



## Further Observations of Parson Brown and Other “Surviving” Citrus

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**Observations of *Citrus sinensis* ‘Parson Brown’ trees, aged at over 100 years and trees at the site of the J.L. Carney homestead on the eastern shore of Lake Weir, Marion County, FL, continue. These trees still appear to be relatively healthy; although visual symptoms associated with Huanglongbing (HLB or citrus greening) continue to be observed. Fruit samples were harvested in December 2015, resulting in acceptable juice quality and ‘taste panel’ results. Budwood has been submitted to the Florida Department of Agriculture and Consumer Services, Division of Plant Industry Parent Tree Program. The process of assembling budwood from these and other “survivor” trees and promising rootstock selections for further evaluations is slated to begin within the year.**

In 2014 observations of citrus trees believed to be descendants of *Citrus sinensis* ‘Parson Brown’ orange (‘Carney Parson Brown’) originally propagated by J.L. Carney in the Weirsdale, FL, area in the late 19th century and expressing apparent tolerance to citrus greening (Huanglongbing, or HLB) were initiated (England, 2015). Interest in these observations among growers and other citrus professionals prompted further observations in 2015 and 2016.

It was determined that two of the original trees at the site of the former J.L. Carney Grove on the east side of Lake Weir just north of the City of Weirsdale, Marion County, FL, would be entered into the Florida Department of Agriculture and Consumer Services (FDACS) Division of Plant Industry (DPI) ‘Parent Tree Program’ (PTP). The initial estimated release of six “cleaned up” (certified pathogen free) trees for each of the two selections would be available for propagation sometime in 2017.

Citrus growers in Marion and Lake Counties, FL, with experience growing and handling Carney ‘Parson Brown’ oranges describe superior fruit quality with this cultivar. For this reason, a juice quality evaluation for the remaining two Carney ‘Parson Brown’ trees on the former Carney Grove Property was scheduled for Dec. 2015. In Mar. 2016, additional qPCR tests for presence or absence of HLB was scheduled.

Additional examples of “apparently surviving” trees were observed and noted in central Florida groves. At least one of these has also entered the FDACS, DPI, and PTP.

### Materials and Methods

**BUDWOOD COLLECTED FROM TWO SPECIMEN TREES AND SUBMITTED TO FDACS, DPI, PTP.** Budwood was collected from the two most promising specimen trees from the former J.L. Carney property on the eastern shore of Lake Weir on 15 Sept. 2015. The specimen tree denoted as Tree 2 (visual HLB symptoms expressed and positive qPCR) and Tree 3 (visual HLB symptoms expressed and negative qPCR to date) (Table 1) were entered

into the program denoted as cultivars J. Carney Lytle 2 and J. Carney Lytle 3, respectively. Collection procedures for each tree were completed according to protocol provided by Peggy Sieberth from the FDACS, DPI Citrus Germplasm Introduction Program, Bureau of Citrus Budwood Registration:

- six bags (numbered 1–6) consisting of three bundles containing 6 (approximately 6-inch-long) bud sticks, and
- one bag of 10–12, approximately 12-inch-long bud sticks.

Samples were immediately delivered to the FDACS/DPI facility in Winter Haven, FL.

**FRUIT COLLECTED FOR QUALITY EVALUATION.** Approximately sixty pounds of fruit was harvested from the two most promising specimen trees from the former J.L. Carney property on the eastern shore of Lake Weir on 17 Dec. 2015. Allison Drown transported the fruit directly to the Pepsico Laboratory in Bradenton, FL, where it was frozen and held at –80° F for analysis which occurred on 17 Jan. 2016.

**APPARENT SURVIVOR CITRUS OBSERVED IN CENTRAL FLORIDA GROVES.** Visits were made to various groves with examples of apparent “surviving” citrus trees. Some of the more promising will be reported.

Table 1. qPCR analysis of the presence of HLB, recorded as positive (present) or negative (not detected) for 3 sweet orange *Citrus sinensis* selections. Data provided by S.J. Harper and R.H. Brlansky of the University of Florida/IFAS Citrus Research and Education Center.

Selection	Mar. 2015	Mar. 2016
JCL-1, Replicate 1	Negative	Not analyzed
JCL-1, Replicate 2	Negative	Not analyzed
JCL-1, Replicate 3	Negative	Not analyzed
JCL-2, Replicate 1	Negative	Negative
JCL-2, Replicate 2	Negative	Positive
JCL-2, Replicate 3	Negative	Positive
JCL-3, Replicate 1	Negative	Negative
JCL-3, Replicate 2	Negative	Negative
JCL-3, Replicate 3	Negative	Negative

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## Results and Discussion

**BUDWOOD COLLECTED FROM TWO SPECIMEN TREES AND SUBMITTED TO FDACS/DPI—PTP.** Dr. Sieberth of FDACS has provided quarterly status reports on the progress on the FDACS, DPI “clean up” of the plant material. The latest progress report from the FDACS, DPI, PTP (Table 2) indicates that, in addition to citrus tristeza virus from the initial report, concave gum and other viroids are still present in the plant material in the program. The anticipated date for “clean up” and release of budwood is now Sept. 2018.

**FRUIT COLLECTED FOR QUALITY EVALUATION.** The fruit quality report from the Pepsico laboratory indicated that juice quality in both selections was good (Table 3). A sensory panel also conducted at Pepsico indicated the juice from both selections was rated as “acceptable.” Some comments from the panel was “very good fresh taste,” “slightly immature,” “some grapefruit off-notes,” and “good orange flavor.”

**APPARENT SURVIVOR CITRUS OBSERVED IN CENTRAL FLORIDA GROVES.** A single *C. sinensis* ‘Valencia’ tree in Lake County, FL, has continued to be productive and mostly non-symptomatic in an organic citrus block with an almost 100% HLB infection. The owners of this tree are continuing evaluations.

Another ‘Valencia’ tree in Polk County, FL, (Fig. 1) remains very productive, although expressing distinctive blotchy mottled symptoms typically associated with HLB infection. Budwood from this tree has been submitted to the FDACS, DPI, and PTP, and is denoted as ‘Dickinson Valencia’.

Randomly distributed *C. sinensis* trees in a 40-acre ‘Hamlin’ on ‘Swingle’ block with a high HLB infection rate near Howey



Fig. 1. *Citrus sinensis* ‘Dickinson Valencia’ exhibits sustained yield in a Polk County, FL, grove with high HLB rate of infection.

Table 2. Florida Department of Agriculture and Consumer Services (FDACS) Progress Report for May 2016, for 2 *Citrus sinensis* cultivars ‘J. Carney Lytle 2’ (DPI-229-2) and J. Carney Lytle 3’ (DPI-229-3). Provided by Peggy Sieberth, FDACS.

Variety/clone	Biological indexing on parent	STGing	Testing on STGs update	DPI increase	Entered	Completion date	At nursery	Billing	Anticipated completion date
Carney Orange DPI-229-2	Biological indexing positive for concave gum, sweet orange cool temperature bioindexing needed on STG; viroid positive, biological indexing needed on STG	STG selected	1st qPCR neg; 2nd collection 6/23/16	6 props req. 2/23/16	9/14/15	--	--	--	9/14/18
Carney Orange DPI-229-3	Biological indexing positive for concave gum, sweet orange, cool temperature bioindexing needed on STG; viroid positive, biological indexing needed on STG	STG selected	1st qPCR neg; 2nd collection 10/1/16	6 props req. 4/29/16	9/14/15	--	--	--	9/14/18

Table 3. Juice quality for two sweet orange samples. Data provided by Allison Drown, Pepisco Laboratories, Bradenton, FL.

Desc.	Fruit wt.	Juice wt.	Juice (%)	°Brix	°Brix corr.	Acid	Ratio	Color	pH	Oil	Sink pulp	Vit. C	Solids/box <sup>a</sup> (lb)
T2	57.00	32.55	0.57	12.0	12.08	0.6	20.1	33.98	3.9	0.02	15.0	71.9	6.15
T3	56.72	28.30	0.50	12.8	12.91	0.7	17.1	34.71	3.8	0.02	16.0	63.5	5.73

<sup>a</sup>Calculated 90 lb. box equivalent.

In The Hills, Lake County, FL, have continued to very productive. There are from 1–4 “surviving” trees in each row of this grove. Although these trees appear to be on ‘Swingle’, it has been suggested by a few local growers that some “off type” rootstock which may have been thought to be ‘Swingle’ could have been utilized during extensive replantings following the freezes of the 1980s. Evaluation of the rootstock in these “surviving” trees may be warranted.

### **Conclusion**

As the effort to keep Florida citrus producers profitable continues, further study of “surviving” citrus could be beneficial

to the industry. Some cultivars could be increased and planted or utilized in breeding programs focused on developing HLB tolerant or resistant rootstock or scion cultivars.

### **Literature Cited**

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