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I. NOTES OF INTEREST

A. Vegetable Crops Calendar.


June 10, 1993. Vegetable Field Day. North Florida REC, Quincy. 1:30-5:00 pm eastern daylight time. (Contact Steve Olson).

B. New Publications.


II. COMMERCIAL VEGETABLES

A. Vegetable Field Day - North Florida Research and Education Center.

VEGETABLE FIELD DAY

Thursday, June 10, 1993
North Florida REC, Quincy, Florida
1:30-5:00 p.m. Eastern Daylight Time

Introduction: D.C. Herzog - Center Director.


Impact of Pesticides on Movement of Tomato Spotted Wilt Virus - D.O. Chellemi.

Whitefly and Tomato Mottle Gemini Virus Update - J. E. Polston.

Alternative Fumigants for Crop Production - J. W. Noling.

Selective Wavelength Mulches for Watermelon Production - S. M. Olson.

Crop Production with Mushroom Compost - F. M. Rhoads.

Soil Solarization for Crop Production - D. O. Chellemi.

Tomato and Onion Variety Trials - S. M. Olson.

(Olson, Vegetarian 93-05)

B. Lake Apopka HUA Project Carrot Study.

A carrot field demonstration site was established in the fall of 1991 to be used in a 4-year fertilizer management evaluation. The objectives of the study were to demonstrate the use of predictive soil testing for managing phosphorus fertilization and to determine the need for starter fertilizer for carrots. Treatments were: (1) P based upon soil test - none required; (2) grower applied rate - 120 lb P₂O₅/acre; (3) 1/2 grower rate - 60 lb P₂O₅/acre; and (4) liquid starter fertilizer in a band over-the-row - 17.3 lb N plus 58.5 lb P₂O₅/acre.

Soil test before fertilizing and planting indicated the field to be high in P and that additional P would not be needed. Therefore, treatment number 1 received no P. All treatments received 40 lb N and 96 lb KCl/acre (the rate the grower applied). Plots were 8 beds wide and 140 ft long and replicated 5 times. Fertilizer for treatments 1-3 were hand applied on October 7, 1991. The liquid starter fertilizer was applied October 14, five days after planting. Harvest was on February 3, 1992, 119 days after planting. There
were no significant differences among treatments for fresh weight of the carrot tops, average weight per root for jumbo, fancy, culls, or total marketable roots. Yields per acre for jumbo, fancy, culls, or total marketable carrots were not significantly different. Yields for total marketable carrots ranged from 700 units/acre (1 unit = 48 lb) for treatments 2 and 4 to 621 units/acre for treatment 1. Based on this one trial, the crop nutrient requirement for P was supplied from the soil without a decrease in yield or size. Soil testing was demonstrated to be a valuable tool in managing P fertilizer applications.

(White, Vegetarian 93-05)

C. Lake Apopka HUA Project Sweet Corn Study.

Two sweet corn demonstration sites were established in the spring of 1992 to be used in a 4-year fertilizer management evaluation for phosphorus (P). The objectives of the demonstration were to use soil testing to predict the need for P fertilization and to determine if a liquid starter fertilizer would increase yield. Treatments were: (1) control, no P added; (2) P based upon soil testing, none required; (3) Grower applied rate of 72 lb P$_2$O$_5$/acre; (4) 1/2 grower applied rate, 36 lb P$_2$O$_5$/acre; (5) grower rate of P-K at 72-288 lb/acre; and (6) banded liquid starter fertilizer of N-P-K at 5.9-20-0 lb/acre. Soil testing indicated the fields to be high in P and K; therefore, treatments 1 and 2 received no P. Fertilizer for treatments 3-5 was applied by hand on February 18, 1992, for site 2 and on March 6, 1992, for site 1. The liquid started fertilizer was applied on February 28 and March 22 on site 2 and 1, respectively. The planting dates were February 26 and March 9 for sites 2 and 1, respectively. Site 1 was abandoned for this study due to poor drainage in a large area of the trial.

Harvest of site 2 was on March 20, 1992, 84 days after planting. Each of the four replications were 30 x 120 ft. Data were taken from two 25 ft randomly selected rows in each replication for each of the 6 treatments. There were no significant differences for husked ear width, length, average ear weight or maturity. There were no significant yield differences for all of the treatments except the liquid banded P was significantly lower than the soil test P and control treatment which did not receive any P fertilizer (Table 1).

<table>
<thead>
<tr>
<th>Table 1. Sweet corn yields on muck soils, May 1992.</th>
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</thead>
<tbody>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>2. Soil test (no P)</td>
</tr>
<tr>
<td>1. Control (no P)</td>
</tr>
<tr>
<td>5. Grower rate (0-72-288)</td>
</tr>
<tr>
<td>4. 1/2 grower rate P (36)</td>
</tr>
<tr>
<td>3. Grower rate P (72)</td>
</tr>
<tr>
<td>6. Liquid P banded (6-20-0)</td>
</tr>
</tbody>
</table>

In this study, there was no yield increase when P or K fertilizer was added to a muck soil when the soil test indicated there was an adequate amount already in the soil.

(White, Vegetarian 93-05)

III. VEGETABLE GARDENING

A. Alternatives to Chemical Pest Control in Vegetable Gardens.

When I read all the press that Alternative Pest Controls has been getting recently I have to wonder, "is this what the organic community has been calling for all these years?" Even though current technology is much farther advanced than most organic gardeners, or anyone, for that matter, could envision, the plea I have always heard was "please quit using synthetic chemicals which can also kill natural predators, build up pest resistance, pose possible health risks, and generally
harm the environment!" The warnings and admonishment reflected in this plea were often disregarded as unfounded concern, and emphasis on chemical pest controls continued as usual.

Then integrated pest management (IPM) ushered in a new sense of environmental sensitivity, especially here in Florida. IPM still allowed the use of chemicals for pest control, but to a much lesser degree. The focus shifted toward alternatives such as resistant varieties and the wise use of cultural practices which discouraged pest invasions.

Today the shift toward organic or natural methods of pest control seems to be going almost 180 degrees away from the strict reliance on synthetic chemicals. In vogue now are terms like "biorationals", "biocontrols", "biosystems", and "biotechnology". The April, 1993 issue of Florida Grower and Rancher refers to it all as "The Biorational Revolution".

The technological search for natural pest controls which are environmentally, safe is well underway. So far, most of the products and practices are still experimental, theoretical, and speculative. However, those of us who are in positions to advise gardeners should be aware of some of the recent trends and developments. Therefore, to this end this article is written. No attempt will be made here to assess or recommend any of these products or practices as workable or even as yet legal to use in gardening situations. The following merely reflects some of the progress underway, as good news for the future.

Recent advances in biotechnology.

**Bacillus thuringiensis (Bt)** - this bacterial preparation (microbial insecticide) has proven itself for several years now in Florida gardens as an effective control for Lepidopteran larvae control, particularly for such hard to kill larvae as cabbage loopers. Also called ICP (insecticidal crystalline proteins), the many formulations and trade names contain protein crystals which cause gut disintegration upon ingestion by the caterpillars. While complete control is seldom achieved, the remaining plant damage can readily be tolerated, and the product is harmless to mammals (us).

From the major subspecies called kurstaki and aizawai, and so-called "transconjugated strains," many product brand names have entered the market. Some of these are, in no particular order of significance:

- Biobit (DuPont) Condor (Ecogen)
- Dipel (Abbott) Cutlass (Ecogen)
- Agree (Ceiba Geigy) Foil (Ecogen)
- XenTari (Abbott) Javelin (Sandoz)
- Larvo Bt (Fermone Corp)

Some of these newer strains are touted as being effective on other pests such as Colorado potato beetles, ants, mites, nematodes, and houseflies.

**Parasitic nematodes.** Still experimental, these microscopic worms can migrate through the soil, attacking insects in the soil, infecting them with bacteria which kill the insects.

**Mighty mites.** These predator mites can attack spider mites, such as those that cause a lot of trouble on strawberries in Florida gardens.

**Parasitic wasps.** Some of these tiny wasps are imported while others are native to Florida. Cotesia plutellae comes from Asia. The wasps are in a tube, which is inserted in the ground. When the tube's cap is removed, the wasps are released to seek and attack fall armyworms and corn earworms. When the wasps reproduce, more predators join the attack. Cotesia marginiventris is another imported species
that is said to attack armyworms. Diadegma insulare, a native Floridan, attacks the diamondback caterpillar.

Other insect predators: Lady beetles, lacewings, praying mantis, green garden spiders, etc.

Pheromone attractants. These experimental synthetic sex attractants tend to interrupt and confuse the insects’ normal mating cycle, thus keeping the males from finding the females. Although eggs are produced, they are infertile, so no caterpillars.

Usually, pheromones are released through walls of tubes which are stretched on a wire along the row. Some are contained as absorbents in "twist-ties", while others come in impregnated polymers and sprays.

One brand called "Rescue" is claimed to call in soldier bugs as a predacious insect. Another, called "SOS", is a synthetic turpenoid, which simulates the natural turpenoids released from the leaf by feeding larvae. These turpenoids act as distress signals attracting the predator wasps to come to the rescue.

The Fermone Corp. has two pheromone products of interest; "Stirrup-M" is a mite-mover, causing the mites to move about where they can be easily killed or caught by the "Mighty Mites". "Bee-Here" is supposed to attract bees for better pollination. Other companies with pheromone products are Dow Corning, Phillips Petroleum, AgriSense, and Biological Control Systems.

Pathogenic fungi. Even fungi have potential against a range of insects. Paecilomyces fumorosoroseus (PFR), is under study for use against the silverleaf whitefly. PFR was found on mealybugs at the Apopka research center. It has potential on several insects, especially in greenhouse conditions.

Botanicals. Several natural biopesticides have been in use for many years. Some of the better known ones are pyrethrin, rotenone, and ryania. Of recent interest is the Indian Neem tree, which produces a biopesticide called azadirachtin, said to attack 200 types of insects, mites, and nematodes. Some of the products of neem already on the market are BioNeem (Ringer Corp) and Margosan-O (Grace). Neem cake, a residual from the extraction of oil, has been used as fertilizer in some countries where this form is said to impart systemic protection to plants. So far, Neem is experimental on food crops.

Other natural products. Among the other natural organic products said to be effective as pesticides, some of which are in popular use today, are insecticidal oils and soaps. Studies are underway with combinations of vegetable oils and dish detergents. But it should be cautioned that these are not registered pesticides.

In summary, one can readily see that the "biorational revolution" is well underway. In the meantime, Florida vegetable gardeners should use chemical pesticides judiciously and only when absolutely necessary to prevent loss of the garden crop.

The wise use of preventive gardening practices such as resistant varieties, coupled with a greater degree of tolerance for injured vegetables can go a long way to a successful gardening experience and a cleaner environment.

(Stephens, Vegetarian 93-05)