MR. COUNTY AGENT:

It just isn't so!.....these exaggerated claims for "water culture", "hydroponics", "tray agriculture", "tank farming", etc....they're all NUTRICULTURE.

If you're having troubles along these lines, write the College of Agriculture, University of California, Berkeley, California, (yes, we said CALIFORNIA) and get yourself a copy of Agricultural Experiment Station Circular 347, revised January 1950, "The Water-Culture Method for Growing Plants Without Soil".

Here's some select quotes from same:

"Most claims for the advantages of nutriculture are unfounded. It is not a new method for growing plants. Anyone who uses it must have a knowledge of plant physiology. Its commercial application is justifiable under very limited conditions and only under expert supervision. Nutriculture is rarely superior to soil culture: Yields are not strikingly different under comparable conditions. Plants cannot be spaced closer than in rich soil. Plant growth habits are not changed by nutriculture. Water requirement is no less in nutriculture. Nutritional quality of the product is the same. Nutrient deficiencies, insect attacks, and diseases present similar problems. Climatic requirements are the same. Favorable air temperatures are just as necessary as in soil."

Well, to make a long story short the California boys go ahead to say..."If, realizing these limitations, you still wish to experiment with nutriculture methods, you will find directions beginning on page........"

Fair enough, and until someone proves scientifically otherwise, it's a good attitude for Florida county agricultural agents.

RESEARCH REVIEW---Sub-Tropical Station, Homestead

In recognition of the work that has been conducted at the Sub-Tropical Station during the period July 1, 1951 to June 30, 1952, with the conviction that it is of interest to several other areas, here's an attempt to sum it up from the annual report manuscript.

Be certain you understand that this is a summary of the year's research, most of it single tests at best, and is not intended to be the complete picture or recommended practice.
The Sub-Tropical station staff is headed by Dr. Geo. D. Ruehle, with the vegetable research by Entomologist D. O. Wolfenbarger, Plant Pathologist Robert A. Conover, Soils Chemist John L. Malcolm, and Horticulturist J. C. Noonan.

**VARIETIES AND BREEDING**

**Potatoes:** Dakota Chief and Bliss Mutation significantly outyielded Bliss Triumph. LaSoda yielded significantly less than any variety in the trial.

**Sweet Corn:** Calumet and Golden Security probably showed the best combination of disease resistance, high yields and good appearance, although both varieties had certain undesirable traits. Calumet had poor eating quality, while Golden Security did not fill well at the tip under sub-optimum conditions. Ioana filled well and had good eating quality, but was very susceptible to Helminthosporium diseases and produced rather low yields. Other varieties worth further testing were Huron, Aristogold, Bantam Evergreen and Iochief.

Most of the varieties under test this year were of poor quality. It may be difficult to find a disease resistant variety that will produce high yields of well filled ears of good quality during the short days of winter.

**Tomatoes:** Under the conditions of the experiments Rutgers (S), STEP 176, Manasota and STEP 89 ("Homestead") were best in the first yield trial, while in the second yield trial Manasota, Stokesdale (R), STEP 176 and Urbana were best. In both trials Manasota had rather rough fruit, Urbana produced small fruits, and Stokesdale and STEP 176 produced fruits of good commercial type. STEP 89 was observed in commercial plantings on both rockland and marl soils, and it was superior to both Rutgers and Grothen Globe.

**Blight-Resistant Tomato:** The prospects of achieving a commercial type late blight resistant tomato that looked so encouraging last year was dealt a serious blow this season with the occurrence of a virulent race of Phytophthora infestans in the planting. All lines, including the primitive resistant parents, were severely defoliated by the time fruit were maturing. The evidence available does not indicate the origin of this virulent race.

**FERTILIZERS**

**Potatoes:** The fertilizer variables included several levels and sources compared to a standard 4-7-5 with 3% MgO and 2½% MnO at 1500 pounds per acre. The results were "much the same as those found in the last three years". There have been apparent slight responses to N, P, and K. Possibly the lowest rate of application of MnO (1½%) has been beneficial; too much Mn was harmful. Mg made no difference.

"On the basis of these experiments, the present high rate of application of fertilizer for potatoes cannot be justified. The practice of using P and K in much higher proportion than N also seems incorrect. These results were obtained in one location and may not be generally applicable, but they suggest certainly that our present practices are wasteful."

**Tomatoes:** In a somewhat similar test as above, the addition of Mg and Mn to the fertilizer made no significant difference in the yields. 850 pounds per acre of cyanamide (21% N) for sclerotiniose eliminated any N response. After the
first increment of \( P \) equal to 70 pounds \( P_2O_5 \) per acre, there was no increase in yield with larger amounts of \( P \). The total yield increased with increasing (0 to 15\%) amounts of \( K_2O \) and the proportion of marketable fruit also increased.

**Foliar sprays:** On tomatoes, several soluble fertilizer sprays did no harm to the plants, but did not improve yields.

**Nematodes**

Tests compared velvet bean cover crop and clean cultivation with liquid and powder forms of EDB and DD, and systox (in transplant water), for root knot control. There were little differences in tomato yields and no differences as to knots on the roots.

**Insects and Diseases**

**Sclerotiniosis:** Comparing fallowing, weeds, velvet beans and pearl millet cover crops, the results of two years work indicate that cover crops do not offer any solution to the sclerotiniosis problem.

Calcium cyanamide was the outstanding treatment, completely inhibiting aplithecial formation at 500, 750 and 1000 pounds per acre; at 250 pounds per acre the plots contained an average of only 18 aplithecia per plot.

Ground-line stem infections decreased as dosage of calcium cyanamide increased; they were unaffected by other treatments. This indicates calcium cyanamide not only inhibits aplithecial formation but it also tends to suppress soil-borne infections of *S. sclerotiorum*.

There were no differences in foliage infections of the test crop (beans) whether considered as number or percentage of plants infected. This clearly indicates that in small areas such infections are not indicative of the effect of treatment on the sclerotia in the soil. Such infections may result from ascospores produced in adjacent untreated areas.

The bean test crop, planted the same day the treatments were applied, showed no effect from any treatment in either germination or subsequent growth.

**Tomatoes:**

**Late Blight:** Under the conditions of the experiment the following treatments provided the best control of late blight with insignificant differences between them: zineb at 2#/100, zineb at 1.5#/100, nabam plus zinc sulfate, manzate, and nabam plus manganese sulfate. The following failed to provide adequate protection: orthocide 406, tribasic copper, 0-51, LO-2H2O, and an experimental phygon-copper mixture. Yields closely paralleled disease control.

**Spray Injury:** Damage to the foliage and skin of the fruit was observed in nabam plus zinc sulfate treatments; the addition of B-1956 spreader decreased but did not eliminate fruit injury. Neither fruit nor foliage showed any injury from nabam plus manganese sulfate sprays, or from zineb or manzate sprays.

**Soil Rot:** Spraying orthocide 406, penta-chloro-nitrobenzene or thiram on the soil at 32 pounds active ingredient per acre resulted in a significant decrease in soil rot (*Rhizoctonia solani* Kuhn) of mature green tomatoes. The
reduction amounted to about 50% of the untreated check, and there were no differences among these treatments. Eight pounds of active ingredient per acre had no effect on the disease.

**Leaf Miners and Worms:** Leaf miner infestations were controlled more effectively with phosphatic insecticides than with the chlorinated hydrocarbons. Reductions in wormy fruit were greater with the chlorinated hydrocarbons. Each insecticide was combined with zineb, 2#/100.

The phosphatics in the test were: EPN ⅔ 27% combined with urea 5#; metacide ½ pt. 50% emulsion; and systox ½ pt. 50%. The chlorinated hydrocarbons were: endrin 1# 10% wettable; isodrin 1# 10% wettable; dieldrin 1# 25% wettable; DDT 1 qt. 25% until crown-hand fruit then toxaphene 1 pt. 50% combined with VHPF 5#; DDT 2# 50% until crown-hand fruit then toxaphene 2½# combined with VHPF 5# and aldrin 2# 20%.

Worm control was satisfactory with EPN and metacide but was very inferior with systox.

**Mist-Blower Sprays:** A standard hydraulic spray of 150 gallons per acre of zineb-parathion was compared with concentrated mist blower sprays in which the same amounts of insecticides and fungicides were applied with 30 and 15 gallons of water per acre. The control of leaf miner and worms was practically the same with all treatments.

**Potatoes:**

**Late Blight:** Blight control was good with manzate, zineb, nabam plus zinc sulfate, and cop-o-zink plus phygon. Orthocide 406 and tribasic copper were less effective and two experimental fungicides were ineffective.

**Seed Piece Decay:** Semesan bel, phygon and orthocide 406 were ineffective on bacterial seed piece decay which caused loss in stand. Fusarium seed piece decay was not active.

**Wireworms:** In wireworm control, broadcast applications of 3# active ingredient per acre of aldrin and heptachlor gave small differences between the two materials; these were in favor of aldrin. Broadcast applications of 4½# active ingredient of chlordane per acre gave slightly inferior results. Wettable powders and emulsion formulations of aldrin, heptachlor and chlordane were nearly equal in control, but emulsion formulations did not clog the spray nozzles as did the wettable powders.

**Aphids and Leaf Miners:** Phosphatic insecticide sprays of EPN, malathion, and metacide combined in each case with nabam plus zinc sulfate generally gave more effective aphid and leaf miner control than chlorinated hydrocarbon insecticides. Systox combined with nabam plus zinc sulfate was more effective than alternation sprays of DDT and toxaphene or DDT and aldrin combined with nabam plus zinc sulfate. Combination of urea with EPN and VHPF with metacide gave effective aphid and leaf-miner control.

**Sweet Corn:**

**Budworm:** The budworm was controlled by 7 weekly applications of DDT, 50% wettable powder 2#/100, and by endrin, 10% wettable powder, 1#/ per
100, each combined with 2# of zineb per 100. These sprays were applied at the rate of 60 gallons per acre.

**Earworm:** For earworms 6 spray treatments were applied at from 2 to 4 day intervals, as silking began. DDT emulsion (2 lb/gal) at one quart per 100 gave 56% control; compound 269 emulsion (1-1/2 lb/gal) at 1 quart per 100 gave 18% control. Two DDT-mineral oil formulations gave 71 and 62 percent control. Plants sprayed with one of the materials were yellowed slightly.

**Helminthosporium:** In the statewide test, better disease control, larger yields and greater profits were obtained from (1) nabam plus zinc sulfate than zineb, and (2) from spraying twice a week than once a week. Zineb was good but nabam was slightly better. Manzate was fungicidally equal to zineb, but caused injury on young corn. The addition of casein stabilized zineb-DDT emulsion mixtures without loss of fungicidal power. No differences were observed between plots sprayed with zineb-DDT wettable and zineb-DDT emulsion mixtures. A sufficient volume of spray must be applied to allow rundown into the whorl if maximum disease control is to be realized.

In a large commercial field nabam plus manganese sulfate sprayed corn showed less northern (H. turcicum) leaf blight than corn sprayed with nabam plus zinc sulfate. Taller plants and larger leaves indicated also a nutritional response to manganese.

**Okra:** Spray applications of parathion, chlordane, and toxaphene, compared with parathion-zineb, chlordane-zineb, and toxaphene-zineb indicated reduced effectiveness in pumpkin bug control by the zineb combinations. Observations in treated tomato field also suggested less control where zineb-insecticide combinations were used. Of several dusts, a parathion-toxaphene combination was a little more effective although some control was obtained from each treatment.

Sincerely,

FORREST E. MYERS
Asst. Veg. Crop Specialist

FEM:mr
Ext. Ser.
250 copies