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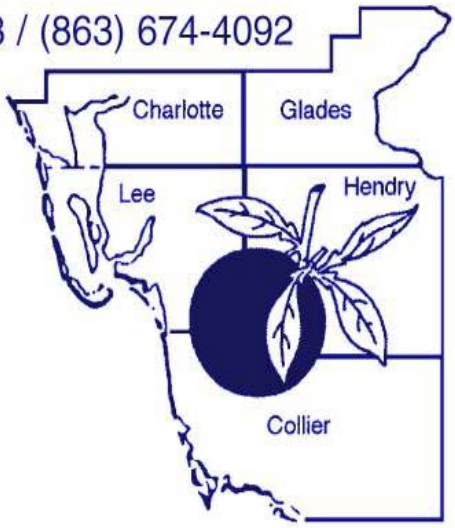
Flatwoods Citrus



Vol. 10, No. 3 **March 2007**

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

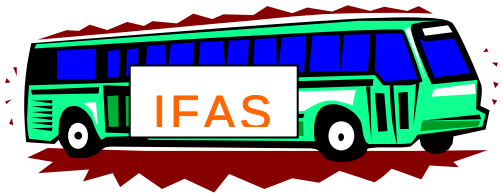
U P C O M I N G E V E N T S

PESTICIDE LICENSE TRAINING/TESTING

Monday, 5 March & Tuesday, 6 March 2006
Location: University of Florida, IFAS,
Hendry County Extension Office, LaBelle
For more information and/or registration, call 863 674 4092

COLLIER COUNTY EXTENSION AG TOUR

Date: Wednesday, 21 March 2007

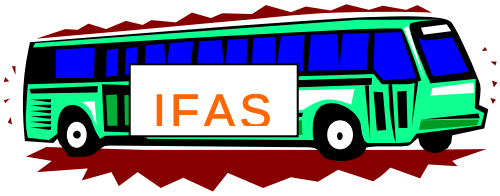


For more information or to sign up,
Contact Robert Halman
Phone: 239 353 4244
rdhalman@ifas.ufl.edu

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

CHARLOTTE COUNTY EXTENSION AG TOUR

Date: Thursday, 22 March 2007



For more information or to sign up,
Contact Holly Shackelford
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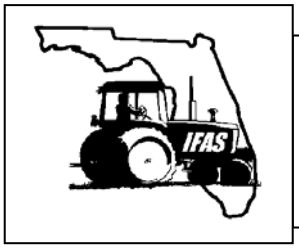
MECHANICAL HARVESTING WORKSHOP AND FIELD DAY

Date: April 18, 2007
Location: Immokalee IFAS Center

To enable us to plan for lunch and materials, we are asking for anyone interested in attending to please RSVP. To RSVP or for further information please contact Barbara Hyman at (239) 658-3461 or email brh@ifas.ufl.edu. Please visit our website at citrusMH.ifas.ufl.edu



FARM SAFETY DAY

Saturday, June 2, 2007, Immokalee IFAS Center
Coordinator: Mongi Zekri

120th Annual Meeting of the Florida State Horticultural Society

http://www.fshs.org/

Date: June 3-5, 2007
Location: PGA National Resort & Spa, Palm Beach Gardens www.pgaresort.com

Abstract Submission Deadline: March 10, 2007

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SPRAYER CALIBRATION

Sprayers must be checked to ensure all nozzles are applying pesticides uniformly and at the correct rate. Make sure your equipment is working properly and calibrated to ensure the correct amount of pesticide is delivered to the target area.

Pesticide application, greater than the label rate, is illegal and can result in needless risk to groundwater, increased production costs, and crop damage. Under-application might be costly by not properly controlling the target pest. Although you can sometimes repeat the application, doing so is time-consuming, costs more, increases the risk of applying too much and increases the risk in pesticide resistance.

Regular sprayer calibration includes measuring the output of each nozzle to ensure all nozzles are functioning properly. Specific calibration guides are available from a number of sources. Sprayer calibration should be done every time a different pesticide is applied or at least once each season.

The rate of application depends partly on the particle or droplet size, texture, and other properties of the pesticide being applied. Use only water during the test if the pesticide is a liquid. Contact the manufacturer to get reliable information regarding carrier material to perform the tests if the pesticide is a dust, granule, or fumigant, or a liquid diluted with a liquid other than water.

Follow calibration and mixing instructions carefully. Mixing, loading, and calibration methods must also conform to the speed of the application machinery. Moving too fast or too slow changes the rate of application.

Minimizing spray drift

Spray drift, movement of a pesticide through air during or after application to a site other than the intended site of application is a challenging issue facing pesticide applicators. Complete elimination of spray drift is impossible. However, drift can be minimized by following these control measures:

1. Read and follow the pesticide label.
2. Select low or nonvolatile pesticides.
3. Use spray additives following label guidelines.
4. Use large orifice sizes for spray nozzles.
5. Avoid high sprayer pressures, which create finer droplets.
6. Use drift reduction nozzles.
7. Use wide-angle nozzles, lower spray boom heights, and keep spray boom stable.
8. Do not spray when wind speeds exceed 10 mph and when wind direction is directed toward sensitive vegetation.
9. Use a shielded spray boom when wind conditions exceed preferred conditions.
10. Avoid spraying on extremely hot and dry days, especially if sensitive vegetation is nearby.
11. Keep good records and evaluate the results.

IMPORTANCE OF SPREADER CALIBRATION AND MAINTENANCE

Properly calibrated and maintained equipment ensures a more uniform distribution of nutrients. This, combined with other conservation practices, reduces production costs, soil surface runoff, and nutrient movement to nearby surface waters. Spreaders that have not been properly maintained and calibrated will have problems delivering accurate rates and evenly distributed fertilizer amounts to the grown crop.

Calibration

Calibration is the process used to help ensure that the equipment applies proper rates of the selected product. Proper calibration is the key to successful fertilizer use efficiency. Failure to calibrate equipment can result in ineffective applications. Applying too much is costly, unlawful and may cause crop injury. Applying too little can result in poor crop growth and production. It is important to calibrate equipment on a regular basis to compensate for variations. The equipment will become worn or damaged with use and result in inaccurate output and spread pattern.

Two items must be considered when calibrating a spreader. The first is the distribution pattern of the spreader. The second is the product application rate, which is the amount of product applied per acre. There are many factors that affect the distribution pattern of a rotary spreader and some of them relate directly to the product. For this reason, it is recommended that the spreader be calibrated separately for every product to be applied. Spreader calibration should be checked more often when the spreader is used frequently.

Product & application

Choose a product according to the need of the crop. Before applying the product, read the spreader manual. The spreader manual will usually indicate proper settings for various application rates. However, calibration still needs to be performed to ensure the settings are accurate and to compensate for wear and variations in equipment. Be sure that the proper procedures and application rates are followed. Check the ‘spread pattern’ and amount being applied. The physical properties of dry fertilizer can vary widely. Since larger particles are thrown further than small particles, a product of uniform size should be used to achieve a consistent application pattern. It is essential to maintain a constant speed when using a rotary spreader to obtain uniform and accurate distribution.

Maintenance and Cleaning

Proper care and maintenance will help retain precise applications and prolong the life of spreaders. Manufacturer’s directions on cleaning and lubricating should be followed. With the shutter or gate wide open, remove all granules from the spreader at the end of each application. Then, the spreader should be thoroughly washed and allowed to dry. Hot water may help break lose fertilizer which is caked on. Finally, lubricate the spreader according to instructions. Spreaders should be stored in a clean, dry place out of direct sunlight.

IRRIGATION

Florida citrus growers and production managers should keep in their mind that they can't grow citrus successfully and competitively without supplemental irrigation. Through research and field experience, we know that irrigation is necessary because of the non-uniform distribution of the rainfall and the very limited water holding capacity of our sandy soils.

Irrigation is of particular importance during the dry period (February-May), which coincides with the critical stages of leaf expansion, bloom, fruit set, and fruit enlargement.

Proper irrigation scheduling is defined as the application of water when needed and in the amounts needed. Citrus production managers should accurately determine when and for how long to irrigate. With proper irrigation scheduling, tree growth and fruit yield will not be limited by water stress or water excess. Over-watering will waste water and pumping energy, will leach nutrients and other chemicals below the rootzone, and will contribute to contamination of the groundwater.

Because of the high water table in SW Florida, citrus trees have over 90% of their feeder roots within the top foot of soil. For this situation, irrigating for long duration can lead to loss of water below the rootzone. Therefore, it is recommended to increase the frequency and reduce the length or duration of irrigation. Irrigating every other day is better than irrigating once or twice a week. Research work in Florida has shown the importance of the area wetted by irrigation systems. When managed properly, greater area coverage by irrigation emitters provides higher yield than very limited coverage.

Because of the relatively high annual rainfall in Florida, roots of mature trees are spread throughout the grove and are not restricted to the wetted area by the irrigation system emitters. Roots are commonly found in the middles between tree rows and outside the wetted zone by microirrigation systems. Therefore, it is important to have the irrigation system cover most of the area under the tree canopy and even slightly outside the canopy dripline.

Drip systems may not provide enough water to mature citrus trees in Florida because of the limited horizontal distribution of water on poor fine sands. Irrigating with drip systems for too long will neither provide more coverage nor reduce water stress and wilting, but will drive most of the water below the shallow rootzone. Increasing irrigation frequency rather than duration with microirrigation systems is one of the most important factors improving water use efficiency. Raising the water table in the ditches or water furrows will certainly help the trees recover from water stress.

Good water management practices should include precise irrigation scheduling and well-designed, uniform irrigation systems to minimize waste. Non-uniform irrigation will cause excess water to be applied in some areas while other areas will not get enough. Production managers should not only be aware of the losses resulting from irrigation systems that apply water and chemicals non-uniformly, but should adopt the recommended ways to minimize these losses.

SALINITY

In Florida, salinity is becoming more and more of a problem in agricultural areas.

What is salinity? Salinity is the amount of salts in the soil solution or irrigation water.

How does salinity affect my crop? High salinity can make plants spend more energy to absorb water, cause nutritional imbalances, and interfere with the intake of necessary nutrients.

How do salts build up in my soil? Salts build up in the soil by naturally weathering minerals, low-quality irrigation water, fertilizers, and upward migration of shallow ground water or salt-water intrusion.

What are the signs that my groves are being affected by high salinity? For the most part, symptoms of salt injury are similar to drought conditions or water stress, which is reduced growth, leaf drop, and reduced crop yields.

How can I determine if I have a salinity problem? Soil with little salt will have a lower electrical conductivity (EC) and soils with high salt concentrations will have a higher EC as the electricity is conducted by the salts. Salinity in measured with an electrical conductivity meter. Salinity is expressed in units of decisiemens per meter (dS/m) or millimhos per centimeter (mmhos/cm). Both are equivalent units of measurement and give the same numerical value. The total dissolved salts or solids (TDS) in part per million (ppm) can be estimated by multiplying EC in dS/m or mmho/cm by 700.

Management. Not all water is suitable for irrigation use. Prior to implementing an irrigation management, the water source should be tested for water quality. The results of the test will determine if the water is suitable for irrigation or reveal if any special strategies will be required to alleviate some of the problems. Salinity is not cheap and easy to manage. The primary requisite for managing soil salinity is adequate drainage. When saline irrigation water is already a potential problem, foliar feeding using saline water should be avoided and fertigation (injection of fertilizer through irrigation water) should be managed properly. The frequencies of fertigation and dry fertilizer application have a direct effect on salt concentrations in soil solutions. A fertilizer program using frequent applications of relatively low fertilizer levels is recommended over a program using infrequent applications of high fertilizer (salt) concentrations. Selecting nutrient sources that have a relatively low salt index can reduce salinity problems. Avoiding the addition of chloride from the application of muriate of potash (potassium chloride) and the addition of sodium from sodium nitrate and selecting nutrient sources that do not add a potentially harmful ion to already high salt levels in irrigation water and soil are also good strategies. It is recommended to routinely monitor the TDS of irrigation waters, to keep poor quality water off the leaves especially under dry weather conditions, and to keep the soil moist so that not to further increase its salt concentration.

CITRUS SCAB

Citrus scab affects grapefruit, Temples, Murcotts, tangelos, and some other tangerine hybrids. Three applications may be needed to control the disease: one at about 1/4 expansion of the spring flush, a second at petal fall, and a third about three weeks later. Ferbam, Enable, Abound, Gem, or Headline are good choices for the first application because they are all able to kill the fungus in old lesions and thus reduce inoculum as well as protecting foliage. Any of these products may then be used in the petal fall spray but do not use a strobilurin product (Abound, Gem, or Headline) twice. Copper fungicides, Abound, Gem, or Headline are good choices for the third application, but copper products are less effective for scab and should not be selected where scab pressure is high.

On Minneola tangelos, Murcotts, and certain other varieties, Alternaria brown spot and scab occur in the same grove. In those cases, copper fungicides, Abound, Gem, or Headline may be preferred since Ferbam and Enable 2F are less effective for Alternaria control. With average quality copper products, about 2 lb of metallic copper per acre are usually sufficient for scab control. The scab fungus may develop resistance to Abound, Gem, or Headline. These products are all strobilurin fungicides and only one should be selected for scab control each season. Fruit usually becomes resistant to scab by the end of May about 2 months after petal fall.

DO NOT APPLY ABOUND, GEM, OR HEADLINE IN NURSERIES. This can result in selection of resistant strains, which are then distributed on nursery stock to groves.

Newly updated Table on fungicide effectiveness by Dr. Pete Timmer

PRODUCT	Canker	Greasy Spot	Alternaria	Scab	Melanose	PFD
Copper	Good	Excellent	Good	Moderate	Excellent	Poor
Oil	None	Good	None	None	None	None
Ferbam	None	Weak	Moderate	Good	Weak	Moderate
Topsin	None	Excellent	None	Excellent	Weak	Good
Headline	None	Good	Very Good	Excellent	Good	Moderate
Abound	None	Good	Very Good	Excellent	Good	Moderate
Enable	None	Excellent	Poor	Good	Weak	?
Gem	None	Good	Good	Excellent	Good	Moderate
Trilogy	None	Weak	Fair	None	None	None

Fresh vs. processed fruit

MANAGEMENT DECISIONS

Basic horticultural input to increase production efficiency and maximize profits includes optimization of fertilization, irrigation, weed control, and pest management. Florida citrus is marketed either for the fresh market or processed market. Irrigation, fertilizer and pest management strategies employed by growers for fruit destined for these different markets must differ. It is a waste of money to seek to achieve fresh market fruit quality in a processing fruit production operation.

In the production of fresh market fruit, good fruit size and a high level of control of external blemishes are needed to achieve maximum profitability. A great input of pesticides and a high level of pest scouting can be economically justified. If pest or windscar damage occurs early in the season, the grove can be switched to a processing program without suffering severe economic losses.

Grapefruit, navel oranges, tangerines, and tangerine hybrids have high values as fresh fruit and relatively low value for processing. These varieties are also more severely affected by diseases such as scab, melanose, Alternaria brown spot, and greasy spot rind blotch than are sweet orange cultivars. They must be monitored closely and timely applications must be made to control rust mites and fruit blemishing fungal diseases. If a high degree of control is not achieved and the fruit must be processed, the producer will experience a loss.

In the production of fruit for processing, yields and internal quality must be maintained with minimal input. Irrigation, fertilizer, and weed control should be maintained but control of foliar fungal diseases and arthropod pests should be reduced or omitted. When the protection of foliage and fruit are considered, only a few diseases and pests are of primary importance, namely greasy spot fungus on foliage.

Close observations, informed decision-making, and pesticide application only on an as-needed basis should reduce the level of input and associated costs in most seasons.

EFFECT OF WATER pH ON PEST-CONTROL MATERIALS

A possible reason for lack of control of a pesticide material may have to do with the pH of the spray solution. The pH scale ranges from 0 to 14. A pH value below 7 is acidic, whereas a pH value above 7 is basic, or alkaline. A pH of 7 is considered neutral.

Many common insecticides and miticides are susceptible to breakdown if the pH of the water is not within an acceptable range. When the pH is greater than 7, a process known as alkaline hydrolysis occurs. Alkaline hydrolysis is a degradation process in which the alkaline water breaks apart insecticide or miticide molecules, which may then reassemble with other ions. These new combinations may not have any insecticidal or miticidal properties.

Insecticides and miticides are more susceptible to alkaline hydrolysis than fungicides and herbicides. Many insecticides and miticides degrade under alkaline conditions. For example, Malathion and Kelthane are very sensitive, degenerating within a few hours after being diluted in alkaline water. In general, the carbamate and organophosphate chemical classes (for example, Sevin and Lorsban) are more susceptible than chlorinated hydrocarbons or pyrethroids (for example, Lindane or Talstar, respectively).

Higher temperatures can increase the rate of insecticide degradation. Alkaline hydrolysis occurs more rapidly when temperatures are high.

The ways to avoid water pH problems include:

1. Follow manufacturer directions on the desired water pH. The ideal pH range for most insecticides and miticides is between 5.5 and 6.0.

2. Regularly test the pH of water because it can change from season to season.

3. Apply insecticides and miticides as soon as possible after mixing.

4. Don’t leave insecticides or miticides sitting in a spray tank for an extended period of time.

5. Adjust water pH with buffers or water-conditioning agents. Buffers or water-conditioning agents are compounds that reduce alkaline hydrolysis, and adjust the pH of the spray solution to maintain it within a safe and efficient pH range.

WATER QUALITY AFFECTS HERBICIDE EFFICACY

Water is the primary carrier for pesticide applications. The chemistry of water added to the spray tank greatly impacts herbicide effectiveness.

Weak acids. Acids are compounds that release H^+ ions when dissolved in water. Weak acids are compounds that release H^+ ions, but just slightly. Postemergence herbicides that are weak acids include: Glyphosate, Paraquat (Gramoxone), Sethoxydim (Poast), and 2,4-D. Herbicides that are weak acids partially dissociate (split into pieces) when mixed in water. The major portion, which does not dissociate is more readily absorbed by plant foliage than the portion that dissociate. How much the herbicide dissociates depends primarily on pH of water in the spray tank. Dissociated herbicide molecules have a negative charge. After being dissociated, herbicides might remain as negatively charged molecules, or they might bind with other positively charged cations.

Water pH. Water pH for Florida water is alkaline or basic (pH 7.3 to 8.0). Acidic conditions (pH 3 to 6) are most suitable for mixing postemergence herbicides classified as weak acids. When water pH exceeds 7, consider adding adjuvants to lower the pH. Weak acids dissociate less under acid conditions where H^+ ion concentration is high. Dissociated herbicides are absorbed more slowly across plant cell membranes. Ideally, spray water pH should be low such that herbicides do not dissociate, or dissociate at low levels. Avoiding herbicide dissociation is the primary reason that water used in herbicide mixing should be acidic.

Alkalinity. Under conditions of low pH (less than 6.0), hard water has no substantial effect on these products. Low pH likely prevents the herbicide molecules from dissociating. When pH is higher than 7, hard water can interfere with herbicide activity. Higher pH allows the herbicide molecules to dissociate, after which they are quickly bound to free cations. Herbicides containing 2,4-D are available in two broad categories, ester and amine formulations. Many growers prefer the amine formulation because it is less volatile and less prone to drift off target and injure other crops. However, amine formulations are more sensitive to poor water quality than esters.

Hard water. Hard water contains high levels of calcium (Ca), magnesium (Mg), sodium (Na), or iron (Fe). Other cations can cause hard water, but these are the usual suspects. These positively charged ions attach to negatively charged herbicide molecules. Often, the association between herbicides and these cations renders the herbicide ineffective. High pH and hard water act together to reduce herbicide effectiveness. High pH causes more of the herbicide to dissociate while high concentrations of cations bind with the dissociated herbicide to reduce its effectiveness. Because the pH of Florida water supply is alkaline, growers should take corrective action. The use of adjuvants to lower pH in spray tanks is important. When labels permit, additions of ammonium sulfate to the spray tank overcome many interactions with herbicides and cations.

PESTICIDE RECORDKEEPING - BENEFITS & REQUIREMENTS

BENEFITS

Exemption from pesticide contamination liability. As provided by section 487.081(6), Florida Statutes, if you keep records of all your pesticide use (general and restricted use products), and you have used pesticides legally, you may be exempt from proceedings by the Florida Department of Environmental Protection to recover costs associated with damages, assessment, evaluation, or remediation of pesticide - contaminated property. Records must be kept indefinitely.

Evaluate effectiveness of controls. Use your records to analyze your pest management programs: what works and what doesn't. You can compare pesticides with other control tactics.

Resolve pesticide failures. If reduced pesticide product performance occurs, having record will help you determine the cause such as pest resistance or use of the wrong application rate.

Improve your ability to buy the right amount of pesticide. Records will help you buy the correct amount of pesticide the following year. You'll save money and eliminate excess pesticide disposal problems.

Provide buyers with required records of pesticide use. Nurserymen must document certain preventative applications before selling nursery stock. Other buyers may also require a report on pesticides used on crops or other commodities treated with pesticides.

Improve crop rotation decisions. With records, you know your crop rotation options. Some pesticides have restrictions on crops that can be planted within certain time frames after pesticide application.

Determine carryover injury. If your fields exhibit pesticide carryover injury, records will help evaluate the situation.

Document your legal use of pesticides. Records are your best defense if you are accused of an improper application that causes drift, personal injury, or other problems.

Provide necessary information in a medical emergency. If an accident or pesticide exposure occurs, records may be necessary for medical personnel to give treatment.

Support studies that identify critical pesticide registrations. Through surveys, your records can contribute data needed to preserve pesticide registrations.

Provide accurate data to respond to public concerns about pesticide use. Your records can be added to national databases that will accurately show pesticide use. Efforts to reduce pesticide use can be documented in the information.

Be prepared for requirements of lending institutions. Some lending institutions and buyers request field records to evaluate potential environmental liability when making land sales or loans.

Be in compliance with the law. The Florida Pesticide Law requires all licensed pesticide applicators to keep records of restricted use pesticides applied.

RECORDKEEPING REQUIREMENTS

The following information must be recorded for each application of a restricted use pesticide:

- Name and license number of licensed applicator
- Name of person who applied the pesticide (may be an unlicensed assistant)
- Date, start time, and end time of treatment
- Location of treatment site using one of the following methods:

1. County, range, township and section
2. Maps and/or written descriptions that accurately identify the treatment location and distinguish it from other sites
3. USDA identification system found in 7 CFR 110 which uses maps and numbering systems
4. Legal property description

5. Global Positioning Satellite (GPS) coordinates or longitude/latitude points that delineate the treatment site
- Crop, commodity or target site treated
- Total size of area treated
- Brand name and EPA Registration Number of product applied
- Total amount of product applied
- Application method
- Name of person authorizing the treatment, if the application was made to property not owned or leased by the licensed applicator

ADDITIONAL REQUIREMENTS

- The required pesticide application information must be recorded within 2 working days after application.
- Records may be kept in any format that includes all the required information and may be incorporated into other business records.
- It is not necessary to record repetitive information that applies to all records, as long as the information is recorded one time and there is a written record that this information applies to other applications as well.
- Records must be kept for 2 years from application date and must be made available to authorized FDACS representatives upon request.
- Commercial applicators must provide a copy of the application record to the person for whom the application was made within 30 days of application.
- Pesticide application records and any available label information must be provided to licensed health care professionals or their designated agents in the event of a medical emergency or if the health care professional determines the information is necessary to provide medical treatment to an individual who may have been exposed to a pesticide included in the record information.

VIOLATIONS

Licensed applicators who violate any of the above requirements are subject to a fine imposed by FDACS. Violators who are fined have the right to respond to the charges or request a hearing.

FORMS

A Suggested Pesticide Recordkeeping Form for Restricted Use Pesticides and WPS (Worker Protection Standard) is available from the FDACS Bureau of Compliance Monitoring or may be downloaded from **http://www.flaes.org**

CONTACT

For more information contact the FDACS Bureau of Compliance Monitoring, 3125 Conner Blvd., Bldg. 8 (L-29), Tallahassee, Florida 32399-1650, telephone (850) 488-3314.

WEB SITE

More information about Bureau pesticide programs and copies of various forms are available from the web site **http://www.flaes.org**

Florida Department of Agriculture & Consumer Services
Division of Agricultural Environmental Services

Pesticide Recordkeeping Benefits and Requirements

Make wiser, more profitable decisions by keeping records of your pesticide use.

CHARLES H. BRONSON, Commissioner
Florida Department of Agriculture
& Consumer Services

Flatwoods Citrus

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Multi-County Citrus Agent
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975

Subscriber's Name:_____

Company:_____

Address:_____

City:_____State:_____Zip:_____

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Racial-Ethnic Background

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

Gender

__Female __Male