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TO: COUNTY EXTENSION DIRECTORS AND AGENTS (VEGETABLE AND HORTICULTURE)

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I. NOTES OF INTEREST

A. Coming Events

Be sure and mark these events on your calendar. Detailed programs will be included in subsequent issues.

Tomato Institute - will be held Thursday, September 10, 1981 in Naples.

Tomato Packinghouse Conference - will be held Friday morning, September 11, 1981 at Marco Island.

The State 4-H Congress is rapidly approaching. It will be held July 27-30, 1981, with State Events Day being Tuesday, July 28. Two horticultural events will take place at that time: The Horticultural Demonstration Contest and The Horticultural Identification and Judging Contest. Both events will be held at the Horticultural Science/Plant Pathology Building.

Nine district champion demonstrations are scheduled for the demonstration contest, and each county may enter a team in the Identification and Judging event. I encourage all of you to participate. Please contact me if you need further information. Though I will no longer be here after June 30, I will be coordinating both events.

June 30, 1981 will be my last day of employment in the Vegetable Crops Department. I want to express my appreciation and thanks to each of you who have made the past 7 years so fulfilling and enjoyable for me. I regret very much the fact that I must leave.

The cooperation I have received in the horticultural youth and Master Gardener programs has been excellent. I feel we have accomplished much in both areas and wish for this progress to continue.

There are so many people I would like to thank for the support they have given to my work. Without that support and cooperation, our success would not have been possible. I ask all of you to continue your support of these program areas.

Thanks again to each of you. I sincerely appreciate all of your efforts on my behalf. Best wishes.

(Gray)
II. COMMERCIAL VEGETABLE PRODUCTION

A. 1981 Field Blossom-end Rot Problems

Blossom-end rot of tomato, pepper and watermelon first becomes apparent as a water-soaked lesion or series of lesions on the blossom-end of the fruit. This can happen at anytime during fruit enlargement and maturation. The tissue breakdown usually develops rapidly, eventually becoming sunken, dark and leathery.

Blossom-end rot is a calcium deficiency disorder. This year, however, we are seeing the disorder in soils with optimum to high available calcium.

The reason for this is several fold.

1. Ca Uptake

Interactions with other ions can strongly influence uptake of Ca by the plant. Non-specific competition (cation antagonism) notably by K, Mg, and Na and NH₄ can substantially depress Ca uptake. Of these cations, ammonium tends to decrease calcium uptake the most, sodium the least.

2. Ca Translocation and Distribution

A low Ca content in the fruit, causing blossom-end rot may not be a result of insufficient Ca but rather a problem of distribution in the plant.

Calcium transport in the plant is relatively slow and primarily in water in the xylem. Transpiration then becomes a prime mover of xylem water and Ca.

Shortage of water or an irregular water supply results in reduced Ca translocation, especially into fruit. Fruit have low transpiration rates but a high Ca demand.

When water is supplied to drought stressed plants, water in the plant moves primarily to leaf tissue and not to fruit and results in Ca deficiency. In contrast, withholding water has little effect on Mg and almost no effect on K influx into the fruit. This tends to increase the Mg+K/Ca ratio in the fruit which makes Ca deficiency more severe.
Where blossom-end rot is starting to become a problem in fruiting vegetables there are several control measures that can be suggested.

1. Maintain a good soil moisture content. In times of severe drought as this year, irrigate more often with less water per irrigation. This will eliminate the flooding-wilting cycle and increase the amount of calcium reaching the fruit.

2. Foliage sprays of calcium, using calcium chloride or calcium nitrate can be used to supplement a limited soil solution calcium supply. This may allow more calcium to reach the fruit and prevent the development of blossom-end rot.

3. Do not sidedress with fertilizers that contain tremendously high ratios of NH₄, Na, K and Mg. These can be antagonistic to Ca uptake. This is more important in extremely dry years such as this one has been.

4. Before planting subsequent crops, make sure soil Ca is adequate with all major and minor nutrients in balance.

(Stall)

B. Using Rates of Maturity as a Management Tool

Extension agents and fieldmen who work with vegetables are often asked about the length of time it takes from flowering to harvest maturity for various crops. The answer has to be qualified with two very important points involving the growing season and the stage of maturity desired.

1. Growing Season

If the growing season is moderately warm and good soil fertility and moisture are maintained, vegetable crops can be expected to perform quite consistently within the limits shown in Table 1. The plant does not clock calendar days as we know them. Plants clock or integrate simultaneously ten or twelve different environmental factors which influence growth and development. As these accumulate the plant responds with new roots, new or larger leaves, flowers and development of fruit. Air temperature, soil temperature, relative humidity, soil moisture, the number of hours of certain wavelengths of light at a given intensity, relative humidity, soil moisture, and various other factors influence growth and development. Soil and air temperatures are generally considered to have the greatest influence on rate of growth.
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Table 1. Approximate Time From Pollination To Fresh Market Maturity Under Warm Growing Conditions

<table>
<thead>
<tr>
<th>Vegetable Crop</th>
<th>Days</th>
<th>Vegetable Crop</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bean, Bush</td>
<td>7-10</td>
<td>Pepper, Green</td>
<td>46-55</td>
</tr>
<tr>
<td>Corn, Sweet</td>
<td>18-23</td>
<td>Squash, Summer</td>
<td>6-7</td>
</tr>
<tr>
<td>Cucumber, Slicing</td>
<td>15-18</td>
<td>Squash, Winter, Acorn</td>
<td>55-60</td>
</tr>
<tr>
<td>Eggplant</td>
<td>25-40</td>
<td>Tomato, Mature green</td>
<td>35-45</td>
</tr>
<tr>
<td>Muskmelon</td>
<td>42-46</td>
<td>Tomato, Red Ripe</td>
<td>45-60</td>
</tr>
<tr>
<td>Okra</td>
<td>4-6</td>
<td>Watermelon</td>
<td>43-45</td>
</tr>
</tbody>
</table>

Adopted from: Lorenz, C.A. and D.N. Maynard 1980

If a grower planted beans every week throughout an entire summer he would find that the plantings in the warmer periods would reach harvest maturity on almost the same date as many of the plantings made many weeks before when the weather was cooler. He would also find that a large drop in yield associate with plantings made in mid-summer as shown in Table 2.

Table 2. Yields of Green Beans in Relation to Time of Planting, Gainesville, 1978. (Yield, Bushels per Acre)

<table>
<thead>
<tr>
<th>Planting Dates</th>
<th>Provider</th>
<th>Contender</th>
<th>Harvester</th>
<th>Bush</th>
<th>Blue Lake</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 31</td>
<td>282</td>
<td>195</td>
<td>194</td>
<td>215</td>
<td></td>
</tr>
<tr>
<td>April 20</td>
<td>279</td>
<td>192</td>
<td>195</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>May 11</td>
<td>167</td>
<td>198</td>
<td>119</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>June 1</td>
<td>176</td>
<td>73</td>
<td>137</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>July 13</td>
<td>13</td>
<td>8</td>
<td>24</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>August 3</td>
<td>202</td>
<td>176</td>
<td>137</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>August 24</td>
<td>157</td>
<td>235</td>
<td>168</td>
<td>221</td>
<td></td>
</tr>
<tr>
<td>Season Average</td>
<td>182</td>
<td>154</td>
<td>139</td>
<td>155</td>
<td></td>
</tr>
</tbody>
</table>

(Courtesy Prof. L. H. Halsey, Vegetable Crops Department)

In some crops such as sweet corn and peas for processing, these environmental factors can be recorded and used for prediction of harvest maturity. A temperature baseline, derived from long term research studies, is used in
most prediction systems. After a given number of growing units above the base line have been accumulated, the crop is checked to be sure the crop development has reached the stage predicted, and if it has, harvesting is started as soon as possible.

2. **Stage of Maturity**

The term maturity has several meanings to the horticulturalist, although most fruit type vegetables are consumed in the immature stage. **Botanical** maturity indicates that the fruit and seed are at fullest development; **market** maturity is a stage which will allow for effective handling and transportation from the field to consumer, and **horticultural** maturity when optimum culinary value (taste, texture, color, etc.) has been reached. The horticultural stage is often referred to as "the fleeting moment of perfection", and all of us who have had fresh picked, prime stage sweet corn just out of the pot know what that means!

A few examples of the three types of maturity are:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Market Maturity Category</th>
<th>Horticultural Maturity Category</th>
<th>Botanical Maturity Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>Mature green to hard ripe</td>
<td>Hard ripe to soft ripe</td>
<td>Soft ripe to early decay</td>
</tr>
<tr>
<td>Beans, Bush</td>
<td>Slight to moderate seed bulge</td>
<td>Very little to slight seed bulge</td>
<td>Pods dry, seeds hard</td>
</tr>
<tr>
<td>Okra</td>
<td>Pods moderate size, seeds soft to firm</td>
<td>Pods small, seeds soft</td>
<td>Pods seeds hard</td>
</tr>
</tbody>
</table>

Maturity concepts are important management factors for the grower-shipper, roadside market operator, and home vegetable gardener.* Sometimes, but not always the market and horticultural maturity stages can be the same, and that is happiness for the consumer!

* They can be helpful in planning labor and harvesting supplies, scheduling harvest periods, and development of market outlets.

(Marlowe)
A. Chlorine Management

It is recommended that all water that comes in contact with produce (other than lettuce) in vegetable packinghouses be chlorinated (1). Chlorination does not disinfect the tissues of contaminated fruits or vegetables but it does prevent the spread of decay-producing organisms in the water of dump tanks, washers, and hydrocoolers. Chlorine should also be used in cleanup water to sanitize grading belts, packing lines, sizers, picking containers and other sites that come in direct contact with the produce.

The aqueous chemistry of chlorine is complex. In packinghouse water chlorine exists in both available and unavailable forms. Only free (available) chlorine is effective as a disinfectant. Free chlorine decreases as the leaves, stems, soil and other debris increase in dump tanks and hydrocoolers. It is suggested that free chlorine levels be maintained between 100 and 150 ppm (mg/L).

Every packinghouse manager should have a test kit for monitoring free chlorine levels, even if automatic chlorination equipment and monitoring services are contracted. Test kits that test only total chlorine are not useful by themselves because total chlorine includes both the available and unavailable forms. A DPD (N, N. Diethyl-P-Phenylenediamine) kit is necessary to test for free (available) chlorine. Some test kits allow the user to test both free and total chlorine in less than 5 minutes. Other kits provide a rapid test for free chlorine only. Unfortunately, these kits test in the range from 0 to 2.5 or 3 ppm (mg/L). To use in packinghouse water tests, managers must dilute the water sample one hundred times to bring samples on scale. Water used for dilution should be chlorine-free and distilled or deionized water would be best. The dilution can be done simply by bringing 10 ml of packinghouse water to 1000 ml (1L) with chlorine-free water. Another alternative is to bring 1.25 fluid oz. of sample water to a gallon with chlorine-free water. Diluted samples can then be tested and readings multiplied by 100 to reflect the chlorine concentration. For dump tanks, chlorine concentration should be tested at least twice a day and more often in especially dirty conditions. Dump tanks and hydrocoolers should be emptied daily and thoroughly cleaned of debris.

Poor chlorine management can be a serious problem in vegetable packinghouses. Too many managers assume that because they have automatic equipment the job is being done. Prior to the freeze substantial decay losses occurred in some tomato shipments. A check of packinghouses revealed that free chlorine levels were as low as 0 ppm in some locations.
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As part of the Postharvest LET project, 15 counties will soon be equipped with test kits to aid Florida vegetable packers and shippers in chlorine management. County agents can assist packinghouse managers, in cutting losses due to poor chlorination by establishing programs to accomplish the following:

1. Make operators aware of the need for chlorination and testing.
2. Help operators locate a source of chlorine-free water for dilutions.
3. Make periodic follow-up checks with your own test kit to verify packinghouse findings.

Agents needing help in establishing these programs should contact Dr. Mark Sherman.

Reference


(Sherman)

IV. HOME VEGETABLE GARDENING

A. When to Pick the Garden Vegetable

Most garden vegetables cannot be enjoyed at their best unless they are harvested at just the right time. In the case of English peas and garden beans, two or three days may make a big difference. Even with today's "stringless" varieties of string beans, the pods may tend to become stringy after they have reached a certain stage.

"String" beans, or more appropriately "snap" beans, are best quality when they snap readily and have soft pliable tips. Seeds should be rather immature. Shell beans, of course, must be left until the pods are well-filled with plump seeds.

The Lima bean is a type of shell bean. Gardeners should check to see that there are well-developed yet tender seeds in the pods before harvesting. They should check the foliage carefully near ground levels for the earliest pods. Likewise, Southern peas should have seeds developed, yet picked when the pods are still green and tender. Some
southern pea pods should be harvested when seeds are immature so that the pods may be "snapped" for added variety to the cooked dish. Pole beans should be picked regularly so that the vines will continue to set more pods.

Potatoes may be dug as soon as the vines begin to dry out, although the tubers will keep on growing for some weeks after. A few may be dug at a time, or the entire crop at once.

Head lettuce does not always have to be as hard and firm as a head of cabbage before it is ready to eat. Young lettuce leaves go well in a tossed salad.

Kohlrabi grows rapidly, so it must be watched to make sure it does not get too large. Kohlrabi must be eaten before the skin hardens, which means before the bulb gets as big as a baseball. Radishes also depend on early picking to be good and free from hotness and pithiness. Other root vegetables, which easily may get too large and tough are turnips, rutabaga, carrots, beets, and parsnips. Young carrots are especially good, and they should be pulled when tender and less than two inches in diameter.

Most cooking greens are ready as soon as leaves are large enough to grasp. Pull off a few leaves from each plant, leaving the bud-growth to replenish the supply. Use beet greens when the attached beet root is only about 1 inch in diameter.

Swiss chard is ready for the table when the outside leaves are a foot high, although it is well to cut lightly at first to keep the plants growing. When near maturity, the outside leaves will have large midribs, which can be cut out and used as somewhat of a substitute for asparagus, the rest of the leaves being boiled like spinach.

Collard greens may be harvested in two ways. The first is to pull the entire plant when about 2 feet high. The second way is to remove leaves individually from the bottom of the stem, called "cropping."

Summer squash must be picked before the shell hardens. Zucchinis are at their best when not more than two thirds grown. However, those that get old should not be discarded, as various recipes utilize them. Never let squash stay on the vine too long, as this depresses further fruit production.

Cucumbers should be harvested when young, tender immature) and still green. Yellow is a sign of over-maturity and poor quality.
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The members of the melon family are sometimes difficult to determine when ready for harvest. Muskmelons “slip” from the vine at maturity and usually show slight color change from green to orange. Bright yellow means over-maturity and loss of flavor.

Honeydews turn from pale green to a subtle yellow-cream color at maturity. Watermelons sometimes fool even the experts. Each variety has its own characteristics to indicate its flesh is sweet and ready to eat.

Other fruiting vegetables which may be harvested when mature are tomato and strawberry. Peppers, eggplants, okra, and sweet corn should be harvested at an intermediate maturity stage. The point of harvest is especially critical for sweet corn. When the silks first turn black, the kernals should be plump, milky, and sweet. The sweetness develops almost overnight, and disappears almost as quickly. Sweet peppers may be harvested green or red, as long as the pods are crisp, firm, and fresh.

It is important for gardeners to know all the signs, if for no other reason than to stay one jump ahead of nature’s harvesters - bugs, birds and raccoons.

(Stephens)

B. Know Your Minor Vegetables - Rakkyo

Rakkyo (Allium chinense G. Don.) is an onion relative. It is also called ch'iao t'ou. It is important as a vegetable in the Orient, and is grown and used mainly in this country by people of Oriental origin. The plants do not produce seeds and are propagated by bulb division. In Florida, the bulbs should be planted in late summer, early fall and the crop harvested in early summer of the following year. Several small bulbs are obtained from each bulb planted. Rakkyo bulbs are mainly pickled, some canned, and others used as a cooked vegetable. The leaves have hollow blades. Rakkyo should be grown as bulb-set green onions. Harvest about 10 months after planting. Do not confuse with wild leeks, or ramps, which have flat, bladed leaves and grow well around the state.

(Stephens)