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I. NOTES OF INTEREST

A. New Publications

Vegetable Variety Trial Results in Florida for 1982, Experiment Station Circular S-306 is available from IFAS Publication, Bldg. 440, University of Florida, Gainesville, 32611.

B. Vegetable Crops Calendar


2. January 26, 4pm-9pm North Florida Watermelon Meeting, Newberry High School Auditorium.

3. February 8-10 - Florida is hosting Weed Science Society of America at the Hyatt Regency Hotel, Miami.


5. April 18, 1984 - 1 pm, Immokalee Field Day Immokalee ARC.


7. September 6 - Tomato Institute, Marriott Hotel, Marco Island.

II. PESTICIDE UPDATE

A. Sonalan Labeled on Watermelon, Cucumbers and Muskmelons

Ethalfluralin (sonalan) has been labeled for the control of certain broadleaf weeds and annual grasses in watermelon, cucumbers, and muskmelons.

Application should be made at 3 pts/A material, surface applied, preemergence to the crop (post-plant). Rain or overhead irrigation is required
III. COMMERCIAL VEGETABLE PRODUCTION

A. Injection of Fertilizers into Drip Irrigation Systems for Vegetables

In recent years, commercial vegetable growers in Florida have shown increased interest in drip (trickle) irrigation as a means of irrigating their vegetable crops. Drip irrigation, the newest of all the commercial irrigation methods, is the frequent, slow application of water to soils in the plant's root zone through small holes in the water delivery line or from mechanical devices (emitters) attached to the water delivery line. Drip irrigation is not only an irrigation method, but also can be utilized as a means by which plants can be supplied with supplementary soluble materials such as fertilizers, fumigants, insecticides, or herbicides. The process of adding soluble fertilizer through the drip system is called fertigation. The advantages of applying fertilizers through the drip irrigation system are improved fertilizer use efficiency, labor savings, energy savings, and greater flexibility in timing nutrient applications to meet a crop's demand for nutrients. With the capability to inject fertilizers through the drip irrigation system, fertilization can take place at any time, regardless of a crop's growth stage or the accessibility of the field to machinery. Fertilizers which are injected into the drip irrigation system versus the spreading/broadcasting method with dry materials are more efficiently utilized because a smaller amount of fertilizer is in the soil at any particular time and therefore, less susceptible to loss from leaching and run-off during heavy rainfall. Fertilizers which are injected into the drip irrigation system present less danger of injuring the plant's root system, since the liquid fertilizer is greatly diluted in the irrigation water.

Elements That Can Be Applied Through Drip Irrigation Systems

Nitrogen

Nitrogen (N) is the most frequently injected element into drip irrigation systems, as it is readily leached from sandy soils and must be applied to maintain good crop growth. N is generally injected into the system
as ammonium nitrate, calcium nitrate, or potassium nitrate. The pH of the irrigation water should be known at the time of fertilizer injection since some N sources will increase the pH of the water. By increasing the pH of the water, the threat exists of precipitation of insoluble calcium and magnesium carbonates present in some water sources that can clog the drip irrigation system.

**Phosphorus**

Injection of phosphorus (P) into drip irrigation systems is generally not recommended because (1) properly applied preplant P satisfies the plants' P needs, 2) the P injected into the drip system is a clogging hazard to emitting orifices, and 3) because of the restricted movement of P in the soil.

**Potassium**

Potassium (K) is also easily leached in sandy soils and generally must be applied with N to maintain good crop production and quality. K can be injected into the drip irrigation system as potassium sulfate, potassium chloride, or potassium nitrate.

**Micronutrients**

Generally, micronutrients can be applied preplant for most crops and in most soils. Iron, copper, zinc, and manganese may react with the salts in the irrigation water and precipitate. The chelated forms of iron or zinc EDTA, which are more soluble than the non-chelated forms, usually cause little clogging problems and are preferred over the previously mentioned salts when this application is needed.

**Injection Methods**

The three principal methods utilized to inject fertilizers into drip irrigation systems are pressure differential, the Venturi (vacuum) and metering pumps. It is essential that drip irrigation systems equipped with a chemical injection system have a vacuum breaker (anti-siphon device) and a backflow preventer (check valve) installed upstream from the injection point. The vacuum breaking valve and backflow preventer will prevent chemical contamination of the water source in case of a water pressure loss or power failure.
General Fertilization Procedures

1. Approximately 30-40% of the N and K, and 100% of the P, secondary elements (Ca, Mg, and S) and micronutrients should be applied into the plant bed. This fertilizer should be applied as a 50% broadcast application in the bed. Fertilizer placement in drip irrigated beds has not been determined for each of the commercial vegetable producing areas in Florida. The incorporation of fertilizers into the plant bed has been shown to be better than banding on the soil surface. If fertilizer is banded in the plant bed, the fertilizer band must be within the wetting pattern. The remaining 60-70% of the N and K should be injected into the drip system during the growing season.

2. Fertilizers may be injected into the drip irrigation system on a daily, bi-weekly, or weekly basis.

3. The quantity of fertilizer to inject will depend on the growth stage and rate of growth of the crop.

A research study on drip irrigation of tomatoes was conducted where N and K (60% of the total season requirement) were injected weekly with the following percentages of the total injected N and K being injected each week (14 week crop); 0, 2, 4, 6, 8, 12.5, 12.5, 12.5, 12.5, 7.5, 7.5, 7.5, 2.5, 2.5, and 0%.

4. The drip irrigation system should be allowed to reach its working pressure prior to the injection of the fertilizer solution. The actual time for the fertilizer injection interval should be not more than 80% of the irrigation interval. The short span of time (20% or more of the irrigation interval) is left at the end of the fertilizer interval to allow for flushing of the fertilizer pump and the irrigation system.

5. Fertilizers should not be injected at the same time that pesticides or chlorine (liquid bleach) are being injected. Chlorine (liquid bleach) is injected into the drip irrigation system to prevent the formation of bacterial slimes and iron deposits which can clog emitting orifices of drip irrigation systems. Chlorine should be injected following the injection of fertilizers with the injection interval being long enough to permit 30 minutes of chlorine to reach the last emitter. For example, if it takes 15 minutes for the chlorine to reach the last emitter, then the total time for chlorine to be
injected will be a minimum of 45 minutes (15 minutes plus 30 minutes). The frequency of chlorination and quantity of chlorine to inject depends on various water quality factors (pH, and concentrations of iron and hydrogen sulfide). For further information on the frequency of chlorination and quantity of chlorine to inject, growers need to contact their local Florida Cooperative Extension Service (IFAS) office.

In conclusion, the Institute of Food and Agricultural Sciences (IFAS) of the University of Florida, through research and extension programs, plans to continue to assist vegetable producers and irrigation industry personnel in meeting the technological changes taking place in the area of waters and fertility management. With the introduction of drip irrigation and its accompanying advantage in cultural management (fertigation), the challenge exists to adapt and maximize drip irrigation according to Florida's growing conditions.

(S.P. Kovach)

B. Factors Affecting The Replanting Of Cold Damaged Crops

The December freeze damaged in some form much of the vegetables in production in the state. Unfortunately, and/or fortunately, depending on which way you look at it, we do have experience on replanting decisions and choices that the growers must make.

The first and foremost caution is do not overplant and cause a market glut. In the southern portion of the state it is not too late to direct-seed and produce tomatoes, peppers and eggplant for a timely market. The mad scramble for transplants is now probably over, also with growers looking for other choices.

Choice 1: Procure transplants from other states or Mexico. Historically, this is not the best choice. The transplants coming from other states and especially Mexico have to be inspected before entering the state. The Florida Department of Agriculture and Consumer Services, Division of Plant Inspection is responsible for this function.

For information on inspection procedures from different areas or to set up inspections contact:

North Florida: (904)372-3505, Gainesville
Central Florida: (305)886-4375, Apopka
South Florida: (305)251-9540 or 238-6561, Miami
State Office: (904)372-3505, Gainesville
Choice 2: Plant alternate crops. This is an excellent way to use the fertilizer and cultural expenditures already invested. The big caution here is to check on whether there will be a market for the crop at the time of harvest. A few growers found to their sorrow in past years that the alternate crop they chose to grow either could not be harvested due to lack of a market caused both by a glut and in other cases no demand and lastly, lack of transportation.

Other growers were able to recoup their losses and make a profit on alternate crops sold nationally and locally.

Choice 3: "Suckering" to produce at least partial crops. After the 1977 freeze this method worked surprisingly well. The methods followed were based on the degree of damage to the plant and consisted of hand pruning, mowing plants back to a stump and in a few cases leaving plants untouched. Eggplants responded more uniformly then did tomatoes or peppers, producing higher quality fruit. In tomatoes, varieties responded differently in fruit sizing, after suckering. In pepper, plants recovered satisfactorily but did not produce the blocky, "crown-pick" type of fruit. They did grade out with a high percentage of fancy fruit however.

In areas where crops were completely destroyed and replanting or reseeding of the same crop or alternate crops can be made there are several factors that should be kept in mind:

1. Fertility (Rates and Placement)

   Refertilization may raise the soluble salt levels in a field to an excess and cause damage to the young seedlings.

2. Herbicides

   Here again be careful not to overdo it. Also, in planting alternate crops check the tolerance of the crop to previously applied herbicides. Alternately, herbicides applied to the alternate crop may not be compatible with pesticides such as nematicides applied to the first crop.
3. Crop and Variety Selection

Don't plant any old crop just because seed or transplants are available. Check for marketability and suitability for the area before planting.

4. To Plant or Not to Plant

The winter isn't over yet and there are possibilities for other frosts and freezes.

A decision should be made by each grower, depending on his situation, whether the investment output is worth the gamble in replanting. In many cases where all the grower's plantings were not destroyed, it may be more efficient and a wiser choice to protect the remaining crop, which should be assured a decent market price, than to replant and possibly over extend himself and lose both.

Another problem could blossom, if you'll forgive the pun, from the extended cold period.

This is the vernalization of many cool season crops. Vernalization is the specific promotion of flower initiation by a previous cold treatment. The vernalization requirements of each crop vary with the number of hours below a certain temperature, the stage of maturity of the crop and in some cases the day length. Vernalization requirements also vary among cultivars within a crop. An example of this is the early cultivars of celery being prone to bolting. The newer cultivars have been selected in many cases to have a higher tolerance.

Lettuce will probably bolt more rapidly when the temperatures begin to warm, now that it has had an exposure to a long cold period. On the other hand, some crops could be devernalized by a significant temperature increase.

Growers of celery, cabbage and other crucifers, lettuce, carrots, etc. should be aware of the possibility of their crop being vernalized and thereby keep an eye on it during its development.

(W. M. Stall)
IV. HOME VEGETABLE GARDENING

A. Florida Master Gardeners Begin a New Year

1984 marks the sixth year for the Master Gardeners program in Florida. The first classes were held in the pilot counties of Brevard, Dade, and Manatee in 1979. Since then 29 counties have participated in the training of these specialized volunteers we call Master Gardeners.

Last fall (1983), eight counties participated in training. A joint session was held in Jacksonville where Master Gardeners from Clay, Duval, Putnam and St. Johns received the training together. Agents in Alachua, Highlands, Marion, and Volusia conducted training by themselves.

Thirteen counties are scheduled to hold training this spring (1984). Flagler and Escambia are two newcomers to the program. Hillsborough, Manatee, and Pinellas are combining in a unique method of training, meeting in each county on a rotational basis. Charlotte and Lee are getting together in a somewhat similar way by training one day in Lee and the next in Charlotte. Those planning to go it alone are Brevard, Dade, Escambia, Flagler, Leon, Martin, Osceola, and Palm Beach.

The continuing expansion of the program into more and more counties speaks well for the overall success and acceptance of the program in Florida. In just five years, almost 1/2 (43 percent) of Florida's counties have adopted the program. As expected, agents in the major urban areas have been more anxious to tap the energies of volunteer Master Gardeners than their more rural counterparts.

While the Master Gardeners have served in a variety of useful roles in the educational programs of the separate counties, by far the greatest use of their talents has been in answering individual home horticulture questions via telephone, clinics, or office visits.

Agents wishing to initiate a Master Gardener program should get in touch with me for all of the pertinent information.

(J. M. Stephens)
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