Distribution (Fate) and Metabolism in animals may be necessary if pesticide residues are on the feed, or the animal is treated directly with the pesticide. Here, chemical changes of the compound are studied in the various animal tissue.

Mode of action studies determine the effect of the chemical on the various animal organs. Finally, before the pesticide is offered for sale, Industrial Hygiene Engineers must decide what safety precautions are to be followed in the manufacture and formulation of the compound. Safety precautions may also be suggested to growers if the compound has a high mammalian toxicity.

Chart 11

FORMULATION

MINIMUM $50,000

1. MUST DETERMINE PHYSICAL AND CHEMICAL PROPERTIES
2. MUST DETERMINE EFFECTS FORMULATION ON
   a. PLANTS
   b. ANIMALS
   c. EQUIPMENT
3. MUST DETERMINE EFFECT FORMULATION ON PERFORMANCE
   a. DOES IT GET TO SITE OF ACTION IN MOST EFFICIENT FORM?
   b. COMPATIBILITY WITH COMPLIMENTARY PESTICIDES
   c. STABILITY IN STORAGE
   d. STABILITY IN SPRAY MIXTURE
   e. DOES IT HAVE DESIRABLE PHYSICAL PROPERTIES?
4. IS IT AFFECTED BY EXTREMES IN TEMPERATURE?
5. DOES IT SEPARATE OR AGGREGATE IN STORAGE?
6. EASE OF APPLICATION

Chart 11—FORMULATION studies start early since a proper formulation often decides the success or the failure of a material. As mentioned previously, it is necessary that our final formulation be decided in the early Development Stage. The average cost for Formulation studies, during this stage, run at least $50,000.

Since the properties and use of a compound determine the desired formulation, the first step is to ascertain the active pesticide's physical and chemical properties.

Then the effects of the formulation must be studied on different plants, animals as well as manufacturing and application equipment.