The VEGETARIAN Newsletter

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Professor  Professor

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

FROM:  James Montelaro, Extension Vegetable Specialist

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NOTE:  Anyone is free to use the information in this newsletter.  Whenever possible, please give credit to the authors.
A. Checklist of Things to Consider Before Planting Vegetables

Planning for and carrying out things that need to be done before planting is the first step to success in vegetable production. If only one operation is not attended to before planting, the crop may be doomed to failure. The number of things needing attention may vary from time to time. However, all potential preplant requirements needed to insure success of a crop should be taken into consideration. In order to do this, a grower should develop a checklist of things together with a timetable which will permit carrying them out in an orderly fashion.

Following is a sample checklist and a general timetable which can be used as a guide in preparation for planting vegetable crops.

1. **Equipment** - Before the season starts, check equipment to insure that all are in good operating order. Maintain an adequate supply of critical spare parts.

2. **Irrigation System** - Growers should check to see that an adequate amount of water of good quality is available for the crops. This includes checking pumps, water district regulations, quality (soluble salts), land leveling, ditching, etc.

3. **Drainage System** - Parallel to the irrigation system, drainage should be checked to see that water can be removed rapidly. Items to be checked are ditching, slope, pumps, etc.

4. **Liming Requirements** - At least two months prior to planting, take a soil test and lime adequately, if needed.

5. **Crop Residues** - Five or six weeks before planting, turn under all crop residues. During this period, maintain soil moisture to permit complete decay of organic matter.

6. **Land Preparation** - About three weeks before planting, prepare the soil for bedding by thorough plowing, diskng, harrowing, etc.

7. **Preplant Fertilization** - Just prior to final bed-shaping, apply fertilizer to be applied broadcast. Banded fertilizer can be applied during the bed-shaping operation. Consideration should be given also to sources and rates of fertilizer.

8. **Soil Insect Control** - Together with preplant fertilization, apply a soil insecticide for control of wireworms, grubworms, cutworms, etc.

9. **Nematode and Disease Control** - About two weeks before planting and during final bed-shaping, apply soil fumigants or other materials to be used for nematode and soil disease control.

10. **Seed** - Check seed to insure adequate supply of quality seed. Have seed tested several weeks before planting if there are any doubts about its germination and vitality.

Growers with years of experience probably can modify this checklist. The timetable, presented here as a general guide, can be varied depending on a variety of factors. What is important is a systematic approach in planning to avoid costly mistakes.

(Montelaro)
B. Pointers for Control of Vegetable Leafminer and Tomato Pinworm

Control of the vegetable leafminer and tomato pinworm has been almost impossible in vegetable crops over the past few years. This is in spite of intensified chemical control programs. Jim Brogdon, Extension Entomologist with IFAS, suggests that vegetable growers can lessen the seriousness of this problem by taking a few precautionary measures. These suggestions are based on research reports published by Poe, Musgrave and Weems.

Briefly, Mr. Brogdon's suggestions are as follows:

1. Develop a good sanitation program. This includes destruction of all crop residues and cull fruit immediately after last harvest. Leafminer and pinworm larvae buried in the soil cannot emerge easily as adults. Use only transplants that are free of eggs and larvae.

2. Destroy host plants in border areas one month before planting.

3. Use high volumes of water when applying herbicides to soak all mined foliage where larvae feed.

4. Do not use insecticides indiscriminately. In many cases, overuse of insecticides, by killing natural predators, results in higher populations than otherwise.

5. Try to time application of insecticides to kill larvae in early stages of development or when moving from one site to another.

These simple suggestions may aid vegetable growers in economically coping with the problem of leafminer and pinworm control. A good program of monitoring, pending infestations of either of these two insects, can help in scheduling insecticide applications.

(Montelaro)

C. How Big is an Acre of Tomatoes?

Several years ago tomatoes were grown in rows 5 to 6 feet apart with plants spaced 1.5 to 2 feet apart in the row. It was assumed that the plants utilized the fertilizer and soil moisture in this "feeding zone" of 7.5 to 12.0 square feet per plant. During this period fertilizer recommendations were based on pounds of fertilizer per acre, a term most growers understood. Plant populations varied from 3,600 to 5,900 plants per acre.

In some tomato-growing areas of Florida, spacing between rows now varies from 4.5 to 12.5 feet. The spacing of plants in the row may vary from 1.5 to 2.5 feet. Plant populations may vary from 1,400 to 6,400 plants to the "acre". The term acre is an old term that may have outlived its usefulness, especially in fertilizer recommendations.

Workers in nematology and weed control consider rate recommendations on the per cent acre treated. Perhaps we should use this approach in fertilizer recommendations, too.

An example of the difficulty encountered in the per acre method may be of interest if we compare several true stories in this growing season.
Grower A has seep ditches 25 feet apart. Between these seep ditches, he grows 2 rows of tomatoes under plastic. The rows are actually only 36 inches wide, but the grower considers his spacing to be 12.5 feet apart. In each of these rows, he spaces his plants 30 inches apart. He states that one row 3,484 feet long is an "acre", with a plant population of 1,394 plants.

Grower B beds up two rows of tomatoes between seep ditches 18 feet apart. He figures his "acre" to be 9 feet wide and 4,840 feet long. In this acre he sets 1,940 plants in the full-bed mulch system with in-the-row spacing of 2.5 feet.

Grower C grows his crop in rows 4.5 feet apart with a ditch every seven rows. The plants, spaced 1.5 feet apart number 6,450 in the "acre" row 9,680 feet long.

Most growers want to achieve high yields in their 2-4 harvests, so they give serious attention to moisture and pest control and use high levels of fertilizer (nitrogen 250-300 lbs, phosphate 200-250 lbs, and potash 350-450 lbs to the "acre"). In general these amounts are added without much consideration of the plants per acre.

In the full-bed mulch system, the root zone seldom extends beyond the covered area of 32-38 inches. When 250 lbs of N and 400 lbs of potash are added to the 1,400 plant "acre", the per plant application is approximately 4.5 times greater than the 6,400 plant "acre".

Growers reason that the "wide row system" saves on labor, provides better drainage and reduces the need for pruning on the determinate 'Walter' variety. The functional area of the acre does not change, actually one should consider a three foot wide row with so many plants per hundred feet of linear row. Preliminary studies by Dr. C. M. Geraldson, AREC-Bradenton, indicate that these high rates of fertilizer are justified on the fewer plants per acre because of yield increases per plant at the wider spacings.

Many growers are requesting fertilizer recommendations on lbs per 100 foot of row basis. The following text table may be of value. An application of 250 lbs of N and 350 lbs of K2O could be provided by 100 lbs ammonium nitrate 33.5%, 1,290 lbs of calcium nitrate 15.5%, and 700 lbs of sulfate of potash (total 2,090 lbs).

<table>
<thead>
<tr>
<th>Distance between beds, ft.</th>
<th>Length of bed, feet per acre</th>
<th>Pounds of fertilizer* per 100 ft/row</th>
<th>Plants per acre</th>
<th>Plants/100 ft. row at 2.5 ft spacing</th>
<th>Lbs. fruit per plant, 900 box (30 lb) yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5</td>
<td>9680</td>
<td>20.7</td>
<td>3872</td>
<td>40</td>
<td>6.97</td>
</tr>
<tr>
<td>5.5</td>
<td>7920</td>
<td>25.2</td>
<td>3168</td>
<td>40</td>
<td>8.52</td>
</tr>
<tr>
<td>6.5</td>
<td>6712</td>
<td>29.8</td>
<td>2785</td>
<td>40</td>
<td>9.69</td>
</tr>
<tr>
<td>7.5</td>
<td>5808</td>
<td>34.4</td>
<td>2323</td>
<td>40</td>
<td>11.62</td>
</tr>
<tr>
<td>8.5</td>
<td>5125</td>
<td>39.0</td>
<td>2050</td>
<td>40</td>
<td>13.17</td>
</tr>
<tr>
<td>9.5</td>
<td>4585</td>
<td>43.6</td>
<td>1834</td>
<td>40</td>
<td>14.72</td>
</tr>
<tr>
<td>10.5</td>
<td>4148</td>
<td>48.2</td>
<td>1660</td>
<td>40</td>
<td>16.26</td>
</tr>
<tr>
<td>11.5</td>
<td>3788</td>
<td>52.8</td>
<td>1515</td>
<td>40</td>
<td>17.82</td>
</tr>
<tr>
<td>12.5</td>
<td>3484</td>
<td>57.4</td>
<td>1394</td>
<td>40</td>
<td>19.37</td>
</tr>
</tbody>
</table>

*Approximately 2,000 lbs 12-0-18 or equivalent.

It is quite obvious from the above table that the plants in the "wide" rows are getting much more fertilizer per plant than in the "narrow" rows. The yield per plant on a theoretical basis would have to increase as shown in the table in order to have equivalent yields over the entire range of row spacings.
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Someday we may wish to report yield-fertilizer relationships on a per plant basis. If a grower using 6,000 plants to the acre wished to achieve a 1,300 box yield (assuming good cultural practices, pest control and moisture control), he might consider application of the following:

<table>
<thead>
<tr>
<th></th>
<th>Nitrogen</th>
<th>P2O5</th>
<th>K2O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds/plant</td>
<td>0.04</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>Grams/plant</td>
<td>19.07</td>
<td>7.26</td>
<td>26.33</td>
</tr>
<tr>
<td>Pounds/acre</td>
<td>250</td>
<td>100</td>
<td>350</td>
</tr>
</tbody>
</table>

There are many ways to express fertilizer recommendations such as pounds per acre, pounds per linear foot of bed, or pounds per plant, each having advantages and disadvantages. Perhaps a uniform method is not likely with the wide range of row spacings and plant populations used today. We should, however, carefully consider the placement, plant population, potential salt problems, desired yield level, and cost-benefit of fertilizer to be applied in this intensive full-bed mulch culture.

(Marlowe)

III. VEGETABLE GARDENING

A. Timely Gardening Topics

These questions and answers are suggested for agents' use in developing periodic (weekly) radio or newspaper briefs. They are based on letters of inquiry from Florida gardeners.

(1) Timely Topic for Week of September 19-25

Question

I don't seem to have any luck growing garlic here in Florida, what could be the reason?

Reply

Garlic is sensitive to such environmental factors as length of day and temperature. It is started by planting the cloves (parts of the bulb). After harvest, these cloves go into a period of dormancy. Storage of these cloves at around 40°F will start the sprouting process. Then, they should be planted for early growth during cool days around 68°. Following this wintertime growth in Florida, bulbing should take place as the days get longer in the spring and early summer. Higher temperatures during this bulbing period are not detrimental but dry weather near and at harvest time is needed for a yield of high quality bulbs. Any breakdown in the sequence outlined, in addition to many other factors, could be responsible for your disappointments with this crop.

(2) Timely Topic for Week of September 26-October 2

Question

I have a bad nutgrass problem in my garden and am wondering if mulching will take care of it.
Mulching with dead plant material or plastic will do little good to suppress the nutgrass. These mulches are easily pierced by the growing point of the nutgrass. It then has a competitive advantage over other weeds which are not able to grow through the mulch. Even though the mulch would not thwart the nutgrass, it still should be applied. The mulch would lessen the competitive effects of the nutgrass. For example, sufficient soil moisture and fertilizer would be conserved for both the weed and the crop plant.

(3) Timely Topic for Week of October 3-9

Question

I understand that the fall is the best time of the year to start my strawberry planting in my garden. How can the plants withstand the cold winters even here in Florida?

Reply

The varieties of strawberries grown in Florida are short-day varieties. Plants are set in the fall. During the cool, short-days of winter, flowering is initiated. Berries formed during the cool winter months quickly mature as days become warmer and longer in the spring. In the event of frost or freezing temperatures, the plant leaves, stems and roots are not damaged, but such tender parts as flowers, flower buds, and fruits may be injured or killed. The degree to which the parts are injured is affected by such things as (1) the duration and rate of temperature drop, (2) the condition of the plant, and (3) the variety grown. Frost protection techniques, such as covering the plants with heat-loss barriers, are helpful in producing an early crop. However, even with early losses due to frost, all areas of Florida may expect suitable yields during the frost-free months of March, April and May.

(4) Timely Topic for Week of October 10-16

Question

I read a gardening article on cucumbers the other day which several times mentioned the term "gynoecious" in reference to hybrid varieties. What does this term imply?

Reply

The standard common cucumber plant is called monoecious, having similar numbers of both male and female flowers on the same plant. Of course, it is the female flower that develops into the fruit following pollen transfer from the male flowers (via bees). A gynoecious hybrid has mostly female flowers, and thus a potential for a much higher number of fruits than standard varieties. The problem is how to get the female flowers pollinated when there are only a few male flowers present. The answer is to mix seeds of a monoecious variety into the seedbag containing seeds of the gynoecious variety. In actual practice, the commercial seedsman does this before selling the seed. Usually the mix (called a blend) is somewhere around 10-15% monoecious and 85-90% gynoecious.

(Stephens)
B. Know Your Vegetables - Seedless Watermelons

Seedless watermelons are sterile hybrids that develop fruits, but no seeds. The seeds for growing them are produced by crossing a normal watermelon with one that has been changed genetically by treatment with a chemical called colchicine (pronounced kol-chi-seen). The seed from this cross produces seedless plants which, when pollinated with pollen from normal plants, produce seedless melons.

In seedless watermelons, rudimentary seed structures develop. These are small, soft, white, tasteless, undeveloped seedcoats that are eaten right along with the flesh of the melon.

A scientist named H. Kihara, of Kyoto University, Japan, developed the technique for producing seedless watermelons. He reported his procedures in 1950. Here is a more technical version of the above explanation.

The normal watermelon (called a diploid) has 22 chromosomes per cell. By treating seedlings with colchicine, a new plant type called a tetraploid having 44 chromosomes is produced. Then, by crossing a tetraploid (44 chromosomes) with a normal diploid (22 chromosomes) as the pollinator, one gets a triploid (33 chromosomes). This triploid seed produces a sterile hybrid which will not reproduce itself (much like the mule and the banana). When flowers of this sterile triploid plant (called the seedless watermelon plant) are pollinated by a normal plant, seedless fruits develop.

Due to the entire hand-oriented process, the resulting seeds are expensive. Therefore, much care should be given to the culture of the seedless watermelon crop. For this reason, seedlings should be started in peat pots or other suitable transplanting containers. From then on, culture is similar to that for regular watermelons.

(Stephens)