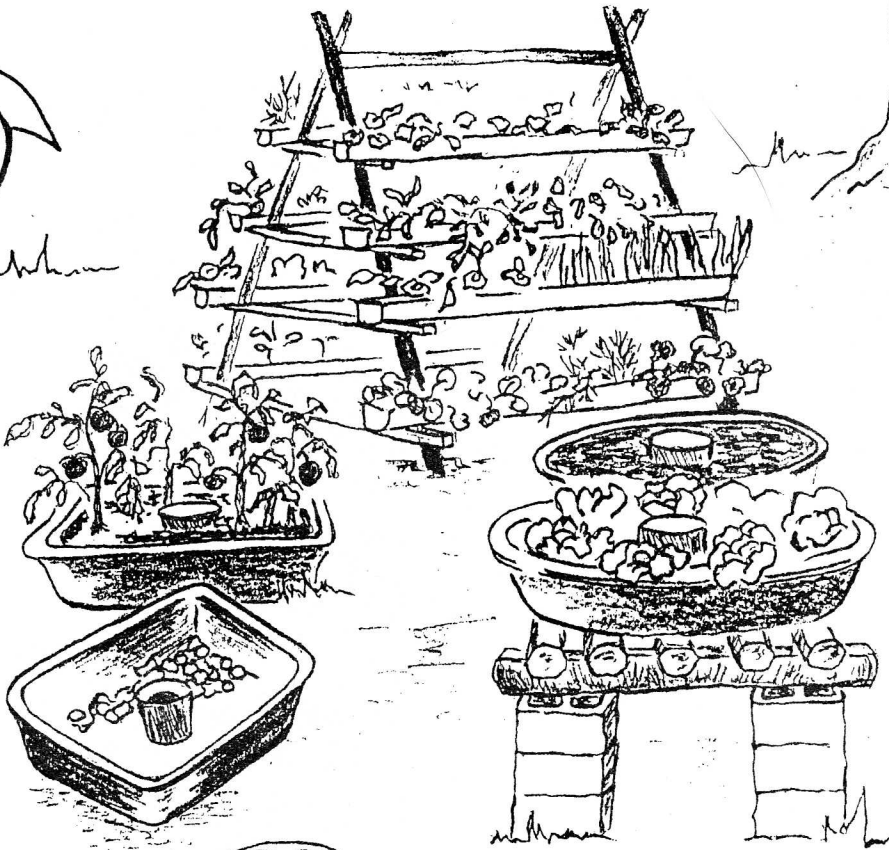


\$3.00

Using Cola Cans in Your Soil Mix



a Gardening Hint from

ECHO
Educational Concerns for Hunger Organization

USING COLA CANS IN YOUR SOIL MIX

By Martin L. Price, Ph.D.

Revised April 1993

I like to grow flowers and vegetables in containers with soil/cola can mix for two reasons; the elimination of moving heavy containers and of buying expensive, potting mix.



This large flower pot can be readily moved because the growing mix contains 40% cola cans.

A major reason for my interest in containers is that they can be safely moved to the garage in the event of a frost or freeze. Here in Florida, if I can protect plants a few times a season, year-round gardening is possible. Gardeners in the North can add several weeks to their growing season by doing the same thing.

Another reason that I grow some of my flowers in containers is for splashes of color at key spots along my entryway, driveway and screened in porch. Those spots do not lend themselves well to beds, whereas containers suit the locations wonderfully; the container itself can add to the elegance of the display.

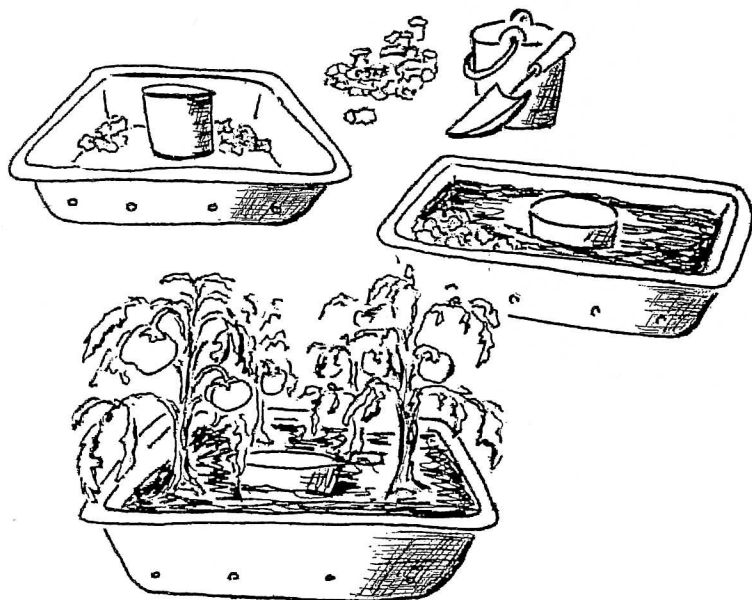
Why do I need to move these containers? I like to have continual color all year, something that few annuals provide. So I let the flowers develop in their final pots in my work area, then move the pots to key locations just as they begin to bloom.

The simple technique described in this gardening hint can save you a lot of money in potting soil, make it much easier for you to move relatively large pots yourself, and might even keep you from injuring your back.

The Soil/Cola Can Mix

The idea for this technique came from our work on rooftop gardening at ECHO. Locating enough organic material for gardens can be difficult in some urban situations in the Third World. So we considered mixing organic matter with items from the garbage dump that would not normally be considered in gardening. We chose cola cans, readily available here, as a uniform model for garbage.

In one of our more striking successes, we not only reduced the volume of organic material by 1/2, we were also able to make a 12 inch, deep bed that was no heavier than our other 4 to 6 inch beds. We simply alternated layers of cola cans and grass clippings. As an additional advantage, roots, which might not be expected to grow very many inches into a soggy bed of decaying grass clippings, were able to obtain air by growing into the openings of the cans.



Preparing the Container

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The same technique was transferred to soil mixes for containers. It's very simple. Begin by collecting cola cans, or any other aluminum can. Next, take a pen knife or other sharp object and poke holes in the sides of the can. I jab the can with my knife and give it a half twist to make a hole roughly the size of a finger nail. Because the walls are so thin, six such holes can be made in a can in just a few seconds.

Place one or two layers of cans in the bottom of your container, add whatever soil mix you normally use, and gently shake so that it fills in around the cans. No doubt there will be some spots under some of the cans which the soil mix did not fill. Do not worry about these. If you shake the pot vigorously in an attempt to fill every spot between the cans you will be in for a surprise.

The "Fluidized Bed"

Vigorously shaking small particles make what is called a "fluidized bed." That means that the bed of particles begins to act like it was a fluid. One consequence is that lighter weight items will float. At least with the mix I use, when shaken vigorously the cans come right to the top. We use this technique to separate chaff from seeds. Just a few seconds of vigorous shaking is often enough to cause the lighter chaff to "float" to the top of the seeds.

After the soil mix has covered the cans to a depth of an inch or so, add another layer of cans. Continue these layers until you are near the top of the container. Be sure to stop a few inches from the top and fill the rest of the way with pure potting mix. Otherwise, you will run into cans when you are planting.

Materials other than cola cans may be used. For example, you may have several plastic six-packs and 4-inch pots that are too old for further recycling as planting containers. Use them instead of cola cans, placing them upside down for air space and to make the container lighter.

A Thought About the Shape of Containers

Our work with shallow bed gardens has convinced us that, for many vegetables and flowers, most containers are the wrong shape. The typical container is quite deep but not very wide. I believe that roots are better able to make use of the available soil in our shallow bed gardens, which are 3 to 6 inches deep but very wide. **The ideal container for us is 6 inches deep and as wide as possible.** Although containers with those dimensions are not made for plants, I have found two inexpensive containers that meet our requirements.

One is a plastic tray used for mixing cement or for storage. They are sold for use by homeowners at a modest price of \$4.50 to \$6 depending on the store. A second inexpensive container with the shape we like is a child's wading pool (\$6.95).

See the gardening hint, "*Wading Pool Gardens*" for details of our most productive and low maintenance design for a container garden.

The Old Sock/Cola Can Garden

The reader can be forgiven for thinking we have gone off the deep end with this one. Actually our first trial proved to be exceptionally productive and gave a large volume of growing medium in an unbelievably lightweight container.

In designing our above-ground, gardening systems at ECHO, we keep in mind three requirements that must be met for the roots; there must be an abundant supply of air, constant moisture, and a constant supply of nutrients.

For larger plants, the system must also encourage root growth that can anchor the plant, unless a trellis is planned to support it. Small plants like onions can be grown right on a sheet of polyester cloth covered with some pine needles to keep sun and wind off the roots.

See the gardening hint, "*The Wick Method of Gardening*".

When we have grown larger plants, like bell peppers, on such a shallow medium, they fell over, often tearing roots in the process. The old sock/cola can garden works well for plants like peppers, though they may eventually fall over a bit.

I chose one of the cement mixing trays for the container. Painted with a redwood paint, these containers have a terra-cotta look like clay pots. Several 3/8 inch holes were drilled in the sides 1 inch up from the bottom to provide for ample water storage. Two cola cans on their sides, one atop the other, just reached the top edge of the tray. It can be of any width and length you desire.

With a pen knife, make a straight cut nearly the length of the can, slightly curved toward you at the two ends. Bend the cut part inward to create a long open slit about 1/4 inch wide. (Be careful that you don't cut yourself on the metal). Make two more such slits around the can. Half of one such slit can be seen in the photo on Page 6.

Place a small empty flower pot in the middle of the container. We call this a monitoring well. It will let you monitor the water level at a glance.

Place the can in an old sock. Probably two will fit in one sock. Make a solid layer of cola can-filled socks on the bottom of the container. Then make a second layer on top of the first. You are now ready to plant.

Remove small plants from a six-pack and tuck them gently between the sock-covered cans as best you can. We fit six peppers into one tray. You can add a small amount of potting mix to help assure good contact with the socks, but this will probably not be necessary.

Fill a watering can with a complete nutrient solution. Be sure your mix contains the following: (1) the major nutrients: nitrogen, phosphorus and potassium, (2) the usual micro-nutrients and (3) calcium and magnesium.

Because calcium and magnesium tend to make other nutrients form a precipitate and come out of solution, companies do not like to include them. For example, Miracle Grow is a wonderful soluble fertilizer, but



The Old Sock/Cola Can Garden

only if these two elements are added. We believe you can compensate for lack of these two nutrients by adding a heaping tablespoon of dolomitic limestone, but we have not yet tried this. We used 1 tablespoon of Nutrisol, a complete fertilizer, per gallon of water. The container is filled until water starts running out the side holes. The inch of water and nutrients provides a reserve that lasts for several days.

Standing water does not hurt the plants because the roots have all the air they can use. Add water and nutrients whenever the solution runs low. After a heavy rainstorm empty the water and replace it with nutrient solution.

Our six plants produced a heavy crop of nice peppers. When we dismantled our first bed, we found that pepper roots grew primarily within the socks and inside the bottom layer of cans.

What About Aluminum Toxicity?

The press has hinted at possible links between aluminum in the diet and Alzheimer's disease. So we are often asked whether cola can gardens pose a health risk and should be limited to growing flowers? This is a good question. The answer, I believe, is that there is no danger. Here is my thinking, subject to change if someone brings new facts to my attention.

Aluminum compounds are a major component of soils. I have never heard anyone say that one should not eat vegetables or crops grown in soil that contains aluminum. In any event, aluminum metal is not the problem, but aluminum ions (compounds). Before aluminum could be taken up by the plant, and then eaten, it would be necessary for the aluminum to react with oxygen or some other substance and become an aluminum compound.

Even aluminum ions can only be taken up if they are in a soluble form. In soil this happens only where the acidity is quite high. Sometimes tropical soils have so much aluminum and such acidic soils that the aluminum actually becomes toxic to plants. Even there I have never heard of people worrying about eating those plants which are able to survive and produce. Large areas of the earth would be unsuited for food production if this were a problem. If a reader knowledgeable in medicine or soils knows of a factor I have overlooked, by all means bring it to my attention.

Let us know of any helpful innovations you make and of any special successes or failures. **Happy gardening!**

ECHO'S PURPOSE

ECHO, Educational Concerns for Hunger Organization, was begun "...for equipping the Christians for the work of service, to the building up of the body of Christ." *Ephesians 4:12*

ECHO's primary mandate is to strengthen the ministry of missionaries and national churches that work with subsistence farmers and urban gardeners overseas. Assistance is also offered to many other organizations, such as the Peace Corps, who are doing agricultural work.

ECHO's primary activities are to:

- 1) summarize new ideas and agricultural information in a technical newsletter;
- 2) answer technical questions from overseas;
- 3) send seeds of underutilized and hard-to-find tropical food plants;
- 4) research appropriate technology applications, agricultural techniques, tropical plants (food, forage, cover crops, ...), and other issues important in small-scale, tropical agriculture;
- 5) provide short-term training and consultation in project planning for development workers; and
- 6) offer various training opportunities in small-scale farming to college students and graduates.

Guided by a Board of Trustees, ECHO and its services have evolved in response to the felt needs of missionaries and development workers in ECHO's network.

For more information on how ECHO is helping to ease hunger around the world, please feel free to contact us. Our address is located on the back of this gardening hint.

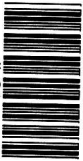
The ECHO Garden Hint Series

A collection of publications designed to share some of ECHO's innovative gardening techniques.

- Shallow Bed Gardening
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 - Growing Wick Gardens
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Echo is a non-profit, interdenominational, Christian organization dedicated to the flight against world hunger. We accomplish this by providing consultation, agricultural information, and seeds to those working in the Third World with peasant farmers or urban gardeners. ECHO receives no government help and depends upon public donations to carry on its work.

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