

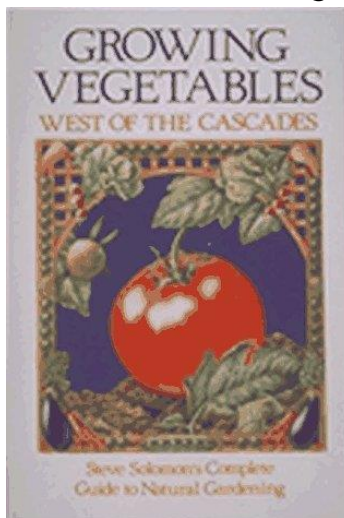
# COMPLETE ORGANIC FERTILIZER FORMULAS For Vegetable Crops

This report contains sections on:

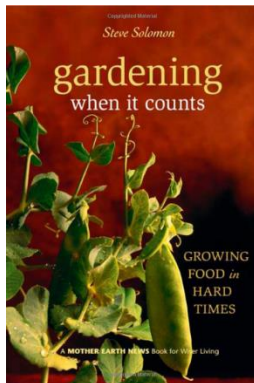
1. Reasons to make your own vegetable fertilizers
2. Ingredients for the mixes
3. Recipes for the mixes
4. Adding mycorrhizae and dry molasses to early and late spring mixes
5. How to mix the ingredients together
6. How to use the fertilizers
7. Where to find ingredients for the mixes, locally and on-line

## **1. Reasons to Make Your Own Vegetable Fertilizers:**

I am suggesting to our Victory Garden Club members that they seriously consider replacing Soil Mender's Yum Yum Mix fertilizer with one of Steve Solomon's home-made complete organic fertilizers. Steve Solomon is the founder of the Territorial Seed Company and the author of several books on organic gardening, including the bible of organic gardeners in the Pacific Northwest, *Growing Vegetables West of the Cascades*.



*and Gardening When It Counts – Growing Food in Hard Times .*



I believe you will find that Steve's mixes -- which Paul and I have used for years – to be much less expensive, will help your vegetables grow better and.....keep your family from eating Roundup.



Roundup???? Yes. Although Yum Yum Mix is marketed as “Organic/Natural”, over half of its recipe is alfalfa meal, which is not listed as “organic alfalfa meal” on the package. Most alfalfa meal grown in this country right now is Roundup Ready Alfalfa, which has been genetically modified to withstand multiple sprayings of Roundup herbicide used to kill weeds in alfalfa pastures for livestock. I strongly suspect that since the alfalfa meal in Yum Yum Mix is not listed as “organic”, that it comes from Roundup Ready Alfalfa.



Steve Solomon's complete organic fertilizers contain many of the ingredients that Yum Yum Mix contains, but in much larger quantities: seed meal of some kind, kelp meal and rock phosphate; and it also contains some ingredients that Yum Yum Mix does not contain, such as blood meal and bone meal.

A note: Manure from animals grazed on Roundup Ready Alfalfa would probably not be a good choice for use in a vegetable garden because the Roundup herbicide on the alfalfa remains in the manure of the animals sometimes for several years and is known to adversely affect the growth of many vegetables. It's an herbicide, after all.....

All the quotations used in the rest of this document come from Steve's book, *Growing Vegetables West of the Cascades*, pp 45-49.

## **2. Ingredients for the Mixes:**

"Well-balanced, pre-blended organic fertilizers are sold in sacks up to 40 pounds each for fairly stiff prices.... But gardeners may easily mix their own complete organic fertilizers and save considerable money as well as tailor-make fertilizer blends to suit the plant and the season."

Emmy's note: I have not been able to find ANY pre-blended, certified organic fertilizer anywhere in town or on-line. If you come across some, PLEASE let me know so I can inform all the rest of our members.

## Oil Seed Meal, the N in NPK:

Emmy's note: Steve suggests that several kinds of oilseed meal might be suitable for the nitrogen ingredient in his mixes: linseed meal (flax), soybean meal, canola meal, sunflower meal or cottonseed meal, for example. The flax meal I find on line is very expensive. So are all the certified organic seed meals, but at least they are available for those who prefer to use them.



“Cottonseed meal...is particularly easy to use: it is an odorless, dry-flowing granular material and blends easily with other fertilizers. Fish meal is also a good base for organic fertilizers and stronger than seed meals, but is unpleasantly smelly and attracts the interest of pets and rats....Cottonseed meal...varies from 5 to 7 percent **nitrogen**, (N); the higher nitrogen lots are labeled as higher protein and sell for much more money.”



\$13.03 3.5lbs

Emmy's note: Most cotton grown in this country today is genetically modified "Bt cotton". Bt is an insecticide approved by the official organic overseeing organizations as safe for growing vegetables in organic gardens. (See information on Bt below.)

### Approved for Organic Growers



DiPel PRO DF is a biological insecticide containing the bacteria *Bacillus thuringiensis* or Bt. It is used specifically for control of caterpillars which are the worm like larvae of butterflies and moths. After ingesting a lethal dose, larvae stop feeding within the hour, and will die within several hours. It is best used when the larvae are young and actively feeding, but before the plants are damaged. DiPel PRO DF is registered to control most caterpillar insects on fruits, citrus, tropical fruits, vegetables, grains, bulbs, flowers, herbs, turf, ornamental trees and shrubs. Pests controlled include: loopers, budworms, bagworms, army worms, web worms, tomato hornworm, cutworms, cabbage worms, leaf roller and over 30 other pests.



So I am no longer concerned about the fact that Bt cotton has Bt inside it, but I had been very concerned about all the herbicides that have been sprayed on cotton in the past and are still sprayed on it today. Cotton, in fact, is possibly the most sprayed crop in this country. Soybeans come in second or third.

The information below from Steve Solomon, however, has allayed my concerns. He wrote this before Bt cotton came on the market, so cotton is no longer sprayed with the “potent insecticides” he mentions, only the herbicides.

“I am frequently asked if it’s safe to use cottonseed meal, since cotton is heavily sprayed with herbicides and dangerously potent insecticides not approved for food crops. These chemicals tend to be oil-soluble and concentrate in the seed, so will not the seed itself carry large quantities of poisonous residues? It does.



Fortunately for gardeners, before we buy the meal, the seed is crushed and heated in a retort at high temperature with a most efficient solvent which dissolves all the oil. The dissolved oil is extracted from the seed mash, and the solvent is evaporated from the oil and re-condensed for another use. The cottonseed oil thus obtained contains virtually all the remaining pesticide and herbicide residues.

Stripped of the oil, the seed meal is now a fairly clean food, sold for animal food protein supplements and fertilizer; the oil is probably a fairly toxic food, sold to fast food and Oriental restaurants for deep-frying and to the makers of salad dressings. Think about that next time you go out for dinner. And read the label on your favorite salad dressing, mayonnaise or tinned sardines.”



## List of Foods with Cottonseed Oils

**Mayonnaise** - Several brands of mayonnaise use a cottonseed oil blend as the main ingredient. Both mayonnaise and salad dressing spread blend oil with other ingredients like egg yolks, corn syrup and vinegar. Mayonnaise producers like cottonseed oil because the light taste lets the flavor of the spices come through.

**Salad Dressing** - Many varieties of salad dressing contain cottonseed oil. With its mild taste and clear light golden color, cottonseed oil is

the base of many types of salad dressing such as ranch, thousand island and blue cheese. Even the olive oil-based Italian dressings will sometimes contain a cottonseed oil blend.

**Pasta Sauce** - Tomato-based pasta and pizza sauces contain small amounts of oil. Cottonseed oil has proven to be more cost-effective than olive oil. Blends of cottonseed and soybean oils are widely used in canned sauces for spaghetti and pizza.

**Vegetable Oil** - Blended vegetable oils and shortenings made for cooking will likely contain cottonseed oil. Many brands of non-stick cooking spray contain cottonseed oil. If you eat fried food at a restaurant or fast food chain, it was probably cooked in a cottonseed oil blend. When you buy frozen foods like French fries, chances are they contain cottonseed oil.

**Chips** - Potato chips and other deep-fried snack foods are often prepared with cottonseed oil blends. Soybean and cottonseed oil blends give fried snacks crispness without the heavy greasy taste.

**Margarine** - Many brands of margarine contain cottonseed oil. If you see a tub of margarine marked low in saturated fat, it probably contains cottonseed oil. The fat content of cottonseed oil is 70 percent unsaturated fat. This makes it a great choice for diet products.

**Baked Goods** - Baked goods like cake and breads often contain cottonseed oil. About 35 percent of all the cottonseed oil produced in the U.S. goes into baking and frying oils.

Emmy's note: Cotton grown in the South used to be sprayed with arsenic just before harvest to separate the boll from the rest of the plant. This practice was outlawed some years ago. Today, all the chemicals used for this purpose must biodegrade within two weeks. In the panhandle region of Texas, where most of Soil Mender Cottonseed Meal comes from, no



chemical at all is needed at harvest because the weather is cold enough that Nature does the work that the chemicals have to do in the South.

Rock Phosphate or Bone Meal, the P in NPK:

“I recommend either **rock phosphate**



or **bone meal** to boost **phosphorus (P)**. Bone meal



is more expensive than phosphate rock, but breaks down much faster, so less is needed. However, phosphate rock continues releasing for several years, giving long-term residual benefits that improve overall soil health.” Emmy’s note: Steamed bone meal breaks down even faster than regular.



Kelp Meal, the K in NPK:

“For **potassium**, the best source by far is **kelp meal**, which...contains traces of just about every element and micronutrient a plant could use. Kelp also contains some plant growth hormones that may improve the overall vigor and stress resistance of plants.”



### **3. Recipes for the Mixes:**

All measures are by volume, not by weight.

#### **Complete Organic Fertilizer for Late Spring – Early Summer**

4 parts seed meal or fish meal

1 part Dolomite lime (Omit if intended for alkaline soils.)

1 part rock phosphate or ½ part bone meal

1 part kelp meal

Such a blend will analyze about 1:1.5:1 NPK.

Emmy's note: The lime in the original formulas were added for two reasons: First, soils in the Pacific Northwest are generally acidic. Adding lime, which is mostly calcium and magnesium, to the fertilizer mixes helped neutralize the soil pH.

Secondly, many seed meals are acidic too, so adding lime to the mixes intended for already acidic soil made sense. However, here, where most soils are alkaline, adding more lime is counterproductive and we actually welcome the acidity of seed meals. So best to omit the lime altogether.

“This fertilizer blend may be adjusted to suit different purposes; the ratios are not critical in any respect. For fertilizing legumes, which can manufacture their own nitrogen, the seed meal may be left out or greatly reduced. I use one part each when blending for beans or peas.”

## **Complete Organic Fertilizer for Legumes**

1 part seed meal

1 part rock phosphate or ½ part bone meal

1 part kelp meal

“In early spring, when soils are very cold and seed meals release nutrients very slowly, one part seed meal may be replaced with blood meal. Blood meal, though expensive, is very high in nitrogen and is the only dry organic fertilizer that is water soluble. It has an intense, but relatively short lasting, effect. Blood meal is the only organic fertilizer substance I know of that can easily burn plants if it sticks on leaves. It also contains health-producing plant growth regulators.”

## **Early Spring Complete Organic Fertilizer**

3 parts cottonseed meal or fish meal

1 part blood meal

1 part rock phosphate or ½ part bone meal

1 part kelp meal

Emmy's note: Paul and I have found that animals like to eat blood meal, so best to keep it in a metal container with a tight lid, like the canisters that some people use to store their sugar, flour or coffee. You won't be buying a lot of blood meal, so it should be easy to store safely.

“In mid-summer, I lower the nitrogen percentage of the blend and increase the kelp percentage, changing the ratios to two parts seed meal, one part lime and one part phosphorus, one part kelp, because slow-growing plants

handle winter better. Growth regulators in kelp meal make late fall or overwintered crops huskier and better able to handle freezing weather.”

### **Mid-Summer Complete Organic Fertilizer for Crops Harvested Late Fall**

2 parts cottonseed meal or fish meal

1 part rock phosphate or ½ part bone meal

1 part kelp meal

### **4. Adding Mycorrhizae and Dry Molasses to Early and Late Spring Mixes:**

You might want to add some Dry Molasses

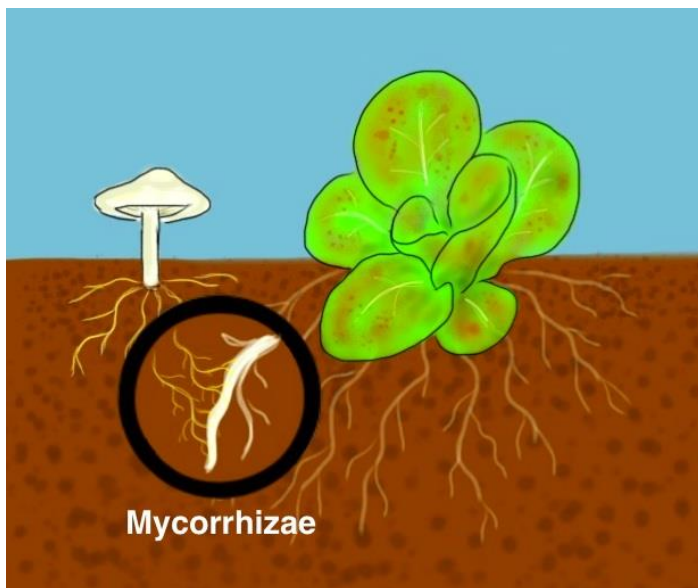


to your mixes or to your beds to feed your mycorrhizae. Larry Stebbins suggests that we add mycorrhizae to our vegetable garden beds in the spring to prepare them for spring planting.





Mycorrhizae are beneficial fungi which attach to some plants, (not those of the brassica family), and help them absorb nutrients up to 700 times better.



Mycorrhizae love to feed on sugars, like dry molasses, an ingredient in Yum Yum Mix not present in Steve's complete organic fertilizer mixes. It is a simple matter to add some to your garden beds. The instructions on the back of the Soil Mender Dry Molasses package say to add  $\frac{1}{2}$  to 1 pound per 100 sq. feet. This translates to 2.5 oz. to 5 oz. per 4' x 8' raised bed.

## **5. How to Mix the Ingredients Together:**

“I mix my complete organic fertilizer in a big garden cart. It could also be done on a tarp spread on the lawn or on a concrete driveway. Simply dump out the stuff by the sack, and blend it by turning with a shovel until it’s a uniform color, then shovel it into a large garbage can with a tight lid or back into the empty sack for storage and use as needed.” (or a bucket)

“Lately, I’ve gotten so relaxed about proportions that I measure by the sack: for example, two 50-pound sacks cottonseed meal; one 50-pound sack of lime, one 40-pound sack of phosphate rock; one 55-pound sack of kelp meal. That’s close enough.... The substances all store well.”

Emmy’s note: Steve highly recommends buying the COF ingredients in bulk or by the sack to save a lot of money, since small quantities are much more expensive.

## **6. How to Use Complete Organic Fertilizers:**

“To take effect, organics...must be blended into the soil so bacteria can break them down.”

“They’re broadcast at around a gallon per 100 square feet” (Emmy’s note: about 5 1/3 cups per 4’ x8’ raised bed.) Broadcast into a bed before planting, organic fertilizers should be tilled in.



Emmy's note: Larry Stebbins strongly suggests using a broad fork



or radius pitchfork to work dry soil amendments into garden soils so as not to damage the soil structure or harm the earthworms.

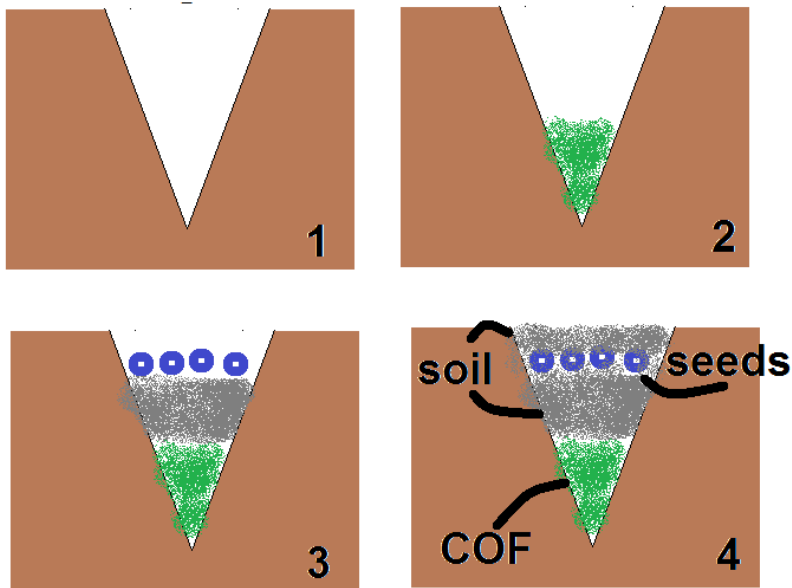


Sprinkled atop the ground as an afterthought, they must be worked in shallowly with or rake so they can break down."



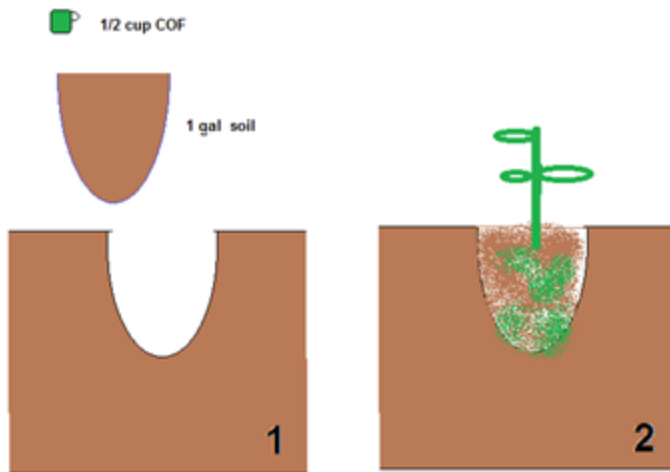
“Some care should be taken to keep organic fertilizers...out of direct contact with sprouting seeds, because the fertilizer promotes a rush of biological soil activity that can induce too much damping off, (a fatal wilt), and greatly lower germination.

### **Sowing seeds in rows with COF**



When sowing seeds in rows, make a deep furrow with a hoe or harrower and sprinkle organic fertilizer along the bottom. Partially fill in the furrow; then sow and cover the seeds.”

## Setting out small transplants



“When setting out transplants, mix a half cup or so of complete organic fertilizer into about a gallon of soil directly below the seedling.

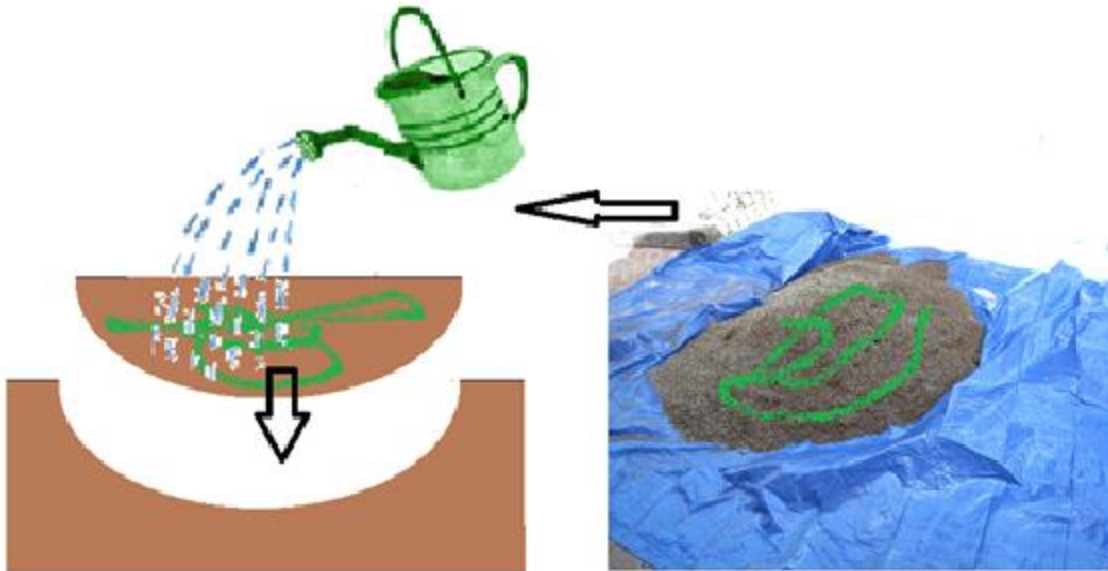
## Sowing big, fast-growing vegetable seeds Part 1



Fertilize big, fast-growing types of vegetables...such as squash or melons, by mixing a pint of complete organic fertilizer or a shovelful of chicken manure into 5 to 10 gallons of soil. (Moisten the soil)

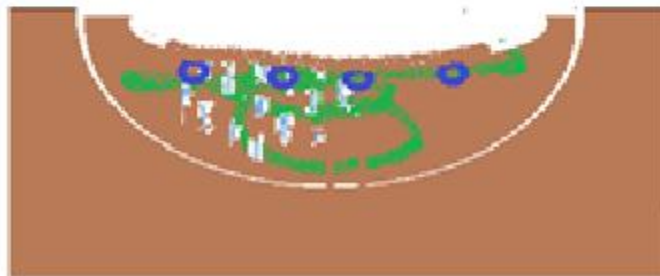


## Sowing big, fast-growing vegetable seeds Part 2



## Sowing big, fast-growing vegetable seeds Part 3

Test soil for moisture.  
Press the seeds into the soil.  
Cover the seeds with soil.  
Do not water again until seeds sprout.



Emmy's notes: Larry Stebbins suggests that we sow these seeds or plant these transplants in shallow depressions to catch and hold water, rather than on top of small "hills", as is traditionally done, so the soil to be mixed with the fertilizer should probably have been removed from the area directly beneath where the plant will go.

To test the soil for moisture, grab a small handful of soil and squeeze it as hard as you can. Then open your hand flat. If the soil falls apart, it is too dry

## **7. Where to Find Ingredients for the Mixes, Locally and On-Line:**

Local Sources – There are many other sources -- garden stores and feed stores -- that aren't listed here. Much smaller quantities of these ingredients are also available locally and on-line. The price per pound is generally much greater for the smaller quantities. All the ingredients store well for years

Rockin' B Feed in Black Forest, (Bob), on Black Forest Rd. just south of Shoup, 719 495-3463, has high protein, (46 1/2%), non-organic , soybean meal in the 50# sack for \$21.00.

Colorado Agri-Feed, 4625 Park Vista Blvd., near the corner of Austin Bluffs and Barnes, has non-organic cottonseed meal in the 50# sack for \$21.05 and non-organic soybean meal in the 50# sack for \$23.00. 719 599-9961

Rick's Garden Center, 1827 W. Uintah, has Soil Mender Cottonseed Meal, (non-organic), in the 40# sack for \$29.00. 719 532-8491 or 719 623-5022

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On-line, the Down to Earth brand offers excellent quality organic and natural fertilizers and soil amendments for organic vegetable gardens. [http://www.everwoodfarm.com/About\\_Down\\_To\\_Earth\\_Fertilizers\\_and\\_Amendments](http://www.everwoodfarm.com/About_Down_To_Earth_Fertilizers_and_Amendments) Everwood Farm distributes many of their products in both large and small packages. [www.EverwoodFarm.com](http://www.EverwoodFarm.com)

1. Down to Earth Cottonseed Meal in the 50# bag for \$43.50. The MSDS, Material Safety Data Sheet, says it contains no hazardous materials.

[http://www.everwoodfarm.com/DTE\\_Natural\\_Single\\_Ingredient\\_Fertilizers/Cottonseed\\_Meal\\_6-2-1/50\\_LB\\_Bag](http://www.everwoodfarm.com/DTE_Natural_Single_Ingredient_Fertilizers/Cottonseed_Meal_6-2-1/50_LB_Bag)

2. Down to Earth Organic Kelp Meal Fertilizer (1-0.1-2), in the 20# bag for \$37.25.

[http://www.everwoodfarm.com/Down\\_To\\_Earth\\_Organic\\_Fertilizers/Kelp\\_Meal\\_1-0.1-2\\_fertilizer](http://www.everwoodfarm.com/Down_To_Earth_Organic_Fertilizers/Kelp_Meal_1-0.1-2_fertilizer)

3. Down to Earth Organic Soybean Meal,(7-2-1), in the 40# bag for \$61.75.

[http://www.everwoodfarm.com/DTE\\_Organic\\_Single\\_Ingredient\\_Fertilizers/Soybean\\_Meal\\_7-2-1/40\\_LB\\_Bag](http://www.everwoodfarm.com/DTE_Organic_Single_Ingredient_Fertilizers/Soybean_Meal_7-2-1/40_LB_Bag)

Honeyville's on-line store has flaxseed meal in the 50# sack for \$98.00 +\$5.00 shipping <http://shop.honeyville.com/flax-seed-meal-50lb.html>

Espoma brand has organic products which are carried by many local stores like Wal-Mart, as well as on-line distributors. They are generally packaged in small quantities, for example:

Espoma Organic Cottonseed Meal from Amazon.com, 3.5# for \$13.02 Free shipping over \$35.00.

[http://www.amazon.com/Espoma-CM3-Cottonseed-Meal-3-5-Pound/dp/B005KBKQOY/ref=sr\\_1\\_25?s=lawn-garden&ie=UTF8&qid=1430166282&sr=1-25&keywords=espoma+organic](http://www.amazon.com/Espoma-CM3-Cottonseed-Meal-3-5-Pound/dp/B005KBKQOY/ref=sr_1_25?s=lawn-garden&ie=UTF8&qid=1430166282&sr=1-25&keywords=espoma+organic)

Espoma Organic Rock Phosphate from Amazon, 7.25 # for \$16.71

[http://www.amazon.com/Espoma-RP7-Rock-Phosphate-7-25-Pound/dp/B0063ZDTPY/ref=sr\\_1\\_17?s=lawn-garden&ie=UTF8&qid=1430166056&sr=1-17&keywords=espoma+organic](http://www.amazon.com/Espoma-RP7-Rock-Phosphate-7-25-Pound/dp/B0063ZDTPY/ref=sr_1_17?s=lawn-garden&ie=UTF8&qid=1430166056&sr=1-17&keywords=espoma+organic)

Espoma Organic Bone Meal from Amazon, 10# bag for \$22.13

[http://www.amazon.com/Espoma-BM10-Organic-Traditions-4-12-0/dp/B002SAJVEG/ref=sr\\_1\\_1?s=lawn-garden&ie=UTF8&qid=1430166391&sr=1-1&keywords=organic+bone+meal+fertilizer](http://www.amazon.com/Espoma-BM10-Organic-Traditions-4-12-0/dp/B002SAJVEG/ref=sr_1_1?s=lawn-garden&ie=UTF8&qid=1430166391&sr=1-1&keywords=organic+bone+meal+fertilizer)