

Brazoria County Master Gardener Association



CONTENTS

Soil, Part 1	1
November Job Jar	3
Book Review	3
Inquiring Gardener	4
Fertilizers	6
Plants of the Month	7
Prez Sez	8

COMING UP

- ⇒ FREE November Seminar
 Wed, 11/04/09
 12:05 pm—12:50 pm,
 Lake Jackson Public Library
 "Winterize Veggie Gardens"
- ⇒ BCMGA BOARD MEETING
 Tues, 11/10/09
 5:30 pm AgriLIFE Office
 All members welcome!
- ⇒**BCMGA MEETING**Tues, 11/10/09
 6:30 pm AgriLIFE Office
- ⇒ FREE December Seminar Wed, 11/04/09 10:00 am—11:30 am, Lake Jackson Public Library "Holiday Plants"

THE "DIRT" ON SOIL, PART 1



"The nation that destroys its soil, destroys itself." *Franklin Delano Roosevelt, 1937*

You walk on it, garden and farm it, grow lawns on it, build on it, concrete over it, dig it up, sweep it up, use it up.

But do you think about it, worry about it, cherish it? If you don't, better start now! 99.7% of all consumed calories comes from the land.

The importance of fertile, healthy soil is finally getting equal billing with clean air and water.

<u>National Geographic</u> magazine highlighted soil in its "The Good Earth" article in the September, 2008 issue.

The Smithsonian Institution's Museum of Natural History mounted the "Dig It! The Secrets of Soils" exhibit that will travel throughout the country after its run in D.C.

Texas A&M instituted the EarthKind® program, now being replicated in other parts of the country, to foster garden practices that result in less inputs (irrigation, fertilizer, pesticides, herbicides) to achieve both healthier soil and a productive lawn or garden.

"We might say that the earth has the spirit of growth; that its flesh is the soil." Leonardo da Vinci, 1500's

What is soil? Is it dirt?

You might use either term, but dirt is inert... soil is alive. Dirt is what you sweep up in the house. When a soil's been used up, degraded, abused, "killed", it's just dirt. Nothing will grow in it.

Chemicals & Critters

How can soil be alive? Well, it's the combination of complex chemical and biological processes. Just imagine taking a census of the critters found in soil. Besides the big guys easily seen, like earthworms and grubs and beetles, there are microbes — bacteria, fungi, nematodes, protozoa, mites and viruses — to the tune of about 7,000,000,000 in just one heaping tablespoon of healthy soil. They all have jobs to do, even though they're just living their lives: eating organic matter; excreting nutrients and hormones; assisting plants in nutrient uptake; mediating disputes between chemicals; changing the structure of the soil; dying.

While the soil microbes are doing their work, the chemical elements in the soil, with their positive and negative charges, are moving about, combining with some elements, breaking apart the bonds of others, being slurped up and exuded by plants as nutrients, expelled as waste by microbes.

Now add the major macro element: the plants that intake and release carbohydrates and chemical elements,

(Continued on page 2)

Jim Richardson shot this amazing photo of Indiangrass (*Sorghastrum nutans*) in Kansas for the National Geographic article mentioned above. Indiangrass occurs from the Rocky Mountains east to the Atlantic, and from Florida to the Hudson Bay in Canada. Yep, it's in Brazoria County, but don't expect 10' roots. The soil's different, not to mention the water table.

THE "DIRT" ON SOIL

(Continued from Page 1)

put down roots, set up symbiotic relationships with microbes, and offer themselves as food when their leaves drop or the plants die.



Healthy soil is the largest, most integrated complex corporation in the world. And we can't live without it.

The Birth of Soil

All soil starts out as rocks, whether they were spewed out of volcanoes, built up by the death of billions of sea creatures, or subjected to heat and pressure.

As the rock is worked on by lichen, pulverized by glaciers, tumbled by water, weathered by sun and air, and blown about, miniscule crumbs of rock get thrown together. They build up over the bedrock. This subsoil, or proto-soil, contains minerals but not in a usable form until they're changed.

"Growing" Topsoil

If conditions are right, enter those microbes with plants following. It's the living community that's called "topsoil", a very happening place, where organic and mineral new is added to the old, mixed up, and aerated. It's a happening place, but it's not happening fast. It averages 500 years for nature to replace 1" of topsoil. The depth of the topsoil, from a few inches to several feet, depends on climate, rainfall, topography, type of bedrock, age, disturbances, and native vegetation.

Soil Gets Around

Of course we think of soil as being stuck in one place. Your soil doesn't get up and move to your neighbor's backyard. Or does it?

Blown by wind, moved by glaciers, carried by water, topsoil should have a passport. We in Brazoria County can thank folks to our northwest for a lot of our present day soil. We're in an active area. Gulf waters advanced and receded over the millennia. Huge rivers carried glacial melt and soil toward the Gulf. Flood after flood built up, or took away, different layers, some sandy, some silty, some gravel, and a whole lot of clay.

The recommendation to always keep the soil covered by mulch or plant material is just because topsoil moves so easily. 30% of the world's fertile land has been lost to erosion in the last 40 years.

"Given only the health of the soil, nothing that dies is dead for very long." Wendell Berry, <u>The Unsettling of America</u>, 1977

Not All Soils are Created Equal

So what constitutes a fertile soil? The answer depends on who is being asked the question. A naturalist hiking the Brazoria Wildlife refuge might say that the refuge is amply fertile to sustain the plant and animal life that exists there. The same could be said of the Arizona desert, the Okefenokee swamp or the windward side of Mt. Whitney. The plant life in these places has adapted to the soil and climate; it cycles round and round from living matter to dead matter to living matter. It's called Ecosystem Integrity and refers to the ability of a system to sustain itself in a healthy, balanced state.

At odds with the definition above, a fertile soil is often thought of as one capable of producing a maximum yield of one of the 15 plant species that are the mainstays of human sustenance. Soils that are too dry, too wet, too acidic, too cold or too hot must either be manipulated or left to their natural state. Harvest prevents these farming systems from completing a natural cycle, and sustainability and balance are nonexistent.

Nevertheless, we do have to eat. And with increasing population pressure and vanishing cropland, the necessity is for use of practices that prevent further losses.

Gardener's Integrity

As gardeners, we manage mini ecosystems and gauge a soil's fertility by what we are able to grow. We are faced with soils that have already been disturbed—cleared, moved, removed, compacted and planted with nonative grass. Much can be done to restore or improve soil health and a little "groundwork" can go a long way to creating a happy gardening experience. So how can we contribute to the integrity of our little managed ecosystems? What are the soil problems and gardening mistakes particular to our area?

"To be a successful farmer one must first know the nature of the soil." Xenophon, Oeconomicus, 400 B.C.

The Nature of the Soil We Have

Bedrock Brazoria County is underlain by sedimentary rock — all of it marine in origin. Layers of sandstone, limestone, gravel and clay are often concreted together by calcium carbonate. Calcium carbonate is the chief component of marine shelled critters. It's also the active ingredient in agricultural lime. We've got a lot of it which keeps the pH higher than we might want [see page 5 for more info on pH and limestone].

Recent Soils Within the last 12,000 years or so, soil deposits came by rivers, chiefly the Brazos (which is now a stream compared to its volume after the last glaciers melted). The potential nutrient load is actually high, especially the bottomlands, with one author stating that "the Brazos bottom, for instance, is one of the most fertile farming regions in the world" (Deussen, 1914).

That #&*@! Gumbo Much of our soil has typically slow drainage (its permeability) because of the high amount of clay and silt. The same author quaintly mentions that the chief drawback of this very fertile soil is its "liability of overflowing". We have an average yearly rainfall of 50"-55", twice that of the upper Midwest's grain belt (which is also clay-based). With an average slope of 1' per mile, all that rain isn't exactly rushing to the Gulf. It's sitting in your garden, maybe bubbling up some of that calcium carbonate, very slowly percolating down through those clay particles that can only be seen by an electron microscope.

"All clays are pretty well unworkable with ordinary implements. For the melted toffee consistency of winter, you might prefer a large soup-ladle; for light working over summer, a hammer and cold chisel. Is the soil always too wet or too dry? No, there's a period - usually a day or two in May - when you can actually use a fork."

John Lucas, <u>Backs to the Garden Wall</u>

More problems with the Soil We Have plus

The Nature of the Soil We Want (and how to get there) next month

NOVEMBER JOB JAR-WHAT SHOULD WE DO THIS MONTH?

Flower gardens: All of our experts mentioned that they will continue to <u>clear out</u> <u>weeds</u> this month. <u>Mulch</u> will get attention, too; either fresh mulch will be brought in or the present mulch will be fluffed up. This will help protect plants from whatever awaits them this winter. In your garden, be sure to <u>cut down and clean out tops as plants die back</u>. Clearing away all that dead ginger and canna foliage can go a long way toward reducing insect pests next year.

Now is the time to <u>plant bulbs</u> for spring - see the October newsletter for ideas on that. And you can <u>sow seeds for more early spring color</u>. Larkspur can be sown directly to the beds, as can sweet peas. Remember that larkspur is poisonous, and its young foliage looks a little like parsley and other edibles; so, keep it out of the veggie garden.

Get the rest of those cool weather color transplants into the ground. Nights should finally be cool enough so that even the least heat-tolerant bedding plants, such as pansies and violas, can be happy.

The problem is that most of the cool season color started appearing in the garden centers back in early September. Check out bedding material before you buy. Annuals that have been suffering through the heat for over a month in those tiny 6-cell packs are likely to be really, really root bound. The roots have been circling around and around, and the tops of the plants may be very stressed. Choose transplants that are fresh and green. Pull one out - if the root ball mostly root with very little dirt look for something better.

Sometimes, it's best to buy 3 plants in a bigger pot, rather than plants in 6-packs. You can divide them with a knife or your fingers before planting, and they probably will turn

out better than the tired, stressed plants from the packs. If 6-packs are the only choice, and if you can at least find some that seem to be actively growing, at least tease apart the roots before putting them into their holes. Also, it's usually best to choose transplants that don't have lots of flowers - once they're happy the flowers will come, but if the plant has been blooming in poor conditions, it may never bloom again.

Herbs: Make the most of your basil now - before cold weather takes it. We're getting closer to the time when frost is possible. We've had mild winters of late, but we never know when our luck will run out. Just a little bit of frost will turn your basil black and useless, so make pesto now. (Freeze it in ice cube trays and you can have some to flavor food all winter long.)

You might want to <u>plant some parsley</u>. Parsley likes cool weather, and the next six months will give it ample time to grow a healthy root system before hot weather stresses it out. It might be a good time to put in some new thymes and rosemary, as well.

Veggies: Debbie Soderman says we should keep planting those leafy vegetables. If you sow a little bit every two weeks, you should have a good supply right into warm weather. If you're running out of garden space, tuck some lettuce in among the ornamentals, and pot up some pak choi for the patio. Lettuces generally need 40 to 60 days from sowing to harvest, and pak choi is ready in about the same time. The cole crops take longer, but some of them, like the black Tuscan kale, look dramatic enough to add a real punch to your decorative beds, even if you never eat it.

Propagation: Barbara Brown says that this is the time for taking rose cuttings. In fact, it's

the time for <u>semi-hard wood cuttings of all</u> <u>sorts of shrubs</u>, for instance, hibiscus. If the terms "semi-hardwood" and "cuttings" don't tell you much, you need to come to a work day and track down Bebe and the propagating crew and find out more.

If you are wanting a big <u>new supply of hardy perennials</u>, such as salvias and rudbeckias, now is when you should sow the seed in outdoor beds. The seeds will germinate and start to grow in their own time, and by spring you will have a crop of young plants to spread around your garden. Use collected seed or storebought; be sure to label where you sow, so that early spring weed control doesn't wipe out the results.

Orchard: Dan Sebesta says the thing to do in your home orchard in November is to pick the fruit! For orchard newbies, that may be easier said than done. When to pick? For Barb Bruyere, the harvest starts in September, with satsumas that still look green. She starts sampling as soon as the green fruits get a little "squishy" - her scientific term. She says that some years her satsumas never get orange, because she eats them all first.

On the other hand, Carol Farmer likes her fruit sweet; she waits until the satsumas have turned mostly orange before picking. Carol picks her lemons a few at a time once they're yellow. Barb and Carol agree that citrus fruits store better on the tree (and will keep quite a long time there), so pick just what you need.

If you're growing persimmons, Carol suggests that you pick them before they're ripe, although it's probably too late for that advice this year. She had a bumper crop ripening nicely, until the raccoons took the whole lot. Next year she plans to pick persimmons early.

& & & NOW READ THIS

Teaming with Microbes. Lowenfels, Jeff & Lewis, Wayne. Timber Press: Portland. 2006, 196 pp, \$24.95

Subtitled A Gardener's Guide to the Soil Food Web, the authors split the book into two parts: the science of the soil food web and what each of the microbes does, and then the actions that a grower can take to build up a healthy soil.

If your previous readings in soil science have been unbearably ponderous, you're in for a pleasant read. The hard science is there, complete with references and bibliography, but in layman's terms complete with stunning photographs, most taken with an electron microscope. It's fascinating to learn of a whole unseen world of conquest, mutual-aid pacts and interactions.

After gaining an appreciation of the soil food web's science, you can learn how to apply the science to your gardening. The second part covers how to recognize your particular "web"; composting (a different method than usually is used); compost teas; mulching; using soil web principles on lawns, ornamentals, and veggies; calendar; and, soil web rules.

Working off the basic premise that "no one ever fertilized an oldgrowth forest", *Teaming with Microbes* is an unabashedly organic treatise, backed by hard science. Newbie gardener or old green thumb, you'll find new info and an appreciation for the "underground".

ANN Mclain, the inquiring gardener: get a soil test

Do you know how much fertilizer to use?

The short answer is right there at the top of this column - GET A SOIL TEST! Gardeners spend a lot of money on this fancy fertilizer and that all-purpose product, and often it is money wasted. How can you fix a problem if you don't know what the problem is?

Ordering a soil test does cost money, but if it tells you that you don't need fertilizer at all, it can save money, too. You can buy soil test kits at the garden centers, but if you want accurate results, you're better off sending a sample to the soils lab.

The process is actually easier than reading the instructions. By following the instructions, you'll have a reliable result (and won't waste your \$\$\$).

The Sample Bag and Form

Your first step might be to go to the Extension office and pick up a sample bag and the order form and instructions. Or, you could go to the soil lab's website (http:// soiltesting.tamu.edu) and print out the paperwork for yourself. In either case, be sure to get the "Urban and Homeowner" form - the agricultural form asks some questions you might have trouble with. If you choose to print out your own forms, you will have to provide your own sample bag, in the shape of a quart size zip-top plastic bag. I'm partial to the official bag, myself, because it sternly tells the user: "DO NOT put check in the soil bag". This gives us a peek into the little aggravations of daily life in the soil lab.

Getting Started

Having read the instruction sheet, you can proceed to gathering your sample, or samples. The recommendation is that you not combine samples from different areas that might be different in soil type or use. You would recognize soil differences by the slope (here in Brazoria County, we mostly don't have any slope, but you might), or by texture and color, or by water drainage or lack thereof. Soil in those areas may very well have different chemistry to match those physical differences, and that would confuse your analysis.

Different use would be one area for a veggie garden and another devoted to tropicals.

Collecting the Test Sub-Samples

The basic idea is to gather a little soil from 8 to 10 spots across the area you want to know about. Take a trowel or small shovel and dig a little hole about 6" deep. If the weather has

been dry, this will be the hardest part of the whole thing. (If the weather has been very wet, it may be no picnic, either.) Collect the dirt from the hole into a clean, plastic bucket. Repeat at random spots, putting all the soil in the same bucket.

Aggregating the Samples

Now you will "aggregate" the sample. This can be a challenge, too. When I collected a soil sample a few years ago, it was very dry, and the sub-samples came up like so many broken bricks. This doesn't mix well, and it doesn't fit in that little sample bag too well, either. Pick out all the visible roots and plant bits, and mix the soil together, crumbling it up if needed and/or possible. Ten shovels worth of soil is probably going to be more than the two cups you are asked to send, so it is important to mix it all thoroughly, so that the sample represents the whole.

The soil you have collected has to be dry before it's closed in the bag and shipped. If the sample sits wet during shipment and while waiting for its turn in the lab, the nitrogen values may not be accurate. Do not dry the sample in the oven, although this does sound like the easy way; not only does it stink but it can mess up the analysis, too. Spread it out on a clean surface in the shade or garage.

Preparing for Shipment

Finally, you can load about 2 cups of soil into a sample bag and send it off. But wait, first you need to label the sample bag with an identification number or code, using a permanent marker. This is so that in case you are sending several distinct samples, or in case your request form blows off the lab table, your sample can be firmly connected to the form. (Remember, do not put the form inside the sample bag either.) You can use a number, or your initials, or you can use the name of your favorite Star Wars character, if you feel so inclined. (Think how that would liven up the daily routine in the soil lab.)

The request form asks for your name and address and all that good stuff. It wants to know that ID code. You can send in three different samples with one form, and those ID codes will keep them straight. For each sample, the form also asks you to estimate the size of the area from which you sampled. It asks when you fertilized last, and what you used. It also wants to know what you are growing in that area. There isn't a code for "Perennials" or for "Tropicals"; "Shrubs and

Ornamentals" will probably cover it, or you can try entering more than one code. It worked for me a few years ago.

Choosing the Analysis Type

You can choose how much analysis you want to have done. The basic service (for \$10) will give information about those three nutrients featured on the fertilizer bags: nitrate (N), phosphorus (P), and potassium (K). This also gets you pH (how acid or alkaline the soil is), calcium, magnesium, sodium, sulfur, and conductivity. For more money you can also get an analysis of micronutrients, and of organic matter. Fill out the form, and write your check and pack the whole thing into whatever works. The information sheet suggests that a padded envelope is good enough.

Understanding the Results

In a few weeks you will receive a printed soil analysis. The report lists all the factors you ordered, one per line. It gives the laboratory value, and shows a bar graph for each. The bars are printed across a field marked with descriptors from "slight" to "excessive". The line between "medium" and "high" is labeled CL, which stands for Critical Level. At that point and above, no additional nutrient should be added to the soil. (This indicator doesn't apply to nitrogen, which fluctuates so much. The value may be over the line, and additions may still be suggested.) Over at the side of the page are fertilizer recommendations. This is the amount that you should add to bring your soil just up to the critical level. At the bottom of the sheet you will find more detailed recommendations for fertilizing your soil, considering the use you're putting it to.

Real Life Examples

Debbie Soderman and Ray Michalik and I sat down with several soil reports to see how they came out. The gardens sampled were on different soil types, and were being used for different purposes.

Report A was for a <u>lawn</u>. It had not been fertilized for years. It was not a great surprise that the nitrogen value was reported at zero, although that could have been due to sample collection problems. Nitrogen is very soluble, and leaches through the soil very easily. In our warm and rainy climate, if it isn't replaced regularly, the value will be very low. It will also be low if there has been high demand, as from rapidly growing plants. For this lawn area, the report recommended addition of nitrate.

ANN Mclain, the inquiring gardener: get a soil test

Nitrogen levels were also in the very low range in Report B. This sample came from an unfertilized lawn that was being redesigned for **shrub** and ornamental beds. In this garden, phosphorus was in the high range, but not up to the critical level. The fertilizer recommendation here was for some nitrogen and a small amount of phosphorus. All other nutrients were over the critical line. The pH was higher than the other two reports at 7.8 (the average for Brazoria County).

Report C was for a **vegetable** garden. In this garden, potassium (K) was in the high range, but not quite to the critical line, so reaching that maximum would require addition of a small amount of potassium. The other nutrients were over the critical line.

Although there was plenty of nitrogen in this sample, because it was for a vegetable garden, full of rapidly growing things, the overall fertilizer recommendation was to add nitrogen every 4-6 weeks, <u>if needed</u>. Phosphorus (P) levels in this sample were way up into the very high range. The report recommended that no phosphorus be used in this garden for the next five years. Too much is often as bad as not enough.

So what did we learn from all this?

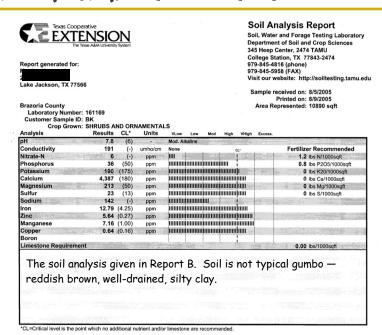
One thing that pops out is that the so-called all purpose fertilizers we so often buy, say 13-13-13, aren't the right thing for everyone. We need nitrogen for our growing things, but we seldom need more than a trace amount of phosphorus or potassium. Both of those elements tend to adhere to clay particles, which we have a lot of, so they don't leach through our soils and disappear as quickly as nitrogen does. If we keep pouring on the 13-13-13 to give growing plants enough nitrogen, we could seriously overdose on the phosphorus (P) and potassium (K).

Bottom line?

A soil test costs money, but it can save money, too, when you buy just the fertilizer you need. And, those glossy ads and fancy packages in the garden centers aren't talking about YOUR garden. Be smart, know what your soil really wants.

What About the Soil Organic Matter Test?

Although a valued soil component, Southern soils average 2%-3% organic matter. Those who add lots of organic matter and compost know they have higher organic matter rates without a test. Auburn U suggests that SOM tests have little short term value unless the grower uses herbicides because high SOM degrades herbicide action. For the rest of us, just keep on truckin' ... compost.



Besides N-P-K, What Else Does This Analysis Cover?

In general, a soil test gives the potential availability of the listed specific nutrients. Complex factors interact at any given point in time to change the availability of these nutrients. Besides nutrients, the soil analysis adds a few other factors to best manage our soil.

pH Short answer — a measurement of how acid or alkaline the soil is. On a scale of 0-14, a pH below 7.0 is considered acid and above 7.0 alkaline. This is an important measurement because many plant nutrients are most readily available at about 6.5. Brazoria County's average is 7.8, moderately alkaline. The pH around house slab foundations is often even higher because lime (alkaline) leaches out of concrete for a number of years. Quite a few ornamentals and veggies perform best at a lower pH than our average. Permanently lowering a native soil's pH is impossible (without a cataclysmic geologic event), but various products can temporarily get you to that magic 6.5 pH or even lower. Veggie gardeners will find it easier as they can keep amending between plantings. New beds can be treated with elemental sulfur dug in at least 6". Aluminum sulfate is faster acting than elemental sulfur, but improper application causes death-by-aluminum to plants. Top dressing with cottonseed meal or compost will help keep the pH a bit lower. Ammonium sulfate and sulfur-coated urea are the typical acidifying ingredients in water soluble "acid" fertilizers. Unless the pH lowering amendment is regularly applied as indicated on labels, the soil pH gradually creeps back up. Garden with plants adapted to your pH, build raised beds with completely different soil, or group and treat "acid-loving" plants together.

Limestone Requirement Limestone RAISES the pH, making it more alkaline. Don't ever add it unless a soil test specifically requires it.

Conductivity The flow rate of the electrical charges of soil nutrients, thus a predictor of how readily available nutrients are in a soil solution. Measured in the alien (to non-engineers) units "µMho/cm" or "µS/cm", a good reading would generally be between 200 and 1200. So many variables affect this rating that the ideal number is site and time specific. However, a rating lower than 200 indicates nutrient deficiency or reduced microbial action. Above 1200 may show: waterlogged soil, excess fertilizer, very high pH, or high salinity. If you want the science and variables about the complex interactions occurring with electrical conductivity, check out http://tinyurl.com/EC-Soil.

Sodium NOT a nutrient. This is one where you want a low number — most plants aren't sodium-tolerant and it "binds" or displaces calcium in the soil. Don't confuse it with soil salinity; they're not the same. High sodium is often associated with high alkalinity. Gypsum, Epsom salts and elemental sulfur can reduce sodium.

AFTER THE SOIL TEST

Fertilizer Application Conversions

Q: Your soil sample result recommends 2 lbs N (nitrogen) per 1000 sq. ft. of garden. So how much fertilizer do you apply?

A: It depends on the N-P-K. For example, a 10-lb, bag of 21-0-0 (ammonium sulfate) contains 21% or 2.1 lbs of N. In order to apply the recommended 2 pounds, it takes $100 \div 21 \times 2 = 9.5$ lbs. of N fertilizer for 1000 sq. ft.

Q: My soil test gives application rates of P_2O_5 and K_2O instead of P and K. How come?

A: Without getting too Dow about it, the answer goes way back to lab methods used to get a good measure of P and K content by weight. If you check out a bag of any commercial fertilizer, the P (phosphorus) and K (potassium) are always shown as P_2O_5 and K_2O . P_2O_5 is about 56% P and K_2O is about 83% K.

A soil lab recommends $1\frac{1}{2}$ lb. P_2O_5 per 1000 sq. ft. Your fertilizer is 0-60-0 or 60% P_2O_5 You will need to apply 100 ÷ 60 x $1\frac{1}{2}$ = 2.5 lbs. fertilizer. If the lab recommends $1\frac{1}{2}$ lbs of P, you will need to apply $100 \div (60 \times .56) \times 1\frac{1}{2} = 4.5$ lbs. of P₂O₅ fertilizer.

Finally, the lab recommends $\frac{1}{2}$ lb. K_2O per 1000 sq. ft. and your fertilizer formulation is 0-0-23. Your application rate is $100 \div 23 \times \frac{1}{2} = 2.2$ lb. fertilizer. If the lab recommends $\frac{1}{2}$ lb. K, your application rate is $100 \div (23 \times .83) \times \frac{1}{2} = 2.6$ lb. of K2O fertilizer.

The basic formula is $\underline{100 \div \% \text{ of nutrient } \times \text{ recommended number of lbs}}$. The result is the number of pounds for 1000 sq. ft. Don't forget to adjust for the area's size. Your area's sq. ft. ÷ 1000 x recommended lb = your area's lbs. Using the above N example for 120 sq. ft: $120/1000 = .12 \times 2 = .24$ lbs

You can also use the same formula to calculate **organic fertilizers**. Thanks to Wayne McLaurin and Walter Reeves of the University of Georgia Cooperative Extension Department for the extremely useful table found on the right.

WHERE TO FIND ORGANIC FERTILIZERS

Most garden centers and even the big-box stores now carry little bags and bottles of various organic amendments. Many are outrageously expensive.

First check the local feed stores before buying "commercial" products. For example, to get the 2 lbs of N/1000 sq. ft you need 28 lbs of 7-0-0 or 33 lbs of 6-0-0. \$2.10/lb gets you a commercial organic fertilizer (7-1-2) or you could buy cottonseed meal (6-2.5-1.7) for only \$.28/lb. at the feed store.

Compost is great and obviously cheapest if you make it yourself, but leaf compost is available (not cheap) in bags.

Composted cow, sheep, etc. manure is readily available and inexpensive, but the bags have a high moisture content and low nutrient value. They're more valuable for soil conditioning.

Mushroom compost (also called spent mushroom compost) is what's left after growers harvest their crop. It can't be reused for mushrooms as they need a sterile medium to start, but it's certainly okay for the garden as a soil conditioner. It's available through a couple of local soil businesses.

Alfalfa pellets and cottonseed meal are favorites; both are "dirt"-cheap compared to other products, have good nutrient values and are available in 50 lb bags (about \$12.75 and \$13.95 respectively) at your local feed store.

Microbes and Microbe Containing Products probably aren't worth buying. If you concentrate on building a healthy soil the microbes will come.

And, yes, there really is such a thing as cricket manure available commercially.

Guide to the Mineral Nutrient Value of Organic Fertilizers (Percent1)

Materials	N	P ₂ O ₅	K₂O	Relative Availability
Alfalfa Meal	3.0	1.0	2.0	Medium-Slow
Blood Meal	12.0	1.5	0.6	Medium-Rapid
Bone Meal (steamed)	0.7-4.0	11.0- 34.0	0.0	Slow-Medium
Brewers Grain (wet)	0.9	0.5	0.1	Slow
Castor Pomace	5.0	1.8	1.0	Slow
Cocoa Shell Meal	2.5	1.0	2.5	Slow
Coffee Grounds (dry)	2.0	0.4	0.7	Slow
Colloidal Phosphate	0.0	18.0- 24.0	0.0	Slow
Compost (not fortified)	1.5	1.0	1.5	Slow
Cotton Gin Trash	0.7	0.2	1.2	Slow
Cottonseed Meal (dry)	6.0	2.5	1.7	Slow-Medium
Eggshells	1.2	0.4	0.1	Slow
Feather	11.0-15.0	0.00.0	0.00.0	Slow
Fish Meal	10.0	4.0	0.0	Slow
Fish Emulsion	5.0	2.0	2.0	Medium-Rapid
Fish Scrap (dry)	3.5-12.0	1.0-12.0	0.8-1.6	Slow
Garbage Tankage (dry)	2.7	3.0	1.0	Very Slow
Granite Dust	0.0	0.0	6.0	Very Slow
Greensand	0.0	1.0-2.0	5.0	Slow
Guano (bat)	5.7	8.6	2.0	Medium
Guano (Peru)	12.5	11.2	2.4	Medium
Hoof/Horn Meal	12.0	2.0	0.0	Medium-Slow
Kelp ²	0.9	0.5	1.0-4.0	Slow
Manure ³ (fresh)				
Cattle	0.25	0.15	0.25	Medium
Horse	0.3	0.15	0.5	Medium
Sheep	0.6	0.33	0.75	Medium
Swine	0.3	0.3	0.3	Medium
Duck	1.1	1.4	0.5	
Poultry (75% water)	1.5	1.0	0.5	Medium-Rapid
Poultry (50% water)	2.0	2.0	1.0	Medium-Rapid
Poultry (30% water)	3.0	2.5	1.5	Medium-Rapid
Poultry (15% water)	6.0	4.0	3.0	Medium-Rapid
Manure ³ (dry) Cricket Manure	3.0	2.0	1.0	Medium Rapid
Goat	2.7	1.8	2.8	Medium
Dairy	0.7	0.3	0.6	Medium
Steer	2.0	0.5	1.9	Medium
Horse	0.7	0.3	0.5	Medium
Hog	1.0	0.7	0.8	Medium
Sheep	2.0	1.0	2.5	Medium
Rabbit	2.0	1.3	1.2	Medium
Marl	0.0	2.0	4.5	Very Slow
Mushroom Compost	0.7	0.9	0.6	
Sulfate of Potash Magnesia	0.0	0.0	22.0	Rapid to Medium
Soybean Meal	6.7	1.6	2.3	Slow
Wood Ashes ⁴	0.0	1.0-2.0	3.0-7.0	Rapid
¹ Percentage of plant nutri	ents is high	ly variable;	average %	are listed.

² Contains common salt, sodium carbonates, sodium and potassium sulfates.

³ Plant nutrients vary with amount of straw/bedding

⁴ Potash content depends on the tree species burned. Wood ashes are alkaline, containing approximately 32% CaO.

PLANTS OF THE MONTH

HEIRLOOM SHRUB: Hibiscus mutabilis (Confederate Rose)

Size: 10' H x 8' W (or larger)

Shape: Large, mounded, multi-

trunked

Foliage: Deciduous large coarse bright green with hairy under-

sides

Light: Full sun

Water: Any soil as long as moist; tolerates some wetness

and gumbo

Flowers: Huge (up to 5") double camellia-like; white changing to

rose

Fertilize: Average—low
Propagation: Cuttings in spring

and summer

Photos and text courtesy of Ann McLain

MAKE ROOM

Although native to South China, this shrub takes to our conditions like a native. It has been a popular passalong all across the south for many years. The shrub is just plain big, and the deciduous foliage is nothing special, but when fall comes and it starts to bloom, the Confederate rose has a lot of bling. And it doesn't stop flowering until frost.

There are several varieties, but the one pictured opens in the morning a pure white, then shifts to a





deep rose pink in the afternoon. When the weather is cooler, flowers may last two days.

In colder climates, the Confederate rose may die back in winter, but it is root hardy to at least Zone 7. In some years, the leaves may be covered with white fly, but not to worry – it will prosper anyway. It may be bothered by cotton root rot when grown in alkaline soil where cotton has been grown in the past.

Available: Plant sales, passalong.

NATIVE PERENNIAL: Symphyotrichum oblongifolius (Aromatic Aster)

Size: 3' x 4' (some cultivars are smaller)

Shape: Loose sprawling Light: Full to part sun (flowers best in full sun) Soil: Sandy to clay

Water: Dryish to moist Flowers: 1"+ typical aster in shades of blue

Fertilize: Average-low Propagation: stem cuttings, root cuttings, division



AUTUMN FLOWERS

This used to be *Aster*...looks like an aster, flowers like an aster...let's just call it an aster.

The native range is extensive, growing from just east of the Rocky Mountains right through to the Atlantic Coast. The variable colored flowers, in shades of blue, bloom in Brazoria county in October and November.

The species is somewhat upright and sprawling, tending to lose lower leaves during the summer. If trimmed back early in the summer, the plant can be made more compact.

Several cultivars are now offered, primarily on-line:

'October Skies', shown left, available through several on-line re-

tailers, was selected by Walters Gardens for shorter (18"), bushier size and bluer flowers than the typical species color

'Raydon's Favorite', again available on-line, pictured at right, is an upright sprawling 3'-4' plant with medium blue-purple flowers



'Dream of Beauty' (above), offered by High County Gardens,



has sugar pink flowers on a dense 12" H x 24" W plant. It's the pinkest of the cultivars available.

'Fanny', 2'x4', is a passalong that came through several gardeners from a grandmother in South Carolina. The selection has typical blue flowers in masses.

Species Available: local plant sales or passalong.

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Thanks!

First I'd like to thank the many Master Gardeners who brought food or helped at the Precinct 2 appreciation BBQ on the 22nd of October! About 100 hundred people were there including the Gardeners. I am proud that so many helped out for these guys that help us at the gardens throughout the year.

Rain

Well looks like it could be a wet El Niño winter. We've had several Pacific fronts that have brought us much needed rain. At the County airport they have gotten about 6.5 inches of rain this month. Other parts of the area have gotten much more rain; in fact, as I write this, there are flash flood warnings for our county and Brazos River flood warnings. It could be a challenging fall and winter for gardening if these fronts continue once or twice a week.

Sago Palms and Scale

If you have sago palms you need to look for scale infestations. I checked few weeks ago and I had a heavy infestation on 2 sagos and light infestation on my others. I'm not sure if it's Asian Cycad Scale or another kind. I have over a dozen sagos in my yard; I love the look of them. I'm cutting off all the bottom leaves and just leaving the top

row of leaves. I hate the look of just the one row of leaves, but this way I can spray much more effectively because you have to spray the tops and bottoms of the leaves. The scale can get so thick they make some of the fronds look completely white.

If you don't take action, Asian Cycad Scale WILL KILL YOUR PLANT!

AgriLife Extension recommends carbaryl (Sevin) and products containing acephate, pyrethrin and permethrin. Another article I read recently said to combine these insecticides with Neem oil. I'm going to try and spray every week but the rain and high winds have prevented me from keeping up with my routine.

Here is a link to Florida Palm and Cycad Society recommendations: http://www.plantapalm.com/centralfl/emergency_care.asp

The link to Texas AgriLIFE Extension recommendations is: http://insects.tamu.edu/extension/publications/epubs/CAS_control_tips-landscape4.pdf

Also, please check your neighborhood to see if any plants are infected. Let your neighbors know what they should do. If you don't, we could literally lose every sago palm in the county.