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Pesticides Reach Consumers

Those few new pesticides introduced nearly every year beat odds of 10,000 to 1 in reaching the consumer, says Winand K. Hock, plant pathologist and pesticides specialist for the College of Agriculture at The Pennsylvania State University.

Such new pesticides, he claims, cost chemical companies about 5½ million dollars and about 7 years of research and development before the product is marketed. The 7 years cover the time from initial laboratory synthesis of a compound to final government registration of a packaged product.

Biological screening is perhaps the area of greatest importance and highest cost in developing a new chemical compound, Dr. Hock said. This work comes between the initial laboratory synthesis of a compound and field testing of the nearly finished product.

"The scientist must determine the range of biological effectiveness as well as the level of crop safety for a new compound. A new chemical is screened to determine its broadest possible use. It is tested for disease control, as a weed control agent, as a growth regulator, as a controller of nematodes, and as an insecticide. No stone is left unturned," he observed.

Once a compound shows promising biological activity, requirements must be met for information on toxic

effects, crop residues, and environmental impact. Scientists determine the toxicity of compounds based on ingestion, skin contact, and inhalation by test animals. Toxicity levels for animals are required for ultimate federal registration.

The probability of a compound causing tumors, birth defects, or genetic mutations must also be examined, he pointed out.

Crop residue data are essential as a basis for establishing tolerances on food and feed crops. Tolerances represent the maximum amount of pesticide residue permitted on a crop at harvest.

"Environmental impact studies are required to discover any potential hazards the chemical might have for nontarget organisms such as fish and animal wildlife, as well as to determine the behavior of the compound in soil, air, and water," Dr. Hock explained.

When all of these tests are

completed and the information is compiled and evaluated, only then can the pesticide manufacturer apply for a product registration and petition for tolerances, he noted. All pesticide products in the United States must receive a registration from the Environmental Protection Agency (EPA) before being marketed.

Each product bears a label describing the precise uses permitted for that product. Deviation from the label constitutes a violation of federal law. Any changes on the label or the addition of supplemental uses for a particular product must first be cleared through EPA.

"The farmer, home gardener, and environmentalist can be assured that extensive research has gone into any new pesticide product. When used properly, pesticides can be a tremendous asset in man's never ending struggle to increase the quantity and quality of food and fiber," he concluded.

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