Chart 4—Synthesizing a new chemical first involves the selection of compound to be made. It may be desirable to make an entirely new compound whose agricultural application is unknown, or you may prefer to synthesize one related to those of known activity. In the first case, perhaps your aim is to uncover a new or more effective pesticide, but if you already have a promising candidate you might consider making related compounds in order to give you a better patent position.

After you decide on the compound, the next problem is to select the best way to make it in gram samples. A literature survey or your chemist's experience with related compounds may prove profitable. If these fail, a brand new method will have to be developed.

Chart 5

CHEMICAL EVALUATION

1. DETERMINING CHEMICAL & PHYSICAL PROPERTIES
2. DETERMINING STABILITY
3. FORMULATIONS
4. POSSIBILITIES FOR ANALYTICAL METHODS
5. PRELIMINARY INFORMATION ON BEHAVIOR DURING AND AFTER APPLICATION
6. DEVELOPING ANALYTICAL METHODS FOR IDENTIFYING COMPOUND AND INTERMEDIATES
7. DEVELOPING SCALE UP CHEMICAL PROCESS (FOR MANUFACTURING OZ. to LB. QUANTITIES)

Chart 5—Chemical evaluation of the candidate material is also important if you are to make it work as a successful pesticide. Determination of the chemical and physical properties is necessary before you can prepare satisfactory formulations. If the compound is of such a nature that it cannot be stabilized at ordinary temperatures, or if it oxides or hydrolyzes too rapidly under conditions encountered in the field—it may have to be discarded. However, if the promising pesticide is stable and can be formulated, analytical methods must be found for determining amounts of residue in animals and plants.

Finally, preliminary information on the behavior of the compound during and after application must be determined. Here, you need to know if it persists or does it change to another compound in presence of air and water. Also, does its chemical property change when placed on plant or building surfaces.