February 1, 1977

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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 77-2

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THE VEGETARIAN NEWSLETTER

I. NOTES OF INTEREST

A. Rodent Damage—Prevention in Watermelon Crops

Several growers have asked about preventing field rodents from eating watermelon seed from the row after planting. To prevent rodent damage, watermelon seed may be treated with a watermelon seed treatment kit. To the best of our knowledge, these kits can be purchased from Asgrow Florida Company or Seminole Feeds.

(William)

B. Vegetable Field Days — Dates Set for Two in June

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

I. Location — Agricultural Research Center
   Leesburg, Florida
   Date and Time — 1:15 PM, Wednesday, June 1, 1977
   Crops — Watermelon, Cantaloupe and Cukes

II. Location — Vegetable Crops Department
    Gainesville, Florida
    Date and Time — 9:30 AM, Thursday, June 2, 1977
    Crops — General Vegetables

A more detailed announcement on both field days will be sent out later. Put these dates on your calendar and plan to attend both.

II. COMMERCIAL VEGETABLE PRODUCTION

A. Soil Fumigants Vs. Granular Nematicides for Vegetable Crops in Florida

Vegetable growers in Florida are on the lookout for pesticides that are easy to apply. They are especially interested in the possible use of the granular nematicides (Nocap, Dasanit, Puradan and Nemacur) in the place of the liquid soil fumigants. Equipment and application techniques for the granular nematicides are simpler than those used for soil fumigants. The only questions are relative efficiency and difficulties which may be encountered. We asked Dr. Robert A. Dunn, Extension Nematologist, Department of Entomology and Nematology at the University of Florida to answer these questions. His reply is as follows:

"Many vegetable growers would like to use the new granular or contact nematicide—insecticides for nematode control in their vegetables this year. These materials are convenient to apply at the time of planting or immediately before planting and many people prefer to handle a granular material rather than a liquid fumigant. However, there are several difficulties that should be considered before making this important management decision: 1. Is the material labeled for the specific use which you have in mind? Several of these chemicals are labeled for low rates of use for insect control but not at rates high enough for nematode control. If the label
does not indicate nematode control, do not try to use the material for that purpose on that crop. A grower with several different crops who wants one contact material that he can use for nematode control on all of his crops is not very likely to find one. There is almost no contact material which is labelled for a wide variety of crops. Of course, use of an unlabelled material on a crop may result in illegal residues and seizure and other legal penalties to the grower."

"Contact materials offer very good control of many kinds of nematodes, but fumigants are often superior to contacts for control of rootknot nematodes. Since the rootknot nematodes are the principle pests of vegetables in many parts of the state, this should be considered very seriously. Growers are strongly encouraged to use fumigants wherever rootknot populations are moderate or higher where susceptible vegetables are to be grown."

"A third pitfall of use of granular nematicides on vegetables is the temptation on the part of the grower to put off soil preparation until just before planting, thinking that it's not as necessary for this kind of nematode control program as for the fumigants. That is wrong. Destruction of roots by soil preparation several weeks in advance of planting is just as important for successful use of the contact nematicides as it is for the fumigants. Nematodes which are protected inside unrotted plant roots may escape the effects of either a fumigant or a contact nematicide and provide a ready source of inoculum for infection of the crop."

"In short: granular nematicides should not be looked upon as a shortcut to nematode control with less work; many vegetables do not have contact nematicides available for legal use on them in Florida; contact nematicides may not be as effective as soil fumigants against high populations of rootknot nematodes. The grower should balance these disadvantages carefully against high populations of rootknot nematodes. The grower should balance these disadvantages carefully against potential ease of application and additional control of soil-borne insects that he may enjoy from use of these materials."

Anyone contemplating use of granular nematicides should read Dr. Dunn's statement carefully. Any questions on this matter can be referred to him or this office.

(Montelaro)

B. Transplant Production Problems

The production of vigorous, disease-free vegetable transplants is an important part of growing a crop. The field grower depends heavily on his plant source, expecting high quality plants to be ready at an agreed-upon date for field setting. Plant production requires a special understanding of the many details necessary to grow a balanced transplant. Attention to these details requires a continual monitoring of the environment provided the young seedling.

Many tomato, pepper, and cucumber growers have started to grow their own transplants this year for the first time. Some have had tremendous success and some have had problems they never knew existed. Most of the problems observed are related to a practice sometimes referred to as "over-kill". In their concern to produce excellent plants they may over-water, over-fertilize and/or over-spray.
Some growers spray seedlings 5 times with pesticides and apply 3 or more nutrient feedings before the seedlings develop their first true leaves. Actually, nutrient feedings before the first true leaves are visible usually do more harm than good. The stored food in the seed is usually very adequate to carry the seedling through the first leaf stage. The small root system could probably not absorb very much of the extra feeding until that time anyway. Soluble salt readings in some of these production media have been found to exceed 4000 ppm—about 3200 ppm more than the level considered ideal for these tiny plants.

A sound, but not excessive pest control program is absolutely necessary. Usually one good covering spray every 5-7 days of a recommended fungicide (Maneb or Bravo) and one of the recommended insecticides (endosulfan:thiodan); (dimethoate: Cygon, Defend); or (azinophosmethyl:Guthion) should provide good control. Plants should not be sprayed when wet, and plants should not enter the night hours with wet leaves, if this can be avoided.

A balanced transplant should have the following characteristics:

1. Root system should be large in proportion to top growth.
2. Seed leaves should be large, free of defects, and of a healthy green color. These should persist until field setting.
3. Stems should be hairy, turgid, and with a slight purple tinge of color.
4. True leaves should be well spread, moderately dark green in color, with no yellowing.

In the past three years the importance of the seed leaves has achieved new significance. Recent research in Israel and Japan has shown that the condition of the seed leaves is closely related to the days to flowering and fruit set. Cotyledons (seed leaves) were removed or shielded from light in a wide array of combinations. The number of days from cotyledon expansion in a Japanese tomato cultivar was as follows (Chin, Paulsen and Beavers, 1972. Plant. Physiol. 49:482-489).

<table>
<thead>
<tr>
<th>No. Cotyledons removed</th>
<th>1st cluster</th>
<th>2nd cluster</th>
<th>3rd cluster</th>
</tr>
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<tbody>
<tr>
<td>0.0</td>
<td>39</td>
<td>46</td>
<td>54</td>
</tr>
<tr>
<td>1.0</td>
<td>43</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>1.5</td>
<td>46</td>
<td>52</td>
<td>59</td>
</tr>
<tr>
<td>2.0</td>
<td>49</td>
<td>57</td>
<td>62</td>
</tr>
</tbody>
</table>

The Israeli research on 'Cal Wonder' pepper seedlings showed that seed-leaf removal or covering delayed pepper first bloom as much as 10 days (Ryalski and Halevy, 1972. HortScience 7:69-70). This could mean that the first cluster or crown set has been blanked out or at least seriously thwarted and reduced in function.
The cotyledons tell us a great deal if we take the time to "read" them. Overwatering, drought, excess nitrogen, spray burn, inadequate light, toxic fumes are but a few of the many factors which may cause one or more cotyledons to become discolored, malfunctional, or drop from the seedling. Almost any serious stress can throw the plant out of balance and cause the cotyledons to drop.

The first cluster of tomatoes or crown set of peppers is often the most profitable in early market production. It pays to take the time and effort to produce a steadily growing, healthy transplant.

(Marlowe)

C. Root Injury - Prevention in Vegetable Crop

This is the second in a series of articles on root injury in vegetable crops. The first dealt with factors contributing to this problem. This article points out ways of avoiding root injury.

The primary injury to roots in vegetable crops is caused by soil nematodes, diseases and insects. These three groups of soil pests can be attacked singly or all together. The multi-purpose fumigants containing Chloropicrin, Methyl Bromide and other chemicals, separately or in combination will give fair to good control of all three soil pest groups. In addition, some weed seeds may be killed.

If a multi-purpose fumigant is not used, the three groups of soil pests must be attacked separately. Crop rotation, alternate flooding and drying of land, and complete decay of crop residues will help control all groups.

Soil nematodes alone can be controlled by use of the simple soil fumigants of granular nematicides. Care should be exercised in the use of these materials. Label instructions as to interval of time between application and planting, soil moisture requirements, temperature effects, etc. should be adhered to closely. Avoiding root injury to crops from soil pests is extremely important as there is little, if anything, that can be done after the crop is planted.

The use of clean seed free of disease organisms, seed treatment with a fungicide, and use of fungicide in the drill furrow will all tend to reduce root diseases. Even depth of planting can play an important role in development of root diseases. Seed should be as shallow as possible consistent with moisture needs to obtain good germination. Deeply planted crops are much more subject to attack from soil fungi than those planted to a lesser depth.

Soil insects causing root injury can be attacked in two ways. Seed treatment with a good insecticide is inexpensive insurance. Secondly, a broadcast application of an approved insecticide disked into the soil prior to planting will help control many soil insects.

The next three factors contributing to root injury are closely interrelated. They are (1) salt injury, (2) misuse of fertilizer and (3) misuse of irrigation and drainage. Salt injury is just another name for "Fertilizer burn". Roots of young seedlings are very susceptible to this type of injury. Young tomato seedlings can be killed at levels less than 1000 ppm total soluble salts in the soil solution, whereas, full grown plants can withstand 4,000 ppm salts. The use of "in the drill" application of fertilizer beneath, with, or above seeds should be avoided. In addition, split applications and use of low salt-index materials will do much to reduce salt injury to roots.
Since soluble salt concentrations are inversely proportional to soil moisture contents, irrigation and drainage play an important role. Permitting soils to dry out excessively increases the hazards of salt injury to a crop at any stage of development. Overhead irrigation can be used to keep fertilizer concentrations from building up excessively by moving them downward periodically. Overuse of irrigation or poor drainage can cause injury by excluding oxygen from the root zone. Quality of water used for irrigation must be taken into consideration, also. Use of water high in salts can increase soluble salts significantly in a soil.

Plant roots often are damaged or retarded by certain properties which are not conducive to normal root development. These include soil compaction, shallow water tables, large clods, stoned, low soil temperatures, etc. Chemical damage can result from pesticides or fertilizers formulated or used improperly. A hazard of recent origin is injury from a herbicide used for the crop or previous crops. All pesticides, fertilizers, and other amendments should be used with care to avoid root injury.

Mechanical damage is results from the use of poor cultural practices. Roots can be damaged by excessively close or deep cultivation, improper injection of fertilizer and other materials, soil erosion and heavy wind. These problems can be avoided, at least in part, with good production practices. The channeling and up-rooting of small plants by certain soil and rodents can be controlled to a degree with approved insects chemicals.

Most of the factors contributing to root injury in vegetables are discussed here in a brief fashion. It should be noted that avoiding the problem from any source is the most economical approach. The next article will deal with correction of root injury after it occurs.

(Montelaro)

D. Cutworm Control in Watermelon

Cutworms may seriously damage newly planted watermelon, especially if the melons are planted following pasture, sod, turf, or any grass crop. By walking through the field every other day or so, growers can monitor the emergency and growth of their crop, especially being alert for symptoms of cutworm damage. Initially, the cutworm will nibble at the stem, and later the stem and cotyledons may be cut completely from the root system.

If cutworm damage is observed, Dr. Freddie Johnson, Extension Entomologist, suggests that either a 2.5% methomyl bait at the rate of 40 lbs. commercial product/acre or a 5% trichlorfon field bait at the rate of 20 lbs. commercial product/acre be broadcast as a soil application. The bait should be applied uniformly over the entire area using aircraft or tractor-mounted granular spreader equipment. If banding equipment is available, the bait may be applied directly over the row, but the rate should be adjusted according to the area being covered with banding equipment.

Because cutworms feed at night, baits should be applied in late afternoon to avoid decomposition of the active ingredient by sunlight and to reduce vaporization or dilution from irrigation or rainfall.

(William)
E. Tractor Furrow Weed Control For Tomatoes

Weeds growing in the tractor furrow between fully mulched tomato beds can be controlled with a combination of chloramben (trade name Amiben) at 3 lbs. active ingredient/acre plus paraquat at 0.5 lb. Active ingredient/acre. The combination must be applied with a shielded boom to avoid contact of the spray solution with the tomato foliage and should not be applied during periods of strong winds. Weed control can be improved by applying the herbicides when the weeds are 2 to 2.5 inches high.

After application, the grower will recognize immediate dessication and bleaching of the green color in the weed foliage, usually the day following herbicide application. These symptoms are caused by paraquat. Chloramben is added to the mixture because it offers residual weed control of susceptible species for a few weeks after application.

(William)

III. HARVESTING AND HANDLING

A. Harvesting and Handling Freeze-Damaged Vegetables

Harvesting and handling of all vegetables will require special attention and care following the freeze. Freezing resulted in physical damage that will produce scarring, leaf burn, or actual breakage even on those crops that survived. Foliage loss of some crops may lead also to increased sunburn. Damaged and weakened tissue will be of lowered quality and also will be more susceptible to rapid decay and additional damage. Grading and selection should be carefully supervised. Supplies are too limited to permit indiscriminate elimination of marketable vegetables. However, quality in general has been adversely affected by the freeze, and containers should not be improperly marked. U.S.D.A. inspections are not required for most vegetables, but vegetables must meet U.S. No. 1 grade standards, for example, if they are so labeled.

Cool-season crops - cabbage, lettuce, celery, etc. - suffered mostly leaf burn and some cracking. Cabbage and lettuce may develop soft rots within damaged heads, and more sampling and cutting will be needed to insure their elimination. Young celery probably has been chilled enough to induce bolting that will be evident in the spring crop.

Warm-season crops - peppers, cucumbers, squash, tomatoes, beans, etc. - were essentially all killed. Those that were not have now been subjected to a prolonged period of temperatures within the chilling range (below 50°F). These may begin to show chilling symptoms in the field, russetting of beans, for example, or very soon after harvest if not handled properly. All of these vegetables will be in a weakened condition and very susceptible to decay and further physical damage. Some attempts will be made to salvage tomatoes from damaged plants. Loss of foliage will probably increase the amount of sunburned fruit. All fruit remaining on tomato plants should be permitted to reach full maturity before harvesting. Fruit chilled on the plant will more nearly overcome the effects if they remain on the plant until mature or ripe. Immature fruit should be discarded. Attempts to ripen immature chilled fruit off the plant will result in severe losses from abnormal ripening, decay, soft fruit, and generally poor quality.
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In no case should tomatoes be held below 55°F after harvest. Greater than normal losses can be expected during the ripening of those severely chilled fruit.

NOTE: Dr. B. D. Thompson is a Professor, Vegetable Crops Department, University of Florida, Gainesville, Florida.

(Thompson)

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 February 13-19.

Question

What can I do in my garden to overcome the shortage of fresh vegetables that is bound to occur following this winter’s record Florida freeze?

Reply

To answer this, it must first be pointed out that the danger of yet another freeze is not yet passed. So gardeners should adhere to normal planting schedules. Cool season vegetables can be planted with a better-than-average chance of success anytime now throughout all areas of the state. However, warm season crops, such as tomatoes, cucumbers, and squash, should not be planted until danger of frost is over, which is mid-March in extreme North Florida.

Unfortunately, gardeners planting now can do little to provide fresh vegetables from their gardens during the peak high price period, which extends to the end of March. Vegetables grown in gardens take just as long to mature as vegetables grown in the commercial fields. Therefore, garden production following the recent freeze will coincide with commercial farm production. Vegetables from the garden could reach the table a bit early if they are harvested in the young, immature stage. Certainly most leaf and root crops, such as lettuce, mustard, turnips, collard, kale, spinach, chard, cabbage, carrot, radish, potato, and beet could be eaten several days before they have reached the best stage of maturity for marketing purposes. Even fruiting vegetables, such as cucumber, squash, and bean, are useful when harvested early.

In many cases during the freeze, gardeners were able to give more adequate protection to their growing plants than the farmers trying to protect large acreages. Those gardeners still having live plants, even though damaged, should strive to bring them out by removing damaged leaves, fertilizing, watering and nurturing plants back to good health. Skips in the rows may be replanted. Efforts should be made to thin crowded seedling areas that escaped severe cold injury, and reset the extra plants into sections of the garden where plants were killed.
Seeds that were in the ground at freeze time probably were not injured. However, some time will be necessary for the soil to warm to proper germinating temperature before the plants will emerge. Gardeners should dig into the seed furrow to examine the seeds and to determine if replanting is necessary.

Gardeners should expect to see more problems than usual from premature seeding of leafy crops and a general reduction in quality. However, these problems can be tolerated in light of the alternatives.

Vegetables that were nearing maturity may still be salvageable. For example, potatoes whose tops were killed still have usable tubers. These should be dug, cleaned, and sorted as soon as possible. They probably will not store long due to the stage of immaturity, so should be eaten rather soon.

Looking further into the spring, gardeners will be unlikely to save as much as usual on their home grown produce, for vegetables grown commercially will probably be priced more reasonably than usual as soon as production resumes in April. These lower prices could result from overlapping of supply from the various major production points in Florida. Each area will be replanting many major crops about the same time as the other areas, so that subsequent harvest periods will probably coincide more closely than in normal years. The net results should be over-supply and lower prices. However, such prognostication precludes future weather developments, which could offer more cold before the winter is through, resulting in high food prices for a considerably longer time than we might anticipate.

So in summary, those who can have a vegetable garden should be encouraged to do so. But the benefits are not going to be much greater or much less than in other years having more normal weather.

(2) Timely Topic for Week of February 20-26.

Question

I often hear the terms "determinate" and "indeterminate" used in reference to tomato varieties. What does it mean and what are some example varieties?

Reply

The terms apply to growth habit of the tomato plants. In general, "indeterminate" refers to plants that are tall, vining, and continuous growing. The terminal (tip) growth is vegetative rather than fruiting. Blossom clusters form about every three leaf internodes. This plant habit makes such varieties adaptable to staking or trellising. Here is a partial listing of varieties within the "indeterminate" category: Better Boy, Big Boy, County Fair, Fantastic, Bonny Best, Beef Steak, Earliana, Floradel, Indian River, Jubilee, Manupal, Manalucie, Marlon, Oxheart, Ponderosa, Rutgers, San Marzano, Super Sioux, Tropic, Beefmaster, Monte Carlo, Golden Boy, Glamour, Trip L Crop Climber, Sugar Lump, Red Cherry, Red Pear, Red Plum, Yellow Cherry, Yellow Pear, Yellow Plum.

The following fit best in the "determinate" category: Ace, Cal-ace, Early Pak, Florida MH-1, Homestead, Marglobe, Napoli V.F., New Yorker, Pearson, Roma, Sheyeene, Walter, Tropi-Cro, Tropi-Red, Spring Set, Bigset, Bonus, Patio, Terrific, Wonder Boy, Americana, Tumblin Tom, Small Fry, Royal Chico, Golden Delight, Cold Set, Heinz 1350, and Tiny Tim.
Question

I have noticed several kinds of melons on display in the supermarkets. They look something like cantaloupe but are not netted. What are they?

Reply

These are all members of the muskmelon group, (Cucumis melo). Those having distinctive "netting" on the surface of the rind and "sutures" (ribs) are generally called cantaloupes. Musknelon may mean more specifically the larger fruited, heavier ribbed types. Those without netting, and to which you are referring, are mixed melons more closely related to honey dews.

Some of the more common kinds are described as follows:

- **Casaba** has wrinkled exterior skin, developing a rich golden color when mature.
- **Santa Claus** is a long casaba type with wrinkled skin and a dark-green-and-gold mottling.
- **Cranshaw** is a round, slightly corrugated, dark-green melon that turns yellow when ripe.
- **Honey Dew** is nearly round, with a creamy white smooth surface.
- **Persian** is similar to the others in size and shape, but is completely covered by fine netting. Unlike the cantaloupe, it has no sutures.
- **Banana** is a long cylindrical melon 4 inches in diameter by 12 inches long. The surface is smooth with no netting, although it tastes more like a cantaloupe than a honey dew.

(4) Timely Topic for Week of March 6-12.

**Question**

How are some beans able to climb and others are not?

Reply

Pole types are characterized by what is called an "indeterminate" growth habit, whereas bush beans are "determinate" in habit. In the indeterminate habit the flowers form in the axils of leaves and stem, thus, the stem may continue to grow longer more or less indefinitely; in the determinate habit the main growing point terminates in a flower cluster, thus, preventing further stem elongation. Beans that climb do so by virtue of their hairy, sinuous, twining stems. The absence of tendrils or tendril leaves in beans helps in one way to distinguish beans from peas. The beans do not have the ability to climb until well along in growth.

(Stephens)

**B. Know Your Vegetables - Vegetable Spaghetti**

Vegetable spaghetti (Cucurbita pepo) is also known as spaghetti squash, spaghetti gourd, Manchurian squash and squaghetti. It has erroneously been called cucuzzi, which is an edible gourd.
The interesting thing about vegetable spaghetti is its resemblance to a bowl of spaghetti when properly prepared. If the yellowish-orange mature fruit is cooked whole for about 20 minutes and then cut open, the flesh is in loose shreds, somewhat resembling spaghetti in appearance. The taste, however, is squash-like, although rather bland. Proper seasoning, as with salt, pepper, and butter, is required for the best tasting dish.

The fruit is about ten inches long and five inches in diameter, weighing about two pounds. The fruit stem is five-sided, grooved and not conspicuously flaring at attachment to fruit. Like the other members of the vegetable marrow group, zucchini and cocozelle, the smooth skinned fruits are produced on a bush.

Cultivation of vegetable spaghetti should be as for any summer squash. The plant is tender, being damaged or killed by cold weather, so seed should be sown early in the spring as soon as danger of frost is passed. In South Florida, it may be seeded anytime from September through March. Space plants 3 feet apart in rows spaced 42-48" apart. Major plant pests are mildews, pickleworms, and fruit rots. Both male and female flowers are produced on the same plant, so bees are necessary for pollination purposes. Fruits develop to harvest stage about 70-80 days after seeding.

(Stephens)