

THE  
GASTRONOMIC



GARDENER

# Composting for Beginners

David P. Offutt

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David P Offutt

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**Contents**

Composting for Beginners ..... 4

Why should you compost and why is compost good for the garden? ..... 4

    Composting can save you money! ..... 4

    Composting is good for the community. .... 4

    How is compost good for soil structure? ..... 4

    Besides soil structure, what else is compost good for?..... 4

So what is compost? ..... 4

What should I compost? ..... 5

Is there anything that shouldn't go in the compost? ..... 5

Ingredients ..... 5

Ratios ..... 6

How it works ..... 6

How do I know when it's ready?..... 6

Composting Methods..... 7

    Pile it up and wait method..... 7

    Quick Compost Method ..... 13

    Hybrid System ..... 16

How to use Compost..... 16

    Improving soil structure..... 16

    Compost as top dressing..... 18

    Compost as Mulch ..... 18

Conclusion..... 19

Composting method comparison chart ..... 19

References: ..... 20

About the Author ..... 21

## **Composting for Beginners**

Compost, seemingly such a humble thing yet so important to the garden. Veteran gardeners often refer to compost as “Black Gold,” and some are almost as proud of their compost production as they are of their vegetables, and for good reason. The addition of organic compost to garden beds is about the finest thing I can think of to improve your soil and vegetable production.

### ***Why should you compost and why is compost good for the garden?***

#### **Composting can save you money!**

Composting can help you save money, or at least spend less. Where I live, I have to pay the waste hauler to take away my trash. Why spend good money to have hauled away what, given a little time and effort, will improve the garden? In addition to saving on waste hauler bills, compost added to the soils reduces or removes the need for additional expensive soil amendments.

#### **Composting is good for the community.**

Composting removes valuable organic matter from the waste stream and reduces the volume in already stressed landfills. I think putting organic material in a plastic bag, only to have it toted off to the landfill where it will sit until that bag breaks down is lunacy. Instead, compost those veggie and grass trimmings! It is free and it can improve your garden. It is turning trash to treasure!

#### **How is compost good for soil structure?**

Compost is almost magical in its ability to improve garden soils. Compost can add water retention to sandy soils and improve drainage to clay soils

#### **Besides soil structure, what else is compost good for?**

Compost is full of nutrients. It'll feed plants with trace elements found in the material that broke down. It can increase soil aeration and conserve moisture if used as a top dressing or mulch. Save yourself some cash, skip the ground up pallets, impregnated with that horrible red dye that makes your yard look like a gas station.

#### ***So what is compost?***

Compost is simply the product of decayed organic material. Have you ever walked in old woods? Years of leaves that fall naturally and decay in place, build up a rich dark layer over time, creating a soft fertile carpet for new plants to grow.

Everything organic is compost-able, from a big tree – which may take many decades to break all the way down, to kitchen scraps which can be converted from recognizable vegetables to usable compost in as little as four to six weeks. Despite what many believe, it is even possible to compost animal products, even human waste<sup>1</sup> though it may be difficult for the home gardener to achieve and maintain the necessary heat in order to kill off the pathogens (dangerous bacteria) in the material. Most references for the home gardener discourage the composting of table scraps that would include meat, bones, or dairy. Those references site reasons of safety or the attraction of wild animals to the compost pile as

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<sup>1</sup><http://humanurehandbook.com/>

reasons to avoid meat, bones and cheese scraps in your compost. I would suggest that beginning gardeners follow that advice.

### ***What should I compost?***

Autumn leaves, weeds, vegetable kitchen scraps, coffee grounds, *untreated* lawn clippings, eggs shells, tea bags, fruit peels, shredded clean newspaper (not the shiny colored inserts), dead houseplants are all fair game to get started. Stall litter from farm animals, chickens, horse, goats, llamas, rabbits, etc. make excellent additions to compost. Make sure the additions are in small pieces to speed decomposition. Most of the items listed above are pretty small already, but you want to make sure no big stalks or clumps are in the pile. They *will* break down, but big pieces do take longer.

### ***Is there anything that shouldn't go in the compost?***

I would not compost obviously diseased plant material or any pernicious vining weed, such as bindweed (wild morning glory) as that could infect your garden. Thorny bushes such as roses will compost, but hitting a thorn while you are sifting can put a damper on an otherwise pleasurable activity. Leave them out. Also, if your lawn or weeds are treated by any herbicide (and I don't buy that "completely safe in 6 hours" claim) by you, your lawn service or a well intentioned spouse, I wouldn't put that in the compost either. Why? If you are trying to grow healthy food, the addition of herbicide treated material makes no sense.

### ***Ingredients***

When creating compost, you need to be aware of the four basic ingredients that combine for good compost.

- Carbon (sometimes referred to as brown, cold, or dry ingredients)
- Nitrogen (sometimes referred to as green, hot, or wet ingredients)
- Air
- Water

Carbon comes from dry and (usually brown) organic material. It might include autumn leaves, shredded newspaper, or straw. Straw, (not hay, hay is green and high in nitrogen) is one of the best dry ingredients for the compost pile. Not only is it a good dry material but the hollow nature of the straw adds air to pile.

Nitrogen comes from fresh "green" materials – weeds, spent plants at the end of their growing cycle, kitchen scraps including vegetable peelings, eggshells, coffee grounds and teabags. These should be chopped rather small to speed decomposition.

Air – seems self explanatory but air needs to get into the compost pile in order to for proper decomposition to occur. I'll cover decomposition a little later.

Water – there needs to be enough moisture to support the microbes. Compost should be about as wet as a damp sponge or rag. If you pick up a handful and give it a squeeze, it should hold together loosely, if it only crumbles, it is too dry, if water drips out, it is too wet. Some experts advocate covering your compost heap to keep rain out as a matter of course. In my experience that has not been necessary though it would provide more control over moisture levels

## ***Ratios***

Often recommended is a ratio of brown to green of 30:1. While this might be optimum for rapid decomposition, you can get useable compost out of more varied amounts of ingredients as long as you have enough time. But nature certainly doesn't measure her compost ingredients, and you don't have to either. Given time and space, organic material does break down. That said, if you really want to speed up the process and have the inclination, you could help Mother Nature along. Paying attention to the carbon to nitrogen ratios, proper water and aeration can produce *in weeks* what nature may take *years* to do.

## ***How it works***

Put simply, composting works because bacteria break down organic material in multiple stages. I'll compare it to a multi stage rocket. During the process, the bacteria are activated by the carbon, and they use oxygen to break it down into usable forms – leaving heat ( an exothermic reaction) and carbon dioxide (bacterial flatulence?) in their wake. Bacteria, like plants, are not created equal. Just like plants, different bacteria have conditions that are most favorable for them to thrive. Composting takes advantage of these differences to break down your organic waste to usable humus. (Humus is just a fancy name for compost, not to be confused with *Hummus* the delicious creamy chickpea based dip.)

In the first stage, mesophilic bacteria (literally “middle lovers” as they survive and thrive at a temperature between 70F - 100F (21C - 38C)) work to break down the easily digested materials. Their reactions are the ignition that causes the compost pile to heat up before handing off to the second stage bacteria, the heat-lovers.

After the first stage has achieved lift-off, the second stage begins. Thermophilic bacteria thrive at hotter temperatures ranging from 113 to 160 degrees Fahrenheit (45C – 71C). This temperature range (above 130 F), kills many unwanted seeds and disease-causing beasties. Fats, proteins, and cellulose ( the fibrous component in plants) break down at this temperature as well.

Just as rapidly as a pile may heat up, once the food supply or conditions are less than optimal, a compost pile will begin to cool. By turning, watering or activating you can spur spikes in activity (measured by heat) but eventually the pile will no longer get hot. It may stay warm for some time indicating there is some activity, but it will not get hot again. At this point, you can screen the compost using what you need, and return the bigger bits to the pile or you can let it sit and it will continue to break down slowly during the third stage.

Think of the third stage as the rocket coasting through space. It may not be as exciting as the first two stages but that doesn't mean you aren't going somewhere! Just because the thermophilic bacteria are no longer heating and thriving in the pile, doesn't mean the pile is not active. In fact, the next wave of bacteria (and fungi) prefers cooler (70-75F or N to N C) temperatures. They arrive and hang around breaking down the most stubborn materials. This coasting stage can last months, even years.

## ***How do I know when it's ready?***

So the bacteria have done their job, at least you think they have, but how can you be sure the compost is ready? It's ready when that pile of identifiable vegetable peelings, shredded newspaper and other raw ingredients are long gone. In their place is a pile of uniformly textured, dark brown colored crumbly material. Give it a sniff. It doesn't stink like those rotted onions you threw in there does it? Smells more

like fresh dirt after a rain. It's done! While there may be variations from batch to batch, and some woodier components may need to return to the pile, you may use the brown crumbly stuff.

## ***Composting Methods***

There are an overwhelming number of options for composting available to the home gardener. But the first question to ask yourself is, "Am I in a hurry or not?" As I said before, given time, nature composts everything organic.

For the beginner, there are three basic methods of composting; there is the "Pile- it-up-and-Wait" method, the "Quick-Compost" method, or a "Hybrid Method." I've used all three methods and can say they all work, and will make usable compost that will help your vegetables thrive. Pile It Up is more of an ongoing process, while the Quick Method is a batch process, and the Hybrid method is well, a hybrid between the two. At this point in my experience, I prefer the hybrid method in terms of time and effort.

What method you choose depends on your available space, time and energy. Let's examine at each one.

### **Pile it up and wait method**

This is by far the simplest method, and the name pretty much says it all. You simply need to take all your compostable materials and throw it in a pile. In time, you'll have beautiful compost to add to your garden. Not enough information? OK here goes....

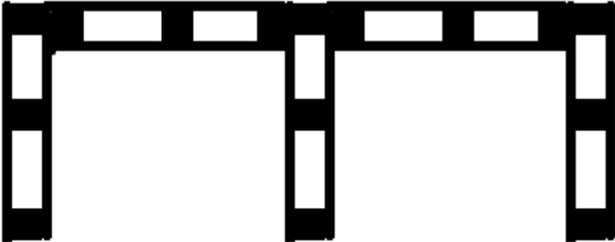
A compost pile (often called a heap) is the simplest method, but there are a few things to keep in mind. If you have a large property, you can take your material to the way back and just pile it up, it will work, but is not so neat or manageable. Most of us don't live on a big enough property to be able to devote space to a big pile. You might even have neighbors, who likely won't want to look at that big unorganized pile. With that in mind, some sort of containment system is helpful, and since this method is relatively slow, you may want more than one container or bin. This would allow you to let one pile age while you add to the other. Each year you take the usable compost out of the old one, shovel the newer one (turning it, which adds air) into the empty spot to allow it to age and continue adding new material to the now empty bin.

If you look through your garden catalogs, or walk through the garden center, you will undoubtedly see beautiful bins, with lovely wood slats, glowing in the morning light. They sure are pretty, right? Pretty unnecessary I'd say! I'm sure they will work, but we're talking about rot and decay. If you want the fancy pretty bins, spend the money. I think it's a waste.

One of the simplest ways to create usable bins is with inexpensive wooden shipping pallets. With as few as three pallets, or five or more, you can create a single or multiple bins for keeping your compost. As seen from above, here are the configurations of single and double bins using three and five pallets respectively.



**Single Bin**



**Double Bin**

I initially used this technique, and it worked great. Let's take a look on the next page.

Years ago, when I started turning my attention to vegetable gardening over at a “remote plot” I knew we needed a compost pile. Over the course of the year we added grass clippings, vegetable kitchen scraps, poultry stall waste until we had a big pile. Well, one and a half piles. The one on the left was the original pile and almost two years old. The one on the right was the second year pile.

Keep in mind, we never measured what the ratios were, we didn’t water it, nor keep it covered, it wasn’t fancy, and it wasn’t pretty. Fortunately the homeowner at this location had enough property that aesthetics weren’t important.



**Two years worth of organic material**

The following March we covered the older pile with black plastic so it would “cook” in the spring sunshine. We were hoping to speed any final decomposition as well as kill any seeds or nasty stuff that may be remaining.



**Covered in black plastic the pile heats quickly**

By May, it was ready. I shoveled into buckets, carted it back to my house, screened it and put it in the beds. I had made a screen out of scrap lumber and a bit of 1/2" (1 cm) screen. I can put it across some sawhorses over the wheelbarrow and just dump in the material and push it through the screen thus removing any small sticks and stones or other debris.



**Cheapo & Simple Compost screen**

I put the organic material that is too big for the screen back in the pile to break down some more.

Here's what I started with.



Fresh from the compost pile

And here it is after screening.



Screened and ready to use

This compost was added to the raised box beds in the early spring. By added, I mean I dumped about an inch of compost into the beds and then raked it in. The bed soil is light, fluffy, drains well, yet stays moist. The garden loved it! I didn't add any other fertilizer, only compost. This picture is from early July, about 8 weeks into the season.



I think it is clear from the photo above, that the garden indeed thrived with the addition of the nearly two-year-old compost. But, not everyone has two years to wait. In today's society of fast food, instant messaging, and win-now mentality, two years may as well be a lifetime.

Before we move on to the other two methods, I want to talk about composting bins or containers because you're going to need one (or two) for the next two methods

## Home Composting Bins

Initially I planned to run an experiment as to the best method for home composting but I figure there is no sense in reinventing the wheel. As I was looking on the internet I found an interesting series of videos\* that compare composting systems. I was surprised with the results. You can just watch the first and last if you are pressed for time.

Introduction - <http://bit.ly/GTOTma>

Part 2 - <http://bit.ly/GPCNFL>

Part 3 - <http://bit.ly/H677Ae>

For those of you who do not want to watch videos, the results are:

- Large bins work well over the long period (see pallets bins above).
- Those little tumblers once loaded don't seem to have enough air flow, nor adequate drainage, resulting in wet stinky output.
- Plastic stationary bins work, but are unwieldy, and difficult to access. The doors also may become brittle and fragile.

- Seems the "best" system may in fact be the simplest. A basic container that allows ample airflow, is easy to empty so the material may be turned, and lightweight enough to be handled by one person.

The "best" kind may be purchased or home made. They are often made of flexible plastic, or you can make one out of heavy duty chicken wire, or cattle panels formed into a cylinder and secured. That's what I did.



Now back to the technique!

## Quick Compost Method

Quick is a relative term here. Compared to two years, four to six weeks *is* quick. Earlier I discussed how composting works, and the different stages of decomposition that depend on bacteria to break down and heat up a compost pile. The Quick method helps nature along by providing the optimal environment for decomposition to occur.

There are several differences between the Quick method and the Pile It Up. To the beginning composter this means three things:

1. The Quick method is more of a batch process. Instead of gradually adding organic matter to an ever-growing pile and having it all cook together over time, you will need to have the ingredients to build a pile on hand. This means you will need to gather the carbon and nitrogen ingredients *before* you start.
2. The mixture of the four ingredients (carbon, nitrogen, water and air) is more closely controlled and it becomes more important to adjust the ratios, and monitor moisture levels. This sounds complicated but it is not.

3. A minimum size of 25-30 ft<sup>3</sup> is recommended in order for quick composting to occur.

One more thing, since you're trying to accelerate nature, it is useful to measure your progress. The best tool for this is a compost thermometer, available from garden centers and on line for about \$30.



Do you need one? No, but it sure is helpful.

## Gathering ingredients

Gathering ingredients is easy. A five-gallon bucket with a lid is the perfect place to gather kitchen scraps, coffee grounds, eggshells and other green ingredients until you have enough to start. Do you remember the ratios? You want about 30:1 brown to green, but don't get too worried about perfection.

Rot happens.

Brown ingredients are super easy to come by. A bale of straw will cost about \$6 and provides enough carbon for several batches of compost. Dry (and it's important that they are dry) autumn leaves also make for a good "brown" component. Shredded junk mail (separate out the plastic and glossy paper first) is one of my favorites or shredded paper from the office, or shredded newspaper. I think this is recycling at its finest!

## Putting it together

When you've gathered the materials it's time to assemble the pile.

Most resources recommend a layered approach, but after the initial "cook" you'll be turning the pile, so a careful layering doesn't matter so much.

In the container of your choice, lay down a layer of brown/dry/carbon material (leaves, straw, shredded newspaper), add some green/wet/nitrogen material (grass clippings, kitchen scraps, manure). Give a quick spray with the hose, or watering can. You don't want to soak the layers, just get them moist. Now

I've read you need 25-30 cubic feet (ft<sup>3</sup>) of material in order for it to heat up properly. My experience is you can get a hot pile at about 20-30 ft<sup>3</sup> Repeat until you have at least 25 ft<sup>3</sup>.

Give one more spray of water on the top and let nature take its course. Depending on the weather, it may take a few days for the pile to heat up.

Take the temperature. If just starting out it may rise to 110°F ( N° C) or so. But when bacterial action really takes off the temperature may zoom to 140°F or more, even 160°F!

At that temperature, the compost is really cooking and it will steam if you dig into the center of it. You also may notice the pile collapsing in the center. This is a normal part of the process and indicates active decomposition.

Monitor the pile daily.

When the temperature drops to below 100°, it is time to turn it. Don't worry if you are too busy and can't turn it right away, it will still continue to break down. Remember what I said, Rot happens!

If the pile is going over 160°, turn it, or risk killing off the thermophilic bacteria.

## **Turning the pile**

Now comes the hard part. Well, not really difficult, but more interactive. You need to turn the pile in order to add air to the pile, as well as move the material from the outer part of the pile to the inner part.

The easiest way I have found to do this is to open a medium sized tarpaulin (about 10'x10') next to the pile. If you can, lift the container off the compost, or, as I do it, tip it over onto the tarp. This can be heavy so it can help if you have a friend to lend a hand. Set the container back up. Hold the edge of the tarp and raise it up until the pile starts to tumble. You can work your way around the tarp tumbling the compost until it is well mixed. Alternatively, turn the compost using a shovel or a fork – be careful not to tear the tarp too badly. Once the compost is evenly mixed, check the moisture level.

To test the moisture level, pick up a handful and give it a squeeze.

Does water drip out? It's too wet, and as you move it back into the container, you'll want to add some brown/dry material. Does it fall apart or crumble? Ideally it holds together a bit before crumbling apart, remember from the beginning, it should be as wet as a damp sponge.

Now shovel (a flat snow shovel works well) or fork the material back into the container making adjustments as needed. – Add water or carbon to get the moisture level right.

The next day take the temperature. Then the next. It is likely to go up again but perhaps not as high as the first "cook."

Repeat the process each time the temperature falls below 100°F.

Eventually the pile won't heat up much past the ambient air temp. This occurs because the pile is lacking in one or more of the ingredients. It shouldn't be air, - you've been turning it, or water because you've been keeping it moist. That leaves nitrogen or carbon. In my experience, it is usually nitrogen that is lacking. Or, maybe it's done?

Look at the compost. Is it still mostly recognizable material or has it turned brown and crumbly? If brown and crumbly it's done. If you can still make out mostly distinct ingredients you need to make it "hot" again. Small soft bits of straw are ok, especially if they make it through your screen. Remember, it doesn't have to be perfect to work.

Sometimes your compost may need an extra little boost, usually in the form of nitrogen.

I'm partial to a few scoops of alfalfa pellets (rabbit food) tossed in a bucket of water and left for 30 minutes or so until a slurry forms (you can also use fresh manure if you have access). This mixture, dumped into the middle of a pile can heat things up. If it fails to heat up the pile, you may either need more carbon or the pile may be nearly finished.

Adding nitrogen should be enough to spike the activity (and temperature) again. I have found that this procedure is only effective a few times.

## **Hybrid System**

The hybrid system brings the best of both methods together. It's easy to do, makes compost "quickly", takes up only a little room and you don't need all the ingredients on hand to begin with, just the brown.

To begin with, you will need the brown material on hand, and a bin. I've already described the bins I construct.

Add a layer of brown material (straw, dry leaves, shredded paper) as the bottom of the pile. As you collect green waste – add it to the pile. After each addition of green, add a brown.

Have a hose or watering can handy to moisten the pile.

When you finally have enough collected, the pile will start to heat up. At this point, the process is the same as for the Quick method.

You can see why this is handy to have another bin to start, As the first one cooks, you can be filling the second. I have three bins, which give me a steady stream of compost throughout the growing season.

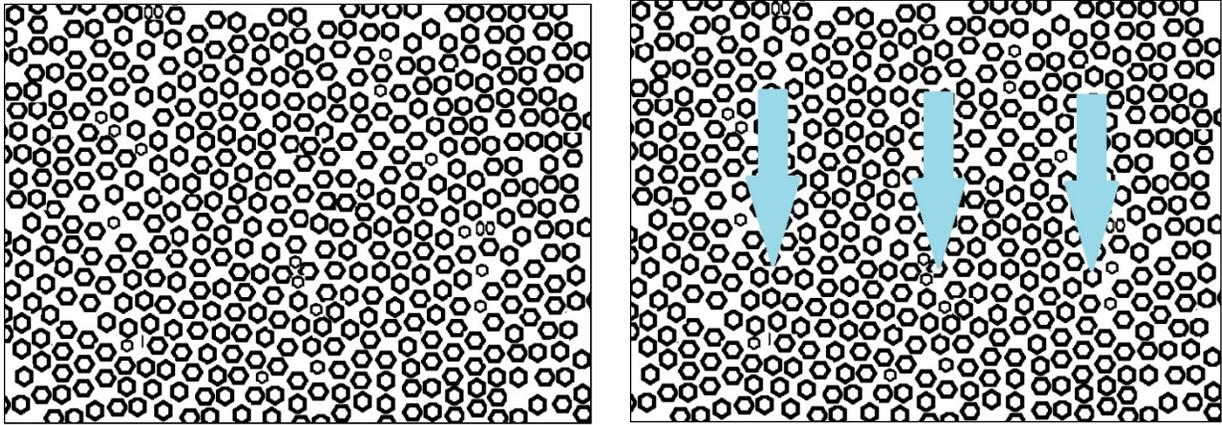
## ***How to use Compost***

Congratulations! You've made compost. Now comes the benefits part. In general, compost is used to improve soil structure, as a top dressing, or as a mulch.

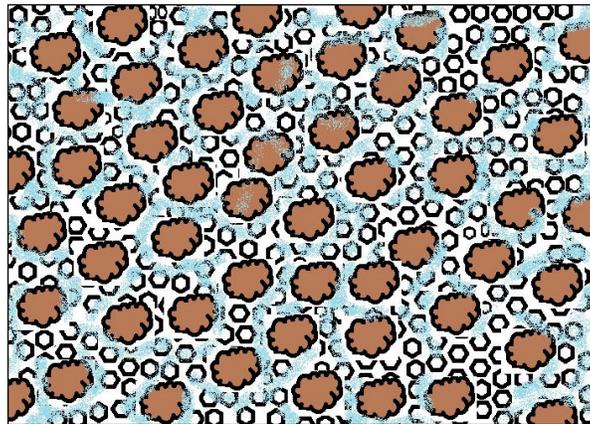
### **Improving soil structure.**

To improve soil structure, spread one to two inches of compost on the growing bed. Work it into the top six inches of soil using a rake or a hoe. Your garden will benefit from this, especially if you do it annually! But what is really happening when you do this?

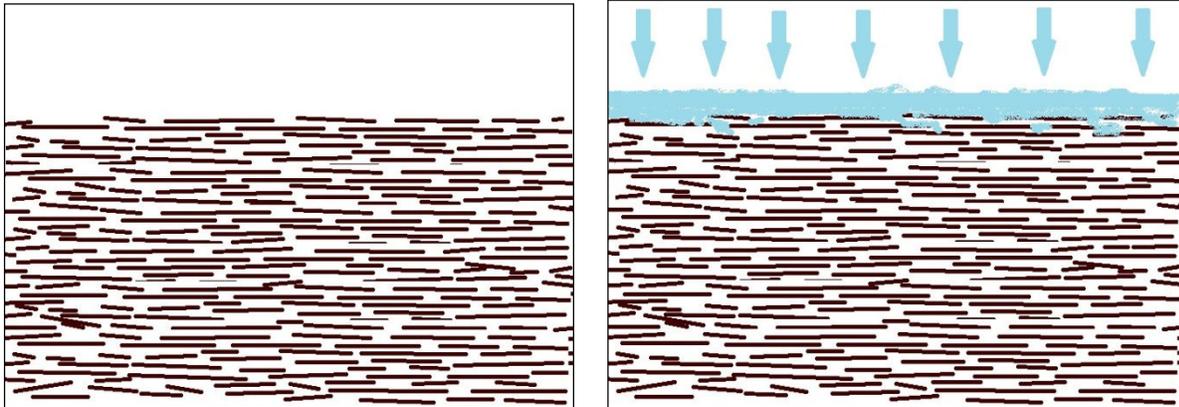
**Sandy soils** are high in mineral content and low in organic matter. The combination of the spaces between the sand particles and the low absorbency of minerals makes for excellent drainage but poor water retention, as water flows between the gaps.



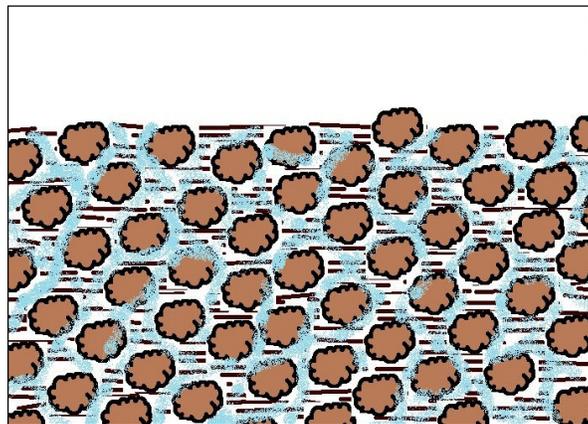
However, when compost is added, the compost acts like tiny sponges throughout the sandy particles, holding water until needed by the plants.



In **Clay soil**, the minerals line up flat, making it difficult for water to penetrate. There is little space between the clay particles for water to flow, and water tends to puddle or run off on clay soils.



Once again, the addition of compost greatly improves the soil. The irregular shape of the organic material breaks up the clay, removing the alignment of the flat particles thereby improving drainage.



### **Compost as top dressing**

Apply the finished compost in a 1" thick layer and scratch it into the top 2-3 inches of soil. Plants effectively drink, and the majority of vegetable roots are in this top layer. Even root vegetables – carrots, beets, and turnips for example, will benefit as the nutrients in compost are water-soluble and will be available to the plants when the garden is watered or when it rains.

### **Compost as Mulch**

You can also apply compost as mulch, just placing it on the surface around your vegetables. It will help with water retention, cool the soil surface, provide nutrients and suppress weeds. Consider that some folks fork out good cash for bags of yucky industrial byproducts labeled as mulch, dyed with who knows what. If you use your own compost, you save money, the mulch will be a lovely natural brown, and you know what went into it. What could be better than that?

## Conclusion

Composting is easy, well easier than doing your taxes anyway, saves you cash, and reduces the volume in landfills. Compost will improve soil structure, and feed your garden naturally. Making compost and applying it to your garden is the single most important thing you can do to ensure organic gardening success.

## Composting method comparison chart

Used this handy chart to pick the method that is best for you.

Method	Pro	Con	Notes
Pile it up an Wait Method	Low effort, no need to stockpile materials	Takes a long time  May take a large amount of space.  Compost is ready every year or two	This method may take a year or more to produce usable compost. I recommend at least two bins, one for last year's pile one for the current year.  Additionally the top or cap will likely not be fully decomposed, toss that into the current year pile. The best and most usable compost will be at bottom of the old pile.
Quick Compost Method	Usable compost in as little as 6 weeks	Materials need to be on hand before building the batch.  Relatively high effort.  Multiple bins are recommended for best results and a constant supply.	Requires weekly turning and possible adjusting of water levels and carbon / nitrogen (easy though).  Compost thermometer is very helpful tool.
Hybrid	Initially as easy as Pile it up method, but rapid results like Quick method  Creates as constant supply during the warm season.	Need to have brown materials on hand.  Multiple bins are recommended for best results and a constant supply	Once built same as Quick Method.  Requires weekly turning and possible adjusting of water levels and carbon / nitrogen (easy though).  Compost thermometer is very helpful tool.

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<http://humanurehandbook.com/>

\*Disclaimer - I received no compensation or consideration from Dave Wilson Nursery in regards to the videos linked above.

## ***About the Author***

David P. Offutt, “The Gastronomic Gardener” is an enthusiastic vegetable gardener and home cook. He got his start gardening more than a decade ago when he researched and installed a perennial garden in his little lot in the suburbs of Chicago, Illinois.

Once he turned his attention to vegetable gardening, and started cooking with his own-grown produce he was hooked!

He’s now on a mission to spread the joy of veggie gardening, cooking from the garden and reaches thousands of readers between his facebook page [www.facebook.com/Gastronomicgardener.com](http://www.facebook.com/Gastronomicgardener.com) and his website [www.gastronomicgardener.com](http://www.gastronomicgardener.com) .

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