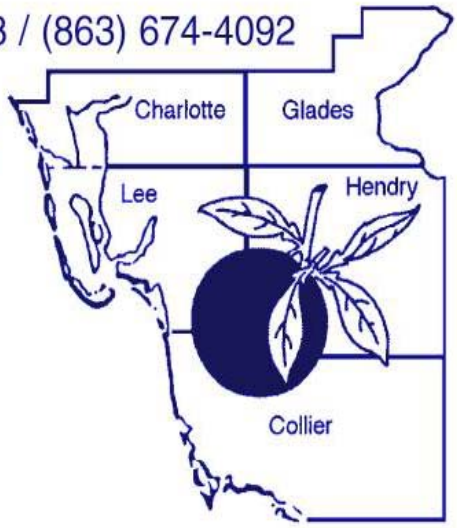
UNIVERSITY OF FLORIDA | IFAS EXTENSION

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

Flatwoods Citrus



Vol. 8, No. 4 **April 2005**

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

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

☺ **Update on greasy spot control**
☺ **Managing Phytophthora diseases and interactions with Diaprepes**

Date: Tuesday, 19 April 2005, 10:00 AM – 12:00 Noon
Location: SW Florida Research & Education Center, Immokalee
Speakers: Drs. Pete Timmer and Jim Graham
2 CEUs for Pesticide License Renewal
2 CEUs for Certified Crop Advisors
Sponsor: Rachel Walters, Bayer CropScience
Following the seminar, we are planning a free lunch (Compliments of Bayer CropScience). To reserve lunch, call 863 674 4092 no later than Monday, 18 April 2005.

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

Citrus Nitrogen Accumulation, Uptake and Cycling
Leaf and soil sampling and analysis to adjust citrus fertilizer programs
Date: Tuesday, 17 May 2005, 10:00 AM – 12:00 Noon
Location: Hendry County Extension Office, LaBelle
Speakers: Drs. Kelly Morgan and Mongi Zekri
2 CEUs for Certified Crop Advisors
Sponsor: Danny Jones, Diamond R

☺**Exotic Citrus Diseases: CVC, Stem Pitting Tristeza, Leprosis and Greening**
Date: Tuesday, 14 June 2005, 10:00 AM – 12:00 Noon
Location: SW Florida Research & Education Center, Immokalee
Speaker: Dr. Ron Brlansky
2 CEUs for Pesticide License Renewal, 2 CEUs for Certified Crop Advisors
Sponsor: Ed Early, DuPont

Aquatic Weed Control Short Course

www.conference.ifas.ufl.edu/aw
Date & Location: May-16-20, 2005, Fort Lauderdale Marriott North.

FARM SAFETY DAY

Saturday, June 4, 2005, Immokalee IFAS Center

Coordinator: Mongi Zekri

118th Annual Meeting of the Florida State Horticultural Society (FSHS)

Date: June 5-7, 2005
Location: MARRIOT TAMPA WESTSHORE
http://www.lal.ufl.edu/fshs/

CITRUS EXPO

IN FORT MYERS

Wednesday, August 24 &
Thursday, August 25, 2005

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Morse Enterprises Limited, Inc.

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DIAPREPES

Notching along the margins of the most recent leaf flush is the best way to determine the presence of root weevils.

It is best to look for a sign, such as the pest doing the damage.

Weevils are found on the outer portion of the tree in the early morning or late evening hours.

Adults generally hide within the tree canopy during the heat of the day. When the adults are disturbed or the tree is shaken, the weevils will fall to the ground faking death.

Tedder's traps placed under the tree canopy have been used to capture adults and determine time and intensity of seasonal adult emergence from the soil.

The larvae channel on the outer bark tissue into the cambium layer to the woody portion of the root and often girdle the taproot causing its death and impeding the ability of the tree to take up water and nutrients resulting in tree mortality. In addition, this type of injury provides an avenue for pathogen invasion such as *Phytophthora*. Although adults can emerge year round, their primary emergence period in SW Florida was found to be mid April to mid May. Larval entry into the soil begins about 20 days after adult emergence begins. Two applications of parasitic nematodes at 4 and 12 weeks after adult emergence begins may give satisfactory root protection. In SW Florida, nematode applications are generally recommended with first summer rains. Diaprepes long distance dispersal is through the movement of contaminated soil and nursery plants and trees containing potentially all life stages of the weevil. In addition, soil residues on vehicles and grove equipment may be contaminated with larvae and can move this pest from one grove to another.

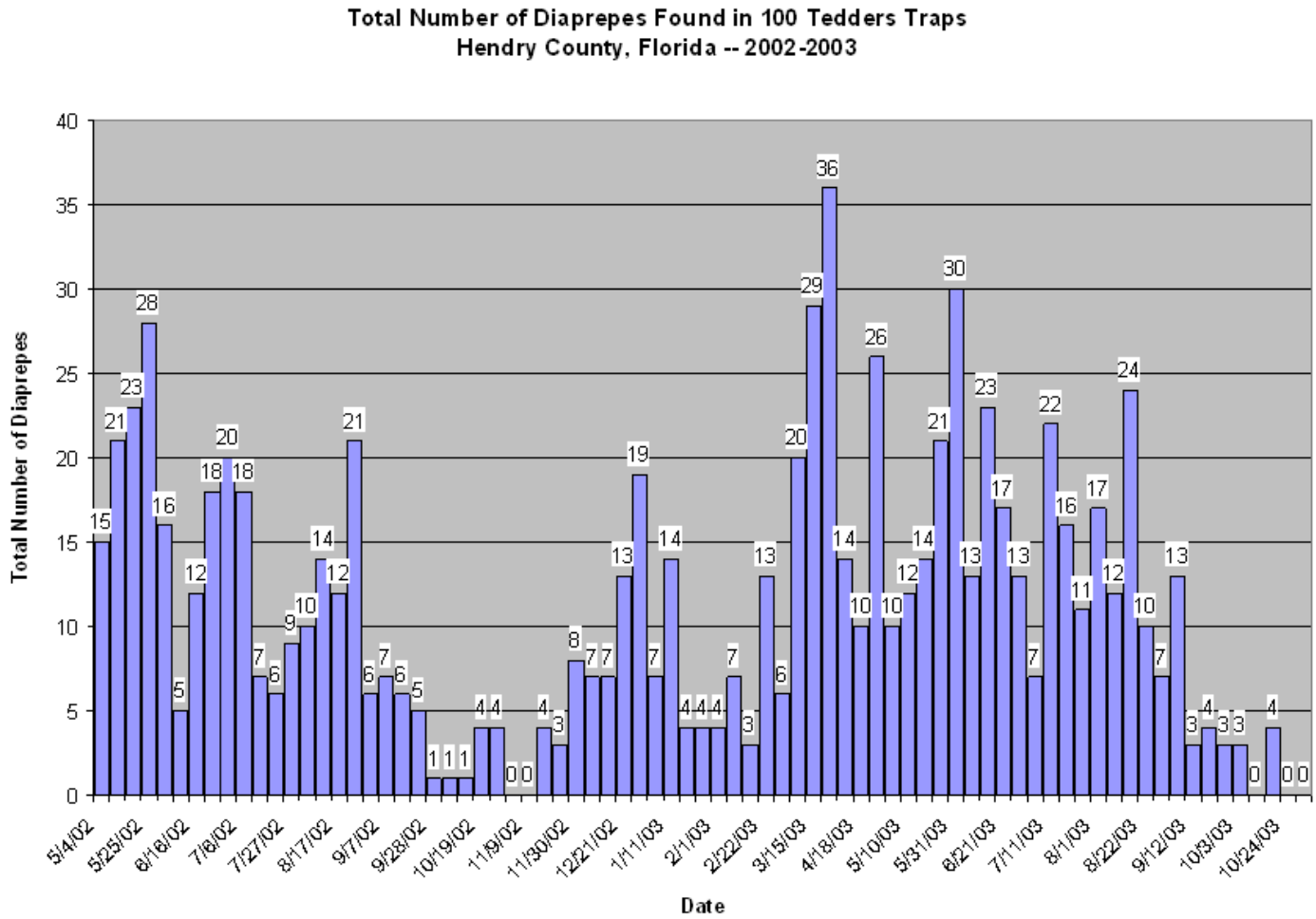
The use of horticultural oils to separate leaves that have been stuck together to protect eggs may reduce Diaprepes population. When leaves are separated, eggs desiccate or are more subject to parasitism. Oils also prevent females from gluing eggs to leaves. Just after peak trap captures, foliar spays of Danitol, Kryocide or Orthene, or Guthion, Micromite or Sevin plus at least one gallon of petroleum oil. Capture 2EC can be applied as a soil barrier treatment to control young (neonate) larvae. There are some restrictions and disadvantages for applying some chemicals. **Always READ CAREFULLY THE LABEL before using any chemical**. It should be kept in mind that frequent use of insecticides against adults could affect non-target organisms including biological controls.

For more detailed information on this pest and other citrus pests, **GET YOUR COPY OF THE 2005 FLORIDA CITRUS PEST MANAGEMENT GUIDE.**

DIAPREPES ROOT WEEVIL EMERGENCE

The University of Florida and seven grower/cooperators conducted a 3-year-long survey to determine the weekly emergence patterns for Diaprepes root weevils. At each location, 100 Tedder's traps are surveyed weekly to determine the number of weevils collected in the traps. From this data, graphs are being developed to provide growers with average number of weevils per traps as well as total weevils collected during the weekly intervals. From the collected data, growers can get a feel for the emergence patterns over time which have occurred at each of the seven locations. With knowledge of emergence patterns, growers can then determine when the best time to apply sprays to reduce Diaprepes injuries. The locations for the surveyed groves are in the following six counties: Lake, Polk, DeSoto, Hendry, Indian River, and Dade.

The information is posted to a web site maintained at the Citrus Research & Education Center in Lake Alfred at: **http://www.lal.ufl.edu** Once at the web site, click on the "Extension" Section and then click on "Diaprepes Survey" or try to go directly to it at: **http://www.lal.ufl.edu/Diaprepes/diaprepesemergence.htm**. At this site, you can choose the county location closest to your grove to estimate the emergence pattern that represents your area. At this site, you can also find other information related to Diaprepes control.



Plant Growth Regulators (PGRs)

Plant growth regulator sprays can provide significant economic advantages to citrus growers when used in appropriate situations. Many citrus growers routinely use PGRs to enhance crop profitability. Depending on variety and timing, PGRs may improve fruit set, increase fruit size by reducing cropload, extend the harvest season by delaying rind aging, and reduce preharvest fruit drop. Excessive rates, improper timings, untested surfactants or tank mixes, and inappropriate environmental conditions can result in phytotoxicity, erratic results, and/or greatly reduced cropping. Growers are urged to become familiar with PGRs through application to small plots before treating significant acreage. To avoid drift onto susceptible crops in surrounding areas, products containing 2,4-D (2,4-Dichlorophenoxyacetic acid) have stringent requirements for application conditions. Consult with your County Extension Office.

Since PGRs function by directly influencing plant metabolism, plant response can vary considerably with concentration, making sprayer calibration and accurate material measurement especially important. Studies show that variability in spray deposition increases as spray volume is reduced below 250 gallons/acre in mature citrus groves. At lower water rates, canopy closest to the sprayer manifold tends to retain much more material than other plant surfaces. Because material concentration is especially important in PGR use, water volumes below 125 gallons/acre are not generally recommended.

Unlike most agrichemicals applied to crop, efficacy of PGRs depends on entry of materials into plant tissues. Uptake is influenced by a number of factors: amount of PGR applied, concentration of PGR, presence of surfactants, solution pH, environmental conditions during and after application, foliage condition, and plant stress level. Application of PGRs is recommended only on healthy citrus blocks. Even when properly applied, some PGRs may cause leaf curling, especially when sprayed on young leaves.

Chemical thinning of tangerines with NAA to increase fruit size and reduce branch breakage and alternate bearing

NAA (naphthalene acetic acid) encourages greater physiological-drop (usually in May for Florida citrus). Sunburst and Murcott are especially likely to benefit from judicious use of NAA.

NAA rate

Since concentration is so important, growth regulator treatments are usually expressed on a concentration basis (part per million or ppm) rather than ounces per acre. Rates of 250-500 ppm NAA have been most effective in thinning citrus varieties. For mature groves of large trees, 125-150 gallons per acre is probably adequate and lower volumes should be used for smaller trees by turning off some sprayer nozzles. Growers uncomfortable with calculations on a ppm basis can use the ounces of NAA/125 gallons, at appropriate ppm, as a rate per acre when applying at 125 gallons/acre. All NAA applications should include a surfactant at 0.05% and should not be tank mixed with other materials, unless you confirm that it is compatible with NAA.

For most healthy, unstressed groves, NAA should be applied at 120 ounces Fruit Fix 200 (or similar product, NOT Citrus Fix, which is 2,4-D rather than NAA plus 6.5 ounces of surfactant per 100 gallons, at 125 gallons per acre. Murcott should receive a lower rate 60-96 oz NAA/100 gallons.

Timing

NAA should be applied near the beginning of physiological drop, when most fruitlets are about 1/2 inch in diameter, which typically occurs 6 to 8 weeks postbloom**. Rain within six hours of treatment, drought stress, or very hot or cool conditions may affect response.**

Environmental conditions can greatly influence uptake and activity of NAA. Higher temperatures and delayed drying of spray solution both contribute to greater thinning action. Best results are likely to occur when applied between 75° and 85° F. Higher temperatures may cause excessive thinning. Since uptake continues for several hours after the spray dries, heavy rain within six hours of application may significantly reduce NAA action.

For more details, get your copy of HS-800 EDIS publication by Ed Stover, Adair Wheaton, and Gene Albrigo at http://edis.ifas.ufl.edu/pdffiles/CH/CH14700.pdf

SAVE YOUR GROVE AND NURSERY FROM CITRUS CANKER

1. Whenever possible lock the gates of the property and restrict access at all times.

2. Before entering and leaving groves or nurseries, equipment should be first cleaned of all plant material, debris and soil and then disinfected with approved decontamination products.

3. Prior to entering and leaving groves, blocks and nurseries, all workers should disinfect hands and shoes with antimicrobial soap or other approved disinfectants.

4. All workers including fruit picking personnel should wear freshly laundered clothes each day.

5. All grove and nursery traffic including personal vehicles, equipment and visitors should be limited as much as possible.

6. Exchange of personnel, vehicles and equipment between groves, blocks and nurseries should be limited as much as possible.

7. It is very important to require grove service contractors to practice stringent decontamination and sanitation procedures.

8. Restrict access of all personnel, vehicles, and equipment and movement in groves or nurseries when foliage is wet with rain or dew. Do not harvest fruit before the trees dry.

9. Restrict irrigation to nighttime hours to reduce worker exposure to wet foliage.

10. Before entering and leaving a grove, all harvesting equipment including trucks, trailers, tractors, “goats”, ladders, tubs, boxes, picking bags and gloves must be decontaminated.

11. Do not collect canker specimens. Flag adjacent trees, map the location and immediately contact the DPI at 1 800 282 5153 or 1 800 850 3781.

IMPORTANCE OF FOLIAR FEEDING

Because fertilizer applications to the soil are subject to various factors such as leaching, runoff, and being tied up in the soil in unavailable forms to citrus trees, foliar application of nutrients should be included in the fertilizer program. Foliar application of nutrients is of significant importance when the root system is unable to keep up with crop demand or when the soil has a history of problems that inhibit normal growth.

Foliar feeding is proven to be useful under prolonged spells of wet soil conditions, dry soil conditions, calcareous soil, cold weather, or any other condition that decreases the tree's ability to take up nutrients when there is a demand.

Foliar applications of low-biuret urea or phosphite in late December-early January are known to increase flowering, fruit set, and fruit production. **Postbloom foliar applications of potassium nitrate or mono-potassium phosphate have been found to increase fruit yield and size.**

FOLIAR POTASSIUM APPLICATIONS

BRIEF SUMMARY FROM A POWERPOINT PRESENTATION

By Dr. Brian Boman

Potassium (K) in Citrus

•A primary component in cell walls
•K accounts for over 40% of ash from fruit
•70% of fruit size is related to number of cells
•Cell division ceases by late April
•Size changes after April is mainly from cell enlargement
•Post-bloom K (applied in April) may increase cell numbers plus help cell enlargement
•Absorption of K into leaves after foliar application is very rapid

Grapefruit Summary

•Trials on Marsh, Star, Ruby Red, Flame
•Post bloom most important
•Late summer/fall applications successful in half of years
•8 lb K_2O per acre per application
•Little change in acid, Brix, juice volume, ratio
•1/2 to 1 size increase due to foliar K applications
•Smaller fruit increased more than larger fruit

Foliar K Advantages on Valencia

25% more fruit
28% more boxes/acre
33% more size 80 and larger fruit
28% higher gross returns for packed fruit
23% more TSS/acre

SUMMARY

Foliar K applications can increase fruit size and help return higher $$
• K source is not critical
• Salt index should be considered when using low gal/ac applications (MKP or DKP)
• Coverage is not as critical as for fungicides or insecticides
• At least 8 lb/ac K_2O per application recommended
• Foliar applications not a substitute for good nutrition program
• Potential results:
Grapefruit: ½ to 1 size increase
Valencia: Significantly more solids/acre
Sunburst: More larger-sized fruit

PRECISION AGRICULTURE

Precision agriculture is an integrated crop management system that attempts to match the kind and amount of inputs with the actual crop needs for small areas within a grove. This goal is not new, but new technologies now available allow the concept of precision agriculture to be realized in a practical production setting.

Precision agriculture often has been defined by the technologies that enable it and is often referred to as GPS (Global Positioning System) agriculture or variable-rate farming. As important as the devices are, it only takes a little reflection to realize that information is the key ingredient for precision agriculture. Managers who effectively use information earn higher returns than those who don't.

Precision agriculture distinguishes itself from traditional agriculture by its level of management. Instead of managing whole grove as a single unit, management is customized for small areas within the grove. This increased level of management emphasizes the need for best management practices (BMPs). Before considering the jump to precision agriculture management, a good farm management system must already be in place.

The need for precision agriculture

Growers are aware that their fields have variable yields across the block. These variations can be traced to management practices, soil properties and/or environmental characteristics. Soil characteristics that affect yields include texture, structure, soil water content, organic matter, nutrient status, and landscape position. Environmental characteristics include weather, weeds, insects, and diseases.

Seeing this magnitude of variation prompts most growers to ask how the problem that is causing the low yields can be fixed. There may be no economically feasible method of "fixing" some problems. However, the management challenge is to optimally manage the areas within the grove that have different production capacities. This does not necessarily mean having the same yield level in all areas of the grove.

A grower's mental information database about how to treat different areas in a grove requires years of observation and implementation through trial-and-error. Precision agriculture offers the potential to automate and simplify the collection and analysis of information. It allows management decisions to be made and quickly implemented on small areas within larger blocks.

Tools of precision agriculture

In order to gather and use information effectively, it is important for anyone considering precision agriculture to be familiar with the technological tools available. These tools include hardware, software and recommended practices.

Global Positioning System (GPS) receivers. Global Positioning System receivers, either carried to the field or mounted on equipments allow users to return to specific locations to sample or treat those areas.

Yield monitoring and mapping. Yield monitors can provide data necessary for yield maps when linked with a GPS receiver. Yield measurements are essential for making sound management decisions. However, soil, landscape and other environmental factors should also be weighed when interpreting a yield map. When used properly, yield information provides important feedback in determining the effects of managed inputs such as fertilizer, lime, pesticides and cultural practices including irrigation.

Yield measurements from a single year may be heavily influenced by weather. Examining yield information records from several years and including data from extreme weather years helps in determining if the observed yield level is due to management or is climate-induced.

Yield maps are only as accurate as the data collected to produce them and only demonstrate that yield variability exists. Monitors must be correctly installed and periodically checked to provide accurate data. Yield map data should be used with soil and plant tissue analysis data, scouting notes and other observations to learn why variability exists. The knowledge gained from site-specific crop management equips growers to make better management decisions that have positive environmental benefits and that result in improved productivity and profitability.

Grid soil sampling and variable-rate fertilizer (VRT) application

The recommended soil sampling procedure is to take samples from areas that are no more than 2 acres in size. Several soil cores should be taken at random locations from each 2-acre area, combined together, and sent to a laboratory for testing. Grid soil sampling uses the same principles of traditional soil sampling but increases the intensity of sampling. Soil samples collected in a systematic grid also have location information that allows the data to be mapped.

The goal of grid soil sampling is a map of nutrient needs, called an application map. Grid soil samples are analyzed in the laboratory, and an interpretation of crop nutrient needs is made for each soil sample. Then the fertilizer application map is plotted using the entire set of soil samples. The application map is loaded into a computer mounted on a variable-rate fertilizer spreader. The computer uses the application map and a GPS receiver to direct a product-delivery controller that changes the amount and/or kind of fertilizer product, according to the application map.

Site-specific management strategies

Site-specific strategies for improving productivity and profitability have common elements related to soil characteristics, topography and past management practices. These strategies often have at least some general relationship to yield maps.

Where the topsoil has varying physical properties, such as soil type or soil depth, the yield potential will vary considerably throughout the field. Past management practices of uniform nutrient applications may have created excess nutrient applications and accumulations in areas with low yield potential and nutrient deficits in areas with high yield potential. A variable rate application strategy will generally place higher rates of nutrients in areas with higher yield potential and lower rates of

nutrients in areas with lower yield potential.

Where controllable factors such as weed pressure and drainage limit yield, modifications to management or renovations to the land should be used to improve productivity if the long-term benefits out-weigh the costs.

GeoAg Solutions is one stop for complete Precision Agriculture and Geographical Information System (GIS) solutions. They provide GIS data collection, analysis, and management services for all types of agriculture industries, specializing in Florida citrus.

GeoAg Solutions offers geo-referenced data collection services, data management, and GIS and precision agriculture consultation. Data collection services include but are not limited to:

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Geographic information systems (GIS)

Geographic information systems (GIS) are computer hardware and software that use feature attributes and location data to produce maps. An important function of an agricultural GIS is to store layers of information, such as yields, soil survey maps, remotely sensed data, crop scouting reports, tissue nutrient concentrations, and soil nutrient levels. Geographically referenced data can be displayed in the GIS, adding a visual perspective for interpretation. In addition to data storage and display, the GIS can be used to evaluate present and alternative management by combining and manipulating data layers to produce an analysis of management scenarios.

Information management

The adoption of precision agriculture requires the joint development of management skills and pertinent information databases. Effectively using information requires a grower to have clear objectives and crucial information necessary to make decisions. Effective information management requires more than record-keeping analysis tools or a GIS. It requires an attitude toward education and experimentation.

Identifying a precision agriculture service provider

Growers should consider the availability of custom services when making decisions about adopting site-specific crop management. Agricultural service providers may offer a variety of precision agriculture services to growers. By distributing capital costs for specialized equipment over more land and by using the skills of precision agriculture specialists, custom services can decrease the cost and increase the efficiency of precision agriculture activities.

The most common custom services that precision agriculture service providers offer are intensive soil sampling, yield mapping and variable rate applications of lime, fertilizers and herbicides. Equipment required for these operations include a vehicle equipped with a GPS receiver and a field computer for soil sampling, a computer with mapping software and variable-rate applicators for fertilizers, lime, and herbicides. Purchasing the equipment and learning the necessary skills is a significant up-front cost that can be prohibitive for many growers. Agricultural service providers must identify a group of committed customers to justify purchasing the equipment and allocating human resources to offer these services.

Summary

Precision agriculture gives growers the ability to more effectively use crop inputs including fertilizers and pesticides. More effective use of inputs means greater crop yield and/or quality. Precision agriculture can address both economic and environmental issues that surround production agriculture today. It is clear that many growers are at a sufficient level of management that they can benefit from precision management.

Questions remain about cost-effectiveness and the most effective ways to use the technological tools we now have, but the concept of "doing the right thing in the right place at the right time" has a strong intuitive appeal. Ultimately, the success of precision agriculture depends largely on how well and how quickly these new technologies will be embraced.

FLATWOODS CITRUS NEWSLETTER

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

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__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

Gender

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