APPROPRIATE CHEMICAL PLANT PROTECTION TECHNOLOGY FOR AGRICULTURAL DEVELOPMENT ENVIRONMENT AND PRODUCTION ISSUES: (Summary)

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Pesticides must be used in Farming. Crop Protection is vital to all countries, to further agricultural development. Today with issues like the depletion of the ozone layer, global warning, fruit and food contamination, ground water contamination and acid rain, any future crop protection chemicals must be environmentally sound. Pesticides have had quite an evolution since the early 1900's. Let us take a brief look at this cycle.

THE PAST

The first major crop protection chemicals to be utilized were the pyrethroids. Pyrethrins are derived from Chrysanthemum flowers. It was discovered that when dried and crushed they could be used to control household pests such as flies and mosquitoes. After this discovery came the introduction of the Retinoid and Alkaloid insecticides derived from the roots of the Derris and Ryania speciosa plants respectively. It is interesting to note that Ryania is native to Trinidad and the Amazon Basin. However, these insecticides could only control a limited number of pests. By the 1940's man was on a quest to introduce chemicals that would have a broader spectrum, give better control, increase yields and of course earn profits. Millions of dollars were being spent on research. In 1942, J.R. Gag company launched Gesarol or as it is commonly referred to - DDT. The introduction of DDT, a chlorohydrocarbon launched a new era in crop protection chemicals. The phenomenal success achieved by DDT was due to the following:

(1) High insecticidal activity
(2) Low acute mammalian toxicity
(3) Wide spectrum
(4) Simple manufacture and handling
(5) Low price and
(6) Long duration activity.

At the same time more research was being conducted on Pyrethroids. It was logical to search for compounds available by adding other chemicals to the structure of the Pyrethrins derived from Chrysanthemum flowers and therefore enhance their properties.

In 1950, Allethrin was introduced. It was the first synthetic pyrethroid produced. It had an LD50 of 1100 mg/kg as compared to DDT which had an LD50 of 113 mg/kg. Allethrin was 10 times safer than DDT. Other research yielded such pesticide groups as organophosphates and carbamate. Research also lead to various other developments such as nematicides, acaricides, fungicides, herbicides and rodenticides.

Crop protection was big business. World population had exceeded four billion and its nourishment was of critical importance. Withdrawing pesticides would mean the loss of whole harvests. Little was done in toxicological tests and environmental issues.

TODAY

In the last ten to fifteen years the agricultural industry has seen a dramatic turn around. Gone are the DDT's and Aldrins. DDT which is said to have saved over one billion people from malaria was withdrawn from the market in the

1970s. With the formation of the Environmental Protection Agency in the United States of America and new regulations including safety requirements being introduced, most chemical manufacturers thought it unwise to spend thousands of dollars to obtain the data requested by the EPA since either (1) the chemical was no longer patented, (2) sales were not enough to warrant such a large expenditure or (3) new introductions had made some chemicals obsolete. Some chemicals also fell to the mighty sword of the environmentalist since they proved to be carcinogenic in tests to laboratory animals, when administered at extremely high dosages.

Chemical manufacturers now have different rules and guidelines by which to operate. They must now look at chemicals that are safe to humans. We cannot, as a people, have another disaster as happened in Bopal, India. But a great deal of this new technology in environmentally safe pesticides has already been introduced. The development of these chemicals will only assist agriculture.

THE FUTURE

What the future holds, no one can predict. Based on the last ten years of research and commercial developments, the next 10-15 years should see dramatic changes. By the year 2000 environmentally safe pesticides will control at least a fifth of the pesticide market, as the lobbies for environmental groups put pressure on their Governments to ban today's common pesticides. The use of Hormones, Chemo-Sterilants, Attractants or Pheromones, Repellents as well as insects, viruses or bacteria to control specific pests, will be common. Of final importance to the future will be the role of Education. It is all too common in the West Indies for farmers to believe that if one litre is recommended per Hectare, two litres will kill faster and control better. Private enterprise, environmentalists and Government organisations with assistance from foreign organisations such as GIFAP must unite to educate the farmer on the use of chemicals. Today's and tomorrow's crop protection technology will enable future agriculturists to continue to feed the growing population of the world.