The VEGETARIAN Newsletter

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

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I. COMMERCIAL VEGETABLE PRODUCTION

A. Tank Mixes and Serial Application of Pesticides

The Environmental Protection Agency (EPA) has finally issued a statement which clarifies the agency's thinking on the use of "tank-mixed" pesticides. It is an important statement in that it ends a long period of indecision by spelling out guidelines under which vegetable growers can use certain "pesticide mixes" for awhile at least with tacit approval of EPA. Vegetable growers should study these guidelines carefully in order to avoid a disastrous mistake by using an "illegal pesticide mix." EPA includes "Serial Application" which they explain as "application of one pesticide immediately or shortly following the application of another."

The agency divides tank mixes and serial applications into three categories, presented below with EPA's interpretation following each.

Category 1. Instructions provided for such use on one or more labels of EPA registered products.

Tank mixes or serial applications recommended on EPA labels (Category 1) are obviously consistent with the label and do not constitute use inconsistent with such label.

Category 2. Such use may be covered by an intra-state registration.

Intra-state registrations remain valid until replaced by EPA registrations under Section 3 of the amended Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). This will occur generally after October 21, 1974, and will be completed by October, 1976, under the schedule spelled out in the law; or, by special actions taken by the Administrator in the form of orders bringing products under sole EPA registration at some earlier time. This latter action will occur primarily with respect to products containing the same active ingredients and registered intra-state for the same kinds of uses as the Administrator has cancelled or suspended in inter-state commerce under the 1947 version of the FIFRA. The first and only action of this nature taken to date was the April 10, 1973, order with respect to registration of products containing DDT.

Therefore, tank mixes and serial applications registered by a State (Category 2) will not be deemed uses inconsistent with the label.

Category 3. Various tank mixes and serial applications have been tested and recommended by Agricultural Experiment Stations, State Department of Agriculture or are common agricultural practices.
Finally, the legislative history of the amended FIFRA clearly shows that the Congress intended EPA to apply the test of reasonability in enforcing misuse provisions. From this point of view, during a transitional period while parties adjust to the new law, tank mixes and serial applications in Category 3 will not be deemed uses inconsistent with the label if:

(a) the products in the mix are applied at a dosage rate not to exceed the label instructions for use of any product in the mix used singly for the same set of insects on the same crop; and

(b) the label on one or more of the products does not explicitly instruct against such mixture.

Further clarification of EPA's stand of tank-mixes and serial application of pesticides is given in the following three paragraphs.

It must be recognized under Categories 2 and 3 that EPA has not reviewed any efficacy or human and environmental safety data on the combination of products and the user applies them in this manner at his own risk with respect to effects on crops and application equipment, applicator safety, environmental effects and tolerance pre-harvest intervals. The policy of deeming such use not inconsistent with the label must not be construed as EPA approval of the use.

If adverse effects are observed from any particular tank mix or serial application, EPA may take appropriate action to rule the use of such specific mix or serial application to be inconsistent with label instructions on a case-by-case basis. Regional Offices are requested to be watchful of any adverse effects and advise the Office of Pesticide Programs (OPP) of such through the PASS system, calling special attention to the causal nature of the event.

This policy will be in effect until modified by further statements or regulations. It has been reviewed by General Counsel and is legally acceptable under the amended FIFRA and meets with the acceptance of the Office of Enforcement.

The terminology used may be somewhat technical, but we felt it best to present it as published by EPA. Anyone having any questions may contact the writer or Mr. James E. Brogdon, who in addition to his duties as Extension Entomologist is also Pesticide Coordinator for the University of Florida with officials in Washington.

(Montelaro)

B. Mushrooms - Information on Production in Florida

Even though Florida is not considered an important producer of mushrooms, we often get requests for information on the production of this crop. Up-to-date publications on mushrooms have not been generally available for distribution.
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to anyone interested in this crop. Since 1971, we have had available a report entitled "Mushroom Information." It was prepared by Jim Stephens of our Department. It includes abstracts of articles, papers, bulletins, etc. Even though much of the information is out-of-date, it contains much that is useful for the producer of mushrooms in the home or commercially. One of the bulletins abstracted was "Growing Mushrooms in the United States," Farmers Bulletin No. 1875, U. S. Department of Agriculture. We have a limited supply of this publication for distribution. This bulletin as well as the report, VC 71-3 dated March, 1971, can be obtained by writing this office.

Vegetable Crops Report VC 73-1 entitled "Producing Mushrooms in Florida" was authored by Dr. G. J. Stout and Dr. D. E. Buffington of the University of Florida. Both professors have had experience in the mushroom industry. County Extension Directors and other County Extension Agents with horticultural responsibilities are being sent one copy for their files. Anyone else wanting a copy of VC 73-1 can obtain it from the Vegetable Crops Department.

(Montelaro)

C. Preparing Land for Planting Vegetable Crops

The spring season is just over and vegetable growers in Florida are already preparing land for the fall season. Land preparation is probably one of the most important operations in vegetable production. One mistake made in preparation of the soil for planting can mean partial or even total crop failure. Following are some pointers that growers should check carefully in order to avoid costly mistakes.

(1) **Land Selection** - Select land that is uniform, level, relatively free of hard-to-control weeds and other soil pests and relatively easy to manage from the standpoint of irrigation and drainage.

(2) **Plowing and Disking** - Prepare land early enough to obtain good decay of organic matter and a fine, firm seedbed.

(3) **Land Leveling** - Level land before planting to avoid excessively low or high spots and to facilitate irrigation and drainage.

(4) **Ditching** - Design and develop adequate main and secondary ditches to facilitate irrigation or removal of excess water after heavy rain.

(5) **Liming** - Have soil tested and add the right amount and type of lime needed. Lime should be applied 2 to 3 months before planting, but can be any time before planting.

(6) **Fertilizer Rate and Sources** - From soil test data, determine the amounts and sources of N-P-K, secondary and minor elements needed.

(7) **Fertilizer Placement** - Place fertilizer so as to minimize salt injury. Never place large amounts of fertilizer directly below or above seed.

(8) **Soil Pest Control** - Treat for nematodes, soil insects, soil diseases and/or weed seeds, if needed.
The eight points listed above are presented here primarily as a check-list. They cover a wide range of technologies and for that reason cannot be discussed in detail here. Information is available for each area from the County Extension offices.

(Montelaro)

D. Graywall in Tomatoes

Tomato fruit are subject to a disorder known as graywall. Blotchy ripening, vascular browning, and cloud are other names often given to the disorder. Some, however, feel that they are distinct maladies and others feel that they are stages or manifestations of graywall. The disorder is of worldwide occurrence and has been the subject of numerous investigations designed to find the cause for the disorder.

Dr. R. A. Conover described the symptoms in an article he published in 1949 as to the malady in Dade County tomatoes. "Vascular browning (graywall) appears externally on the fruit as a grayish-brown discoloration... In mildly affected fruit, only the vascular bundle is discolored; more severely affected fruit show a lateral extension of browned tissue which, in some cases, involves the entire fruit wall. Fruit of all sizes larger than one-half inch may be affected."

Many observations of the occurrence of the disorder in Florida have indicated that graywall has tended to show up on (1) fruit shaded on vigorously growing plants, (2) on plants growing in spray rows (where soil has been compacted), (3) on plants in portions of fields with higher soil moisture, and (4) on plants in areas following periods of cloudy, cool weather.

Tomato losses in Florida have been reported as 10 to 20 percent and as high as 70 percent in some isolated instances. Appearance of the disorder has been sporadic from year to year and often within the same season differences have been noted.

Research studies have taken several paths attempting to solve or find the basic cause of the disorder. Nutritional-environmental and pathological (viral and bacterial) studies have shown some relationships, but no consistent conclusive evidence as to the basic cause of the disorder has developed.

Nutritional studies have found that low potassium, the N:K ratio (high N, low K) and the P:K ratio (high P, low K) conditions are involved. These conditions were found to increase or emphasize graywall symptoms in numerous studies. However, the researchers were unable to consistently reproduce graywall with these conditions from year to year. Most workers have implied that nutritional status, while influencing the occurrence of graywall, is not the prime causal agent in the disorder, but a part of a complex set of conditions leading to its appearance.

Pathological studies have dealt with viruses, primarily Tobacco Mosaic Virus (TMV), as the suspected causal agent in graywall. While this area is still under scrutiny as a possible causal factor, many workers feel that TMV may act as an agent which predisposes the plant to be susceptible to graywall and is not the causal agent.
In other pathological studies, research workers in Florida have found that bacteria of several genera were capable of inducing graywall symptoms in tomato fruits following a chilling treatment. This aspect was brought to the forefront following the isolation of bacteria from graywall affected fruit.

While the exact causal agent or factors responsible for graywall are elusive at the moment, there are two operations that can be performed by the grower to reduce potential losses. These are not foolproof measures; however, they can reduce the incidence and intensity of graywall.

(1) Proper Varieties - Perhaps the most important method is to utilize a variety which has a tolerance for the disorder. Recent variety introductions generally have a greater tolerance to graywall than older standard varieties such as 'Homestead'. For example, 'Floradel', 'Florida MHi-1', and 'Walter' have a greater tolerance to graywall than most older varieties.

(2) Fertilize Properly - Follow recommended fertilizer practices and rates developed through soil tests and reference to research developed for your area. Avoid over or under-fertilization, but take measures to insure an adequate level of potassium is available for the crop.

(Kostewicz)

E. Check Herbicide Equipment Before the Season Starts

Success with herbicides starts with proper rate of application and placing it in the desired area. These are among the essentials for good weed control. Too frequently herbicide application equipment is used, problems noted and left to be repaired (if they are not too serious) or remedied in the off-season. The new season often finds the equipment in the same condition as when it was "put up for the year" and thus, the cycle continues until major overhaul is required. Often, this ends in frantic trips and searches to find parts and results in wasted time and delays in application. A few hours checking the rig out, well in advance of the season, will result in fewer headaches and will insure proper herbicide application.

An outline to follow might be:

I. Sprayers

A. Check power source function
   1. Time and/or adjust the engine.
   2. Insure the PTO drive mechanism is functioning properly.

B. Check the pump
   1. Replace leaking bushings or seals.
   2. Make certain pump output is proper for its rating.
   3. Check the pressure regulator for accuracy and function.
C. Check the delivery system
   1. Clean all filters and strainers of debris.
   2. Insure By-Pass is operating correctly.
   3. Check agitation system for broken paddles, vanes, etc.
   4. Replace worn or frayed hoses.
   5. Check connections for leaks--tighten or replace as required.

D. Critical application areas to do
   1. New nozzle tips and strainers.
   2. Adjust booms and drop pipes.
   3. Adjust and set pattern.
   4. CALIBRATE

II. Granular Applicators

A. Make certain hoppers are clean and free of unwanted holes.
B. Check drive mechanism for proper operation.
C. Check mixing or "de-clopping" apparatus to make certain it is operating properly.
D. Clear dropping or delivery tubes of debris or blockages.
E. CALIBRATE

   (Kostewicz)
II. HARVESTING AND HANDLING

A. Packinghouse Modifications

This is the time of year when the management of Florida vegetable packinghouses reflects on the past year's efforts in terms of profit and loss, as well as trouble spots which may have contributed to the loss column. This is also the time of year to make any modifications in the packinghouse which may be necessary. Any packinghouse not equipped for palletized handling may wish to consider this change. It might also be wise to consider type and availability of shipping containers.

Packinghouse sanitation was discussed in last month's Vegetarian. It is mentioned again this month only because it is so important both to efficient operation of a packinghouse and to the reputation of that house for quality produce. Any revamping or modification of existing packinghouses should certainly include the sanitation aspects as an integral part of the overall plan.

The importance of precooling was discussed in the January 1972 edition of the Vegetarian. That discussion lists some of the effects of precooling on the maintenance of vegetable quality. Many vegetables are shipped without precooling because low temperatures are not needed for maintaining quality. For those vegetables that require low temperatures, precooling is probably the most critical operation in the packinghouse.

Inadequate facilities - We all know that occasionally there are peak periods of harvest, usually brought on by weather conditions and an interruption in harvest plans based on scheduled plantings, where none of the packinghouse facilities are adequate to really handle the volume coming in. Scheduled planting and cooperation among growers using common packinghouse facilities could alleviate much of the problem. A packinghouse is built to handle a particular volume and precoolers should be designed and constructed to handle the maximum output from the packinghouse. It must be remembered that rush periods usually occur during warm or hot weather which hastens maturity, and the need for fast and adequate precooling is very critical under these conditions.

Misused facilities - This occurs infrequently, but still too often. Sometimes it is merely an oversight and at other times it is actually a result of overloading. It is most often reflected in produce not being cooled down to the desired temperature because of inadequate time in the cooler. At other times, the cold air or water is simply not cold enough.

Mishandling produce - Much too often vegetables are packed in the field and allowed to remain in the sun for periods of time before precooling. This increases the temperature of the commodity and makes precooling a harder job because there is more heat to remove. Sometimes it is necessary to hold produce for a short time (the shorter the better) before precooling. For example, if several field trucks arrive simultaneously, every effort should be made to get them out of the sun. Provisions should also be made for shading vegetables such
as tomatoes, which are not ordinarily precooled. An even worse situation occurs when vegetables that have already been precooled are allowed to remain for several hours without refrigeration before shipping. The commodity has been precooled, but much of the effect is lost.

Some problems can be dealt with to a certain extent in existing packing-houses without major modification. However, the most opportune time to really correct problems of sanitation, precooling, and storage facilities is when a new packinghouse is being built or an old one remodeled.

(Hicks and Showalter)
A. Organic Versus Inorganic Plots

This spring afforded observers a good opportunity to compare organic gardening techniques with conventional practices. While University of Florida students were busy tending 25 "conventional" gardens on one side of the campus, other gardeners were busily going about mulching, composting, and manuring some 100 plus "organic" plots on another part of the campus.

The conventional gardens were part of a vegetable gardening course taught by Dr. V. F. Nettles of the Vegetable Crops Department. The course was popular with the girls as well as the men on the campus, and students represented many areas of study. The "organic" project was sponsored through a student body function referred to as the Environmental Action Group (EAG). For a small fee ($10.00), each person taking the project got a small 10 X 25 foot plot and some basic materials for cultivating it. The project was open to students, staff, and others.

While direct comparisons cannot be made due to variations in such treatments as planting dates, location, soil type, etc., some general observations were apparent.

Throughout the month of May, while students were tending their gardens, the conventional plots were outstanding. Plant vigor was excellent, showing that inorganic 6-8-8 fertilizer could really do the job when applied in proper amounts at the right time. Vegetable "fruits" such as bean pods and squash were setting on the plants in abundance. On the other hand, the organic plots looked erratic, with some plants appearing to be over-fed while others were starved. The compost and manures were slow to release needed nutrients in some plots, while contributing to lush vegetative growth with few "fruits" setting in other plots.

The most obvious differences were observed with insect damage. Dusting with sevin and malathion was keeping the foliage clean in the conventional plots. Almost every organic plot was "protected" by a cup of praying mantis eggs dangling with a string from a bamboo pole, and marigold plants guarded each row. Leaves in the organic plots were riddled, especially the bean leaves (pole, bush, and lima) and the crucifers. However, many of the other vegetables were yet unbothered from insects. One gardener was spraying Bacillus thuringiensis on everything in his garden. He listed several insects which he expected to kill with it. He was extremely proud of the abundant working population of lady bird beetles in his and surrounding plots. He was careful not to spray any of them. He showed disbelief when it was pointed out that instead of lady bird beetles they were Mexican bean beetles. Neither the Bacillus thuringiensis nor the rotenone and pyrethrin dusts were controlling them.

At harvest time, all plots yielded some vegetables, whether grown organically or otherwise. Although a heavy hail storm had riddled the organic plots, tomato fruit worm holes could still be seen among the hail scars on the tomato fruits. Overall, the plant condition in the organic plots was improving, with a fair amount of edible produce in evidence. Bean pods were produced in spite of the broad damage inflicted by the bean beetles. Very few good crucifers were produced, but a goodly amount of lettuce, especially leaf and bibb, was grown.
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Most all of the produce in the conventional plots was in good condition. Bean rust and wilt (fusarium and bacterial) in the tomatoes was most evident there with some scattered late blight.

Then the students went home. The water was turned off, the spraying was stopped, and no one was there to weed out the conventional plots. They seemed to go backwards in a hurry. The dark green color disappeared, and insects proliferated.

Now, the organic plots began to compare favorably. The dark green color continued as the compost and manure kept the nutrients supplied. Weeds were healthy, too, and insects were having a field day. But where mulching had been well applied, the weeds were sparse and the plants looked well fertilized.

The main lesson to pass on is that both systems of gardening have something of value to offer the observing gardener. One would be wise to employ the best practices from either system in order to produce better vegetables for himself and his family.

(Stephens)

B. Results - 1973 State 4-H Vegetable Judging Contest

The contest was held during State 4-H Club Congress at Gainesville. Contestants identified insects, diseases, weeds, seeds, nutrient disorders, defects and varieties, in addition to judging and grading vegetables.

Eleven teams participated. The winning team was from St. Johns County, followed by Marion, Escambia, Volusia, Orange, Okaloosa, Martin, Columbia, Suwannee, Dade, and Polk. St. Johns is to represent Florida in the National Contest in Oklahoma City in November (NJHA Convention). The trip is co-sponsored by the Florida investor-owned power companies and the Florida Department of Agriculture and Consumer Services.

(Stephens)

C. Results - 1973 State 4-H Horticultural Demonstrations

Eleven demonstrations on horticulture were presented during State 4-H Club Congress. The results are as follows:

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<thead>
<tr>
<th>Placing</th>
<th>County</th>
<th>Name</th>
<th>Title of Demonstration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>St. Johns</td>
<td>Cindy Brubaker</td>
<td>&quot;Potatoes&quot;</td>
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<td></td>
<td></td>
<td>Sharon Griffis</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>St. Johns</td>
<td>Ann McGraw</td>
<td>&quot;Terrariums&quot;</td>
</tr>
<tr>
<td>3</td>
<td>Brevard</td>
<td>Peggy Wassmuth</td>
<td>&quot;Edible Centerpiece&quot;</td>
</tr>
<tr>
<td>4</td>
<td>Hardee</td>
<td>Ricky Stephens</td>
<td>&quot;Orchid Culture&quot;</td>
</tr>
<tr>
<td>5</td>
<td>Orange</td>
<td>Robin Turner</td>
<td>&quot;Methods of Propagation&quot;</td>
</tr>
<tr>
<td>6</td>
<td>Pasco</td>
<td>Kathy Hawlin</td>
<td>&quot;Indoor-Outdoor Flowers&quot;</td>
</tr>
<tr>
<td>7</td>
<td>Lee</td>
<td>Luther Atkinson</td>
<td>&quot;Farming in a Flower Pot&quot;</td>
</tr>
<tr>
<td>8</td>
<td>Dade</td>
<td>Larry Crosby</td>
<td>&quot;Potting an Orchid&quot;</td>
</tr>
<tr>
<td>9</td>
<td>Okaloosa</td>
<td>Karen Blair</td>
<td>&quot;Fondue&quot;</td>
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<tr>
<td></td>
<td></td>
<td>Linda Rader</td>
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<tr>
<td>10</td>
<td>Wakulla</td>
<td>Bill Harvey</td>
<td>&quot;Indoor Vegetable Gardening&quot;</td>
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<tr>
<td></td>
<td></td>
<td>Robert Gammons</td>
<td>&quot;Good Eating&quot;</td>
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</tbody>
</table>
The winning demonstration will be presented at Oklahoma City in November, courtesy of the same co-sponsors as for vegetable judging.

(Stephens)

D. Know Your Vegetables - Okeechobee Gourd

Florida has many unique distinctions, one of which is that it is home of the Okeechobee gourd, *Cucurbita okeechobeensis* Bailey.

According to L. H. Bailey, it is an annual climbing vine, growing abundantly in heavy tangled woods along the southeastern shore of Lake Okeechobee. It uses its tendrils to climb into tall trees.

The gourd plant has grape-like foliage of shallowly-lobed (5-7 angle-lobed) leaves. The gourd fruits hang conspicuously from trees long after the annual vine is dead. The flowers are cream-color or nearly white rather than bright yellow, with very small sharp calyx lobes and 3-inch long corolla. The gourds (fruits) are nearly globular, long-stemmed, 3 to 3½ inches in diameter. They are hard-shelled and durable, light green with faint longitudinal lines of lighter color and sometimes having rather definite marks of yellowish-green.

Since accounts of its edibility are not clear, it should be considered inedible until further clarification.

(Stephens)