Chart 9

TOXIC RESIDUES

$100,000 to $250,000

1. PREVIOUS INFORMATION WILL HELP EXPERIMENT STATIONS TO DETERMINE WHEN TO EXPECT CROP RESIDUES IN FIELD.
2. EXPERIMENT STATION WORKERS THEN DESIGN EQUIPMENT TO COLLECT SAMPLES WHICH WILL SHOW EFFECT OF:
   a. TIMING
   b. DOSAGE
   c. RATE OF DISAPPEARANCE
   d. RESIDUES AT HARVEST
3. PROBLEMS OF COLLECTION AND SHIPMENT OF SAMPLES
4. ANALYZING SAMPLES
   a. RESIDUES OF COMPOUND ALONE
   b. RESIDUES OF TOXIC METABOLITES

Chart 9—The determination of *Toxic Residues* in plants is shared almost equally by Experiment Stations and Industry. Cyanamid's average cost runs between $100,000 and $250,000 per product. Chemists at the originating laboratory help the Experiment Station worker to ascertain when to expect crop residues in the field by determining the effect of moisture, temperature, sunlight and soil type on the compound's stability. Knowledge of a soil pesticide's solubility will enable the field worker to judge whether or not to expect toxic symptoms on succeeding crops. Also, vapor pressure data will help estimate the chemical's volatility under varying field conditions, thereby helping the worker predict the length of time residues can be expected to remain on plants.

With a knowledge of the physical and chemical properties of the pesticide, Experiment Station workers can then design tests for collecting samples which show the effects of proper timing, dosage, rate of disappearance of the compound in plants, and residues at harvest. Analysis of dosage rates several times higher than recommended is desired in order to supply residue knowledge for situations where mistakes are made in the actual application. Also, if residues at harvest are too high the information gained from the rate of disappearance studies will help determine when the last application should be made.

The proper collection and shipment of samples is very important. Green plants and perishable fruits and vegetables must be frozen and shipped in dry ice so as to arrive at the testing laboratory before the samples thaw. Improper shipments of a highly perishable crop like strawberries could result in insufficient residue data, thereby delaying registration another year.

The job of actually analyzing samples will be shortened if the residues found on or in the plant are the same as the compound itself. However, if the