January 6, 1977

Prepared by Extension Vegetable Crops Specialists

J. F. Kelly  
Chairman  
James Montelaro  
Professor

J. M. Stephens  
Associate Professor  
G. A. Marlowe, Jr.  
Professor

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

FROM: James Montelaro, Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 77-1

IN THIS ISSUE:

I. NOTES OF INTEREST
   A. New Vegetable Extension Specialist

II. COMMERCIAL VEGETABLE PRODUCTION
   A. Root Injury - Contributing Factors
   B. The Increasing Role of F1 Hybrids in Modern Vegetable Crop Production

III. HARVESTING AND HANDLING
   A. Control of Bean Molds

IV. VEGETABLE GARDENING
   A. Timely Gardening Topics
   B. Know Your Vegetables - Sea Kale

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. New Vegetable Extension Specialist

Dr. Ray William joined our faculty as Extension Vegetable Specialist January 10. Ray has replaced Steve Kostewicz and will be giving his primary efforts in the 26 north and west Florida counties previously covered by Steve. He will also be giving state-wide leadership in weed control for vegetables.

Ray is a graduate of Purdue University and has most recently been a crop production specialist at the Asian Vegetable Research Institute in Taiwan.

(Kelly)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Root Injury - Contributing Factors

It can be said that a vegetable crop is as good as its root system. Without good, healthy roots, no crop can be expected to produce top yield and quality. Root injury is a commonly occurring problem in the production of vegetable crops in Florida. The reason is that there are many factors which can contribute to this complex problem. Root injury problems often are hard to diagnose accurately and without a good diagnosis, corrective measures cannot be taken.

The importance of understanding the basic principles involved in crop root injury and their proper management cannot be overemphasized to the vegetable grower. This is the first in a series of three articles dealing with root injury in vegetable crops. The series will cover the following items: (1) factors contributing to root injury, (2) how to prevent root injury, and (3) how to correct root injury.

In a general way, the main causes of root injury are: (1) attack from soil nematodes, insects and diseases, (2) salt injury, (3) improper fertilizer placement, (4) misuse of irrigation, (5) poor soil environment, (6) mechanical damage, and (7) chemical damage. Many of the above factors interact to intensify root injury and to further complicate diagnosis. For instance, a plant might survive a moderate nematode attack or salt injury separately but not both at the same time.

It is not possible in a series of three short articles to discuss causitive factors, methods of prevention and corrective measures in great detail. It is hoped that these brief remarks will encourage crop production managers to search out more detailed information from bulletins, textbooks, manuals and other publications which describe symptoms, conditions and tests which can be helpful in handling root injury problems.

Three of the most damaging nematodes in vegetable crops are root-knot, sting and stubby. As can be seen, the names are quite descriptive of the type of damage each exhibits. Soil insects attack crops from seeding to maturity. The type of injury varies from destruction of roots from feeding to upheaval of seedlings. Some of the more common soil insects are wireworms, cutworms, mole crickets and cucumber beetle larvae. The most common soil disease is damping-off of seedlings. The fungi causing damping-off, like Rhizoctonia and Pythium can cause root injuries even at the more advanced stages of growth. In addition to these, there are the wilts—Fusarium, Verticillium and bacterial.

Salt injury is a common problem which is often overlooked because there may be no visible root symptoms unless the injury is quite severe. Furthermore, salt injury is rather erratic in occurrence. It can be intensified or reduced quickly by rainfall
and irrigation patterns, drought, fertilizer sidedressings and other factors. Improper fertilizer placement may not only contribute to salt injury but to shallow root development also. Plants with shallow roots are much more susceptible to injury from droughts than otherwise.

Soil environmental factors affecting root development include lack of oxygen, high level of carbon dioxide, poor soil aggregation, soil compaction, excessive or deficient moisture supply and excessively low or high temperature. Each of these factors can retard development to some degree. The injury may be minor in the case of low soil temperatures (above freezing) for a short period of time, but serious if seedlings are subjected to heaving as a result of freezing of the surface soil.

Mechanical and chemical damage encompasses a range of factors too numerous to list here. The most common mechanical damage results from actual destruction of roots from deep cultivation, injection of fertilizer, wind and rodents. Chemical damage may result from pesticides applied to the soil at any time. Almost any chemical applied to a soil can cause root injury under certain conditions. The list is long if the native chemicals in the soil and those supplied in fertilizers are also considered.

From this brief discussion, it can be seen that many factors can contribute to root injury. Many of these problems can be prevented if good cultural practices are used in growing the crop. The next article will discuss steps that can be taken to avoid root injury in vegetable crops.

Montelaro

B. The Increasing Role of F1 Hybrids in Modern Vegetable Crop Production

A brief look at a modern vegetable seed catalog reflects the growing interest and availability of F1 hybrid varieties. The advantages often listed for these new hybrids include (a) greater uniformity of:

1. seed germination
2. emergence of seedlings
3. stand
4. growth and development
5. fruit set and fruit size

(b) increased earliness and (c) for many vegetables, higher yields than inbred or pure lines.

Another distinct advantage to a seed company is the control of seed production and availability of the hybrid. Plant breeders generally feel that these hybrids can result in highly desirable combinations in less time than by the traditional breeding approaches.

The main disadvantage of F1 hybrids is their higher cost. It costs more to produce these hybrids because of the greater labor involved in emasculation, crossing, record keeping and handling. Some F1 hybrid seed costs 5 to 10 times that of standard varieties. New techniques being developed to help reduce these costly processes include chemical modification of the sex ratios and development of male sterile parents.

The Japanese vegetable breeders are credited with the first development and testing of F1 hybrid vegetables. As early as 1927 an F1 hybrid eggplant was observed commercially in Japan. By 1930, F1 hybrid seed production for eggplant and watermelon was well established in Japan.

In the early 1930's, hybrid field corn was being developed in the United States. The rate of adoption was most rapid in areas where corn production was most important. An essentially complete transition from open-pollinated varieties to hybrids was effected.
in Iowa and Illinois in about 10 years, for the rest of the Corn Belt in about 20 years, and for the rest of the U.S. in about 30 years. By 1963, 95% of the field corn grown was hybrid.

The impact of hybrids on yields has been significant for some vegetables, but their singular contribution is difficult to assess because of the great improvements in fertilizer use, soil fumigation, soil moisture control, pest control, and other cultural practices.

In Japan, techniques for producing F1 hybrid cucumbers were reported in 1933 and tomatoes in 1940. Soon after World War II, the U.S. and European seed houses were listing F1 hybrids of cucumber, tomato, muskmelon, squash and watermelon. By 1955, almost 40% of the varieties of tomato, eggplant, cucumber and watermelon listed in Japan were F1 hybrids.

A brief tally of five current U.S. seed catalogues to assess the availability of F1 hybrids may be of interest (% of total).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Broccoli</td>
<td>50</td>
<td>20</td>
<td>0</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>Brus. Sprts.</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>Cabbage</td>
<td>25</td>
<td>40</td>
<td>0</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Corn, Sw.</td>
<td>33</td>
<td>20</td>
<td>0</td>
<td>33</td>
<td>80</td>
</tr>
<tr>
<td>Cucumbers, Sl.</td>
<td>60</td>
<td>30</td>
<td>100</td>
<td>70</td>
<td>33</td>
</tr>
<tr>
<td>Eggplant</td>
<td>50</td>
<td>0</td>
<td>100</td>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td>Muskmelon</td>
<td>36</td>
<td>0</td>
<td>100</td>
<td>62</td>
<td>0</td>
</tr>
<tr>
<td>Onions</td>
<td>19</td>
<td>60</td>
<td>0</td>
<td>23</td>
<td>41</td>
</tr>
<tr>
<td>Peppers</td>
<td>21</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Squash, S.</td>
<td>30</td>
<td>44</td>
<td>100</td>
<td>83</td>
<td>14</td>
</tr>
<tr>
<td>Tomato</td>
<td>38</td>
<td>0</td>
<td>25</td>
<td>52</td>
<td>0</td>
</tr>
<tr>
<td>Watermelon</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
</tr>
</tbody>
</table>

The F1 hybrid has earned its rightful place in the increasingly complex array of factors vital to modern successful vegetable production.

(Marlowe)

III. HARVESTING AND HANDLING

A. Control of Bean Molds

Winter weather that limited grocery shopping in northern cities has reduced the sale of large volumes of snap beans from Florida in recent weeks. This, coupled with cloudy, wet conditions in the production areas of Florida, has resulted in a lowering of quality from mold and end rot according to Market News Reports. Two fungus diseases known as cottony leak (from Pythium) and watery soft rot (from Sclerotinia) may develop rapidly after harvest. Cottony Leak usually starts where pods touch the soil, and the area becomes dark green, soft and water soaked. In shipping containers, a white, fluffy mold develops and binds the pods together, usually in the center of the container.

Watery soft rot also produces watersoaked areas that may occur anywhere on the pods with or without previous injury. This soil fungus grows rapidly under moist conditions at 60° to 80° F and spreads from pod to pod, holding them together in so-called nests that are similar to those infected with cottony leak.
Control measures for both diseases include harvesting only when pods are dry. Suitable harvest periods may be shortened by dew, fog and rainy or cloudy weather. All pods with watersoaked spots should be discarded and precautions taken to keep pods cool during harvesting and packing. If the fungi are present in the field, rapid sorting, precooling and shipping under desirable temperatures (45°-50°) will do much to control the disease. Air cooling, not hydrocooling, and rapid movement through market channels are recommended. If beans warm after cooling and moisture condenses on the pods, conditions are ideal for mold development. Beans should not be cooled below 45° because of chilling injury.

(NOTE: This article was prepared by Mr. R. K. Showalter, Professor, Vegetable Crops Department, University of Florida, Gainesville, Florida.)

IV. VEGETABLE GARDENING

A. Timely Gardening Topics

These questions and answers are suggested here for your use in developing periodic (weekly) radio or newspaper shorts. They are based on letters of inquiry from gardeners around the state.

(1) Timely Topic for Week of January 9-15

Question

I plan to plant three or four rows of Irish potatoes in my garden next month. Are there any precautions I should take with my seed potatoes?

Reply

Briefly, here are the steps you should take to insure a good stand of potatoes in your garden.

(a) Buy clean, certified seed potatoes. Table stock potatoes do not perform well.
(b) Cut tubers into blocky two-ounce seed pieces with at least one eye each. Tubers already near this size may be planted whole.
(c) Place cut seed pieces in a moist burlap bag. Keep the bag moist and cool (at 60° if possible, but room temperature if not). This helps heal the cut surface to reduce decay. After 6 to 10 days curing, plant seed pieces 3 to 4 inches deep and about 12 inches apart.
(d) Further protection from rotting may be obtained by dusting seed pieces with captan or Dithane M-45 just before planting.

(2) Timely Topic for Week of January 16-22

Question

I am planning on having a spring vegetable garden. Being new to Florida, what should I plant?

Reply

Chances are most of the vegetables you and your family like to eat can be grown successfully down here when planted in January, February, March and April. This is the
best planting time for just about all of the warm-season vegetables. In addition, many of the cool-season crops do well when planted in the early spring. Some of the warm-season crops for this time of the year are: tomato, pepper, eggplant, okra, cucumber, squash, cantaloupe, watermelon, bean (lima, pole, bush), southern pea, sweet corn, and sweet potato. Some of the cool-season crops still suitable for early spring planting are: green onion, beets, collard, endive, leaf lettuce, bibb lettuce, radish, mustard, cabbage, carrot, turnip, potato and English peas. Crops which must be started in the fall rather than now are: strawberry, bulbing onion, cauliflower, garlic, spinach, and head lettuce. Crops not well suited for Florida are: globe artichoke, asparagus, and rhubarb.

(3) Timely Topic for Week of January 23-29

Question

Sometimes I see tomato plants for sale which already have small fruits on them. Are these plants still suitable for putting out in my garden?

Reply

Wherever possible, buy younger plants. A tomato plant which has from five to seven true leaves (also from five to seven weeks old) is at the best stage for transplanting. The first flower cluster may be visible but not yet open. A plant bearing fruit is slow to recover and resume growth following transplanting and seldom produces a normal crop. Even a plant smaller than the ideal size would be a better choice than the older plant. If you have no alternative, you may remove the fruits to improve early plant growth.

(4) Timely Topic for Week of January 30-February 5

Question

What kind of dust or spray may I use on the soil in my vegetable garden to control ants and cutworms?

Reply

For many years, the gardener's stand-by for such soil-inhabiting insects has been chlordane. Today, due to restrictions placed on the use of chlordane, gardeners must turn to diazinon as its chief substitute. As a dust or spray directed to the soil at the base of the vegetable plants, diazinon is a fairly effective control for such soil-frequenting insects as wireworms, crickets, cutworms, ants, and white grubs.

(Stephens)

B. Know Your Vegetables - Sea Kale

Sea kale (Crambe maritima L.) is also called sea-colewort, scurvy grass, and halmyries. It is a hardy perennial grown in manner similar to asparagus. The plant grows to 2 feet, with large, heavy, glossy green leaves that are fringed or curled on the edges. The edible, young, tender, whitened shoots arise from the roots each spring in areas where it is adapted. Also like asparagus, Sea kale is not adapted to Florida. It requires a cool, moist climate. It grows wild abundantly on the West European seacoast, especially in the British Isles.
Its name comes from its use on long sea voyages. The Romans stored it in pickled form aboard ship, then fed it to the crews to prevent scurvy. In fresh form, it is cooked and used like asparagus. The young shoots and very small leaves are eaten.

To produce the crop, seeds or cuttings are planted in beds; thereafter, roots are maintained for several years. As the young shoots emerge from the roots upon resumption of favorable growing conditions each spring, they are "blanched" (whitened) by heaping soil upon them or by covering with a suitable device such as a pot to exclude light. Young shoots are harvested when 4 to 5 inches long while crisp and tender before leaves start to expand.

(Stephens)