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

FROM: James Montelaro, Professor and Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 77-10

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Dale Cheshire

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I. NOTES OF INTEREST

A. Greenhouse Tomato School

A one-day session on Greenhouse Tomato Production is planned for Florida county agents and producers.

DATE: November 15, 1977
TIME: 9:30 to 3:00 lecture and panel discussion
      3:00 to 4:00 tour of a local greenhouse
PLACE: Community Center, Oxford, Florida

A copy of the program outline will be mailed to county agents about mid-October.

(Montelaro)

B. Last Month's Article on Nemagon Revised

Last month's Vegetarian Newsletter 77-9 carried an article in the gardening section about the recent controversy over Nemagon. Due to new developments, that article has been revised and appears in the gardening section of this issue.

(Stephens)

C. North Florida Vegetable Marketing Meeting - Thomasville, Georgia

The Georgia Department of Agriculture - Marketing Division and the Georgia and Florida Cooperative Extension Services are planning a meeting for county agents and growers who currently sell or wish to sell at the Thomasville Vegetable Market. We plan to discuss pointers on production, varieties, handling, grading and packing quality vegetables and market prices. The meeting is scheduled for December 2, 1977, 9:30 AM, at the Thomasville Market in Thomasville, Georgia.

(William)

II. COMMERCIAL VEGETABLE PRODUCTION

A. The Linear Foot Concept in Vegetable Crop Fertilizer Recommendations

Many of the major Florida vegetable crops are now being grown with the full-bed mulch system or some modification of this method. Growers used to think of "field acres" but this idea is gradually changing to "bed acres" because of this new system of culture. Application rates for fumigants, herbicides, plastic film, stakes (when used), and drip tubing are all based on the row concept. Fertilizer recommendations are still being given in pounds per acre which often causes great confusion and error for farm managers, fertilizer salesmen, and county extension agents.
The spacing between beds varies a great deal from grower to grower, but the actual bed width is fairly constant (32-48 inches). In a recent four-county survey in southwest Florida it was noted that the distance between beds varied from 6.5 to 12.5 feet. Much of the space between beds is used for roadways and ditches for drainage and irrigation. At the various row spacings the space utilization is as follows: (Based on a 208' x 208' acre).

<table>
<thead>
<tr>
<th>Distance Between Beds, Feet</th>
<th>Percent of Total Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual Bed Surface</td>
</tr>
<tr>
<td>6.5</td>
<td>41</td>
</tr>
<tr>
<td>9.0</td>
<td>33</td>
</tr>
<tr>
<td>12.5</td>
<td>30</td>
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</tbody>
</table>

The distance between rows is not considered by most growers in the calculation of fertilizer rates to be applied. Most growers consider the "plastic acre" to be a six foot wide strip 7,260 feet long, thus omitting the fact that the bed may be only about 3 feet wide and beds from 6.5 to 12.5 feet apart. Confusing? Yes indeed, and this complicates fertilizer, irrigation, and yield calculations, too!

A brief look at some yield relationships may be of interest. The distance between plants varies from 18 to 32 inches, with most at 24 inches. The average yields for fields with narrow to wide row spacings is as follows:

<table>
<thead>
<tr>
<th>Distance Between Beds, Feet</th>
<th>Length of Row for 1 &quot;acre&quot;</th>
<th>No. of Plants* per &quot;acre row&quot;</th>
<th>Avg. Yield,# per acre</th>
<th>Pounds Fruit, per Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5</td>
<td>6700</td>
<td>3350</td>
<td>33150</td>
<td>9.9</td>
</tr>
<tr>
<td>9.0</td>
<td>4840</td>
<td>2420</td>
<td>24450</td>
<td>10.1</td>
</tr>
<tr>
<td>12.0</td>
<td>3485</td>
<td>1742</td>
<td>27210</td>
<td>19.2</td>
</tr>
</tbody>
</table>

* Average distance between plants in the row 24 inches.

It may be noted that the wider spacings produce more fruit per plant but less per "acre". Growers feel that the wider spacing produces larger fruit which usually means more dollar return per "acre".
It is common practice among tomato growers to mix the phosphate and micronutrient fertilizer in the bed, apply some low analysis starter fertilizer on or into the upper surface of the bed, and place the major portion of the N and K in bands on the surface. The typical grower provides a total of 322 lbs N, 220 lbs P₂O₅, and 525 lbs of K₂O to the "acre". This amount is applied to narrow or wide rows, using the "6 foot" row width calculation. A 6 foot strip, 100 feet long is visualized. The 100 foot length is preferred for calibration purposes. This 600 square feet "row" is divided into the 43,560 square feet "acre" resulting in 72.6 units per acre.

If the fertilizer recommendation is for 2,000 pounds of a fertilizer for the bands, the grower then divides 72.6 into the 2,000 lbs for a rate per 100 linear feet of row (approximately 27.5 lbs). One may ask a rather important question: Does this result in more fertilizer per plant than recommended by IFAS? Or less? Are IFAS fertilizer recommendations based on a broadcast acre? In any case, there is merit in developing a standard for the current row method of culture. This would approach more nearly the ideal of applying fertilizer based upon plant population and/or fruit production capacity. A realistic view would be to consider the 36 to 48-inch bed top 14,520 feet long for the linear foot of row concept. The fertilizer calculation for a 3' x 100' unit would always be 48.4 units (or a 4' x 100' unit, 36.3). This linear feet concept (100 feet or 31.2 meters) would make fertilizer, herbicide, fumigant, and other rate calculations much easier. Reactions to this concept from County Extension Agents and others would be greatly appreciated.

(Marlowe)

B. Response of Common Weeds To Herbicides In Vegetables

Weed identification and selection of appropriate weed control methods are essential steps in designing or modifying a weed control program. Where more than one herbicide is registered for a specific vegetable crop, the grower may choose the most effective chemical for control of those weed species found growing in the field.

The following tables were developed from research data and experience of research and extension workers from Florida and southeast United States. The information is based on comparative ratings obtained under normal to optimal conditions for herbicide activity including appropriate temperature ranges, rainfall or soil moisture, application rate and method, soil type and texture, soil organic matter contents, etc. Consult the herbicide label for specific information relating to the use and expected response of the herbicide under your conditions.

(William)
CONTROL OF COMMON WEEDS FOUND IN FLORIDA BY HERBICIDES USED IN VEGETABLES

<table>
<thead>
<tr>
<th>Common weed name (Scientific name)</th>
<th>Alachlor (Lasso)</th>
<th>Atrazine (Control brand)</th>
<th>Bentazon</th>
<th>CIPC (Foliad+)</th>
<th>Chloramben (Pentacle)</th>
<th>Chloroneb (Nupine)</th>
<th>Atrazine (Monsanto)</th>
<th>Dicamba (Banvel)</th>
<th>Dihuron (Monsanto)</th>
<th>EPTC (Pregnant)</th>
<th>Linuron (Lanzone)</th>
<th>MCPP (Pколо)</th>
<th>Naptalam (Alar)</th>
<th>Piminexidine (Trifluralin)</th>
<th>Trifluralin (preplant)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRASS WEEDS (From Seed)</strong></td>
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<td>Alexandergrass (Brachiaria plantaginea)</td>
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</tr>
<tr>
<td>Barnyardgrass (Echinochloa sp.)</td>
<td>E*</td>
<td>G*</td>
<td>F-G*</td>
<td>G*</td>
<td>F-G*</td>
<td>G*</td>
<td>E*</td>
<td>G*</td>
<td>F-G*</td>
<td>F*</td>
<td>G</td>
<td>G*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Crabgrass (Digitaria sp.)</td>
<td>E*</td>
<td>G*</td>
<td>G*</td>
<td>F-G*</td>
<td>G*</td>
<td>F-G*</td>
<td>G*</td>
<td>E*</td>
<td>G*</td>
<td>G*</td>
<td>G*</td>
<td>F-G*</td>
<td></td>
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</tr>
<tr>
<td>Crowfootgrass (Dactyloctenium aegyptium)</td>
<td>E*</td>
<td>G</td>
<td>F-G*</td>
<td>F*</td>
<td>G</td>
<td>E*</td>
<td>E*</td>
<td>E*</td>
<td>G*</td>
<td>G*</td>
<td>G*</td>
<td>F-G*</td>
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<tr>
<td>Goosegrass (Eleusine indica)</td>
<td>E*</td>
<td>G*</td>
<td>G*</td>
<td>F-G*</td>
<td>G*</td>
<td>G*</td>
<td>G*</td>
<td>G*</td>
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<td>G*</td>
<td>G*</td>
<td>F-G*</td>
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<tr>
<td>Johnsongrass (seedlings) (Sorghum halepense)</td>
<td>F-G</td>
<td>N</td>
<td>G*</td>
<td>F-G*</td>
<td>G*</td>
<td>G*</td>
<td>F*</td>
<td>G*</td>
<td>G*</td>
<td>G*</td>
<td>G*</td>
<td>F-G*</td>
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<tr>
<td>Signalgrass (broadleaf) (Brachiaria platyphylla)</td>
<td>*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
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<tr>
<td>Signalgrass (narrowleaf) (Brachiaria piligera)</td>
<td>-</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
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<tr>
<td><strong>PERENNIAL SEDGES</strong></td>
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<tr>
<td>Purple nutsedge (Cyperus rotundus)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>G-E*</td>
<td>N*</td>
<td>N*</td>
<td>N*</td>
<td>R</td>
</tr>
</tbody>
</table>

1/ Key to symbols: E = Excellent; G = Good; F = Fair; N = No Control or "-" No information based on research or extension information from Southeast U.S.; "*" Indicates weed is listed on herbicide label. Dalapon (Dowpon M+) will control most annual and perennial grasses when applied postemergence to actively growing weeds or preemergence to some annual grass seedlings. Also, EPTC is labelled for control of bermudagrass rhizomes and trifluralin for johnsongrass rhizomes.

2/ © = trade mark.
| Common weed name | Atrazine (Savannah brand) | Benomyl (Prevent) | CDNA | DEC | Chlorazapax | Chlorate | Copper | CPTC | Bifenil | Diquat | EPTC | EPTC2 | EPTC3 | Erigeron (Beg. C.) | Foliar | Horsetail | Iron | Iron (S. s.). | Iron (S. s). | Iron (S. s). |
|------------------|--------------------------|-------------------|------|-----|-------------|----------|--------|------|--------|--------|------|-------|-------|-------|-------------------|-------|----------|------|----------|----------|----------|
|**Roadleaf Weeds**|                          |                    |      |     |             |          |        |      |        |        |      |       |       |       |                    |      |          |      |          |          |          |
| Iron (S. viridis) | G                        | E                  | N     | N    | N           | N        | N      | N    | N      | N      | N    | G     | G     | F     | N                 | G    | N        | F    | N        | N        | N        |
| Cocklebur (Xanthium sp.) | N                       | G                  | N     | N    | N           | F*       | N      | N    | N      | F-G    | F    | F     | F     | G     | N                 | G    | G        | N    | G        | G        | N        |
| Sicklepod (coffeeweed) (S. obtusifolia and S. occidentalis) | N                        | G                  | N     | N    | N           | *        | F      | N    | F-G    | F      | F    | G*    | G*    | F*    | N                 | N    | F        | N    | N        | N        | N        |
| Florida Biggarweed (Eremolobus rostratus) | F-G                       | E                  | N     | -    | G           | -        | F-G    | F    | N      | G      | G    | F     | F     | F     | N                 | -    | N        |      |          |          |          |
| Lamb's quarter (Chenopodium album) | F                        | E*                 | F-G   | F    | F-E*       | G*       | F-G    | G    | G-E*   | G*     | E*  | E     | G*    | G-E*  | E     | G*     | G*    | E*    | G*     | E*    |
| Morningglories (annual) (Ipomea sp.) | N                        | G*                 | N     | N    | N           | N        | *      | F    | N      | N      | G*  | F     | F     | N     | G                 | N    | F        | N    | G        | G        | N        |
| Nightshade (Solanum nigra) | F                       | *                  | -     | -    | -           | -        | -      | -    | -      | -      | -   | *     | -     | -     | -                 |      | -        |      |          |          |          |
| Pigweed (careless weed) (Amaranthaceae sp.) | E*                       | E*                 | G     | G    | G*          | G*       | G-E*   | G*   | G*     | G*     | E*  | G*    | G*    | E*    | G*     | E*    | G*    | E*    | E*    |
| Purslane (Portulaca oleracea and P. pilosa) | G*                       | E*                 | F     | G    | G*          | E*       | G*     | G*   | G*     | G*     | G*  | E*    | G*    | E*    | E*    | E*    | G*    | E*    | E*    |
| Ragweed (Ambrosia artemisiifolia) | F                        | E*                 | N     | F-G  | F           | G*       | *      | F    | N      | G-E*   | G*  | F     | N     | G     | N                 | G    | N        | N    | E        | N        | N        |
| Smartweed (Polygonum pensylvanicum) | F                        | E                  | N     | N    | F           | G*       | *      | N    | F-G    | G*     | G*  | F     | N     | G     | G                 | F    | G        | N    | E        | N        | N        |
| Southern Sida (tea or Ironweed (Sida abutilia) | G                        | G-E               | N     | -    | I-G         | -        | G     | F    | N      | G      | F-G | E*    | G*    | N     | F-G     | G*    | N     | G     | F-G    |

* to symbols: E = Excellent; G = Good; F = Fair; N = No Control or """" = No Information based on research or extension information from Southeast U.S. """" Indicates weed is listed on herbicide label. Herbicide efficacy for Southern horseweed (Erigeron pusillus) and dogfennel (Eupatorium capillifolium) were not listed in any consulted reference.
THE VEGETARIAN NEWSLETTER

Ten Noteworthy Developments of the Past Decade in Florida Vegetable Production

In spite of freezes, droughts, inflation, regulations, competition, etc., vegetable production in Florida in 1977 is still a thriving business. This accomplishment can be attributed primarily to the tenacity and ingenuity of the vegetable grower. Credit must be given, also, to the many people from industry and government agencies who support him.

To progress, or even to survive, a highly competitive business like vegetable production in Florida must be aggressively innovative. This is certainly true of our industry. Many innovative developments can be noted over the past decade. Ten such developments, in the opinion of the writer, are worthy of note. They are:

1. Soil fumigation in potatoes, beans and certain mulched crops.
2. Full-bed plastic mulch culture.
3. Use of containerized transplants.
4. Plug-mix seeding.
5. Efficient use of fertilizer.
6. Irrigation of watermelons.
7. Development of the semi-closed irrigation system.
8. Drip irrigation.
9. Integrated pest management.
10. New crops and varieties.

Beans grown in East Palm County and potatoes at Hastings showed a dramatic increase in yield and quality with the incorporation of soil fumigation. Yields of 200 bushels of marketable snap beans are now common on soils treated with a multi-purpose soil fumigant. At Hastings, quality of potatoes improved tremendously with soil fumigation. The poor appearance resulting from corky ringspot and nematode damage has been practically eliminated. The phenomenal success with tomato and pepper yields can be attributed, in part, to the use of multi-purpose fumigants under full-bed plastic mulch culture.

Full-bed plastic mulch culture was expanded from use on strawberries to tomatoes, peppers, eggplant and other crops during the past ten years. Yield and quality of these crops have improved dramatically. Many growers feel that full-bed plastic mulch culture is one of the main reasons for their competitive position with these crops presently. Last winter's freeze demonstrated one more unforeseen advantage gained from this system of culture. Full-bed mulched crops recovered quickly and produced satisfactory crops following one of the hardest freezes in Florida's history. Double-cropping, being used successfully by some growers, may make full-bed mulch culture even more attractive.

With the advent of full-bed plastic mulch culture, containerized transplants also appeared on the scene. Growing transplants in greenhouses reduces "field time" for crops like tomato and pepper by three to five weeks. Although cost comparisons are not available, growers feel that the use of containerized transplants has contributed significantly to recent success in the production of tomato, pepper, eggplant and other crops.

Plug-mix seeding might have gained widespread acceptance in Florida had it not been for the almost overnight success of containerized transplants. Nevertheless, it is being used quite extensively in the rocky soils of Dade County where containerized transplant
use is somewhat limited. Plug-mix seeding has not been exploited to its fullest extent. We feel that it offers promise for a number of other direct-seeded crops in Florida.

Although less obvious than other developments, efficient use of fertilizer, must be rated high on the list of changes contributing to a healthy vegetable industry in Florida. Growers in this state are more aware today than ever before in such matters as use of phosphorus residuals, use of low-salt index fertilizer and proper placement and timing to reduce salt injury. Liming is used not only to correct pH, but to supply desired levels of calcium and magnesium. Growers, in general, are using soil tests to more accurately manage all aspects of crop fertilization. The results may be reported in actual dollars saved without loss in yield, better seedling survival, more uniform crop maturity, increased yields and quality and more. Although hard to measure, benefits to vegetable growers from more efficient use of fertilizer are substantial.

Incorporation of irrigation as a standard practice in watermelon production, together with use of other improved practices, has resulted in dramatic yield increases in central and north Florida. Many growers in Marion County now consider 40,000 pound yields average and are shooting for 50- and 60,000 pounds instead. Watermelon growers in other areas of the state now are being advised to increase inputs, including irrigation, fertilizer, lime, spraying, etc., to reduced acreage to enhance profit potentials. Watermelon growers, like growers of all other vegetables in Florida, have done well by moving toward irrigation as a standard practice.

Use of semi-closed systems for sub-surface irrigation was started more than a decade ago in the Hastings area. It did not gain acceptance elsewhere in Florida until water shortages and rationing threatened. Growers in other areas not only installed plastic pipe to replace open ditches but made further improvements by developing inexpensive and precise discharge systems. Thousands of acres of vegetables are being equipped with the improved semi-closed system. This innovation conserves valuable water and reduces pumping costs by 40 to 50%. All of the sub-surface irrigated land used on permanent basis for vegetable production in Florida should be equipped with the semi-closed irrigation system for greatest efficiency.

Drip irrigation, although relatively new, has made its mark on Florida vegetable production. It is being used on a limited scale on strawberries and tomatoes under full-bed mulch culture in south Florida. Field tests with tomatoes in the Quincy area look promising. Drip irrigation will become more attractive as more water shortage problems develop and the techniques of using it are refined.

Integrated pest management is an extension of what growers have been attempting to do for decades. Forecasting for certain diseases on potatoes, celery and sweet corn has been used in Florida on a limited scale for several years. Work being done now on celery and tomatoes indicates that insects and diseases might be controlled efficiently and economically with fewer applications of pesticides. Integrated pest management, now in its infancy, promises to be a development worth watching over the next decade.

New varieties and crops of the past 10 years contributed significantly to Florida's sound position in vegetable production today. The 'Walter' tomato introduced within the past decade is the number one variety in Florida today. An improved selection, 'Walter FF', will probably replace it in importance. Other tomato varieties as well as other crop varieties will be forthcoming to the industry.
THE VEGETARIAN NEWSLETTER

Carrots were not a major crop until recently. They are produced now on more than 10,000 acres in Florida. Onions appear to be the next in line for major production in Florida. Several hundred acres are due to be planted next season. There are a number of other crops which we feel could be grown profitably in Florida also. With certainty, others will be added to this list.

In summary, the vegetable industry has survived and even prospered over the past decade. This is a tribute to the growers and the many people supporting it. If it continues to be innovative, it will survive and prosper as it has in the past.

(Montelaro)

III. VEGETABLE GARDENING

A. Bitterness in Cucumbers

Anyone who has eaten a cucumber without first peeling it probably is familiar with bitter taste in cucumbers. Even peeled cucumbers may have some of the bitter taste.

The bitter taste is due to natural compounds called cucurbitacins. Wild cucumbers, which are extremely bitter, contain these and other related contributing compounds. Cucurbitacins occur in all parts of the plant and leaves, stems and roots in varying amounts. Only occasionally does the bitter principle spread from the vegetative parts into the cucumber fruits.

When it is found in the fruit, the bitterness does not accumulate uniformly. It varies from fruit to fruit as well as within individual fruits. The compounds are likely to be more concentrated at the stem end than at the blossom end. Bitterness is located in and just under the peel of the cucumber, rather than deep within the fleshy portion of the fruit.

Why there is more bitterness one time than at another is difficult to answer. Many theories have been suggested, but few proven. Temperature seems to have an effect, since there are more complaints of bitter cucumbers during a cool growing season than during a warm one. Research has shown that fertilization practices, plant spacing, and frequency of irrigation have little consistent effect on the number of bitter cucumbers produced. However, hobbins and other misshapen fruits resulting from poor production practices seem more likely to be bitter than well-shaped fruits.

There does appear to be a relationship between the variety (cultivar) of cucumber and bitterness. Most of the varieties that grow well in Florida do develop bitterness to one degree or another from time to time. For the most part, however, bitterness is only an occasional nuisance rather than an overwhelming problem. If fruit is bitter, just remove the outer flesh with the peel, peeling more deeply at the stem end.

(Stephen)
B. Early Frost in the Vegetable Garden

Although not as popular as spring for gardening, wintertime in Florida is an excellent time to grow vegetables at home. Commercially, Florida leads the nation in the production of vegetables during the period of December through April. One does not have to live in sunny south Florida to have a winter garden, although it helps. A difference of 4° in latitude between Jacksonville and Miami gives about a 6 degree change in mean winter temperature. Gardeners should be aware of normal temperature expectations for their area as well as abnormal possibilities when selecting planting dates and those kinds of vegetables to plant.

Frost occurs occasionally over the interior of the extreme northern position of the state during the last week of October, but the temperature is rarely low enough to materially damage any crop before the second or third week of November. No portion of mainland Florida is immune from frost under favorable conditions of atmospheric pressure and sky. However, many areas of south Florida can expect plant-killing conditions so rarely that warm season vegetables should be included in the winter garden.

To acquaint gardeners around the state with what to expect (but not necessarily get) in the way of first frost of the season, here are some selected geographical points and average dates for an 8 consecutive year recorded period:

Apalachicola - (Franklin) -- December 2, November 25, December 9, November 20, November 30, November 16, November 24, and December 3.

Arcadia - (DeSoto) -- December 3, None, None, None, November 21, December 15, December 13, and December 10.

Bartow - (Polk) -- December 3, December 1, December 20, November 12, November 21, December 1, December 13, and November 25.

Bradenton - (Manatee) -- December 4, None, None, None, None, December 15, December and December 20.

Brooksville - (Hernando) -- December 2, December 1, None, November 10, November 21, November 30, November 20, and November 25.

Defuniak Springs - (Walton) -- November 13, November 28, November 10, November 18, November 30, November 16, and November 24.

Deland - (Volusia) -- November 5, December 1, December 20, November 10, November 21, December 1, November 20, and November 25.

Ft. Lauderdale - (Broward) -- None, None, None, None, December 10, None, None.

Ft. Myers - (Lee) -- None, None, None, None, December 10, None, None, None.

Gainesville - (Alachua) -- December 2, November 25, November 25, November 10, November 20, November 30, November 16, November 24, and December 29.

Jacksonville - (Duval) -- December 2, November 25, None, December 9, November 20, November 30, November 17, November 25, and December 29.

Miami - (Dade) -- None, None, None, None, November 21, None, None, and December 10.
C. Indoor Lighting for Indoor Vegetables

Many hobby vegetable growers in Florida find themselves with a desire or a need to grow vegetables in containers indoors. Since vegetables require several hours of full sunlight for best growth, supplemental artificial lighting is required when attempts are made at indoor production.

Artificial light does not exactly duplicate sunlight, but certain types of artificial light can support natural responses in plants, including vegetables.

On an equal wattage basis, fluorescent lamps are more ideal for plant growth than regular incandescent light bulbs because they give off greater and more uniform light, last up to fifteen times longer, and give off less heat. By burning cooler, fluorescent lamps can be placed closer to plants, giving more light without burning the plants.

Adequacy of light is not measured just in terms of duration and brightness, however. The quality of light as measured in wavelength is just as important.

Research studies have shown that many favorite indoor ornamental plants and some leafy vegetable plants mainly use two wave length regions of the light spectrum, the bands of red and the bands of blue. In contrast, flowering and fruiting vegetable plants generally use three wavelength regions—red, blue, and far-red.

Incandescent bulbs are rich in red and far-red light. However, they are low in blue, so are an incomplete source of light. Fluorescent lights, on the other hand, are high in blue light range, but low in red and far-red. It stands to reason then that to produce both plant foliage and flowers, one should use a combination of incandescent and fluorescent. Try experimenting to find the proper ratio of incandescent watt to fluorescent watts. Usually, somewhere around 1 (I) to 5 (F) will be needed.

There are available special growth lamps that provide all the light ranges necessary. These are proving to be very acceptable and are suggested here for trial. Since they are manufactured and sold under several trade names, check at your garden center for brands best suiting your needs.

(Stephens)
D. Know Your Vegetables - Watercress

Watercress belongs to the genus Nasturtium, yet the plant generally known as nasturtium is completely distinct. Botanists still are confused over alternative generic names, suggesting both Rorippa and Radicula. Perhaps the most commonly found scientific name for watercress is *Nasturtium officinale* - aquaticum.

Cultivated watercress also goes by a variety of other names, such as eker, billers, bilurer, rib cress, brown cress, tangle tongue, long tails, and well grass.

Watercress is a perennial plant grown for the pungent leaves and young stems which are widely used for garnishing and in salads. The leaves are smooth and compound with three to a dozen nearly round leaflets. Leaves and stems are partially submerged during growth. It grows wild in running water and flooded places all of the United States, Europe, and the East. Commercially, it is grown in unshaded shallow pools of flowing clean water. It was brought to this country by European immigrants.

Watercress does best in a moderately cool climate. Much of the nation's winter supply is grown in central Florida. Very few home gardeners attempt to produce it.

Production - This report deals with the home growing rather than commercial production of watercress.

If you have your own stream, and know that the water is clean, set aside a shallow portion, such as on the inside of a bend, for a patch of watercress. The site should be relatively flat with a slight slope below the spring that supplies the water.

For those without a stream, watercress may still be grown in small quantities. Fashion a plant bed using 4 mil polyethylene or sheets of heavy duty roofing paper. Scoop out a 6 inch deep basin, then line it with the waterproof material. Fill the bottom of the basin with about 2 inches of composted soil, peat moss, or other regular potting mix.

Watercress can be grown from either seed or cuttings. Small plants may be transplanted. Seed is very small. Broadcast it thinly over finely prepared compost or potting mix, then lightly rake to cover the seed. One ounce of seed sows 700 square feet of plant bed. Obviously, this is far too large an area for the home gardener. Only a tad of seed will be needed to sow the 100 square feet or less most gardeners would plant (seed may be mixed with sand for ease of distribution). In the final stand, allow 6 inches between plants.

Keep the plant bed moist, but not covered with water. If you are using a shallow portion of a stream bed, you may have to start plants first in pots, then transplant into the water-covered bed.

After the seedlings appear in about 5 days, keep raising the water level until the plants are growing in water. For proper spacing, transplant seedlings when they are about two inches high. In this small homeowner arrangement, it is not necessary to have moving water. However, a slow flow would be more desirable if possible.
One must learn by trial and error how to fertilize the watercress. Start out by mixing 1 cup of garden fertilizer into 25 square feet of planting soil.

In about three weeks the plants are ready to harvest. Following cutting, they continue to grow and even appear to become thicker in the bed. Cuttings (12" long) from the old beds may be used to start new beds.

To harvest, cut the tops of the plants about 6 inches below the tips. Gather them into bunches as they are cut. Trim the butt ends so the bunches are about 4 inches long. Thoroughly wash with clean water, then place into plastic bags and keep in the refrigerator crisper until used. Periodic sprinkling helps keep it fresh. Even under ideal conditions one cannot expect to hold it much more than a week without loss in quality.

Watercress is a good source of Vitamin A and Vitamin C, along with niacin, ascorbic acid, thiamine, riboflavin and iron. It is seldom used alone, but adds zest and zing to many other foods.

(Stephens)

E. Nematode Control in the Vegetable Garden

Ridding the soil of those pesky nematodes has long been a somewhat tedious, yet very worthwhile chore for most Florida vegetable gardeners. The buildup of these soil borne plant parasites eventually causes a general decline in the productivity of most all garden plots in the state. Thus, many thousands of gardeners have become familiar with DBCP soil fumigant, better known as Nemagon and also available as Fumazone and OXY-BBC. This liquid or granular material, when placed into the center of the planting row prior to planting, has provided satisfactory plant protection.

Recent reports have cast some doubt on the safety features of the chemical DBCP during manufacture and use. Therefore, all products including Nemagon, Fumazone, and OXY-BBC will no longer be available for purchase or use by the general public. The general public, of course, includes home gardeners. Fortunately, there are other materials available to the public which have been recommended and used for years for controlling nematodes in the home garden. The most common ones are Vapam, Fume V, Vidden D, Vorlex, D-D, Telone, and soilbrom (EDB). Many of these offer other benefits in addition to nematode control. In all cases, gardeners should read the label to become thoroughly acquainted with the proper way to use these chemical nematicides.

(Stephens)
SNAFU- For reasons we have not been able to uncover, probably in the distribution system rather than in the addressing system, several of our regular Vegetarian readers have not received one or more of our last several issues. We have not skipped any month for several years, so if you are missing any issues, especially since this past spring, please let us know and we'll send out replacements.

In order that we may check out the system we ask that you please return this slip to us: Vegetable Crops Department
3026 McCarty D Hall
University of Florida - IFAS
Gainesville, Florida 32611

Date Vegetarian Received: __________________________

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Back Issues Missing - To Be Replaced: ______; ______; ______;
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