

# Calculating the Carbon Footprint of NFC Orange Juice

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# Introduction

- With the passage of the cap-and-trade bill in the U.S. House of Representatives, there is increased interest in the carbon footprint.
- U.S. agricultural interests have been vocal in their opposition to cap-and-trade even though some landowners would realize a new source of income if cap-and-trade becomes law.
- Tropicana conducted its own estimation of the carbon footprint of its Tropicana Pure Premium which was released last spring.

- One problem is the Pepsico has declined to release the specifics of how the study was conducted.
- In a joint effort among the Food and Resource Economics and Food Science and Human Nutrition Departments, and the School of Forest Resources and Conservation, a study was initiated to estimate the carbon footprint of NFC.

# Interest vs willingness to pay for “green” products

- A segment of US consumers (~18%) is ‘alarmed’ at the state of the planet and willing to pay extra for environmental benefits (pre-recession)
- A larger segment (~33%) is not willing to pay more, but would be interested in purchasing if an equivalent product is available at the same price
- According to a recent survey (2009) by Mintel, the number of Americans who say they almost always or regularly buy green products has not changed from the same period last year, at 36%.
- This comes after 2008’s percentage tripled from the previous year (12%).
- The main reason for the trend is that consumers are reticent to pay extra for the category. Mintel’s survey found that the majority of Americans are willing to pay only a little extra for green products.

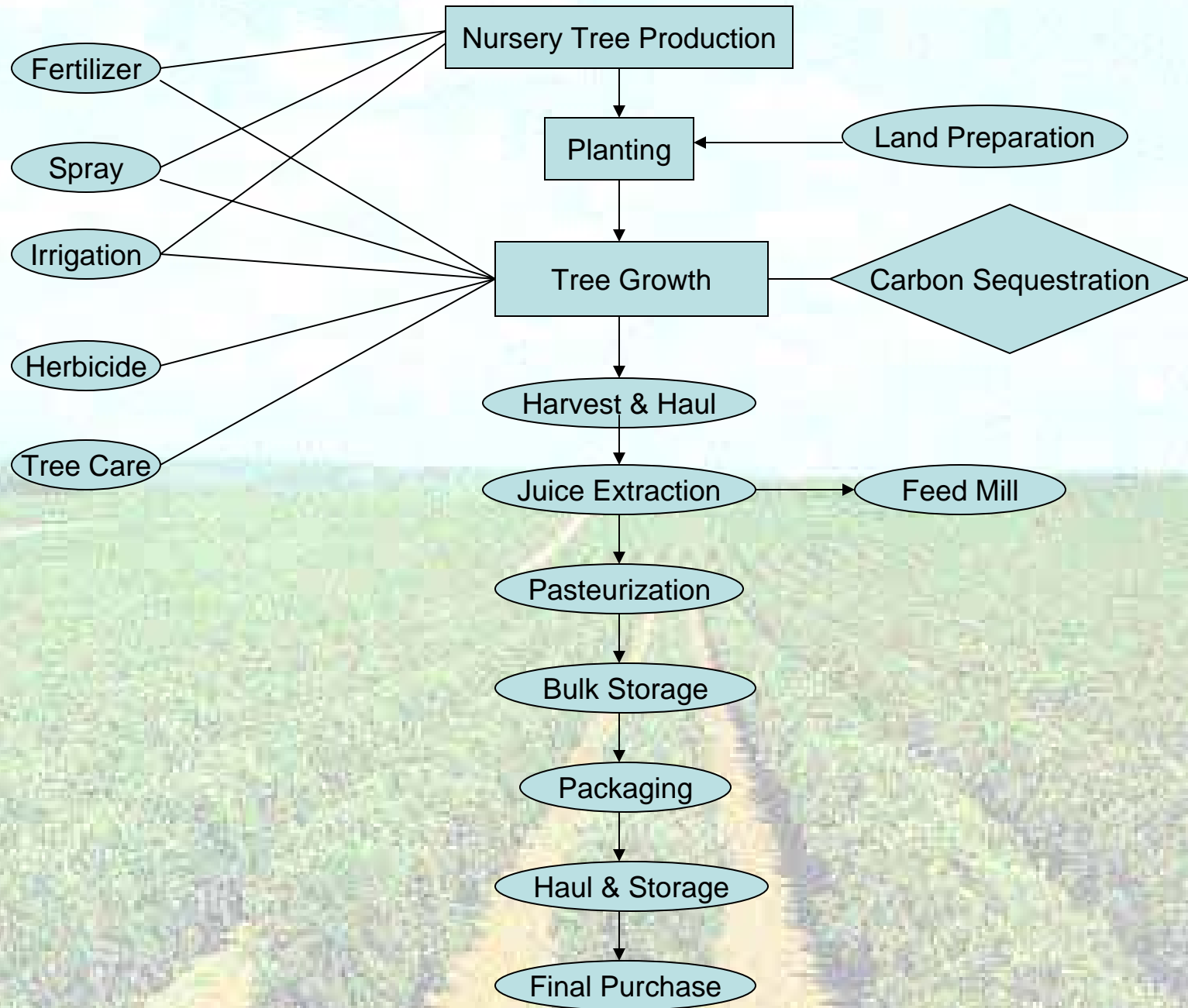
From: GreenBiz, 2009. <http://www.greenbiz.com/>

# Procedure

- Tree nursery operators, grove care management operations, and citrus processors were contacted.
- Tree nursery operators were asked to provide inputs used per nursery tree produced. Inputs include fertilizer, spray, irrigation, and the medium used for the young tree.
- Groves are assumed to be planted at 150 trees per acre and have an expected life of 30 years.

- Fruit and juice yields are taken from the *Citrus Summary*.
- Input use is based upon the reports published annually by Muraro, et al. That data is augmented by grove records that I maintained while I was a grove owner.
- Carbon emissions measured include both direct and indirect. Direct emissions are those from tractors, trucks, and other petroleum powered equipment as well as diesel powered wells for irrigation.

- Indirect emissions include those emissions that result when inputs such as fertilizer and pesticides are manufactured.
- A boundary, however, must be placed on the system which results in some carbon emissions not be measured.
- For example, the gasoline consumed by the final buyer on her trip to the supermarket or the electricity consumed by the supermarket itself is not “charged” to orange juice.



# Carbon Sequestration

- Citrus trees, like all plants, breathe in carbon dioxide and respire oxygen.
- Through this process, carbon is sequestered in the branches, trunk, and roots of all plants including citrus trees.
- When a citrus tree dies, however, it is either burned or chipped and allow to decay. In either case, the carbon that has been sequestrated is released back into the atomosphere.

- In the Tropicana study, they chose to give no credit the citrus trees for the carbon sequestered over their lifetime.
- After considerable thought and a review of literature on other tree crops, we have decided that is assumption is faulty.
- While it is true, that a particular citrus tree will eventually die and its sequestered carbon is released, at any period in time, there are millions of citrus trees alive in Florida, sequestering carbon that would not be removed if that land were in an alternative use.

Biomass



Plant

Eradicate

Carbon is sequestered in the trunk, branches and root system

- Our preliminary calculations indicate that the decision to not credit orange trees for carbon sequestration makes a significant difference in the carbon footprint estimation.
- We are still in need of data from processors to complete our calculations.

# Concluding Remarks

- Carbon emissions and carbon footprint calculations are becoming important topics.
- A third of consumers use environmental attributes in the purchase decisions.
- A study of the carbon footprint of NFC orange juice has been initiated by UF.
- We hope to have our research concluded shortly, but still need assistance from the industry to supply data.