

Tree of Life

Sprouting Class Handout

January 2012

Tree of Life Sprouting Class Handout

1. Overview	3
2. Sprouting Supplies	5
3. Growing Sprouts in Jars	
a. Small Vegetable Sprouts	7
b. Bean Sprouts	9
c. Grains	10
d. Quinoa	11
e. Harvesting and Storing Jar Sprouts	12
f. Cliff Notes on Growing Sprouts in Jars	13
4. Growing Sprouts in Trays	
a. The Importance of Topsoil	14
b. Composting & Making Sprouting Soil	16
c. Planting & Growing Leafy Green Sprouts	19
d. Harvesting & Storing Leafy Green Sprouts	21
e. Cliff Notes on Growing Sprouts in Trays	21
5. Troubleshooting	22
6. Other Resources	23
7. Sprouting Planner	24

Tree of Life Sprouting Class Handout

Overview

What are Sprouts?

Seeds possess the energy to transform into strong plants, thus making sprouts one of nature's most nutritious foods, full of biogenic energy and life force. All of the energy and the blueprint of a mature plant are contained in its seed, along with all the potential of its future being and the ancestry of its lineage. Harnessing the life force of sprouting seeds is one of the easiest and quickest ways to create live foods for use in a raw food, vegan diet. Sprouts are high in nutritional value and contain a high concentration of vitamins, minerals, proteins, enzymes and anti-oxidants. Starches are converted to simple sugars, thus making sprouts easily digested. Each pound of seeds develops sprouts 3 to 5 times its original volume, and is ready to eat within days.

Germination initiates the following changes in the seed:

1. Nutrients are broken down and simplified; protein into amino acids, fats into essential fatty acids, starches to sugars, and minerals chelate or combine with protein in a way that increases their utilization. These processes all increase nutrition and improve digestion and assimilation. This is the reason sprouts are considered pre-digested food.
2. Proteins, vitamins, enzymes, minerals and trace minerals multiply from 300% to 1,200%.
3. Chlorophyll develops in green plants.
4. Certain acids and toxins, which ordinarily would interfere with digestion, are reduced and/or eliminated.
5. Size and water content increase dramatically.

-Excerpt from universal-tao.com/article/sprouts.html

The Many Benefits of Sprouting

Alkalizing – Our blood must maintain a delicate pH balance of 7.365. An acidic environment and lifestyle can lower our pH, and the chlorophyll in sprouts helps offset this acidity by oxygenating our cells.

Bio-available Nutrition – As sprouts grow, their nutrients increase greatly and are easily assimilated by the body.

Easy – Sprouting is as easy as placing viable seeds in contact with pure water!

Highly Digestible – Sprouting reduces the enzyme inhibitors that keep the seed or grain dormant until it is ready to grow. Reducing the inhibitors activates the enzymes, resulting in pre-digested, easy to absorb nutrition.

Quality Protein – Germination causes the seeds to become pre-digested amino acids and simple sugars. Unlike cooked proteins, the amino acids of raw sprouts don't coagulate, making them easier for the body to absorb.

Fresh – Sprouts can be prepared year-round and full of life force and energy.

Varied – There are many varieties of seeds, beans and grains that can be sprouted for different flavors, textures and nutrition.

Cheap – It costs pennies to produce pounds of greens.

Sprouting Supplies

Organic Unhulled Seeds – Unhulled means the hull or shell of the seed remains intact. Store seeds in an airtight container in a cool, dry place. Ideal temperature should be between 50F (10C) and 80F (27C). Do not store the seeds in a refrigerator, as moisture may cause the seeds to sprout. Available from: Local Organic Growers; SunOrganicFarm.com; SproutPeople.com and Sproutman.com.

Hydrogen Peroxide (3% Food-grade) – Hydrogen Peroxide (H^2O^2) oxygenates the soil and kills microorganisms, fungus and bacteria that are harmful to plants. It will not harm worms. Food grade H^2O^2 is available at Guardian of Eden www.dfwx.com/h2o2.htm or health food stores.

H^2O^2 Dilution Formula – Most food grade H^2O^2 is sold at 35% strength. To dilute to 3%, add 1½ cups of 35% food grade H^2O^2 to 1 gallon of water. **Handle with care!**

Effective Microorganisms (EM-1[®]) – Effective Microorganisms is optional. We use it at the TOL to promote beneficial microbial communities and help reduce pathogenic bacteria by decreasing the pH level of soaking solutions. It produces high levels of polysaccharides, other beneficial enzymes and organic acids that improve soil for growing. It is available at <http://www.teraganix.com/>.

EM-1[®] Diluted Mixture Formula – EM-1[®] must be made into a diluted mixture prior to use. The formula is 10 oz EM-1[®] and 10 oz Black Strap Molasses in 1 gallon of water. The mixture must rest for two weeks to mature before using.

Ocean Grown Minerals – Derived from the ocean, these minerals provide over 90 naturally occurring elemental nutrients and friendly aerobic bacteria necessary for healthy seed growth. Alternatively, you may use sea salt and seaweed or vegetable material soaked in water. OceanSolution™ is available from www.ocean-grown.com.

Glass Jars – Any wide-mouth glass jar will work. Most sprouting applications will use either a quart size or gallon size jar. Sprout bags and other sprouting containers are available in the market, but glass jars are easy to find and work great. Glass jars are available from Grocery and Discount Stores, Health Food Stores and Kitchen Stores.

Mesh Nylon Window Screen – Mesh nylon screen is used to cover the jar opening when soaking, rinsing and draining seeds and sprouts. It is available at Hardware Stores.

Rubber Bands – Rubber bands are used to hold the mesh screen in place over the jar opening. Alternatively, if you buy jars with lids that have a separate top and ring closure, the ring can be used to secure the mesh nylon to the jar opening. They are available at Office Supply and Discount Stores.

Additional Supplies for Tray Sprouting

In addition to the supplies listed above, the following supplies are needed for growing sprouts in trays of soil.

Nursery Trays – The TOL uses nursery trays that measure 11” x 22”, which hold about 1 to 1½ cups of planted seed. Any tray with drainage holes will suffice. If the trays come without drainage holes, drill holes in the bottom. Drainage is important to keep the soil from developing mold. Nursery trays are available at gardening stores and many online sources (key words “nursery trays”).

Soil – Soil may be purchased from a gardening store that carries organic soils, or you may make it yourself. If you wish to make your own soil, a full discussion of composting and mixing your own soil begins on page 16 of this handout. Ingredients needed to make your own planting soil are as follows:

Organic Compost – Organic compost may be purchased from a gardening store, or made according to the discussion beginning on page 16 of this handout.

Peat Moss or Coconut Coir – Purchase organic peat moss or coconut coir from a gardening store. Coconut coir is the shredded fibrous outer shell of the coconut. This is used to help bind the other ingredients in the soil mixture.

Vermiculite – Vermiculite is a naturally occurring mineral compound that expands when wet to hold moisture and dispense nutrients. It is available at gardening stores.

Worm Castings – Worm castings are the nitrogen rich digested organic waste created by composting worms. It can be purchased at gardening stores; look for castings found at least 6” below the topsoil.

Small Vegetable Sprouts

Sprout	Highlights	Nutritional Info
Red Clover	Mild taste, tender and crisp. Contains a significant amount of isoflavones, a phytoestrogen that has been proven to have anti-cancer properties.	Vitamins A, B, C, E and K; Calcium, Iron, Magnesium, Phosphorous, Potassium, Zinc, Carotene, Chlorophyll, Amino Acids, Trace Elements; Protein 35%
Broccoli	Mild peppery taste and crunch. Broccoli sprouts have been found to contain 10 to 100 times higher levels of sulforaphane (a cancer fighting compound) than mature broccoli. This compound raises the anti-oxidant and thereby the anti-inflammatory capacities of the cells.	Vitamins A, B, C, E and K; Calcium, Iron, Magnesium, Phosphorous, Potassium, Zinc, Carotene, Chlorophyll, Amino Acids, Trace Elements, Antioxidants; Protein 35%
Radish	Spicy hot flavor, easy to grow. Radish sprouts have 29 times more Vitamin C (29mg vs. 1mg) and 3 times more Vitamin A (391 IU vs. 126 IU) than milk. They also have 10 times more calcium (51mg vs. 5mg) than a potato, and contain more vitamin C than pineapple.	Vitamin A, Thiamin, Riboflavin, Pantothenic Acid, Calcium, Iron and Copper; a very good source of Vitamin C, Niacin, Vitamin B6, Folate, Magnesium, Phosphorous, and Manganese.
Alfalfa	Mild taste, tender and crisp, easy to grow. Alfalfa sprouts contain saponins which lower cholesterol and stimulate the immune system. They also have a high antioxidant capacity and phytoestrogen that may prevent menopausal symptoms, cancer and heart disease.	A good source of protein, Vitamin A, Thiamin, Pantothenic Acid, Calcium and Iron. A very good source of Dietary Fiber, Vitamins C and K, Riboflavin, Folate, Magnesium, Phosphorous, Zinc, Copper and Manganese
Fenugreek	Fenugreek is used as a spice in Indian food, as well as a digestive aid. It is a powerful antioxidant and acts as a mucous solvent and throat cleanser. Fenugreek also has the reputation as a lymphatic cleansing herb and strong liver cleanser.	Vitamins A, B, C E, Calcium, Iron, Magnesium, Phosphorous, Potassium, Zinc, Carotene, Chlorophyll, Amino Acids and Trace Elements: Protein 30%

Growing Small Vegetable Sprouts in Jars – Step by Step

<p>Day 1</p> <ol style="list-style-type: none"> 1) Soak in H₂O² for 20 minutes 2) Soak in EM for 20 minutes 3) Soak in Ocean Minerals for 8 to 12 hours 4) Tip jars to drain; set on rack to start growing 	<p>Fill a 1 gal. jar 1/10 full of seed and add water to the top. Add approximately 1 Tbs of 3% Food Grade Hydrogen Peroxide (see p.5 for dilution instructions) per 1 gallon water. Cover the jar mouth with mesh nylon screen and secure with rubber band or jar lid ring. Allow seeds to soak for 20 minutes.</p> <p style="text-align: center;">TIP: Mix different seeds to make a gourmet blend</p> <p>After 20 minutes, drain and refill the jar with water. Add 1 tsp of EM per gallon of water. Let soak for 20 minutes. (EM is used at the TOL, but is not mandatory for home growing. EM creates an acidic environment that kills harmful bacteria and decreases incidence of disease.)</p> <p>After 20 minutes, drain and refill the jar with water. Add ½ tsp of the ocean mineral solution per 1 gallon of water. Let soak for 8 to 12 hours. This releases the seeds’ enzyme inhibitors so the seeds can sprout and grow.</p> <p>After soaking for 8 to 12 hours, drain the water and lay the jar upside down on a rack at about a 45° angle, out of direct sunlight.</p> <p style="text-align: center;">TIP: After soaking with the ocean mineral solution, use the soak water to water your trees and plants; it is very rich in nutrients from the mineral solution.</p>
<p>Days 2 to 4</p> <p>Rinse and drain 2 to 3 times per day</p> <p>Store in low light</p>	<p>Rinse and drain the seeds 2 to 3 times per day for 2 to 4 days, returning jars to rack at 45° angle each time. Make sure there is good air circulation, to help prevent mold. A fan or open window is helpful. Optimal temperature is about 70F (21C).</p> <p style="text-align: center;">Note: Fenugreek sprouts faster than the others, and may be 1” long and ready to harvest by day 3.</p>
<p>Days 5 and 6</p> <p>Rinse and drain 2 to 3 times per day</p> <p>Store in indirect sunlight or grow lamp</p>	<p>When sprouts grow tails about ½ inch long, place sprouts in a diffused light for a few days. Continue rinsing 2 or 3 times per day. (Note: it is normal for broccoli and radish to have “fuzzy” root hairs. This should not be mistaken for mold.)</p> <p>When sprouts are 1” to 2” long, they are ready to harvest.</p> <p>TIP: Taste sprouts as you go along; use them when you like them.</p>

Bean Sprouts

Sprout	Highlights	Nutritional Info
Lentils	Lentils have an earthy flavor and can be purchased in red, black or green varieties. Lentils benefit the heart and circulatory system, stimulate the adrenal system and increase vitality of the kidneys.	High in Potassium, Iron, Folic Acid, Fiber, Vitamins A, B, C and E, Calcium and Phosphorous; Protein: 35%
Mung Beans	Mung beans are used extensively in Asian cuisine, making them the most consumed sprout on Earth. They detoxify the body and remove environmental toxins such as lead and pesticides. Mung beans should be sprouted in the dark to avoid a bitter flavor.	Vitamins A, B, C, and E; Calcium, Iron, Magnesium, Potassium, Amino Acids; Protein: 20%

Growing Bean Sprouts in Jars – Step by Step

<p>Day 1</p> <ol style="list-style-type: none"> 1) Soak in H₂O² for 20 minutes 2) Soak in EM for 20 minutes 3) Soak in Ocean Minerals for 8 to 12 hours 4) Tip jars to drain; set on rack to start growing 	<p>Fill a 1 gal. jar 1/4 full of seed and add water to the top. Add approximately 1 Tbs of 3% Food Grade Hydrogen Peroxide (see p.5 for dilution instructions) per 1 gallon water. Cover the jar mouth with mesh nylon screen and secure with rubber band or jar lid ring. Allow seeds to soak for 20 minutes.</p> <p>After 20 minutes, drain and refill the jar with water. Add 1 tsp of EM per gallon of water. Let soak for 20 minutes. (EM is used at the TOL, but is not mandatory for home growing. EM creates an acidic environment that kills harmful bacteria and decreases incidence of disease.)</p> <p>After 20 minutes, drain and refill the jar with water. Add ½ tsp ocean mineral solution per gallon of water. Let soak for 8 to 12 hours. This releases the seeds' enzyme inhibitors so the seeds can sprout and grow.</p> <p>After soaking for 8 to 12 hours, drain the water and lay the jar upside down on a rack at about a 45° angle, out of direct sunlight.</p>
<p>Days 2 to 3</p> <p>Rinse and drain 2 to 3 times per day; store out of sunlight</p>	<p>Rinse and drain the seeds 2 to 3 times per day for 2 to 3 days, returning jars to rack at 45° angle each time. Make sure there is good air circulation, to help prevent mold. A fan or open window is helpful. Optimal temperature is about 70F (21C). Lentils are best at ½ inch and Mung bean sprouts at 1” to 2” inches long</p> <p style="text-align: center;">TIP: If sprouts fill the jar, split into 2 jars to allow more room to “breath” and grow.</p>

Grains

Sprout	Highlights	Nutritional Info
Millet	Millet is high in amino acids, iron and rich silicon content. It is an excellent source of fiber and B vitamins. It is more alkaline than other grains, making it easier to digest, and contains little gluten.	Vitamins B, C and E, Calcium, Iron, Magnesium, Pantothenic Acid, Phosphorous and Amino Acids. Protein: 15%
Spelt	A great alternative for those allergic to wheat. Spelt contains abundant phytochemicals, enzymes and mucopolysaccharides in addition to proteins, fats and crude fibers.	Vitamins B, C, and E; Calcium, Iron, Magnesium, Pantothenic Acid, Phosphorous and Amino Acids. Protein: 15%

Growing Grains in Jars – Step by Step

<p>Day 1</p> <ol style="list-style-type: none"> 1) Soak in H²O² for 20 minutes 2) Soak in EM for 20 minutes 3) Soak in Ocean Minerals for 8 to 12 hours 4) Tip jars to drain; set on rack to start growing 	<p>Fill a 1 gal. jar 1/4 full of seed and add water to the top. Add approximately 1 Tbs of 3% Food Grade Hydrogen Peroxide (see p.5 for dilution instructions) per 1 gallon water. Cover the jar mouth with mesh nylon screen and secure with rubber band or jar lid ring. Allow seeds to soak for 20 minutes.</p> <p>After 20 minutes, drain and refill the jar with water. Add 1 tsp of EM per gallon of water. Let soak for 20 minutes. (EM is used at the TOL, but is not mandatory for home growing. EM creates an acidic environment that kills harmful bacteria and decreases incidence of disease.)</p> <p>After 20 minutes, drain and refill the jar with water. Add ½ tsp ocean mineral solution per gallon of water. Let soak for 8 to 12 hours. This releases the seeds' enzyme inhibitors so the seeds can sprout and grow.</p> <p>After soaking for 8 to 12 hours, drain the water and lay the jar upside down on a rack at about a 45° angle, out of direct sunlight.</p>
<p>Days 2 to 3</p> <p>Rinse and drain 2 to 3 times per day; store out of sunlight</p>	<p>Rinse and drain the seeds 2 to 3 times per day for 2 to 3 days, returning jars to rack at 45° angle each time. Make sure there is good air circulation, to help prevent mold. A fan or open window is helpful. Optimal temperature is about 70F (21C). Grain sprouts are best at ½ inch long.</p> <p style="padding-left: 40px;">TIP: At TOL, these grains are dehydrated and ground into flour with a coffee grinder or Vitamix. The flour is stored at room temperature and used for breads, crusts and crackers.</p>

Quinoa

Sprout	Highlights	Nutritional Info
Quinoa	Although quinoa is often classified with grains, it is actually a seed. It has a warming thermal nature, sweet and sour flavor, and is strengthening for the whole body. Quinoa contains more calcium than milk and is higher in both protein and fat than any grain.	Vitamins A, B, C and E, Calcium, Iron, Magnesium, Niacin, Phosphorous, Potassium, and Amino Acids. Protein: 15%

Growing Quinoa in Jars – Step by Step

<p>Day 1</p> <ol style="list-style-type: none"> 1) Soak in H₂O² for 20 minutes 2) Soak in Ocean Minerals for 8 to 12 hours 3) Tip jars to drain; set on rack to start growing 	<p>Fill a 1 gal. jar 1/10 full of seed and add water to the top. Add approximately 1 Tbs of 3% Food Grade Hydrogen Peroxide (see p.5 for dilution instructions) per 1 gallon water. Cover the jar mouth with mesh nylon screen and secure with rubber band or jar lid ring. Allow seeds to soak for 20 minutes.</p> <p>EM is not used in soaking Quinoa due to the short growing cycle.</p> <p>After 20 minutes, drain and refill the jar with water. Add ½ tsp ocean mineral solution per gallon of water. Let soak for 8 to 12 hours. This releases the seeds' enzyme inhibitors so the seeds can sprout and grow.</p> <p>After soaking for 8 to 12 hours, drain the water and lay the jar upside down on a rack at about a 45° angle, out of direct sunlight.</p>
<p>Days 2 to 3</p> <p>Rinse and drain 2 to 3 times per day; store out of sunlight</p>	<p>Rinse and drain the seeds 2 to 3 times per day for 2 to 3 days, returning jars to rack at 45° angle each time. Make sure there is good air circulation, a fan or open window is helpful. Optimal temperature is about 70F (21C). Quinoa is ready when ¼" to ½" long, soft yet crunchy.</p> <p>TIP: Toss Quinoa sprouts with fresh squeezed lemon juice and sprinkle with sea salt; dehydrate until crunchy for a great salad topper.</p> <p>TIP: Dehydrate and grind for Quinoa flour</p>

Harvesting and Storing Jar Sprouts

<p>Alfalfa, Broccoli and Clover</p>	<p>Alfalfa, Broccoli and Clover should be “de-hulled” before being packaged and stored. The hulls may be eaten, but removing them will help keep the sprouts fresher in storage.</p> <p>To de-hull, place sprouts in a bowl of fresh water treated with 1 Tbs of 3% food grade H²O² per 1 gallon of water. Swirl the sprouts around in the bowl to loosen the hulls, which will either float to the top or sink to the bottom. Use a screen strainer, to remove and discard the hulls.</p> <p>Place the de-hulled sprouts in a colander to drain, or better, spin in a salad spinner. The dryer they are the longer they will last in storage.</p> <p>When dry, place the sprouts in a dry sealable container; either a rigid plastic container with lid, or flexible re-sealable bag. Evert-Fresh brand bags will double storage time, and there are Ziploc bags made for veggies.</p> <p>Properly packaged and refrigerated, these sprouts will keep for about a week.</p> <p style="padding-left: 40px;">TIP: Prepare small batches and eat as soon as they are ready. They will still have the vital life force that so many other foods are lacking.</p> <p style="padding-left: 40px;">TIP: Keep your jars clean! Clean with fresh water and detergent, rinse well with fresh water and then rinse with 3% food grade H₂O₂. Clean jars and preparation processes will prevent disease and lengthen storage shelf-life.</p>
<p>Radish, Fenugreek, Lentils, Mung Beans, Millet, Spelt and Quinoa</p>	<p>These sprouts do not need to be de-hulled.</p> <p>To prepare for packaging, place sprouts in a bowl of fresh water treated with 1 Tbs of 3% food grade H²O² per 1 gallon of water. Swirl the sprouts around in the bowl to clean and sanitize.</p> <p>Place the sprouts in a colander to drain, or better, spin in a salad spinner. The dryer they are the longer they will last in storage.</p> <p>When dry, place the sprouts in a dry sealable container; either a rigid plastic container with lid, or flexible re-sealable bag. Evert-Fresh brand bags will double storage time, and there are Ziploc bags made for veggies.</p> <p>Properly packaged and refrigerated, these sprouts will keep for about a week.</p>

Cliff Notes on Growing Sprouts in Jars

Sprout Name	Fill Jar	Soak w H²O²	Soak w EM	Soak w Ocean Minerals	Growing Process	Harvest @
Alfalfa, Broccoli, Clover, Fenugreek, Radish	1/10 full	20 min.	20 min.	8-12 Hrs	Rinse & drain 2-3 times per day for 5-6 days (2-4 days low light; remainder of time in indirect sunlight or grow light)	1 to 2 inches
Lentils	1/4 full	20 min.	20 min.	8-12 Hrs	Rinse & drain 2 to 3 times per day for 2-4 days; store out of direct sunlight	½ inch
Mung Beans	1/4 full	20 min.	20 min.	8-12 Hrs	Rinse & drain 2 to 3 times per day for 2-4 days; store out of direct sunlight	1 to 2 inches
Millet & Spelt	1/4 full	20 min.	20 min.	8-12 Hrs	Rinse & drain 2 to 3 times per day for 2-4 days; store out of direct sunlight	¼ inch
Quinoa	1/2 full	20 min.	None	3-8 Hrs	Rinse & drain 2 to 3 times per day for 1-2 days; store out of direct sunlight	¼ to ½ inch

Growing Sprouts in Trays

Topsoil is Critically Important

According to Wikipedia.com, the online dictionary, “Topsoil is the uppermost layer of soil, usually the top 15 – 20 cm. It has the highest concentration of organic matter and microorganisms, and is where most of the earth’s biological soil activity occurs. Plants generally concentrate their roots in, and obtain most of their nutrients from this layer. Without topsoil, little plant life is possible.”

Dr. Linus Pauling, winner of two Nobel Prizes said, “You can trace every sickness, every disease, and every ailment, ultimately, to a mineral deficiency.” Topsoil gives plants these vital minerals that we need to thrive.

Topsoil, however, is becoming scarcer. In his book, How to Grow More Vegetables, John Jeavens wrote “Current agricultural practices reportedly destroy approximately 6 pounds of soil for each pound of food produced. United States croplands are losing topsoil 18 times faster than the soil formation rate...worldwide, only about 42 to 84 years’ worth of topsoil remains.”

The yields in conventional farming are dropping all over the world because we’ve depleted the topsoil. We’re getting many more diseases in our crops so we have to use many more pesticides to counteract the diseases. All these poisons (pesticides, herbicides, and chemical fertilizers) are killing everything in the soil by causing oxidation and putrefication. Without healthy soil, we can’t grow healthy plants.

When plants don’t have healthy soil they send out an impulse or signal to bugs and pests telling them that it is time for the pests to do what they were born to do and make the plants into compost. So the pests are actually attracted to the plants with the intention of starting the composting process. Because so many plants worldwide don’t have healthy soil, more pesticides are needed to keep the bugs away.

Dr, Gabriel Cousens wrote in his book, *Spiritual Nutrition* (pg. 501), that “Pesticides are designed to kill living creatures, and human beings are living creatures. The organic farming movement is one of the most important things we have to begin to rectify the destruction of our soils...research has shown that when children are put on an organic diet there is a 50% cure rate of hyperactivity...This is not surprising since (children’s) developing nervous systems are more vulnerable to these brain and nervous system

poisons. More than 12,000 children in the U.S. are diagnosed with cancer every year... These high cancer rates were unheard of before this era of pesticides, herbicides, and genetically engineered food.”³

So, how can we make sure the topsoil gets the nutrients it needs? How do we make sure we get the nutrients we need? How do we help the animals and the circle of life thrive? How you spend your money is your most powerful vote! How you spend your time can be your greatest asset!

“If we consume food that has been grown using methods that inadvertently deplete the soil in the growing process, then we are responsible for depleting the soil. If, instead, we raise or request food grown in ways that heal the earth, then we are healing the earth and its soils. Our daily food choices will make the difference. We can choose to sustain ourselves while increasing the planet’s vitality. In the bargain we preserve resources, breath cleaner air, enjoy good exercise and eat pure food.

It has been estimated that 1/3 of the health care costs in the United States could be eliminated through an increase in exercise and by eating a nutritious diet. Gardening and mini-farming provide both of these, resulting in a win-win proposition. By doing something that is wondrous and fun (growing food) each individual becomes important again in the face of an otherwise overwhelming global environmental challenge. The earth, the soils, and each individual will be better as a result of these efforts.”

Ojibwa Prayer

Grandfather, look at our brokenness. We know that in all creation only the human family has strayed from the sacred way. We know that we are the ones who are divided and we are the ones who must come back together to walk in the sacred way. Grandfather, Sacred One, teach us love, compassion, honor that we may heal the earth and heal each other.

Excerpt from Wisdom of the Masters CD by Dr. Wayne W. Dyer

Composting Basics

Benefits of High Temperature Composting:

- Reduces volume of wastes by approximately 50%
- Improves soil structure, resulting in better drainage and aeration
- Contains stable nitrogen better utilized by plants
- Kills most pathogens when compost temperature reaches 130F (55C)
- Introduces a wider range of microbes than found in the raw ingredients

Key Decomposers:

- Aerobic bacteria are the primary decomposers in the first stages of decomposition. The bacteria feed on plant sugars and simple carbon compounds which release heat and warms the compost pile. Bacteria reproduce quickly, doubling their population every hour. Heat is created as microorganisms break down organic materials.
- Actinomycetes are a type of bacteria, but grow as strands like fungi. They decompose complex carbon compounds like cellulose and produce gray, cobweb like growths that give compost an earthy smell.
- Fungi decompose complex carbon compounds like cellulose and chitin. They bind soil particles and aid in disease suppression.
- Macro-organisms like worms, beetles, spiders, centipedes and mites continue to break down organic matter after the pile has cooled.

Compost Materials:

- Nitrogenous materials such as vegetable, fruit and plant scraps
- Carbon materials such as straw or brown leaves
- Water and Oxygen

Building a Compost Pile:

Layering is a good way to estimate proportions and build a compost pile. Thin layers put the diversity of ingredients in closer proximity to one another. A good proportion is 3 inches of vegetation and 1 inch of loose straw. Shredding or chopping materials will speed the composting. Moisture content should be approximately 50% to 60%; you should not be able to squeeze excess water out of the compost. Excess moisture will cause compaction and loss of air, while insufficient moisture will cause a pile to decompose slowly.

Do Not Compost:

- Perennial weeds resistant to decay
- Waste of carnivorous or omnivorous animals
- Diseased plants
- Meat and dairy
- Large quantities of fats and oils

Aeration

Aerobic bacteria, which make hot composting happen, require oxygen and produce CO². Anaerobic bacteria will populate the compost pile when oxygen is low. This creates methane gas and sulfur compounds that generate a rotten egg smell. Turning the compost pile reintroduces oxygen, stimulating new growth of aerobic bacteria and breaking up anaerobic pockets. Turning should be performed at least 2 times per week. The advantages of turning include:

- Speeds composting by aerating the pile
- Achieves more thorough composting by moving outer materials to center
- Additional mixing of ingredients
- Physical breakdown of material particle size

Volume

The minimum size for a hot compost pile is 5ft x 5ft x 5ft. At this size, the pile is self-insulating and can reach an ideal temperature of 130F to 150F (55C to 66C). Maximum height and width should not to exceed 6ft, in order to avoid compaction and reduced aeration.

Compost Maturity

The following factors indicate compost maturity:

- Dark brown or black in color with earthy smell
- Original parent materials are largely indistinguishable
- Small particle size with crumbly texture
- Temperature has cooled to ambient levels
- Macro life, such as red worms, begin to appear

Vermicomposting

Vermicomposting uses earthworms and other organisms to digest organic waste, such as kitchen scraps. Vermicomposting requires minimal space and creates little odor. Making a “worm bin” stocked with composting worms fed plant and garden scraps is a

convenient, low-maintenance waste processing method usable almost anywhere, including urban environments. Vermicomposting makes a positive impact on the environment by reducing the amount of green waste. The resulting nutrient rich compost is an environmentally sound soil fertilizer.

Composting and soil-dwelling worms are not the same. The primary job of soil-dwelling worms, commonly called earthworms, is soil aeration. The primary job of compost worms is to consume organic matter. Compost worms produce castings – rich brown organic compost – that can be mixed 1 part castings to 3 parts organic potting soil to create an enriched soil for sprouting.

Worm bins require three main things – dampness, darkness and dinner:

- Worm bins should be damp but not soggy
- Worms are sensitive to light and should be kept in a dark environment
- A pound of worms can eat 2 pounds of food scraps each day

As the worm population grows, the amount of food should increase. But compost worms will never outgrow their bin. If the population gets too large, the worms will stop reproducing and their population will decrease naturally according to the bin size and food supply. Compost worms can tolerate a wide range of temperatures, but work best between 70F-80F (21C-27C). Temperatures inside the bin are generally lower than the surrounding air because evaporation of moisture in the bedding creates a cooling effect. Worms need oxygen and produce CO². The air in the bin is refreshed each time it is opened to feed the worms.

Mixing your own Sprouting Soil

To make your own sprouting soil, mix ingredients approximately as follows:

- 30% Compost (see page 16 et. seq.)
- 30% Peat Moss or Coconut Coir
- 30% Vermiculite
- 10% Worm Castings

The exact mixture will depend on your region and climate, so ask a local organic gardener for advice. For further information on organic gardening and composting visit:

<http://www.journeytoforever.org/compost.html>

<http://www.gardenersnet.com/organic.htm>

Leafy Green Sprouts

<p>Wheatgrass</p>	<p>Wheatgrass juice is 70% chlorophyll and high in enzymes. It is a powerful cleanser that brings toxins stored away in cells or fatty tissues into the bloodstream.</p> <p>(Use un-hulled hard winter wheat seeds)</p>	<p>70% chlorophyll, Vitamins A, B, C, E, K, Calcium, Iron, Lecithin, Magnesium, Pantothenic Acid, Phosphorous, Potassium, Amino Acids, Trace Elements, Protein 30%</p>
<p>Sunflower</p>	<p>Delicious thick, crunchy sprouts! Affectionately called Sunnies. Sunflower sprouts are an excellent cleanser and blood builder.</p> <p>(Use un-hulled black sunflower seeds)</p>	<p>High in digestible protein, great source of vitamin E, D and B-complex vitamins, 55% to 70% chlorophyll, rich in Phosphorous, Calcium, Iron, Copper, Iodine, Potassium, Magnesium</p>
<p>Buckwheat</p>	<p>Tender sprouts with thin stems and leaves. High in bioactive lecithin, which reduces excess cholesterol and helps to eliminate deposits on arterial walls. Supplies choline needed for nerve transmission, gall bladder regulation, liver function and lecithin formation. Minimizes excess fat in the liver and aids in hormone production.</p>	<p>Good source of chlorophyll and calcium, rich in Vitamins A, C and B-complex, Iron, Lecithin, Potassium, Amino Acids, Protein 15%</p>

Planting Leafy Green Sprouts in Trays – Step by Step

<p>Day 1</p> <ol style="list-style-type: none"> 1) Soak in H₂O² for 20 minutes 2) Soak in EM for 20 minutes 3) Soak in Ocean Minerals for 8 to 12 hours 4) Tip jars to drain. 	<p>Fill a jar with 1 cup (generous) seed per tray to be planted and add water to the top. Add 3% food grade Hydrogen Peroxide (see p.5 for dilution instructions) at a ratio of 1 Tbs per 1 gallon water. Cover the jar mouth with mesh nylon screen and secure with rubber band or jar lid ring. Allow seeds to soak for 20 minutes.</p> <p>After 20 minutes, drain and refill the jar with water. Add EM at a ratio of 1 tsp per 1 gallon of water. Let soak for 20 minutes. (EM is used at the TOL, but is not mandatory for home growing. EM creates an acidic environment that kills harmful bacteria and decreases incidence of disease.)</p> <p>After 20 minutes, drain and refill the jar with water. Add the mineral solution at a ratio of ½ tsp per 1 gallon of water. Let soak for 8 to 12 hours. This releases the seeds’ enzyme inhibitors so the seeds can sprout and grow.</p> <p>After soaking for 8 to 12 hours, drain the water and lay the jar upside down on a rack at about a 45° angle, out of direct sunlight.</p>
<p>Day 2</p> <p>Plant Seeds in Tray</p> <p>Store in low light</p>	<p>Fill perforated nursery tray with about 1½ inch of soil mix. Saturate the soil with water until it is draining from the bottom perforations.</p> <p>Spread the soaked seeds evenly over the top of the soil, about 1½ cups soaked seed per 11”x22” tray (the seeds expand about 50% in volume while soaking). Water gently until soil is saturated again.</p> <p>Cover the trays with a second tray to provide darkness and retain moisture. Place trays on a shelf in a room maintained at about 70F (21C) to incubate. For the Sunnies, weight the tray cover with a couple of rocks or bricks; this aids root development.</p>
<p>Days 3 and 4</p> <p>Mist with EM</p> <p>Store in low light</p>	<p>Keep the soil slightly moist by watering 1 to 2 times per day, so the roots can bury. Two days after planting, mist the seeds with diluted EM. Keep trays covered, but remove weights on the Sunnies. The sprouts will be a yellowish/white due to being kept in the dark.</p>
<p>Days 5 to 10</p> <p>Move to sunny location, uncover, water gently 2x/day</p>	<p>When sprouts are about 1” tall, remove covers and move to a sunny location where they can develop chlorophyll and turn green. If sunlight is unavailable, use full spectrum growing lamps. Be careful not to over water or let dry out.</p>

Harvesting and Storing Leafy Green Sprouts

<p>Days 8 to 12</p> <p>Harvest green sprouts, wash and store</p>	<p>Wheatgrass is ready to harvest when about 5” to 6” high. Leave in tray near wheatgrass juicer; cut close to the soil only as needed for juicing.</p> <p>Sunflower sprouts are ready to harvest when they are about 3” to 4” tall and have green leaves. If you see a few greens with tiny leaves forming in the center of the first two leaves, it is time to harvest. The greens get a little bitter if left too long. Sunnies will have many hulls still attached to the leaves, which need to be brushed off while harvesting.</p> <p>Buckwheat greens are ready when about 3” to 4” tall and most of the hulls have fallen off naturally.</p> <p>Cut both Sunnies and Buckwheat greens close to the soil with scissors or a sharp knife. Brush off any remaining hulls. Wash in a large bowl of water treated with 3% food grade Hydrogen Peroxide at a ratio of 1 Tbsp per 1gallon of water. Place sprouts in a colander to drain and dry, or better, spin in a salad spinner.</p> <p>When sprouts are as dry as possible, store in a sealed container and refrigerate. Plastic food containers with lids or Ziploc bags work well. Sprouts should last about 1 week if properly cleaned, washed, dried and refrigerated.</p>
---	---

Cliff Notes on Growing Sprouts in Trays

Sprout Name	Fill Jar	Soak w H ² O ²	Soak w EM	Soak w Ocean Minerals	Growing Process	Harvest @
Wheatgrass	1/2 full	20 min.	20 min.	8-12 Hrs	Plant in soil; water gently daily; ready for harvest in 7 to 10 days	5 to 6 inches
Sunflower Greens	1/2 full	20 min.	20 min.	8-12 Hrs	Plant in soil; water gently daily; ready for harvest in 7 to 10 days	3 to 4 inches
Buckwheat Greens	1/2 full	20 min.	20 min.	8-12 Hrs	Plant in soil; water gently daily; ready for harvest in 7 to 10 days	3 to 4 inches

Troubleshooting

My sprouts have mold – Mold can be a problem especially in hot or humid climates. It is a fungus that develops with time in moist environments with poor ventilation. (Don't mistake the fuzzy "root hairs" of broccoli and radish sprouts as mold; continue to rinse and drain them as usual.)

One or more of the following steps should correct your mold problem:

A. General

- a. Soak the seeds for less time
- b. After soaking seeds in H^2O^2 , do a second soak in a 1:100 dilution of EM-1[®] Agricultural in water. This provides a probiotic environment for the sprouting seeds that helps ward off contamination by mold spores. It will also help prevent the hatching of fruit flies.
- c. Create more air circulation; open windows or turn on a fan
- d. Keep the air temperature around 70F (21C) and dry
- e. Try an ozone purifier or dehumidifier if necessary
- f. Air conditioning will pull moisture from the air
- g. Purchase a new batch of organic seeds from a different, reputable supplier

B. Jar Sprouting

- a. Rinse well with good water then shake the jars to drain completely

C. Tray Sprouting

- a. Spread seeds less densely when planting, so they don't overlap
- b. Try watering less
- c. Try adding some sand to the soil to improve drainage
- d. Mist soil with a solution of 1 Tbs 3% food grade H^2O^2 per 1 gallon water

My wheatgrass is yellow and wilted

Don't let your wheatgrass get too old. Wheatgrass will begin to yellow after it has depleted all the minerals in the soil. Plant only as much as you can use and

keep small batches in rotation. With practice you will learn how much and when to plant for optimal freshness.

If your wheatgrass is starting to yellow, cut the grass and store refrigerated in a plastic bag, removing as much air as possible. Cut wheatgrass will last about a week, refrigerated.

I have a lot of un-sprouted seeds

Seeds will not sprout if they are waterlogged. After each rinsing you must drain thoroughly by tipping the jars upside down and shaking out all the excess water. Be sure to return the jars to the shelf at a 45° angle to allow any remaining water to seep out. Try watering less when tray sprouting.

My seeds sprout, but do not seem to continue growing properly

There are three potential problems: Your soil may be low in the nutrients needed for good sprout growth. Review the preceding sections on soil preparation and consider steps that might enrich your soil, such as adding worm castings. Another problem may be too high a temperature; keep the temperature in your sprout room between 60F (15C) and 70F (21C). Last, you may have a poor batch of seeds, and may want to try another seed provider.

My sunflower greens don't grow uniformly

This is usually a problem with the seed crop. After you harvest the first crop of your sunflower tray, continue to water and harvest a second crop from the seeds that are growing slower. You may want to try another seed provider.

Other Resources

Sprouts the Miracle Food: Steve Meyerowitz, Sproutman Publications 2007

The Wheatgrass Book: Ann Wigmore, Avery, 1985

An Earth Saving Revolution: Dr. Teruo Higa, Sunmark Publishing Inc. 1996

An Earth Saving Revolution II: Dr. Teruo Higa, Sunmark Publishing Inc. 1998

Sprouting Planner

Sprout	H ² O ² Soak 20 min	EM-1© Soak 20 min	Mineral Soak 8-12 hrs	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Sunflower Greens	X	X	9am / 5pm	8am R&D 4pm Plant	8am Wtr 4pm Wtr	8am Wtr Put in Sun 4pm Wtr	8am Wtr 4pm Wtr	8am Wtr 4pm Wtr	Continue Wtr or harvest if ready	Continue Wtr or harvest if ready	Continue Wtr or harvest if ready	Continue Wtr or harvest if ready

Duration of each step will vary by climate;
adjust according to local conditions as necessary

↑
Quinoa
Finish
Line

↑
Beans/
Grains
Finish
Line

↑
Small
Veggie
Finish
Line

↑
Greens
Finish
Line
24