

Chart 3—Mass screening of compounds for basic evaluation against indicator plants, insect organisms or nematode may be used to point out agricultural areas where the candidate chemical may apply. Other laboratories may skip this procedure and evaluate compounds against specific insects, disease organisms, or in case of herbicides against specific grasses or broadleaf weeds.

Regardless of whether one or both of the above systems are used, once a promising pesticide is found it is tested against a wide number of specific pests in the group in order to determine the effect of various dosages. At this stage it is important to determine the effect of the candidate chemical on the host or crop you want to protect. Even though the chemical controls the pest in question, if it injures the crop or animal you wish to protect, it will have to be rejected.

Prior to undertaking large greenhouse or small scale field trials, preliminary toxicology tests are made to assess the danger of the chemical to the worker handling it. Usually these consist of acute oral and dermal LD 50's, that is to determine the amounts required to kill 50 per cent of the test animals. The pesticide may also be tested at this stage on laboratory animals for possible eye irritation and vapor inhalation studies. These may be concluded in the Research Stage with a 30-day feeding study to determine what effect the chemical will have on the test animal if fed in the daily diet.

Preliminary bio-chemical information may also be required at this time to determine the metabolism or chemical changes of the pesticide in plants and animals. It may be desirable to study the mode of action or what effect the chemical has on animal and plant tissue. Also if the compound is translocated within the plant.

Chart 4

SYNTHESIS  
(New Compound)

1. SELECTING COMPOUND TO BE MADE
  - a. NEW COMPOUNDS WHOSE AGR. APPLICATION IS UNKNOWN
  - b. SYNTHESIZING COMPOUNDS RELATED TO THOSE OF KNOWN ACTIVITY:
    1. FOR MORE EFFECTIVE PESTICIDES
    2. FOR PATENT PROTECTION
2. SELECTING INITIAL CHEMICAL PROCEDURES:  
(FOR PREPARING GRAM QUANTITIES)
  - a. LITERATURE SURVEY
  - b. EXPERIENCE WITH RELATED COMPOUNDS
  - c. DEVELOPING NEW METHOD