

Henderson County Master Gardener

“The Inside Dirt”

What’s in a Dream?

Gwen McGlaun

Dreams are usually what you make of them. The first dream of the Henderson County Master Gardener Association when it was formed in 2001 was a place to educate the community on sound gardening practices and demonstrate proven techniques to accomplish those goals. Such a place became a reality when through the generosity of the East Texas Arboretum and Botanical Society the Master Gardeners were entrusted with a garden spot just for such purposes.

The second dream came in the spring of 2005. Dr. Steve George of Texas A & M spoke at the annual spring conference on Earthkind™ roses. He voiced the need for volunteers to plant trial gardens to test selected roses for their worthiness to be bestowed with the Earthkind™ designation. The Master Gardeners became eager to participate in the trials. The third dream was an association with enough enthusiastic, dedicated members to feasibly maintain such a garden. The fall class of 2005, whose members are currently interns, in addition to members who were previously certified completed this dream.

In early 2006 the D.R.E.A.M. Garden, an acronym for Demonstrate, Research, Educate, Apply, and Maintain was born. The Henderson County Master Gardeners became part of the Earthkind™ Rose Brigade. Rose selections to be tested were assigned by T.A.M.U.

Master Gardener Denise Hoch drew a beautiful garden design. The plan divided the garden into two distinct areas. One side includes a large oval bed with a planting of roses demonstrating those that have already been designated Earthkind. The other side of the garden is the trial portion.

A flurry of activities at the garden site began in May. Grass was sprayed with glyphosates, tilled and raked. The beds were laid out. Yards and yards of organic compost were shoveled and tilled into the beds. A split-rail cedar fence was built encompassing the perimeter of the garden. The demonstration area was planted. Irrigation lines were

dug; soaker hoses were laid. Shredded trees and leaves delivered by a local tree service were shoveled over the surface of the beds for mulch.

The trial beds lay fallow for three months to insure that any raw organic material had a chance to decompose so as not to rob the roses of nitrogen when planted. In late September the mulch was raked back; the soil was tilled once again; the roses for the Earthkind trials planted.

Once planted, according to the trial guidelines, no fertilizers, commercial or organic, will be used. Fungicide, miticides and insecticides or any kind of pest control is strictly forbidden. Watering is permitted only when the soil dries to one inch below the soil surface. Organic mulches, preferably leaves and shredded native trees, must be maintained to a level of 3 inches. Pruning or removal of rose bushes that may die is not permitted. Data will be recorded and evaluations made over the course of the three-year trial.

So, what are Earthkind™ roses anyway? They are roses that grow on their own rootstock at a good rate, that have been found to be drought tolerant through testing, that are insect and disease resistant and are prolific bloomers without constant pruning. Sound like a dream? If you love roses but don’t have the time to deal with fussy plants this could be your dream come true.

Visit the trail garden often and see if you can predict which one will be the next Earthkind™ rose.

Allelopathy: Rehab for Killer Plants

Elmer Belssner

There may be a deadly assassin in your yard, engaging in chemical warfare. Before you place a call to Homeland Security, I am referring to plants in your yard that are willing to kill to protect their space. The idea that plants affect neighboring plants by releasing chemicals in the environment has been known since 300 BC when Theophrastus of Greece, the "Father of Botany," noted that chickpeas tended to exhaust surrounding soil and kill off all nearby weeds. By 64 AD both the Greeks and Romans, were using this knowledge in agriculture, but it was not

until 1937, that the Austrian plant physiologist, Hans Molisch, gave it a formal name, allelopathy. His book "The Influence of One Plant on Another: Allelopathy" (1937), described allelopathy as inhibitory or stimulatory biochemical interactions between two plants.

All plants compete for nutrients, water and sunlight. The conflict is about survival. Some plants are armed for chemical combat releasing allelochemicals. Two forms of allelopathy are recognized: (1) the production and release of an allelochemical by one species inhibiting the growth of only other adjacent species, and (2) autoallelopathy, in which multiple species produce allelochemicals and unrelated species are indiscriminately affected.

Surprisingly allelopathy is considered a new science today. The term which had been primarily interpreted as the detrimental influence of one plant upon another is once again defined to encompass both detrimental and beneficial interactions between plants mediated by specific chemicals released from one or more plant species. Allelopathy plays a crucial role in both natural and manipulated ecosystems by determining species distribution and abundance. The agricultural practice of rotating crops that was once believed to be necessary because of the depletion of nutrients is now thought to be partially necessary due to autoallelopathy. Some companion planting is now seen to be advantageous due to allelopathic effects. Allelopathic interactions are also thought to be an important factor in the success of many invasive plants. Last year the International Allelopathy Society (IAS) held the Fourth World Congress on Allelopathy and as further proof that allelopathy is in vogue there is a website dedicated solely to it. <http://www.allelopathy-journal.com/allelopathy.aspx>

How Does Allelopathy Work?

Allelopathy is a chemical process that a plant uses to keep other plants out of its space. Allelopathic chemicals differ in the manner in which they function. Allelochemicals may attack plant DNA (e.g. alkaloids), mitochondrial function (e.g. quinones), water balance (e.g. phenolics), photosynthesis, phytohormone activity, or ion uptake. Frequently it is difficult to determine the exact mechanism of allelopathy because a chemical compound may have multiple phytotoxic effects or a synergistic effect with other chemicals. It is also difficult to isolate the effects of

allelopathy from those due to natural resource competition. Allelochemicals may also affect a plant indirectly by disrupting microorganisms in the soil, e.g. nitrogen-fixing bacteria. If the nitrogen-fixing bacteria are chemically inhibited (e.g. condensed tannins from pine needles and pine bark) there will be a significant reduction in the conversion of ammonia-nitrogen to nitrate-nitrogen. Plants requiring high nitrogen (e.g. grass) will not do well. The reason grass and other plants may not grow well under your pine trees could be attributed to allelopathic effects rather than shading, pine needle litter and acidification of the soil.

Some plants release allelochemicals as a volatile gas through small pores in their leaves. The majority of allelopathic plants release chemicals into the ground directly from their roots, by leaching from their leaves and stems, or through the decomposition of their leaves, fruits, stems and roots. Plants growing near the allelopathic plant absorb those chemicals from the soil. Allelopathic chemicals have low water solubility and are persistent in soil that drains poorly. The accumulation and depletion of these toxins in the soil is affected by factors such as soil type, drainage, aeration, temperature and microbial action. Both abiotic and microbial decomposition will have significant effects on the concentration of allelochemicals reaching other plants. Soil microorganisms ingest allelochemicals as energy sources, and metabolic decomposition can render the chemicals non-toxic to plants. Wet, poorly aerated soil discourages microbial growth, while soils that are well drained and aerated, host a healthy population of aerobic microorganisms that can accelerate this process. Toxins adhere to organic matter rather than being absorbed by plants, and organic matter also encourages a healthy soil microbial population proving once again that soil high in organic matter is the best growing medium.

Allelopathy has been demonstrated to play a crucial role in forests influencing the composition of the vegetation growth, while also providing an explanation for the patterns of forest regeneration.

1. Plants that will suppress tree growth may reduce the cost of pruning or herbicide applications in conflicts between trees and power lines.

(See Allelopathy Pg. 3)

A Word From the President

Sharon Barrett

As we come to the close of the year I find I am as excited about it as I was at the beginning; perhaps more so. My first article as your president was about my goal of being progress and it seems fitting to look back at ways that we were.

Your executive committee set forth a few major goals for 2006. We determined that we wanted to become more visible in the community; that we wanted a larger, more inclusive spring conference; that we would initiate a fall conference; and, that our long dreamed plan of a demonstration garden would become a reality. These weren't simple goals and we would have been happy if we had only attained the majority of them. Any of these things would constitute Progress. Were we Progress? By any interpretation of the word we have to judge our year as a complete success and we did success well. We not only accomplished all our goals, we did it early in the year and with style. Both our conferences surpassed our expectations and our dream garden literally became the DREAM Garden. How? You were Progress. Your incredible spirit of volunteerism and dedication to our projects rose to every opportunity to be Progress.

The Progress of 2006 has put us in a position of being better equipped to provide more educational opportunities. It launched us into a three year official trial of the EarthKind™ Rose project. It fostered new friendships and alliances. Were we Progress? Yes. Can we continue to be Progress? Well, 2007 is coming right up!

Allelopathy (continued)

2. Use of allelopathic cover crops for weed suppression can decrease reliance upon herbicides. Many crops have been reported as showing allelopathic properties and farmers report that some crops such as oats seem to clean fields of weeds. The current list of weed suppressors includes: wheat, barley, oats, cereal rye, brassicas, red clover, yellow sweet clover, trefoil, vetch, buckwheat, lucerne, rice, sorghum.

3. Certain weed species produce toxins that effect crops. *Cyperus rotundus* (nut grass) is one of the most invasive plants known. It has been called "the world's

worst weed." Known as a weed in over 90 countries it infests over 50 crops worldwide. Even low concentrations of toxins extracted from nutgrass tubers reduced soybean root growth by fifty percent. Gardeners observe distinct plant stunting when even a few nutgrass plants are present. Damage exceeds what would be expected from the competitive effect. Other allelopathic weeds include couch grass, creeping thistle and chickweed. Where they occur together they may have a synergistically negative effect on crops.

4. Allelopathic plants have an effect on surrounding plants and other living organisms ranging from death to beneficial effects perhaps by removing competition or attracting insects for pollination. An understanding of plant/chemical relationships could reveal practical benefits of "companion planting", a practice endorsed by organic gardeners. A partial list of garden plants with their "good" and "bad" neighbors can be found at:

<http://www.frenchgardening.com/tech.tmpl?SKU=31091285647395>

5. The brightest hope for allelochemicals is that they will act as natural herbicides and pesticides to stunt or kill specific unwanted plants and insects while not injuring desirable plants. Generally allelochemicals are not toxic to humans and are readily biodegradable. Several products based on allelochemicals are currently available or under development for large-scale manufacture. Leptospermone is a purported allelochemical found in lemon bottlebrush (*Callistemon citrinus*). It was investigated as a possible commercial herbicide but was found to be too weak. Mesotrione a chemical analog of leptospermone was found to be an effective herbicide and is used in a commercial product to control broadleaf weeds in corn. It also seems to be an effective control for crabgrass in lawns. New Zealand has recently granted organic certification to a "natural" herbicide based on an allelochemical extract from pine needles.

Allelopathy is another factor along with competition that complicates the mixing of plants. There is no chemical control available to stop the potential toxicity of one plant toward another. The only practical controls are physical separation and planning ahead to prevent the interaction of incompatible plants. Because allelochemicals are generally most damaging to young plants causing inhibition of seed and/or seedling growth leaves, bark or

wood chips of certain trees containing allelochemicals should not be used directly in gardens as mulch or covering until the young plants are established.

It is difficult to determine when allelopathic interactions are causing problems in your garden. The only readily visible symptoms are reduced growth and wilting. Neither symptom can be positively attributed to allelopathy. The best approach is to avoid allelopathic interactions before they occur. Composting all questionable plant material will reduce the chance of a toxic reaction. Soils that are enriched with organic matter will absorb and hold toxins reducing harmful effects. A partial list of allelopathic plants, the chemicals they produce, and the plants they affect can be found at:

http://www.sustland.umn.edu/implement/trees_turf.html
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Oak Trees Lookin Bad

Rick Hirsch
County Extension Agent
Henderson County

Lately I have been getting a good many calls concerning oak trees that look bad or are dying. Many of you have seen television and news articles about a disease called oak wilt and are concerned that this is the problem with your trees.

Disease is a problem here, but it is not oak wilt. There has not been, I repeat has not been a case of oak wilt confirmed east of the Dallas area. Oak wilt is disastrous in the Hill Country, Central Texas and has moved into the area southwest of Dallas and Fort Worth.

We do, however, have hypoxylon canker. This fungal disease is deadly to oaks and is quite prevalent on trees experiencing a great deal of stress. There are no sprays to control hypoxylon canker. The best thing is to not let your tree become weakened and stressed if possible. Hypoxylon attacks trees that are weakened and stressed.

Before you dismiss this theory let's examine it further. The winter of 05 - 06 was extremely dry. Oak trees are shallow rooted and do not perform well when there is a severe lack of moisture. This year we had one of the driest summers since the drought of the '50's. Trees are still recovering from the previous droughts. The roots were damaged several years ago and now cannot take up sufficient water to maintain a good healthy tree.

This inability to regenerate roots explains why we see oak trees weaken and sometimes die one or two years after new construction has been done in these areas. Fill dirt can only be safely applied, at the most, an inch per year. If you are planning construction around oak trees, extreme care must be taken because oaks just cannot take tampering with the roots.

Insects usually pick out trees that are weakened. They are considered secondary pests. If you find a large number of ants on your trees, you should try to control them with an insecticide and then start taking better care of the tree through watering and proper fertilization.

Trees are a vulnerable part of the home landscape. They help shade houses in summer, protect from cold winds in winter, provide oxygen for our use and most of all they are pleasing to the eye.

Survivors - Summer 2006

Nina Ellis

My garden has received no significant rainfall since July 4. Today is September 6, and as expected the grass is brown and crunches under foot. The leaves on the trees are turning yellow and falling to the ground. As I survey the remnants of the once beautiful hillside I realize some good choices were made when the garden was planted. "Gold Star" esperanza has been blooming all summer providing nectar for butterflies. Maximilian sunflower has been flowering nonstop since the first of July. Salvia coccinea, "Lady in Red", is alive with hummingbirds. Wedelia is covered with small golden blooms providing nectar for the Bordered Patch butterfly. In one bed salvia azurea with its sky blue blossoms is awaiting the bumblebees as the day warms. Salvia greggi is providing color with red and white blossoms. Of course Turk's Cap provides myriad blossoms for hummingbirds. Texas lantana both the white and purple forms are constant bloomers. With the onset of shorter days Copper Canyon daisy is setting buds. Georgia aster is showing some purple color soon to be followed in bloom by both New England aster and aromatic aster. Bidens (tickseed) is showing signs of coming into flower. Have you noticed all of these plants have one thing in common? They are all native plants! They have received no supplemental water this summer and yet continue to grow and thrive providing nectar and pollen sources for our bees and butterflies.

Non-natives that continue to survive and even bloom in the 100-degree heat are surprising to me. Bronze fennel has provided a larval source for the Swallowtail butterfly while Phlox paniculata, both the white and purple forms, has been a constant source of nectar for them. The reseeding annuals, orange cosmos, periwinkle, gomphrena and portulaca, continue to flower.

While we await the fall rains that will surely come my garden has become a host for birds, bees and butterflies.

Chinkapins

Annette Trammell

One of the native trees of Henderson County that doesn't get enough attention is the chinkapin, sometimes spelled chinquapin. It hasn't always been that way. Fifty years ago every boy knew about them, and would usually have a pocket full of chinkapin nuts after they ripened in September.

Chinkapin trees are members of the beech family that includes oak trees and chestnuts. In fact a chinkapin is a small chestnut, and most agree that it is the tastiest of the chestnuts. Chinkapins grow from north to south in the eastern United States. There are two main types, the Allegheny and the Ozark. The Allegheny is just a bush and the Ozark is a small tree. Our county is fortunate in having the largest of the trees, the Ozark. They are easy to spot in the woods when they are in bloom; the whole tree is a mass of yellow stamens (male blooms).

On Highway 31 east there are two that can easily be seen. One is on the west side of Keyworth's Auto Parts. The other is about fifty feet tall and is located in front of the RV sales place just down the road. When they are blooming you can spot chinkapin trees while driving around on country roads. From Athens or perhaps Malakoff west you won't find chinkapins. They are strictly a Piney Woods tree. In Dallas they will live for a year until the roots hit alkaline soil then they wither fast.

There have been attempts to grow chinkapins commercially, but there are some problems. They are very difficult to harvest in economic quantities. If a shaker is used on the tree, very few nuts fall out. They must be removed from the burs manually.

Chinkapins are very similar to their cousins, American chestnuts, except for the fact that chinkapins have one nut to the bur where the American chestnut has three. The nut itself is about half the size of the American chestnut. The American chestnut was once the dominant forest tree in the east and grew to gigantic proportions. It supported a huge industry that supplied tannin for curing leather, telephone poles, fences, shingles and any use that required a good strong rot-resistant wood. It was a very tall tree and large enough to be known as the Sequoia of the East.

The American chestnut was completely wiped out by a fungus that arrived from the Orient in the early 1900s. The chestnut blight killed all the trees by the 1950s except for some few that were isolated. The trees still come back from the roots, but die back as soon as the bark cracks and lets the pathogen enter. This was the greatest botanical disaster in known history. Aside from the loss of trees, the whole ecosystem was altered due to the loss of the main food supply of many creatures such as turkey and deer.

It's been said that chinkapins are susceptible to chestnut blight, and this may be true to a small degree. The fungus is present in Henderson County and can be detected by the orange spores leading to dead bark that girdles and kills some Chinese and European chestnut trees. The chinkapin tree is not bothered much by the blight, but is more likely to succumb to Ink's disease where the lower trunk turns black and eventually dies. Chinkapin trees are not long-lived trees like most oaks, but they have a decent life span and could perhaps be used in an orchard setting to be depreciated over ten to twenty years or maybe more.

This is something that not many people know. Chinkapins make very good rootstocks for European and Japanese chestnuts for which there is a market. A European chestnut grafted onto an Ozark chinkapin will make a very beautiful fast growing tree that can reach forty feet or more in ten years and a trunk diameter of 12 inches. The tree shape is similar to a magnolia except that it is deciduous.

Henderson County would make a perfect setting for a chestnut orchard, and the nuts would find a ready market with the increasing population of Asian and Latin American immigrants in the Dallas area.

Henderson County Master Gardener

<http://agfacts.tamu.edu/D5/Henderso/hc-mg.htm>

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The Henderson County Master Gardener Association is sponsored by the Henderson County Cooperative Extension Service which is a part of the Texas A&M University System. Its objectives are to increase knowledge of gardening to its members and the general public, and to provide the community with information on good gardening practices.

If you have received this newsletter in error, or to provide us with a change of address, please contact the Henderson County Extension Office at (903)-675-6130.