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SWEET POTATO OR YAM?

Someone asked me the other day to describe the difference between a sweet potato and a yam. It really is an interesting story.

The terms 'sweet potato' and 'yam' can be confusing because in both plants the section of the root that we eat, the tuber, look very similar. They look so much alike that sometimes people use the two names interchangeably, that is, they consider both a sweet potato and a yam the same thing. Actually, these two root crops are big time different, and botanically speaking that difference is like night and day. To really appreciate the difference between them, we have to take a short peek at the plant world.

A basic rule of botany is that the plant kingdom is quite diverse. To make that diversity easier to understand, botanists have divided plants up into groups or divisions. Each member of a specific division has the same characteristics as the other members of that division. Some of the plant divisions are made up of simple plants, like algae and fungi. Others are more complex because they have tubes inside of them that carry water and energy throughout the plant. Almost all of our garden and landscape plants fit into this category. Of the several divisions of higher plants, the largest by far are those plants that produce flowers.

Flowering plants are divided up into two major groups with the basic characteristic used by botanists to separate them being the number of energy storage structures in the seed. These storage structures are called cotyledons. Those plants that produce only one cotyledon are called monocotyledon plants, "mono" meaning one, and those with two cotyledons are called dicotyledons. The term "di" means two. The true yam has only one cotyledon and is in the monocotyledon group. A sweet potato is a dicotyledon. This basic but huge difference is just one reason that the two plants are unrelated. There are other differences.

Monocotyledon plants have veins in the leaves that are parallel while dicotyledon plants have a netted vein arrangement in the leaves. Monocotyledon plants have flower parts, like petals, in groups of three and their tubes that conduct water and energy are scattered throughout the entire stem. Dicotyledon plants have their flower parts in groups of four or five and their tubes are arranged in rings under the bark. All of these mean that the two plants look different, grow different, and live different. With this background in mind, let's take a closer look at the two plants.

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Yams are native to Africa and the Asian tropics while the sweet potato is native to Central and South America. The sweet potato vine has heart-shaped leaves that alternate along the stem and flowers that have petals attached along the sides. Both male and female parts can be found in the same plant.

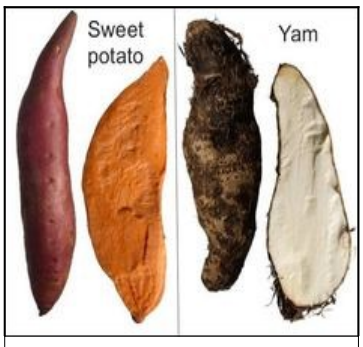
The yam plant also develops heart-shaped leaves but produces flowers that has the male or female parts in separate flowers. That is, it produces both male flowers and female flowers, and those flowers are found in different places on the plant. Because of this, pollination is somewhat restricted in the yam and plants often do not produce seed as a result.

There are many varieties of both the yam and the sweet potato and, as a result, there is a great variation in colors and sizes of tubers. In sweet potato, the flesh can vary in color from beige to white, red, pink, violet, yellow, orange, and purple. In the yam, colors of the tuber flesh include white, yellow, purple, and pink according to sources.

Yams are not frequently grown in the US nor are they generally sold in this country. Most tubers sold as yams in the US are really sweet potatoes, of which there are many different varieties. It is difficult to obtain stock to plant yams in this country and many references say that it is an invasive, weedy plant. I am not sure how well it would grow under our dry conditions.

Sweet potatoes on the other hand can be grown easily here in the desert. Many locals say that they have produced good crops in their gardens. They are started as a summer crop and put into the ground between May 1 and June 15 here in the desert. They are transplanted into place from stem cuttings, sometimes called “slips” or “sets” and they are ready for harvest within 120 to 160 days, depending upon the variety. Some people choose to plant them into their outdoor gardens while others grow them in containers, outdoors or indoors, but in a sunny spot. Just be aware that the vines will take up a lot of room. Wherever you grow them, remember that you will need to plan adequate space horizontally or vertically for the plants.

Sweet potatoes will need frequent irrigations, regular nitrogen fertilization, and a well drained soil. Many people work a heavy dose of compost into the soil at planting and mulch the surface of the soil frequently with additional compost to help maintain soil moisture and temperature. The plants also will use a lot of nitrogen during the growth of the vine and the development of the underground tubers. During these times, frequent additions of a nitrogen-based fertilizer will be important.



Michigan State University

Both yams and sweet potatoes are highly nutritious root products of garden plants. While you will find it difficult to find yams here in this country, sweet potatoes are plentiful. They are also easy to grow in the garden. You might want to give it a try. If so, I would suggest that a good reference for additional information can be found on the Utah State University website. Set your browser to find Sweet Potatoes in the Garden Utah and it should pop up as a choice on your screen.

When it comes right down to it, there is a huge difference between the true yam and sweet potatoes. Because of the color of the tuber skins and the internal flesh, it is not always easy to tell them apart, however. The rule of thumb should be this: Unless what is being called a yam actually comes from an African specialty shop, chances are the yams that you are offered to eat are really sweet potatoes.

Bringing Shade to Outdoor Living Areas

All of us who have experienced the heat of the summer sun know that shade is important here in the desert.

It doesn't take long to get the picture. Stand just a few seconds in the mid-day June sun and one will quickly find a deep appreciation for shade. If we encounter an acquaintance outside the post office or supermarket, anywhere for that matter, and want to continue the conversation for any length of time, both parties will soon suggest hunting shade. It doesn't matter whether that shade comes from a building, an awning, or a tree. Any shade is always welcome that time of year.

In addition to the discomfort that comes from direct sun shining on our heads or backs, there is also the discomfort that comes when it is time to pay for the power required to cool our homes and businesses. Heat from sidewalks, paved streets, bare soil, rock mulch, buildings, roofs, and other solid surfaces radiates back into the atmosphere late into the night and into the early morning. These high temperatures keep the ambient air temperature warmer, perhaps by several degrees, for longer periods of time.

Check the differences between the lows in Phoenix in July and compare them with those of Casa Grande, Maricopa, or Eloy. They are usually several degrees warmer than us. When the temperatures go up, and stay up, the air conditioning systems in our homes, businesses, and public places must work longer to keep the inside temperatures livable. The longer our air conditioning equipment must work, the higher our cooling costs will be. Shading hard surfaces is one way to lower our air conditioning bills.

Beyond helping us make it though the summer by blocking the sunlight and helping us reduce our electric bills, shade also provides significant esthetic benefits. It provides an attractive and inviting atmosphere to the yard. People enjoy sitting out when there is shade to shield them from the sun. Trees also attract birds and other wildlife which can provide interest and opportunities to learn about nature while enjoying the outdoors. In the desert, shade provides an opportunity to sit outside in relative comfort and enjoy the outdoors.

Not all shade, however, is the same. Some trees have a thick, full canopy that creates full shade. Others, like the palo verde, has a thinner canopy which allows more sunlight. In either case, the shade is helpful. On a hot day we will not sneer at any shade, will we? The various intensities of shade, however, do provide opportunities for doing different activities, such as growing other plants underneath the canopy. It is more difficult to grow container plants in full shade than it is in partial shade. On the other hand, the more sunlight that comes through a tree canopy, the warmer the shaded area will probably be.

When a decision is made to increase outdoor shade, most people take out a sheet of paper and draw up a rough design. Included in that design will be a list of all of the desired uses of the area. Going back to the previous example, if no sunlight at all is desired, the design would reflect the presence of a tree known to produce full shade. If the design lists other activities that require at least some sunlight, like growing container plants, a tree or structure permitting filtered sunlight would be the choice..

Let's visit a little more about that list of activities. The decision to install a new outdoor living area, or upgrade an existing one, usually is sparked by a need. That need may be a patio, a children's play area, or an outdoor kitchen. There may be a perceived need for several uses combined. If so, the very first step should be to write them all down; to make a list of all the factors that will come into play. Will the area be mainly for sitting and conversation, or will there be a barbeque grill that will give off smoke during the cooking process. These and any other identified condition or requirement will impact the design of the area. Once we know what we want, we can then make a plan to incorporate them into the final product.

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One of the key decisions in the design will be the amount and type of shade required. The easiest way to provide shade, but not always the least expensive, is to build a porch or veranda. These solid structures are long lasting, look good, and provide excellent and instant shade.

A less expensive way to provide full shade is to select and plant a tree whose canopy provides dense shade. Examples of such trees include the mulberry tree and the ash tree. There are other trees that approximate full shade but most of those trees, especially those that are considered to be low water use plants, tend to have more open canopies.

An intermediate choice is to create a canopy with shade cloth over the area. These horticultural plastic cloths are designed to admit light dependent upon the size of the mesh opening in the cloth. Depending upon the amount of sunlight passing through the mesh, they can be too warm under which to sit or work, or they can be quite comfortable, even during the heat of the day. Again, it depends upon the various activities desired as to whether this option will work in your situation.

Some people tend to use a hybrid of one of the above systems. They like the aesthetic value of a tree but choose for one reason or another to also use a porch or shade cloth to provide additional shade. Whatever fits your situation will be the right choice for you, but do not forget that it will take time for the tree to grow to full size and to provide the most efficient shading.

If the choice is to use a tree for shading, it is important to arrange the tree for most efficient shading. The most intense heat of the summer day comes between 10 am and just before sundown. One or more trees should be placed carefully to provide the shade needed during those specific times.

When a tree is the right shade choice, don't forget that tree health, and resulting shade efficiency, is dependent upon proper care. It is important to know what to do and how to do it. While different types of tree can have specific requirements, in general good care really boils down to providing the right amount of water and fertilizer at the correct time, coupled with the use of good pruning techniques. These are key elements to maintaining good health and obtaining maximum shade from the tree. Remember always that any tree that is not given the water it needs at the time that it needs it will lose not only its leaves, but also its ability to provide shade.

Shade is important for spending any amount of time outdoors during the summer and can reduce energy bills. Consider using one or more trees in the landscape as part of the solution.

THE TAPROOT MYTH

We want to believe that every plant has a taproot that grows deep into the soil but, in reality, the existence of a taproot in transplanted landscape plants is pretty much a myth.

Every so often the question comes in: "When will the roots of my tree grow down to the water table so that I do not have to irrigate?" The answer, with just a few exceptions, is pretty much written in stone. Never.

There are two basic problems with this line of reasoning. First, we cannot assume that the water table, the level in the soil where stored water maintains a continuous presence, will be high enough to allow trees and shrubs to access the live-giving liquid. Sure, the water table along free-flowing streams and rivers, can support large populations of trees and shrubs. Most of us are familiar with the dense vegetation that lives along these beautiful, picturesque streams. The problem is that free-flowing rivers of water are few and far between here in the desert and the water moving through soil from these perennial streams will only extend out so far. When the large trees next to a river thin out and merge with dry desert plant communities, we can pretty much guess where the underground water ends.

"Okay, I can see that," you say, "but there is water down there somewhere, isn't there? When will my plant roots reach that water?"

Groundwater levels rise and sink dependent upon the rate of replenishment from water supplies flowing underneath the ground from higher elevations to lower elevations. In most areas, this movement is very slow, and very much affected by drought. In normal years, the water table along a stream that flows at least intermittently may be relatively shallow, say fifty to a hundred feet down. However, in much of Pinal County, the water table may be as deep as 2,000 feet. Even in the best of cases, it is pretty much a stretch to ever expect plant roots to find the water table. In the worst case scenario, it is a pipe dream.

Yes, there are such things as hanging water tables; places where relatively shallow water is trapped by the geology below. In these cases, depending upon how far down that water may be, it is possible to expect plants to access these reserves. However, shallow pockets of water tend to contain more dissolved salts than deeper aquifers and can be hazardous to susceptible plants.

When we understand the nature of natural water sources in the desert, we begin to understand why it is so important to irrigate our ornamental plants correctly. In irrigated landscapes and gardens, the depth of water in the soil is generally dependent upon how long the water runs. The shorter the period of irrigation, the more shallow will be the wetted area. Most trees will have a root system depth of about three feet, We can know just how far down the water is sinking by using a soil probe. When the soil is moist the probe sinks easily into the ground. When the tip hits dry soil, it will stop. The length of probe in the soil will correspond to the depth of water penetration.

It is also important to understand that landscape plants tend to have shallow root systems. These plants tend to send roots out from the trunk more than they send them deep. One reason for that is the natural growth habit of plants. Another reason may be tied to the way we irrigate. Instead of letting the irrigation water run long enough to sink down deep in the soil, we tend to let it run for shorter periods of time. Depending upon the amount of sand or clay in the soil, water may sink down only a couple of feet or sometimes even inches. Roots follow the water. Since roots tend to grow only in wet soil, the root systems of the affected plants may remain fairly shallow. Have you ever looked at the root systems of trees that blow down in windstorms? Almost always, the root system is fairly shallow.

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"The taproot, Rick, don't forget the taproot! That will solve the problem!" Okay, let's talk about the taproot.

Trees, shrubs, and other plants, when planted from seed, do develop a long root that can, if irrigated correctly, extend straight down into the soil. We can see them grow in some trees to impressive depths, forty to sixty feet down, in some cases. However, once again, it must be emphasized that roots only extend down into wet soil. Most of the trees with massive taproots are those that are growing from seed and in the presence of ample amounts of moisture. The classic examples of deep rooted trees are those growing along permanent streams.

In most landscape plants, however, taproots do not exist. When a tree or shrub grown in the nursery is dug from the ground and placed into a box or container, the taproot is cut off. Once it is cut off, it never grows back. In studies with transplanted trees, the developing root systems extended out laterally from the tree to some distance, but rarely very much deeper than the depth of the original root ball.

When we understand that the roots grow laterally more than they do down, it begins to make sense that we need to irrigate out away from the trunk instead of close in. It is unfortunately a common mistake to build up an irrigation berm or place drip emitters where the root ball only will be kept moist. This is a problem because the size of the root system will be limited by the area of soil receiving irrigation. If we only have a well of, say, two feet in diameter, that will be the size of the root system. Is it any wonder that trees tend to blow over during our summer storms? If, in this scenario, we are counting on the development of a taproot down deep into the soil to carry the plant through, especially with transplanted trees and shrubs, we just have to realize that it isn't going to happen.

The better plan is to dig a hole at planting that is just as deep as the size of the root ball in the container so that when it is placed into the planting hole the root ball is sitting on firm, undisturbed soil and the top of the root ball is at or no more than one inch lower than the surface of the soil after the hole is filled in. Then, the outside perimeter of the irrigated area must extend out to at least the edge of the canopy of the tree. As the tree grows, that perimeter must expand to match the growth. I think it a good idea to irrigate well out from the root ball, at least two feet beyond the edge of the root ball of young trees, to encourage the growth of roots of newly planted trees into the native soil.

By managing our water in this manner, and ensuring that when we irrigate the water extends down to the bottom of the root zone, we can help our trees, shrubs, and other plants develop strong, healthy root systems. In so doing, we can assist the plants endure the heat of the summer and avoid blowing over in the middle of a storm.

An understanding of the nature of plant root systems is critical to the proper management of landscape and garden plants. If we know the rules that govern their growth and development, keeping plants healthy will be a much simpler task.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jeffrey C. Silvertooth, Associate Dean & Director, Economic Development & Extension, College of Agriculture and Life Sciences, The University of Arizona. The University of Arizona is an equal opportunity, affirmative action institution. The University does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, veteran status, or sexual orientation in its programs and activities.

TOMATOES

I know that this is still January and that throughout February there remains a chance of frost but, with the warming trend that we are currently seeing, it may be time within the next few days or weeks to take a chance and get your tomatoes into the ground.

The secret to producing good tomatoes in the desert is to get them planted early and expect to finish harvesting before the heat of summer sets in. Planting tomatoes early means putting out transplant sets in February, babying the plants through any late season frosts that might occur and pushing the plants hard to get maximum production before the high temperatures arrive in June. While frosts and freezes in February and early March can make for anxious moments, planting early is definitely the best way.

Tomatoes are simply not well adapted to the low deserts of Arizona. If they were, there would be a viable field-grown tomato industry in Arizona. Tomatoes do not do well in southern Arizona because of the high temperatures of summer, the alkalinity of the soil, and the bright sun that easily burns the tender fruit. If you want to produce a good eating tomato, you must contend with these obstacles.

Tomatoes set fruit only when night temperatures are above 55 degrees F and when day time temperatures do not exceed 90 degrees F. Because of these temperature limitations, the total production season of a tomato plant is quite narrow and the successful gardener must make good use of this time to get in a good crop.

The best way to plant tomatoes is to set out six-inch transplants beginning in mid-February in the northern and central parts of the county and in mid-March in the southern and eastern parts of the county. The eastern and southern parts of the county are a little higher in elevation and the resulting cooler temperatures delay the planting window.

Tomatoes can be planted from seed successfully, but seeding requires an additional six weeks to get the plants germinated and up to size. This means that seed must be placed in the ground or in pots for transplants in January with adequate cold protection to ensure that the plants will be ready to produce fruit at the earliest possible time.

The short-season varieties which will produce fruit in less than 70 days are the best for our area. The Cherry-type varieties and Early Girl are good examples of short-season varieties. Columbia and Rosa are also good varieties but these plants are extremely hard to find. Longer-season varieties are quite risky because of the looming hot weather waiting to sear late developing fruit.

Another variety that seems to work well in our area is Celebrity. Many avid tomato gardeners like it for its quick growth, good fruit setting capability and flavorful fruit. The larger fruited varieties, like Beefstake and Better Boy should probably be avoided because they seem to produce a lot of vines but little fruit. Now I know that there are some of you out there that absolutely love these varieties and can cox them into fruiting. All I am saying is that quite often, for many growers in our climate, they simply do not meet expectations.

To beat the summer heat, it is important that tomato plants get off to a good start quickly. Proper soil preparation before planting and good nutrition and timely irrigation during the growing season will help build a productive vine in a short amount of time.

All tomatoes require good light in order to produce effectively, but they must be protected from the harsh, burning sunlight of summer. Many successful tomato gardeners plant their vines with an eastern exposure so that the plants get adequate sunlight during the less harsh morning hours while being protected from the intense heat of the afternoon. If you prefer to plant out in the open, rig a shade cloth of nursery fabric or burlap over the plants to protect both the vines and the fruit from afternoon heat. Stay away from planting beds next to a masonry wall with a western exposure. These areas almost always spell disaster for tomatoes.

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Good soil preparation will encourage the development of the deep root system necessary to provide water and nutrients during the fruiting season. Our desert soils can easily become compacted making it difficult for plants to develop an adequate foundation for later growth. Loosen the soil by spading or tilling down to at least 12 inches and work in 4 inches of composted manure to help keep the soil from compacting again after the next irrigation. Roots need not only water and nutrients, but also air. A compacted soil which limits the availability of these essentials will slow and stunt the development of tomato plants.

Protect your young, tender plants from cold and frost damage by placing a tall cage made of construction wire around the plant and cover the cage with a clear plastic to give a greenhouse effect. The plastic should be loose enough to provide some air circulation but tight enough to prevent frosty air from touching the plant. During warm days, loosen the plastic or remove it so that the plants will not burn from too much heat. The plastic should only be in place long enough to prevent frost damage. Once the danger of frost is past, it should be removed.

Other devices can be used to provide cold weather protection. There are a number of frost-related products sold in garden stores that will provide protection. Some people use plastic milk containers filled with water to provide early warmth and protection for small plants. During the day the sun heats the water inside the containers. The warm water, in turn, provides heat during the cold night time hours to protect the plant.

As the plants begin to grow to maturity, you will need to add nitrogen and water as appropriate, watch for insect problems, and make sure that the fruit does not burn in the sun. The big task now, however, is to get the ground loosened up, add organic matter to help build soil structure, and make sure that you are ready to irrigate regularly.

Tomatoes in the desert require excellent management. It is not a crop that you can put into the ground and forget about and all of these tasks are critical to good plant health. Great tasting tomatoes can be produced in desert gardens, but only if we follow the rules of the desert environment.

If you have questions about this newsletter, have any plant related problems, or wish to have a publication sent to you, please call (520) 836-5221 x204 or (520) 374-6263 and leave a message. If you have a plant problem and are able to email a picture, please send a picture with any information you can provide about the plant, and your contact information to our diagnostic team at macmastergardener@gmail.com and a Master Gardener will contact you.

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The University of Arizona Cooperative Extension, Pinal County is offering Spring 2019 Garden & Landscape Short Course to begin in January 15, 2019 for the greater Casa Grande area. For more information or to register, please contact:

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