sense, composting serves to fortify the organic matter with high population of disease-suppressive microbes." The Biological Control Of Turfgrass Diseases by Eric B. Nelson, Ph.D. Golf Course Management, March 1992.
- "The St. Augustine grass is much more prone to disease and insect infestation, too. We see a lot of brown patch in it, and we treat that with compost." Please Spray Off The Grass by Robert Kimber, National Gardening, May/June 1993.
- Research done at the Connecticut Agricultural Experiment Station by Dr. Abigail Maynard indicates that tomatoes grown in soil with compost are lusher, greener, and healthier as compared to the controls. RCRA Review October 1992.
- "Finished compost, or humus, is the best soil amendment." Feed The Soil, Rodale Institute.
- "...reports of experiments and commercial demonstrations showing that when properly made compost was used for the fertilization of crops, the results were increased yield and improved quality. When these crops so grown were used for food, there was greatly improved health in the domestic animals and humans. These demonstrations are so numerous and widespread as to constitute proof beyond question." Exhausted Soil Produces Exhausted People, Acres USA, June 1993.
- "Compost. The successful soil improver. It's no wonder that most gardeners feel they can never get enough." Elliot Coleman, Organic Gardening, November 1992.
- Studies have shown a 38% increase in yield when tomatoes were grown in compost as compared to native garden soil (Composting Demonstration Project, Fairfield Connecticut).
- Adding compost to commercial crops increased yields 10-135% (Applying Compost To Crops, Biocycle, June 1993).
- The beneficial aspects of humus include:



- provides a storehouse of essential plant nutrients: it stores over 95% of the nitrogen, 60% of the phosphorous, and 98% of the sulfur available to plants
  - helps make nutrients more soluble and available to plants
- contains substances that stimulate plant growth, improve crop quality, and increase a plants resistance to pests and disease.
- Research has found that the contents of plant cells (the sap) have the ability to suppress the growth of bacteria and fungi. ...organic substances produced by soil microorganisms, when absorbed through the plant's roots, increase the natural immunity of plants to infections. Soil Microorganisms and Higher Plants, N.A. Krasil'niko (i.e. fertilize with compost to ensure lots of microorganisms)
- Plant growth is often limited by the amount of CO<sub>2</sub> available to the plant. C.H. Wadleigh, 1957 USDA Yearbook of Agriculture, "Soils", (p.41). Agronomists and farmers are increasing yields by adding carbon dioxide (CO<sub>2</sub>) to their bag of practices...Carbon dioxide is a basic requirement for plant growth. October 1968, World Farming (p.31).

We have evidence that CO<sub>2</sub> produced by the respiration of microorganisms in the soil is an important factor in the supply of the gas to photosynthesizing plants. A soil rich in decomposing organic matter provides a much higher level of CO<sub>2</sub> in the air just above the soil than a barren, infertile soil.

- Compost has another benefit, if it was done at high temperatures; it kills weed seeds, and disease causing organisms (does not hurt the beneficial microorganisms). Commercial composts often meet this requirement.
- Compost is the result of the aerobic decay of organic materials. The end result is composed almost entirely of humus like materials. Humus:
  - is a complex, colloidal material (composed of small particles) containing proteins, lignin, fats, carbohydrates, and organic acids, as well as other broken-down products of the original organic matter, plus the metabolic remains of the microorganisms that did the composting (i.e. nitrogen absorbed from the air plus other valuable materials).



- is a storehouse of plant nutrients. Because of its colloidal properties, it can hold three times the amount of nutrients that clay can.
- helps make nutrients available to plants. Acids released during decomposition increase the breakdown of mineral soil particles, form chelated compounds, which speed the plant's uptake of minerals and stimulate plant growth.
- encourages living microorganisms to temporarily "tie up" or hold nutrients in their living cells, thus counteracting leaching of the nutrients into groundwater or runoff. The nutrients are released when the microbes die.
- encourages these microorganisms, especially the symbiotic mycorrhizae fungi, to actually find and "feed" nutrients to plant roots.
- When compost is used to add humus to soil it provides its beneficial properties immediately. There is no waiting weeks or months for material (i.e. green manures, etc.) to decompose in the soil and does not tie up nutrients during this decomposition phase.
- Compost encourages the growth of many types of bacteria that have the ability to help detoxify many types of pesticides, simply by using them as food. High humus levels are the most important property facilitating pesticide degradation.
- Using corn as a test crop, compost was applied at rates of 4.5 to 200 tons per acre. In these experiment yields increases were positive in all cases and ranged from 10 to 135%.
- Using sorghum as a test crop, compost was applied at rates of 3 to 150 tons per acre. In these experiment yields increases were positive in all cases and ranged from 10 to 25%.
- In one study applying MSW compost at a rate of 25 tone per acre produced higher yields than 1800 pounds of standard synthetic N-P-K fertilizer.
- Another study on oats as a test crop MSW compost was applied at 200 tons per acre. In this study yield increased by 173%. (Hortenstine & Rothwell, 1968)
- Adding MSW compost to a planting of slash pine trees in Florida increased



growth 170% as compared to controls. (Jokela, et al., 1990)

- Research has shown that compost contains weed (seed and tubers) destroying fungus.
- Trichoderma a micro-organism occurring in compost actually attacks and subdues Rhizoctonia solani the fungus that causes brown patch. "The Many Benefits Of Compost", Texas Gardener, November/December 1993.
- "Agricultural Quality of Composts Derived From Organic Wastes", Rogalski, Wojciech, ISWA Times No.3, p. 15 (1993) found the following:
  - the fertilization effects of 40 tons of compost per hectare correspond to a mineral nitrogen input of 50 kg N/hectare
  - Brown Rot infestation was less in compost fertilized lots than in synthetic nitrogen lots the application of compost leads to positive results.
- "Evaluating the Suitability of MSW Compost as Soil Amendment in Field Grown Tomatoes, Part B: Elemental Analysis", D.E. Stilwell, Compost Science & Utilization, 1(3):66-72 (1993).

Statistical analysis showed that plants grown in soils amended with compost had fruits with higher concentrations of sodium (Na) and Potassium (P) and concentrations of beryllium (Be) and cadmium (Cd) decreased.

- Research at Cornell University plant laboratories have shown compost as effective as standard fungicides in suppressing many diseases and pathogens such as pythium root rot, typhula incarnata blight, rhizoctonia solani, sclerotinia homoeocarpa, and laetisaria fuciformis. BioCycle, February 1992.

Other composts have been found to be suppressive of: phytophthora cinnamomi, rhizoctonia solani, fusarium oxyysporum, sclerotium rolfsii and pythium spp. BioCycle June 1992, p. 50.

- Studies have shown that compost can be added for three straight years in quantities to supply ALL nutrients without contaminating groundwater (*unlike synthetic chemical fertilizer*). BioCycle, April 1993, p. 76.



- Compost that has been produced using higher composting temperatures (130°F) will kill many bad diseases such as; Botrytis fungi (gray mold on fruits, flowers, & onion neck rot), Rhizoctonia fungi (damping off disease), Phytophthora fungi (late blight on tomatoes, potatoes, and related plants), Sclerotinia fungi (white rot on lettuce and onions), stem rot of tomatoes, bacterial blights (chrysanthemum, etc.), Cyst nematodes (potatoes), Southern rootknot nematodes (affect many plants). Commercial compost piles (generally hotter temperatures) will also kill Fusarium fungi and tobacco mosaic virus. Organic Gardening, November 1993.
- Extensive research in Germany has established that vegetables grown in soils amended with composted manures have better keeping quality.
- "Compost is the heart and soul of successful organic gardening." Organic Flower Gardening, Spring 1994.
- "...a variety of composts suppress rhizoctonia, pythium and fusarium diseases... compost is particularly effective against damping-off" Dr. Hoitink, Annual Review of Phytopathology.
- "Use compost to maintain about 4% organic matter in your soil (up to 25% by volume for potting). When you have the correct amount of organic matter in your soil-a condition we call microbiostasis-the beneficial organisms that fight disease will thrive." Organic Flower Gardening, Spring 1994.
- "Add some compost to your soil on an annual basis to ensure a fresh supply of food for your compost based disease-fighters. This is even more important in the South." Organic Flower Gardening, Spring 1994.
- A study by the "Clean Washington Center" and funded in part by Weyerhaeuser Company in greenhouse trials found that unamended yard trimming compost is naturally suppressive to three pathogens; fusarium solani, rhizoctonia solani, and pythium ultimum. A supplemental study showed the addition of BDCA's (Biological Disease Control Agents) to the compost increased its disease suppressive nature to 100% disease control in some cases. BioCycle, April 1994.
- Another service of compost is in neutralizing toxins in the soil. The organic acids



produced from compost have the ability to bind metals such as aluminum (highly toxic to plants and prevents the absorption of phosphorus) into stable compounds. Thus the aluminum is "locked up" in a stable complex, unable to harm plants. Composting, Rodale Press, 1992.

- The toxicity of plant poisons (high salt concentrations, heavy metals, etc.) becomes less severe in a soil high in humus (compost). Humus: Origin, Chemical Composition, and Importance in Nature, Dr. Selman A. Waksman.
- Addition of compost reduces plants reliance on specific pH levels. Often, plants that prefer a certain "acidity" or "alkalinity" can be grown outside their normal range in compost amended soils.
- Tests have shown that humic acids from compost, in addition to stimulating plant growth, also assist plants in the absorption of bitumens, vitamins, and vitamin analogs that are essential for plant health and disease resistance. Composting, Rodale Press, 1992.
- The dark color of compost when applied as a mulch in winter, helps warm the soil by absorbing heat from the sun stimulating plant growth and release of nutrients in the soil by microorganisms.
- Compost in the soil helps moderate soil temperatures. If temperatures are too high or low plants lose the ability to absorb both water and nutrients properly.
- As mentioned before compost helps to aerate the soil, good aeration helps maintain the balance of oxygen and carbon dioxide in the soil. If these are out of balance then plants lose the ability to absorb nutrients.
- Research has shown that humic acids in compost produced from manures increase a plants ability to absorb nitrogen while humic acids from materials such as peat moss do not.
- Research has shown that some of the nutrients (i.e. sugars) in compost can be absorbed directly by plants without further reduction thus saving the plant energy (in producing these compounds) that can go into other areas of growth such as larger and better tasting fruit.
- The release of nitrogen from compost parallels plant demand since microbial



activity speeds up at the same time (increasing temperatures in spring and into summer).

- Research at the Connecticut Agricultural Experiment Station has reported that root rot fungus that thrives in ordinary soil was unable to survive in compost. Many researchers now support the theory that microorganisms present in compost produce natural disease fighting antibiotics.
- Dr. H. Hoitink, professor of plant pathology at the Ohio Research and Development Center of the Ohio State University has pioneered developments of "custom" composts that suppress pythium organisms responsible for damping-off disease and root rot.
- Researchers at the University of Florida Agricultural Experiment Station have discovered that the organic matter in composts kills harmful nematodes. It seems that compost promotes the growth of certain kinds of fungi that feed on nematodes.
- Compost containing animal manures contains phenols that are toxic to pathogenic fungi. A "compost tea" made from this compost is effective in treating or preventing mildews and fungal blights. This tea is also rich in nutrients and also serves as a mild foliar fertilizer.
- Scientific researchers have observed that plants or crops grown in an organic program using lots of compost amended soil are less likely to sustain insect attack and damage.
- Hazardous chemicals such as carbofuran insecticide (carbamate family) and simazine herbicide (triazine family) were added to compost piles. Tests showed that 100% of the carbofuran was degraded and 98.6% of the simazine was degraded after only 50 days of composting. Department of Health Services, California, October 1988.
- Compost has been used to help cleanup toxic wastes and chemical spills. Bioremediation of soil contaminated with diesel, JP-4, and motor gasoline at a site (Fairbanks, Alaska) were treated with sewage sludge and composted. Within 70 days some toxins were below measurement limits and others significantly reduced. "Treatment of Fuel Product Contaminated Soil in a Cold



Climate Using Composting Technology"; T. J. Simpkin, D. Walter, J. Doesburg, June 1992.

- Activity of antagonists involved with biological control is affected by nutrients present in compost. Highly stabilized organic matter, such as sphagnum peat, does not support an actively suppressive biomass. On the other hand, 'properly' stabilized composts do support such activity. "Biologic Control of Plant Pathogens", Hoitink and Fahy, 1986.
- Annual applications (of compost) can build up reserves of nutrients, possibly providing a greater fertilizing effect than the NPK measurement would indicate. "Yard Waste Composting: Guidebook For Michigan Communities", Michigan Department of Natural Resources 1989.
- The humus molecule in compost is a long chain-like affair. It has the capacity to bind plant nutrients to itself- phosphate or nitrate for instance. It can coat itself with some amino acids, certain sugars, and a host of trace minerals, becoming a veritable sponge for nutrients. An Acres U.S.A. Primer.
- Using compost made from or with manures is better than using manures directly. USDA studies indicate that raw manure lost 50-75% of its nitrogen in storage and application. A study by Iowa State University indicated that 65% of the nitrogen, 75% of the phosphorus, and 49% of the potassium is lost when manures are spread directly on farm acres. Proper composting prevents the loss of these nutrients.
- Using compost as an organic fertilizer stimulates microorganisms to take nitrogen from the air and fix it in the soil where plants can use it. Up to 120 pounds of nitrogen can be fixed per acre per year under ideal eco-conditions. An Acres U.S.A. Primer.
- Research has shown that as little of worm worked compost or vermicomposting (5%) in a mix of commercial growing medium (95%), increased germination and growth. Twice as many roots grew in pure worm castings than in sphagnum. Dr. Clive Edwards, Ohio State University.
- A common fungus (white rot) found in compost that decomposes dead wood has been found to be valuable in degrading toxic wastes. It has been found to



degrade, pentachlorophenol, dioxins, cyanides, TNT, DDT, creosote, and coal tars. After treatment it was found that 90% of the toxin was destroyed within 60 days. Organic Gardening, August 94.

- Composting destroys allelopathic chemicals from trees such as cedars, junipers, walnuts, eucalyptus, etc. International Plant Propagators Society, 1992.
- A 12 year study by the Connecticut Agricultural Experimental Station has shown that 1 inch of compost per year can supply all plant nutritional needs and **gave yields equal or better** that all combinations of chemical and synthetic fertilizers. Additionally, compost improved the soil pH and increased organic matter content of the test plot from 5.9 to 12.6% which is enough organic humus to hold a two week supply of water an obvious side benefit• The compost used for this study was made from tree leaves a relatively poor feedstock material as compared to other types of compost. Organic Gardening, September/October 1994.
- The organic matter in compost helps plants absorb critical nutrients better. For example: Thiamin (vitamin B<sub>1</sub>, aneurin) is a naturally occurring compound present in soils, water, plant and animal tissue, that is required for microbial and plant growth. Thiamin is known to affect both root and plant growth. A reduction of organic matter in soils reduces the CEC ratio which leads to reduced Fe (iron) and Al (aluminum) availability on surface of clay particles which may cause a reduction in thiamin absorption. Organic matter also helps bind thiamin with increasing pH. The absorption of thiamin is closely related to the stoichiometric exchange of the Ca<sup>++</sup> (calcium ion) which suggests that absorption of Thiamin occurs by an exchange mechanism. Soil Science Society of America Journal, Nov./Dec. 94, p.1829.
- New research from Israel has confirmed German studies that show "fermented compost tea" have the power to protect plants from a whole host of afflictions. The two studies found a 50-90% drop in severity of infection after tomato, pepper, grape, beet, potato, strawberry, and bean plants had been stricken with botryis molds, downy mildew, late blight, and powdery mildew after thorough spraying with compost tea. Scientists theorize that compost tea works to protect plants in two ways: 1) suppressing the growth of fungi that cause diseases



(composts famed disease-suppression ability is enhanced by fermentation) 2) by making plants more disease resistant. Highest level of control occurred with compost tea that had fermented for 10-14 days at room temperature. Organic Gardening, November 1994.

- A USDA laboratory in Oregon has produced petunias plants that are 30% larger and have more flowers using engineered compost containing certain microorganisms. Avant Gardener, December 1994.
- Research in Colorado has shown that plants grown in compost with a certain strain of trichoderma fungus, increased and speeded germination of seeds, caused faster growth and more flowers or fruits on both bedding plants and vegetables. Avant Gardener, December 1994.
- Numerous recent research has shown compost very effective at preventing erosion. This usually occurs at lower cost and without the pollution of traditional or conventional approaches. The International Erosion Control Society at its 1994 conference in the USA had many papers on the use of compost for flood control, watershed management, sediment control, revegetation and Xeriscape<sup>l</sup> technology.
- DISEASES DEFEATED BY DIFFERENT FORMS OF COMPOST AND MATERIALS:

TYPE OF DISEASE

<u>MATERIAL</u>	<u>Rhizoctonia</u>	<u>Pythium</u>	<u>Phytophthora</u>	<u>Fusarium</u>
Pine Bark	No	No	No	No
Pine Bark Compost	Yes	No	No	No
Dairy Manure	Yes	Yes	No	No
Grape Pomace	Yes	No	No	No
Sewage Sludge	Yes	No	No	No
Hardwood Compost	Yes	Yes	Yes	Yes



- A recent study found that earthworm produced compost *dramatically increases germination and growth* in many plants. Adding only 5% of the compost to commercial growing media significantly increased plant growth. Dr. Clive Edwards, Ohio State University, Nursery Management & Production, January 1995.
  - Research has found that biodegradation of PCB and TCB, and BaP (PAH) with compost is a function of time with a 40% reduction of these chemicals in 4 months. Compost Science & Utilization, Winter 1995.
  - Organic matter (compost) affects the inoculum potential of both plant pathogens and their biological control agents which in turn affects the severity of the disease. Major mechanisms that effect this suppression in composts are:
    - better aeration of the root zone minimizing development of molds
    - ability of compost to act as a food base for microflora that are antagonistic to, or competitive with, plant pathogens
    - the secretion of materials that have fungistatic activity into the medium, thereby suppressing pathogenic fungi
- Hoitink & Grebus (1994), Compost Science & Utilization, Winter 1995.
- The White Rot Fungus that decomposes dead wood (into compost) also has the ability to clean up (digest) chemicals such as: pentachlorophenol (a wood preservative more toxic than CCA), dioxins, cyanides, DDT, TNT (explosive), creosote, and coal tar. Other toxic chemicals being tested are Lindane and Toxaphene. Organic Gardening, July/August 1994.
  - "Since we have begun using compost (on liner beds) we have noticed a significant change in our soil compaction and significant improvement in certain crops such as ornamental grasses and Buxis". Bill Hendricks, Klyn Nurseries, Combined Proceedings International Plant Propagators Society, Vol. 43, 1993.
  - A common fungus (*Aspergillus fumigatus*) found in forests, wooded areas, compost facilities, soils, etc. has been found to contain chemicals called pyripyropenes. These compounds are the most effective inhibitors of an enzyme called ACAT associated with build up of cholesterol in arteries. A single dose



reduced blood cholesterol levels in hamsters up to 50%• BioCycle, March 1995.

- Retention pond water from Cornell University's composting site was tested for nutrient content in the summer of 1994. It was found that the pond water contained 3.5 lbs. of potassium (K), 0.4 lbs. of phosphorus (P), and 0.5 lbs. of nitrogen (N) per 1,000 gallons of water. BioCycle, April 1995.
- Compost made using high temperature techniques (windrow, forced aeration, etc.) is of lower quality than slower moderate temperature techniques (static pile). High temperatures kill the disease-fighting microbes hence airborne pathogens quickly repopulate the material (Encyclopedia of Organic Gardening 1994). High temperatures equal fast composting not good. Moderate temperatures for longer periods of time reduces pathogens better, biodegrades synthetic chemicals better (pesticides, herbicides, fungicides, etc.), and retains higher levels of nutrients.
- Low-tech (natural methods) such as no turn piles offer low cost and high quality compost. Generally exceeding all modern techniques in quality. Adding 20 days to static piles techniques offers same maturity as windrows but much higher quality compost. Will Briton, PhD, Woods End Research Institute, BioCycle National Conference, Washington D.C. 1995.
- It is often assumed that Carbon Nitrogen ratios (C:N) of less than 20 equals mature compost. Research has indicated than stable/mature composts can easily vary between 8-29 C:N ratio depending on source materials and composting technique used. Values actually found ranged from 151 (wood based compost) to 8 (chicken manure based compost). "Predicting Compost Stability", Journal of Compost Science & Utilization, Spring 1995.
- Research has found that applying biosolids compost to vegetables for 4 consecutive years actually reduced the amount of metals absorbed by vegetables as compared to those grown in control plots. This is effect is believed to be related to the biosolids matrix which binds metals in the soil and makes them unavailable for plants to absorb. "Metal Levels In Garden Vegetables Raised on Biosolids Amended Soils", Journal of Compost Science & Utilization, Spring 1995.



- Research at the U.S. National Arboretum has found that large pile composting of wood waste eliminates (kills) the pathogenic fungus *Botryosphaeria dothidea*, a canker causing fungus known to infest *Cercis* (Redbuds), *Rhododendrons* (Azaleas), *Syringa* (Lilacs) and *Prunus* (Peaches, Plums, Cherries, etc.) species. It also found that similar pathogenic fungus is also killed by composting at temperatures over 122EF. This method is also used for wood chips that line paths, in mulches and in soil amendments. *Nursery Management and Production*, September, 1995.
- A study commissioned by the State of California has found that urban waste compost made from leaves, grass and tree trimmings, when used as a soil amendment in stone fruit trees (Peaches, Plums, Cherries, etc.) dramatically reduces brown rot fungus. *Waste New*, August 21, 1995.
- According to *California Agriculture*, published by University of California, composted yard trimmings (lawn clippings and tree trimmings) deserve credit for reducing brown rot disease in a San Joaquin Valley research plot. Adjacent plots treated with traditional composts and fertilizers. Compost amended trees had 0% brown rot and unamended control had 2.5% while the trees in the conventional grown plot had 24%. Fruit grown with compost had millions of yeast spores on the fruit surface which is believed to block or prevent brown spot. *BioCycle*, December 1995.
- High E. C. (electrical conductivity) values in compost does not always mean a high salt content. A high E.C. value in compost is often associated with the organic acids in the compost. The amount of these organic acids will decrease as the compost matures. *Compost Science and Utilization*, Spring, 1996.
- Field studies at the Louisiana Army ammunition plant have shown that the explosives 2,4,6,-trinitrotoluene, hexaydro-1,3,5,-trinitro-1,3,5-triazine, octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine can be degraded by composting. Chlorophenol, PAH's (1-octadecene; 2,6,10,15,19,23-hexamethyl-tetracosane, phenanthrene, flouranthene and pyrene) and Aroclor 1232 can be degraded by co composting. Mineral oil and grease can also be degraded by compost. Co composting of Weathered Hydrocarbon Contaminated Soil, *Compost Science and Utilization*, Spring, 1996.



- New research has shown that it is the beneficial microbes contained in compost that have a destructive effect on the nematodes *Ascaris lumbricoides* (human pathogen) and *Ascaridia galli*. In this study the composting was done at low temperatures (30EC) to eliminate temperature effects. The Effect of Sewage Sludge Compost on The Viability of the Eggs of a Parasitic Nematode, Compost Science and Utilization, Spring, 1996.
- Yard Trimmings Compost generally contains 1.5% N, 0.25% P (0.6% phosphate), and 1% K (1.2% potash) on a dry weight basis. If we apply 1" of compost to a 1,000 square foot garden, we would be applying: 15 pounds of nitrogen (N) + 6 pounds of phosphate (P) + 12 pounds of potash (K). A&L Western Agricultural Laboratories, Modesto, CA.
- Trees worldwide are having a decline problem that results in increased disease and pest problems and in eventual tree death. This problem has been linked to unhealthy soil caused by over use of synthetic chemicals and improper soil management. The recommended treatment is *composted wood and/or leaves* applied around the base of the tree. Dr. Alex Shigo, Tree Care Industry, October 1996.
- The Louisiana Extension service has found that a 10 ton per acre application of compost using normal fertilizing processes (synthetic chemical fertilizer) affects a 15% increase in the yield of sucrose in sugarcane crops. Composting News, February 95.
- Research at the University of Florida has shown that compost especially immature compost, applied to crop row middles reduces weed growth. Avant Gardener, April 1998.

#### USEFUL REFERENCES:

A non-technical overview of composting:

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- The Secret Life of Compost, Malcolm Beck, Acres, USA Press, Copyright 1997, Published 1996, ISBN 0-911311-53-X.
- Let It Rot - The Home Gardener's Guide To Composting, Stu Campbell, Gardenway Publishing, ISBN: 0-88266-050-0.

A semi-technical overview of composting:

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