The writing for this week includes an article for a consumer-oriented publication, VSCNews <http://vscnews.com>. The publication is dedicated mostly for growers of vegetables and specialty crops. The second portion of the writing includes the beginning of a literature review for a research project that I hope to complete as part of my Ph.D. research.

Currently 695 words. 750-850 words max.

Title: Bags protect developing peaches, improve fruit appearance, and extend shelf life

Peach growers have rediscovered a tool to add to their integrated pest and disease management toolbox- a paper bag. This paper bag is special; it is easy to install and remove with extra durability to withstand wind and rain throughout the season. If our data is consistent with previous observations, it will also be affordable for many operations. Producers in the United States, Spain, Japan, and China are currently using the practice of fruit bagging for many different crops including peach, apple, pear and loquat (Sharma 2014). Bagging has been shown to reduce pomegranate injury caused by the anar butterfly (Bagle 2011) as well as reduce Anthracnose and stem end rot for mango (Hofman 1997). World-wide, bagging generally increases yield and reduces damage for multiple crop-pest complexes, but fruit quality characteristics, including percent of soluble solids and acidity, have shown mixed results.

A multi-state research team including horticulturalists, economists, and pest management experts from Florida, Georgia, and South Carolina are investigating the practicality and efficacy of bagging for southeast peach growers. The team has collected preliminary data that indicate bagging can protect peaches against insect feeding and pathogenic fungi. After fruitlets are thinned to an appropriate density and receive an approved protective anti-fungal spray, young peaches are bagged. The bag is placed over the fruitlet when it is approximately one inch long. The bag is designed to fit snugly over the branch. The sides of the bag are folded in an accordion-like fashion, and the bag is finally secured with a metal twist tie that is built into the bag. Approximately seven to ten days before harvest, the bag is removed to increase the red color in the skin and fruit is manually harvested as usual. After the metal twist tie is removed, the bag can be recycled depending on the recycling requirements.

In Florida, bagging can begin as early as February but will occur later for cultivars that require more chill hours. Producers in Georgia and South Carolina typically bag fruit in March and April, respectively. In Florida, members of our research team installed an average of 2.5 bags per minute and removed 48 bags per minute. Depending on the size of the operation, bagging can require an extensive labor force and the choice to bag may depend on the grower’s market. Depending on the quantity purchased, bags cost around one penny per bag. For an acre of Florida peach trees planted to a density of 117 per acre that that yielded 150 fruit/tree, the cost of bagging would equal $1,592, based on bag price plus $12/hr labor, in addition to the estimated 123 man-hours of total labor needed for bagging installation and removal. Additional research is needed to determine if bagged peaches can be sold at a price premium or current management practices could change, such as a reduced spray schedule, to offset the price of bagging.

For organic or conventional producers who experience a significant loss in yield due to pests and diseases, bagging may provide the tool needed to improve fruit quality and increase yield. Bags are currently commercially available and any producer in the southeast interested in testing this technology can contact the authors of this article for more information.

Key Florida findings in 2018

Statistical analysis of the first year’s data, comparing to unbagged to bagged peaches showed that bagged peaches:

* Did not reduce fruit size and yield
* Had a longer shelf life with less brown rot
* Had fewer scab-like lesions (inclusive of all black spots on the skin)

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**Peach colored bag literature review (HortScience**

Horticulturists have been altering the light quality and quantity of peach trees since the beginning of intensive cultivation because light can have a profound effect on peach tree growth and fruit quality. Innovations such as orchard design, tree spacing, and pruning allow machinery to traverse the orchard and ensure maximal incident solar photosynthetic active radiation (PAR) within the tree canopy as well as on a land area basis (Bastias and Corelli-Grappadelli, 2012; Minas et al., 2018). Maximizing PAR ensures that the photosynthetic components in the chloroplasts are capturing optimal levels of light to assimilate C from the atmosphere. Changes in PAR can result in an increase in vegetative and fruit dry matter and as such has been the primary focus of research efforts on light and plant physiology.

On a sunny day, the PAR contacting the leaves on the perimeter of the canopy is approximately 2,000 micromol m-2 s-1, but PAR at the bottom of a dense canopy may be only 10 micromol m-2 s-1 (Taiz et al. 2015). The quantity of light intercepted by the leaves is determined by the transmittance and reflectance characteristics of each tree species and leaf shape (Awad et al., 2001; Combes et al., 2000). Intercepted light is captured by photosynthetic pigments (Chlorophyll A, Chlorophyll B, Carotenoids, and other accessory pigments), and pigment activity is directly related to the PAR quantity. A reduction in PAR has been shown to decrease canopy temperature and alter photosynthetic capacities of blueberry (Lobos et al., 2012); increase shoot growth and the shoot to root ratio in citrus (Li and Syvertsen, 2006); and reduce total soluble solids, delay maturity, and reduce the red blush of peach fruits (Marini et al., 1991). An increase in PAR can increase canopy air temperature and relative humidity (Layne et al., 2001), improve apple and peach skin color (Glenn and Puterka, 2007; Ju et al., 1999, Layne et al., 2001), increase apple fruit weight (Glenn and Puterka, 2007), and increase sweet cherry firmness and total soluble solids (Whiting et al., 2008).

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