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Survey of Florida Farmers Market - Current Food Safety Issues

Celia Lynch[a] and Soohyoun Ahn[b]

Locally grown food accounts for a small segment of the US agriculture, but local food products and their marketing channels continue to grow. Direct-to-consumer marketing channels for local food products, where growers bypass market middlemen and sell directly to consumers, include farmers' markets, roadside stands, on-farm stores and community-supported agriculture arrangements (CSA). Among these available channels, farmers' markets have become an important venue for both producers and consumers by serving not only as a sales outlet for agricultural produce but also as a place for "face-to-face" interactions between producers and consumers. The number of farmers' markets has significantly increased over the past decade from 3,706 in 2004 to 8,628 in 2014 (Fig. 1; USDA-AMS, 2014). Consequently, farmers' markets have become an important source of revenues for a growing number of farmers, particularly those with small-to-medium sized operations. According to the 2008 Agricultural Resource Management Survey (ARMS), small farms with less than $50,000 in gross annual sales and medium-sized farms (those with grow annual sales between $50,000 and $250,000) represent 95% of all local food farms (Low and Vogel, 2011). Small-to-medium sized farms rely primarily on family labor and management for their operation and often cannot generate enough volume for distributors that demand high volumes of local food. As a result, they are more likely to market through direct-to-consumer channels such as farmers' markets. In fact, the USDA estimates that 34% of small farms and 39% of medium-sized farms are relying exclusively on direct-to-consumer channels with $1.2 billion of gross sales (Low and Vogel, 2011). With consumers' growing desire to obtain fresh produce directly from growers, it is expected that the importance of farmers' markets as marketing channel and income source for small farms will keep rising.

As the number of farmers' markets surge, concerns over the safety of food sold at farmers' markets has also increased. In fact, many foodborne pathogen outbreaks have been directly linked to foods sold at farmers' markets (Bridges, 2000; The Packer, 2010; Gardner et al., 2011; FDA, 2011; CDC, 2014). Moreover, a survey study about food safety practices in farmers' markets show that there is a lack of safety practices and of food safety knowledge among market managers and farmers (Harrison et al., 2013). This issue is especially pressing because many small farms that sell directly to consumers are exempt from the requirements of the newly proposed Produce Safety Rules under the Food Safety Modernization Act (FSMA). The fact that fresh produce sold farmers' markets is not required to get inspected by the state or county further raises the concern for food safety. On the contrary, studies show that consumers who frequently shop at farmers' markets perceive food items, especially fresh produce sold at farmers markets, are healthier and safer than those sold at conventional retail stores, and only 2-6% of respondents were concerned about foodborne pathogens in food purchased from farmers' markets (Crandall et al., 2011; Gao et al., 2012).

Limited number of studies have assessed the microbiological safety of fresh produce from farmers' markets by evaluating the occurrence rates of generic *E. coli* and pathogens in fresh produce that is locally grown and sold farmers' markets (Arthur et al., 2007; Bohaychuk et al., 2009). These studies found higher rates of generic *E. coli* (4.4 to 27.1%) and *Salmonella* (0.79%) in fresh produce from farmer's markets than those of fresh produce in general reported by the USDA-Microbiological Data Program (MDP) (3.5% for *E. coli* AND 0.53% for *Salmonella*). Results from these studies and general lack of market inspection and food safety education for market managers and vendors suggest that fresh produce sold at farmers' markets are not microbiologically safer than those from traditional retail markets.

The objective of this survey study is to assess the food safety risks linked farmers' markets by surveying market conditions and food safety practices at the markets. For this goal, 25 farmers' markets from 10 different counties in North and Central Florida were selected based on their size, location and operating hours. Selected markets were anonymously visited at least more than once from April to October 2014, and observation on current market conditions and vendor practices was made and recorded. Market conditions that were observed included availability of hand washing facility, animal presence, waste management, and separation of items sold at markets.

This study showed only 22% of surveyed markets employed any kind of food station segregation strategies: for example, food items separated from non-food items and/or raw meat/poultry separated from ready-to-eat food. Lack of hand-washing facility was major problems observed in this study. Of 25 markets surveyed, only 31% of markets had accessible restrooms on site for patrons and the rest of markets had restrooms with limited access or used restrooms in nearby shopping areas. Additionally, 8% of markets relied on portable toilets without any separate hand-washing facility. The majority of the markets (64%) had animal presence on the day of survey. Most commonly found were dogs; however, other animals including pigs, turkeys, birds, large lizards or monkey were also found more as an attraction for visitors (Fig. 2). While 25% of visited markets had an eating area, all markets allowed animals in the eating area. Moreover, 20% of the visited markets were hosted on a farm area surrounded by cattle. On vendor practices, only 14% of vendors of ready-to-eat food (non-produce items) used gloves while handling food.

The results from this study suggest that there is a significant lack of food safety practices at farmers' markets. Animals, especially cattle, have been associated with foodborne illnesses as pathogen carriers and their common presence in markets and eating area raises great concern for food safety. Since the spread of foodborne pathogens through the hands of food handlers is one of the most common causes of foodborne illnesses, it is critical to practice proper hand-washing to reduce the transfer of pathogen from hands to food, and eventually to other people. It was notable that many vendors have hand sanitizers in their stalls. However, many studies have shown that hand sanitizers are not effective to all kinds of pathogens, and washing hands with water and soap is still the best practice for food safety. Providing effective education program for farmers' market managers and vendors will improve food safety at farmers' markets and this will ultimately lead to enhanced marketability of products sold at farmers' markets.

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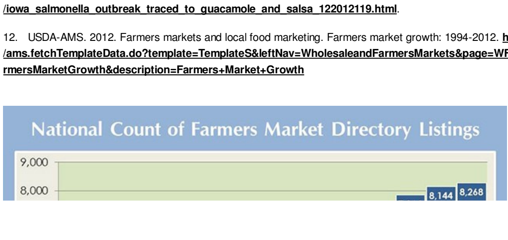

Figure 1. Number of farmers' markets operating in the US by the year (**http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=**

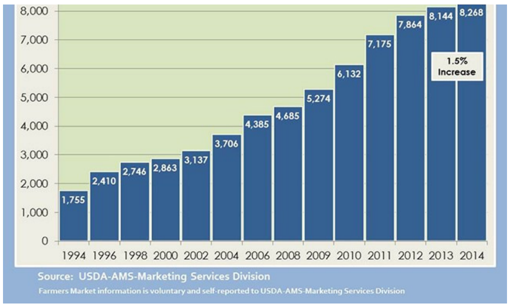

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Figure 2. Animals displayed for patrons at farmers markets.

Monica Ozores-Hampton and Luther Carson

Nitrogen Release Properties of Controlled-release Fertilizer in Tomato Production in Florida

Florida had the second largest fresh-market tomato acreage in the US with 26,500 acres with a value of $455 million in the 2013 season. The Federal Environmental Protection Agency and Florida Department of Environmental Protection recognize the importance of water quality through the enforcement of the Federal Clean Water Act of 1972 and the Florida Restoration Act of 1999. The Florida Vegetable and Agronomic Crops Best Management Practices (BMPs) manual (**www.floridaagwaterpolicy.com**), adopted by the Florida Department of Agriculture and Consumer Services, contains a series of BMPs to maintain and ameliorate water quality. A BMP must be technically feasible, economically viable, socially acceptable, and based on sound science. The objective of this study was to determine the efficiency of nitrogen (N) release from several enhanced efficiency fertilizers for use as a best management practice in Florida tomato production systems.

The used of enhanced efficiency fertilizers (EEF) are recognized as nutrient management BMPs. The use of EEF may reduce the risk of nutrient loss to the environment and subsequently increase nitrogen use efficiency (NUE) in a seepage irrigated tomato production system where the majority of the fertilizer will be pre-planted incorporated in the polyethylene mulched bed. There are three subgroups of EEF: slow-release fertilizers, controlled-release fertilizers (CRFs) and stabilized fertilizers. Controlled release-fertilizers are soluble fertilizers (SF) encapsulated in a polymer, resin, or a hybrid of sulfur coated urea occluded in a polymer coating. Several factors influence N release from CRFs including soil temperature, moisture content, osmotic potential, nutrient composition, coating thickness, and prill diameter. Manufacturers of CRF manipulate the N release duration of resin-coated fertilizer, polymer-coated fertilizer, and polymer sulfur-coated urea by adjusting the coating thickness and composition, with thicker coatings having longer release durations. Also, manufacturers measure CRF release duration as 75% N release at a constant temperature (e.g., 68 to 77 °F). Therefore, the purposes of these studies were to: evaluate N release from CRFs buried using a pouch method in seepage-irrigated tomato polyethylene mulched beds, and correlate the N release with the laboratory accelerated temperature controlled incubation method (ATCIM) extraction values. Furthermore, selected N CRF was used in a "hybrid fertilizer system" CRF N rates with SF in seepage-irrigated tomato polyethylene mulched beds. The pouch methods used fiberglass mesh screen 2x2.4 to 5x5 inches containing CRF and then incubated them in the soil.

In 2011 and 2013, 12 and 14 CRFs; respectively, were incubated in pouches containing CRF (3.5 g) N placed in polyethylene mulched raised beds in Immokalee, FL and extracted in the ATCIM. The ATCIM consisted of a 30 g CRF exposed to four increasingly aggressive (in length and temperature) extractions, using 0.2% citric acid as a solvent, during the course of 72 hours. The hybrid fertilizer system studies were conducted on a commercial tomato farm Immokalee, FL during fall 2011 and 2012, using tomato 'BHN 726'. A CRF mix was applied at different N rates (100, 150 and 200 lb/acre) applied bottom of the bed in combination with SF at 50 lb/acre banded in the shoulders of the bed with a total of 150, 200, and 250 lb/acre N. Data collection consisted on marketable fruit yield, postharvest quality, leaf tissue N content (LTNC), and post season soil N content. A randomized complete block design with four replications was used to determine the arrangement of treatments in the ATCIM, field pouch methods and hybrid fertilizer tomato system field studies. Data were subjected to analysis of variance, correlation and regression analysis or orthogonal contrasts using the general linear model procedure.

High soil temperatures in polyethylene mulched tomato beds, compared to the 68 to 77 °F incubation temperatures used by CRF manufacturers were reduced release duration by 23% to 88% and 23% to 79% in 2011 and 2013; respectively. By definition, CRFs must release greater than 75% N during the season, which was not found to be true with all CRFs tested in these studies. Since the pouch field method takes 120 to 140 days and requires numerous samples with high laboratory N analysis costs, an N release model that correlates the ATCIM and pouch field method was used to predict CRF N release in a tomato production system. The correlation model predicted the percentage of N release of the individual 12 to 14 CRF's tested with an R^2 of 0.95 to 0.99 and 0.61 to 0.99; however when CRFs where grouped by release duration the R^2 was -0.64 to 0.99 and -0.38 to 0.95 in 2011 and 2013; respectively. Modeling CRF N release using CRFs grouped by release duration would not be recommended for a CRF with a180 days N release duration due to the coating technologies behavior that apparently differs in response to greater fall soil temperature in polyethylene mulched tomato beds. However, with further model validation, grouping CRFs of 90 to 140 days release to simulate the CRF N release profile may allow the ATCIM to predict CRF N release without performing the pouch field method. The hybrid fertilizer system produced similar or greater marketable tomato yields and low residual soil N post season with CRF100/SNF50 (150 lb/acre) or CRF150/SNF50 (200 lb/acre) compared to the grower standard SNF (250 lb/acre N), CRF200/50SNF (250 lb/acre N), or the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS) SNF (200 lb/acre) rates. Thus, the hybrid fertilizer system may allow for reduced N rates by 25% to 46%. There were no commercially important differences in stage 5 or 6 (red ripe) tomato firmness and skin color for any CRF after mature green tomatoes were subjected ethylene treatment. Also, no negative impacts of CRFs were found LTNC during the seasons.

From a scientific standpoint, tomato growers may use CRF at a 25% to 46% reduced N rate to produce similar yields to UF/IFAS recommended SNF rates; thus as a BMP, CRF can be a considered a technically feasible horticultural fertilization practice. However, facts from these studies do not support the conclusion that CRF reduces N loss to the environment. Therefore, CRFs can be partially incorporated in a fall tomato fertility program maintaining marketable yields and fruit quality at reduced N rates with a low soil residual N. Despite the fact that CRF utilization may be socially acceptable and science indicates that they can be technically feasible, the use of CRF does not meet the economic and environmental criteria to be a BMP for seepage produced tomato in south Florida. Therefore, further investigations into CRF as a BMP must include an environmental and economic analysis.

Figure 1. An accelerated temperature controlled incubation unit as described by Sartain et al. (2004). Credit: Luther Carson

Figure 2. Installation of CRFs in raised beds, prior to plastic mulch installation. Credit: Monica Ozores-Hampton

Figure 3. Field tomato overview hybrid fertilizer system using controlled release fertilizer (1 acre) Immokalee, FL. Credit: Luther Carson

Pomegranate disease survey update:

Applying what is currently known to improve disease management in the upcoming season.

Achala Nepal KC and Gary E. Vallad,

Gulf Coast Research and Education Center, Wimauma, FL

During the summer of 2014, surveys were conducted to identify fungal diseases of pomegranate in Florida. Many fungal species were isolated and at least six of them were determined to be pathogenic on pomegranate fruits and

foliage after re-inoculation. Two different *Colletotrichum* species, *Neofusicoccum parvum*, *Lasiodiplodia* sp., *Amphilogia* sp., and *Pilidiella granati* were very aggressive on fruits and leaves. These pathogens were commonly isolated from leaves, fruits, and stems suggesting possible habitats and inoculum sources of these pathogens for the coming season.

Species of *Colletotrichum*, two species in botryosphaeriaceae family, and *Pilidiella granati* have been previously reported as pathogenic on pomegranate, however *Amphilogia* sp. is new for this host and confirmation of the species is in progress. *Amphilogia* belongs to Cryphonectriaceae family and is closely related to *Cryphonectria parasitica*, the cause of chestnut blight that nearly eradicated the American chestnut in North America in the early 1900s. The pathogenic species in this family typically cause stem canker and die-back symptoms in woody plants. The cankers often girdle the branches or main trunk of the infected tree and can kill the tree in one to four years depending on its age. *Amphilogia* have been reported to reside on roots and bark of *Elaeocarpus* species and cause stem and root cankers. These species produce both sexual and asexual spores at the site of infection and reside on these tissues until favorable conditions for infection occur. The sexual spores are mostly dispersed with wind and play a role in long distance spread. The asexual spores are dispersed with rain or irrigation water and also on the bodies of insects and mites, birds and mammals, and equipment used for cutting or pruning that come in contact with spore masses on cankers.

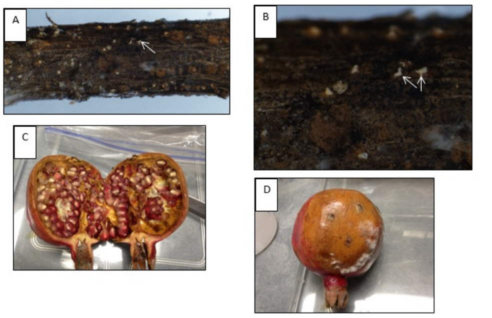

Figure 1. A) and B), stem samples from which *Amphilogia* sp. was isolated. The white arrows show the overwintering structure (Pycnidia) of the fungus. C) and D), fruits infected with *Amphilogia* sp.

Two different species of *Colletotrichum* were also identified and both were very aggressive on pomegranate fruits causing fruit decay. Exact species identification is still in progress. In most other studies, *Colletotrichum gloeosporiodes* has been reported to cause leaf and fruit spots and pre and/or post-harvest fruit decay in pomegranate. This is one of the most important pathogens that infects at least 1000 plant species, including avocado, citrus, coffee, guava, mango, passion fruit, papaya, rose apple and strawberry. *Colletotrichum gloeosporiodes* colonizes plant tissues forming abundant spores on the surface. The asexual spores are readily dispersed by rain splash and/or overhead irrigation. Sexual spores are airborne and dispersed by wind to long distances. These spores germinate on the surface of leaves or fruits producing symptomatic lesions. They either develop further producing more symptoms or remain dormant until conditions favor further infection. Dead leaves, wood and plant debris are primary sources of inoculum.

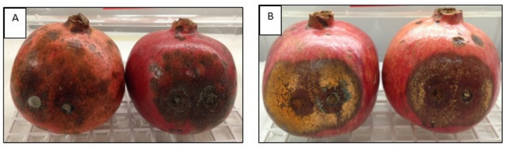

Figure 2. A) Fruits infected with *Colletotrichum* sp.1 and, B) Fruits infected with *Colletotrichum* sp.2. The yellow structures on (B) are the conidiospores (asexual spores) produced on the surface of infected fruit.

Two species, *Neofusicoccum parvum*, *Lasiodiplodia* sp., belong to botryosphaeriaceae family. In our survey, they were mostly isolated from rotten fruits, stems with small, black dot-like lesions (Figure 3a and 3b) and pedicels (part of branch attached to fruit). These pathogens have been previously reported to cause stem scab, stem canker, fruit rot, and tree decline in pomegranate. Members of botryosphaeriaceae family are also pathogenic to many other fruit trees like pistachio, almond, blackberry, blueberry, walnut etc. causing a range of symptoms like leaf spots, die-back, gummosis, fruit rot, and cankers. The fungi overwinter on dead and diseased tissues. Both sexual and asexual spores are produced depending on host and are spread through either air movement or splash dispersal and also through the use of contaminated cutting and pruning tools.

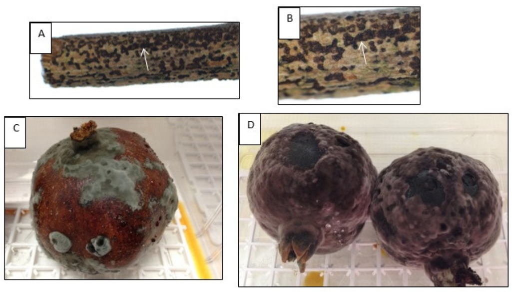

Figure 3. A) and B), stem samples from which *Neofusicoccum parvum*, *Lasiodiplodia* sp.were isolated. The white arrows show the overwintering structure of the fungi. C) fruits infected with *Neofusicoccum parvum* and, D) fruits infected with *Lasiodiplodia* sp.

Pilidiella granati was also identified in the survey and was very aggressive on inoculated fruits. This has also been reported in pomegranate in California causing stem and crown canker and fruit decay. The pathogen overwinters as pycnidia (asexual spores) and mycelia in stem cankers, and in plant debris like rotten fruit, tree cuttings and detached leaves. Once environmental conditions become favorable, they infect through wounds and can also spread to healthy plants through contact from infected fruit and from contaminated equipment.

One interesting finding of this research was that *Alternaria* was only recovered once from fruit samples, but was not pathogenic when further tested on fruits. This is one of the major problems in California causing "black heart" or fruit rot disease in pomegranate. However, additional field samples will need to be collected and results with the current isolate confirmed under field conditions.

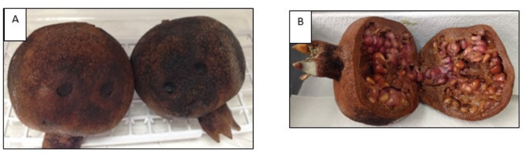

Figure 4. A) and B), fruits infected with *Pilidiella granati*. The black structures on the surface of fruit are overwintering structures of the fungi (Pycnidia).

Most plant pathogens wait for favorable conditions to initiate disease. If there is an aggressive pathogen, a susceptible host, and favorable environmental conditions for the pathogen to grow then disease will develop. Disease management relies on manipulating any of these three factors. Field sanitation is an integral part of any disease management strategy, since it helps reduce the level of the pathogen present in the field, which in turn can delay disease development. Even as research progresses, eventually leading to pomegranate varieties with improved levels of resistance and fungicide recommendations, lowering pathogen levels through field sanitation helps enhance fungicide performance and may even help lower the risk of fungicide resistance developing in pathogen populations. Although our knowledge about some of these pathogens is limited, it is clear from other crops that growers will benefit from implementing sanitation practices to minimize the presence of the pathogen in the field for the upcoming season. This can be best achieved by clearing leaf litter, fruit, and diseased stems from orchards; especially when many trees go dormant and lose their leaves, it is very important to clear leaf debris from around trees that is harboring the pathogen from the previous season. This is also an ideal time to inspect trees for diseased branches. We recovered pathogens belonging to botryosphaeriaceae family from most of the pedicel (part of branch attached to fruit) samples. So, pruning diseased branches and pedicels should help minimize carryover of the pathogen. All the infected leaves, stems, and fruits should be removed from the orchard to a safe distance and burnt as permitted by local ordinances. Similarly, equipment that comes into contact with diseased tissues should be sanitized using either a 75% alcohol, a 10% sodium hypochlorite solution (Regular Clorox® bleach), or other approved disinfectant. Growers are encouraged to refer to the article "Disinfection of Horticultural Tools" that is available on EDIS (**http://edis.ifas.ufl.edu/ep380**) for additional information.

Jalapeño Peppers Under Different Shade Cloth

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Jalapeño hot peppers (*Capsicum annuum* 'Jalapeño'), originated from Mexico and are popular due to their nutrient content, pungency, flavor, color and taste (Nalliah and Ranjan, 2010). Burden (2012) reported that in the United States, demand for jalapeño and other hot peppers increases every year as the popularity of ethnic cuisine increases. California and New Mexico produce most of the hot peppers grown in the United States, but many Florida farmers grow hot peppers as a niche crop (Ozores-Hampton and McAvoy, 2014).

The world population continues to increase, resulting in less space for agriculture and greater food demand.we must try to increase the amount of food that can be produced in a given space. One practice that might increase yield for a given amount of area is the use of different colored shade cloths. Recently, colored shade cloth designed specifically for manipulating plant growth and development has become available. Stamps (2009) discussed the use of these shade cloths on microclimate, vegetative growth, and fruit yield and quality. Plant response to different colors has been documented for many crops (Bastias and Corelli-Grappadelli, 2012). However, the effects are varied and plant responses may differ, even among cultivars of the same species (Stamps, 2009).

We are currently investigating the application of five different shade cloths and a control treatment (no shade cloth) on jalapeño peppers in a field trial at the University of Florida, Tropical Research and Education Center (TREC), Homestead, FL. The study began on December 21, 2014. The shade cloths being tested are aluminet 50%, white 30%, red 30%, pearl 30%, black 50% and a control (no shade cloth) (Fig.1). The aluminet 50%, white 30%, red 30% and pearl 30% are made by Polysack® Plastic Industries (Negev, Israel).

Jalapeño peppers were grown outdoors in pots with a drip irrigation system. Pots were placed inside cages with each cage representing a treatment replicate (Fig. 2). Thus, there were six treatments with four replications of 16 potted plants per treatment. After transplantation into pots, each plant received 1 g of Osmocote Plus® 15-9-12 (%N-%K_2O-%P_2O_5) (Scotts-Sierra Horticultural Products, Maryville, OH) and 70 ml of a fertilizer solution containing 22 ml of Miracle Grow® fertilizer (Miracle-Gro Lawn Products Inc., Marysville, OH) in 3.79 liters of water. The following week (Dec. 30, 2015), 3g of KCl, 3g of urea and 3g of Osmocote Plus® 15-9-12 were manually applied to each pot. Thereafter, each plant was manually fertilized with 70 ml of a solution containing 3 g of Peters Professional® 20-20-20 fertilizer (Everris NA Inc., Dublin, OH) per liter of water and 22 ml of Miracle Grow® per 3.79 liters of water. Following that, each plant was manually fertilized every two weeks with 10 g of W/suretex 12-6-8 (Diamond R. Fertilizer, Winter Garden, FL) and 70 ml of a solution containing 3 g of Peters® 20-20-20 per liter of water, 22 ml of Miracle Grow® per 3.79 liters of water, and 1 g Sequestrene 138 Fe (Becker Underwood, Ames, Iowa) per 3.79 liters of water.

During the early stages of plant development, plants exhibited symptoms of aphids, thrips, white fly and pepper weevil infestation. Therefore, abamectin (Agri-Mek -Syngenta, Greensboro, North Carolina), spinetoram (Radiant SC - Dow AgroScience, Indianapolis, IN), Kocide 3000 (Dupont, Wilmington, DE), sulforaflor (Dow AgroScience, Indianapolis, IN), thiamethoxam (Actara - Syngenta, Greensboro, North Carolina) and induce® (Helena Chemical Co., Collierville, TN) were applied as foliar spays to control those pests.

Plant growth was evaluated by the number of leaves, plant height, stem diameter, leaf chlorophyll index [SPAD units determined with a SPAD 502 meter (Konica Minolta Inc., Osaka, Japan)] and net photosynthesis [measured with portable photosynthesis system (CIRAS 2, PP Systems, Inc., Amesbury, MA)]. For all treatments, plant height and stem diameter increased over time, showing typical plant growth and development. No significant differences were observed among treatments for leaf chlorophyll index or net photosynthesis. However, a significant difference in stem diameter was observed on the last two measurement dates, when plants in the control treatment (no shade cloth) had significantly less height and stem diameter than those in each of the shade treatments. Stem diameter was significantly greater for plants in the white and aluminet treatments compared to the other treatments on the last three measurement dates [60, 75 and 90 days after treatment initiation (DAT)] (Fig. 3).

These preliminary results suggest that the use of shade cloth increases growth of jalapeño pepper compared to no shade cloth. We will continue to collect plant growth and yield data as plants mature to provide more information on how shade cloth impacts jalapeño pepper production.

Figure 1. Left: Trays with the jalapeño pepper seedlings. Center: Jalepeño pepper plant in a pot with a tensiometer. Right: cages in the field

Figure 2. Left: Cages in the field with four pots inside the Black screen. Center: Jalapeño pepper with fruit. Right: plants in the field at TREC.

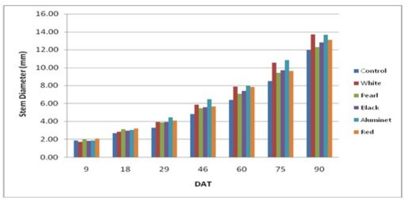

Figure 3. Stem diameter of jalapeño pepper over time under different colors and shading (aluminet 50%, white 30%, red 30%, pearl 30%, black 50% and control (no shade cloth) measured at varying days after transplant (DAT).

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ARTICLE #12 – CALCULATING FARM WORKER WAGES

Gene McAvoy, Hendry County Extension Director, recently asked this question on behalf of a blueberry grower:

"Is minimum wage for a piece rate worker calculated on a daily basis or can it be weekly? For instance, one day they hit a light patch in the field and the piece work rate does not come up to minimum but the for the other 4 or 5 days they pick a lot of berries and exceed minimum and at the end of the week make at least minimum or better for all the hours worked. Is this ok? Or do you have to bring them up to minimum for the light day?"

Answer: Based on the FLSA (Fair Labor Standards Act), minimum wage is calculated for the week. The only time it varies from weekly are rare cases where the employer pays by the day and the worker is gone the next day, in which case the calculation should be by the day. Note: The pay period must be disclosed to the workers as part of the Terms & Conditions of Work statement.

To determine whether a piece rate worker has been paid at the minimum wage, one divides total piece-rate earnings for the week by the total number of "compensable" hours gives you a worker's average hourly earnings. As long as that average is above the minimum wage, the employer is OK. Presently in Florida, the minimum wage is $8.05 per hour (newly revised as of January 1, 2015) and takes precedent over the currently lower federal minimum wage rate of $7.25. An employer is free to set an even higher minimum wage through the Terms & Conditions of Work statement. If, for example, an employer promises a minimum wage of $10.00 per hour, then the piece rate worker's average hourly earnings during the week must be equal to or greater than $10.

Most agricultural employers have made errors by not correctly counting the appropriate number of compensable hours. This happens, for instance, when they fail to include all the "waiting" time after arriving at the farm, and/or they deduct for lunch breaks when workers are actually working. A smaller denominator (i.e. compensable time) artificially inflates average hourly earnings.

Another related caution: Employers need to beware when they start making deductions beyond federal taxes (and state taxes, if applicable), and social security, as this affects the minimum wage issue. For example, deductions for transportation are NOT allowed (see MSPA, the Migrant & Seasonal Worker Protection Act). Deductions for any employer provided "tools" ARE allowed, but MAY NOT bring worker below minimum wage in any single pay period. Deductions for meals and housing are also allowed and those deductions MAY bring a worker below minimum wage. Side Note: Deductions for tools, meals and housing may not amount to more than the employer's COST and represent "reasonable" market conditions.

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DO YOU HAVE QUESTIONS RELATED TO FARM LABOR MANAGEMENT RULES AND REGULATIONS? Please email **carlene@ufl.edu** and we will try to get your questions answered.

Also, you can educate yourself, crew leaders, and farm or grove supervisory management by taking classes for Farm Labor Supervisors developed by SWFREC/IFAS Immokalee. Take a total of 8 classes and earn the CERTIFICATE OF FARM LABOR MANAGEMENT, offered since 2014. The next set of public trainings will be held in various locations in fall, 2015. Between now and then, on-site grower trainings are available and also we can arrange trainings with a minimum of 15 guaranteed attendees. Contact Carlene Thissen, **carlene@ufl.edu**, 239-658-3449.

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