



CHANDLER
arizona

Public Works & Utilities
Water Conservation

Welcome to Composting 101 Virtual Workshop!

August 27, 2020

We appreciate you joining the virtual class. We will begin our class on time at 6:00pm.

Just Some Reminders:

- All attendees are automatically muted and will not be able to unmute or share video once joined in the class.
- Please place all comments or questions in the Q&A box. We will have personnel reviewing and answering questions as they are received. We will present the questions to the instructor at points within the presentation and at the end.
- Class handout material(s) are in the reminder emails that were sent leading up to this class. The attachment links to the handout documents are toward the bottom of the email.
- If you are having technical difficulties, feel free to email us at: conserve@chandleraz.gov or call 480-782-3606
- This workshop and the conversations in the Q&A chat box will both be recorded.
- The most recent Class Reminder email that was sent a couple hours ago includes the presentation slides.




THE DIRT ON COMPOST

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Composting can be very simple...
...or quite complicated.
It's your choice!

You need to choose a system that works for you.



Your choice should take into account:

- the time you are willing and able to spend on your compost
- the physical effort required by the different systems
- the materials that are available

Choosing a pile style

Generally, a mass that is about a cubic yard (or larger) is good for successful composting. If it is too small, it won't hold heat or moisture very well (and will take longer to process).

The size of your system should take into account the amount of space you have available, as well as the amount of material you have to compost.



Your system can be a simple heap or pile...

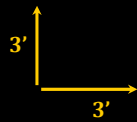


...or it can be some sort of bin if you are interested in tidiness or aesthetics.



Gardening - Henry Beard & Roy McKie

If you prefer a bin system, it should be at least 3' wide and about 3' tall.



32" - 36" is considered the maximum height for ease of working your system.

Consider whether you want a stationary or a movable structure.

If the bin is stationary, removable panels or slats, gates, or doors can make working easier.



**Bins can be open-sided or enclosed
(but not airtight)**

OPEN-SIDED
better aeration
dries out faster
loses heat faster



vs.

ENCLOSED
decreased aeration
retains moisture
holds heat better
deters animals



Some bin styles:

galvanized hardware cloth, or chicken wire
-making a circular enclosure is easy





recycled pallets

-pine is more rot-resistant than hardwoods
-choose pallets that have narrow spaces between the slats
(paint can pallets)

screen - keeps small material from falling out



wood

- untreated wood will decompose over time, (cedar or redwood are slowest to decay)
- treated wood or painted wood may contain heavy metals such as arsenic, copper, chromium, or other toxins, that could leach into compost over time



cinder blocks



flexible plastic enclosure



recycled trash bins

with or without lids,
right-side-up or
upside-down



standing recycled plastic bins







NO PITS!!!

Pits don't allow proper aeration and can hold too much water!

They can easily become anaerobic (and stinky!)

1 compartment vs. 2 or more compartments

Take into consideration the space you have available, the quantity of material you have to compost, and your habits.



Locating your compost system

- easy access for you
- access from your kitchen and garden areas
- enough space to maneuver as you work



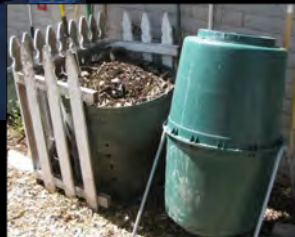
- *access to a water source
- placed away from walls or fences that can rot or discolor
- located on level, well drained surface
- not a low spot in the yard



- not too close to a tree or large shrub
- roots will grow up into the compost
- sun vs. shade
- summer: sun will dry the pile out faster
- winter: sun will keep microorganisms more active



-aesthetics



The composting process

To create a finished compost product, you need to provide food, water, and air.

If you provide these essentials, the workers will come.

The *food* is the material you put into the compost.

A carbon to nitrogen ratio of at least 3:1 will provide a suitable combination of material.

Carbon (C) is obtained from *dry* leafy and woody materials.

carbon sources:
*dead leaves



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carbon sources:

dead leaves

dried winter ryegrass clippings

(best not to include Bermuda grass)

straw (with no Bermuda grass)

chipped/shredded branches (from a tree removal service)

wood shavings (non-treated wood)

*coffee filters

tea bags

shredded newspapers

paper bags

cardboard egg cartons



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compostable items





Nitrogen (N) is provided by green or moist material.

nitrogen sources:

kitchen fruit and veggie scraps
pulp from a juice bar



Nitrogen (N) is provided by green or moist material.

nitrogen sources:

coffee grounds (from coffee shops)
fresh winter ryegrass cuttings (best not to include B...)
young weeds (that have not flowered yet)
fresh yard/garden waste
hair
manure



manures

cows
horses
goats
sheep
chickens
rabbits



NO cats, dogs, or birds
(can carry disease-causing pathogens, or parasites
such as roundworms or tapeworms)

It is safest to use fully composted manure in your herb and vegetable gardens. This should prevent possible pathogens, such as *Salmonella*, *Listeria*, and *E. coli*, from contaminating your garden produce.

If not fully composted, the greatest risk of pathogens is with root crops or edible parts of other vegetables or herbs that come in direct contact with the soil.

Manure can contain concentrated salts.

Fresh manure can burn plant roots.



**cover food scraps with a layer
of carbon to discourage flies**



Do not feed your pile:

diseased or insect-infested plant materials
meat, fish, bones or dairy products
(can attract houseflies)
fats or oils of any kind
(can become rancid, smelly)
weed seeds (unless you compost hot!)
ashes
mineral lime
eggshells (made of calcium...)
cat or dog feces
magazines, colored pages of newspaper (ads)





no seeds
-flowering weeds = dangerous
young weeds = ok



Plant material with toxins or growth inhibitors:

The chemical toxins or growth inhibitors are broken down if the material is *fully* decomposed.

oleander
eucalyptus
salt cedar (tamarisk)
sunflower
palo verde

The *water* is the moisture you provide for the compost materials. Maintain the materials in a moist condition, damp like a wrung-out sponge.

If the pile becomes too wet, an anaerobic condition is created, along with an accompanying odor. Aeration and additional carbon materials can create an aerobic environment once again, suitable for the desired organisms.



The *air* is the aeration of the compost.

Provide proper aeration of the system by frequently turning and mixing the materials so air will be available for the hard working microorganisms.

Ideally, turn the pile once a week.

Do not aerate more than three times a week.



Some handy tools for aerating your pile:

pitchfork
digging fork
flat-edged shovel



compost aerator gizmos

pvc tube with holes



winged aerator



Compost Crank®



aeration



The *workers* are the microorganisms (and macroorganisms).

You can add a few shovels-full of compost, soil that has been amended with compost, or some commercial compost “starter” or inoculant (or activator) to provide the agents needed to decompose the organic matter.



The organic materials are broken down by fungi, bacteria, actinomycetes and other microorganisms.



mycelia –
indicates good fungus at work!



There are both *aerobic* and *anaerobic* bacteria.

With healthy composting habits, you will encourage the preferred types of *aerobic* bacteria.

- psychrophilic bacteria – active between 0 – 55°F
- mesophilic bacteria – active between 50 – 120°F
- thermophilic (heat-loving) bacteria – active between 120 – 150°F

Chop, shred, or dice the debris into small pieces.
The increased surface area makes it easier for the microorganisms to do their work, so you will have finished compost faster.



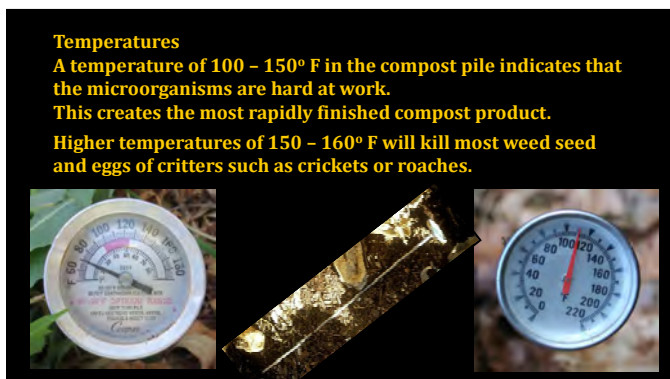


shredders









Stages of composting:

stockpiling, hot composting, and curing.

Stockpiling is collecting materials until you have enough to make a batch of compost.

Holding bins can keep things tidy, keep leaves or other lightweight materials from blowing away.





stockpiling...

...shredding



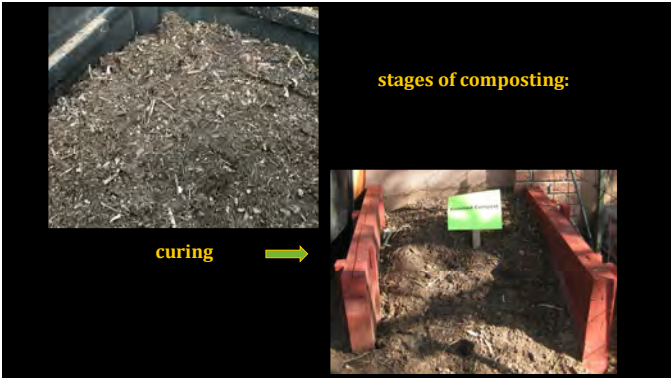
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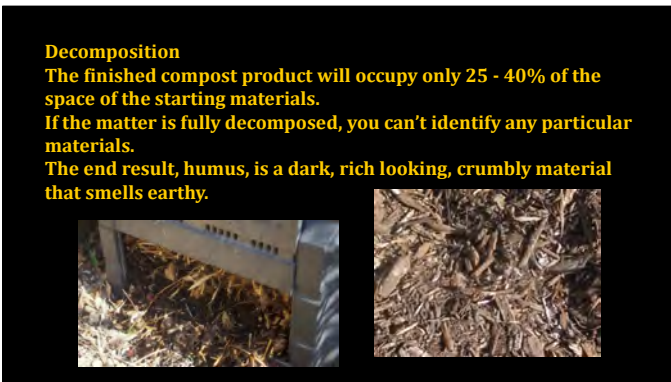
hot composting



stockpiling









Timeline

The process can take as little as 4 – 6 weeks, or more typically as long as 6 months, to a year.

More fibrous materials (fibrous agave leaves, corn cobs, banana peels, pine needles) take longer to break down.



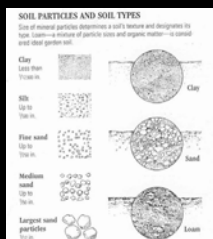
Benefits of compost for vegetables and herbs

-Compost enhances soil structure, allowing better root development for stronger plants.

-loosens heavy, clayey soils

-holds sandy, or gravelly soils together

-reduces soil compaction and erosion



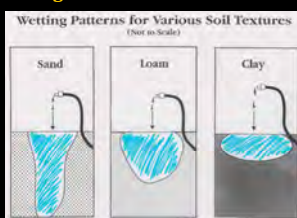
-Compost provides better water-holding capacity of soil.

-creates better drainage in clayey soils

-allows salts to leach below the root zone

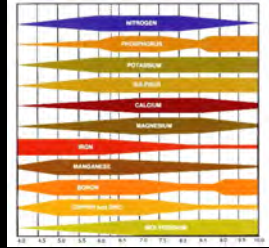
-holds moisture more effectively in sandy or rocky soils

-reduces leaching of nutrients below the root zone



- Compost helps lower soil pH over time.
- makes nutrients more readily available for absorption from the soil

SOIL NUTRIENT AVAILABILITY RELATIVE TO SOIL pH



- Compost returns small quantities of nutrients to the soil.
- this, combined with more friendly soil pH, reduces the need for additional fertilizers



Compost Tea 101: What Every Organic Gardener Should Know
Updated by: Chemical, David and Jane 10/1/2016

Introduction
 Compost tea is a liquid fertilizer made from compost. It is a natural, organic fertilizer that can be used to feed plants and improve soil health. Compost tea is made by steeping compost in water for a period of time, usually 24 to 48 hours. The resulting liquid is then filtered and applied to plants. Compost tea is a great way to get the most out of your compost. It is a natural, organic fertilizer that can be used to feed plants and improve soil health. Compost tea is made by steeping compost in water for a period of time, usually 24 to 48 hours. The resulting liquid is then filtered and applied to plants. Compost tea is a great way to get the most out of your compost. It is a natural, organic fertilizer that can be used to feed plants and improve soil health.

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-The good microorganisms associated with compost create a healthy soil that can keep soil-borne pathogens (bad bacteria and fungi) in check.



...and that's the
dirt on compost!





Thank you for
joining us!



Additional Resources

City of Chandler

Solid Waste & Recycling
chandleraz.gov/residents/recycling-and-trash
Email: solidwaste.customerservice@chandleraz.gov
Ph# 480-782-3510

Water Conservation
chandleraz.gov/water
Email: conserve@chandleraz.gov
Ph# 480-782-3580

Town of Queen Creek

Solid Waste & Recycling
QueenCreek.org/Department/Trash-Recycling
Ph# 480-358-3450

Water Conservation
QueenCreek.org/ReduceTheUse
Email: ConserveTheQC@queen creek.org
Ph# 480-358-3455
