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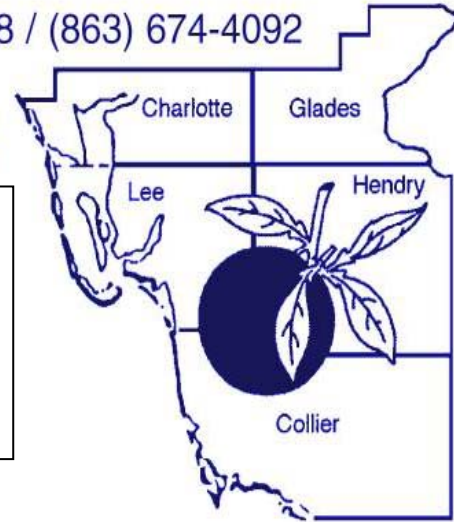
Hendry County Extension / P.O. Box 68 / LaBelle, Florida 33875-0068 / (863) 674-4092

Flatwoods Citrus

Vol. 8, No. 1

January 2005

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



HAPPY HOLIDAY SEASON AND JOYOUS AND PRODUCTIVE NEW YEAR!

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

Hendry County Extension Office, LaBelle

Workshop on scouting for citrus insect pests and diseases. **CEUs day!**

Date: Tuesday, January 11, 2005, 9:00 AM – 3:00 PM

Speakers: Drs. Pete Timmer, Steven Rogers, and Phil Stansly

5 CEUs for Pesticide License Renewal, 5 CEUs for Certified Crop Advisors

Sponsor: Craig Noll and Gary Simmons, Nufarm Agriculture USA

Registration is required. Registration form is enclosed.

Immokalee IFAS Center

Update on PFD, scab, Alternaria, melanose, and canker

Date: Tuesday, 18 January 2005, 10:00 AM – 12:00 Noon

Location: SW Florida Research & Education Center, Immokalee

Speakers: Dr. Pete Timmer and Holly Chamberlain

2 CEUs for Pesticide License Renewal, 2 CEUs for Certified Crop Advisors

Sponsor: Bob Gregg, Syngenta

Following the seminar, we are planning a free lunch (Compliments of Syngenta). To reserve lunch, call 863 674 4092 no later than Monday, 17 January 2005.

Hendry County Extension Office, LaBelle

AGRICULTURAL WATER MANAGEMENT SEMINAR

Date: January 27, 2005, 8:30 AM

Reservation is required. Registration form is enclosed.

UPDATE ON MECHANICAL HARVESTING

Date: February 2, 2005,

For more information and reservation, call Gulf Citrus Growers Association at 863 675 2180.

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

SCOUTING FOR PESTS AND DISEASES

Florida citrus industry uses sustainable production practices. Florida citrus growers help preserve environmental quality by using many sound cultural practices including integrated pest management (IPM) strategies. IPM depends on grove scouting and close observations to determine the need and timing for pesticide applications as well as modification of cultural practices to minimize damage. Scouting for early warnings of pests and diseases is becoming very important in citrus operation. Scouting not only helps growers control pests more efficiently, but also lowers the use of pesticides and the chances of pesticide resistance. In most cases, there is no way to predict on a seasonal basis the incidence and severity of pests. However, based on grove history and frequent observations, many situations can be reasonably assessed. With most citrus pests, the pressure must be high before economic damage levels on the processing fruit crop are experienced. Pest populations should be suppressed only when high levels of infestation threaten tree vigor and productivity. There are several techniques and procedures for scouting and there are many things to know before scouting. To learn more, you need to attend the workshop on scouting for citrus insect pests and diseases scheduled on Tuesday, 11 January 2005.

Indian River Citrus Seminar (See enclosed brochure)



January 25, 2005 from 8 to 4:30

January 26, 2005 from 8 to noon

For registration information, contact Florida Grower Magazine at:

Phone: 407 539 6552, Fax: 407 539 6544, Email:

indianriver@meistermedia.com

Special Thanks to the sponsors
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863 674 4092.

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PRUNING CITRUS TREES

Pruning healthy, mature citrus trees usually reduces yield in proportion to the amount of foliage removed and can delay fruiting of young, nonbearing trees. Proper control of vegetative growth is essential for the maintenance of healthy, productive citrus groves. Most groves in Florida must be pruned at some time during their development to avoid problems associated with overcrowded, excessively tall trees.



When pruning should begin will depend to a large degree on the initial tree planting density. Crowded conditions result in poor light accessibility, loss of lower foliage and bearing wood, relocation of fruiting to the upper tree canopy areas and reduction in fruit yield, size, and external quality. Therefore, good management dictates the need to prune before the occurrence of these undesirable effects.

The response to pruning depends on several factors including variety, tree age and vigor, growing conditions, and production practices. As no one system or set of rules is adequate for the numerous situations encountered in the field, growers are encouraged to gain a clear understanding of the principles involved in pruning and to take advantage of research results and knowledgeable colleague and custom operators' observations.

Too much nitrogen after severe pruning will produce vigorous vegetative growth

at the expense of fruit production.

Therefore, nitrogen applications should be adjusted to the severity of pruning.

Reducing nitrogen applications avoids an imbalance when heavy pruning is done.

Omitting a nitrogen application before heavy pruning and possibly after will reduce both costs and excessive vegetative growth. However, light maintenance pruning should not affect fertilizer requirements.

A heavy crop of fruit tends to deplete carbohydrates and results in a small crop and increased vegetative growth the following year. Pruning after a heavy crop additionally stimulates vegetative growth and reduces fruit yield the following year. Pruning after a light crop and before an expected heavy crop is recommended because it can help reduce alternate bearing.

Severe pruning stimulates vigorous new vegetative growth, especially when done before a major growth flush. This happens because an undisturbed root system is providing water and nutrients to



a reduced leaf area. The larger the wood that is cut, the larger is the subsequent shoot growth. Severe pruning reduces fruiting and increases fruit size. Severe pruning of a very crowded grove typically results in a crop reduction the first year, recovery of the previous yield the second or third year, and higher yields thereafter, although this can vary with tree vigor,

grove conditions, and size of the previous crop.

RECOMMENDATIONS

Severe pruning and training of young, nonbearing trees tends to delay fruit production and should be avoided. Most trees usually need no pruning for the first few years in the grove except for removal of sprouts on the trunk or vigorous suckers on weak trees. When the tree is 3 or 4 years old, depending on its growth, branches that are too closely spaced or are crossed and entangled may be removed. This pruning should be light, just sufficient to establish a desirable framework without stimulating excessive vegetative growth. Mature Trees require pruning when they approach containment size because crowding results in inadequate light conditions, loss of foliage and loss of fruit production in the lower portion of the tree.

Hedging, which consists of cutting back the sides of trees to prevent or alleviate crowding, has become a common practice. Hedging causes numerous cut wood surfaces along the side of the tree canopy from which new sprouts arise eventually developing into a wall of new foliage. Middles between tree rows should be sufficiently wide to accommodate grove equipment and provide adequate light access to the sides of the trees. Middles are usually hedged to a width of 7 to 8 ft.



Hedging should be started before crowding becomes a problem so that only cutting of small branches is necessary and minimal crop reduction results. The closer the spacing and the more vigorous the trees, the sooner hedging is required and the more frequently it needs to be done. Removal of a large portion of the tree will result in excessive vegetative growth and a drastic reduction in subsequent yield. Hedging of severely crowded groves aids in the eventual restoration of the tree skirts and opens them up for passage of grove equipment. However, heavy cutting is expensive, reduces the crop, and increases problems and cost of brush disposal.

Hedging is usually done at an angle, with the boom tilted toward the tree tops so that the middles are wider at the top than at the bottom, allowing more light to reach the skirts of the tree. Hedging angles being used vary from 0 to 25 degrees from vertical, with 10 to 15 degrees being more commonly used and more satisfactory. With wide angles, topping can sometimes be done with one pass of the boom instead of two or can be eliminated entirely if the trees come to a peak at a suitable height. Another advantage of hedging at wider angles may be better spray coverage, particularly aerial.

Topping should be done before trees have become excessively tall and should be an integral part of a maintenance program. Long intervals between topping will increase costs of the operation due to heavy cutting and more brush disposal. Excessively tall trees are more difficult and expensive to harvest and spray. Topping trees will increase light penetration into the tree canopy thereby stimulating intense vegetative growth. Topping will also reduce harvesting costs and enhance pest and disease control due to better spray coverage, and increase fruit quality and size. Yield reduction due to

light topping is usually not great if trees still have their lower skirt areas. However, if the trees have lost their lower canopy bearing wood, a large reduction in yield will occur in the first year since much of the fruit-producing wood and foliage would be removed. Topping these trees would still be beneficial in the long run since it may help them regain their skirt areas and bring them to a more manageable height. Since topping usually increases fruit size (by reducing crop load), fresh-market fruit from topped trees may have a higher packout.

Some trees are flat-topped, especially if they are small or narrow or have been hedged at a wide angle. Closely-spaced rows and those with a sufficient hedging angle can be flat-topped with a single pass of the boom. However, trees can be topped at angles ranging from 15 to 30 degrees from horizontal, resulting in a peak which is 2 or more ft higher than the shoulders. Angles between these extremes are commonly used. The slope aids machines in sweeping brush from the tops.



Optimum tree height depends on the distance between trees, the hedging angle and tree width. Topping height may vary from about 10 to 20 ft, but is usually about halfway between. Some common topping heights are 12 to 14 ft at the shoulder and 15 to 16 ft at the peak. Lower heights are mostly used for training trees, increasing



fruit size or rejuvenating declining trees. Topping should be started before heavy cutting is required. If heavy cutting is required in older groves, the initial cuts should be low enough to avoid cutting heavy wood in subsequent topping operations. Retopping is generally done just above the old cut.

Skirting, which is pruning to raise tree skirts has become a more widely accepted practice. With low tree skirts the movement of herbicide booms and other equipment is impeded, and the inspection of irrigation systems is more difficult. Fruit and limbs near the ground are often damaged by the passage of such equipment by herbicide spray and fertilizer contact. Low tree skirts may also increase the incidence of Phytophthora foot rot, because of poor air circulation under the tree canopy. Lower canopy fruit is also more susceptible to Phytophthora brown rot. Skirting has the advantage



in reducing problems with vines and facilitating mechanical harvesting.

PRUNING PROGRAMS

Hedging programs can vary considerably with variety, tree vigor, and spacing. The grower can hedge every middle every year; hedge alternate middles every year; or hedge every middle every other year. Groves on a 2-year program are hedged in one middle one year and the other middle the next. A 3-year program might consist of hedging one middle the first year, the other the second and topping in the third year. The possibilities for hedging and topping schedules are numerous and should be decided on an individual basis.

The best time of year to hedge depends on variety, location, severity of pruning, and availability of equipment. Since hedging is usually done after removal of the crop, early maturing varieties are generally hedged before those which mature later in the season. Many prefer to hedge early before bloom, but they may also get more regrowth which may or may not be desirable. Hedging could begin as early as November in warmer areas. Moderate hedging can be done until July with little or no crop loss and perhaps less regrowth. Light maintenance pruning can be done throughout the summer and until early fall with little or no loss in fruit production. Hedging should not continue into the fall in freeze-prone areas as trees with tender regrowth are more susceptible to cold injury.

Hedging `Valencia' orange or late harvested grapefruit presents a special problem because of overlapping crops. Hedging has usually been done in late spring after the old crop is harvested and the new crop is set. Fruit harvest should be scheduled early in the season for `Valencia' groves that are to be hedged. Good results have been obtained when

annual hedging has been done in late winter with the old crop still on the tree and before bloom. The first cut is usually done after harvest and then the grove is rehedged annually in January or February. When this is done annually at the same width, the wood and foliage removed contains few fruit and there is little or no reduction in yield. The key to this program is consistency.

Fresh fruit

Fruit size is very important in fresh fruit operations, with small sizes often resulting in a reduced pack-out and lower prices. In some cases, large fruit are spot-picked and the rest of the crop is never harvested. Hedging and/or topping after a light crop and before an expected heavy crop can reduce the number of fruit with a corresponding increase in fruit size and also alleviation in alternate bearing. The grower may wait until the fruit-set so that the amount of fruit-set can be more accurately determined. However, it is extremely important that pruning is done before the fruit has attained appreciable size since later fruit removal could result in a crop reduction without a compensating fruit size increase.



Robert M. Bancroft
Citrus Hedging, Inc.

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The Worker Protection Standard (WPS)

The Worker Protection Standard (WPS) is a federal regulation implemented by EPA in 1992. Its goal is to ensure the health and safety of agricultural workers and pesticide handlers while working on agricultural establishments. The Florida Department of Agriculture and Consumer Services is charged with implementing and enforcing this federal regulation in Florida.

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:

1. providing pesticide safety training to agricultural workers and pesticide handlers they employ,
2. providing personal protective equipment and decontamination supplies to employees in order to minimize the risk of pesticide exposure and
3. 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 an agricultural crop such as orange groves, peanut farms, watermelon farms, etc. Also covered under WPS are greenhouses and plant nurseries. These establishments produce agricultural crops as well as flowers, ferns and ornamentals. Forestry operations that grow trees for the production of wood fiber or timber are also covered under the WPS. Areas that are not covered by WPS include pesticide applications on golf courses, on pasture lands, for control of vertebrate pests, for mosquito control, to dwellings and structures, or to private lawns.

Only certain pesticides are covered under the WPS. You will find that nearly all the pesticides that are labeled for use on some type of agricultural establishment are covered by 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 you are using a pesticide with a WPS label on an establishment covered by the standard, you must comply with WPS.

The Florida Department of Agriculture and Consumer Services serves as the State Lead Agency for carrying out the Worker Protection Standard. The Division of Agricultural Environmental Services, Bureau of Compliance Monitoring is responsible for outreach, compliance assistance, interpretive guidance, enforcement and limited training.

The Cooperative Extension Service in Florida serves as the primary provider for WPS training. Training includes compliance assistance training, the "Train the Trainer" program and some worker and handler training. The "Train the Trainer" program trains participants to conduct the standardized training required for the agricultural workers and the pesticide handlers. Upon completion of the course, trainers will receive a certificate of completion and instructions on how to participate in the training card program. Upon agreement of certain provisions, trainers can participate in the training card program, which allows them to distribute EPA training cards to the workers and handlers they train. Contact your local

cooperative extension office at <http://www.ifas.ufl.edu/extension/cesmap.htm> to find out when and where the Train the Trainer programs are offered. Click here to find out more about the training card program administered by FDACS.

For outreach materials, compliance assistance and interpretive guidance for Florida, contact:

Eric Sespico
FDACS-Pesticide Certification Section
3125 Conner Blvd. Bldg 8 (L-29)
Tallahassee, FL 32399-1650
(850) 488-3314

For information on enforcement contact:

Craig Bryant
FDACS-Pesticide Enforcement Section
3125 Conner Blvd. Bldg 8 (L-29)
Tallahassee, FL 32399-1650
(850) 488-5872

Who Needs a Pesticide Applicator License

All persons who apply restricted use pesticides (RUPs) to any outdoor area in Florida not associated with buildings or public health pest control must have a pesticide applicator license issued by the FDACS Bureau of Compliance Monitoring, Pesticide Certification Office. Any treatments made within 10 feet of a building are considered to be associated with buildings.

In Florida, restricted use pesticide (RUP) licenses are for pesticide applicators who treat agricultural and related sites, such as agricultural fields, plant nurseries, golf courses, industrial sites, highway right-of-ways, and other similar areas. For a list of license categories, go to the License Categories, Exams and Study Materials. The RUP license types available in Florida are private, commercial, and public. For more information on license types, go to License Types and Fees.

Restricted use pesticide (RUP) licenses issued by the Bureau of Compliance Monitoring, Pesticide Certification Office are not valid for residential applications, structural pest control, or public health pest control (mosquito control, etc.). If you need a license for residential, structural, or public health pest control, go to the FDACS Bureau of Entomology and Pest Control at (850) 921-4177 (Pest Control Section) or (850) 922-7011 (Mosquito Control Section).

20 more copies of the 140-page book entitled “*WORKER PROTECTION STANDARD FOR AGRICULTURAL PESTICIDES – HOW TO COMPLY*” are available for sale (\$3.00/copy) at the Hendry County Extension Office.

Earning Continuing Education Units (CEUs)

Applicators must become recertified in order to renew their pesticide applicator licenses. To become recertified, individuals have the option of either retaking the certification exams or earning Continuing Education Units (CEUs).* CEU credits are earned by attending professional meetings or seminars or completing online or correspondence courses which have been approved in advance by FDACS to award CEUs.

If an individual has more than one license, the same CEUs can be used to renew both licenses, provided the CEUs were earned during the license period for each license (from the day the license was issued until it expires) or within one year after expiration.

***In rare situations, reexamination may be required for recertification, with no option of using CEUs. The Florida Department of Agriculture and Consumer Services will notify all applicators affected by this requirement.**



CEUs Required

After January 1, 2005 - Applicators who renew their licenses with CEUs after January 1, 2005, must have 4 Core CEUs plus the number of category CEUs shown in the table below. Only 4 Core CEUs are required per license - not 4 Core CEUs per category.

Beginning in 2005, all category CEUs must be approved for the specific category. There will no longer be a requirement for having 2 Core CEUs per primary category, and Core CEUs can no longer be used to meet the required number of category CEUs. Example: After January 1, 2005, private applicators must earn 4 Core CEUs plus 4 CEUs approved for the Private Applicator Agriculture category. No substitutions of other types of CEUs will be allowed.

Table of CEU Requirements - The table below gives the number of CEUs required for applicators who choose to recertify with CEUs. ***Effective January 1, 2005, all applicators must earn 4 Core CEUs in addition to the category CEUs listed below.***

Primary Categories	Number of Category CEUs Required
Aerial	16
Agricultural Animal Pest Control	4
Agricultural Row Crop Pest Control	8
Agricultural Tree Crop Pest Control	8
Antifouling Boat Paint Application	4
Aquatic Pest Control	16
Forest Pest Control	8
Chlorine Gas Infusion	4
Natural Areas Weed Management	16
Ornamental & Turf Pest Control	12
Private Applicator Agricultural Pest Control	4
Raw Agricultural Commodity Fumigation	4
Regulatory Inspection & Sampling	4
Regulatory Pest Control	12
Right-of-Way Pest Control	8
Seed Treatment	4
Sewer Root Control	4
Soil & Greenhouse Fumigation	4
Wood Treatment	4
Secondary Category	Number of Category CEUs Required
Demonstration & Research	4

Aerial CEUs

The aerial category issued under the authority of Chapter 487, Florida Statutes, is for agricultural and related applications and is not valid for public health aerial (mosquito control, etc.) applications.

The ag aerial category is a primary category and is the only category required for aerial applicators who do not make pest management decisions (determining when to treat and which pesticides to apply). Aerial applicators licensed in only the aerial category are licensed to simply apply pesticides according to the directions of another person who has made the pest management decisions. Aerial applicators who make determinations of when treatments are needed and which pesticides to apply must be licensed in all work related categories (ag row crop, ag tree crop, forestry, etc.) in addition to the aerial category.

Aerial applicators licensed in the ag aerial category only are not authorized to make ground application of restricted use pesticides. Applicators must be licensed in the appropriate ground categories (ag row crop, ag tree crop, forestry, etc.) to make ground application of restricted use pesticides to these sites.

Aerial License Renewals - The 16 CEUs required to renew the Aerial category must consist of at least 2 Core CEUs; plus at least 8 Aerial CEUs; plus 6 additional CEUs approved for either Core or Aerial. After January 1, 2005, aerial applicators must earn 4 Core CEUs plus 16 Aerial CEUs to renew the Aerial category - no substitutions allowed.

Using a Combination of CEUs and Exams to Renew

Applicators have the option of taking the certification exams again if they do not have enough CEUs for renewal. If an applicator has earned the required category CEUs but not enough Core CEUs, the Core exam may be taken instead of using Core CEUs for renewal. Applicators may also choose to take the category exam(s) and earn the required 2 Core CEUs per category (if renewing before January 1, 2005) or 4 Core CEUs, regardless of the number of categories being renewed (if renewing after January 1, 2005).

Applicators who have more than one category may choose to renew some categories with CEUs and other categories by exam. For categories renewed by exam, the Core exam must also be retaken, or at least 2 Core CEUs earned per category, if renewing before January 1, 2005. Two Core CEUs are required per category renewed before January 1, 2005, or the applicator may retake the Core exam and will not need to earn any Core CEUs, regardless of the number of categories being renewed. If renewing after January 1, 2005, all applicators must either earn 4 Core CEUs or retake the Core exam, in addition to either earning the number of category CEUs shown in the table above or retaking the category exam for each category renewed.

Example 1: Effective January 1, 2005, private applicators will be required to have 4 Core CEUs plus 4 CEUs approved for the Private Applicator Agriculture category. A private applicator who has 4 Private Applicator CEUs and only 2 Core CEUs may choose to take the

Core exam instead of earning 2 additional Core CEUs, if desired.

Example 2: A commercial applicator has the Agricultural Row Crop category plus the Agricultural Tree Crop category and has earned 8 Ag Row Crop CEUs, 2 Ag Tree Crop CEUs, and 3 Core CEUs. The license is expiring on December 31, 2004. If the applicator renews before January 1, 2005, he will need to earn 4 more Ag Tree Crop CEUs plus 1 more Core CEU to renew with CEUs. He also has the option of substituting up to 2 additional Core CEUs for 2 of the Ag Tree Crop CEUs. Or he may take the Ag Tree Crop and Core exams again instead of earning any additional CEUs, or take one of those exams and earn CEUs for the other. If the applicator renews after January 1, 2005, he will need to earn 6 more Ag Tree Crop CEUs plus 1 more Core CEU. He cannot substitute Core CEUs for any of the required Ag Tree Crop CEUs. However, he has the option of taking the Ag Tree Crop and Core exams again instead of earning any additional CEUs, or he may take either of those exams and earn the required CEUs for the other.

CEU Programs

Training programs that provide CEU credits are offered by the County Agricultural Extension Offices as well as many other education providers. Most of the programs are offered within Florida; however, many out-of-state programs are also approved. To locate training programs offering CEUs, use the searchable [CEU Classes](#) database on this web site. After locating classes of interest, call the contact person listed for more information or to register for a class. Or, you may want to contact local County Extension Offices in your area to find out their training schedules. You may also call the FDACS Pesticide Certification Office at (850) 488-3314 for information about upcoming CEU classes. Eric Sespico is the contact person for information about CEU class schedules.

Keeping Records of CEUs Earned

Each licensed applicator is responsible for keeping track of CEUs earned and must submit the attendance records at license renewal time. For each CEU class you attend, be sure to obtain an official FDACS Record of Attendance form that has been signed by the trainer or contact person for the class. ***The Record of Attendance form must be filled out completely, with your name, address, and license number; the name, date, and location of the class; the CEU program number; your sign-in and sign-out times; the number of CEUs awarded; your signature (licensed applicator) and date signed; and the signature of the trainer/contact person for the program and date signed.*** If any of this information is missing, the form will be returned to you for completion before your license can be renewed.

You will need to keep your Record of Attendance forms until time to renew your license, then mail them in with your completed Renewal Notice and license renewal fee. If you send your CEU attendance records to our office more than 60 days before your license expiration date, we will return them to you to resubmit with your renewal notice and license fee. Renewal notices are mailed to all licensed applicators approximately 60 days before license expiration. If your address has changed, be sure to notify us of your new address so you will receive the renewal notice. A Change of Address form is available for downloading on the Forms and Documents page.

CITRUS COMPOUNDS FIGHT CHILD CANCER CELLS



Compounds found only in citrus fruits not only fight colon cancer cells but also halt the spread of the childhood cancer neuroblastoma, according to research in laboratory animals.

The researchers based at the Texas Agriculture Experiment Station have already shown that limonoids, of which eight different kinds have so far been characterized from extractions, reduce the ratio of LDL cholesterol to 'good' HDL cholesterol, improving the profile for a healthy heart.

The new research on neuroblastoma cells, submitted for publication in a scientific journal, adds to the potential benefits of the compound for future use by the food industry.

Neuroblastomas account for about 10 per cent of all cancers in children. Neuroblastoma cells died with relatively

small amounts of concentrated limonoids, in 48 hours or less, said the researchers.

The citrus findings are important because limonoids induce no side effects, according to the researchers.

Limonoids, a major phytochemical class in citrus fruits, are not the only compounds to offer potential health benefits. A [report](#) commissioned by the Australian Citrus Growers Association suggested that the industry could promote the fruits for future mothers - due to their folate content - for blood pressure lowering - for the high potassium and low salt content - and for heart health, owing to the antioxidants, fiber, folate and phytochemicals present.

Dr Bhimu Patil, a plant physiologist at the Texas A&M University-Kingsville Citrus Center, noted that there is some work to go before the food industry can market purified limonoid extracts.

"It is very difficult to say whether these could be added to foods as we have not yet done any toxicity testing. However once such studies are completed, we may be able to start producing the isolated compounds in industrial scale with a partner," he told NutraIngredients.com.

He added that isolating the limonoid compounds is challenging "because some are present in very small concentrations".

The researchers are also hoping to learn how limonoids, not present in any other fruits or vegetables, work to fight cancer.

Structurally different from the flavonoids also found in citrus fruits, limonoids seem to work against cancer three ways: prevent it from forming, slow the growth of existing cancer and kill cancer cells.

Limonoids with a sugar unit attached, limonoid glucosides, are water soluble and tasteless and so could be a suitable food additive. These were also responsible for 'a dramatic effect' on cancer cell death.

Patil's lab is also examining whether the compounds vary among citrus species and at different times of the year.

GRAPEFRUIT JUICE MAY CONTAIN CANCER-FIGHTING COMPOUNDS

Citrus fruits like oranges and grapefruits are known to be a rich source of vitamin C but new evidence suggests they also contain compounds that fight cancer.

Researchers at Texas A&M University reported this week that freeze-dried grapefruit pulp, similar to whole grapefruit, reduced the incidence of early colon cancer lesions in an animal model of the disease.

Meanwhile a researcher at Kanazawa Medical University in Japan showed that nobiletin, a compound found in tangerines, has also demonstrated possible action against colon cancer.

Cancer of the colon or rectum is the second deadliest form of cancer after lung cancer but is also considered one of the most preventable types of cancer, as there are several dietary factors that appear to play a protective role against the disease.

In another trial, presented yesterday at the symposium on health benefits of citrus fruits, taking place during the American Chemical Society's national meeting this week, a team from the University of Hawaii reported that drinking grapefruit juice may help reduce the risk of cancer in smokers.

In a controlled study involving 49 smokers, the researchers found that those drinking three 6-ounce glasses of grapefruit juice a day reduced the activity of a liver enzyme called CYP1A2 that is thought to activate cancer-causing chemicals found in tobacco smoke.

The meeting underlines the nutraceutical potential of the fruit at a time when sales are being hit by the current trend for low-carb diets as well as warnings about the interaction between grapefruit and prescription drugs.

Grapefruit are a key component of the once fashionable 'grapefruit diet', now pushed to the sidelines by the low-carb mania. But a recent trial, reported earlier this year and presented at the meeting yesterday,

suggests that grapefruit may indeed stop weight gain by lowering insulin levels.

Meanwhile the fruit's effects on drugs could be turned into a benefit for the pharmaceutical industry. Scientists at Texas A&M Citrus Center have identified three compounds belonging to a class called furocoumarins that are responsible for inhibiting a key enzyme, CYP3A4, that metabolizes and regulates certain drugs involved in the grapefruit-drug interaction.

The researchers hope that these enzyme-blockers can eventually be developed into a 'super-pill' or specialty grapefruit juice that can be co-administered with prescription drugs to increase their bioavailability, thus reducing dose and cost.

ORANGE JUICE EVERYDAY CAN KEEP CANCER AT BAY

Orange juice might be synonymous with Vitamin C but new research by scientists at the Texas Agricultural Experiment Station, has now indicated it also has other important benefits like a glass of orange juice a day could help in keeping cancer at bay.

According to them this is because orange juice and other citrus foods contain potent natural compounds called limonoids, which show dramatic results in killing certain cancer cells.

The study, found that limonoids targeted and stopped neuroblastoma cells, which account for about 10 percent of all cancer in children. Neuroblastoma cells usually create a solid tumor in the neck, chest, spinal cord or adrenal gland.

The researchers said that what makes the finding even more promising is the fact that not only can it arrest cancer, but also because limonoids induces no side effects.

They said that flavonoids which were found in citrus fruits were also beneficial, together

flavonoids and limonoids, nutrient- packed pigments that give color and taste to fruit, prevent cancer in any of the three ways: prevent it from forming, slow the growth of existing cancer, or kill cancer cells.

During lab tests it was found that the neuroblastoma cells were all dead within two days with just 5, 10 and 50 micromoles of limonoids. A micromole is about the equivalent of a tiny skin flake. Some limonoids were more effective than others, but all had killing potential. These amounts of limonoids could easily be obtained from a glass of orange or grapefruit juice.

"Now that we have seen the cancer cells die and in such a short time. We need to find out why they are so vulnerable and exploit it. It could be that ultimately we are able to give patients an oral cocktail of limonoids in such concentration as to stop their cancer," the researchers wrote in their study.

GRAPEFRUIT MAY BE EASY WEIGHT LOSS REMEDY



Eating grapefruit, long recommended by diet programs for weight loss, may indeed impact the body's insulin levels, speeding up metabolism and leading to weight loss, say researchers from the US-based Scripps Clinic.

In a 12-week pilot study, led by Dr Ken Fujioka from the clinic's Nutrition and Metabolic Research Center, researchers found that people eating a serving of the citrus fruit with each meal led to an average weight loss of 3.6 pounds.

About 100 male and female participants, who had an average weight of 218 pounds, were divided into three groups. One ate half a grapefruit with each meal, a second was instructed to drink a serving of grapefruit juice three times a day, and a third acted as a control group. The study participants maintained their daily eating habits and slightly enhanced their exercise routine.

Those eating the fruit three times daily lost on average 3.6 pounds over the study period, while those on the juice regime lost 3.3 pounds. The control group only saw an average decrease of 0.5 pounds.

Some of the patients taking grapefruit lost more than 10 pounds, added the researchers.

"For years people have talked about the grapefruit diet, and some even swear by it, but now, we have data that grapefruit helps weight loss," said Dr Fujioka.

The study also indicates a physiological link between grapefruit and insulin. The researchers speculate that the chemical properties of the fruit reduce insulin, seen in measurements of the participants' glucose levels.

Insulin is known to help regulate fat metabolism and also plays a key role in diabetes. The finding means it could also protect obese people from developing type 2 diabetes. However lowering insulin levels also makes people feel less hungry and this could also explain its link to weight loss.

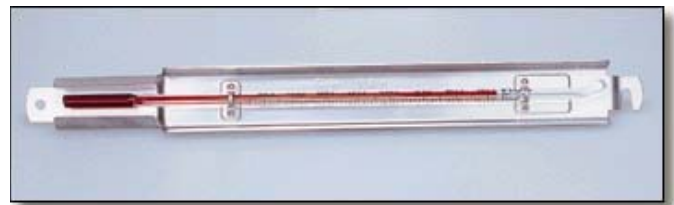
Grapefruit is already known to affect the metabolism of some drugs, by impacting the enzymes needed to break down common medications.

The researchers are planning a much larger study to see if the results can be confirmed.

COLD HARDINESS AND COLD PROTECTION

Both citrus fruit and foliage can be damaged if temperature falls below freezing for a prolonged period. However, weather conditions prior to cold temperature, duration of cold, position of the tree in the grove or yard, maturity of the fruit, health and age of the tree can affect tree and fruit hardiness. Citrons, Tahiti and Mexican limes are the most sensitive. True lemons are slightly more cold hardy, followed by grapefruit, tangelo, limequat, sweet orange, most mandarins, and kumquat. Leaves of kumquats are hardy to 20F. The majority of sweet oranges are hardy to 26-27F. Thin-skinned, small-sized fruit or fruit held toward the outside of the canopy are usually more sensitive to cold. Fruit that is mature or close to maturity and has high sugar content can withstand more cold than immature fruit. Trees are more cold hardy when exposed to cooler temperature over several weeks prior to freezes. Sudden cold snaps can be particularly damaging to citrus. Cold tolerance develops most readily when trees are not flushing. Warm temperatures at any time during the winter may cause citrus trees to resume growth and reduce their cold tolerance. Ice formation in citrus tissues -not low temperature- kills or damages citrus trees and fruit. One hour below 28F may kill tender growth and citrus flowers. New flush growth and bloom buds will experience minimal damage at 28F when exposed for 30 minutes, but will be killed at 26F for the same period of time. **Fruit damage occurs when the temperature falls below 28F for at least 4 hours.** Frozen fruit can be salvaged for juice. Mature citrus leaves can generally withstand 4 hours of 23-24F with minimal damage. Four hours at 20F can kill 3/8-inch or smaller wood and temperatures below 28F for 12 continuous hours may kill larger limbs and possibly the entire tree. A clean, hard-packed surface intercepts and stores

more solar radiation during the day and releases more heat at night than a surface covered with vegetation or a newly tilled area. Addition of water to the cleanly cultivated area prior to a freeze further improves heat accumulation during the day. Therefore, keep the area around the trees free of weeds and apply water to the soil prior to cold weather. Water should also be pumped high in the ditches the day before and during the time of freezing weather. But water has to be removed within 2-3 days after the freeze to avoid root damage. As the water cools, it releases heat, increasing air temperature around the trees. Young trees are more vulnerable to cold damage. It is more of a problem in open, solid-set plantings than resets in mature groves. Minimum-reading thermometers should be installed in the coldest locations of the groves. They should be placed at a height of 42 inches (4.5 ft) on a stand sheltered at the top and facing north.



Use of microsprinkler for cold protection is very important. **Turn on the water early when the air temperature reaches 36F. Remember that in cold pockets, the ground surface can be below 32F when it is 36F at the thermometer location. You have to keep running the system all night. In the morning when the temperature warms up, it is recommended to use the “Safe Cutoff Temperature Estimator” (see page 10, previous issue of the Flatwoods Citrus newsletter) to turn off the irrigation system safely and economically or when the wet bulb temperature is above 33° F. If the above information is not available for you, the irrigation system can be turned off when the air temperature rises to 40F.**

Scouting for Citrus Insect Pests & Diseases Workshop

Location: Hendry County Extension Office, LaBelle

Date: Tuesday, January 11, 2005

5 CEUs for Pesticide License Renewal

5 CEUs for Certified Crop Advisors



Diseases (9:00 AM - 11:00 AM)

By **Dr. Pete Timmer**

Scouting Tips, Techniques, and Models

Foliar and Fruit Production Diseases

Alternaria Brown Spot

Greasy Spot

Citrus Scab

Melanose

Postbloom Fruit Drop

Phytophthora Brown Rot

Phytophthora foot and root rot

Citrus Canker

"MSI: Mite Scene Investigations" (11:00 AM - 12:00 Noon)

By **Dr. Steven Rogers**

Mites & Insect Pests (1:00 PM - 3:00 PM)

By **Dr. Phil Stansly**

Principals of Entomology and IPM

Mite Pests of Citrus

Sucking Insect Pests of Citrus

Soil Inhabiting Pests

Citrus Leafminer and Misc. Insects

12:00 Noon - 1:00 PM: Lunch

Program Sponsored by Nufarm Agriculture USA – Craig Noll & Gary Simmons

***** DETACH*****

REGISTRATION FORM

(Registration is required)

Registration Deadline: Tuesday, January 4, 2005

Name:

Company:

Address:

Phone:

Mail completed registration form and check for \$10.00* per person to:

Dr. Mongi Zekri, Hendry County Extension Office, P.O. Box 68, LaBelle, FL 33975-0068. Checks should be made payable to: Hendry County Extension.

*The registration fee of \$10.00 includes refreshments, lunch, and handouts.

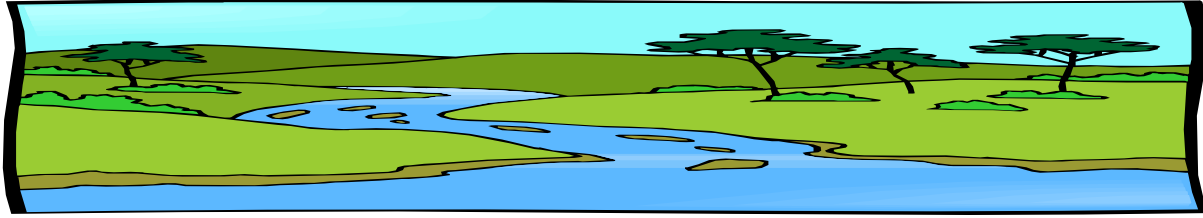
Registration fee at the door, the day of the meeting, is \$15.00.

AGRICULTURAL WATER MANAGEMENT SEMINAR

January 27, 2005 8:30 a.m.--1:30 p.m.

Dallas Townsend Agricultural Center

LaBelle, Florida



CO-SPONSORS: Gulf Citrus Growers Association
Florida Department of Agriculture, Office of Water Policy
University of Florida, Institute of Food and Agricultural Sciences
Hendry County Cooperative Extension Office
South Florida Water Management District

As you are acutely aware, the issues of water supply/ consumptive use permits and water quality/BMPs have surfaced to the top of the list of concerns for the region's agricultural community. Growers, farmers and ranchers have increasingly been facing an ever-increasing complexity of issues related to water management! This seminar is being designed to present the latest information related to these topics in a half-day format, and will include lunch! Administrative leaders from the South Florida Water Management District's Regulation Department and the Florida Department of Agriculture's Office of Water Policy will update the agricultural community on these key issues! You will not want to miss this very, very important seminar!

Here is brief outline of the topics:

Update on the Caloosahatchee Basin Water Quality BMP Development Efforts

---Citrus ---Cattle ---Vegetables ---Sugarcane

Update on Consumptive Use Permit Issues

---Permit Renewal Process-What to Expect
---Pump Calibration Manual and Grower Alternatives
---Short Hydroperiod Wetland Study Results and Impact on Permit Renewals

LUNCHEON SPONSORED BY: Environmental Consulting & Technology, Inc.;
MacVicar, Federico & Lamb, Inc. and the Pavese Law Firm.

PLEASE RSVP TO ATTEND THE SOUTHWEST FLORIDA AG WATER SEMINAR

(There is no registration fee to attend this seminar, reservations are required)

Name(s) _____
Company _____
Telephone _____

RSVP TO: Becky Adams, Gulf Citrus Growers Assn., Box 1319, LaBelle, FL 33975
(863) 675-2180