April 1, 1977

Prepared by Extension Vegetable Crops Specialists

J. F. Kelly  
Chairman

James Montelaro  
Professor

G. A. Marlowe, Jr.  
Professor

J. M. Stephens  
Associate Professor

R. D. William  
Assistant Professor

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

FROM: James M. Stephens - Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 77-4

IN THIS ISSUE:

I. NOTES OF INTEREST
   A. Vegetable Field Days - Six dates set

II. COMMERCIAL VEGETABLE PRODUCTION
   A. Hairy Indigo Cover Crop for Nematode Control
   B. Water Conservation in the Early Growth of Vegetables
   C. Nutsedge Control in Vegetables - Cultural Management

III. VEGETABLE GARDENING
   A. Timely Gardening Topics
   B. Know Your Vegetables - Banana Squash

NOTE: Anyone is free to use the information in this newsletter. Whenever possible, please give credit to the authors.
THE VEGETARIAN NEWSLETTER

I. NOTES OF INTEREST

A. Vegetable Field Days - Six dates set.

Dates for six Vegetable Field Days have been set. They are as follows:

I. Location - ARC (Yelvington Farm), Hastings, FL
   Date and Time - 1:15 PM, Thursday, April 14, 1977
   Crops - Potatoes and Cabbage

II. Location - AREC, Belle Glade, FL
    Date and Time - 9:30 AM, Thursday, May 5, 1977
    Crops - General Muck-grown Vegetables

III. Location - ARC, Leesburg, FL
     Date and Time - 1:15 PM, Wednesday, June 1, 1977
     Crops - Watermelon, Cantaloupe and Cukes

IV. Location - Vegetable Crops Department, Gainesville, FL
     Date and Time - 9:30 AM, Thursday, June 2, 1977
     Crops - General Vegetables

V. Location - Zellwood Farm (of AREC, Sanford), Zellwood, FL
     Date and Time - 7:00 PM, Thursday, June 2, 1977
     Crops - Sweet Corn

VI. Location - AREC, Bradenton, FL
     Date and Time - 9:45 AM, Wednesday, May 25, 1977
     Crops - Tomatoes, Peppers, etc.

A program for most field days will be sent out at a later date. Please put these dates on your calendar and plan to attend all events.

(Montelaro)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Hairy Indigo Cover Crop for Nematode Control

Cover crops are recommended highly in a rotation program in vegetable production. If for nothing else but the organic matter and nitrogen added to our sandy soil, they are worthwhile. Adding nematode control should make cover-cropping during the off-season (summer) even more attractive to vegetable growers.

Hairy indigo is a cover crop offering all three benefits. This was proved in a three-year study by Dr. H. L. Rhoades at the AREC at Sanford. Dr. Rhoades grew hairy indigo, sesbania and sorghum as summer cover crops and followed them with vegetable crops. Some of the plots were fumigated to find out if nematode control could be improved. Results of the three-year study with snap beans are presented in the following table.
Nematode populations and snap bean yields following three different cover crops

<table>
<thead>
<tr>
<th>Cover crop</th>
<th>Sting nematodes (100 cm³ soil)</th>
<th>Root knot index (a)</th>
<th>Yield (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorghum</td>
<td>145</td>
<td>1.3</td>
<td>3387</td>
</tr>
<tr>
<td>Sesbania</td>
<td>63</td>
<td>3.7</td>
<td>5592</td>
</tr>
<tr>
<td>Sesbania + DD (260 liters/ha)</td>
<td>1</td>
<td>1.8</td>
<td>8923</td>
</tr>
<tr>
<td>Hairy indigo (broadcast)</td>
<td>5</td>
<td>1.5</td>
<td>8858</td>
</tr>
<tr>
<td>Hairy indigo (in-row)</td>
<td>2</td>
<td>1.2</td>
<td>8987</td>
</tr>
<tr>
<td>LSD .05</td>
<td></td>
<td>0.5</td>
<td>2540</td>
</tr>
<tr>
<td>LSD .01</td>
<td></td>
<td>0.7</td>
<td>3517</td>
</tr>
</tbody>
</table>

(a) Root knot nematode galling of snap beans at maturity based on an index of 1, no galling, to 5, severe galling.

Dr. Rhoades' study indicates that hairy indigo may be a valuable summer crop for reducing sting nematode populations before fall and winter vegetable production in Florida. He warns, however, that additional control measures may be needed when hairy indigo is followed by a crop like cucumber which is highly susceptible to nematodes. This is true in spite of the fact that hairy indigo is quite resistant to these two rootknot species found in Florida.

To be successful as a cover crop, hairy indigo must be grown properly. Dr. Rhoades has found that broadcasting seed in early June at a rate of about 12 pounds per acre is probably the best practice. Good seed should be used to lessen the hazard of hard seed which may become a weed problem later. For the same reason, hairy indigo should be plowed under before it produces seed.

Considering the benefits of organic matter, nitrogen fixation, and nematode reduction, hairy indigo offers promise in a vegetable-cover crop rotation program. Anyone interested in a copy of Dr. Rhoades' report published in the Plant Disease Reporter can obtain one from this office.

(Montelaro)

B. Water Conservation in the Early Growth of Vegetables

Water conservation is destined to become mandatory in future crop production. "Most from least" may be the watch words of tomorrow: the most quality and yield from the least water, the least space, least time, least agrichemicals, and the least labor. One contribution to most from least systems (MFLS) in vegetable production may be greater containerization of plants in early growth stages.

Vegetables in the United States are usually started in the field by direct-seeding or by transplanting small seedlings. In Florida, a third and very valuable method is used. The plug-mix method, developed by Prof. N. C. Hayslip,
ARC/Ft. Pierce, provides a favorable environment for the germinating seed and early seedling development with less total water than direct seeding.

A comparison of water efficiency between the transplant and direct-seeded methods may be of interest. The plug-mix efficiency probably falls somewhere between these two methods.

A plant-growing structure (such as a greenhouse) 35 x 225 feet in size can produce enough transplants to plant approximately 250 acres of tomatoes (assuming for this example 2000 plants to the acre) in six weeks. During this 42-day period the seedlings may be watered as often as 3 times a day with approximately 300 to 350 gallons of water per acre per application (or 1050 gal/acre/day). For the entire production period (42 x 1050), the gallonage used would be about 44,000 gallons per acre of 1.6 acre inches of water (44,000 divided by 27,154, the number of gallons per acre inch).

In the same six-week period, a direct-seeded crop would require enough water to maintain adequate soil moisture for germination and seedling development. In central Florida the evapotranspiration (ET) figure derived for a Feb. 1 planting of tomatoes is 16.5 inches for the entire 100-day growing period. The first six weeks would require about 46% of this total ET (16.5 x .465 = 7.67) or roughly 8 inches of water. Therefore, 250 acres would require 2000 acre inches or translated into gallons (2000 x 27,154) 54,308,000 gallons during this portion of the total season.

To supply 2000 acre inches of water, assuming zero rainfall during the period, the grower would probably use seep irrigation (30-50% efficient), sprinkler irrigation (65-90% efficient), or drip irrigation (80-95% efficient).

A bed covered with plastic mulch would, of course, reduce the water needed to maintain field moisture. If one estimates that 33 to 40% of an entire area would be covered, the evapotranspiration may be reduced from the 8 inches required to approximately 6 inches (thus 250 acres x 6 inches = 1500 acre inches or 40,731,000 gallons).

The water application level for the three most common methods in Florida for full-bed-mulched tomatoes would look something like this:

Seep 50% efficiency for 1500 acre inches, or 3000 acre inches
Sprinkler 80% efficiency for 1500 acre inches, or 1875 acre inches
Drip 95% efficiency for 1500 acre inches, or 1580 acre inches

As stated before, the plug-mix system would require less total water because most of the water is applied only into the holes where the seed and mix are placed. As the seedlings mature, whole field watering is then initiated.

The savings in water between the direct-seeded and containerized method is but one of several advantages. The plants growing in the somewhat crowded but controlled environment may be provided more effective pest control, weed control, fertilizer application, and climate modification with less labor and time than in the open field.
THE VEGETARIAN NEWSLETTER

The beds in which the seed or the transplants are to be placed, both must be brought to approximate field capacity 7-10 days before planting so that beds can be properly formed, fertilized, and covered.

Under present day conditions the added cost of transplanting versus direct-seeding may override water efficiency and other advantages. Direct-seeded planting by machine takes about 0.8 hr. per acre (4 row planter), whereas a one row machine-transplanting operation takes 3 1/2 to 5 hours per acre. The two systems would need to be checked for cost-benefit relationships.

The time may never come when we will have to operate under such conservative methods, but our agricultural leadership must be looking ahead for such a possibility. Since containerization methods use only about one thousandth of the water used in full field irrigation for direct-seeding they deserve serious consideration.

(Marlowe)

C. Nutsedge Control in Vegetables - Cultural Management

Purple nutsedge or nutgrass is recognized as the world's worst weed in cultivated row crops where warm temperatures prevail throughout the entire year. Modern vegetable production and use of intensive cultural practices tend to encourage the growth and distribution of nutsedge, especially in land planted regularly to vegetables. Despite the continued efforts of thousands of research workers, agriculturists, and vegetable growers from around the world, we still lack a simple and relatively inexpensive method of controlling purple nutsedge.

To assist growers in perfecting their weed management system, this and a subsequent article will discuss factors associated with cultural and chemical management of nutsedge in cropping systems involving vegetables.

Purple nutsedge competes with most cultivated crops because the leaves and shoot germinate and emerge from numerous tubers and underground storage organs along with or before most other weed species and direct-seeded crops. Under normal planting conditions in Florida, most nutsedge shoots will have emerged within a 3 to 5 week period after planting. Frequent cultivations only suppress the growth of purple nutsedge and the use of most herbicides registered for vegetable production eliminate the competition from other weeds, thereby enhancing the growth of nutsedge. Initial nutsedge growth not only competes with vegetable crops for water, light, and nutrients; but may reduce the efficiency of other pest control measures and fertilizer applications.

The first step towards successful control of purple nutsedge is prevention. Because purple nutsedge does not generally germinate from seed, growers can easily recognize the dark brown tubers covered with partially decomposed leaf scales. Tubers are about the size of a peanut seed. Therefore, growers must carefully inspect transplants, seed, and other propagating materials to avoid introducing purple nutsedge into an uninfested field. Also, all equipment should be thoroughly cleaned and inspected before transferring from one infested field to other fields that lack or contain only a few nutsedge plants.
Once purple nutsedge becomes established in a field, the grower must learn to live with this weed and may be able to produce an excellent crop by only partially controlling nutsedge growth. In fact, we may need to modify our concept of acceptable weed control for most weed species to a concept of partial control of nutsedge based on economic threshold levels. For example, it may be economically feasible to reduce the nutsedge population by approximately 70% which may completely eliminate the biological competition for most vegetable crops, rather than expect near perfect (approximately 95%) control as we do for most other weeds. Presently to attain even a 70% control, growers must consider every management aspect that will reduce nutsedge reproduction rates and populations. Some of these factors are:

a. Selection of competitive crops and varieties - Most vegetables can be grouped into three broad categories depending on their ability to grow in fields infested with purple nutsedge. Examples of these broad groupings are summarized in the following table.

<table>
<thead>
<tr>
<th>Crop competition group with nutsedge</th>
<th>General description and crop example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive</td>
<td>Fast growing crops that form complete canopy. (e.g.) - bush green beans planted in closely spaced rows - cucumbers or winter squash - sweet potato</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Tall growing crops or crops that form only a partial canopy. (e.g.) - sweet corn - transplanted tomato, pepper, cabbage - pole green bean - watermelon</td>
</tr>
<tr>
<td>Non-Competitive</td>
<td>Slow or short growing crops. (e.g.) - onion (either direct seeded or transplanted). - carrot - okra - direct seeded tomato, pepper, or cabbage</td>
</tr>
</tbody>
</table>

In addition to selecting a competitive crop, the grower may also select certain varieties that are more competitive against purple nutsedge than others. Usually, more vigorous, faster growing varieties will be more competitive than shorter, slower growing varieties. Growers are best advised to plant competitive vegetables in land free from purple nutsedge and to consider an intensive land management system aimed at suppressing and reducing the nutsedge population in seriously infested land.
b. Optimum planting dates, planting patterns, and cultural practices - Growers who can select an optimum planting date that coincides with a stable market will reduce the number of weedicings necessary during the initial stages of crop growth. In addition, closely spaced planting patterns combined with high plant densities designed to create a dense canopy and shade will help suppress nutsedge growth during the crop cycle. Bank placement of fertilizer where soluble salt problems can be avoided and where the crop can efficiently utilize the plant nutrients will also swing the competitive balance in favor of the crop.

A subsequent article will discuss chemical control of purple nutsedge and implications of developing year-round cropping systems designed to reduce nutsedge populations to manageable levels.

(William)

III. VEGETABLE GARDENING

A. Timely Gardening Topics

Four timely topics on vegetable gardening are offered each month to assist Extension agents in developing periodic (weekly) radio or newspaper shorts.

(1) Community Gardening

Are you or your group looking for a worthwhile civic project to promote for the benefit of your community? If so, consider organizing a neighborhood garden in your community. Why would it be worthwhile? Because most neighborhoods have residents who would like to have a vegetable garden but who do not have a sufficient plot of ground of their own.

Here are some general procedures to consider. The first step is to find a sponsoring agency or group, such as a civic club, to develop the project. Then, some initial monetary investment will be necessary, such as for land rent, fees or permits, fencing, etc. An early step is to get an estimate of the demand for garden plots within a particular neighborhood. A contact person needs to be identified to furnish information on the project.

About the same time, a proper site should be selected. It should provide space for a minimum of 10 gardeners. A good site should have sunlight, water, good soil, adequate parking space, or be within easy walking distance of home. Consult local government about the availability of public land. Drive around, spot a likely site, then inquire about its ownership and availability.

Getting the operation going first requires quite a bit of personal time spent in formalizing arrangements for use of the land. Prepare a lease or memorandum, stating such conditions as starting and ending dates, payment, what will and will not be provided by sponsors and what materials can be used by the gardener. Stipulate arrangements for water and its use, insurance coverage, and what the sponsors will not be responsible for.

In your final sign-up, prepare and mail final applications stating terms, conditions and rental fee for individual plots. Determine order of assignment
of plots. Make assignments in writing. Prepare educational packets for gardeners covering planting, cultivation and harvesting information.

And perhaps the most important step is to recruit a trained person as the garden supervisor to oversee land preparation, laying-out plots, and aiding gardeners.

(2) Deep Planting Tomatoes

Quite often the home gardener is faced with the problem of buying plants that have been growing too long in the flat or transplant container. These plants are usually tall and spindly--referred to as "leggy" plants. Faced with no better alternatives than to use the plants, the gardener must set the plants in such a way as to minimize loss of the plants resulting from their spindly nature. To do this, deep planting is suggested, in spite of the general rule in transplanting most nursery plants "never deeper than they grew in the nursery". The tomato plant has the ability to develop roots along the stem, wherever the stem comes in contact with moist soil. Therefore, set any tomato transplant, and especially "leggy" ones, deeper than originally planted. You may wish to dig a 4 inch deep trench long enough to accommodate the stem of the plant. Place the plant at an angle in the trench so that only the leaves and one or two inches of stem protrude from the soil. Pour water in the hole to moisten the soil, then keep it moistened. A vigorous rootball should result all along the buried stem.

(3) Deck Tomatoes

A wooden deck seems to be the modern day version of the topless porch. Your deck can be given a different look by constructing a "mini-garden" planter and trellis for tomatoes on one side or end of it. The planter need not be of elaborate construction. Instead of troughs or boxes, merely build a short (18 inches high) lath screen. The 5-gallon containers can be placed in a row on the deck hidden from view by the lath screen. A lath trellis about six feet high should be constructed behind the cans. As the tomato plants grow, they can be trained and tied to this trellis. As a suggestion, Florida gardeners should try the "Tropic" variety of tomato in their containers.

(4) Cutworms in the Garden

No gardener needs to be told how discouraging it is to buy a fine tomato plant, spend a lot of time preparing the garden soil, set out the plant, then the next morning find it cut down by a cutworm. Small cutworms generally are not large enough to sever the plant at the soil line or just above it as can the larger ones. They may nibble on the stems, biting out tiny semi-circular notches. Larger cutworms that are medium-sized to full-grown do most of the damage to vegetable seedlings. They hide beneath the soil surface in the daytime, coming out to feed at night. When you see a freshly cut-off plant, dig around the base of the plant stub and you'll likely find a grey colored, greasy looking, plump worm curled up tightly in the soil.

To prevent loss of plants, two practices are suggested here. First, dust or spray an area about 6 inches wide on either side of the freshly set out plants. Use the chemical diazinon. Then, whether or not the chemical has been used, place a waxy cardboard collar around the stem of the plant. Insert one end of the circular collar about 1 inch deep in the soil with the top end extending about two inches up the stem. Cutworm baits are also effective sometimes.

(Stephens)
B. Know Your Vegetables - Banana Squash

Banana squash (Cucurbita maxima) is a member of the winter squash group. It is not grown commercially in Florida, nor is it often found in home gardens. Perhaps the reason is its susceptibility to leaf diseases such as powdery and downy mildew.

There are several varieties of banana squash, each differing mainly in the color of the skin. All grow on a large vine having both male and female flowers. Blue Banana is blue or slate colored, with medium thick, yellow-orange flesh which is dry, fine textured, and of good quality. The brown seeds are enameled. The fruits mature in about 105-110 days after reaching a length of 20-22 inches, a diameter of 6 inches, and a weight of 12 pounds. The surface of the skin is slightly wrinkled.

Pink Banana is quite similar to Blue, except for the skin color which is a dull deep pink. Orange Banana, likewise, is similar, the chief difference being its brilliant orange colored flesh and exterior. The big one of the bunch is Pink Mammoth Jumbo. It reaches a length of 48 inches, a diameter of 12 inches, and a weight of 75 pounds.

Banana squash, like most winter squash, are best grown in the Florida garden in the spring of the year, except in South Florida where they may be grown through the winter and spring. Plant the seeds after the danger of frost has passed. Culture is similar to cantaloupe, with wide row spacing a necessity. The vines become quite lengthy. Space plants 42 inches apart and allow a row width of at least 60 inches. An initial application of 6-8-8 fertilizer at the rate of 3# broadcast per 100 sq. ft. is suggested, with side or top dressings at 2-3 week intervals or as needed.

In addition to the disease problems already mentioned, fruit rots (soil decay) can be troublesome. A mulch barrier on the soil is helpful. A variety of insect problems could occur such as aphids, squash bugs and pickleworms. Bees are needed for pollinating, so dust or spray after mid-morning when bee activity has diminished.

Since banana squash is mature when harvested, its hard rind allows it to be stored for a month or more until eaten.

(Stephens)