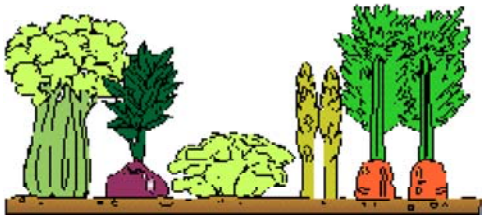


VEGETARIAN NEWSLETTER

A Vegetable Crops Extension Publication
Vegetarian 03-01
January 2003

University of Florida
Institute of Food and Agricultural Sciences
Cooperative Extension Service

Vegetarian Archive Vegetarian Index

Print Version

COMMERCIAL VEGETABLES

List of Extension Vegetable Crops Specialists

* * * * * * * UPCOMING EVENTS CALENDAR * * * * * * *

Tri-States Watermelon/Cucurbit Meeting. Washington County Ag. Center. Tuesday, January 14, 2003. Contact Charles Brasher at 850-482-9620 or clbrasher@mail.ifas.ufl.edu

Florida Postharvest Horticulture Industry Tour. Statewide. March 10-13, 2003. Contact Steve Sargent at 352-392-1928 or sasa@mail.ifas.ufl.edu OR Mark Ritenour at 561-201-5548 or mrit@mail.ifas.ufl.edu

Drip Irrigation School. Ft. Pierce-IRREC. March 13, 2003. Contact Betsy Lamb at 772-468-3922 x138 or emlamb@mail.ifas.ufl.edu

Florida Postharvest Horticulture Institute at FACTS (Florida Agricultural Conference & Trade Show). Lakeland. April 29-30, 2003. Contact Steve Sargent at 352-392-1928 or sasa@mail.ifas.ufl.edu

Vegetable Field Day. GCREC-Bradenton. April 10, 2003. Contact Don Maynard at 941-751-7636 x239 or dnma@mail.ifas.ufl.edu

116th Florida State Horticultural Society. Sheraton World Resort Hotel International Drive - Orlando, June 8-10, 2003.

GROW IT LOCALLY, BUY IT LOCALLY, EAT IT LOCALLY – WITH A LITTLE HELP FROM THE IRON CHEF

Both consumers and chefs are interested in purchasing locally grown vegetable crops for their freshness and high quality. Consumers purchase local produce because of freshness, taste and the support of local farmers (Food Processing Center, 2001). The factor most likely to increase purchases of local produce was increased availability in the area (63%). In this survey of consumers in Nebraska, Iowa, Wisconsin and Missouri, approximately 70% of respondents reported that it was very or extremely important to them to purchase food that is locally produced and, in particular, 55% were interested in being able to purchase locally produced food in restaurants. As the proportion of meals consumed away from home increases, this becomes a larger and larger market for locally produced vegetable crops. A survey carried out by the Mid-Atlantic Produce Project found that while only 11% of surveyed restaurants and caterers currently purchased local produce, 89% indicated that they were interested in buying from local growers (Hanson and Rada, 1992). Freshness and quality were the primary attractions, as well as the possibility of purchasing products difficult to find from other sources.

The Agricultural Marketing Service of the United States Department of Agriculture (USDA) reported a trend in direct marketing (marketing of a product directly to the end-user) of agricultural products. This is especially true for small farmers, because of their difficulty in participating in wholesale marketing and their interest in higher returns per unit area (Bills et al., 2000). While much of the increase in direct marketing is through farmers markets and roadside stands, direct marketing to restaurants can be a profitable association for both parties. Restaurants and caterers are considered mid-volume markets which combine the advantages of small to medium production volumes with moderate to high prices (Adam et al., 1999). Local producers may be able to provide chefs with specialty products that are unavailable through other sources, or work with them to meet specifications of size, type and quality. Growers working with chefs can also better anticipate consumer trends in food choices.

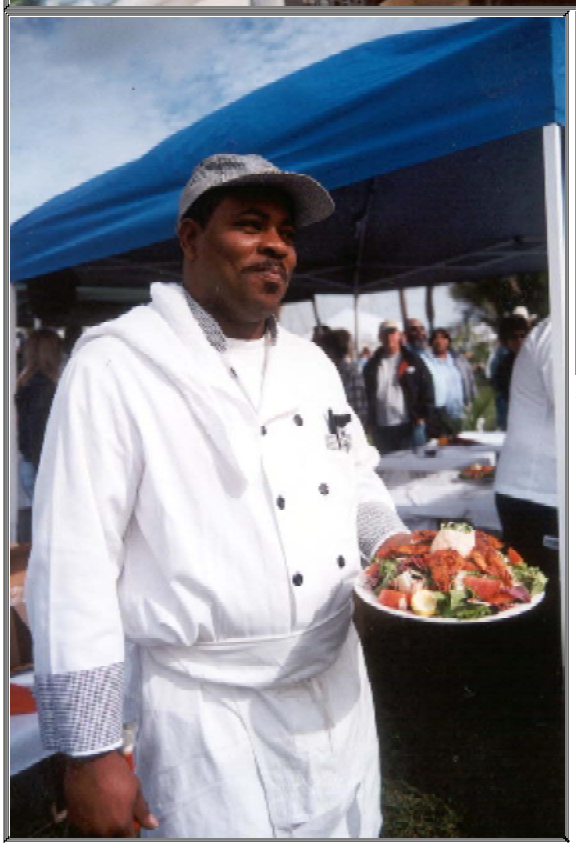
In a focus group of producers, marketers and marketing facilitators (Bills et al., 2000), at least 75% of respondents suggested that information and networking and producer marketing skills were problems for producers wanting to participate in direct marketing. Nearly 80% of respondents suggested that networking and contacts were very important sources of information on direct marketing. While much of the direct marketing literature suggests that growers use other growers as their information source, a direct relationship between growers and chefs is more likely to provide the specific information necessary to meet production and culinary requirements. Chefs need to know what products are available in which seasons and growers need to know what specialty products are needed and in what form. Both groups need to understand the underlying forces that control the other industry. In addition, the groups can work together to develop marketing/advertising plans to benefit from the consumer desire for local produce.

Within the five-county area around St. Lucie County, there are at least 25 small farmers with organic or conventional and greenhouse or field production of vegetable crops. One of the most common requests received by Cooperative Extension personnel from these small farmers is assistance with marketing. An initial meeting with the Treasure Coast Chefs' Association indicated that while many of the members were interesting in buying produce from local growers, only one chef had ever done so. Therefore, a program to promote the direct marketing of vegetables produced in the Treasure Coast region to regional up-scale restaurants was initiated.

At the first joint meeting of chefs and growers, an organic grower from Indian River County and the chef/owner of a Vero Beach restaurant discussed how they made initial contact and developed a lucrative marketing program that benefits both. This meeting also led to the creation of a contact list of chefs and growers with products available or desired and preferred methods for contact, to help ease the initial interaction of chef and grower.

However, the third side of the direct local marketing triangle is the consumer. According to a 2001 Consumer Report on Eating Share Trends (CREST), 9% of entrees served in restaurants were primarily comprised of vegetables (National Restaurant Association, 2002). CREST data also showed that vegetarian entrees accounted for 1.5 percent of entrees or main-dish salads. Most of the remaining entrees included at least one vegetable or small salad. In order to take advantage of this trend while also demonstrating that local produce is available at restaurants in the area, chefs from three well-known Fort Pierce restaurants participated in a cooking competition modeled after the popular Iron Chef television program and held at the Saturday morning Downtown Fort Pierce Farmers' Market on December 14. The Farmers' Market Association assisted with advertising and recruiting an MC and judges, and paid for a video crew to record the event. The competition was publicized in a newspaper editorial that mentioned producers, chefs, and the long standing relationship that the University of Florida Institute of Food and Agricultural Sciences has nurtured in St. Lucie County. The Farmers' Market also provided local advertising for several weeks in advance of the date. Judges included food writers from the regional newspapers, local restauranteurs, and an instructor from the Culinary Arts program at Indian River Community College. Approximately 300 people watched the chefs create, in 1 hour, an entrée plate using vegetables from six small farms in Indian River, St. Lucie and Okeechobee Counties, as well as locally produced shrimp, sauces and honey. The MC kept up a constant dialogue, interviewing chefs, judges and audience members, while the chefs worked the judges debated and the participating restaurants handed out their dinner menus.

The event resulted in a variety of anecdotal outcomes. In conversation with Extension personnel, three witnesses to the competition revealed that they dined at the winner's restaurant that night. Extension personnel have been invited to assist in organizing a rematch to be held at the local Grapefruit festival, while requests also surfaced from the audience and the Farmers' Market Association to organize several additional cooking competitions to be held at the Farmers' Market later in the season. These additional opportunities allow us to reinforce the connection between fresh local produce and up-scale restaurants and to continue to increase the number of chefs on the contact list. Perhaps the most interesting outcome from this event came from a local chef who was initially invited, but declined to participate. His question, "When is the local Iron Chef going to defend his title?"



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(Lamb and Ed Skvarch - Vegetarian 03-01)

COLLARD VARIETY TRIALS 2002, NFREC-QUINCY, FL

Collards are a relatively minor crop in north Florida, mainly being produced for local markets. Much of the production is by small or low income growers. Many of the small or low income growers are using some of the old open-pollinated varieties. This trial was conducted to compare some of the new hybrid varieties to older open-pollinated varieties.

Two replicated trials were conducted at the NFREC-Quincy on an Orangeburg loamy fine sand soil. Eight varieties were evaluated, 4 hybrids (H) and 4 open-pollinated (OP). Before transplanting Treflan 4 EC at 1.5 pts/a was incorporated. Total fertilizer applied was 120-80-80 lbs/a of N-P_2O_5-K_2O. Between row spacing was 3 feet and in-row spacing was 12 inches. Insecticides were applied as need to control worms. First crop was transplanted on 23 Jan and harvested on 17 April. Second crop was transplanted on 1 Oct and harvested on 3 Dec. Data collected included yield, average head weight and percentage of off types. Design was a randomized complete block with 4 replications.

Data is presented in Table 1. All 4 hybrid varieties produced significantly higher yields than the OP varieties with the first planting. 'Flash' (H) and 'Top Bunch' (H) also produced larger head weights than the OP varieties. 'Georgia' (OP) produced the highest percentage of off types and was significantly higher than all other varieties except 'Morris Heading' (OP) and 'Top Bunch'(H). With the second planting, 'Flash' (H), 'Blue Max' (H) and 'Top Bunch' (H) produced significantly higher yields than all other varieties. In addition, 'Heavi Crop' (H), 'Morris Heading' (OP) and 'Vates' (OP) produced significantly higher yields than 'Champion' (OP). Head weight followed a similar pattern to yield except 'Georgia' (OP) also produced larger heads than 'Champion' (OP). Percentage of off types did not differ but 'Georgia' (OP) again had the highest percentage.

'Georgia' is considered to be one of the industry standards, but in these trials, it ranked either last or next to last. One reason that the small or low income growers are slow to switch over is due to the cost of hybrid varieties, but increase in yield should make up this difference. Also the hybrids are much more uniform than the OP varieties.

Table 1. Collard Variety Trials 2002, NFREC, Quincy, FL.

Variety	Source	Transplanting Date					
		23 January 2002			10 October 2002		
		Yield (25 lb crates/a)	Head size (lb)	Off types (%)	Yield (25 lb crates/a)	Head size (lb)	Off types (%)
Flash (H)[z]	Sakata	2585 a[y]	4.6 a	2.1 b	1271 a	2.2 a	0.0 a
Blue Max (H)	Abbott & Cobb	2393 a	4.2 ab	2.1 b	1318 a	2.3 a	2.1 a
Top Bunch (H)	Sakata	2344 a	4.3 a	6.3 ab	1338 a	2.3 a	0.0 a
Heavi Crop (H)	Siegers	2335 a	4.1 ab	2.1 b	1119 b	2.0 b	2.1 a
Morris Heading (OP)	Sawan	1995 b	3.7 bc	6.3 ab	1099 b	1.9 b	2.1 a
Vates (OP)	Sawan	1885 b	3.3 c	2.1 b	1125 b	2.0 b	2.1 a
Champion (OP)	Sawan	1823 b	3.2 c	2.1 b	904 c	1.6 c	4.2 a
Georgia (OP)	Sawan	1739 b	3.5 c	12.5 a	1027 bc	1.9 b	6.2 a

[z] H = hybrid, OP = open pollinated.
[y] Mean separation by Duncan's Multiple Range Test, 5 % level.

(Olson - Vegetarian 03-01)

SLOWING VEGETABLE METABOLISM TO EXTEND QUALITY AND SHELF LIFE

During postharvest handling of fresh vegetables, the goal is to deliver a top-quality product to the consumer. However, consumers are usually located far from production areas and fresh vegetables are quite perishable. To extend shelf life and quality, postharvest handling systems must slow the metabolism of these perishable commodities.

Relationship between a commodity's shelf life and its rate of metabolism.
All the different chemical reactions that occur within a commodity are referred to as its metabolism. These reactions both create important chemical molecules (e.g., sugars or color pigments) and break down molecules to release energy. Respiration represents a key series of metabolic reactions whereby cells use oxygen to completely break down carbohydrates (e.g., sugars) and produce energy, carbon dioxide (CO_2), water and heat. Respiration supplies the energy for all the other metabolic reactions so its rate directly reflects the overall metabolic rate of the commodity.

Commodities age both in regards to time (hours, days, months, etc.) and physiologically (how fast metabolic processes are taking place). The relative shelf life of a commodity is tied more to its physiological age than to its temporal age. Thus, **by reducing the metabolism (respiration) of a commodity, its quality is maintained longer, resulting in extended shelf life and quality retention**.

Respiration rates vary depending on the commodity. For example, broccoli respires about 10 times more than tomatoes. The high-respiring commodities such as asparagus, broccoli, and sweetcorn have correspondingly shorter shelf lives compared with lower-respiring commodities such as onions and potatoes. Another byproduct of respiration is heat. Thus, higher-respiring commodities produce more heat that must be removed to prevent commodity warming.

Methods to slow respiration also increase shelf life.
Many factors influence how fast metabolic processes occur within commodities. Among the most important factors are temperature and oxygen (O_2) / CO_2 concentrations. Furthermore, any type of physical abuse (e.g., from drops, punctures, and abrasions) or stress (e.g., dehydration, pathogen attack, etc.) will also cause respiration to rise quickly and shelf life to be shortened.

Temperature management: Proper temperature management is the most effective way to slow metabolism and prolong shelf life of perishable horticultural commodities (Fig. 1). As a general rule-of-thumb, for every 18°F (10°C) increase in temperature, respiration increases 2 to 3 fold with a corresponding decrease in shelf life. For example, sweet peppers will respire about 3 times faster and have only about a third of the shelf life when held at 68°F compared to holding at 50°F. Use of temperature to reduce respiration also applies to how fast the commodity is cooled after harvest; for some commodities, an hour at 90°F can equal a week at 32°F. Other benefits of rapid cooling and maintaining these temperatures throughout the postharvest life of a commodity include slowing the growth of decay pathogens and reducing water loss.

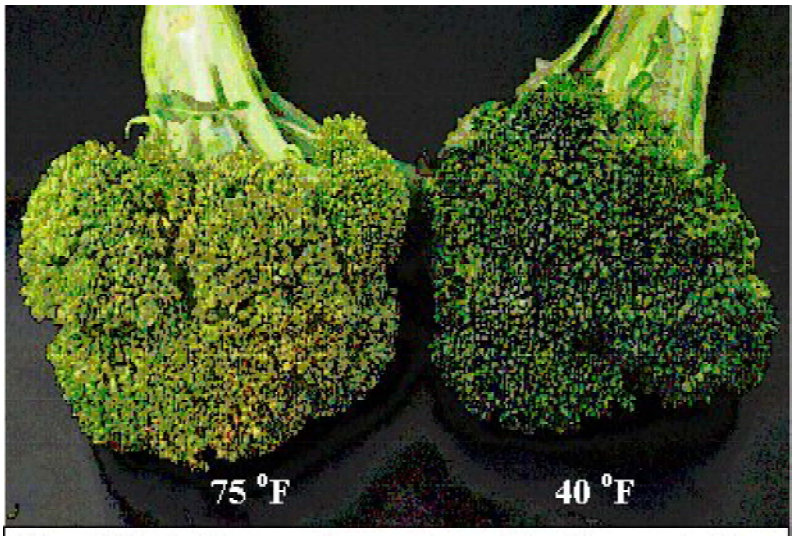

Fig. 1 Effect of temperature on the quality of broccoli after just 48 h of storage at either room temperature (75°F) or in the refrigerator (40°F).

Never expose tissue to temperatures below freezing because freezing kills the tissue. In addition, some commodities such as tomatoes, cucumbers, peppers, etc. are chilling sensitive and are injured by exposure to low but non-freezing temperatures. **For maximum quality and shelf life, always store commodities at the lowest temperature that does not result in chilling or freezing injury**.

Oxygen and carbon dioxide concentrations: Oxygen and CO_2 are key gasses involved in respiration and other metabolic processes within commodities. In general, reducing O_2 levels and/or increasing CO_2 levels around a commodity (called modified or controlled atmospheres) reduces its rate of respiration. Each commodity has its own level of tolerance to changes in O_2 and CO_2 levels before injury occurs and these levels change depending on factors such as cultivar, preharvest growing conditions, and postharvest treatments. Because plant tissues consume O_2 and give off CO_2, simply sealing a commodity in an airtight container will begin to lower the O_2 and raise the CO_2 levels within the container. Modified or controlled atmospheres are commonly used for different commodities with systems ranging from large, specially designed apple and sweet onion storage facilities, to sealed packages of fresh-cut salad mixes. Even protective packaging (wraps) and commercially applied waxes can generate modified atmospheres around and within commodities that may or may not be intentional. Though modified or controlled atmospheres can be an effective means of reducing respiration and increasing shelf life, they are not a replacement for good temperature management and they must be managed to prevent O_2 or CO_2 levels from reaching levels that cause injury.

Other gasses can also influence commodity respiration rates. For example, ethylene is a natural, gaseous, plant hormone. Exposure to ethylene hastens ripening, increases the respiration rate and shortens the shelf life of fresh horticultural commodities. Many commercial procedures work to either add (e.g., to promote ripening) or exclude ethylene from the environment.

Recommended storage and shipping temperatures and O_2 and/or CO_2 levels for specific crops can be found through various sources and online such as at the UC Davis "Postharvest Product Facts" website (http://postharvest.ucdavis.edu/Producefacts/index.shtml) and in the University of Florida EDIS publication, "Handling, Cooling and Sanitation Techniques for Maintaining Postharvest Quality" (http://edis.ifas.ufl.edu/CV115). Drawing on experts throughout the world, the USDA is revising their much-anticipated Agriculture Handbook Number 66 entitled, "The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks." A draft version of the handbook can be accessed on-line at http://www.ba.ars.usda.gov/hb66/.

(Ritenour, Sargent and Brecht - Vegetarian 03-01)

Extension Vegetable Crops Specialists

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Chad Hutchinson Assistant Professor, vegetable production	**Eric Simonne** Assistant Professor, vegetable nutrition
Elizabeth M. Lamb *Assistant Professor, production*	***William M. Stall*** *Professor **and editor**, weed control*
Yuncong Li *Assistant Professor, soils*	***James M. Stephens*** *(retired)* *Professor, vegetable gardening*
Donald N. Maynard *Professor, varieties*	***Charles S. Vavrina*** *Professor, transplants*
Stephen M. Olson *Professor, small farms*	***James M. White*** *Associate Professor, organic farming*

Mark A. Ritenour
Assistant Professor, postharvest

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Gulf Coast Research and Education Center - Dover

This page is maintained by Susie Futch.... if you have any questions or comments, contact me at zsf@mail.ifas.ufl.edu