MR. COUNTY AGENT:

Forwarded you several research reports dealing with pest control in our last newsletter. If you missed checking them, believe it will be to your advantage to look back before plans for fall planting snow you under.

To sort of round out the picture, here's another newsletter you can use... this time considering certain key topics from the soils and horticultural angles.

Dr. W. T. Forsee, Jr., Chemist in Charge
Everglades Experiment Station, Belle Glade

PEAT SOILS--change in P and K needs.

Peat soils undergo considerable change as they become more thoroughly broken down by oxidation. Not only do they change in physical structure but they undergo certain chemical changes which alter the fertilizer needs of plants growing on them.

A very strong tendency for increased phosphate requirements of vegetable crops has been observed. The virgin Everglades peat soils require little or no phosphate for maximum production. Six to 8 percent P2O5 in the mixed fertilizer is all that is normally recommended. As these soils age, the phosphate requirement goes up to such an extent that 12 to 16 percent P2O5 is frequently recommended.

The soils assume certain properties which cause them to fix phosphates. This characteristic makes it advisable to use band applications of this element on many crops. There are soils at the Everglades Station that have been in continuous production of row crops for approximately 25 years that show a lower water soluble phosphate level than the virgin soils which have never received phosphate applications. This condition exists in spite of the fact that the older cultivated soils have received varying amounts of superphosphate annually during the entire period.

At the same time that phosphate requirements increase there seems to be a slight decrease in notash requirements. For example, on virgin soils a 24 percent K2O fertilizer is usually recommended whereas on the older soils the recommendation is usually from 10 to 16 percent K2O in the mixed fertilizer.

MINOR ELEMENTS--insurance or immediate needs?

Considerable minor elements including copper, manganese, zinc and boron are included in the annual application of fertilizers to vegetable crops. Much of this is insurance against the appearance of such deficiencies and it is usually good insurance.

However, on crops that are sprayed at regular intervals for the control of diseases and insects the immediate needs for manganese and zinc, and perhaps boron, can be more efficiently supplied by applying these as nutritional sprays. This, of course, refers to old cultivated areas in which residual levels of these minor elements have been built up by frequent applications of fertilizers containing the minor elements.

Manganese may be used at 2-4 pounds of the sulfate in 100 gallons water, zinc at 1-2 pounds of sulfate in 100 gallons, and boron at the rate of 1/2 pound borax in 100 gallons. The latter should be dissolved separately and poured into the spray tank with the agitator running after the other ingredients have been dissolved.
Manganese and zinc may be applied to beans in the sulfur dust. Such dusts usually contain 10 percent manganese sulfate and 3-5 percent zinc sulfate and are applied at the rate of 30 pounds of dust per acre.

Sweet corn particularly is susceptible to burning by the soluble forms of manganese and zinc. This is due to the fact that excess quantities of the sprays collect in the whorl and are concentrated by evaporation. The less soluble forms of manganese and zinc, such as the oxysulfates, are effective on corn and other crops.

Dr. G. M. Volk, Soils Chemist
Main Station, Gainesville

CHLORINE--reduce amounts in potato fertilizers.
Fertilizer added in the drill at time of planting has gone up to about 2500 pounds of 7-8-8 or 7-9-8 in many instances for Irish potatoes. It is noted that much of this fertilizer carries up to 6 and 8 percent of chlorine. It should be held to less than 3 percent if possible. The cost of making up the material without using chlorides would be about $2 more per ton than where high chlorine is used.

pH DETERMINATIONS--can be improved.
It is recommended that all organizations using glass electrode pH meters have a "stand soil" or two for checking in addition to the regular buffer solutions. Many soils are less highly buffered than the solutions, therefore the use of a very sandy soil of known pH will be a good check to see that the machine is sensitive to a weakly buffered soil as well as to the strong buffers with which it is set.

pH determination after liming is very unreliable if done within one year, especially if the soil is not continuously stirred by tillage to allow for complete reaction of the lime. pH is especially inadequate as a measure of soil condition if the lime has been applied to the surface or has been only marginally incorporated.

LEAF ROLL--watch other crops.
Solonaceous crops should be closely watched for signs of nutritional leaf roll on all new lands, and increased nitrate used to help correct the trouble. There is little need for concern on old land of pH 5.5 or above, because nitrification should be good in such soils.

Dr. Philip J. Westgate, Horticulturist
Central Florida Experiment Station, Sanford

CHELATES & FRITS--easy, boys.
Chelated Iron (Fe - EDTA) has given favorable response when applied as a side-dressing to iron chlorotic vegetables on acid sandy soils in the Sanford area. Between 20 and 40 pounds per acre of the Fe - EDTA (12% Fe) have given satisfactory results without injury to established plants in the field. Chelated iron may be injurious to germinating seeds, and to foliage when applied as a spray.

Fritted Trace Elements have failed to green iron chlorotic vegetables on acid sandy soils in the Sanford area.

Dr. R. A. Dennison, Horticulturist
Main Station, Gainesville

GRAY-WALL--nutritional studies.
Investigations are being carried on at Gainesville in an effort to obtain information as to the factor or factors causing "gray-wall" to develop in tomato
fruit. This is being investigated as a nutrition problem and both sand culture and water culture methods are being used. It is felt there may be an antagonism or interference between certain ions with the plant failing to obtain or translocate all of the essential elements the fruit and the growing points need, resulting in breakdown of the vascular tissue of the fruit.

Gray-wall is a fruit disorder which is a serious problem only periodically. It is usually found in fruit from plants which have made good growth. The fruit with gray-wall are most commonly found under the foliage where they are well shaded. A number of fruit with gray-wall are often found following a heavy rain.

QUALITY--nutrition and fertilizer practice.

A. Influence of source of potash. The use of sulfate of potash in the fertilizer applied for tomato crops produced fruit which ripened firmer than when muriate of potash was used. In the case of cabbage the heads were firmer with the use of muriate of potash.

B. Influence of nitrogen side-dressing on firmness of tomatoes. Some commercial buyers contend they will not take tomatoes which have been side-dressed with nitrogen because the fruit ripen soft. Experimental studies which have been made have not shown this to be true. However, time of application with respect to stage of development of the plants and levels of nitrogen applied have not been investigated sufficiently to reach any definite conclusions. Treatments with 3 levels of nitrogen side-dressing and 3 times of application with regard to stage of development are currently being studied. Research has improved techniques to evaluate the quality of the fruit.

SHADE VS. EXPOSED FRUIT--"white" tomatoes.

Many tomato buyers are placing a premium on light colored fruit as compared with dark green fruit. If the fruit are light colored it indicates they have been protected by the foliage of the plant against direct exposure to the sunlight whereas the dark green fruit have been exposed to the light.

Studies indicate the shaded fruit are firmer and develop a better color. However, the differences depend to a large degree on the temperatures for a period of several days prior to harvesting the fruit. If the temperature is low there is very little difference in the fruit, but if the temperatures are high the differences between the two lots of fruits increase.

The production of shaded and exposed fruit is closely related to cultural practices of which the fertilization program is a very important consideration. If the fruit are going to be protected from the light the plants must make a vigorous growth so they will have sufficient foliage.

SPECIAL FERTILIZER MIXES--superior quality?

A number of tomato growers have fertilizer made up special and will nearly always claim their special mix produces far superior tomatoes to anything their neighbors have. Because of the insistence of a number of growers on these special fertilizer mixes it increases the grades of fertilizers which the industry must produce. Probably most of these growers would produce tomatoes with just as good quality by using some of the standard grades of fertilizer.

Dr. John L. Malcolm, Soils Chemist
Sub-Tropical Experiment Station, Homestead

TOMATO FERTILIZERS--variety differences?

Each new tomato variety may have distinctly different fertilizer requirements from those varieties which are now being grown. For example, the Homestead variety appears to have a much lower phosphate requirement than the older varieties such
as the Grothen and the Rutgers. In addition to this, its more vigorous growth habit makes it better able to utilize nitrogen and potassium from the fertilizer.

Under the conditions of experiments at the Sub-Tropical Station, there was no apparent difference in the manganese and magnesium required by these varieties. It must be remembered, however, that the Station farm is well supplied with both of these elements. The Homestead tomato seems able to extract fertilizer elements retained by the soils and to make very good use of the easily leached elements added in the fertilizer.

**POTATO FERTILIZERS—differences in marl soils.**

Experience with potatoes this year points out the difference in soils rather than in varieties. On the East Glade Farm a commercially mixed 5-10-10 at the rate of 500 pounds per acre was compared with 1500 pounds of 2-8-6. Both mixtures contained magnesium and manganese. Although the yields were generally poor and the stand inconsistent, the potatoes receiving the 500 pounds of 5-10-10 out-yielded those receiving the 2-8-6.

In one cooperative experiment 1000 pounds of 5-10-10 was compared with 2000 pounds of 2-8-6. In this case the yields on both plots were the same as nearly as could be determined. In a second cooperative experiment, 1000 pounds of the 5-10-10 was compared with 2000 pounds of 4-8-6. In this case the yield from the plot fertilized with 5-10-10 was inferior by more than 15 percent. Since the field averaged about 450 bushels per acre, this was a loss of some 70 bushels of potatoes.

This experience suggests that although careful experiments can establish the fertilizer requirements of a crop in a particular field, care must be used in applying these results over a wide area.

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*Sincerely,*

Forrest E. Myers
Assistant Vegetable Crop Specialist

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250 copies