

Gardening the organic way







Virginia Cooperative Extension

Virginia Tech • Virginia State University

MISSION

Sharing Knowledge.
Empowering Communities.

VISION

To be the Virginia Cooperative Extension volunteer organization extending horticulture and environmental outreach across the Commonwealth.

CORE VALUES

RESPECT:

The environment, each other, and those we serve.

ACCOUNTABILITY:

Wise stewardship of resources.
To our organization, our community and each other.

COLLABORATION:

Willing to work with a diverse group to reach a common goal.
Actively seeking out partners.

What is “Organic”?

- In 1990, the federal government passed the Organic Foods Production Act (OFPA), setting specific standards for organic growers and use of the “organic” term. Under this law, a grower must use growing practices and materials (called “inputs”) as defined by the USDA’s National Organic Program (NOP). All inputs (fertilizers, pesticides, soils, etc.) used to help produce a plant must be specifically permitted under the NOP to be considered “organic.”

What is Organic?

- No Synthetic Chemicals
- No Genetically Modified Organisms
- Certified by the USDA



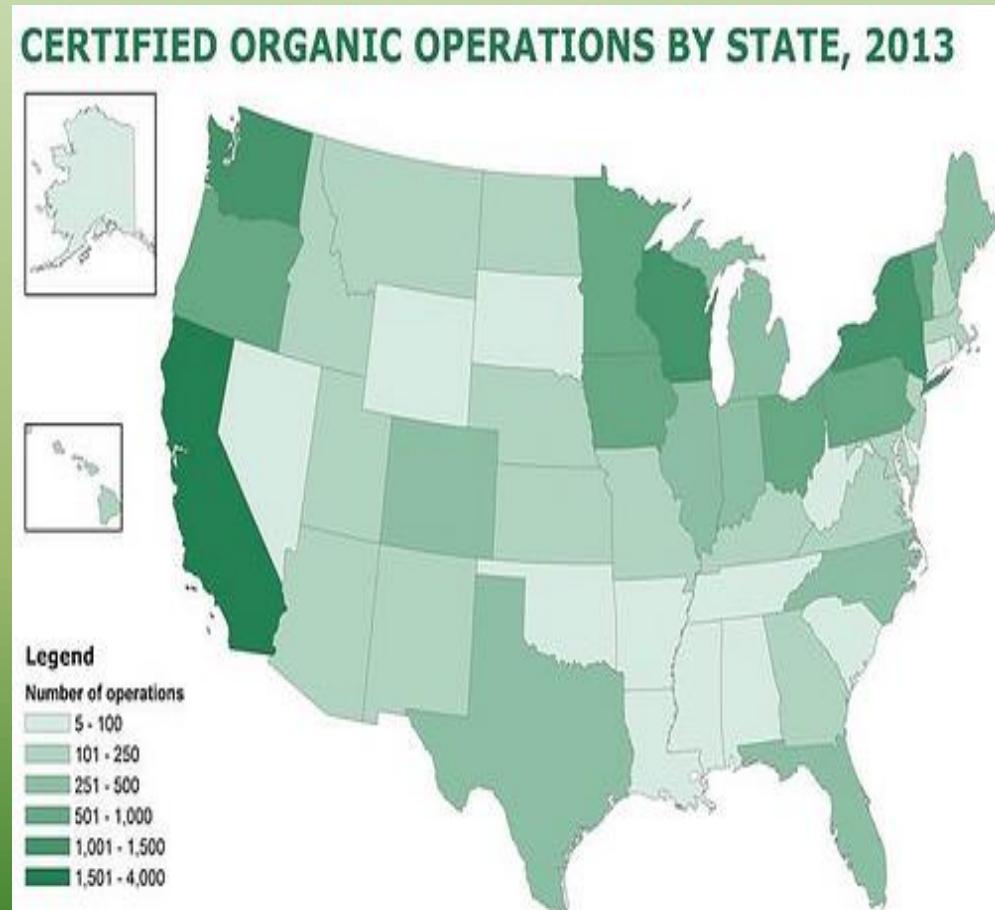
Organic certification

- The USDA organic label is backed by a certification system that verifies farmers or handling facilities located anywhere in the world comply with the USDA Organic Regulations. Certification entails five steps:



Organic certification

- 1: Develop an organic system plan.
- 2: Implement the organic system plan. Have it reviewed by a certifying agent.
- 3: Receive inspection.
- 4: Have a certifying agent review the inspection report.
- 5: Receive a decision from the certifier.
- Typically, there is an application fee, annual renewal fee, assessment on annual production or sales, and inspection fees.



What is organic gardening?

- A basic definition of organic gardening is gardening without synthetic fertilizers and pesticides. But organic gardening is much more than simply replacing manmade chemicals with those derived from natural sources. It is a philosophy of gardening that supports the health of the whole system. In an organically managed yard or vegetable garden the emphasis is on cultivating an ecosystem that sustains and nourishes plants, soil microbes and beneficial insects **rather than simply making plants grow.**

Regulation of Organic vs. All Natural:

- According to the Food Marketing Institute (FMI), “natural” foods are minimally processed and free of artificial sweeteners, colors, flavors and additives like hydrogenated oils, stabilizers and emulsifiers. But there is no certification or inspection system to ensure that the label is accurate.



Neither the FDA nor the USDA has rules or regulations for products labeled “natural.”

Difference Between Organic and Natural Food



Production

Organic Food- Produced using organic means

Natural Food- Are minimally synthesized

Demand and Price

Organic Food- Higher demand and higher price

Natural Food- Priced higher than non-organic foods

Labels

Organic Labels- Have legal implications

Natural Labels- Normally used freely by manufacturers

Certification Agencies

Organic Food- United States Department of Agriculture (USDA)

Natural Food- The International Association of Natural Products Producers (IANPP)





Organic vs. Natural

Organic Natural

Toxic persistent pesticides	Not allowed	Allowed
GMOs	Not allowed	Allowed
Antibiotics	Not allowed	Allowed
Growth hormones	Not allowed	Allowed
Sludge & irradiation	Not allowed	Allowed
Animal welfare requirements	Yes	No
Cows required to be on pasture for pasture season	Yes	No
Lower levels of environmental pollution	Yes	Not Necessarily
Audit trail from farm to table	Yes	No
Certification required, including inspections	Yes	No
Legal restrictions on allowable materials	Yes	No

ORGANIC VS CONVENTIONAL

Vegetables Type of Soil Management	Minerals (in milliequivalents)						
	Calcium	Magnesium	Potassium	Sodium	Manganese	Iron	Copper
Snap Beans							
Organic	40.5	60.0	99.7	8.6	60.0	227.0	69.0
Conventional	15.5	14.8	29.1	0.0	2.0	10.0	3.0
Cabbage							
Organic	60.0	43.6	148.3	20.4	13.0	94.0	48.0
Conventional	17.5	15.6	53.7	0.8	2.0	20.0	0.4
Lettuce							
Organic	71.0	49.3	176.5	12.2	169.0	516.0	60.0
Conventional	16.0	13.1	53.7	0.0	1.0	1.0	3.0
Tomatoes							
Organic	23.0	59.2	148.3	6.5	68.0	1938.0	53.0
Conventional	4.5	4.5	58.6	0.0	1.0	1.0	0.0
Spinach							
Organic	96.0	293.9	257.0	69.5	117.0	1584.0	0.0
Conventional	47.5	46.9	84.0	0.8	1.0	19.0	0.5

Research conducted by Firman E. Bear at Rutgers University in the Natural Gardener's Catalog (1995)

CONVENTIONAL STRAWBERRY



ORGANIC STRAWBERRY



LIVE LOVE FRUIT

Ingredients: Captan, Pyraclostrobin, Boscalid, Tetrahydrophthalimide, Myclobutanil, Pyrimethanil, Fludioxonil, Bifenthrin, Malathion, Fenhexamid, Cyprodinil, Carbendazim, Malaoxon, Azoxystrobin, Methomyl, Quinoxyfen, Fenpropathrin, Acetamiprid, Propiconazole, Bifenazate, Thiamethoxam, Spinosad A, Methoxyfenozide, Triflumizole, Dichlorvos, Hexythiazox, Metalaxyd, Propiconazole II, Thiabendazole, Spinosad D, Imidacloprid, Endosulfan sulfate, Propiconazole I, Iprodione, Piperonyl butoxide, Endosulfan II, Chlorpyrifos, Carbaryl, Pyriproxyfen, Endosulfan I, 1-Naphthol, Acephate, Clothianidin, Azinphos methyl, Naled, Cyhalothrin, Dicloran, Folpet, Tebuconazole, Fenbuconazole, Propargite, Dimethoate, Heptachlor epoxide, Diazinon

Ingredients: Strawberry

Try Organic Food

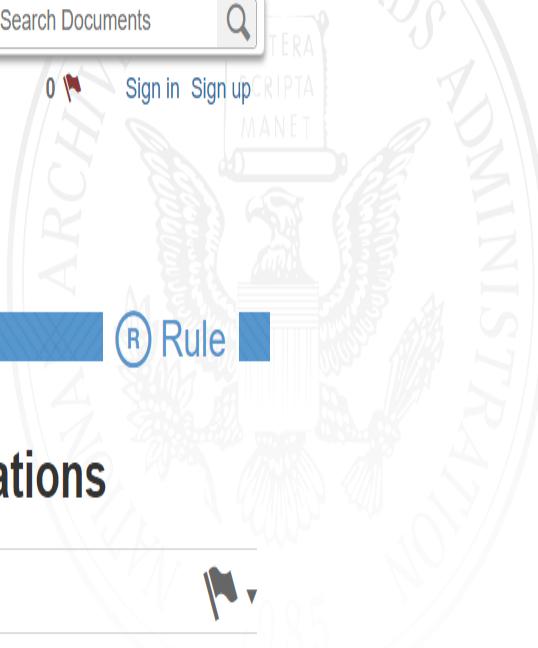
*...or as your
grandparents
called it,
“Food”*





FEDERAL REGISTER

The Daily Journal of the United States Government

0 [Sign in](#) [Sign up](#) Rule

National Organic Program: USDA Organic Regulations

A Rule by the Agricultural Marketing Service on 03/21/2017 

PUBLISHED DOCUMENT



AGENCY:

Agricultural Marketing Service, USDA.

ACTION:

Notification of 2017 sunset review.

SUMMARY:

This document addresses the 2017 sunset review submitted to the Secretary of Agriculture (Secretary) through the Agricultural Marketing Service's (AMS)

National Organic Program (NOP) by the National Organic Standard Board

DOCUMENT DETAILS

Printed version:[PDF](#)**Publication Date:**

03/21/2017

Agencies:[Agricultural Marketing Service](#)**Dates:**

This document is effective March 15, 2017.

Effective Date:

03/15/2017

Document Type:

Allowed Cleaners and Sanitizers

- The cleaning agent itself is not required to be organic. Any cleaner or detergent may be used provided that the cleaning agent is disclosed in the handler's organic system plan and also meets the Food & Drug Administration's (FDA) requirements. Cleaners and detergents are designed to be rinsed off, and a subsequent rinse step is sufficient to prevent contamination of organic foods from synthetic cleaner residues



Allowed Cleaners and Sanitizers

- Acetic acid
(Vinegar)
- Alcohol, Ethyl &
Isopropyl.
- Bleach.
- Detergents.
- Hydrogen peroxide



United States Department of Agriculture
National Institute of Food and Agriculture



Allowed Cleaners and Sanitizers

- Hydrogen peroxide is allowed as a sanitizer of tools/implements, but not as an soil enhancer.



OMRI

- The **Organic Materials Review Institute (OMRI)** is a private, nonprofit organization that determines whether or not a product qualifies as organic under the USDA's National Organic Program (NOP). Goods that are found to comply are listed on the OMRI Brand Name Products List (BNPL). The list is used by certifiers, growers, manufacturers and suppliers to confirm that an item is approved for organic use according to USDA rules.



OMRI

- OMRI's mission is to support the growth and trust of the global organic community through expert, independent and transparent verification of input materials, and through education and technical assistance.



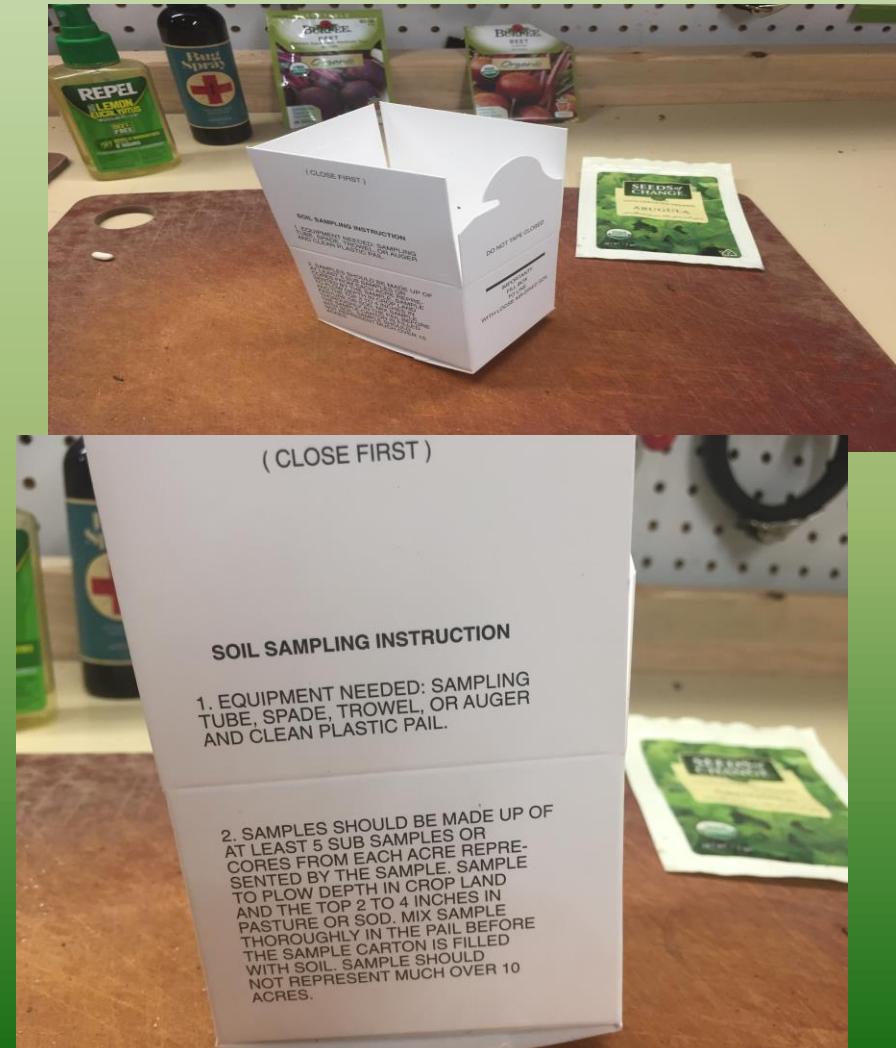
OMRI

- Just because a product does not have the OMRI certification, does not necessarily mean that it is not organic. Not every organic product on the market has gone through the process of having their product certified and listed by the OMRI, due to the expense or stringent guidelines.



Organically enhancing your soil

- Before you apply fertilizer to your garden/lawn, you should have your soil tested. This will also help you determine what balance of fertilizer numbers will be appropriate for your garden's soil needs and deficiencies.



Organically enhancing your soil

- Adding organic matter by mixing compost into the soil increases its capacity to retain water and nutrients and supports beneficial microbes, which are essential to healthy plant growth. Compost can be made at home from grass clippings, leaves, yard debris, and kitchen scraps, or purchased from garden centers and mulch suppliers.



Organically enhancing your soil



Organically enhancing your soil



Organically enhancing your soil



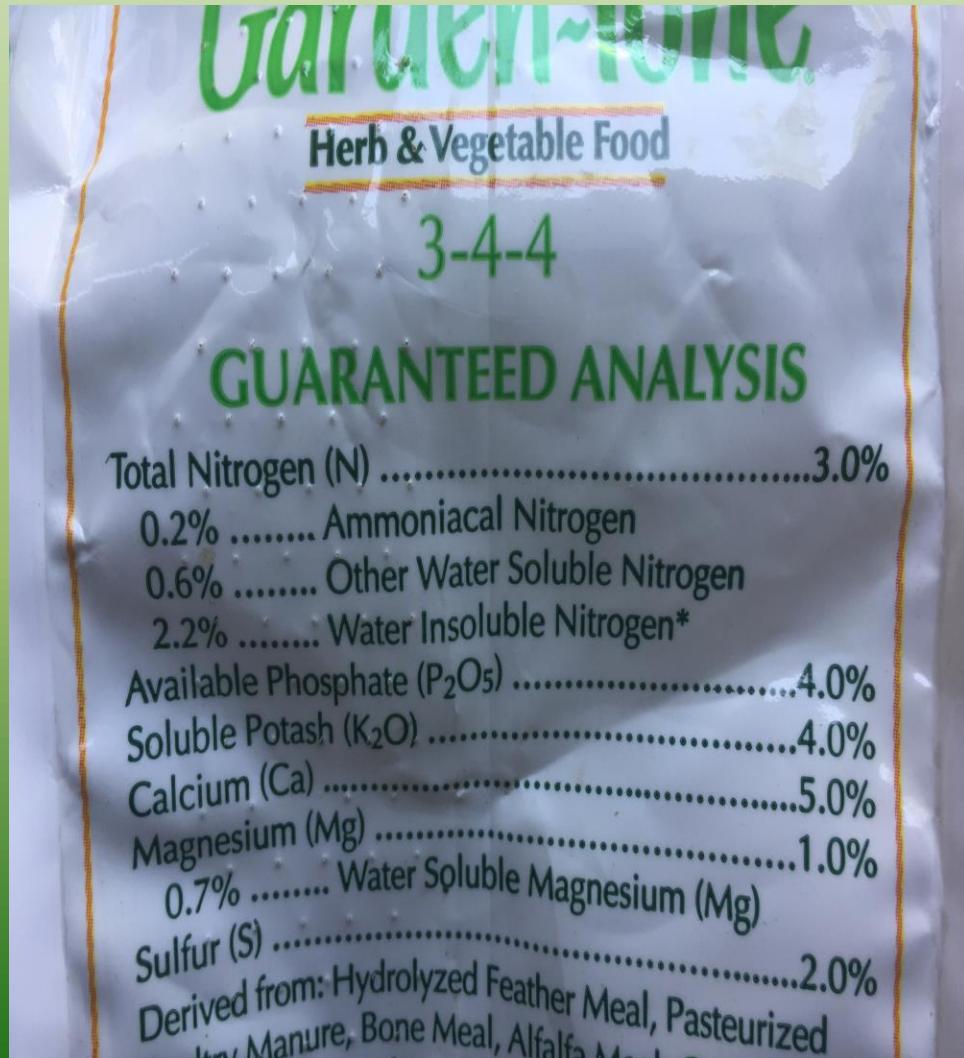
Organically enhancing your soil





Fertilizers – Macro Nutrients

- Macro-nutrients are **nitrogen** (N), **phosphorus** (P) and **potassium** (K) or NPK for short. The higher the number, the more concentrated the nutrient is in the fertilizer. For example, numbers on fertilizer listed as 20-5-5 has four times more nitrogen in it than phosphorus and potassium.



Fertilizers – Macro Nutrients

- Nitrogen (N) – nitrogen is largely responsible for the growth of leaves on the plant.
- Phosphorus (P) – Phosphorus is largely responsible for root growth and flower and fruit development
- Potassium (K) – Potassium is a nutrient that helps the overall functions of the plant perform correctly.



Comparing Organic & Synthetic Fertilizers



Organic Vs. Synthetic Fertilizers

- **Organic** can be either plant-derived or animal-derived. Some examples would be mushroom manure, blood meal, bone meal, cottonseed meal, kelp meal, poultry or horse manure (aged) and compost.
- **Synthetic** fertilizers are those composed of the synthesized chemicals of nitrogen, phosphorus and potassium.

Organic Vs. Synthetic Fertilizers

- **Organic fertilizers**
 - Since they are the ultimate slow-release fertilizers, it's very difficult to over fertilize (and harm) your plants.
 - There's little to no risk of toxic buildups of chemicals and salts that can be deadly to plants.
 - Organic fertilizers are renewable, biodegradable, sustainable, and environmentally friendly.
 - Organic fertilizers break down according to nature's rules, so they may not release nutrients as soon as you need them. You have to be patient – you won't see improvement overnight.
- **Synthetic fertilizers**
 - Chemical fertilizers are primarily made from nonrenewable sources, including fossil fuels.
 - Because the nutrients are readily available, there is a danger of over fertilization. This not only can kill plants but upset the entire ecosystem.
 - Since nutrients are available to the plants immediately, improvement occurs in days.
 - They're inexpensive.

Synthetic Fertilizers

- Ammonium sulfate is an inorganic, factory-made compound used as the nitrogen source in commercial N (nitrogen) P (phosphorus) K (potassium) fertilizer. Ammonium sulfate used as lawn fertilizer has the disadvantage of creating high levels of acidity in the soil. " It requires approximately two to three times as much lime to neutralize the same amount of acidity as formed by other common N (nitrogen) carriers," says a report by Ohio State University Extension Agronomist Jay W. Johnson.



Organic Fertilizers

- While compost and organic matter will increase your soil's ability to hold nutrients, they do not supply large amounts of nutrients themselves. In addition to compost, organic gardeners also have to provide fertilizers derived from natural sources such as animal manures and byproducts.



Organic Fertilizers

- Fish fertilizer/emulsion contains a lower concentration of nutrients than traditionally processed fertilizers, which means the nutrients are released into the soil slowly and the effects last longer.



Organic Fertilizers

Fish Fertilizer/Emulsion

2-3 tablespoons per gallon of water every 3 weeks is recommended for annuals, shrubs, berries, vegetables, and perennials. Root vegetables do best with a more diluted mix of 1 tablespoon in 1 gallon of water, which is the same solution used for herbs and outdoor container plants.



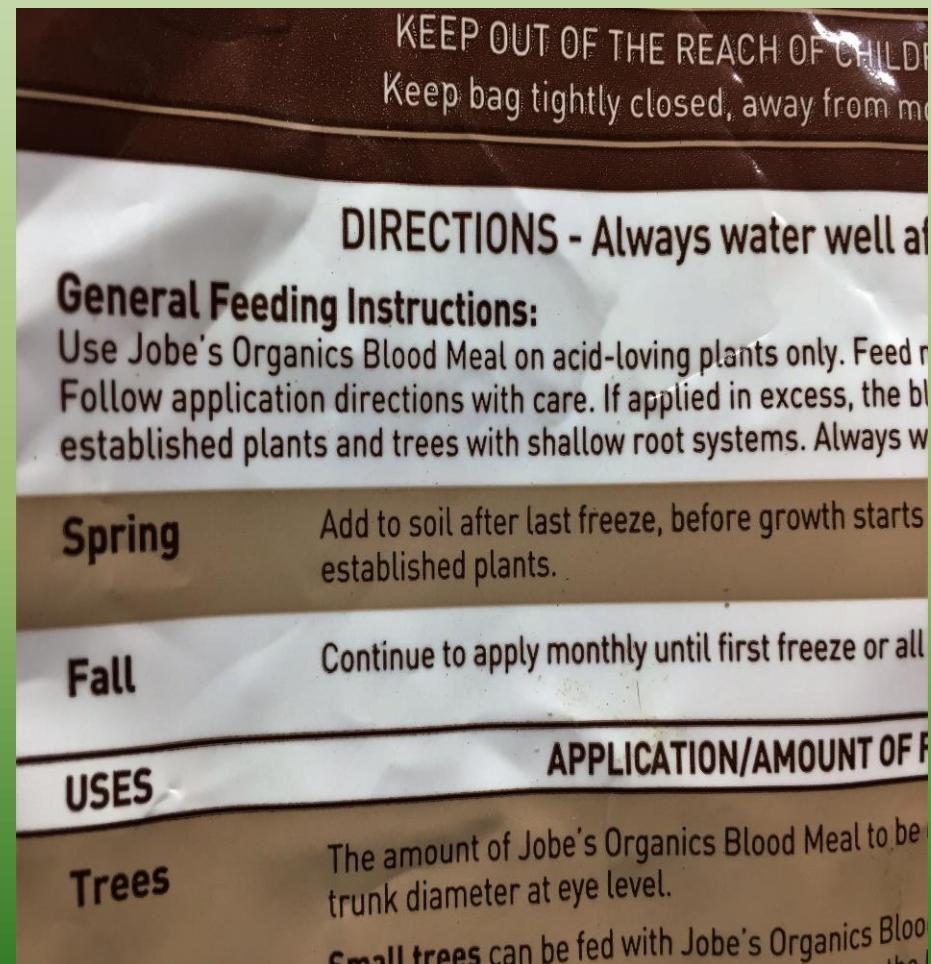
Organic Fertilizers

- **Blood meal** is an organic nitrogen amendment that you can add to your garden. Adding blood meal to garden soil will help raise the level of nitrogen and will help plants to grow more lush and green.



Organic Fertilizers

- **Blood meal** is also used as a deterrent for some animals, such as moles, squirrels and deer. Blood meal may also attract unwanted visitors, such as dogs, raccoons, possums and other meat eating or omnivorous animals.



Organic Fertilizers

- Unlike the chemical kind, organic fertilizers feed soil organisms in addition to your plants, helping to **build healthy soil**—not destroy it.



Organic Fertilizers

- Be wary of products labeled organic that have an NPK (nitrogen-phosphorus-potassium) ratio that adds up to more than 16.



Organic Fertilizers

- Derived From: Hydrolyzed Poultry Manure, Bone Meal, Hydrolyzed Fish Protein, Hydrolyzed Soy Protein, Potassium Sulfate & Kelp Extract.
- Total Nitrogen 1.00 %
- Available phosphate 3.00%
- Soluble Potash 1.00%
- Calcium 1.00%





Organic fertilizers/amendments

Triple super phosphate- rock phosphate (organic) treated with acid bath (renders it inorganic).



Bone meal- Organic source of phosphorus.



Epsom Salts



EPSOM SALTS

Before applying Epsom salt, however, it's a good idea to have your soil tested to determine whether it's deficient of magnesium. You should also be aware that many plants, like beans and leafy vegetables, will happily grow and produce in soils with low levels of magnesium. Plants like rose, tomatoes and peppers, on the other hand, require lots of magnesium, and therefore, are more commonly watered with Epsom salt. When diluted with water, Epsom salt is easily taken up by plants, especially when applied as a foliar spray. Most plants can be misted with a solution of 2 tablespoons of Epsom salt per gallon of water once a month. For more frequent watering, every other week, cut this back to 1 tablespoon.

<https://www.gardeningknowhow.com/garden-how-to/soil-fertilizers/epsom-salt-gardening.htm>

Organic soils

- The need for disease- and weed-free media favors the use of soilless media, or potting mixes, that are made primarily from natural materials, such as peat, compost, and/or manures augmented with perlite, vermiculite, peat moss, and organic fertilizers.



Organic soils



Surpee® Natural & Organic Premium Growing Mix 0.12-0.12-0.12

Guaranteed Analysis

Total Nitrogen (N)	0.12%
0.012% Ammoniacal Nitrogen	
0.012% Other Water Soluble Nitrogen	
0.096% Water Insoluble Nitrogen*	
Available Phosphate (P_2O_5)	0.12%
Soluble Potash (K_2O).....	0.12%
Calcium (Ca).....	0.12%

Derived from composted poultry manure, feather meal and sulfate of potash.

**0.096% slow release nitrogen derived from composted poultry manure and feather meal.*

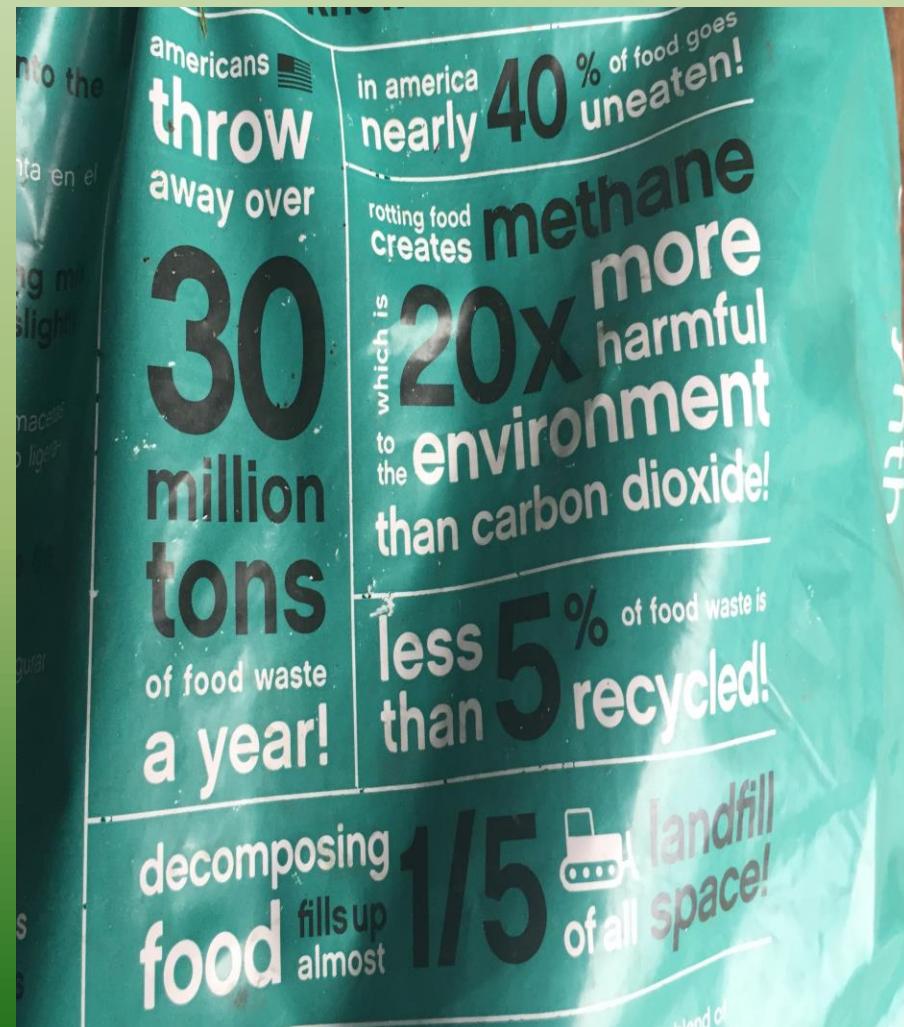
Information regarding the contents and levels of metals in this product is available on the internet at: <http://www.aapfco.org/metals.html>

La información relacionada con el contenido y los niveles de metales en este producto se encuentra disponible en Internet en <http://www.aapfco.org/metals.html>

INGREDIENTS: This product is formulated from

F2167

Organic soils



Make your own potting soil





HORTICULTURAL **VERMICULITE**

VERMICULITA HORTÍCOLA

FINE GRADE EXCELLENT FOR SEED STARTING
DE ALTA CALIDAD Y EXCELENTE PARA LA PRODUCCIÓN DE SEMILLAS

Helps improve soil aeration and drainage

Ayuda a mejorar la aireación del suelo y el drenaje

Perfect for **GERMINATION** of **SEEDLINGS** and **PLANT CUTTINGS**

Perfecta para la germinación de plántulas y el recorte de plantas

REDUCES SOIL COMPACTION

8



Organic weed suppression

- NOP regulations allow the use of newspaper or other recycled paper as an "allowed synthetic" with the provision that it be "**without glossy or colored inks**" (refer to NOP regulations 205.2, 205.601(b)(2), and 205.601(c)). It does take some work to separate out the newspapers that are neither glossy nor use colored inks.



Organic weed suppression

- **Cardboard** can be a useful material used in organic gardening for suppressing weeds, retaining moisture and adding organic matter to your soil.





Herbicide drift from Synthetic herbicide

- High temperatures (above 85°F) during or immediately after application may cause some synthetic herbicides to vaporize and, like highly volatile formulations, move to areas outside the site of application. Volatilized herbicides in a vaporized state may still be capable of causing damage.



Herbicide drift from **SYNTHETIC HERBICIDE**



Organic weed control



Organic weed control



Organic weed control



Organic Herbicide

- **Boiling water** will kill any plant growth it touches. It is very inexpensive and simple to use. It is superb for killing annual weeds and can control and/or kill perennial weeds. It is a popular non-toxic means for killing weeds growing in cracks and driveways.



Organic herbicide

The contact nature of the vinegar + salt mixture can be a benefit. If you need to kill weeds in close proximity to a desirable plant (say, killing chickweed in a flower bed), then glyphosate can be problematic. Only one or two stray drops from the glyphosate spray bottle onto a flower might be enough to kill the entire plant. A few stray drops of the vinegar + salt solution, on the other hand, will probably cause a little speckling but won't kill the desirable plants.



Organic herbicide

- Vinegar concentrates make effective organic weed killers with almost immediate results. Spraying the solution directly on a weed strips off the foliage's waxy cuticle that protects the plant's cells from losing water. This causes the weed to dry out down to the root.



Organic herbicide

- Pour 1/2 gallon of vinegar into a bucket.
- Add 1/2 cup of table salt.
- Stir in 1 tablespoon of liquid dishwashing soap.
- Funnel the weed killer into a plastic spray bottle



Organic herbicide



Organic Herbicide



Organic herbicide



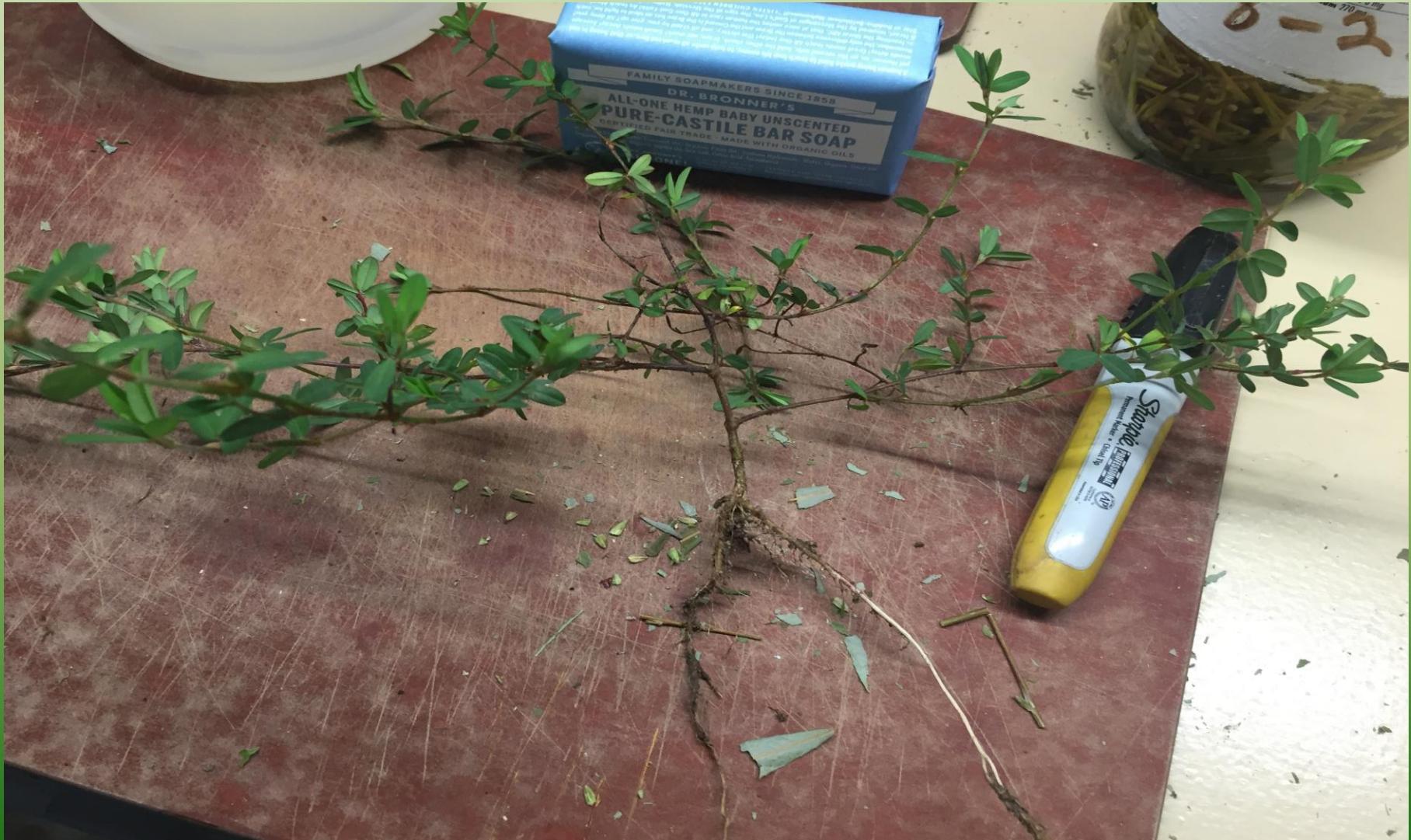
Organic Herbicide



Lespedeza



Lespedeza



Organic Herbicide



Organic Herbicide



Organic Herbicide



Organic Herbicide



Organic Herbicide



Organic Herbicide

- Post emergent of all herbaceous broadleaf and grass weeds
- Fast-acting and effective: kills dandelions within 3 hours
- Active Ingredients: Citric Acid (24%), Clove Oil (8%)
- Inert Ingredients (68%): Water, Lauric Acid, Octanoic Acid, Gum Arabic, Xantham Gum, Sodium Acetate.



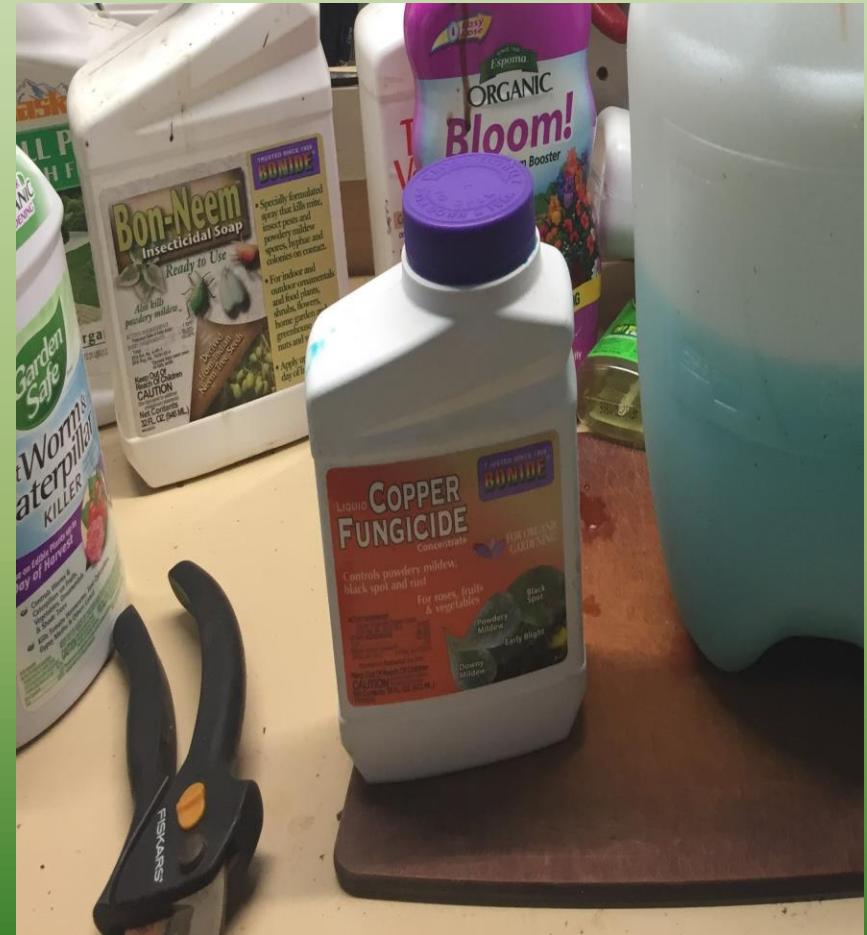
Organic Herbicide

- A natural post emergent herbicide (selective) that can be used on the following weeds and does not harm warm or cool season grasses:
- Dandelion, Plantain Clover, Ground Ivy, Knotweed, Purslane, Black Medic, Wild Violet, Foxtail, Quack Grass, Barnyard Grass, Curly Dock, Annual Bluegrass, Foxtail, Orchard Grass, Catch Weed, and more.
- **OMRI listing is pending.**



Organic fungus control

- Application of copper is a routine disease control practice in organic tomato production in the eastern United States. Copper functions both as a fungicide and bactericide and is labeled (under the NOP) for anthracnose, bacterial speck, bacterial spot, early and late blight, gray leaf mold, and septoria leaf spot.



Organic fungus control

