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TO: COUNTY EXTENSION DIRECTORS AND AGENTS (VEGETABLE AND HORTICULTURE) AND OTHERS INTERESTED IN VEGETABLE CROPS IN FLORIDA

FROM: J. M. Stephens, Associate Professor and Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 79-11

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THE VEGETARIAN NEWSLETTER

I. NOTES OF INTEREST

A. Florida 4-H Horticulturists Win Top Honors

Our congratulations to the Marion County 4-H team for placing 2nd in the national horticultural judging, identification, and information contest, October 27, in St. Louis, during the National Junior Horticultural Association Convention. Teresa Piotrowski was the high individual in the nation. Marion County also entered the Open Division of the Contest and placed first in the nation. Congratulations also are extended to Liz Olsen, Brevard County 4-Her who won first place in the National Horticulture Demonstrations. St. Johns County 4-Hers also participated in the events. The Florida delegation was led by Susan Gray, Extension Vegetable Specialist, Julian Sauls, Extension Fruit Crops Specialist, Bob Renner, Marion County 4-H Agent, and Nettie R. Brown, St. Johns County 4-H Coordinator.

(Stephens)

B. Visiting Professor To Help With "Master Gardening"

Dr. J. S. "Joe" Vandemark, retired Illinois Extension Vegetable Specialist is a visiting professor in our department until January 1. Joe will be assisting with the establishment of a "Master Gardening" program in Florida similar to the one he had so much success with in Illinois.

(Stephens)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Strawberry Production in Florida – A Success Story

An almost unbelievable 800% increase in average strawberry yields over the past 20 years in Florida is a success story worth telling. Yields have increased from less than 2,000 pounds in the mid-fifties to 15,000-pound average per acre, presently. Yields in the 30- to 40,000-pound range are common among the better growers now. Groups and individuals attacking government-sponsored research and extension should take note. Their claim is that these agencies "work for the big operators only". Nothing could be further from the truth in Florida strawberry production as the vast majority of Florida growers are small, independent operators.

This phenomenal success story is a tribute to the American system. The developers and manufacturers of plastic, fertilizers, pesticides, and other supplies made their contributions. Government sponsored research and extension workers made their contribution in the development of new varieties, adaption of plastic-mulch culture, better liming, fertilization, and pest control practices. Least of all is the ingenuity of the grower.
Today, the effort is still very intensive. Research and extension workers are striving to develop ways and means of producing strawberry transplants economically on every farm. This, in itself, could mean thousands of dollars in savings annually to many of our strawberry growers.

Another effort is worthy of note. Strawberries are being promoted as a natural for "U-pick" operations. This type of enterprise can be a boon to small, under-capitalized, part-time farmers all over the state of Florida as well as the consuming public. It permits them to buy fresh, high-quality strawberries at reasonable prices while enjoying the outdoors. Similar stories, possibly not as dramatic as the strawberry story, could be told for a number of other vegetable crops in Florida.

(Montelaro)

B. Inside Florida's Worst Weeds

While inspecting vegetable fields for proper plant growth, insect or disease outbreaks, fertilizer salt accumulation, adequate moisture, or a multitude of other crop problems, certain weeds are often recognized as dominant species in most fields. These weeds include pigweed (Amaranthus sp.), purslane (Portulaca oleracea), nutsedge (Cyperus rotundus), bermudagrass (Cynodon dactylon), goosegrass (Eleusine indica), crabgrass (Digitaria sp.) and many others.

Externally, these weeds appear more competitive due to their height, leaf succulence for conserving moisture, rapidity of growth and flowering, or perhaps their perennial nature. However, these weeds and other subtropical and tropical weed species and crops such as corn, sorghum and sugarcane are more competitive in their internal physiology or the way carbon dioxide (CO2) is fixed to form a 4-carbon sugar. Instead of fixing CO2 into a 3-carbon sugar in the mesophyll cells of C3 plants, these C4 plants form a 4-carbon sugar in special mesophyll cells that surround both the bundle sheath, and xylem and phloem tissue in the leaves. This special physiology and morphological arrangement allows these plants to produce at higher temperatures and light intensities, and with less water and nitrogen fertilizer.

In Florida, about half of the most troublesome or common weeds and most of the world's most troublesome weeds listed in the Vegetarian Newsletter, 78-6 are C4 plants. Because Florida's climatic conditions are especially conducive for the growth and competition of these C4 weeds, growers need to develop year-round cropping systems that suppress the reproduction and growth of the most troublesome weeds in their fields. Cropping systems that involve competitive crop rotations, cover crops, herbicides and crop management practices can reduce the growth and resulting crop competition from these species. For more information, a readable article by J. R. Ehleringer appeared in Hort Science, 14(3): 217-222, entitled "Photosynthesis and Photorespiration: Biochemistry, Physiology, and Ecological Implications". County Agents can request copies from the Extension Vegetable Crops faculty.

(William)
A. Per Capita Vegetable Consumption - 1978*

Per capita use of fresh market vegetables increased slightly in 1978 to 103.0 pounds, up from 101.4 in 1977. (Home garden vegetable consumption and potato crops are excluded).

Excluding potatoes, the most popular fresh vegetables in 1978 were lettuce, at 26.6 pounds per capita annually; tomatoes, at 13.4 pounds; and onions at 10.1 pounds.

Watermelon consumption decreased in 1978 to 13.2 pounds per capita, down from 13.5 in 1977.

Domestic production of 19 major crops increased slightly from 1977. Imports of fresh vegetables, largely from Mexico, were record large in 1978, moving up to 18.5 million cwt. or 8% of our total supply, if one includes the rough estimate for commercial production of minor vegetables.

(Showalter)

*The PMA Report, Volume 11, Number 16
B. Developing County Extension Vegetable Marketing Programs: Product Quality, Marketing Losses, and Market Reputation

One of the first steps that can be effectively used in a County Extension vegetable marketing program is to help growers and shippers understand the importance of the quality of their packed products, the relationship of that quality to marketing losses and their market reputation. Types of "pack quality" problems are (1) packing too low or sometimes rarely too high a quality for a specific market or changing marketing conditions; (2) excessive variability of quality within packs; (3) lack of understanding of the handling requirements needed for different levels of packed quality (lower quality products need more careful handling than higher quality ones); (4) lack of understanding by growers and shippers of the quality of products received, handled, and sold in various wholesale and retail marketing levels. These problems generally occur because growers and/or shippers do not know the quality or condition of their own products at the time they are either sold or discarded in retail stores. This is generally the case with small volume growers and it is not uncommon with large volume, commercial growers and shippers. However, the underlying causes differ for each.

It is difficult, but possible and generally worthwhile for County Agents to help improve the packed quality of growers' or shippers' products. Here are some ideas to consider if you want to try. To be effective we need growers or shippers who really want help, or who need help but don't recognize it.

Arrange a visit to a nearby terminal market and some retail markets to observe the growers' own products in these channels. Encourage them to ask market handlers about quality problems experienced. You may have to go with individual or a few friendly growers on initial marketing trips.

Encourage growers or shippers to keep a packed sample of an occasional lot in their packing house, storage room, or garage and to examine the products after a reasonable simulated distribution and marketing period. Only commercially packed samples should be kept to be representative of lots shipped to markets. Quality deterioration in the unshipped samples will generally approximate that in shipped lots except for the influence of transit factors.

Hold a quality judging of commercially packed samples from several shippers. This works when you have several, or better yet, most growers or shippers in a district who are concerned about market quality. I have found the following technique to be effective.

1. Meet with your potential cooperators either individually or collectively to explain your plan (collecting of commercially packed samples, storage, judging).

2. Select 1 or 2 commercially packed samples directly from the line or packing house of each cooperator on the prearranged day. Be sure that you select the samples, that all are of the same product - sizes, date of harvest, and grade (i.e. Fancy, US No. 1, US No. 2, etc.) used for the product.

3. Take the collected samples to your office, or a prearranged constant temperature room (e.g. at a nearby IFAS - AREC center) and store the samples for the agreed upon (with your cooperators) simulated transit and marketing period.
4. Completely mask all identifications on each container and assign a randomly selected code number to the sample. Because some growers or shippers may pack in specific styles of shipping containers it may be necessary to transfer all samples to new containers of the same style. You can normally get samples from commercial container suppliers. Be sure to keep a record of the code numbers and their respective samples.

5. Prepare a market quality evaluation sheet that includes categories for overall visual quality and for each of the major defects influencing the market quality of that product. Refer to USDA grade standards for specific crops being judged. You might contact a local USDA supervising inspector in setting up judging sheets.

6. Conduct the judging meeting. Ask all cooperating growers and shippers to participate. Have each participant rate each sample on the evaluation (rating) sheet. The samples will be identified only by code numbers so there will be no danger of embarrassment to any of the cooperators. After all evaluations are completed you might ask for comments regarding any of the samples.

7. Analyze the resulting data from the evaluation sheets, prepare a summary report for the cooperators. Let each cooperator know the identity of their sample code number(s) only.

After growers or shippers have seen how their products compare with the same product(s) from other suppliers they can determine the causes of their market quality problems (if any). The cause of packing too low or excessively variable quality can generally be determined. Causes are (1) failure to understand or use grades and standards; (2) the owner or manager does not realize the quality being packed by packers (Yes, this happens.) (3) variation in adherence to grades and standards according to supply and demand conditions prevailing; (4) deception in packing; (5) unknowingly packing otherwise good but mechanically damaged products. The damage caused by rough handling in harvesting and packinghouse operations is not often visible at time of packing but definitely is when the products are examined at markets. I will discuss damage caused by rough handling in a future Vegetarian issue.

County Agents can help interested growers and shippers to market the quality of products needed by marketing outlets. It takes patience and tactfullness, but it can be rewarding.

(Kasmire)*

*Robert F. Kasmire is Visiting Adjunct Professor and Extension Vegetable Specialist, Davis, California.
THE VEGETARIAN NEWSLETTER

IV. VEGETABLE GARDENING

A. Poor Pollination and Other Causes of Misshapen Strawberries

Quite often a gardener will observe that strawberry plants are healthy and productive, but the berries are mildly or extremely deformed. One of the main causes of misshapen strawberries is poor pollination. Although the strawberry is dependent upon good pollination for good yields of uniform fruits, pollination is seldom considered due to the fact that most varieties set a reasonable amount of fruit with no outside help.

The strawberry is considered to be self-pollinating. However, studies have shown that bees also play a role. To better understand how the strawberry is pollinated, let's take a look at the flower. Inside the ring of white petals, the central portion contains the female reproductive structures consisting of a cone-shaped central receptacle covered with 50 to 500 individual pistils. The receptacle enlarges into a strawberry fruit after pollination and fertilization. Each fertilized ovary at the base of each pistil develops into a seed, called an achene. These seeds (achenes) dot the outside surface of the mature strawberry.

When most of the stigmas (receptive surfaces of the pistils) receive pollen, a well-developed fruit results. Without sufficient pollination, the berry is smaller than normal and frequently deformed due to the irregular expansion of the receptacle. The severity of the deformity is directly related to the number of unpollinated or destroyed pistils.

Pollen is produced in the bright yellow anthers, which are part of the stamens that surround the receptacle in a narrow ring. When a strawberry flower opens, the stigmas are immediately receptive to pollination. A little later, the anthers dry and split open, propelling their pollen onto the nearby stigmas. The wind helps to spread the pollen within and between flowers. The primary flowers that bloom first are sometimes shy of pollen. Their unpollinated pistils remain receptive up to a week in cool weather. Insect visits are of great value at this time in bringing pollen from other flowers. Furthermore, varieties differ in their flower structure. Some have tall stamens which contribute to self-pollination. Others have short stamens, making help from bees more useful. After pollination, pistils that were yellow-green become darker. Mottled coloration rather than a uniform darkening usually indicates incomplete pollination.

Honey bees are the primary insect pollinators of strawberry blossoms. A lack of bees around strawberries at blooming time results in reduced yields (perhaps up to 25%) and deformed fruits. In Michigan studies, the greatest benefit from bee pollinators came during the primary (first) blooming period.

Not all deformities of strawberries are due to lack of pollination. Frost injury is one of the main causes in Florida gardens. Frost may injure the buds, the blossoms, or developing fruit. When all of the pistils are killed, the center of the flower turns black and, of course, there is no berry. If some pistils survive the frost, a deformed berry develops. The extent of the deformity is dependent upon the number of pistils killed. If frost injury occurs to the developing berry, the altered growth results in a misshapen fruit.

A very frequent cause of deformed berries is insect injury. In Florida, the two most prevalent culprits are pameras (Pachybrachius bilobata) and flower thrips (Frankliniella cephalica). Pameras belong to the chinch bug family. Pameras cause
"buttons", which are berries in the early stage of development that cease to grow and are hard, dry, and brown. Flower thrips are found in large numbers in the blossoms where they feed on stamens, pistils, and young berries. The blossom may drop, or the developing berry may be hard, deformed, brown and fail to grow.

Another characteristic of insect damage to the pistillate area of the blossom is the concentration of seeds at the apical portion of the berries. This "apical seediness" is deformity enough to cause a berry to be unacceptable.

To avoid these deformity problems, gardeners should (a) insure a good supply of bees where feasible, (b) spray for control of the insects mentioned, (c) use a spray program that is noninjurious to bees, i.e. spray in late afternoon, and (d) use frost control measures such as covering the blossoming berry plants during cold spells.

(Stephens)

B. Know Your Minor Vegetables - 'Sugar Snap' Peas

'Sugar Snap' is a 1979 variety (cultivar) introduction of an edible-podded snap pea (snow pea). 'Sugar Snap' is mentioned here due to its popularity after having won a Gold Medal award in the 1979 All-American Selections Trials. Judges at twenty-seven official All-American Selections vegetable trials in all corners of the USA and southern Canada grew and evaluated this and other varieties. It was deemed the best edible-podded pea tested.

Seeds were available in the spring of 1979, and based on results of gardeners who tried it, 'Sugar Snap' passed its test in Florida.

An edible-podded pea (Pisum sativum var. saccharatum) is similar to an ordinary garden (English) pea (Pisum sativum). The English pea pod is lined on the inside with a thin, but hard and tough membrane which contracts as the pod ripens and dries, causing the pod to open, twist, and expel its seeds. In contrast, pods of the edible podded pea, including 'Sugar Snap', do not have the membrane and do not open when ripe. They are soft, tender and edible.

'Sugar Snap' is so crisp, sweet, and succulent that it may be snapped into pieces and mixed into salads or eaten whole as an appetizer. Like other snow peas, it also may be stir-fried or steamed.

'Sugar Snap' has a distinctive appearance and flavor. The pods are round and reach a length of 2 1/2 to 3 inches at maturity. Pod walls are rather thick in comparison with other edible-podded peas. Mature pods require "stringing", which is the removal of a membranous thread-like string running the length of the pod on top and bottom. This is similar to the "string" in the pods of older bean varieties that gave them the name "string beans". Occasionally there will be overgrown, fibrous pods which may be shelled and combined with other more tender edible pods.

'Sugar Snap' has a vining plant character. Plants may reach a height of 6 feet or more, but usually are about 4 feet. A trellis or other support system is required, very much as for pole beans. Normally, about 70-75 days are required from seeding to edible maturity.
'Sugar Snap' is a cool season vegetable, best grown here in Florida from plantings in September through March. It has been reported to recover from frost and cold down to 20°F. Unlike garden peas, however, snow peas have a wider adaptation and tolerate higher temperatures than garden peas. Florida gardeners who planted it in March were satisfied with the results, but did note some drop-off in pod numbers due to the higher temperatures of late spring.

Gardeners keenly aware of the nutritional aspects of the vegetables they grow will be delighted with 'Sugar Snap' Pea! The peas are nutritious and filling, but are not as high in total carbohydrates and fats as green shelled garden peas. The crunchy pods contribute mostly water and vitamins.

Over-cooking the pods will make them come apart. They should be lightly steamed or quickly fried in oil to retain a touch of crispness. 'Sugar Snap' may be frozen but should not be canned due to high temperatures destroying the structure of the pods.

Several recipes for 'Sugar Snap' peas have been developed by a noted food authority and author of best selling cookbooks. They may be used in a Caesar salad, omelet, soup, beef stew, or jello salad. By themselves, they can be eaten along with hamburger as a substitute for french fries, stuffed, batterfried, or made into cocktail rolls.

Florida gardeners should have no trouble finding seeds, as most major seed catalogs will list them.

(Stephens)