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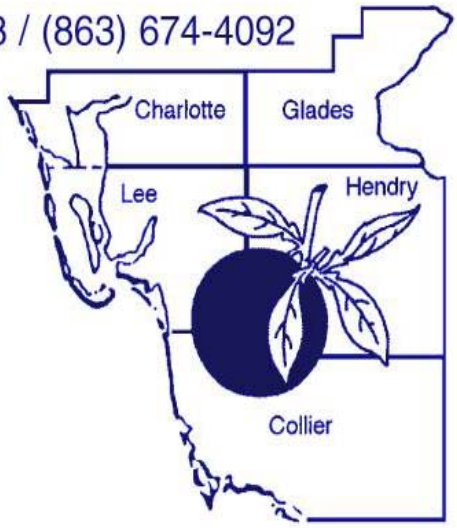
Flatwoods Citrus



Vol. 8, No. 9 **September 2005**

Dr. Mongi Zekri
Multi-County Citrus Agent, SW Florida

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U P C O M I N G E V E N T S

- **Current and Future Uses of Agricultural Reservoirs and Ditches for Water Supply and Quality**
- **Water management**

Date: Wednesday, 28 September 2005, 10:00 AM – 12:00 Noon
Location: Immokalee IFAS Center
Speakers: Hugh English, Tom Jones, and Dr. Sanjay Shukla
2 CEUs for Certified Crop Advisors

If you want to print a color copy of the Flatwoods Citrus Newsletter, get to the Florida Citrus Resources Site at http://flcitrus.ifas.ufl.edu/ You can also find all you need and all links to the University of Florida Citrus Extension and the Florida Citrus Industry

PESTICIDE LICENSE TRAINING

CORE, Private, Ag Tree Crop, Ag Row Crop, Aquatic
Location: Hendry County Extension Office, LaBelle
Date: Monday, October 3rd & Tuesday, October 4th, 2005
For more information and registration, Call 863 674 4092

University of Florida/IFAS CCA Seminar

Date: Wednesday, October 12, 2005
Detailed information is enclosed

51st Annual Meeting of the InterAmerican Society for Tropical Horticulture (ISTH), Date: October 10-14, 2005

Location: Santo Domingo, The Dominican Republic
http://www.cedaf.org.do/eventos/ISTH2005/index.htm
For more information, contact Dr. Richard Campbell at
rcampbell@fairchildgarden.org

WEATHER SCHOOL, 9:30 AM - 12:30 PM

Mark your calendar and contact the Extension Office near you in the following counties: Highlands (863-402-6540), Polk (863-519-8677), Lake (352-343-4101), St. Lucie (772-462-1660), Hendry (863-674-4092) or DeSoto (863-993-4846)
Dates & Locations:

Oct. 25 – Sebring
Nov. 3 – Bartow
Nov. 8 – Apopka
Nov. 15 – Immokalee
Nov. 16 – Arcadia
Nov. 17 – Ft. Pierce

Topics:

- Climate outlook (prediction for the winter)
- Principals of cold protection (include cultural practices)
- The FAWN cold protection tool kit
- Critical temperatures for citrus and other crops
- Agricultural forecasts
- Heat of fusion & evaporative cooling
- Starting and stopping your system (wet bulb shut off tool)
- Other FAWN information for cold nights

Following the program, we are planning a free lunch for all attendees.

Special Thanks to the sponsors of the Flatwoods Citrus newsletter for their generous contribution and support. If you would like to be among them, please contact me at 863 674 4092.

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FLOODING INJURY

Almost all citrus trees grown in southwest Florida are located on high water table, poorly drained soils. Water management on poorly drained soils is difficult and expensive because during heavy rains in the summer, excess water must be removed from the rootzone and in periods of limited rainfall, irrigation is needed. On these soils, drainage is as important as irrigation. The concept of total water management must be practiced. If either system—irrigation or drainage—is not designed, operated, and maintained properly, then the maximum profit potential of a grove cannot be achieved. Both surface and subsoil drainage is necessary to obtain adequate root systems for the trees.

Roots, like the rest of the tree, require oxygen for respiration and growth. Soils in Florida typically contain 20-21 % oxygen. When flooding occurs, the soil oxygen is replaced by water. This condition causes tremendous changes in the types of organisms present in the soil and in the soil chemistry.

Flooding injury would be expected if the root zone were saturated for 3 days or more during extended summer rains at relatively high soil temperatures (86-95° F). Flooding during the cooler December-March period can be tolerated for several weeks at low soil temperatures (< 60° F). The rate of oxygen loss from the soil is much greater at high vs. low temperatures. The potential for damage to roots is less obvious but equally serious when the water table is just below the surface. Flooding stress is usually less when water is moving than when water is stagnant. The use of observation wells is a very reliable method for evaluating water-saturated zones in sites subject to chronic flooding injury.

Short-term estimates of flooding stress can be obtained by digging into the soil and smelling soil and root samples. Sour odors indicate an oxygen deficient environment. The presence of hydrogen sulfide (a disagreeable rotten egg odor) and sloughing roots indicate that feeder roots are dying. Under flooded conditions, root death is not exclusively associated with oxygen deficiency. Anaerobic bacteria (the kind that can grow only in the absence of oxygen) develop rapidly in flooded soils and contribute to the destruction of citrus roots. Toxic sulfides and nitrites formed by anaerobic sulfate- and nitrate-reducing bacteria are found in poorly drained groves. Sulfate-reducing bacteria require both energy and sulfates in order to change sulfates to sulfides. The best sources of energy have been found to be certain organic acids contained in citrus roots, grass roots, and buried pieces of palmetto. Thus, citrus roots can contribute to their own destruction by being an energy source for these bacteria.

Symptoms of flooding injury may occur within a few days or weeks, but usually show up after the water table has dropped and the roots become stranded in dry soils. Leaf wilting, leaf drop, dieback, and chlorosis patterns may develop and tree death may occur. Trees subjected to chronic flooding damage are stunted with sparse canopies, dull colored, small leaves and produce low yields of small fruit. New flushes of growth will have small,

pale leaves due to poor nitrogen uptake by restricted root systems. Usually, the entire grove is not affected, but most likely smaller more defined areas will exhibit the symptoms. Striking differences in tree condition can appear within short distances associated with only slight changes in rooting depths. Water damage may also be recognized by a marked absence of feeder roots and root bark, which is soft and easily sloughed.

With acute water damage, foliage wilts suddenly followed by heavy leaf drop. Trees may totally defoliate and actually die, but more frequently partial defoliation is followed by some recovery. However, such trees remain in a state of decline and are very susceptible to drought when the dry season arrives because of the shallow, restricted, root systems. Moreover, waterlogged soil conditions, besides debilitating the tree, are conducive to the proliferation of soil-borne fungi such as Phytophthora root and foot rot. These organisms cause extensive tree death especially in poorly drained soils.

Water damage may usually be distinguished from other types of decline by a study of the history of soil water conditions in the affected areas. Areas showing water damage are usually localized and do not increase in size progressively as do areas of spreading decline. Foot or root rot symptoms include a pronounced chlorosis of the leaf veins caused by root damage and girdling of the trunk. Lesions also appear on the trunk usually near the soil level (foot rot) or roots die and slough-off (root rot). Flood damage does not produce lesions. Trees with blight or CTV are usually randomly distributed within the grove and diagnostic tests are available to distinguish them from water-damaged trees.

Citrus trees respond physiologically to flooding long before morphological symptoms or yield reductions appear. Photosynthesis and transpiration decrease within 24 hours of flooding and remain low as flooding persists. Water uptake is also reduced which eventually translates to decreased shoot growth and yields.

It is both difficult and costly to improve drainage in existing groves, so drainage problems should be eliminated when the grove area is prepared for planting by including a system of ditches, beds and/or tiling. Growers should not depend on the slight and often unpredictable differences in rootstock tolerance to waterlogging to enable trees to perform satisfactorily under such conditions. Trees, irrespective of scion and rootstock cultivars, should be planted under the best drainage conditions possible. Drainage ditches should be kept free of obstruction through a good maintenance program including chemical weed control. Tree recovery from temporary flooding is more likely to occur under good drainage structure maintenance conditions.

Do not disk a grove if trees were injured by flooding. Irrigation amounts should be reduced, but frequencies should be increased to adequately provide water to the depleted, shallow root systems. Soil and root conditions should be evaluated after the flooding has subsided. Potential for fungal invasion should be determined through soil sampling and propagule counts. If there is a Phytophthora problem, the use of certain fungicides can improve the situation. The nature of the soil, the rootstock, root condition, duration of flooding, soil and air temperature, soil pH, and the presence of sulfur and organic matter in the soil are all factors that need to be considered when trying to evaluate flooding injury and manage tree recovery.

WATER TABLE MEASUREMENT AND MONITORING

Most flatwoods citrus soils have a restrictive layer that can perch the water table and significantly affect tree water relations. To optimize production and tree health, the level of this water table should be monitored and maintained within an optimal zone. Simple and practical observation wells can normally produce adequate information.

Water Table Behavior. The water table under flatwoods citrus may rise rapidly in response to either rainfall or irrigation because sandy soils are highly conductive to water flow. A general rule of thumb is that 1 inch of rain will cause the water table to rise about 10 inches in fine textured soils, 6 inches in most of the flatwoods sandy soils, and 4 inches in coarse sands. It may take 4 to 6 days for the water table to return to its desired levels following rains of 1 inch or more.

Observation Wells. A water table observation well is made with a porous casing buried vertically in the ground. It permits the groundwater level to rise and fall inside it as the water level in the adjacent soils. Observation wells with a simple float indicator can provide rapid evaluation of shallow water table depths. The float and indicator level move with the water table, allowing an above-ground indication of the water level. Water table observation wells installed in flatwoods soils usually penetrate only to the depth of the restrictive (argillic or spodic) layer. Typically this layer is within 30 to 48 inches of the soil surface.

Well Construction. The basic components of the well itself include a short section of 3-inch perforated PVC pipe (3-5 ft long), 3-inch PVC cap, screening material, a float, indicator rod, and small stopper.

The indicator rod can be a dowel, ½ -inch PVC pipe (thin wall) or microsprinkler extension stake. Dowels are a poor choice since they require painting and will rot out near the float within a few years. The float is typically a 2½- inch fishing net float or a 500 ml (approximately 2½ in. diameter x 6 in. high) polyethylene bottle with a 28-mm (1.1 in.) screw cap size. The float assembly can be constructed by inserting the microsprinkler extension stake into the fishing float or ½-inch pipe into the polyethylene bottle.

The bottle neck provides a snug fit for the stake and no sealant is required. The hole in the cap should be drilled slightly larger than the indicator stake to serve as a guide for the float assembly. Fittings should not be glued so that components can be easily disassembled for cleaning or replacement.

Observation well casings are constructed from 3-in. diameter PVC pipe (Class 160). A circular saw or drill can be used to perforate the pipe prior to installation. Perforations should be staggered in rows around the pipe to allow flow into the well from the sides in addition to the bottom. Perforations totaling about 5% of the well's surface area are adequate for sandy soils encountered in the flatwoods. No perforations should be made within 12 inches of the surface in order to minimize the chances of ponded water from high intensity storms creating flow channels into perforations near the soil surface.

The pipe should be wrapped (sides and bottom) with a screening material to

prevent soil particles from moving into the well. Materials such as cheesecloth, polyester drain fabric, and fiberglass screen have been used successfully as filters. The filter material should be taped in place with duct tape. A 3-inch soil auger can be used to bore holes for the wells. When possible, the observation wells should be installed when no water table is present in order to minimize chances of the well sides sloughing into the bore as it is dug.

When a water table is present, it is easiest to install the well by starting off with a larger diameter pipe. For a 3-inch observation well, a 4-inch installation pipe (Sch 40 preferred) will be needed. The installation pipe should be cut at least 6 inches longer than the intended depth of well.

Holes (½-inch diameter) should be drilled in the sides of the pipe opposite each other about 1½ inches from the top of the pipe. These will be used to aid in removing the pipe from the soil after the observation well is installed. Auger a hole in the soil until it begins to slough in (when the water table is reached). The 4-inch pipe should then be forced into the hole. A 3-inch auger can then be used to remove soil from within the 4-inch casing. As soil is removed, the casing needs to be forced downward to keep the hole from sloughing. Continue to remove soil from inside the casing until the appropriate depth is achieved (typically when hardpan material begins to be excavated).

The well casing pipe should be cut to length and installed in the hole so that it extends 2 to 6 inches above the soil surface. Care should be taken to ensure that the casing is installed plumb to minimize binding of the float assembly. If a 4-inch installation pipe was used to excavate the hole, it needs to be removed. A ½-inch rod can be inserted through the holes that were drilled in the top of the 4-inch pipe. If the pipe cannot be removed easily by hand, a chain can be attached to the rod and attached to a high-lift jack. Usually, after jacking the installation pipe up about a foot, the pipe can be easily removed by hand. The soil should be backfilled around the observation well casing and tamped to compact the soil and get a tight fit between the soil and the sides of the pipe.

A measurement should be taken of the distance from the bottom of the well to the soil surface. The float assembly can then be lowered into the well. Make sure that the indicator rod and float do not bind against the sides of the observation well. The well is now ready for calibration.

Calibration. A mark on the indicator stake or rod should be made at the top of the well when the float is at the bottom of the well. This level is the reference mark for the well depth. The indicator stake or rod can then be marked with major divisions (feet) and minor divisions (inches) for easy reading of the water table depth. These rings can be painted at appropriate intervals using different colors for major and minor divisions. Marks painted at 2-inch increments provide enough accuracy for most users.

The mark at the upper level is dependent on the depth of the water furrow and root depth. The upper depth should be selected so that water does not pond in water furrows and it should be at least 6 inches below the bottom of the root zone to prevent root pruning. Observations over time will help to determine the water table level depth that will prevent root damage or excessive wetness in the root zone.

For more details, go to Water Table Measurement and Monitoring for Flatwoods Citrus, Circular 1409,
By Brian Boman and Thomas Obreza
http://edis.ifas.ufl.edu/pdffiles/CH/CH15100.pdf

FERTIGATION

Fertigation is the timely application of small amounts of fertilizer through irrigation systems directly to the root zone. Compared to conventional ground application, fertigation improves fertilizer efficiency. Subsequently, comparable or better yields and quality can be produced with less fertilizer. To effectively fertigate crops, growers must properly maintain microirrigation systems to apply water and fertilizer uniformly. In addition, growers must determine:

(1) which fertilizer formulations are most suitable for injection,

(2) the most appropriate fertilizer analysis for different age trees and specific stages of growth,

(3) the amount to apply during a given fertigation event, and

(4) the timing and frequency of applications.

Properly managed applications of plant nutrients through irrigation systems significantly enhance fertilizer efficiency while maintaining or increasing yield. On the other hand, poorly managed fertigation may result in substantial yield losses. Fertilizers are available in different forms and concentrations. Formulations usually contain two or more nutrients and the solubility of various formulations vary significantly. Fertigation involves deciding which and how much nutrients to apply, selecting the most effective formulations, properly preparing solutions for injection, and scheduling injections to ensure that essential nutrients are available as needed.

Many sources of nitrogen and potassium are suitable for injection through microirrigation systems. They include ammonium nitrate, ammonium sulfate, urea-ammonium nitrate, urea, calcium nitrate, potassium chloride, and potassium nitrate. When using phosphorus (P), magnesium (Mg) cannot be used because Mg-P compounds will precipitate. The use of P can also be a problem when high levels of calcium (Ca), Mg, or iron (Fe) are in the irrigation water.

Solubility of Fertilizers

Solubility indicates the relative degree to which a substance dissolves in water. Solubility of fertilizer is a critical factor when preparing stock solutions for fertigation, especially when preparing fertilizer solutions from dry fertilizers.

Fertilizer	Solubility (lb/gal)
Ammonium nitrate	9.8
Calcium nitrate	8.5
Potassium chloride	2.3
Potassium nitrate	1.1

Hot water increases solubility and makes dissolving fertilizer easier and quicker. Hot water may be especially helpful when dissolving a fertilizer such as potassium nitrate, which actually cools the solution as it dissolves. Because solubility is reduced when water cools, it is not a good practice to heat water in order to dissolve "extra" fertilizer (more than is soluble at normal temperatures). As the solution cools, this extra fertilizer will come out of solution (precipitate or "salt out") and possibly clog emitters.

A solution of 50% urea by weight results in 23-0-0 and has a salting-out temperature of **60^{0}F**. In order to store and handle liquid urea during cooler temperatures, the nitrogen concentration must be lowered to reduce salting out problems.

Crystallization	**60^{0}F @ 23%N**
(salt out)	**43^{0}F @ 20%N**
temperatures	**32^{0}F @ 18%N**
for liquid urea	**19^{0}F @ 16%N**

Liquid Fertilizer Formulations

Preparation of nutrient stock solutions from dry fertilizers may require considerable time and effort and can generate sediments. Therefore, commercially prepared liquid fertilizer solutions (true solutions, not suspensions) that are completely water-soluble should be used. Liquid fertilizers are available in a variety of formulations (8-0-8, 8-2-8, etc.). Liquid formulations are very convenient, because they can be injected directly (without mixing in water) with a variable rate injection pump. Although transportation costs make liquid formulations a little more expensive, they save time and labor and help prevent problems associated with poorly made "home mixes." Also, they eliminate the problems caused by insoluble materials found in some dry fertilizers. Even with liquid formulations, again, be careful when injecting fertilizers containing phosphorus or sulfur (S) into microirrigation systems. Phosphorus and S may react with calcium and/or magnesium in the irrigation water to form mineral precipitates that could clog emitters.

Injection Duration

A minimum injection time of 45 to 60 minutes is recommended. This time is sufficient for uniform distribution of nutrients throughout the fertigation zone. Limit injection time to prevent the application of too much water, because excessive water leaches plant nutrients below the root zone. In addition, too much water saturates the soil, causing damage to roots. The maximum injection time depends on soil type, nutrients, and water requirements of the crop. However, as a general rule, a "reasonable" maximum duration of injection should not exceed two hours per zone.

Fertigation is not recommended with non-uniform, poorly designed irrigation systems.

Fertilizer and water are wasted when fertigating a wet soil to keep up with a fertilization schedule because water and nutrient uptake are drastically reduced under waterlogged soil conditions.

To prevent fertilizers to contaminate the water supply, it is necessary to check that the irrigation system includes the required backflow prevention system devices for the type of chemicals to be injected.

It is very important to determine how long it takes for the fertilizer to travel to the farthest emitter because the system has to be flushed for at least that length of time.

TECHNOLOGY'S SWEET SPOT

Citrus is a major focus of Precision Ag practices in the Sunshine State

By JOHN K. SCHUELLER, a professor in the department of Mechanical and Aerospace Engineering at the University of Florida, Gainesville.

FLORIDA'S predominant North-South axis and wide range of climates has made it home to a wide variety of crops, ranging from corn to tobacco to mangos. And there are varying levels of research and technology for these crops.

But given its importance to the agriculture economy of the state, citrus is really where the most precision agriculture research and development has taken place. In this article, we'll take a look at how precision practices are finding a home in the citrus market.

Similarities, Differences

Tree crops have different characteristics than agronomic crops like wheat, corn, and soybeans. For example, the same tree is in the same place every cropping year. This aids precision agriculture in giving a persistence and year-to-year continuity, which is often greater than in agronomic situations.

But the tree does grow and age over time. In addition, despite most trees being irrigated and well-managed, the yearly differences in weather, pests, fertilizers, and crop protection usage also can cause the tree to respond differently in different years.

Like most crops, yield mapping is the most important aspect of precision agriculture in citrus. And despite the fact that the vast majority of Florida's almost 100 million citrus trees are still harvested by hand, university and private company research has led to commercial yield monitors.

Here's how it works. Harvesters pick the fruit into small bags, which they carry, then empty the bags into tubs or bins. The yield monitors note the geographic location of the tub or bin when it is picked up for transport out of the citrus grove. The locations of the individual tubs or bins are plotted on a map. The density of the "dots" on the map indicate the yield. This technology is used in a significant number of commercial operations. Engineers at the University of Florida's Citrus Research and Education Center (CREC) have researched automating the recording of locations and weighing the individual tubs and bins.

Mechanical harvesting is used on roughly 10% of the crop. Yield mapping has not been demonstrated on those machines, but they should be able to adapt the technologies used to yield map crops like potatoes, peanuts, and sugar beets. The fruit would likely be weighed on a conveyor or in a hopper.

Some attempts have been made at the University of Florida (UF) main campus to map yield before harvest by analyzing images of the fruit-laden trees. The orange fruit easily show up in digital images taken from ground vehicles and small helicopters.

Mapping, Sensing

Since the trees are a persistent factor in production, mapping the trees themselves has useful purposes. Some large commercial operations map individual trees by the thousands. The location of each tree is noted in large geographical information system (GIS) files. Characteristics also recorded include the planting date, the rootstock, the variety grafted on the rootstock, and soil conditions.

There have been significant efforts at the CREC to map the tree size and canopy density. Various experimental equipment have been constructed which use ultrasound, lasers, or images to map the tree canopies from vehicles driving between the rows of trees. Not only is the tree size important for applying the correct amount of fertilizers and chemicals, but it also provides information to help interpret yield maps. Besides images from ground vehicles, aerial and satellite photos can also be used to determine tree size.

On the soils side, sensing holds significant promise. The soils in Florida can have conditions, which affect citrus productivity, such as variable organic matter, cation exchange capacity, and high water tables. Work at the CREC has established that electromagnetic conductivity maps can aid in the management of the establishment and replanting of trees and in managing irrigation.

There is ongoing research at UF to try to use computer vision techniques to detect pest and nutrition problems from tree leaves. There are also remote sensing efforts. Satellite and airborne images show great variability. Research is trying to make that information useful.

VRA, Robotics

Although still not widely practiced, variable-rate fertilizer applicators are used in Florida citrus. The applicators are constructed locally to fit the needs of tree crops, but utilize the same GPS and controllers as other applicators. Ongoing work at the CREC seeks to improve the dynamic accuracy of such applicators.

Commercial citrus operations have long used equipment, which senses the presence and size of trees while spraying pesticides. Such equipment could be modified to take advantage of the tree mapping sensing discussed above.

One application technology receiving more attention, however, is robotics. Because many pesticides must be sprayed up into the trees, it is difficult to limit the exposure of the applicator driver. This concern, combined with the fact that the trees are in fixed and known locations, has made autonomous applicators a subject of research. It is felt by many that one of the first applications of autonomous tractors will be pulling such applicators. Autonomous vehicles might also be used for scouting and mapping operations.

The largest cost in citrus production is the harvesting labor cost. Many feel that harvest must be mechanized if Florida is going to remain competitive with countries such as Brazil and Cuba. Mechanical harvest is being adopted in some groves and research at the Florida Department of Citrus and the CREC is attempting to advance the technologies. One of the efforts at the CREC is to find a chemical, which can be sprayed on the tree to facilitate the removal of the fruit when it is shaken by the mechanical harvesters.

A major effort at UF is to research the development of robotic harvesters, which would remove individual fruit. Such harvesting would reduce losses and improve harvested fruit quality. However, developing robotic equipment that is fast, yet affordable, is a difficult task.

All-in-all, there are significant efforts to develop and utilize precision agriculture and other advanced technology to make Florida citrus competitive despite the high costs of production in Florida. This technology, combined with good management, is being developed in a good atmosphere of cooperation between the growers, suppliers, and public sector researchers.

FOLIC ACID LINKED TO LOWER ALZHEIMER'S RISK

Growing number of studies confirm link

BY JOHN FAUBER
Associated Press

MILWAUKEE — A growing consensus that the B vitamin folic acid can prevent Alzheimer's disease was strengthened Friday by a new study showing that people who consumed sufficient amounts of the nutrient had substantially less risk of getting the disease.

The study looked at a number of nutrients, including vitamins E, C, B6, B12 and carotenoids, but it was folic acid that stood out as having the strongest association with a reduced risk of getting Alzheimer's.

The study followed 579 people aged 60 and older for more than nine years. Those who consumed at least the recommended daily allowance of 400 micrograms had 55 percent less risk of getting Alzheimer's than those who consumed less than 400 mcg.
"It looks like there's a threshold effect (needed) to get a benefit," said lead author Maria Corrada, an epidemiologist at the University of California, Irvine's Institute for Brain Aging and Dementia. "If you go above a certain level, you don't get any improvement in reduction in risk."
While vitamins E and B6 also appeared to lower risk, when those vitamins were analyzed together with folic acid, only folic acid significantly reduced the Alzheimer's risk.

"Folic acid is captivating," said Piero Antuono, a professor of neurology at the Medical College of Wisconsin. "What makes it attractive is the lure of simple intervention for a complex disease."

While the new study does not prove that folic acid prevents Alzheimer's, it adds to other research suggesting that the nutrient may be beneficial, he said. "It's a continuation of several lines of evidence that show that folic acid is good for the brain," he said.

Antuono said he recommends that his Alzheimer's patients take 400 mcg a day.

Folic acid is the synthetic form of folate, a B vitamin found in high amounts in chicken liver, legumes, leafy green vegetables, asparagus and **orange juice**. Since 1998, breads, flours, cereals, pasta, rice and other grains have been fortified with folic acid in the United States as a measure to prevent neural tube birth defects. However, it is believed that many people still may be folate-deficient. For instance, among those in the study, the average daily intake was 318 mcg, although the study was begun before folic acid was added to grains.

The study was published in Alzheimer's & Dementia, a new journal of the Alzheimer's Association.
It comes on the heels of other research suggesting a link between folic acid and memory and Alzheimer's.
"The evidence is mounting," Corrada said.

In June, a Dutch study found that middle-aged people who took 800 mcg of folic acid a day for three years had significantly improved scores on memory tests.

Those who took the supplements essentially performed as though they were two to five years younger.
Other studies have linked high levels of homocysteine, an amino acid found in the blood that has been implicated in heart disease, stroke and vascular disease, with Alzheimer's. Folic acid lowers homocysteine, which is believed to be toxic to brain cells.

In 2002, the ongoing Framingham Heart Study found that people with high levels of homocysteine had nearly twice the risk of getting Alzheimer's as those with low levels.

Other studies that used brain imaging have showed that people who had low levels of folic acid in their blood were more likely to have brain atrophy.
"At this point we have strong indicators, but it is not proof," said William Thies, vice president of medical and scientific affairs at the Alzheimer's Association.

Thies said the new study "completes the train of logic" for doing a large-scale, rigorous study of folic acid to see if it can prevent Alzheimer's.
"What we have are all the pieces for a clinical trial," he said.
However, such a trial would be very time-consuming and expensive.
Thies estimated that it probably would need to run at least five years, involve 5,000 people and cost as much as $60 million.

While such a prevention trial is not planned, the National Institutes of Health is sponsoring a trial of high-dose folic acid and vitamins B6 and B12, which also can lower homocysteine, to see if the vitamins can slow the rate of decline in people who already have Alzheimer's.
That trial is expected to be completed in February.

University of Florida/IFAS Certified Crop Adviser (CCA) Soil and Water Mgt./Crop Mgt. Educational Seminar

Wednesday, October 12, 2005
7:50 a.m. – 6:30 p.m.

Soil & Water Management (5 CEUs)
Crop Management (4.5 CEUs)
Florida CCA Program – A Ten-Year Celebration (0.5 CEUs, Professional Development)

Speakers on-site at the UF/IFAS Indian River Research and Education Center, Fort Pierce.
Available by videoconference at UF/IFAS Research and Education Centers in Lake Alfred, Quincy, Immokalee and Gainesville.

Early registration (by Oct 5): $100.
Late registration (Oct. 6-12): $120.

Lunch provided at all sites.

Organizers: Tom Obreza, UF/IFAS Soil and Water Science Department, UF Gainesville (taob@ifas.ufl.edu; tel. 352-392-1951 ext 243) and Ed Hanlon, UF/IFAS Southwest Florida Research and Education Center, Immokalee (hanlon@ifas.ufl.edu; tel. 239-658-3400)

Program and registration to be mailed soon and will be available online:
www.crec.ifas.ufl.edu/cca

ATTENTION

Grove Self-Survey Submittal Form is ONLINE

www.doacs.state.fl.us/pi/canker

Outbreaks of citrus canker are continuing to be found in Florida's commercial citrus groves and nurseries in addition to residential areas throughout the state. While the state and federal agencies are working hard to control these outbreaks, resources are limited and other mechanisms for early detection of the disease are needed. The citrus industry remains committed to the eradication program and their involvement is critical to its success.

Citrus growers and nursery operators have been, and will continue to be trained to conduct additional surveys which will significantly improve state-wide survey efforts. Their initial survey efforts have already identified a number of positive trees.

The Florida Department of Agriculture & Consumer Services (FDACS) has activated the online reporting of grove self surveys.

Access the grove self-survey form by going to the Web address listed above. Scroll down and click on the Grove Self Survey link.

From there you will be instructed to register as a Florida Department of Agriculture & Consumer Services e-Commerce customer. (You will receive an email confirmation of registration and a PIN number for future visits to the site.)

Once registered, you will be brought to the survey form. Fill out all required fields (required fields are marked with an asterisk *) and submit.

For more information about how to be trained to conduct self surveys or if you have questions about the online forms, please call:

CCEP toll-free helpline number

800-282-5153

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Protection through Detection

Florida Department of Agriculture & Consumer Services

Federal Worker Protection Standard (WPS)

The federal Worker Protection Standard for Agricultural Pesticides (WPS) was implemented by EPA in 1992. Its goal is to ensure the health and safety of agricultural workers and pesticide handlers who work on agricultural establishments.

The Florida Department of Agriculture and Consumer Services (FDACS) is the state agency that implements and enforces this federal regulation in Florida. The Division of Agricultural Environmental Services, Bureau of Compliance Monitoring is responsible for outreach, compliance assistance, interpretive guidance, enforcement and limited training.

WPS requires employers to take several precautionary steps to help prevent their employees from being exposed to pesticides. These steps include but are not limited to:

●providing pesticide safety training to agricultural workers and pesticide handlers they employ;

●providing personal protective equipment and decontamination supplies to employees in order to minimize the risk of pesticide exposure; and

●providing information to employees so they know when, where and what pesticides have been applied.

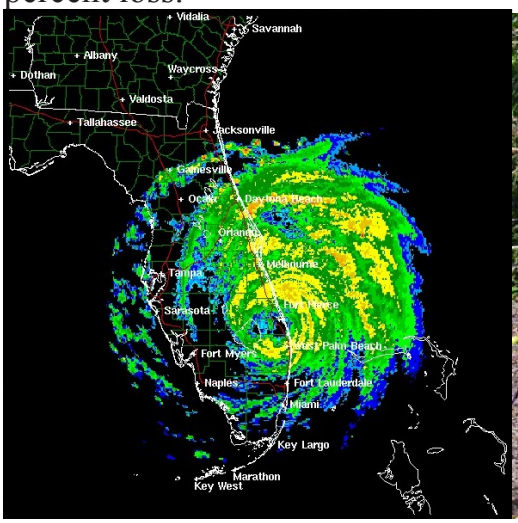
The types of establishments covered under WPS are very specific. They include farms that produce agricultural crops, such as oranges, peanuts, watermelons, etc. Also covered under WPS are greenhouses and plant nurseries. These establishments produce agricultural crops such as flowers, ferns and ornamentals. Forestry operations that grow trees for the production of wood fiber or timber are also covered under the WPS. The following areas are not covered by WPS: golf courses, pasture lands, vertebrate pests, mosquito control, dwellings and other structures, and lawn and landscape maintenance.

Only pesticides designed for use in the production of agricultural plants are covered under the WPS. If a pesticide is covered under WPS, it will be stated on the label under the "Agricultural Use Requirements" section of the pesticide label. If a pesticide with WPS labeling is used on an agricultural establishment covered by the standard, WPS requirements must be complied with.

If you would like to get the 140-page book of the **Worker Protection Standard for Agricultural Pesticides - How to Comply What Employers Need To Know** **for your record and as a reference,** stop by my office. Twelve books are available for $3.00 each.

Hurricane Relief Program Sign-Up Will Close September 9

The USDA Farm Service Agency (FSA) has announced that the Florida Citrus Hurricane Relief Program will close on Sept. 9. This means that growers must have met with the FSA offices by that date to be enrolled in the program. Claims will continue to be paid as long as growers have filed their claims by Sept. 9. The FSA has clarified what the basis of growers' percent loss will be related to. The program states "Crop losses are based upon a normal yield (higher of a producer's APH or county average established under 2001/2002 CDP)." APH refers to Actual Production History and will be the previous three years' average actual production based on individual growers' records. FSA also established county production averages for different varieties. If actual production average is higher than the county average, growers should use their own records to determine their percent losses. If the FSA established per acre averages are higher than the grower's own actual production, use the FSA numbers to determine the percent loss.



Industry Canker Meeting Scheduled September 9, 2005

Florida Citrus Mutual will host a second Industry Citrus Canker Eradication Program Update meeting at the Quality Inn in Sebring on September 9 at 1:00 PM. This meeting follows the July 21 meeting held at the Lake Wales Country Club. At the meeting, federal and state officials will discuss the results of the Sentinel Grove Survey efforts and other eradication program issues with attendees, as well as answer any questions.

☐ If you did not receive the ***Flatwoods Citrus*** newsletter and would like to be on our mailing list, please check this box and complete the information requested below.

☐ If you wish to be removed from our mailing list, please check this box and complete the information requested below.

Please send: Dr. Mongi Zekri
Multi-County Citrus Agent
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975

Subscriber's Name:_____

Company:_____

Address:_____

City:_____State:_____Zip:_____

Phone:_____

Fax:_____

E-mail:_____

Racial-Ethnic Background

__American Indian or native Alaskan
__Asian American
__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

Gender

__Female __Male