Foliar, soil fertility programs help fight HLB in Felda grove

BY BOB ROUSE, MAURY BOYD AND TIM WILLIS

Maury Boyd's Orange Hammock citrus grove has become well known to the Florida citrus industry and to international citrus-growing regions because of his use of foliar fertilizer nutrients and SAR (systemic acquired resistance) products to maintain the health of huanglongbing-infected trees.

The Florida Department of Agriculture, Division of Plant Industry, positively identified HLB in Boyd's grove using PCR (polymerase chain reaction) in spring 2006. Since HLB confirmation, the Orange Hammock grove has maintained tree health and yields, producing seven years of profitable crops.

The production program consists of a foliar spray cocktail of nutrients and SAR products applied three times per year with the initiation of vegetative growth flushes in spring, summer and fall.

Combined with an Asian citrus psyllid insect management program, the foliar spray cocktail has helped reduce and ameliorate HLB leaf symptoms. This, and a good soil-applied dry fertilizer program, has allowed the trees to remain healthy and productive.

The psyllid insecticide management program is applied by fixed-wing aircraft using low volume of 5 to 10 gallons per acre. The applications are timed every five to six weeks during the growing season.

The products in the foliar-applied nutrient/SAR cocktail and ground fertilizer are given in Table 1. Agri-Pro is a humic acid product containing small amounts of many minerals, including nickel, which is a required nutrient for citrus and usually available in nature.

TABLE 1. Products and amounts in 250 gallons/acre of the Boyd Nutrient/SAR cocktail in 2012.

FOLIAR APPLIED PRODUCTS	AMOUNT/ACRE	GROUND APPLIED PER APPLICATION	AMOUNT/ACRE/YR PRODUCTS
Serenade Max WP	2.0 lbs.	N (Calcium nitrate)	216 lbs.
Sonata	2.0 qts.	P	43 lbs.
Di-Oxy Solv Organic (hydrogen peroxide)	2.0 qts.	K (MOP) & K-Mag	266 lbs.
Renew[1]	10.0 gal.	Magnesium	8.6 lbs.
Epsom salts (Magnesium sulfate)	7.5 lbs.	Boron w/herbicide boom annually	1.5 lbs.
Techmangam (manganese sulfate)	10.0 lbs.	Iron where needed	Fe -EDTA or DTPA 22 lbs./ton
Zinc sulfate	2.5 lbs.	Copper nutritional only	As needed
Sodium molybdate	0.75 (oz. dry)		
13-0-44 (spray grade potassium nitrate)	7.5 lbs.		
Agri-pro	2.0 gal. (spring)		
435 citrus spray oil	4.5 gal.		

[1] Renew (Plant Food Systems, Zellwood, FL) is a combination of products 14-7-8 w/K-Phite (1.0 pt./gal) + SAver (salicylate) on spring flush or 3-18-20 w/ K-Phite (1.0 pt./gal.) + Saver (salicylic acid) on summer and fall flush

TABLE 2. Total yield by season and variety from the Orange Hammock Grove in Hendry County. Text in green represents years HLB (citrus greening) was present in the grove.

	HAMLIN ORANGE			VALENCIA ORANGE		
SEASON	Wt. boxes	Lb. solids/box	Boxes/acre	Wt. boxes	Lb. solids/box	Boxes/acre
1999-00	58,206	5.21	480	61,602	6.51	362
2000-01	67,425	5.39	556	57,659	5.89	339
2001-02	66,565	5.33	549	80,376	6.23	472
2002-03	65,004	5.17	536	76,911	6.15	452
2003-04	83,403	4.97	688	107,933	6.56	634
2004-05	73,381	6.00	605	86,104	7.22	503
2005-06	65,981	5.49	544	69,423	7.36	408
2006-07	65,495	5.73	540	68,791	7.10	404
2007-08	73,671	6.14	608	105,045	6.64	617
2008-09	87,938	5.67	725	75,580	6.63	444
2009-10	54,942	5.52	453	70,660	6.43	415
2010-11	70,996	5.67	586	74,223	6.36	436
2011-12	72,697	5.62	599	87,587	6.37	514

More about the Orange Hammock grove

The Orange Hammock grove in Felda, planted in 1992, is a typical bedded flatwoods grove with 165 trees per acre of Hamlin and Valencia sweet oranges on Swingle citrumelo and Carrizo citrange rootstocks. It is irrigated with micro-sprayers.

The grove is now 95 percent infected with HLB. In 2012, the overall severity of tree disease was rated less than in previous years.

Yields from the grove were collected from the grower records. The combined yield and juice quality by variety for seasons 1999-00 to 2011-12 is given in table 2. All fruit yield is reported as 90-pound boxes per acre and mean pound solids per box.

The mean yield of the six years before HLB for Hamlin was 569 boxes per acre. After finding HLB, it has been 576 boxes per acre.

Mean yield for Valencia the six years before HLB was 460 boxes per acre. After HLB, it has been 454 boxes per acre.

Production of 500 to 700 boxes per acre for Hamlin and 400 to 600 boxes per acre for Valencia make this among the top groves in Florida.

Production the past 13 years has remained steady, considering year-to-year variability in conditions.

Since HLB was introduced, production at the Orange Hammock grove has not decreased, according to production records.

Nutritional/psyllid management programs have given hope to citrus growers that they can remain profitable until a more sustainable solution can be found.

Ideally, a long-term solution to HLB would include genetic resistance. The cost of the Boyd program in the Orange Hammock grove is an economic question that must be addressed.

The current cost of the three foliar sprays as formulated and applied each year exceeds $600 per acre. This program is currently possible if product costs remain affordable, juice prices remain above $1.50 pound solids and high yields can be maintained.

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