

Herbs and Spices From South of the Border

In the past few years, my wife, Donna Boe, and I have run across a spice and two herbs, previously unfamiliar to us that are common in Latin America and South America. Some are similar to known varieties but still enough different to offer variety. The trick is finding sources for them. Even with the Internet it can be a challenge.



Achiote (*Bixa orellana*): The spice, annatto, we first encountered on a cooking show, "Mexico, One Plate at a Time." It comes from the Achiote tree and is the red pulp that surrounds the seeds in the pods. If you have been to Cancun or other parts of the Yucatan,

you have probably encountered dishes with this spice. It is also used as a food coloring, for example in cheddar cheese and margarine. In cooking it usually turns the dish a yellow color similar to saffron. Cheddar cheese has been colored with the annatto as early as the 1860s. There is a water soluble component and an acid soluble component and depending on which dominates you get yellow, shades of orange, or red. The tree itself originates in South American but has spread around the tropical world. I found a picture on the Web of an Achiote tree growing in India. If you want to flavor a stew or color your sauce red you can use annatto as well. It comes in powder and paste forms. The paste is usually very salty whereas the powder can be sold as just ground dried annatto. It is available at Sprouts in Tucson. We have not found the tree for sale in southeastern Arizona nurseries, and being a tropical tree, we probably shouldn't try to grow it. Annatto is considered a "natural" food coloring and is "exempt from certification" by the Food and Drug Administration. Interestingly, annatto is also a known and sometimes potent allergen.

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Mexican Oregano: There is some question as to what plant is the real Mexican. We found a plant labeled Mexican Oregano at Civano Nursery on South Houghton Road in Tucson. Their version is *Poliomintha maderensis* and on some research this one seems better suited to our climate and is probably the real Mexican. It is also called lavender spice. We bought the *Poliomintha maderensis* 'Mexican' and planted it in June 2010 in our herb garden. It was in the wrong place at the wrong time I guess because it was dead by fall. The other variety of Mexican oregano we have run across is *Lippia graveolens*, which is in the verbena family. Although the two are not related, they both carry the common name, Mexican oregano. You can buy dried Mexican oregano leaves at Native Seed Search in their store in Tucson. I haven't found out who harvests it or from what plant. Once in a while someone at a farmers market will have Mexican Oregano. You probably should question them about what they really have. These are not related to Greek oregano (*Origanum vulgare*) which is in the mint family and closely related to Marjoram.



Robert E. Call
Area Horticulture Educator
Carolyn Gruenhagen
Editor

Culantro (*Eryngium foetidum*):

This is in the same family, *Apiaceae* (or *Umbelliferae*), as cilantro but bears little resemblance except possibly for flavor. Culantro in the tropics is a small biennial shrub. Culantro is what we think gave the unique flavor to the Costa Rican beans and rice dish served at most meals. It is commonly used in dishes in Puerto Rico and many other parts of Latin America. In Costa Rica, I bought some dried leaves in a jar and brought it home but it is long gone. I have found a source for the seeds at caribbeanseeds.com. Johnny's Seeds may have plants and seeds for sale but is currently out of stock. No one seems to sell the dried leaves although several web sites say it dries and retains its pungent flavor much better than cilantro. Bonnie Plants' website lists it but none of Bonnie's outlets here (Walmart, Home Depot, Lowes, etc.) carry this particular plant. Purdue University has an excellent article about culantro. Google "culantro plant."

Steve Fletcher, Master Gardener

Editor's Note: The Virtual Gardener returns in the July newsletter with a discussion of agriculture and horticulture in the amazing country of Turkey. The VG, Gary Gruenhagen, will present a talk and slide show on Turkey at the July CCMGA meeting. The presentation will focus on changes that have taken place in the country since his last visit 27 years ago and include a discussion of geography, agriculture, and horticulture. If you have never seen this beautiful country for yourself, be prepared for a treat. The presentation is at 5:00 p.m. in the Public Meeting Room of the UAS on July 7. For information:

virtualgardener@cox.net

Cuttings 'N' Clippings

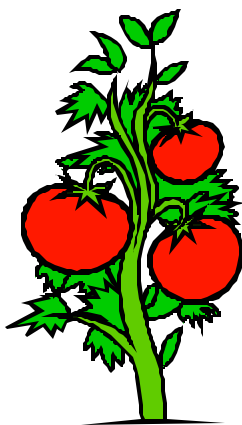
* The next CCMGA meeting is 5:00 p.m. Thursday, **June 2**. This will be the Annual Business Meeting and Graduation for the Master Gardener class.

* On Saturday, **June 4**, 8:30 a.m. to 10:30 a.m., the free Water Wise presentation will be *Sensational Succulents and other Cactus*. If you like year-round green, explosive color, and exotic shapes, then plant this exquisite group of plants! Presenter will be Mark Sitter, B & B Cactus, Tucson. Plants will be for sale. The presentation will be held in the Public Meeting Room of the University of Arizona South.

* **Learn to Identify Plants.** A 6-week course entitled *Learn to Identify Plants* will be taught by Cecile Lumer, PhD. The class will meet Friday mornings, 10:00 a.m.—noon, August 12—September 16 at Cochise College in Sierra Vista. The cost is \$150 and the money will go to support the Cochise County Herbarium. Enrollment is limited to 20 people. Contact the Cochise Community College Center for Lifelong Learning at (520) 515-5492 to register for the class. The class number is 853. For more info call Cecile Lumer at 432-4294 or email: lumer.cecile@gmail.com or call Cindy at 803-1160.

* The Sierra Vista Farmers Market is now open from 10:00 a.m.—2:00 p.m. Thursdays and Saturdays at the corner of Carmichael and Wilcox.

Grafted Tomatoes



A number of major seed catalogs are offering an unusual new product this year—they're selling grafted tomato plants! In other words, you can now buy a tomato plant of one variety that has been grafted on to the rootstock of another variety. Some outfits are even offering two varieties of tomatoes grafted onto a single rootstock so you can pick, say 'Sun Gold' and 'Sweet 100' cherry tomatoes, or 'Cherokee Purple' and 'Brandywine' heirloom slicers (BLT heaven, baby!), off of a single plant!

Why graft tomatoes? There are two big reasons, the first being enhanced disease resistance and the second being increased plant vigor. For instance, maybe you have root knot nematodes in your soil, preventing you from growing a favorite tomato variety that you grew up with. Or maybe you've got one of the soil born wilts, such as fusarium or verticillium, that limit your selection of tomato varieties to those that exhibit resistance to these diseases. By using grafted plants, you can significantly increase the number of tomato varieties you can successfully grow.

As noted above, the other benefit of grafting is that you can increase the yield of your tomato plant by selecting a good, vigorous root stock. Many of the really great heirloom tomato varieties, such as 'Brandywine', don't typically produce a large number of fruits, but with a vigorous root stock, yield increases in the neighborhood of 50% are regularly reported. That might not be enough to justify starting your own catsup (OK, ketchup) operation, but it ain't nothing to sneeze at. Commercial tomato green-

house operations are increasingly using grafted tomatoes to improve their yields and grafting has been widely used in Asia and Europe for many years where they even graft cucumbers, melons, and eggplant.

Be aware, though, that disease resistant root stock only confers resistance to soil born diseases and pests, it won't help with problems such as curly top virus or early or late blight that are transmitted above ground. Also, when you transplant grafted tomatoes into your garden, you must remember to keep the graft union above the soil so as to keep the top (non-resistant) of the plant from rooting itself and thereby forfeiting the benefits of the root stock.

The root stock varieties typically being used by greenhouses are fairly expensive; popular root stock varieties called Maxifort and Beaufort are being sold for \$22 per 50 seed packet by a well known national seed outfit and that price doesn't include shipping! For a commercial green house operation, these costs make sense because of the increase yields. For us regular gardeners, grafting benefits probably extend more to the disease and pest resistance angle. This means we can avoid the expensive root stock varieties and use more common and cheaper hybrids such as 'Celebrity' or 'Better Boy', which also convey disease and pest resistance. Interestingly, eggplant root stock is also a good choice for tomato grafting.

Now, it's probably too late to order grafted tomatoes this year, and I've yet to see them offered in local nurseries, but it is possible to do your own grafting. I must confess that I haven't tried it yet myself, but I've every intention of doing so later this summer. I'll practice getting the technique down this year, then give it a serious try next spring with the aim of growing my own grafted tomatoes. People who do a lot of grafting report that they can do 80-100 grafts per hour, so the process certainly isn't too complex. Nonetheless, I'm sure that getting the technique down will result in my killing a large number of tomato plants. Following are links to two web sites that have video clips showing the grafting process step by step:

http://www.johnnyseeds.com/t-video_tomato_grafting.aspx and <http://www.youtube.com/watch?v=tHnOYcI6B44>. Do an Internet search for grafted tomatoes and you'll have plenty of reading material. Grafting probably isn't for everyone, but it sounds like an interesting challenge and it'll sure expand your gardening knowledge. If you're interested in planting grafted tomatoes, but don't want to graft them yourself, keep an eye out for the 2012 seed catalogs that'll come late this year and place your order for next year right away.

Take that, you nasty nematodes!

Bill Schulze, Master Gardener





What's All the Buzz About?

A whole lot if you like to grow tomatoes. No buzz, no pollen.

Simply put, tomato flowers are structured so that they hold onto their pollen more tightly. The flowers have to be vibrated at certain frequencies to free up the pollen to do its job. This process of vibrating the flower to release the pollen is called sonification, or buzz pollination.

Why so difficult? Well, the anthers of tomato plants are long tubular structures with the pollen deep inside and small holes on the end (see diagram). While this makes extraction of the pollen more difficult, it turns out to be a more efficient means of pollination once out of the bag, so to speak. Unlike the high quantity, low quality approach of some plants (such as tumbleweed), sonification emphasizes the quality side.



Thanks to GeoChemBio for this image.

Although less than 10% of plant species are estimated to be pollinated this way, some are very important to our gardens, such as, peppers, eggplant, potatoes, strawberries, and blueberries.

So how does this relate to our tomato garden? Only certain bees are able to create the vibrations necessary for buzz pollination. Honey bees do not buzz pollinate

and when they do manage to pick up some tomato pollen, it is in very small quantities. Tomatoes are originally from Peru and it was there that one species of halactid bee (the common sweat bee is an halactid) formed an evolutionary partnership with the tomato ancestor.

In our part of the world, the bees that can best buzz pollinate are some of the solitary bees, especially halactids, and bumble bees. These bees, unlike honey bees, tend to concentrate more on pollen than nectar, and they have developed means for shaking more of this loose from a flower by grasping the flower with their legs and using beating their wings in such a way to cause a noticeable vibration, which needs to be as close as possible to the natural frequency of the anthers, namely, 124 Hz¹. This is one of the reasons that commercial tomato growers use bumble bees as pollinators².

As gardeners, we have two solutions to increase our tomato fruit yield through sonification: a natural and an artificial one.

The natural solution is to encourage the population of solitary bees around our garden. A good overview of native and solitary bees can be found at

<http://www.attra.org/attra-pub/nativebee.html>.

The nests of bumble bees and some solitary bees are formed in dirt mounds in the ground. Not so easy to recreate, but there are a variety of ways to build bumble bee nests, the Internet providing ample ideas if you want to go that route³.

Similarly, there are a variety of ways to make nest boxes for other solitary bees, most of which require some work. Ready-made

tubes for mason bees are easily purchased, but mason bees are better suited for pollinated fruit orchards. To get an idea of what is needed to make a solitary bee nest, see

http://www.foxleas.com/bee_house.htm.

The artificial solution is much easier and cheaper: buy a vibrating toothbrush. You simply turn it on and touch the brush head to the back of the tomato flowers. While probably not as good as a buzz-pollinating bee, it is much more effective than relying on honey bees, flies or the wind. For a video on using a toothbrush, see

<http://www.youtube.com/watch?v=tsAGr5qoQzQ>.

(I believe a Japanese man first came up with this idea.) If you buzz pollinate yourself, remember to do it at the optimal time. This is usually the mid part of the day, when the petals of the flower are spread open and back, and the flower is pointed downward.

The toothbrush idea is clearly the best approach to take ini-

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Did you know . . .

According to the Shopper's Voice® Consumer Product Survey the following types of leisure activities panel members and their family enjoy the most are:

- 47% Cooking—homestyle
- 46% Cooking—grilling
- 38% Home improvement
- 38% Gardening**
- 27% Crafts

The Agent's Observations

Q I live in an old home (pre-1920) and I grow a vegetable garden. How concerned should I be about lead in my soil? How can I have the lead level in my garden soil tested? Are there any home kits? What are considered safe levels for growing leafy crops? Thank you.

A The most serious source of exposure to soil lead is through direct ingestion (eating) of contaminated soil or dust. In general, plants do not absorb or accumulate lead. However, in soils testing high in lead, it is possible for some lead to be taken up. Studies have shown that lead does not readily accumulate in the fruiting parts of vegetable and fruit crops (e.g. corn, beans, squash, tomatoes, strawberries, apples). Higher concentrations are more likely to be found in leafy vegetables (e.g. lettuce) and on the surface of root crops (e.g. carrots, potatoes, beets). Since plants do not take up large quantities of soil lead, the lead levels in soil considered safe for plants will be much higher than soil lead levels where eating of

soil is a concern. Generally, it has been considered safe to use garden produce grown in soils with total lead levels less than 300 ppm. The risk of lead poisoning through the food chain increases as the soil lead level rises above this concentration. Even at soil levels above 300 ppm, most of the risk is from lead contaminated soil or dust deposits on the plants rather than from uptake of lead by the plant. There is more concern about lead contamination from external lead on unwashed produce than from actual uptake by the plant itself. If your garden is close to busy streets or highways, remove outer leaves of leafy crops, peel all root crops, and thoroughly wash the remaining produce in water containing vinegar (1 percent) or soap (0.5 percent). To minimize absorption of lead by plants a number of control measures may be taken:

1. Maintain soil pH levels above 6.5. Lead is relatively unavailable to plants when the soil pH is above this level. Most of our high desert soils have pH values between 7.5-8.5. Lead is also less available when soil phosphorus tests are high.

2. Add organic matter to your soil. In soils with high lead levels, adding one-third by volume organic matter will significantly re-

duce lead availability. Organic compounds bind lead and make it less available to the plant. When adding organic matter, the pH should also be maintained above 6.5. Good sources of organic matter include composted leaves, neutral (non-acid) peat, and well-rotted manure. Avoid leaf mulch obtained along highways or city streets as it may contain higher than normal lead levels.

3. Locate your garden as far away from busy streets or highways and older buildings as possible.

4. Because of the possibility of bare soil exposure to children through hand to mouth activity, soils with lead levels exceeding 100 ppm should not be used for gardening. If soil exposure to children is not a concern, then plants can be safely eaten from soils with soil lead levels up to 300 ppm.

Extension Offices have a list of laboratories that conduct soil testing. Call the specific lab to see if they do soil lead testing if you have a concern.

Source:

<http://www.extension.umn.edu/distribution/horticulture/DG2543.html>

*Robert E. Call
Area Horticulture Educator*

He who plants a garden . . . plants happiness!

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How To dispose of Your Unused Drugs Federal Guidelines

Do not flush most prescription drugs down the toilet or drain.

Take medications to a community take-back program or household hazardous waste collection event.

When a drug take-back or collection program is not available:

- 1. Take the prescription drugs out of the original container**
- 2. Mix drugs with cat litter or coffee grounds**
- 3. Put the mixture into a disposable container with a lid, such as an empty margarine container**
- 4. Conceal or remove personal information, including the Rx number**
- 5. Place the sealed container with the mixture, and the empty drug containers in the trash.**

-www.whitehousedrugpolicy.gov

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tially. If you then have the time and energy, you can encourage an increase in solitary and native bee populations through various nesting alternatives. Not only will these then help pollinate plants that need sonification, but you'll be increasing the chances of pollination of all of your fruit trees and vegetables.

1. M. J. King and S. L. Buchmann, "Sonication Dispensing of Pollen from *Solanum laciniatum* Flowers", *Functional Ecology*, Vol. 10, No. 4 (Aug., 1996), pp. 449-456

2. To hear a bumble bee flying around and buzz pollinating flowers, see http://www.youtube.com/watch?v=fBRrsEKB_GQ&feature=related.

3. E.g., see

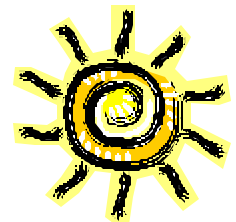
<http://www.bumblebee.org/nestboxes.htm> or

http://www.bumblebeeconservation.org.uk/nest_boxes.htm

Bret Galloway, Master Gardener



June Reminders



- ◆ Check tree ties
- ◆ Remove stakes if new tree can stand alone
- ◆ Mulch trees & shrubs
- ◆ Remove faded flowers & fertilize roses
- ◆ Stake tomato plants & watch for curly top—remove diseased plants
- ◆ Prevent blossom end rot on peppers, melons, squash, and tomatoes by even watering and mulching