CONTENTS

I. NOTES OF INTEREST
   A. New Publications
   B. Vegetable Crops Calendar

II. PESTICIDE UPDATE
   A. Bolero Section 18 on Lettuce, Endive & Escarole
   B. Section 18 for Bayleton on Squash

III. COMMERCIAL VEGETABLE PRODUCTION
   A. Assessing and Correcting Leaching Losses in Mulched Beds
   B. Federal Crop Insurance Approval for Pepper and Tomatoes on a Pilot Basis

IV. HOME VEGETABLE GARDENING
   A. Companion Planting of Vegetables in Gardens
   B. Florida State Fair Horticulture Contest Results
   C. Florida Master Gardener Program Welcomes Four More Counties
I. NOTES OF INTEREST

A. New Publications

1. Available from Bradenton AREC, 5007 60th St. E., Bradenton, Florida 33508:
   (b) Research Report 82-23 - Fertilizer Requirements of Pepper Seedlings for Transplant Production: Symptoms of Inorganic Nutrient Deficiencies by S. S. Woltz.
   (c) Research Report 1982-24 - Weed Control in Spring Transplanted Cauliflower by J. P. Gilreath.

2. Available from Dover ARC, Route 2, Box 157, Dover, Florida 33527:
   (a) Research Report 82-3 - Effect of Stress on Strawberry Transplant Growth and Fruiting Response by E. E. Albregts and C. M. Howard.

3. Available from Publications Distribution Center, Building 660, University of Florida, Gainesville, Florida 32611:
   (a) Circular 100 - Snap Bean Production in Florida by W. M. Stall and M. Sherman.
   (d) Circular 99 - Sweet Corn Production in Florida by R. K. Showalter.

(Maynard)

B. Vegetable Crops Calendar

1. Central and South Florida Weed Tour
   (a) April 20 - Bradenton
II. PESTICIDE UPDATE

A. Bolero Section 18 on Lettuce, Endive and Escarole

Bolero (Thiobencarb) has been granted use under a Section 18 specific exemption for the control of barnyardgrass and purslane in lettuce, endive and escarole grown in organic soils.

A maximum rate of 4.0 lb ai per acre of Bolero 8E is authorized in a single application at the time of direct seeding. Check the label for all cautions and restrictions. The specific exemption expires June 1, 1983.

B. Section 18 Exemption for Bayleton on Squash

Bayleton 50WP may be used for the control of powdery mildew on squash. A maximum rate of 2 ounces ai per application may be used. A maximum of 8 ounces ai per acre per season may be applied. The pre-harvest interval to be observed is 3 days.

Specific protective clothing restrictions and subsequent crops planting conditions are also listed on the label. Read and follow all conditions and restrictions. The specific exemption expires December 20, 1983.

III. COMMERCIAL VEGETABLE PRODUCTION

A. Assessing and Correcting Leaching Losses in Mulched Beds

The yellow, stunted seedlings of eggplant, pepper and tomato crops in many parts of the state have been sending out strong signals that the cupboard is bare! Heavy rainfall in many vegetable production areas has created a fertilizer leaching crisis for many farmers. County Extension Agents, field, sales and technical personnel should be ready with constructive suggestions as many of the crops can be saved if immediate action is taken.
Most growers ditch their field for high-normal to heavy rains, but few plan for the excess levels of water in years like this. Frequently we have seen water standing a few inches from the top of mulch covered beds. When the water reaches this level even for a few hours, most of the soluble fertilizers may go into a solution or suspension in the water front. As the water recedes much of the nutrient content of the bed drops. We have evidence of entire layers dropping down 5 or 6 inches unless the band of fertilizer was on the very top of the bed or shoulder. The lower the placement the greater the leaching in most cases.

This water-front leaching is often accompanied by leaching loss from the plant hole. Soluble salt samples in the plant hole frequently reflect readings of 200 ppm or less which is just about the level of non-cropped land.

Some first aid measures for this problem:

1. **Determine the extent of the leaching damage.** Take soluble salt readings across the mulched bed at 2 to 3 inch intervals, 4 to 6 inches deep. Plot the results on a piece of paper. Show the grower the salt profile of the bed. Caution the grower that insoluble fertilizer components are not generally reflected in these readings so there may be additional N and K in the bed.

2. **Determine the condition of the seedlings.** If only a few pale green leaves remain (and even these seem ravaged by wind or foliar diseases), or if the roots appear light brown, yellow (or with very little white tip branching) the grower may need a count of normal and deficient plants in that field. From this type of information the grower can decide the level of replanting needed or abandonment in extreme cases.

3. **Determine the fertilizer replacement amount needed.** In the case of tomatoes on a staked, mulched, 3-pick program, more than half of the 240 lbs of nitrogen and 360 lbs of K\textsubscript{2}O may have been leached away. For these fields at least 150 lbs of nitrogen and almost 250 lbs of K\textsubscript{2}O would need to be put back into the bed. In some cases the loss replenishment needs may be even greater.

4. **Consider best method of replenishment of the bed.** As shown in step 3, growers must be helped to see the folly of trying to resupply this level of nutrition by foliar sprays. Liquid concentrates can be injected into the bed readily. Granular materials can be punched in by machine or hand into "new" holes on the shoulder of the bed. Soluble materials such as calcium nitrate,
potassium nitrate and any of the readily available complete fertilizers are helpful. Approximately 1.5 to 2.5 ounces of material per hole may be needed. With sprinkler or drip irrigation, materials such as these can be applied easily in the irrigation water.

Some innovative tomato growers that use seep irrigation place a band at the outside base of the bed. This practice has many followers but this specialist feels we need research to evaluate this practice.

(Marlowe)

B. Federal Crop Insurance Approval for Pepper and Tomatoes on a Pilot Basis

The Board of Directors of the Federal Crop Insurance Corporation (FCIC) has formally approved a pilot project for Federal Crop insurance on pepper and tomatoes in Collier, Lee, Hendry and Glades counties. The project request has been forwarded to Secretary Block.

Personnel from the Vegetable Crops Department and certain county extension directors along with representatives from Florida Fruit and Vegetable Association, Florida Department of Agriculture and Consumer Services and the Florida Tomato Committee will be meeting with an FCIC task force to review and consult in regard to policy development. Hopefully a Federal Insurance policy will be available by early summer.

Assuming success in the pilot project, there is reasonable expectations that Federal Crop Insurance can and will be expanded to other areas of the state on pepper and tomatoes, and other commodities will be included in the near future.

(W. M. Stall and Reggie Brown, Collier County Extension Director)

IV. HOME VEGETABLE GARDENING

A. Companion Planting of Vegetables in Gardens

Companion planting refers to the practice followed by many gardeners of planting one kind of variety of vegetable in close proximity to another kind or variety for a specific purpose. Other common terms are intercropping, companionate planting, interplanting, combination planting, co-cropping, and nurse-cropping. The term multi-cropping is different, meaning succession cropping.
Purpose - A number of reasons are given for the companionate planting of vegetables. These purposes vary all the way from the ridiculous "plant onions with the potatoes so that the potato eyes will water and you won't have to irrigate" to the sensible "plant pole beans with sweet corn so that the corn stalk will support the climbing bean vine". Claims are widespread for some plants liking other plants and disliking others.

Here are some of the various purposes given for the growing of vegetables in close association with other vegetables of another kind or variety.

1. **Improve growth and productivity**

   Would a vegetable plant growing alone produce less than if grown beside a companion plant? Many gardeners believe the answer is "yes", and can even name the other vegetables best suited for the companionship role. Especially among organic gardeners, statements such as "potatoes do well planted with beans, corn, and cabbage, but do not fare well planted near pumpkin, squash, tomato, and cucumber" are made. Many of the following reasons are given in explanation for the compatibility of the various vegetables.

2. **Repels insects and other pests**

   A long-held theory among many gardeners, mostly organic gardeners, is that certain kinds of plants will prevent specific pest damage to certain other kinds of plants when grown nearby. The repellancy is thought to be due to root exudates or aromatic characteristics, or in some cases, "catch-crop" effects.

   In a Pennsylvania State test, researchers planted (a) radish with cucumber to see if radish would protect against the striped cucumber beetle; (b) beans with potatoes for Colorado potato beetle control; (c) onion with carrot for rust fly and leaf hoppers; (d) marigolds with beans for bean beetle control; (e) thyme with cabbage for imported cabbage worm control and (f) catnip with eggplant for flea beetle control. The results of these replicated trials showed no indication of protection from insect damage.

   The University of Georgia studied the marigold nematode relationship. Their studies showed that certain varieties of marigold are not used by root-knot nematodes as host plants. There was no repellancy discovered or verified. Another study showed that marigolds would attract certain nematodes, then kill them within the roots. The net effect of these studies is to suggest that marigolds might be useful as an off-season catch or cover crop to suppress nematode build-up in garden soil.
3. **Nitrogen fixation**

Everyone knows that bacteria living in nodules of legumes fix nitrogen from the air into forms that the plant can utilize. An average of 50 to 130 pounds of nitrogen per acre may be added to the soil if the crop is plowed under. While the nitrogen-fixing plant is living, the nitrogen benefits only the host plant. After the plant decomposes, however, the nitrogen may be utilized by any other plant. Therefore, one should not expect the interplanting of a legume such as beans along with another plant such as corn to be mutually beneficial. However, observations of such interplantings have indicated a more vigorous and darker green corn crop than where the corn was planted alone. This now appears to be a mycorrhizal effect.

4. **Mycorrhizae influence**

The roots of most green plants are infected with beneficial fungi; resulting in a symbiotic relationship between green plants and fungi. These fungi are termed mycorrhiza.

Mycorrhiza fungi have been found to produce growth substances and vitamins and to increase host plant resistance to water stress, but the most practical role is in plant nutrition. In particular, P uptake is enhanced by mycorrhizae.

Growth of onions in mineral soils that contained low levels of phosphorous was severely retarded in the absence of mycorrhizal fungi (HortScience 106:86. 1981). Mycorrhizal inoculum added to these soils increased yield 34%.

Individual species of fungi will form mycorrhizae with a wide range of hosts. Crops grown together sharing the same mycorrhizae is one explanation for some plants getting along together.

5. **Increased Depth of Rooting**

Because some plants send roots deeper into the soil than others, it is held by many gardeners and writers of gardening literature that deep-rooting vegetables and even some weeds such as common pigweed should be planted in the row with certain vegetables to pump nutrient from the subsoil and to enhance penetration of the vegetable roots. It is particularly beneficial, they say, on heavy poorly-drained soils. Advocates of this practice have not sufficiently proven their point to offset the possible detrimental effects of establishing a severe weed problem in a garden.
6. **Improves Plant Environment**

According to some advocates on intercropping, certain atmospheric conditions are improved considerably by an adjacent plant. One such condition often mentioned is shade. For example, tomatoes are sometimes planted to shade cabbage, broccoli, and lettuce.

Wind is another atmospheric condition whose detrimental effects are reduced by means of companion plants such as sunflowers that serve as windbreaks.

7. **Enhances Pollination**

Interplanting may contribute to better pollination of vegetables in one of two ways: (a) by mixing a male-flowering pollinator plant at intervals within a row of predominately female flowering plants, and (b) by including bee-attracting types of vegetables in the row of vegetables which require bees for pollination.

In the first instance, the most obvious example is with gynoecious (female flowering) types of cucumbers such as 'Gemini', which require that a pollinator such as 'Poinsett' be planted along with it. Herbs are considered by many gardeners to be the best sort of plant for attracting honeybees to vegetables that need them for pollination.

8. **Germination Assistance**

Seeds of radishes are often mixed with slower germinating seeds to mark the seeded area until all seeds have germinated and the seedlings are up.

Along the same lines, lima bean seeds are sometimes sown in the same furrow and at the same time as seeds of weaker sprouting vegetables. The strong germinating power of the bean seeds breaks the heavy soil crust allowing better aeration and moisture penetration, thus assisting smaller seeds to germinate and emerge.

9. **Space Efficiency**

As gardening space is often limited, it is sometimes wise to make the most of the available area by such intensive use methods as wide row gardening, vertical gardening and companion planting. Interplanting comparatively short and long season crops is the usual practice. When planted at the same time as the more slowly maturing crop, the short-season crop can be harvested before competition and shading from the companion crop becomes a limiting factor.
For example, vegetables are quite often grown beneath and around pecan, orange, and other fruit groves. Within the garden, radishes, spring onions, or leaf lettuce can be planted in or between rows of sweet corn, eggplant, okra, pepper, and tomato.

In Maryland (HortScience 11:238. 1976), studies have shown that sweet corn and soybeans can be grown together in the same row with acceptable sweet corn yields and the soybean yields were 50% of normal after the sweet corn had been harvested.

10. Trellising for Support

The practice of planting pole beans in a corn field has been done for many years. The basis for the idea is the beans use the corn stalks for climbing support.

11. Aesthetic Enhancement

Some vegetables, herbs, and other plants are interplanted to provide a more pleasing visual and aromatic appeal. Lavender and thyme go well together, for example.

Using imagination in the design of garden and arrangement of the vegetables within it, different kinds and varieties of vegetables may be interspersed to provide unique effects.

Summary

Companion planting of vegetables is a common practice with many gardeners. While the technique is not essential for a successful garden, there are instances where it is beneficial. Based on the evidence available to date, the major benefits are related to (a) space efficiency, (b) pollination, and (c) increased aesthetic value of the garden.

(Stephens)

B. Florida State Fair Horticulture Contest Results

Excellent participation was noted this year at the Annual Florida State Fair Horticulture Identification and Judging Contest. Two-hundred thirteen 4-H and FFA members from throughout the State of Florida tested their knowledge on vegetable, foliage and woody ornamental varieties. Each member was required to identify 40 each, of the above mentioned varieties. Judging of 4 classes was also required, 2 of vegetables one from the woody section and one from the foliage section.
High individuals and team placing are as follows:

4-H Division

<table>
<thead>
<tr>
<th>Team Placing</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Manatee County</td>
<td>1894</td>
</tr>
<tr>
<td>2. Hillsborough County</td>
<td>1784</td>
</tr>
<tr>
<td>3. Leon County</td>
<td>1660</td>
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</table>

High Individual

<table>
<thead>
<tr>
<th>High Individual</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subahmaayam, P. - Leon County</td>
<td>668</td>
</tr>
<tr>
<td>2. Konkel, K. - Manatee County</td>
<td>662</td>
</tr>
<tr>
<td>3. Williams, M. - Manatee County</td>
<td>624</td>
</tr>
<tr>
<td>4. Hinton, T. - Hillsborough County</td>
<td>621</td>
</tr>
<tr>
<td>5. Kurina, J. - Manatee County</td>
<td>608</td>
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</table>

FFA Division

<table>
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<tr>
<th>Team Placing</th>
<th>Score</th>
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<tbody>
<tr>
<td>1. Plant City</td>
<td>1993</td>
</tr>
<tr>
<td>2. Dade City, Sr.</td>
<td>1976</td>
</tr>
<tr>
<td>3. Crescent City, Sr.</td>
<td>1932</td>
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</table>

High Individual

<table>
<thead>
<tr>
<th>High Individual</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ahizer, C. - J. G. Smith</td>
<td>704</td>
</tr>
<tr>
<td>2. Sasnet, H. - Plant City Sr.</td>
<td>703</td>
</tr>
<tr>
<td>3. Abbott, M. - Liberty Jr.</td>
<td>693</td>
</tr>
<tr>
<td>4. Morris, T. - Dade City Sr.</td>
<td>686</td>
</tr>
<tr>
<td>5. Cotter, M. - Dade City Sr.</td>
<td>677</td>
</tr>
</tbody>
</table>

(McDonald)

C. Florida Master Gardener Program Welcomes Four More Counties

Sixty-seven Master Gardeners visited Gainesville on February 22, to participate in ceremonies noting the completion of their training. These gardeners traveled from Clay, Baker, Putnam, Duval and St. Johns Counties. State Extension Specialists welcomed the gardeners and explained their extension activities.
Dr. Jim Brasher, Associate Dean for Extension, also welcomed the gardeners, and commented on the importance of their work as master gardeners. He completed his visit by awarding the Certificates of Completion.

The afternoon hours were spent in the Fruit Crops teaching orchard where Dr. Tim Crocker demonstrated pruning techniques.

The Florida Cooperative Extension Services welcomes these new counties into the Florida Master Gardener Program.

(McDonald)

Prepared by Extension Vegetable Crops Specialists

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