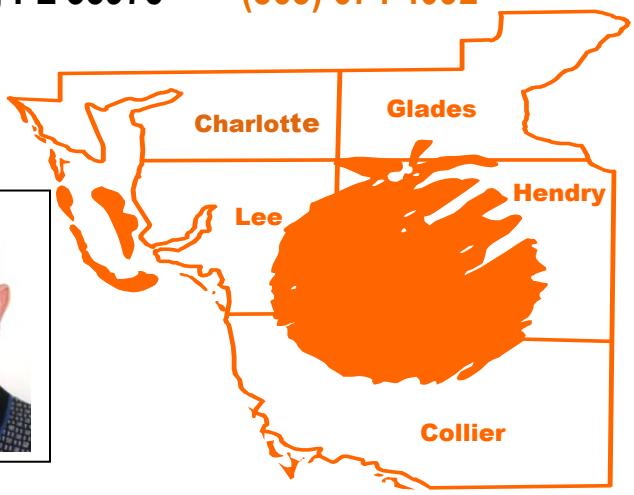
UF UNIVERSITY of FLORIDA
IFAS Extension

EXTENSION

Institute of Food and Agricultural Sciences

Hendry County Extension, P.O. Box 68, LaBelle, FL 33975 (863) 674 4092

Flatwoods Citrus



Vol. 11, No. 10 October 2008

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

UPCOMING EVENTS

Seminar- Florida Mini-Greening Summit

Date: **Tuesday, October 7, 2008,** Time: 9:45 AM – 12:00 Noon

Location: **Immokalee IFAS Center**

- Psyllid control research and management update
- Greening bacteria research update
- Horticultural greening management research update
- Citrus canker research update

Speakers: Chris Oswalt, Steve Futch, Gary England, Ryan Atwood, Tim Hurner, Tim Gaver, and Mongi Zekri

A total of 2 CEUs for pesticide license renewal and 2 CCAs will be offered

RSVP is required. To RSVP, call 863 674 4092 or send an e-mail to maz@ifas.ufl.edu

See enclosed a very useful & important list of insecticides recommended for Florida citrus

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/

Florida Mini-Greening Summit (see enclosed details on Page 5)

Application of handheld computers, GPS, and GIS software for controlling HLB and canker

Date: Tuesday, November 18, 2008, Time: 8:00 AM– 1:00 PM
Location: Southwest Florida REC (Immokalee)
Speakers: Drs. Reza Ehsani and Arnold Schumann & Ms. Sherrie Buchanon
RSVP is required. To RSVP, call 863 674 4092 or send an e-mail to maz@ifas.ufl.edu

Certified Crop Advisor Educational Seminar

Date: October 15, 2008, 7:30 AM – 5:30 PM
Locations: IFAS Research Centers (Lake Alfred, Immokalee, Balm, Ft. Pierce)
For registration or more information, go to: www.crec.ifas.ufl.edu/cca or call 863 956 1151

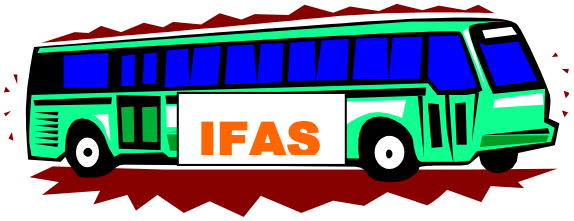
INTERNATIONAL CITRUS CONGRESS

Location: Wuhan (Capital of Hubei province), **China**
Date: October 26-30 2008
http://ICC2008.hzau.edu.cn
Email: ICC2008@mail.hzau.edu.cn

International Conference on Huanglongbing

Hosted by Florida Citrus Mutual
December 1-5, 2008
For additional information on the Conference or to register, go to
http://www.flcitrusmutual.com/greening-info/hlb_conference.aspx

HENDRY COUNTY EXTENSION AG TOUR



Saturday, 6 December 2008
For more information or to sign up, call 863 674 4092

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Florida Mini-Greening Summit

Presented by the Florida Cooperative Extension Service
Citrus Extension Agents

Program Agenda

9:45 AM	Registration
10:00 AM	Psyllid control research and management update
10:25 AM	Greening bacteria research update
10:50 AM	Break
11:05 AM	Horticultural greening management research update
11:30 AM	Citrus canker research update
12:00 PM	Adjourn

Attendees will receive 2 Continuing Education Units (CEUs) for the Restricted Pesticide and Certified Crop Advisory Program.

Speakers-Citrus Extension Agents:

Steve Futch Lake Alfred, FL 863-956-1151	Mongi Zekri Labelle, FL 863-674-4092	Chris Oswalt Bartow, FL 863-519-8677 x 108
Gary England Bushnell, FL 352-793-2728	Ryan Atwood Tavares, FL 352-343-4101	Tim Hurner Sebring, FL 863-402-6540
Tim Gaver Ft. Pierce 772-462-1660		

Meeting dates and locations:

Sep. 30th	Tavares	1951 Woodlea Rd	Lake County Extension
Oct. 2nd	Sebring	4509 W. George Blvd	Highlands County Extension
Oct. 7th	Immokalee	2686 SR 29 N	SW Florida REC
Oct. 8th	Arcadia	2250 NE Roan St.	Turner Exhibition Hall
Oct. 9th	Bartow	1710 Highway 17 South	Polk Co. Ext. Stuart Center
Oct. 14th	Ft. Pierce	2199 S Rock Rd	Indian River REC

To register for a specific location of the following locations, please contact:

Bartow-	Polk County Extension Service	863-519-8677 ext. 111
Arcadia-	DeSoto County Extension Service	863-993-4846
Immokalee-	Hendry County Extension Service	863-674-4092
Tavares-	Lake County Extension Service	352-343-4101
Sebring-	Highlands County Extension Service	863-402-6540
Ft. Pierce-	St. Lucie County Extension Service	772-462-1660

From the Florida Agricultural Statistics Service

Florida Citrus Production (Million Boxes)

Cultivar	**1997-98**	**1999-00**	**2003-04**	**2004-05**	**2005-06**	**2006-07**	**2007-08**
Early/Mid orange	140.0	134.0	126.0	79.1	75.0	65.6	83.5
Valencia orange	104.0	99.0	116.0	70.5	72.7	63.4	86.7
All oranges	244.0	233.0	242.0	149.6	147.7	129.0	170.2
All grapefruit	49.55	53.4	40.9	12.8	19.3	27.2	26.6
Temples	2.25	1.95	1.40	0.65	0.70		
Tangelos	2.85	2.2	1.00	1.55	1.40	1.25	1.5
All tangerines	5.2	7.0	6.5	4.45	5.5	4.6	5.5
Limes	0.44	0.60					
Lemons	0.12						
Total	**304.450**	**298.15**	**291.800**	**169.05**	**174.6**	**162.05**	**203.8**

Production of Florida citrus in the 2007-08 season was 203.8 million boxes, up 26% from the previous season.

Southwest Florida Citrus Production (Boxes)

SEASON	Charlotte	Collier	Glades	Hendry	Lee	Total
2003-2004	7,214,000	11,413,000	3,806,000	33,852,000	3,511,000	59,796,000
2004-2005	6,119,000	10,478,000	3,517,000	29,607,000	2,861,000	52,582,000
2005-2006	2,246,000	6,134,000	1,740,000	15,752,000	1,806,000	27,678,000
% Reduction from 2005-06 compared with 2004-05	63.3	41.5	50.5	46.8	36.9	47.4
2006-2007	2,996,000	8,390,000	2,372,000	21,414,000	2,583,000	37,755,000
% Increase from 2006-07 compared with 2005-06	33.3	36.8	36.3	35.9	43.0	36.4
2007-2008	3,681,000	10,494,000	3,356,000	24,420,000	3,367,000	45,318,000
% Increase from 2007-08 compared with 2006-07	22.9	25.1	41.5	14.0	30.0	20.0

Citrus Report from the National Agricultural Statistics Service - Florida Field Office.

Please visit http://www.nass.usda.gov/fl for more information.

If you have any questions, please call us at 800/344-6277.

ALL CITRUS ACREAGE REDUCED TO 576,577

The 2008 total citrus acreage at 576,577 is the lowest since record keeping began with the 1966 tree inventory. Although the gross loss is less than that reported in the three prior censuses, it represents an 11 percent drop. In addition to urban development, pushing due to canker and greening, and abandonment of nonproductive groves, the reduction includes two large areas being converted to reservoirs by a water management district. With nurseries lost to canker and the regulations now in effect, few new citrus trees were available. Only 22,128 acres of new plantings were counted.

Acreage decreases were recorded in 25 of the 30 counties included in the survey. Martin County suffered the greatest loss in acreage at 34 percent and is reduced by 11,869 acres. Hendry lost 9,799. Even with a loss of 5,023 acres, Polk continues to lead with 81,375. Hendry, Highlands, and DeSoto follow with over 60,000 acres each. Osceola and Hillsborough had substantial losses of almost 25 percent since the last census. For total trees, Hendry remains the leader with 10.6 million, followed by Polk with 9.7 million, and DeSoto with 8.2 million trees.

ALL ORANGE ACREAGE DROPS TO 496,518

All orange acreage at 496,518 is the lowest since the 1986 census, when a record low of 466,252 remained following several major freezes. After a recovery period, acreage surpassed 600,000 in 1992 and remained above that level until the recent hurricanes beginning in 2004. The Southern area leads with 30 percent of acres, followed by the Central and Western which combine for 55 percent.

Total trees are down seven percent and non-bearing account for just six percent of the total. Valencia trees comprise 56 percent of the total orange trees; early-midseason-Navel oranges, which include Temples for the first time, account for almost 44 percent; and the unidentified, primarily non-bearing, trees make up the remainder.

GRAPEFRUIT ACREAGE DECREASED TO 56,881

Grapefruit acreage has fallen over 50 percent in only eight years to a new low of 56,881. The Indian River District, although devastated by losses to canker and urban development, has the highest inventory with almost three-fourths of the state total. Colored seedless acres total 38,125 and white acres are at 17,711. Only 670 acres of seedy grapefruit remain. Due to the limited availability of resets over the past three years, only 3.6 percent of the total grapefruit trees are listed in the non-bearing category.

SPECIALTY ACREAGE SHRINKS TO 23,178

Specialty fruit acreage has continued to decline across the state and now stands at 23,178, less than one-fourth of the record 101,615 acres in 1970. Temples are now included with oranges. Tangelo acreage is down 18 percent, with the Minneola variety least affected.

The tangerine relationship is changing as early varieties decline at a faster rate. Honey tangerines now account for 49 percent with 7,585 acres. Sunburst remains at 80 percent of the early tangerine total with 6,268 acres. Fallglo account for of 1,582 total acres. True lemons have held steady since 2006.

ALL CITRUS: Acreage and tree numbers, by county and year of inventory [1/]

County	2002	2004	2006	2008	2002	2004	2006	2008
	Acres				*1,000 trees*			
Brevard	8,293	6,249	5,080	4,451	891.1	664.0	553.5	477.5
Broward	8	0	–	–	0.4	0	–	–
Charlotte	20,493	20,183	11,883	11,991	3,031.5	2,998.9	1,708.6	1,710.5
Citrus	147	146	145	138	17.6	17.1	16.9	15.5
Collier	33,567	34,878	33,394	31,596	4,948.0	5,101.1	4,881.7	4,634.0
DeSoto	70,365	68,559	61,083	61,426	9,282.3	9,080.1	8,181.7	8,239.5
Glades	10,384	10,103	8,555	9,052	1,664.7	1,640.9	1,390.0	1,392.8
Hardee	54,961	54,414	45,084	45,190	6,466.7	6,462.6	5,511.5	5,463.5
Hendry	94,139	93,155	79,726	69,927	14,444.7	14,298.1	12,280.5	10,576.8
Hernando	1,046	971	921	895	125.3	113.0	106.6	101.9
Highlands	77,391	74,623	62,671	62,599	10,282.9	9,962.1	8,252.9	8,025.6
Hillsborough	23,734	19,187	14,783	11,248	2,605.0	2,131.1	1,628.9	1,259.0
Indian River	56,012	47,539	40,191	39,013	6,191.3	5,322.3	4,504.3	4,344.1
Lake	18,835	17,486	15,198	13,100	2,598.3	2,415.2	2,122.5	1,829.2
Lee	11,874	11,067	10,658	10,373	1,665.9	1,549.2	1,489.3	1,417.1
Manatee	21,922	20,316	18,548	18,389	2,735.9	2,590.5	2,431.0	2,391.9
Marion	1,208	1,212	1,185	1,180	149.1	149.6	146.1	143.8
Martin	42,208	40,330	35,038	23,169	5,947.6	5,732.2	5,024.3	3,388.1
Miami-Dade	388	–	–	–	67.5	–	–	–
Okeechobee	12,035	11,891	9,222	8,327	1,479.0	1,460.9	1,056.9	940.1
Orange	6,884	5,593	4,548	3,674	867.6	666.4	549.4	437.8
Osceola	14,313	13,804	12,170	9,197	1,624.5	1,594.1	1,411.0	1,082.2
Palm Beach	7,964	4,542	1,668	[2/]	1,128.8	699.8	256.4	[2/]
Pasco	10,467	9,831	8,190	7,957	1,395.6	1,323.7	1,140.9	1,113.6
Pinellas	38	[2/]	[2/]	[2/]	3.6	[2/]	[2/]	[2/]
Polk	100,202	95,050	86,398	81,375	11,625.5	11,147.1	10,222.5	9,699.1
Putnam	199	205	182	190	33.4	33.8	30.5	29.5
St. Lucie	92,490	82,987	51,387	48,073	11,266.2	10,342.0	6,637.6	6,151.0
Sarasota	2,182	1,684	1,652	1,502	236.6	190.5	187.7	170.5
Seminole	1,322	1,147	529	491	138.7	122.5	59.6	56.9
Volusia	1,448	1,344	1,231	1,083	141.5	130.4	120.9	108.7
Other Counties [2/]	21	59	53	1,052	2.4	5.8	5.3	175.9
TOTAL	**796,540**	**748,555**	**621,373**	**576,577**	**103,059.2**	**97,945.0**	**81,909.0**	**75,376.1**

[1/] Broward excluded beginning 2006; Miami-Dade excluded beginning in 2004.
[2/] Includes Alachua only in 2002; Alachua and Pinellas in 2004; Alachua and Pinellas in 2006; and Alachua, Palm Beach, and Pinellas in 2008.

SAVE MONEY BY ADAPTING MECHANICAL HARVESTING

Change has kept the Florida citrus industry competitive during the last century. It is a general consensus among industry leaders that efficiencies in harvesting offer the greatest potential to reduce costs and keep our juice industry economically viable.

Generally, citrus groves in Florida were not designed and planted with mechanical harvesting in mind. Therefore, in order to gain the efficiencies necessary, changes to tree shape and grove architecture must occur. There are two paths to follow: 1) begin planting new groves designed for mechanical harvesting, and 2) retrofit existing groves that are suitable for mechanical harvesting.

How Do We Start Preparing Groves for Mechanical Harvesting?

The first change is to begin planting all new trees, both new and resets in groves suitable for conversion to mechanical harvesting, with high-headed trees. High-headed trees have longer than normal (16-inch) trunks, with the scaffold branching beginning at about 30 inches. These high-headed trees are suited to accommodate mechanical harvesting by having higher tree skirts as well as providing greater trunk length to allow for trunk shaker attachment as well as having additional horticultural and practical advantages in the grove. Regardless of the harvesting machine utilized, a catch frame must fit under the tree to capture fruit for maximum cost efficiency. The second objective is to reshape existing trees to accommodate existing mechanical harvesting equipment. The important point to consider is that not all groves may be good candidates for mechanical harvesting and the first criteria should be to determine where mechanical harvesting may be utilized to obtain maximum harvesting efficiency. Groves determined not to be candidates for mechanical harvesting will have to be hand harvested until a decision is made to remove the grove and replant with an architecture that maximizes mechanical harvesting efficiency.

New plantings should be designed along the following criteria:

- High-headed trees should be planted with scaffold branching starting at 30 inches and skirting maintained at the drip line at 36 inches.
- In-row spacing should be 10 to 15 feet and 22 to 24 feet between rows.

Hedging down the row needs to maintain 8-foot width for passage of equipment.

- Tree heights limited to 16 feet with either flat or roof-top.
- Irrigation emitters need to be equal distance between trees in the row.
- Efficiency of machine is enhanced with longer rows.

●Turn space is need at end of row to accommodate large machines.
●In bedded groves, furrows must not be steep and must be suitable to accommodate heavy equipment.

What are the Horticultural Advantages of High-Headed Trees?

In addition to preparing for the future of mechanical harvesting and improving the recovery of fruit, there are many horticultural advantages to high-headed trees:
●Reduced herbicide damage to the tree without contact to low hanging foliage;
●Less exposure to brown rot and greasy spot with improved air drainage under the canopy;
●Reduce severity and frequency for mechanical skirting;
●More uniform wetting pattern of irrigation emitters with fewer obstacles from low hanging limbs;
●Irrigation emitters are visible for checking proper operation and maintenance;
●Fruit production will start sooner after planting because an older tree is planted.

This is not to suggest that high-headed trees won't require some change in attitude and adjustment in cultural practices. The following issues need to be addressed:
●Need a rigid nursery tree to withstand wind, mechanical, and pest pressure;
●Taller tree wraps will be needed and longer stakes if staking is necessary to support the tree at planting time;
●Taller wraps will house insects that attract predators that can pull over and break the tree;
●Initial tree cost may be $0.50 to $1.00 more but production starts sooner.

What About Converting My Existing Grove to Mechanical Harvesting?

Not all groves are suitable for conversion to mechanical harvesting. It must be determined whether existing tree and grove structure (straight trunk and size, high scaffolds, tree health, age, grove layout, missing trees, grove size, etc.) would be cost effective to change. Additional costs will be incurred if irrigation emitters need to be relocated. If the trees can be skirted, hedged and topped, and meet the criteria of a grove design discussed above, it may be a good candidate. Skirting has been shown in several studies to only reduce yield a minimal amount the year skirting is done. Where mechanical harvesting has been used the past 10 years, no negative long-term effects have been observed. Limb breakage the first year is usually interior dead wood and live wood is no more than usually experienced with harvesting ladders. Any root damage is quickly recovered with no affects on yield.

This information was taken from the following EDIS publication:

Start Now to Design Citrus Groves for Mechanical Harvesting

Bob Rouse and Steve Futch

http://edis.ifas.ufl.edu/HS219

For more information on citrus mechanical harvesting check the Citrus mechanical harvesting website at:

http://citrusmh.ifas.ufl.edu/

FIRE ANTS

With too much rain and the harvesting season just got started

Imported fire ants are reddish brown to black and are 1/8 to 1/4 in long. These ants are aggressive and notorious for their painful, burning sting that results in a pustule and intense itching, which may persist for a week. Some people have allergic reactions to fire ant stings that range from rashes and swelling to paralysis or even death. In addition to stinging humans, imported fire ants can sting pets, livestock, and wildlife. Crop losses are also reported due to fire ants feeding on plants and even citrus trees. Fire ants may damage young citrus by building nests at the trunk bases. The ants feed on the bark and cambium to obtain sap, often girdling and killing young citrus trees. Fire ants also chew off new growth at the tips of branches and feed on flowers and developing fruit. In groves infested with ants, harvesting crews may not be willing to work and may request a higher fee to do their job. The ants are also known to cause extensive damage to irrigation lines and plug emitters. They aggregate near electrical fields where they can cause short circuits or interfere with switches and equipment such as water pumps, computers and air conditioners.

BIOLOGY

Red imported fire ants live in colonies that contain cream-colored to white immature ants, called brood. The brood is comprised of the eggs, larvae, and pupae. Also within the colonies are adult ants of different types. They include winged males and winged females, workers, and one or more queens. While thousands of winged males and females can be produced per year in large colonies, they do not sting. Newly-mated queens can fly as far as 12 miles from the nest (or even farther in the wind), but most land within a mile. New colonies do not make conspicuous mounds for several months. Once a colony is established, a single queen can lay over 2,000 eggs per day. Depending on temperature, it can take 20 to 45 days for an egg to develop into an adult worker. Workers can live as long as 9 months at 75°F, but life spans usually are between 1 and 6 months under warmer outdoor conditions. Queens live an average of 6 to 7 years.

Fire ants are omnivorous feeders. Workers will forage for food more than 100 feet from the nest. They can forage during both the day and the night, generally when air temperatures are between 70° and 90°F. When a large food source is found, fire ants recruit other workers to help take the food back to the colony. Liquids are ingested at the food source, and stored within the ants until they are regurgitated to other ants within the colony. Liquids from solid foods are extracted at the source, or are carried back as solid particles. Large solids may be cut into smaller pieces so they can be carried back to the colony. There are two types of fire ant colonies: single-queen, and multiple-queen colonies. A colony may contain as many as 100,000 to 500,000 workers.

CONTROL STRATEGIES AND TECHNIQUES

Numerous methods have been developed to control fire ants. Unfortunately, there are no control methods that will permanently eliminate fire ants. Four strategies are currently being used to control fire ants: broadcast bait applications, individual mound treatments, a combination of broadcast baiting

and individual mound treatments, and barrier/spot treatments.

1. Broadcast Bait Applications

This strategy attempts to reduce fire ant populations by applying insecticides incorporated into an attractant or bait. The ants carry the bait to the colony. The slow action of the toxicant allows the ants to feed it to other members of the colony before they die. When the toxicant is fed to the queen(s), she either dies or no longer produces new workers and the colony will eventually collapse.

●***Keep baits dry.*** Wet baits are not attractive to fire ants. Apply baits when the grass and ground are dry or drying, and rain is not expected, preferably for the next 24 hours.

●***Apply baits when fire ants are actively foraging.*** During hot, summer weather, apply baits in the late afternoon or evening because fire ants will forage at night under these conditions.

●***Follow the directions on the label.*** It is against the law to apply baits in areas not listed on the label.

2. Individual Mound Treatments

This strategy attempts to eliminate colonies of fire ants by treating mounds individually. Individual mound treatments are time consuming and labor intensive. However, colonies treated individually may be eliminated faster than colonies treated with broadcast bait applications.

Baits

Bait products used for broadcast bait applications can be applied to individual mounds. Sprinkle the recommended amount of bait around the base of the mound up to three feet away. In addition, follow the Guidelines for Effective Bait Applications given previously. As with broadcast bait applications, the use of baits for individual mound treatments may take one to several weeks to eliminate colonies.

Dusts

Dusts are dry powder insecticidal products. The dusts stick to the bodies of ants as they walk through treated soil. Ants that contact the dust will eventually die. Dusts are applied by evenly sprinkling a measured amount of dust over the mound. Avoid inhaling or touching the dust. Some dusts, such as those containing 75% acephate, should kill an entire colony within a week.

Aerosols

Some products are available in aerosol cans equipped with a probe, and contain insecticides that quickly immobilize and kill ants on contact. As the probe is inserted into a mound, the insecticide should be injected into the mound for a specified amount of time. Similar to other individual mound treatments, application on cool, sunny mornings will help maximize contact with the colony.

3. Combining Broadcast Baiting and Individual Mound Treatments

This strategy utilizes the efficiency of broadcast baiting and the fast action of individual mound treatments. Baits must be broadcast first to efficiently reduce fire ant populations. Wait a minimum of 3 days after broadcasting to allow fire ants to forage and distribute the bait before individually treating mounds. Treat mounds preferably with a dust, granular, or aerosol insecticide specifically labeled for fire ant control.

4. Barrier/Spot Treatments

These products are usually sold as sprays or dusts. They may be applied in wide bands on and around building foundations, equipment and other areas to create barriers that exclude ants. They also may be applied to ant trails to eliminate foraging ants. Barrier and spot treatments do not eliminate colonies.

TAKE WINDBREAKS SERIOUSLY

From the"Living and Artificial Windbreaks for Citrus" website http://www.lal.ufl.edu/extension/windbreaks/index.htm

Regardless of whether you have already decided to use windbreaks and are searching for additional information or you are about to make your initial decision, here are some considerations to help guide those decisions.
Among the various types of windbreaks, all windbreaks share several generally known and well-established advantages. These include:
■ Reduce the spread of canker disease and its severity.
■ Wind scar reduction.
■ Provide wildlife habitat (living windbreaks).
■ Reduce wind/soil erosion (living windbreaks).
■ Environmental cleanup (living windbreaks).

Windbreaks also have certain disadvantages such as:
■ Occupy space that may be otherwise used for income.
■ Shade adjacent crops and may reduce productivity.
■ Can compete with crop plants for water and nutrients.
■ Have establishment and possibly maintenance costs.
■ Can complicate or interfere with equipment movement.
■ May have effects on microclimate and pest populations.

The balance or tradeoffs between the advantages and disadvantages should be the foundation of any individual decision.
A primary reason for using windbreaks is to manage canker disease.

Successful management of this disease will depend on the integrated effectiveness of three tools – resistant scion varieties, copper sprays and windbreaks.

Some Questions & Answers

Q. What are your expectations for a windbreak?

A. Windbreaks will be a major part of a disease management strategy along with resistant varieties and chemicals. Some Florida experience has shown reductions in windscar incidence, a reasonable expectation. Living windbreaks do not generally establish rapidly, but the windbreak species will probably keep pace, if not exceed, the growth of newly planted citrus trees. The exceptions are Eucalyptus, bamboo, and Silk oak which develop quite rapidly. Artificial windbreaks function essentially instantaneous, but are relatively expensive.

Q. **Will living or artificial windbreaks withstand hurricanes and other severe weather events?**

A. There is considerable evidence to suggest the answer is YES, but the evidence is not consistent nor is the answer predictable without additional experience.

Q. What varieties should be protected from diseases and wind damage?

A. All fruit grown for the fresh market are likely to benefit from reductions in windscar provided by windbreaks. Protecting grapefruit grown for fresh or juice would be particularly important because of its known susceptibility to canker. Likewise, early oranges will benefit, too. It is questionable whether other oranges grown for juice need windbreaks.

Q. What groves, blocks, or other units should be protected?

A. There are three simple rules that dictate how to divide your land into windbreak units:

1. Windbreak height dictates the degree of protection at a ratio of about 1:10, i.e., for every unit of height (H), lateral protection is 10 (H). Thus, a 40-foot tall plant will calm winds about 400 feet into the grove.
2. Your knowledge of the expected (H) for any living windbreak species growing in the local area is very important.
3. In general, windbreak units should be about 10 to 20 acres in size for adequate protection based on the observations in other citrus industries. Size is limited by the height expected for the plant species selected, or the practical limits imposed by cost and other engineering factors for artificial windbreaks.

An appropriate-sized windbreak unit is defined by function, but with adequate consideration for cost, establishment, and maintenance. It makes little sense to plant or erect a windbreak if it is underdesigned.

A Ridge Example. If your grove is located on a typical Ridge Entisol, like Candler sand, you may notice that nearby mature sand and slash pine trees are probably 30 to 50 feet tall. Using 40 feet for (H), the lateral protection expected would be 400 feet which means the windbreaks rows could be spaced 800 feet apart. A square 10 acres is 660 x 660 feet, thus, planting windbreaks to surround the

block should provide more than adequate protection.

A Flatwoods Example. As with the Ridge example, local experience with native plants and their mature (H) suggests that 10- or 20-acre windbreak units are practical.

Q. For a living windbreak, what plant species are best?

A. The plants are divided into three groups:

FOUNDATION - species that could be planted by themselves in single or multiple rows or be the upper story plant in a multi-species windbreak.

FOUNDATION PARTNERS – species that are best used as the lower story in combination with one of the Foundation species.

OTHER – species for which there is virtually no information about their usefulness in a windbreak, but their published characteristics and field observations suggest potential for that purpose.

In the tables is information regarding expected performance, descriptions of the major attributes and weaknesses, and links to related literature and other details to aid in evaluating the choices.

Note that just studying the tables may not provide sufficient information to make the best decisions. Because the performance in windbreaks of many of the plant species is not well known, or known at all, additional time spent reading some of the literature provided in this website is recommended.

Q. For a living windbreak, what design is best?

A. For any grove whether it is be planted or is already established, you must determine the composition, spacing, and location of the windbreak so that it functions properly, but allows for machinery movement and other grove operations once the size of the protected unit has been decided. Do that before you plant!

The composition of the windbreak, i.e., the plant(s) selected, their arrangement and spacing, is critical. The composition determines how rapidly a functioning windbreak will be established, the degree of maintenance required, if any, and the degree of wind reduction. Composition also involves deciding whether to plant one species, or a combination of species, in a single row or in multiple rows. For example, windbreaks around Ridge citrus groves have been planted with either a single-row combination of slash pine and red cedar or in a multiple row arrangement.

The goal in selecting the plants and their spacing is to achieve about 60% density, i.e., allow about 40% of the wind to pass through. There are no established and tested rules to determine how to achieve 60% density. The value of familiarizing yourself with the young and mature characteristics of the species selected by studying any local native stands of the plants, contacting local botanists and foresters or others familiar with plants in uncultured settings cannot be over-emphasized.

Ridge. On the Ridge, a minimum of 25 feet between the windbreak and the edges (i.e., ends and sides of rows) of the planted area is generally adequate for equipment movement and to allow for canopy development of the windbreak plant without crowding the drive middle or adjacent citrus trees. **Plant species**: Only Eucalyptus and bamboo are fast growing among the choices currently available. Eucalyptus is suitable for use by itself as a perimeter and/or internal windbreak and can be planted in single or multiple rows.

Bamboo is cold hardy, relatively easy to establish, but not readily available and the plants are expensive. Nevertheless, it merits some trial on both the Ridge and in the flatwoods. Consideration should also be given to a single-row combination of Eucalyptus (as the upper story species) and a less vigorous bamboo selection such as Bambusa multiplex as the lower story. With that combination, the spacing between Eucalyptus plants could be increased.

Flatwoods. In the flatwoods, the same basic considerations apply for windbreak design and location. However, in typical bedded groves, water conveyances such as canals and ditches impose additional restrictions especially in established groves. To plant a windbreak along an internal waterway in an established grove may require removing trees from the ends of rows. Also, only one side of the waterway can likely be planted so that ditch maintenance can continue. **Plant species**: Eucalyptus is an option as a stand-alone species or, where perimeter space would allow, in multiple rows particularly if the intention was to periodically harvest some of the trees and allow the stumps to coppice. That is one strategy that might generate an income and would at least provide for good windbreak coverage with one species. Also, given the limited space available along internal waterways, Eucalyptus could be an excellent choice because the plant will anchor well along ditch banks and its profile is narrow, thus lateral canopy development would not be a problem. Another option to use Eucalyptus where space is limited would be to plant a single row of trees, but closely spaced (3 to 4 feet apart). The management of this single row would be to eventually cut off every other tree and let it coppice. By using this approach, there would always be a tall upper story of trees and a shorter, lower story of trees that provided good windbreak function at all heights.

Bamboo and Silk oak (*Grevillea robusta*) are also stand-alone options. Silk oak is a popular windbreak species in Brazil and to some extent in South Africa.

Southern slash pine (do not use sand pine) would be suitable for an upper story with red cedar or other species as the lower story. However, slash pine does not perform well in alkaline soils, so avoid using them in Chobee, Floridana, Manatee soil series because they usually have calcareous subsoil and in Bradenton/Parkwood, Hilolo/Winder, Pople, Boca, and Hallandale soil series because they always have calcareous subsoil.

Q. Can I avoid planting a windbreak by using the outside rows of my grove?

A. It has been suggested that the perimeter trees and rows of a block be grown on a vigorous rootstock or simply allowed to grow taller than the interior trees. That approach would save money, and anecdotal evidence indicates that the edges of a block are more likely to have canker infections than further into the block. However, such a plan is unlikely to work well because the citrus trees expected to function as windbreak are susceptible to both bacterial disease, canker and greening, and may help spread the diseases. Also, they may not grow tall enough to provide maximum benefit as a windbreak.

For questions and further details, please contact

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UNDERSTANDING DEGREENING OF FLORIDA FRESH CITRUS FRUIT

In Florida, early maturing citrus cultivars usually meet legal maturity standards before the peel becomes yellow or orange and therefore require degreening. Degreening involves the use of ethylene gas in packinghouses to destroy the chlorophyll and allow the yellow or orange color to predominate on the peel.

Recommended Degreening Conditions

Temperature. Temperatures of 82 to 85°F (28 to 29°C) are recommended for degreening. Both higher and lower temperatures tend to slow the degreening process.

Ethylene. Five parts per million (5 ppm) ethylene is adequate for the maximum degreening rate when using recommended conditions. Some packers are successfully using 3 ppm ethylene.

Humidity. Relative humidity (RH) of 90%-95% is recommended for degreening and can be maintained by steam or pneumatic atomizing nozzles, which mix water with air.

Ventilation. Fresh air should enter the room at the rate of one air change per hour, based on the volume of the empty room. Fresh air will prevent accumulation of carbon dioxide (CO_2), which is given off by the fruit. The rate of degreening is reduced if the CO_2 concentration reaches 0.1% and will nearly stop at 1.0% or above.

Air circulation. Air movement should be a minimum of 10 cubic feet per minute (CFM) per field box or 100 CFM per pallet box. This air flow rate is necessary to maintain uniform temperature, ethylene concentration, and humidity at the surface of each fruit in the degreening room.

Operational Considerations

Degreening with ethylene increases decay. Fruit should not be exposed to concentrations greater than the 5 ppm needed for degreening. Furthermore, fruit should not be exposed to ethylene longer than necessary to obtain degreening.

Degreening tests should be made with sample pickings of fruit early in the season to determine if the peel is mature enough to degreen properly. This is especially important with early-maturing, mandarin-type fruits. If mandarins require longer than 36 hours to degreen, decay will be excessive.

Safe Handling of Ethylene

Ethylene gas used for degreening is sold in compressed gas cylinders containing slightly less than 100% ethylene and has a mild sweetish smell. Some packers use ethylene generators. Although non-toxic, ethylene can cause asphyxiation under very high concentrations as the gas displaces oxygen in the atmosphere. Ethylene is explosive at concentrations between 3.1% (31,000 ppm) and 32% (by volume) in air. These concentrations are extremely high compared to normal citrus degreening concentrations of 5 ppm but may occur through accidental increases in ethylene flow or leaks in ethylene lines or regulators. Be sure to follow these safety rules when working with ethylene:

- Do not move compressed gas cylinders without the cover cap in place (it protects the valve). Only remove the cap when the cylinder is in place and ready to be used. There are vivid stories of cylinders, turned into a rocket when the valve stem breaks.
- Securely fasten cylinders to walls, holding cages or other non-tip structures.
- Check for gas leaks using a solution of soapy water. If the cylinder is leaking, contact your service provider and have it replaced.
- Verify that ethylene flow regulators are operating correctly.
- Keep flames or spark producing equipment away from degreening rooms and ethylene cylinders. Post and observe no smoking signs in these areas. All piping should be grounded to prevent electrostatic discharge.
- Check ethylene flow often to ensure safe concentrations are maintained. Some ethylene monitoring equipment will sound an alarm if concentrations become too high.

This is a summary of a publication written by Ritenour, Miller and Wardowski.

FERTIGATION

It is the application of soluble fertilizers through irrigation systems.

Some advantages of fertigation:

♦ Fertilizer is placed in the wetted area where feeder roots are extensive,

♦ Fertilizer may be applied more frequently in small amounts so that it is available when the tree needs it,

♦ Increased fertilizer application frequency can increase fertilizer efficiency and reduce leaching,

♦ Application cost is much lower than that of dry or foliar fertilizer application.

For microirrigation to be most effective, water and nutrients should be applied simultaneously.

Fertilizer efficiency and fertilizer cost savings of fertigation are greatest for young trees.

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

It should be kept in mind that fertilizer and water is wasted when fertigating a very wet soil to keep up with a programmed fertigation schedule because water and nutrient uptake are drastically reduced under waterlogged soil conditions.

It is a must that backflow prevention devices be used to prevent fertilizers to contaminate the water supply.

Growers must determine: (1) which fertilizer formulations are most suitable for injection, (2) the most appropriate fertilizer analysis for different age trees and specific stages of growth, (3) the amount to apply during a given fertigation event, and (4) the timing and frequency of applications.

Liquid Fertilizer Formulations

Commercially prepared liquid fertilizer solutions (true solutions, not suspensions) that are completely water-soluble should be used. Although transportation costs make liquid formulations a little more expensive, they save time and labor and help prevent problems associated with poorly made "home mixes." Even with liquid formulations, growers should be careful when injecting fertilizers containing phosphorus or sulfur (S) into microirrigation systems. Phosphorus and S may react with calcium and/or magnesium in the irrigation water to form mineral precipitates that could clog emitters.

To avoid emitter plugging, a properly designed microirrigation system should include:

♦ A method of filtering irrigation water,

♦ A means of injecting chemicals into the water,

♦ Equipment for flushing the system,

♦ And in some cases a settling basin to allow aeration and the removal of solids.

Injection Duration

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

A minimum injection time of 45 to 60 minutes is recommended. This time is sufficient for uniform distribution of nutrients throughout the fertigation zone. Limit injection time to prevent the application of too much water. Excessive water leaches plant nutrients below the root zone. As a general rule, a "reasonable" maximum duration of injection should not exceed two hours per zone.

Dormant Season Sprays: Successful Strategy to Reduce Psyllids into the Growing Season

— Jawwad Qureshi and Phil Stansly

In 2007, two 15-acre plots within two 60+ acre blocks of mature orange trees were sprayed with Lorsban 4 E at the rate of 5 pints per acre by ground on Jan 15. We observed that psyllid populations were suppressed for 6 months in the treated blocks compared to the untreated blocks. The 2008 experiment compared three one-application and one two-application treatments replicated four times in the same blocks. Applications were made by ground at the per acre rate of 1 (low) and 2 (high) pints of Vydate 2 L, 5 pints of Lorsban 4 E, and 1 pint of Danitol 2.4 EC; all made on Jan 16-17. The two-application treatment included ground applications of Danitol 2.4 EC on Jan 16-17 and Lorsban 4 E on Feb 15. All treatments except the low rate of Vydate reduced psyllid populations for 5 months. Effects were more pronounced on the adults than flush infestation or nymphal density. The application of Vydate 2 L and Danitol 2.4 EC and of Danitol 2.4 EC followed by Lorsban 4 E provided more suppression of psyllids than Lorsban 4 E by itself. There was no difference in the effectiveness of single application of Danitol 2.4 EC and the one that was followed by Lorsban 4 E, probably due to the short time interval between the two applications. However, both of these treatments performed better than the low rate of Vydate 2 L. There were no discernable treatment effects on ladybeetles that were common in both treated and untreated trees. These findings suggest that one or two applications of broad spectrum insecticides before spring flush significantly reduced psyllid populations for 5-6 months in the growing season. Therefore, the winter dormant season appears to be a safe and effective time to control psyllids with insecticides. Most predators are absent during that period or in the case of many parasitoids protected inside their hosts. Adult psyllids are fewest and most vulnerable. Additional sprays in the growing season should be based on scouting and made prior to anticipated flushes.

Insecticidal Control of Asian Citrus Psyllid and Citrus Leafminer: May 2008

— Jawwad Qureshi, Barry Kostyk, and Phil Stansly

At Southwest Florida Research and Education Center (SWFREC), Immokalee, Florida, 13-yr-old 'Valencia' orange trees were pruned manually to induce new flush and encourage psyllid infestation. Danitol 2.4 EC (21.3 oz/ac), Agri-Mek 0.15 EC + 435 Oil (20 oz + 2%/ac), Warrior 1 SC (5.75 oz/ac), Actara 25 WG (5.5 oz/ac), Actara 25 WG + Induce (5.5 oz + 0.1%/ac), Micromite 80 WGS + 435 Oil (6.25 oz + 2%/ac), and Micromite 80 WGS + 435 Oil (3.125 oz + 2%/ac) were applied on May 22, 2008 using a Durand Wayland 3P-10C-32 airblast speed sprayer with an array of six #5 T-Jet stainless steel cone nozzles per side operating at a pressure of 200 psi delivering 150 gpa at a tractor speed of 1.5 mph. The second application of the low rate of Micromite was made on June 12, 2008. The density of psyllid adults was estimated by using a "tap" sample made by striking with the hand a randomly chosen branch three times and counting individuals falling on a clipboard covered with an 8.5" × 11" white paper sheet. All treated trees had significantly fewer adults compared to untreated trees for 6 weeks. The percentage of flush infested with psyllid eggs was significantly reduced by all treatments for only 1 week. However, the percentage of flush infested with psyllid nymphs was significantly reduced by all treatments for 3 weeks. All treatments resulted in fewer mature nymphs seen on the treated trees compared to untreated trees for 4 weeks. Micromite treatments were less effective compared to all the other treatments during the third week. Thus, all treatments reduced adults and had some effect on nymphs for 6 weeks. The one-time application of the high rate of Micromite 80 WGS with 435 Oil provided better control than the low rate with 435 Oil applied twice during the same period. No significant improvement in performance of Actara 25 WG was observed in combination with Induce. All treatments except Actara 25 WG alone and Warrior 1 SC reduced leafminer populations for 2 weeks. Agri-Mek 0.15 EC + 435 Oil and Danitol 2.4 EC were the most effective treatments. Actara 25 WG + Induce resulted in better control than Actara 25 WG applied alone.

Commercial-Scale Aerial and Ground Applications to Control Adults of Asian Citrus Psyllid in Oranges

— H. Alejandro Arevalo, Phil Stansly (UF-IFAS-Immokalee) and Henry Yonce (KAC Agricultural Research, Inc.)

The effectiveness of 10 insecticide treatments applied by fixed wing aircraft and five by conventional airblast ground equipment + an untreated control was evaluated for 5 weeks after application in two adjacent blocks of Valencia oranges located in Collier Co., Florida. Aerial applications were made to single 10-bed, 12-acre plots at 10 gal/ac and ground

treatments to single 3.8-acre plots at 125 gal/ac. Adult psyllid populations were monitored on 10 trees selected at random toward the middle of two central beds in each plot for a total of 20 trees per treatment. Branches of trees in two locations were tapped three times, and the number of adult psyllids falling on a letter-size 8.5" x 11" white sheet of paper was recorded. Treatments evaluated by air and ground included: Delegate (4 oz/ac, Delegate + Oil (4 oz + 3gal/ac), Imidan + Oil (1.0 oz + 3 gal/ac), Imidan + Oil (1.5 oz + 3 gal/ac), and Provado + Joint Ventura (16 oz + 8 oz/ac). Additional aerial applications included Danitol (16 oz/ac), Danitol + Joint Ventura (16 oz + 8 oz/ac), Mustang (4.3 oz/ac), Mustang + Micromite (4.3 oz + 6.25 oz/ac), and Mustang + Joint Ventura (4.3 oz + 8 oz/ac). Initial populations were high, averaging 3.5 per two-tap sample. Although the design precluded statistical analysis, some clearly defined trends were evident. Counts for the untreated control averaged almost eight for the entire study period. The best aerial treatments were those including Danitol and Imidan, reducing populations to below one per sample for the entire study period. Applied by ground, Imidan and Delegate + Oil essentially eliminated adult psyllids. Delegate alone and Provado + Joint Ventura also performed well by ground but did poorly by air. This trial demonstrated that while aerial application can give comparable results to ground application with at least some broad spectrum insecticides, certain selective insecticides provide much better results when applied by conventional ground equipment.

Management of Asian Citrus Psyllid with Frequent Ultra-Low Volume Applications (Fogging) of Oil and Azadirechtin During the Growing Season

— H. Alejandro Arevalo and Phil Stansly

Most products with insecticidal properties have label restrictions which do not allow them to be used as ultra-low volume (ULV) applications in citrus. Horticultural mineral oil (HMO) and azadirechtin (Aza-Direct®), a botanical insecticide derived from the neem tree, are both OMRI (Organic Material Review Institute) approved and do not have ULV restrictions. We are evaluating three treatments replicated three times in a 62-acre block of Valencia oranges located in Collier Co., Florida: 1) HMO at 1 gal/ac, 2) HMO + Aza-Direct (1 gal + 12 fl oz/ac), and 3) an untreated control. Ultra-low volume applications using a London Fogger belonging to the Beck brothers are made at night once every 2 weeks beginning July 1. Samples are taken the day before application, and collected in the middle section of the central bed in each one of the treatment plots. In each plot, 20 trees are sampled using two tap samples per tree to determine adult Asian citrus psyllid (ACP) populations. To determine the percentage of infested flush, a maximum of 10 flush per plant are observed, the flush with eggs or nymphs present are recorded, and an estimation of the flush concentration is calculated by counting the number of flush found in a 30 x 30 cm PVC square placed over the area where the tap samples are conducted. The initial psyllid population was extremely low after two aerial applications of broad spectrum insecticides. Although we have yet to observe a resurgence of adult Asian citrus psyllids in the first 2 months after the first fogging application, we have seen significantly less infested flush on treated trees compared to untreated trees, with no differences between HMO and HMO + Aza-direct treatments. We plan to continue this trial into the fall to see if differences accentuate. The hope is that these treatments will maintain psyllid populations at low levels during the growing season.

New Publications and Tools Available for Greening Scouting

— Tim Spann

A new EDIS publication is available titled, "Scouting for Citrus Greening." This document describes current recommendations for scouting frequency and the advantages and disadvantages of various scouting methods. Also included is a detailed review of greening symptoms and recommendations for utilizing the field-friendly iodine-based starch test detailed in a separate EDIS document. The scouting document can be downloaded at http://edis.ifas.ufl.edu/CH200, and the iodine test is at http://edis.ifas.ufl.edu/HS375.

A new tool in the final development stages is an online training program for scouts. This interactive training will allow new scouts to learn the history, spread, and identification of citrus greening through a self-paced online tutorial and is available in both English and Spanish. Growers can evaluate their scouts' ability through a series of greening identification quizzes and short answer questions, the results of which are emailed directly to the supervisor. Growers can also use the training program as a refresher course for their scouts as needed and in between in-person trainings by IFAS personnel. The final technical glitches are currently being ironed out, and this new tool will be available for use through the CREC website in a couple of weeks. For questions and further details, please contact Dr. Tim Spann: 863-956-1151, spann@ufl.edu

List of insecticides and miticides recommended for use in the Florida Citrus Pest Management Guide and their effects on citrus pests and their natural enemies

Pesticide active ingredient	Target pest								Effects on natural enemies
	Mode of Action[1]	Psyllid	Leafminer	Rust Mites	Spider Mites	Root Weevil Adults	Scale Insects	Mealybugs	
Abamectin + oil	6	++	+++,R	+++,R	+	+ (oil)	+(oil)	+ (oil)	medium
Acetamiprid	4	-	+++,R	-	-	?	+	++	medium
Aldicarb	1A	+++,R	-	+++,R	+++	-	-	-	low
Carbaryl	1A	+++,R	-	+	?	+++,R	+++,R	+	high
Chlorpyrifos	1B	+++,R	+	+	-	+	+++,R	+++,R	high
Diflubenzuron	15	++	+++,R	+++,R	-	+++,R	-	-	low
Dimethoate	1B	+++	-	-	-	?	+++,R	+	high
Fenbutatin oxide	12	-	-	+++,R	+++,R	-	-	-	low
Fenpropathrin	3	+++,R	-	+	+	+++,R	-	+	high
Imidacloprid (soil application, nonbearing)	4	+++,R	+++,R	-	-	+	++	+	low
Imidacloprid (foliar application)	4	+++,R	+	-	-	-	++	+	medium
Petroleum oil	NR	+	++,R	++,R	++	+(eggs)	++,R	+	low
Phosmet	1B	+++	-	+	?	+++,R	?	?	medium/high
Pyridaben	21	-	?	+++,R	+++,R	-	-	-	high
Spinosad	5	-	+++,R	-	-	-	-	-	low
Spinetoram	5	+++	+++,R	-	?	?	?	?	low
Spirodiclofen	23	-	-	+++,R	+++,R	?	-	-	low
Sulfur	NR	-	-	+++,R	+++	-	?	?	high (short term)

[1]Mode of action class for citrus pesticides from the Insecticide Resistance Action Committee; NR = no resistance potential

(R) = product recommended for control of pest in Florida Citrus Pest Management Guide

(+++) = good control of pest

(++) = short-term control of pest

(+) = low levels of pest suppression

(-) = no observed control of pest

(?) = insufficient data available

UF UNIVERSITY of FLORIDA IFAS Extension

For more information, contact the University of Florida, IFAS, Citrus Research and Education Center 863-956-1151, www.crec.ifas.ufl.edu, or your local county citrus extension agent.

Created by: Michael E. Rogers, revised August 2008

Photo Credit: University of Florida

Imidacloprid soil drench rates for solid plantings on nonbearing citrus

Tree Height	Rate Product/A*	Applications per season	Ounces per tree	Trees per ounce
Imidacloprid 2F				
2 ft – 4 ft	8 fl oz	4	0.057 fl oz	17.5 trees
4 ft – 6 ft	16 fl oz	2	0.114 fl oz	8.77 trees
Imidacloprid 4.6F (Admire PRO)				
2 ft – 4 ft	3.5 fl oz	4	0.025 fl oz	40 trees
4 ft – 6 ft	7 fl oz	2	0.05 fl oz	20 trees
**Rates based on 140 trees per acre*				

Restricted Entry Interval (REI) and Pre-Harvest Interval (PHI) for products listed on front page

Active Ingredient	Restricted entry interval (REI)	Pre-harvest interval (PHI)
Abamectin	12 hours	7 days
Acetamiprid	12 hours	7 days
Aldicarb	48 hours	0; 30 days lemons
Carbaryl	12 hours	5 days
Chlorpyrifos	5 days	21 days
Diflubenzuron	12 hours	21 days
Dimethoate	48 hours	15 days
Fenbutatin oxide	48 hours	7 days
Fenpropathrin	24 hours	1 day
Imidacloprid	12 hours	0
Phosmet	24 hours	7 days
Pyridaben	12 hours	7 days
Spinosad	4 hours	1 day
Spinetoram	4 hours	1 day
Spirodiclofen	12 hours	7 days
Sulfur	12 hours	0
Use pesticides safely. Read and follow directions on the manufacturer's label.		

Additional citrus pest management information can be found in the Florida Citrus Pest Management Guide available online at http://www.crec.ifas.ufl.edu/extension/pest/index.htm

Flatwoods Citrus

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

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

Subscriber's Name:_____

Company:_____

Address:_____

City:_____State:_____Zip:_____

Phone:_____

Fax:_____

E-mail:_____

Racial-Ethnic Background

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

Gender

__Female __Male