



# Organic Sustainability Handbook

## Primer on Establishing and Maintaining Organic Gardens & Soils

**ORGANA HORTICULTURAL, Inc.**

Box 374, 501-I South Rieno Road • Newbury Park, California 91320

*V. 6.0 • Copyright © 2004*

[www.organainfo.com](http://www.organainfo.com)

## Mother Nature's Recipe for "Happy Soil"

**N-P-K of "Happy Soil:" 0.05 Nitrogen; 0.01 Phosphorus; 0.03 Potassium**

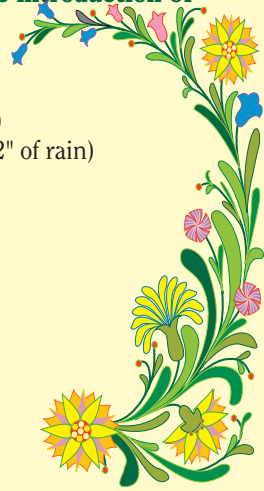
**YIELD:** 1 acre of 6"-deep healthy soil, able to sustain the production of thriving plants without the introduction of artificial chemicals.

**In any sunny location, mix well:**

1,000 tons	Dirt (814 cubic yards)
120 tons	Quality Organic Matter (200 cubic yards)
200 tons	Quality Water (50,000 gallons, or about 2" of rain)
30,000 lb.	Humic Acid
650 cu. ft.	Oxygen

**Carefully blend in the Microfauna:**

4,500 lb.	Fungi (over 100,000 types)
2,700 lb.	Bacteria (over 500,000 types)
2,700 lb.	Actinomycetes (hundreds of types)
2,000 lb.	Mycorrhiza (100,000 types)
1,300 lb.	Algae (hundreds of types)
900 lb.	"Happy Worms"
200 lb.	Protozoa (hundreds of types)



## Nature's Balance = Sustainability

For the first 5 billion years of the earth's history, the laws of nature and *sustainability* were the mechanism of soil creation and maintenance. Because of ignorance, ancient farmers did not appreciate these laws. History abounds with examples of productive, organically rich topsoil being devastated by unenlightened farmers, resulting in the downfall of entire civilizations.

Learning lessons from these failures, some cultures devised ways to enrich the soil with simple agriculture practices. They created new techniques and learned how soil-building amendments lead the way to "sustainable agriculture."

### SUSTAINABLE AGRICULTURE:

*The practice of applying and cultivating quality soil, building organic materials and nurturing the natural flora, fauna and other natural life forms of the soil, for which there are in excess of one million in a healthy soil.*

Letting nature alone, soil is built at the rate of one inch per thousand years. Using quality products properly and intelligently, this process can be sped up dramatically, and even soils that have been abused can be repaired quickly. The creation of a sustainable soil is greatly accelerated with the use of KELP, SAPONIN, and GYPSUM. Properly used, these products will create sustainable soils within a year or less.

In the last century the American farmer has lost about fifty percent of the prime farming top soil. The United States loses about 28 billion tons of top soil per year—that's about 22,000 square miles, six inches deep. At this rate, the United States will run out of top soil long before it does petroleum. As with many ancient cultures, the American farmer will have to reject the current quick-fix system of chemical over-dependence, lest we repeat the mistakes of the ancient farmers.

## Dirt is just dead stuff; Sustainable Soil is Alive

Healthy sustainable soil is a fragile, balanced community of unique life forms and nutrients. These life forms will produce or supply *all the nutrients necessary* for plants to thrive and reach optimum production.

This scientific recipe for one acre of sustainable soil contains all the elements of natural organic life needed to sustain itself. Rich organic soil has a minimum of ten to twelve percent quality organic content. The soils of the American southwest are usually less than one percent. By adding quality organic matter to the soil at a level of at least 6 percent, the soil can grow up to the twelve percent level rapidly. *Please note: wood chip products do not qualify as quality organic content.*

### ***Sustainable, Healthy, Organic Soil Will Produce Plants With:***

- 1 Greater Root Volume
- 2 Deeper Roots
- 3 More-Efficient Uptake of Nutrients
- 4 Inherent Disease Resistance
- 5 Higher Yield
- 6 Higher Quality Plants and Flowers
- 7 Natural Stress Resistance to Heat/Cold/Drought/Transplant/Harvest
- 8 Natural Resistance to Pests/Blight/Insects
- 9 Low Maintenance Costs
- 10 Water Efficiency (up to 70–90% savings)
- 11 Non-Toxic/Safe for Children and Pets
- 12 Food with Flavor, Nutrition, and Texture
- 13 Chemical Free
- 14 Stronger Stems, Less Wind and Rain Loss
- 15 Longer Shelf Life for Fruit and Flowers
- 16 Retain More Water in Plants and Soil
- 17 Lose Less Soil Irrigation to Evaporation

## **There is a difference between Organic Farming and Sustainable Farming and Gardening**

Not all *organic products* contribute to the goal of *sustainability*; in fact, the improper use of many of the most common garden products, such as wood-based amendments, brown and green waste and manures, are often detrimental to the goal of sustainability. Many organic gardeners and farmers feel all organic products are good for the soil. This is not true — many popular garden products effect the soil very negatively.

### ***It is a Scientific Fact:***

*The introduction of commercial fertilizers, wood-based organic products, manures and contaminated water into sustainable organic soils can, in time, impede plant growth and damage the soil. Continued use and over-use will seriously impair and eventually sterilize the soil. (Certain specific conditions may require some fertilizer enhancements.)*

---

---

**The more chemicals you use,  
the fewer worms you will have helping you.**

---

---

## **Undesirable Products**

### **Wood-chip products**

Wood products (including those found in most commercial potting soils and “composts,” are composed of about 98% cellulose (carbon fibers) and 2% nutrients. This carbon fiber needs substantial quantities of nitrogen to break down, requiring high-nitrogen chemical fertilizers to supplement the natural sources of organic nitrogen.

### **Manures**

Long-time friend of the organic gardener, manure has many problems that need to be understood

if it is used on a regular basis.

- 1) All manures are high in salt; in heavy-clay soils salt buildup will be a major concern.
- 2) Commercial manures may have very high concentrations of antibiotics; these drugs pass through the animal's gut and are present in their manures. A major part of the success of sustainability is the building up of bacteria populations; commercial manures can impede this process.
- 3) Manures offer very short-term gain in a very limited number of nutrients.
- 4) Many commercial chicken producers are switching from drugs to arsenic for disease control.

## Dead Dirt and Rotten Balls... Stop the Insanity!

You probably have dead dirt, and you plants have rotten dirt balls. This is so typical of the gardeners, farmers and growers that come to seek our services. Dirt without life is just dead stuff, and typically the gardener and farmer will try to save their plants by over-fertilizing and over-watering. This is the prescription for doom and unhealthy plants and trees. We have even seen growers so desperate in their search for a miracle in a box that they directly inject phosphoric acid into the trunk of the trees to force them to grow roots in an vain attempt to save them. *This is not necessary if you have sustainable soil.*

*Dead dirt wastes in excess of 90% of the water that is poured on it.* If water just sits on top of the dirt, your soil is dead! In this condition, *over 90% of chemical fertilizers will never see the root ball of the plant.* Sustainable soil transports the water into the root zone, and will naturally manufacture its own fertilizer, all for free! (*Praise the Worms!*)

The typical gardener that uses the miracle in a box has lots of other boxes and bottles of miracles in a storage closet — and some of those miracles are very expensive. The major difference with the sustainable gardener is that their closet is loaded with canned fruits and goodies from a productive harvest!

---

**Commercial farmers kill the soil to grow crops;  
Sustainable farmers grow the soil and harvest life.**

---

## It's Alive... And it's Warm!

Sustainable soil is alive and bustling with activity — over one million life forms are in a healthy soil. They range in size from so small that you need an electron microscope to see them, up to the blessed worms. All this life generates heat, and when you scoop a handful of good sustainable soil on a cool morning it will be warm to the touch. That is how old farmers could tell when their soil was ready for planting. On the other hand, dead dirt is literally stone dead cold.

## Water and Air... The Fuel of Life

Water and air are the fuel of all life on this blessed planet, including life in your garden. Your garden needs a *critical balance of each* to remain healthy and productive. Dead dirt is usually dry and lifeless at depths over one inch.

## How Much Water... and How Often

To start your garden off to sustainability, we recommend treating your soil with saponin and kelp extracts. The saponin will allow the water to percolate deeply and the kelp will feed your soil's dormant micro-organisms. Remember, we want to create a zone of life from your current one-inch deep (or less) to over eight inches. A 1000-sq. ft. area contains approximately 25 tons of dead dirt and initially we will need a lot of water to bring it back to life.

The good news is that after the soil is alive, your water usage will be drastically reduced. After your soil is alive and achieves sustainability, you should expect a 70% to 90% reduction of your water bill, and if your sewer bill is determined by your water usage (as it is here in Southern California), your savings will be tremendous!

After achieving sustainability, you will water rarely, but when you do it will be a *deep watering*. The best test is to take a spade and dig a plug out of the soil to a depth of 6–8 inches and check the moisture content. You should be able to cut down the number of waterings from daily, to twice a week in the summer, once a week in the fall and spring, and once a month or not at all in the winter, depending on

the rainfall you receive). The actual number is dependent on many factors, so always test the soil and use good common sense. Look at your yard in the early morning; if the plants are limp and appear to be stressed, they probably need water. After testing the soil physically and determining that it is time to water, water it deeply — at least one to two gallons per square foot.

## **Air... All Life Below the Surface Breathes It**

We can't stress enough the integral need for the successful sustainable gardener or farmer to be able to manage the water and air requirements of the soil. The ritual of daily watering dictated by an electronic timer is a miracle of electrical engineering, but is the kiss of death to the soil. Daily watering actually puts a water barrier at the surface and impedes the flow of air to the million-plus life forms that need it to thrive, and help you reach sustainability. Daily applications of water also deposits lots of chemicals from the city water supplies. It is these chemicals that form the white scum that you see on your dead dirt.

Look at your garden after a good rain and notice the worms on the surface; they come to the surface because they need air to live. The worms are lucky because they are highly mobile and can do this; many other life forms die because the soil will not pass the water and continue the flow of air to sustain them. During times of flood, crops can last only a few short days before suffocating.

## **Plants Derive Nutrition From the Air**

When you have healthy, organic soil that is teeming with biological life, those life forms actually pull nutrition from the air itself. The atmosphere is about 78% nitrogen, and bacteriological forces will use that as a source of nitrogen for your plants, reducing the need to add chemical nitrogen fertilizers. The trees and plants in your yard are about 50% carbon, yet nobody fertilizes with charcoal. So where does this carbon come from? This structural carbon is pulled by the plant from the carbon dioxide in the air. And healthy plants and soils are more efficient at breathing in these vital components.

## **They Want to Live...**

All life forms want to live. For five billion years the planet did very well — before man arrived, anyway. It is humans, *all of us*, who have harmed the planet. Sustainability is nature's way, and to reach it you need at little more care, a little time, some *simple logic*, and respect for all life forms, big and very small. If you follow the simple and logical recommendations we have written about in this booklet, you will have a very successful growing experience, and your land will respond and meet your expectations.

## **The Power of “UN” — (Please Don't Use the “F” Word)**

To become “organically balanced, your “dead dirt” needs to be UN-fertilized with organic products that will biologically accelerate this process in a sane and scientifically sound method, respecting the laws of nature and not the stockholders of chemical companies.

Give a person a fish and they will eat for the day; give them a fishing pole and they will never go hungry. This is the approach ORGANA promotes. Our methods and products promote the expansion of natural life forms in your soil in the same organic way that “mother nature” has done for billions of years, long before there were “Miracles in Boxes.”

The power of “UN” will also help repair massive damage to the environment caused by chemical fertilizers. This pollution is particularly damaging to unborn and young children. On our website we have posted a Newsweek article about the 139 dead zones in the continental United States, and other information about environmental damage from over-fertilized soil.

## **Preparing Your Soil for Sustainability**

### **Before You Start**

It is important and wise to obtain a Science Report on your soil. Organa Corporation is a world leader in the sustainable movement and we always recommend a Science Report before starting a job. A simple, low-cost soil and water test can save many dollars and lots of frustration for the grower, farmer and home gardener.

In our experience, most labs are in the business solely to sell you chemicals. They give you a report

on the inorganic matter in your soil, and sell you more of that. They don't even consider that the most important component of the soil is the *living organic matter*. When we examine most soils with this in mind, we see an over-abundance of chemical fertilizers and toxins in the ground and very little organic matter.

Think of your car with a full tank of gas, but no spark plugs in the engine. You can put all the extra gas cans in the trunk and the back seat, but until you put the spark plugs back into the engine, you're not going anywhere. All the nutrients in the world are worthless without the spark of life from the millions-plus living organisms of the soil. Without the spark, you will produce only inferior, weak and under-developed plants.

The best soil scientist in the USA is Dr. Garn Wallace, founder of the Wallace Lab, 365 Coral Circle, El Segundo, California 90245. You can reach Dr. Wallace at 800-GREEN 99. The Wallace Lab specializes in the analysis of the healthy relationship between nutrients and life forms. There are few other labs that are able to do that.

## Working the Soil

There is no substitute to working the soil. American farmers and their children have left the farm because working the soil is lots of hard work. *We offer no miracles in a box; to get to sustainability you must work the soil!* After you have created a sustainable soil system, then the *worms* and *bacteria* take over and *they* work the soil. *Praise the worms!*

All of the recommended products should be tilled or worked into the soil, the goal being to make the soil as homogenous as possible, giving the roots an even source of nutrients and life forces. Remember, nature takes the path of least resistance, and homogenous soil is easy for roots to work in. You want to encourage the plant to spread as many roots as possible; the general health of the plant is dependent upon this. The worst thing to do is to use drip irrigation and dropping a couple of fertilizer tablets into a hole near the plant. This is a formula for root rot, and the eventual demise of the plant.

## Potting Soils Are Dead Too

If you're one of those that think you can't grow a healthy plant and you've killed all the ones you have bought, what you don't know is that many plants at the garden center are speed grown in chemical factories and are ready to die once they leave the store. After you transplant it in your dead dirt or sterile potting soil it hasn't got a chance. The truth is, they were destined to die, and even the very experienced grower has a problem keeping them alive. Virtually all bagged soils are dead and sterile. Some come with chemical fertilizers, but they leach out quickly and the plants usually go into decline and die. The solution for many home owners who want indoor plants is to purchase silk plants. Well, now you can trade your silk plants in for real ones.

Potting soil can also be activated organically to provide much of the nutrition need to grow healthy plants. When you buy bagged soil, also purchase Organa's POTTING SOIL ACTIVATOR KIT, with all the components necessary for you to have very healthy potted plants.

## Beware of Advertising Hype (Chemical and Organic alike!)

All gardeners are faced with a long list of products and elements deemed "necessary" for the health of their soil and plants; you almost need a degree in chemistry to understand some of the claims. While much of this information is true, often times you are told only enough of the story to get you to buy something. The truth is, healthy organic soil will produce most of these things naturally, and a fried chemical soil will just as surely destroy them. Here is some of the truth behind the hype.

## The "Miracle in a Box"... Isn't

At the garden center we are bombarded with an endless ocean of chemical products. Most make outrageous claims, or deem themselves "miracles," when what they are selling you is poisonous, hazardous, and full of warnings. Which Miracle in which Box are you supposed to use? Or do you need to use any at all?

At *extremely* low rates chemical fertilizers are okay to use, and will give healthy soil a slight

boost. The major problem is that most gardeners have “dead dirt” to start, and the use of high-powered chemical fertilizers just fries the life out of the soil and will certainly prevent necessary soil fauna from establishing. A very slight overdose of chemicals starts the decline of natural fauna, and as the dirt dies, the gardener must turn to a new and more powerful fertilizer, and the race goes on till the soil is fried and sterile.

## **N•P•K**

Real, “happy soil” — that is, soil “Organically Balanced” and in harmony with the laws of Mother Nature — isn’t triple 5, or triple 10, and surely not 46-0-0. Rather it is N (Nitrogen) 0.05, P (Phosphorus) 0.01, K (Potassium) 0.03, along with millions of other natural nutrients and microorganisms. It’s been that way for about 5 billion years. The terms NPK, Ec and pH are buzz-words of the 4 trillion dollar chemical industry, and they do their best to make you think that this is all you need to grow plants. The bottom line: if you use too much NPK, you’re wasting your money and frying your soil.

## **Humic acid**

The need for humic acid is thrown around a lot in the organic marketplace. The truth is that an organic and healthy soil will produce 30,000 lbs. of humic acid per acre annually. If you already have dead dirt the addition of any product with humic acid is, in real science, futile. If you have a healthy soil it is already producing all the humic acid that you need. Save your money.

## **Mycorrhizal Fungi**

There are thousands of research studies on mycorrhizal fungi, and the benefit of this necessary form of microfauna is not in question. Science has identified at least 100,000 form of mycorrhiza in nature. The question is, does adding a few forms of mycorrhiza to dead dirt give any reasonable benefit to the soil, or is it just organic advertising hype? Healthy soil will naturally create all the mycorrhiza that your plants need, and if your dirt is dead or struggling, adding a few spores has questionable results. Mycorrhiza have a very limited shelf life and there is doubt that they can be kept alive in a package for more than a two weeks. The bottom line: save your money and let your “happy soil” build them naturally.

## **Vitamin B**

The need for Vitamin B is pure snake oil; plants manufacture vitamins, they don’t take them in. No real studies support these products and their claims. Save your money.

## **Nitrogen and Oxygen Products**

All living things that require nitrogen and oxygen have created the life-support systems to supply them in abundance. If you need to add them to your soil, your soil is dead. All the nitrogen and oxygen a plant needs is available from the air, but it needs the help of the millions of microfauna found in healthy soil. Healthy, organic soil is teeming with these little helpers that are continually pulling nutrients from the air, making them available to the plants. Save your money and build “happy soil.”

---

---

**Worms will produce 18 tons of organic fertilizer per year, per acre. The more worms that you have, the less you have to work the soil.**

---

---

## **The Organic Revolution is Here**

Begun in the early 1980s, ORGANA is a recognized world leader in the organic revolution. At our core we are a science company, and the reason we get such good results is that we practice sound organic principals that have a sound basis in real science. Our products are used by commercial growers, landscape professionals, and city, county, and federal governments. ORGANA is not just more stuff in a box; our products get real results because they are designed using sound scientific principles.

## Products from Nature That Help Build Sustainable Soil

**KELP** is one of the world's most nutritious vegetables. Eons have washed bits of all the minerals of the earth into the sea, and kelp — hydroponically grown in the world's oceans — is a living filter for these minerals. Adding kelp to your soil adds back trace amounts of the earth's mineral wealth. Coastal farmers for centuries have harvested kelp from the beaches and added it to their soil, turning once-barren beach sand into productive fields. Unlike all land plants which build cellulose for support, kelp does not — because it floats in the water. As such, the protoplasm of the kelp is very low in cellulose — about 3%, compared to wood products at 95%+ cellulose. This is important for a soil amendment because cellulose requires nitrogen to break down — nitrogen that your plants need for their growth. Instead of cellulose, kelp's structure is composed primarily of sugars and carbohydrates that easily break down to make kelp's rich nutrients quickly available to the soil.

**SAPONIN** is derived from cultivated desert yucca, a plant that lives and even thrives in locations that have meager soil nutrients, scarce water and the stress of extreme hot and cold temperatures. Yucca, also called the “soap plant,” has developed a special plant compound called saponin, a natural surfactant that helps water penetrate deeper into dry soil, dissolve soil nutrients, and provide for air circulation underground. These are important elements if you wish your soil's micro flora and fauna to flourish. In the desert, yuccas will be surrounded by colonies of other plants, all benefiting from the power of saponin.

**GYP SUM** easily gives you the biggest bang for your buck. For many reasons, gypsum can be considered the farmer's and gardener's best friend. Over thirty benefits from its use on the land have been documented. It is a very important building component in the goal to reach sustainability. Gypsum is generally applied yearly at the rate of 10 pounds per one-hundred square feet. The best time to apply gypsum is just before the winter rains start. As the gypsum washes down into the soil you will get full benefit of the product. Annual cost to treat the soil with gypsum is about 1¢ per square foot.

Organa uses only pure, mined gypsum, and not recycled wallboard that appears in some commercial-grade garden products.

**ALOE** has long been used as an agent for increasing cell-wall permeability, allowing for better absorption of nutrients right into the cells of the leaves, stems, and roots of your plants.

**WORM COMPOST** is vitally rich source of readily assimilable nutrition for your plants. This compost contains the by-product of organic materials that have been digested and left behind by Mother Nature's little miracle workers.

**FEATHER MEAL, BLOOD MEAL, BONE MEAL** and **CHICKEN COMPOST** provide nitrogen and other micronutrients to your soil, breaking down at varying rates for timed release of nutrients, and supplying a steady source of nitrogen needed to break down the wood pulp found in most “organic” composts.