The number of days required between treatment and harvest where an insecticide is used on a food crop or on forage and pasture is given in each recommendation. The required time depends more on the quick "break-down" of the chemical than on its actual toxicity. An example would be that D.D.T. is not recommended at all on lettuce in control of the insect that carries a virus to this crop. Phosdrin, a very toxic insecticide, may be safely used up to three days of harvest. The three day limit is based on research over a period of years. The trend is to this type of product even though the chemical itself is very toxic at the time of application.

Trend in Recommendations

A few years ago it was common for growers to claim that they would not apply the highly toxic organic-phosphate insecticides. Many of these are permitted close to harvest because they are not persistent like the D.D.T. types. It would appear now that growers have learned to use these toxic substances safely and thus reduce residues on harvested crops.

The trend in both use and recommendations is away from the persistent chemicals that accumulate in soil and animal tissue, such as the chlorinated hydrocarbons, to the quick "break-down" organic phosphates and low toxicity carbamates such as Sevin. The 1964 recommendation for cutworm control has been revised and the aldrin, dieldrin, and heptachlor recommendation has been replaced by poison-bran bait which was the standard recommendation for many years. Will growers change back to a hand-treating method? We cannot force them to do so. Should control over application on an individual's farm be under regulations?

Should we "educate" or "regulate" or is there a working combination?

The CHAIRMAN: Thank you very much, Professor Goble. Would anybody like to ask questions of Professor Goble?

Mr. ROXBURGH: On page two of your brief you made the following statement:

> Under certain conditions some birds have died as a result of insecticides. What is more disturbing, however, is that the losses from pest birds (red winged blackbirds and starlings) of fruit and corn appear to be increasing. Sweet corn and fruit require heavy insecticide application.

What is the reason for that statement?

Professor GOBLE: You have asked me a question which I have not thought of before. The reason for the statement was that in the normal application of insecticides in the fields I have not seen any dead birds or animals, and I have been to a great many orchards over a period of time. That was the thought I had in mind.

You asked another question which I cannot answer. I believe that the heaviest rate of insecticide is applied to orchards in comparison with any other crop. However, we do not seem to find any dead birds in orchards.

Mr. OTTO: So that what you say is that birds seem to thrive on insecticides?

Mr. NESBITT: I am not quite clear on this sentence "What is more disturbing, however, is that the losses from pest birds (red winged blackbirds and starlings) on fruit and corn appear to be increasing". Are you implying that these birds are eating fruit and corn?

Professor GOBLE: Maybe I was misleading in my wording. What I meant is that insecticides do not seem to be reducing their number. Of course, I do not think the insecticides are increasing the numbers of birds but we do know that the losses have not been so great. Something like $1,500,000 is lost in corn