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TO: COUNTY EXTENSION DIRECTORS AND AGENTS (VEGETABLE AND HORTICULTURE)

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VEGETARIAN NEWSLETTER 81-7/8

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS, STATE OF FLORIDA, IFAS, UNIVERSITY OF FLORIDA, U.S. DEPARTMENT OF AGRICULTURE, AND BOARDS OF COUNTY COMMISSIONERS COOPERATING
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I. NOTES OF INTEREST

A. New Vegetable Crops Faculty

Three new faculty members have recently joined the IFAS Vegetable Crops Faculty.

Dr. J. W. Scott was appointed as Assistant Professor at the Bradenton Agricultural Research and Education Center. Jay is responsible for the tomato breeding program and will coordinate the improvement and evaluation of tomato varieties for Florida. He was born in Rochester, N.Y., received his BS and MS from Michigan State University and Ph.D. from Ohio State University. He has most recently been in charge of the greenhouse tomato breeding program at Ohio State.

Dr. S. M. Olson was appointed as Assistant Professor at the Quincy Agricultural Research and Education Center. Steve has research and extension responsibilities for the culture and management of vegetables in West Florida. He was born in Stillwater, MN, received his BS at the Citadel, and MS and Ph.D. at Clemson University.

Ann M. McDonald was appointed as Visiting Extension Agent I in the Vegetable Crops Department. She is responsible for coordination of the Master Gardener Program and youth activities in vegetable crops. Ann received her BS from the University of Florida.

We're pleased to welcome these new additions to the IFAS Vegetable Crops Team.

(Maynard)

B. New Publications

1. Watermelon Field Day, ARC Research Report WC 81-1 is available from the Leesburg Agricultural Research Center, Leesburg, FL 32748.
2. Vegetable Field Day, VC Research Report 81-3 is available from the Vegetable Crops Department, University of Florida, Gainesville, FL 32611.

3. Vegetable Field Day, AREC Research Report GC 81-3 is available from the Bradenton Agricultural Research and Education Center, Bradenton, FL 33508.

4. Non-staked Tomato Variety Trial Results, Immokalee ARC Research Report SF 81-2 by Paul H. Everett is available from the Immokalee ARC, Rt. 1 Box 26, Immokalee, FL 33934.

(Maynard)

5. Florida tomato growers may be interested in reading "U.S. Winter Fresh Tomato Price and Quantity Projections for 1985," Report No. ESS-4, by G. A. Zepp. The author projects winter fresh tomato prices, consumption, and supplies for 1985 under rapid inflation, slower inflation and most likely situations. He also estimates the effects of new Caribbean-area imports and changes in current import duties. Free copies are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

(Sherman)

II. COMMERCIAL VEGETABLE PRODUCTION.

A. Weed Control by Contact Applicators

The application of non-selective systemic herbicides (such as glyphosate) to weeds infesting growing fields has been tried for several years. Several types of application equipment have been developed and a few are in use in agronomic crops in the mid-west and soybean areas of the south.

Machines for this type of application were detailed at the Florida Conference on Pesticide Application Technology sponsored by IFAS in March of this year. A discussion on a
few of these are also outlined by Wills, G.D. and C.G. McWhorter, 1981. Developments in post-emergence herbicide applicators. Outlook on Agriculture 10(7):337-341.

This type of herbicide application may have use under certain conditions in the production of some vegetables in Florida.

The most familiar type of contact applicator is the rope wick applicator. Although modifications of the rope wick and other types of applicators such as roller applicators, and carpet wipers are to be found, they are here briefly described as to type only.

Rope Wick Applicator.

Most rope wick applicators are constructed of PVC pipe, with two rows of braided nylon rope with both ends inserted into the pipe at specific distances.

The herbicide is supplied to the PVC pipe, which acts as a reservoir. The herbicide moves into the rope from the pipe by capillarity similarly to a wick of a lamp.

At the present time most rope wick applicators apply herbicides to weeds growing above the crop. Contact to these weeds is made by keeping the herbicides and the wick just above the crop.

The rope wick applicators are light weight, easy to build, and relatively inexpensive. In many cases, however, the slow wicking nature of the ropes plus applying herbicide to one side of the weed makes control uneven or reapplication in the opposite direction necessary. The speed of travel for application also must be slow. There is no splash problems with the rope wick and the total amount of herbicide per acre used is greatly reduced.
Roller Applicators.

Roller applicators are constructed of a metal tube covered with an absorbing pad of carpet. The roller revolves counter-clockwise to the direction of travel. The herbicide solution is applied to the carpet through plastic tubes spaced at short intervals above the carpet.

As with the rope wick, the roller applicator applies herbicides to weeds growing taller than the crop.

The roller applicator wets weeds better than the rope wick applicator but can drip herbicides onto the crop if not adjusted properly.

Carpet Wipers.

The carpet wipers usually consist of a shag carpet attached face down or on an angle and covered with a hood. Herbicides are applied to the back of the carpet through nozzles positioned inside the hood. A few models have recirculating pumps to return the excess herbicide to the tank.

The carpet wiper can also be adapted to cultivators and used to place herbicides on low growing weeds in close proximity and/or underneath the canopy of many crops.

Two other types of applicators that may also be of interest are the recirculating sprayers and high voltage discharge devices used as weed killers.

Recirculating Sprayers.

Recirculating sprayers (RCS) utilize nozzles arranged in such a way that a trap can catch the sprayed herbicide material not deposited on the weeds.
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There are several types on the market, from one row to broadcast. In most cases the nozzels are arranged horizontally with a pump in the trap recirculating the unused herbicide back into the original tank. Although the rate of travel through the field can be much faster than other types, splashing or dripping onto crop plants can be a problem.

High Voltage Discharge Devises

Lasco Inc., has demonstrated a machine in Florida that kills weeds by electrical shock.

This particular machine generated 15,000 volts using the PTO of the tractor to power the generator. When a plant comes into contact with the conducting unit, an electrical charge grounds through the plant rupturing its cells.

Here, as in many other contact type of applicators, the control is to weeds growing above the crop.

(Stall)

B. Some Points To Consider In The Development Of Crop Water Budgets: Tomatoes

A serious attempt to develop crop water budgets by several of the water management districts is now underway. County Extension Agents, State Specialists, and University Research Personnel are being asked for specific information. The answers given should be consistent, as accurate as current information available will allow, and above all realistic.

The realistic input requires an intimate knowledge of all the water requiring periods in production, protection, harvesting and handling of any given crop for any planting date. Omission of water needs for any operation could result in erroneous water allocation and severe stress in the crop management enterprise.
An example of a realistic water budget for tomato production may be of interest.

1. First, we must realize that rainfall should not be programmed into the budget. Zero based water budgets are realistic and valid. Farmers do not waste money pumping water if there is adequate rainfall. Just think of what would have happened this year if the budget system was operational and based on expected rainfall.

2. Adequate soil moisture must be available during land preparation, as well as for planting and growing the crop to harvest. In sandy soils, a soil moisture of 10% is needed 5 to 6 weeks before transplanting to allow for effective bed formation; fumigants and herbicides to react; and added nutrients and lime to modify the soil solution.

Average day evaporative pan readings for a fall crop may range from 0.38 down to 0.20 inches per day, and spring crop from 0.11 up to 0.40 inches per day. For the 4 to 6 week land preparation period (average 0.24 inches per day) a total of 6.7 to 10.1 inches of water may be needed depending on the planting date, amount of land in beds, shape of the field, and how dry the soil was initially.

3. Water must be available for transplant production during the field preparation time, too. Some growers purchase seedlings, but those who grow their own must program this water need.

To grow plants for an acre of tomatoes (about 2500 - 3000 transplants) about 0.1 of an acre inch of water would be needed for watering, adding nutrients, and spraying of pesticides.

4. Water needs for crop production may seem insignificant but should be counted. Herbicide sprays (usually 1 pre-plant, and 1 post plant) require from 30 to 70 gallons per acre. A non-selective spray for the row middles may be used 3 times per season at 100 gal/acre. Insecticides, fungicides, and bactericides are usually put on with about 150
gal/acre and the number can vary from a 5 to 10 day frequency depending on weather conditions, disease and insect population pressure, and amount of foliage.

For the entire protection program, water needs range for 1.0 to 1.5 acre inches per acre of crop.

5. Water needs to grow the crop depend on when the crop is transplanted, type of bed and mulch used, weather conditions during growth, shape of the field, amount of runoff, percolation, and efficiency of the irrigation system. An evapotranspiration figure of 23 acre inches has been calculated for August set tomatoes for SW Florida, 21.7 for South Florida and 21.0 for Central Florida. To deliver this 21 inches by seep (30 to 50% efficient) 40 to 70 acre inches would be needed. When effective drip technology can be used with tomatoes (80 to 95% efficient), 22 to 26 acre inches would be needed. Mulching helps to reduce water loss and increases irrigation efficiency. These figures assume that the water is piped to the field from the water source with little or no conveyance loss.

In summary the water required to grow and protect the crop up through harvest could range from 47.8 to 81.7 inches of water per 100 day tomato season. The water needed to receive and wash the harvested fruit should also be charged to some budget as this amount can be considerable. This brief article can only point out the fallacy of presenting the water management districts with a simple number that would be good for all seasons, soil types, cropping patterns, field configurations, etc. A realistic figure can be generated from specific situations that would encourage wise use of water by the farmer, be helpful in the allocation of water by the planners, and help to provide consumers with a steady supply of food and water for our daily life.

(Marlowe)
III. PESTICIDE UPDATE

A. Fungicide Treatment Of Bean Seed

Bean seed can be treated prior to planting with numerous seed treatment fungicides. The purpose of such a treatment is to reduce seed rot and seedling blight caused by soil borne fungi after planting. Seed treatment is not a substitute for healthy seed; rather it should be used in conjunction with healthy, certified seed.

Because most seed treatment fungicides (e.g. captan, thiram, maneb etc.) are not systemic, they contribute to better initial stands and yields by reducing seed rots and preemergent seedling blights. A systemic seed treatment fungicide contributes to better stands by reducing post-emergence seedling blights and debilitative effects of non lethal stem lesions in addition to reducing seed rots and preemergent seedling blights.

Rhizoctonia solani, a common soil fungus, causes seed rot, seedling blight and mid to late season debilitative effects on beans and numerous other crops (see Plant Pathology Fact Sheet No. 1). For example, on soybeans five replicated large scale farm tests conducted in Florida in 1979 and 1980 demonstrated a 42.2% reduction of plants with discrete stem lesions caused by Rhizoctonia solani on young plants (less than 30 days old) and a 9.2% increase in yield when Demonson 65W, a systemic seed treatment fungicide, was compared to no seed treatment. The return on the $1.25/acre cost for seed treatment averaged $18/acre. Although such data is not available on vegetable beans the value of the crop is such the returns should be higher assuming that the disease situation is similar. From numerous observations made in Florida on sandy, calcareous and organic soils, Rhizoctonia solani, by itself or in conjunction with other soil pathogens, is a major parasitic fungus on Florida grown vegetable beans.

Demonson 65W is currently labelled for use on beans (which means all kinds of vegetable beans and southern peas) as a slurry or dust treatment of seed in Florida.

(Kucharek)
Extension Plant Pathologist
If the home garden is properly managed it will supply a never-ending succession of vegetables each day of the year. This does not mean, of course, that the vegetables will be fresh all the time. Every gardener should be adept at the various methods of extending the harvest through nonproductive times. One of the oldest methods of preparing vegetables for storing is evaporating, or drying.

Drying was popular as a means of preserving vegetables at the turn of the century and earlier. It is becoming popular again today due to the increasing costs of other energy-dependent methods such as canning, refrigeration, and freezing.

Dried vegetables make very tasty ready-to-eat snacks. For example, evaporated carrot cubes rival any of the dried fruits as a snack item. In fact, given the choice, youngsters and older "kids" alike might prefer the dried veggies to candy and other less nutritious snacks.

After soaking in water, rehydrated vegetables can be used in favorite recipes for any number of dishes. Some authorities suggest however, that the vitamin content particularly vitamin C, is reduced with drying, along with change in color, shape, and taste.

Almost any vegetable can be dried, although not as successfully as many of the herbs and fruits. Peas, corn, beans and strawberries can be evaporated in a few hours. Dried pumpkins and squash make just as good pies as fresh ones, according to many cooks. Also onions, okra, pepper, greens, and tomatoes are just some of the vegetables which may be dried. Even tomato paste, first cooked down to a very thick consistency, may be dried. Once the paste is spread on a drying pan, it is dried until leathery. When water is added, it is just like fresh tomato paste.
Most vegetables need to be blanched before drying. Blanching saves some of the vitamins, sets color, hastens drying by relaxing tissues, prevents flavor loss, and improves reconstitution during cooking.

Drying requires a method of heating the vegetable to evaporate the moisture, and a means of removing the water vapor formed. Some of the popular methods used are solar drying, oven drying, and dehydrator cabinet drying. Instructions and plans for the various methods are usually available from local and state Extension Service Offices.

Simple Solar Device:

An inexpensive, easy-to-build solar dryer has been designed by SEA workers C.J. Wagner and R.L. Coleman, as reported in Agricultural Research, April 1981. Detailed instructions are available by writing to the U.S. Citrus and Subtropical Products Laboratory, P.O. Box 1909, Winter Haven, Fl. 33880.

The energy-efficient dryer may be constructed for less than $20 using simple handtools such as a hammer, drill, pliers, clamps, and a handsaw, and materials such as string, aluminum foil, glue, and framing wood.

The unique feature of the dryer is a low-cost, curved focusing surface that concentrates radiation from the sun just enough to dry foods but not enough to overheat or burn them. The focusing surface is made of household aluminum foil drawn over strings held taut by a framework of laminated wood curves. The framework is designed to focus 16 sq. ft. of incoming solar radiation onto 5.3 sq. ft. of drying surface.

The dryer is covered with polyethylene (clear plastic) with slit openings arranged at the top and bottom for airflow control. The plastic also keeps out dust, flies, and other pests.

A final plus for dried vegetables is that they occupy but very little space, as most of the water which gives them bulk has been removed.
Before storing solar dried vegetables, it is wise to rid them of possible insect infestation. This is accomplished by heating dried food at 150°F for 30 minutes in the oven, or to freeze for 48 hours. Both of these practices remove some of the energy savings rendered by solar drying, yet are necessary where contamination is suspected. Store in sealed, insect proof containers in a cool, dry, dark place.

(Stephens)

B. Know Your Minor Vegetables - Potato Onion

The potato onion, Allium cepa L. (Aggregatum group), is also known as multiplier onion. This type of onion more frequently forms a cluster of underground bulbs of irregular shape than a single round bulb. One of the larger bulbs might be from 2 to over 3 inches in diameter and about 2 inches thick. The skin is thick and of a coppery yellow color.

After removing outer scales, bulbs may be used for various cooked dishes, and green immature onions may be used similarly to regular green onions.

The potato onion rarely produces seeds, so it is propagated by the small bulblets or bulbs which are formed underground. When a strong bulb is planted, it forms a number of smaller bulblets each with a leafy top. However, a weak bulb generally grows into a single large bulb.

The culture is similar to that for regular onions. Since little is known about the plant's sensitivity to day-length for bulbing initiation, it is suggested that bulbs be planted as for green onions during the period September through March.

(Stephens)