vastly improved water-control system, which provides ample irrigation, maintains the water table at near constant levels, and provides fast drainage when needed. Rapid drainage of excess water results in minimization of root injury and water-wilt caused by flooding. The improved control of water table also results in less fruit-cracking and more uniform quality. Second, a grower has the choice of using his crop for either mature-green or vine-ripe harvest, as market conditions may warrant. Staking makes it possible to maintain the crop in good condition through a much longer market season than is possible in the conventional ground culture. Staked plants are not damaged by rough treatment by pickers. Third, as pointed out above, staking increases the opportunity for better ventilation around the plants, thereby minimizing the hazard of gray leaf spot and other leaf spot diseases, as well as soil-borne diseases which cause fruit decay. Fourth, pesticides can be applied more efficiently than on ground crops.

The disadvantages of the system are: First, delayed maturity because of time required to produce extra large plants before fruit-setting can begin. A delay of a few days in setting of fruits could easily mean the loss of the advantage of having fruit for early market. Second, crowding plants with heavy nourishment to produce large plants quickly will often further delay fruit set by causing bloom drop or crease-stem or both. Proper feeding must be learned by experience, and governed by careful attention to the crop. Third, seemingly contrary to the statement above that the increased ventilation around plants by wide spacing reduced the hazards of damage by leaf spotting diseases under normal conditions, the dense growth produced by plants in this method of culture also provides ideal conditions for the development of the more serious diseases, Botrytis and late blight, as well as gray leaf spot, under epidemic conditions which occur with prolonged adverse weather.

It is recommended that close study and personal observations be given to this latest trend in tomato culture by growers in the State, with the objective of applying the ideas involved to their growing problems. The method may be adaptable to several areas where wide row culture is used for ground-grown crops.

The greatest advantage of the method seems to lie in the efficient drainage and irrigation, the undisturbed, extensive root system, and the ample nutrition provided. It appears that modification of the methods described might well be applied in many producing areas, to the advantage of the growers, keeping in mind the main objective: "More production per man hour unit employed, and thus more return per dollar invested."

**PROBLEMS ASSOCIATED WITH INSECT CONTROL ON TOMATOES**

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Insecticides have been blamed for so many failures to control certain insect pests on crops that it is apropos that we consider a few of the factors that influence control.

Most of the contents of this paper will be directly or indirectly concerned with the serpentine leaf miner and its control. Florida is unique in that its growers use tremendous amounts of pesticides. As was brought out in the national residue hearings some years ago, Florida has a long growing season and a wide range of crops so that somewhere in the state crops are being grown every month of the year. Every one of these crops has its pest problems and we are indeed fortunate that we have the chemicals to solve them. Limitations of this paper make it impossible to deal with all crops grown in Florida so the remarks will be confined to tomato growing. It will not be possible to discuss the effectiveness of various insecticides except to say there are many available that will give good controls if properly applied. The best insecticide produced is no better than its application or its applicator.

There isn't a grower or a dealer that hasn't heard a complaint about serpentine leafminer and the failure of certain materials to control it. Recently in conjunction with leafminer control an experiment covering 15 years was concluded. The problem was the effect of cold
weather spraying on the quality and yield of tomatoes. We have advocated over a period of years that although insects continue their destructive work during cool weather, it is not advisable to spray on a day when the temperature remains below 60° F. It has been learned from experience that if the temperature does not reach 60° F by 1 p.m., a very cold night can be expected, barring a cloud bank moving in. It has been shown that if one waits until the temperature rises to 60° and above, the spray application is more effective as a control and there is less damage to the plants and to the fruit. Many of the phosphatics and hydrocarbon insecticides are ineffective if applied when it is cold. Chlorotic and necrotic effects show up as a result of spray burn if plants are sprayed on a cold day. Although not significant, there was a big difference in the amount of rough fruit harvested from plants sprayed in cold weather.

In the test completed this spring three sprays were applied during periods of low temperature, on February 13, when the temperature was 41° F; on February 27 when the temperature was 40° F; and on March 16 when the temperature was down to 48° F.

Up to the time of picking it was difficult to say there was noticeable reduction in fruit set. The first few pickings of pink and ripe fruits showed a marked reduction in fruit harvested from plots sprayed during low temperatures. Size and quality of fruit were the same. However, the difference noted earlier between cold and normal sprayed plots was not overcome and the season ended showing the cold sprayed spots yielding 851.3 bu. or a decrease of 273 bu. from the normal treated plots whose yields were 1124.3 bu. per acre. Thus a grower could repeatedly spray his crop on cold days and not leaving a check, the yield would be the same over the entire field. Most growers never stop to realize how many bushels of fruit may be lost this way. If there has to be a reason for reduced yields, it generally is in the insects and the pesticide that caused it.

Winds also have their effects upon the plants and the effectiveness of the spray. If conditions permit, it is far more desirable to spray during periods of calm because there will be less loss of spray from drift and plants will not show the combination effect of spray burn and windburn. A combination of high pressure, high speed and high wind is the epitome of poor spraying. Without going into detail, it was proven years ago that atomization or the forcing of spray out under high pressure is wrong for phosphatic and hydrocarbon insecticides because the particles are so fine that unless the spray rig is driven very slowly, the material volatizes and is dissipated into the air without touching the plant or insect. The insecticide must reach the plant and come in contact with the insect to be of any benefit.

Spraying during windy weather is not only wasteful spraying but the small amount of spray that hits the plant and/or insects is usually insufficient to kill the insects. Another feature to be considered, especially by truck crops growers is the danger of certain insecticide residues blowing over to crops that have a different tolerance than the crop being sprayed. This is not so important for large growers unless airplane application is used and there the precaution about insecticide drift is as old as airplane spraying of crops.

Do not spray if it is foggy. Parathion generally will burn the foliage under these conditions. But worse yet is the loss of spray through excessive run-off. This is a point we thought never needed repeating, but alas growers grow careless and forget.

In addition to these there are other causes for failure to control such as poor adjustment of nozzles, clogged nozzles, and improper materials. It is hard to conceive of any grower applying the wrong material but occasionally a tankful may be sprayed on by mistake. Most insecticides are more or less specific for certain insects whether chewing or sucking. Many growers insist upon using nothing but parathion for chewing insects. Parathion, a phosphatic, is primarily for sucking insects. It is true that parathion will kill small instar larvae but not the larger instar larvae. When the insecticide fails to control the half grown to mature larvae, the grower is displeased and blames the insecticide.

Last but far from being the least, is sanitation. So long as a green leaf is left on a plant, a leafminer may be produced there. If crop remains cannot be destroyed it is highly advisable to continue spraying them.

In summary, do not make spray applications when temperatures are lower than 60° F. Do not spray in windy weather. Growers are urged to destroy their old crop residues and give a better spray coverage with shorter intervals between rather than change to some insecticide less effective than those recommended.