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

FROM: Stephen R. Kostewicz, Extension Vegetable Specialist

VEGETARIAN NEWSLETTER 76-1

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I. NOTES OF INTEREST

A. Extension Specialist Vacancy

Dr. James R. Hicks, Assistant Professor and Extension Vegetable Specialist in the area of Harvesting and Handling, resigned from his position in Vegetable Crops effective December 26. Jim has accepted a Research-Extension-Teaching position in the same area with the Vegetable Crops Department at Cornell University in New York. Jim's work with growers, packers and retailers on the newly-developed red-ripe tomato concept has done much to overcome some of the ill-informed negative images often thrust upon our tomato industry. We hope to be able to work cooperatively with him as a receiver of Florida winter produce.

The current position freeze brought about by the state's continuing economic crisis prevents us from refilling the position at this time. However, we are accepting applications so that the position can be refilled as soon as we are permitted to do so. In the meantime, please direct all inquiries in the area of harvesting and handling of vegetables to Mr. R. K. Showalter.

(Kelly)

B. Vegetable Production Guides - Control Distribution

We cannot overemphasize the importance of distributing our production guides to the proper clientele. All of our production-oriented circulars are written for commercial growers. The latest issues of these have been so marked. Because of their cost, and more importantly because of the pesticide recommendations contained therein, it is important that these not be distributed to home gardeners. Since this past May, we have completely gone through a 5000-copy printing of the "Eggplant Production Guide" (that's enough to supply 2-3 copies for every acre of commercial eggplants in Florida). Please look over your supplies of literature and return any unneeded materials to Gainesville. And, guard your remaining stock as we plan to produce no more production guides until we are able to furnish you with a gardener-oriented fact sheet for these crops.

(Montelaro and Kelly)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Good Crops Start With Good Seed

Most growers have learned that good seed is not cheap, but is well worth the higher cost when the final results are in at the end of the season. All growers should use the highest quality seed available and not try to "cut corners" on this vital aspect. Price alone does not determine whether a particular variety or brand of seed is better than another. Fortunately, Florida as well as most other states have seed laws which regulate the seed trade. The vast majority of seed companies take pride in handling and selling only top-quality seeds and cooperate closely with state regulatory agencies.

The factors which are used to determine or define good seed are:

1. Germination percentage. Seed "lots" do not germinate 100 percent because of many factors beyond this discussion. Additionally, there are differences in "expected germinations" between kinds of crops. Some crops do, however, germinate 95-98% consistently while others characteristically germinate lower. Standards have been developed for the various crops. Thus, if a crop has a germination standard percentage of 85%, "lots" of seed with a tested germination of below that figure cannot be offered for sale. There are exceptions to this, but certainly one would not consider that lot as quality seed.
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(2) Seedling vigor. High-quality seeds should not only germinate, but also should develop healthy, vigorous seedlings. This factor is hard if not impossible to "pre-test" and indeed in some cases to define, but is as important as any other factor one can use to describe good seed.

(3) Content of weed seeds or debris. Quality seed should be "free" of these, firstly, since seed is sold by weight and one expects crop seed for one's money and not trash, and secondly, most growers have plenty of weed problems without bringing in new problems.

(4) True to type. There should not be a mixture of types within the lot. If one were to plant round, red radishes and instead ended up with long red, long white and/or round black radishes, it would be reasonable to assume that the particular seed lot was of low quality.

(5) Free of diseases and/or insects. Many diseases can be seed-borne and thereby introduce problems for the maturing crop. Commercial seed producers usually take advantage of climatic conditions in specific production areas to reduce or eliminate seed-borne disease problems.

A seed is essentially a live plant in a dormant state, the quality of which is affected by:

(1) Preharvest treatment,
(2) Storage and handling, and
(3) Environmental factors during and following planting.

The best way to maintain seed quality is with low temperatures and low humidity. Normal seed packaging in the trade involves a good many light, moisture and air-tight containers such as cans, foil packs, etc., that do an adequate job of protecting the seed. When the package or container is opened, the seed then is subjected to potentially quality-degrading factors. Some of the things a grower can do to protect his seed may be the following:

(1) Reclose opened containers as thoroughly as possible and store at low temperatures and low humidity.

(2) If planting is delayed by weather, etc., place seed in proper storage conditions as rapidly as possible. Don't let the seed ride around on the back of a pick-up for days.

(3) Don't store seed near chemicals or materials which can contaminate the seed and affect its subsequent germination.

(4) Avoid harsh handling of the seeds at all levels of handling. This is especially critical for large-seeded crops such as beans. Mechanical damage of seeds can reduce the quality of the seed drastically.

How does one get good seed? Generally, reputable seed companies take pride in putting up a quality pack. But, some guidelines can be drawn up to help in selecting good seed.

(1) Don't purchase "old" seed. Most seed containers are dated and should be selected. However, some seed retain good germination and vitality if kept under proper conditions.
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(2) Don't be fooled by specials! Some are legitimate, but they can be old seed, poor germination, full of weed seeds, the wrong variety, etc. A few dollars saved on seed can come back and cost one many dollars if it results in poor stand, yield, etc.

(3) Use only varieties and strains you know will do well in your area.

(4) Do not attempt to save your own seed.

(5) Make sure that only treated seed is used for planting. If the purchased seed is not treated, treat it with one of several seed treatment materials available in most seed stores.

(Kostewicz)

B. Pepper Black Spot - A Fruit Disorder

A recent outbreak of "black spot" of pepper in a field is of sufficient concern to be called to the attention of all interested in pepper growing in this state. In a recent report, Dr. Villalon (Black Spot--A Nonparasitic Disease of Bell Pepper Fruit in the Lower Rio Grande Valley of Texas, Ben Villalon, Assistant Professor, Texas A & M University Agricultural Research & Extension Center, Weslaco, Texas, Plant Disease Reporter, Volume 59, No. 11, November, 1975) described the disorder as follows:

"Black spots occur on mature green pods, but are more noticeable on red ripe fruit. The fruit pericarp remains smooth and unblemished except for conspicuous round to irregular-shaped subcutaneous black spots 2 to 7 mm in diameter below the epidermal layer. Soft to dry internal chlorotic lesions extend deep into and through the thick pericarp. Black spots may or may not be sunken. Necrotic tissue appears to be localized. Number of lesions on the fruit may vary from 1 to 5 or more. Black spot first appears at the mature green stage of fruit development. Some plants may bear fruit with or without black spots. Ninety- to 120-day-old plants with black-spotted fruit may appear perfectly healthy; some others may show mild mosaic or virus-like symptoms. Fruit size, shape and yield do not seem to be affected by black spot."

Dr. Villalon investigated black spot during the 1971 and 1974 seasons when it developed in pepper fields in Texas. From these studies, he concluded, "Attempts to isolate fungi, bacteria, nematodes, and insects were unsuccessful. Attempts to transmit viruses reported on pepper through artificial inoculations from extracted fruit juice to a wide pepper virus host range also yielded negative results." Speculating on probable causes, he stated: "The part that environmental conditions and mineral fertility play in the development of black spot symptoms has not been determined. It is possible that black spot on pepper fruits may be caused by a combination of factors. Further studies are justified in the area of mineral deficiencies, phytotoxicity, and environmental conditions (nutrition, light, temperature, and so forth)."

Having made an "on-the-spot" survey of the problem in the field, we concur with Dr. Villalon's last statement. Based on our limited survey, we feel that variety and nutrition might interact under certain environmental conditions to trigger the disorder. We need to "stay on top" of this potentially serious problem. For that reason, we are asking anyone who finds black spot in pepper fields to please report it to us. In this way, we may not only help the one grower overcome the problem, but keep it from becoming a serious threat to pepper growing in Florida.

(Montelaro)
C. Micronutrients for Watermelons - Additional Information

In last month's issue of the Vegetarian Newsletter, we suggested an application of 20 to 30 lbs/acre of FTE 503 or equivalent from a mix of the salts with the regular fertilizer. The equivalent amount of actual micronutrients can be obtained from TEM-300, a mix of the elemental salts. According to soils scientists, minor element mix like TEM-300 is just as good as the glass fritted material suggested above. (Montelaro)

D. Some Points to Consider About Low Volume, High Velocity Concentrate Spraying

Something new has been added to low volume, concentrate spraying. The new combination, referred to as the LVHVC system (low volume, high velocity, concentrate sprayer) provides more uniform spray droplets of smaller size at greater velocity than the older air-blast sprayers. Previously, droplet size was greatly controlled by high pump pressure and nozzles of the disc and swirl type. The new system utilizes a low pressure pump and a high velocity fan to produce air-sheared droplets of uniform, small size.

The LVHVC sprayers are reported to generate air velocities of 120-200 mph or almost twice the speed of the former air-blast machines (60-115 mph). The pump used in the new system requires about one-half the pressure of the dilute sprayer and is of the less expensive diaphragm or impeller type.

Low volume, concentrate sprayers first gained popularity about 20 years ago. They offered greater savings of time, labor and weight than the dilute sprayers; factors which may be even more important now than in years past. Older spray methods often considered "spray to the point of run-off" as a rule of thumb. This axiom is now being questioned from the standpoint of spray efficiency, economics and environmental pollution. The old method of covering to the point of run-off often wasted 90% of the liquid and contributed to the contamination of soil and ground water. This was not all bad, however, as it did contribute to partial control of root inhabiting insects such as wireworms, rootworms, and the lesser cornstalk borer. In the future, we may be thinking more about dynamic catch (adherence), zone of kill (radius of activity of pesticide), and soak (coverage just short of run-off) than just "visible coverage".

The new LVHVC system produces spray droplets from 5 to 150 microns in size (micron = one millionth of a meter). The velocity encourages adequate turbulence to help overcome the electrostatic charge of the foliage and promotes deposit. Retention by the leaf is, of course, primarily a function of the kind of surface and the physical characteristics of the spray formulation.

Droplet size is of great importance to agriculturists. It influences spray efficiency, cost relationships, and drift. A brief comparison of some common droplet sizes may be of interest. It should be noted that droplets cover a range of sizes within any spray or dust system. (Size expressed in microns, from Frazer, Advances in Pest Control Research, 1969).

<table>
<thead>
<tr>
<th>Type</th>
<th>Size (microns)</th>
</tr>
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<tbody>
<tr>
<td>Overhead irrigation</td>
<td>575-1820</td>
</tr>
<tr>
<td>High volume sprayers</td>
<td>5-1100</td>
</tr>
<tr>
<td>Low volume sprayers</td>
<td>2-150</td>
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<tr>
<td>Thermal aerosols</td>
<td>0.1-50</td>
</tr>
<tr>
<td>Herbicide sprayers</td>
<td>130-740</td>
</tr>
<tr>
<td>Dusters</td>
<td>0.1-100</td>
</tr>
<tr>
<td>Rain</td>
<td>250-1000</td>
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<tr>
<td>Clouds</td>
<td>15-30</td>
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<tr>
<td>Fog</td>
<td>5-10</td>
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<tr>
<td>Smoke</td>
<td>0.01-1.0</td>
</tr>
<tr>
<td>Ground sprays</td>
<td>70-200</td>
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</tbody>
</table>
If the droplet size is too small, excessive drift may be encountered. A 50 micron droplet will drift 478 feet in an 8 mph wind from a 10 ft. height; whereas, a 20 micron droplet will drift 2956 feet before settling under the same conditions. A droplet size of approximately 100 microns is considered by many plant pathologists and entomologists to give the highest index of deposit with an adequate kill zone. Spraying with small droplets should be restricted to quiet days or nights with winds less than 8 mph.

The LVHVC system has great versatility in gallonage delivered per acre, ranging from 3 to 400 gpa. Research on potato blight and insect control showed that 20 gallons per acre was better than 10 gpa and as effective as 30 gallons of spray. Some tomato growers in West Florida spray 6-8 rows by the LVHVC when plants are small, 3-4 rows when several feet high, and drop back to two rows of coverage per swath when the crop is near harvest stage.

Insect and disease control studies at various universities have noted that low volume spraying properly done can achieve results equal to high volume spraying. The lighter weight of equipment and water; the cost saving of labor, material, and time; and reduction in run-off of spray materials make this new system worthy of consideration by growers and intensive study by researchers under Florida conditions.

(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 January 18-24

Question

Are there certain varieties of vegetables I can plant which are resistant to insect injury?

Reply

Some varieties of the same kind of vegetables have been observed to be bothered by certain insects less than other varieties. For example, Shogoin is a turnip variety which is claimed to have resistance to the turnip aphid. We recommend it for Florida home gardeners. Tests were conducted to test its resistance, comparing it to a variety aphids seemed to like. From the tests, it was obvious that when given a choice the aphids greatly preferred the susceptible to the resistant variety. However, the tests did not show why the aphids were more destructive on one than the other. Some possible explanations were (1) that hairs on the leaves of the susceptible variety provided good foot-holds to the aphids; (2) light reflections from the different colored leaf surfaces attracted aphids in different degrees, or (3) that the variety might just be more tolerant of the insect's attack.

In any case, insect resistance in varieties plays only a minor role in practical control of insects in Florida home gardens. One still needs to keep an eye open for early detection of infestations, then apply a recommended dust or spray.
(2) Timely Topic for Week of January 25-31

Question

I have heard that vegetables can be grown in a bail of hay. Is this true and if so, please explain the procedure?

Reply

Hay bales are being used in northern greenhouse culture for cucumbers. Their use might be the answer for a person who has a problem soil or no soil at all. A hay bale provides a well-aerated disease-free growing medium which can be placed on top of a concrete floor or over a very sandy spot. To make the bale productive, it needs to be well prepared by watering and fertilizing it for about 10 days before planting. One schedule in practice is to heavily water the bale for the first 3 days, then apply five ounces of ammonium nitrate fertilizer, then water for two days, then more (2 1/2 oz.) ammonium nitrate on the 7th day, then water again for a couple of days, then apply a complete fertilizer on the tenth day (or 2 1/2 oz. ammonium nitrate plus 7 oz. triple superphosphate, plus 13 oz. potassium nitrate). On the 11th day, apply a 3 to 4 inch layer of top soil or good potting mix into which you set the plants. Other crops besides cucumbers are a possibility.

(3) Timely Topic for Week of February 1-7

Question

Can you tell me what is causing the very tips and edges of my garden lettuce leaves to turn brown and die while the rest of the leaf is healthy?

Reply

Tipburn and edgeburn are two common disorders of lettuce. Actually, dieback of the leaf margins is a condition that had been noticed on many crops, from cantaloupes to beans to lettuce. Although in some cases a disease organism is associated as the causal agent, in general such disorders are the result of root injury bringing about moisture stress at the leaf margin. Fertilizer root burn, nematode injury, even root pruning from too close cultivating, all generally result in brown dead edges of the leaves. Furthermore, deficiencies of certain nutrients such as potash and calcium, or excesses of certain nutrients such as manganese and boron have been suggested quite reliably as causes of tip and edgeburn.

In the case of lettuce, a recent study showed tipburn to be associated with low soil moisture. The idea is that as the lettuce approaches harvest, which is a high water-use time, cells at the leaf edge die due to leaves using more water than roots can take up. Constantly maintaining good soil moisture helps prevent tip dieback of leaves. Low moisture could cause slow calcium translocation and result in calcium deficiency in rapidly developing young tissues, as has been suggested.

(4) Timely Topic for Week of February 8-14

Question

Are vegetables more nutritious when grown with organic fertilizers than with chemical fertilizers?
Reply

There has always been a small controversy over this subject. The usual answer has been that vegetables are similar in nutritional content when they receive the same plant foods from either source -- organic or inorganic. Of course, this answer is too simplified. It is certain that the nutrient content of vegetables does increase or decrease according to many factors including soil fertilization. Therefore, the kinds of fertilizers used and the way one uses them can have an effect on the nutritive content of the plant. In general, it is more a matter of amounts and availability of nutrients to plants rather than the source of these nutrients that counts.

For example, an experiment has shown that nitrate nitrogen increased in spinach leaves when amounts of nitrogen applied to the soil was increased. However, the amounts in the leaves were the same whether the source was organic or inorganic. The one exception was where cow manure was used, apparently the nitrogen it contained was so slowly released that the leaves could not take it up. So, here is an example of source affecting the nutrient level of the plant because it affected availability. Keep in mind that this relationship is never as simple and direct as has been inferred, and other environmental effects may override the effects of nutrient supply.

(Stephens)

B. Know Your Vegetables - Ginseng

Ginseng (Panax quinquefolius) is not a vegetable but is a fleshy-rooted herb. It is also called sang, gin-sin, five fingers and seng. Ginseng plants are about 12 to 18 inches tall. Each leaf stem has three or more compound leaves, with each leaf composed of five oblong-pointed leaflets. The fruit is a bright crimson berry. The mature root, which is the part used, is 3 to 4 inches long, up to one inch thick, and usually forked with circular wrinkles. It somewhat resembles a young parsnip or parsley root that is branched three, four or more times.

Ginseng is native to the cool and shady woodlands from Canada to Northern Florida. The native ginseng seems to be much preferred by oriental users who claim to be able to distinguish wild from cultivated types. Reports indicate ginseng roots often decay when attempts are made to grow them under warm humid Florida summer conditions.

Ginseng requires 5 to 7 years to mature its roots. It needs shade and may be grown in shady wooded areas or in lath houses. Seeds may be planted, but require a longer period from planting to harvest than from seedlings. Set seedlings 8 inches apart. These will produce seed the first year, which then also can be planted. Another way to start ginseng is to plant roots which are obtained either from the woods or from another grower.

The main users of ginseng are orientals who believe the dried roots have stimulative properties. Beverages, such as tea, are often flavored with ground ginseng root. Very high prices per pound of dried root have caused many persons to consider growing it in their wooded areas. And, the woodlands of the eastern U. S. mountains are often scoured by "sang" hunters. Those wishing to try it in Florida should consider it a risky endeavor due to (1) mostly an export market; (2) takes so long to mature; (3) wild roots preferred; (4) our warm climate makes poor-quality roots; and (5) high cost of planting material (seeds, plants, or roots). U.S.D.A. Farmers Bulletin No. 2201, "Growing Ginseng" has been available from U. S. Government Printing Office (1973 issue), and probably still is.

(Stephens)