THE PESTILENCE OF PESTICIDES IN SRI LANKA

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The increasing world demand on food supplies, even at a medium level of population growth, is staggering. The extra annual tonnage needed is estimated in millions, at 200 for cereals, 200 for vegetables and fruit, and 150 for meat and milk, plus animal feed necessary to produce it. Little surprise therefore that agriculture had to lean heavily on agrochemicals, for the production of more food for more people, on less space in lesser time.

Of the chemicals used in agriculture, understandably, pesticides turned out to be widest prevalent. Although initially only 10 per cent of the world supply of these substances was used in the developing world, the proportion has since grown. And, naturally, the practice has brought in its wake, some of the mal-effects of pesticides. That is, though, not to undermine the usefulness of these chemicals . An assessment of the hazards of pesticides should be done with an open, and a balanced mind; for, there is vested interest weighing both for as well as against; and also, overzealoussess and unwanted fears.

There has been a running controversy regarding the relative advantages of 'natural' as opposed to 'synthetic' pesticies. Adherents of both schools appear equally convinced of the infallibility

of their respective stands. However, nicotine, considered a natural insecticide in the past is unlikely to stand the scrutiny of the modern standards laid down by the high-technology based pesticide industry of the modern world !

The uses of pesticides are well documented; but, their hazards, particularly in the less developed countries, are not. In Sri Lanka. there is immense scope for quantifying these aspects of pesticides. Meanwhile, it is possible to learn lessons from other countries where the entry of pesticide residues into the food chain has been amply demonstrated. These are the areas which demand close scrutiny in a local context.

The exact extent of hazards caused by pesticides may not be ascertained in the near future. The immensity of the problem is itself one reason why it may not be ascertained easily. There are also other operative factors, particularly when it concerns hazards to humans. Most cases of accidental poisoning may go un-noticed, or unrecorded because of the possible social stigma attached to suicide. Further, it is only overt acute poisoning that attracts attention, while chronic poisoning may go quite unnoticed, or under another guise.

It has so far been estimated that at any given time, 400 million people in the developing world are afflicted with a pesticide – related ailment. A recent survey in Sri Lanka has indicated that in 1980, a total of 11,811 people have been admitted to hospitals of whom 1,112 had culminated in death. Of the total number, a quarter were accidental poisoning. The estimate for attempted suicides was 9,490. These figures are unacceptably high for a country of the size of Sri Lanka. The indictment against the hazards of pesticides is even more heavy when consideration is given to the fact that the stated figures are, unavoidably, underestimates.

An analysis of deaths coming within the purview of the Department of Forensic Medicine of the Colombo Medical Faculty revealed the following figures. Out of 697 autopsies conducted, 66 were due to pesticide poisoning. This contrasts strikingly with a figure 8 for all other poisons. Of the 66 cases, 65 were due to insecticides, and the other due to a weedicide. The vast majority of cases were suicidal.

The variety of chemical substances found as constituents in pesticide preparation used in Sri Lanka are too numerous to list. Some of the more important ones are chlorinated hydrocarbons, organophosphorous compounds, carbomates, paraquat, pyrethrum, arsenic, thallium, mercury, phosphorous, methaldehyde, and copper. Many of these substances have powerful toxic properties. Besides the main substance itself, some of them are dissolved in toxic solvents, the latter of which can have harmful effects too.

The commonest route of entry for these substances is oral. That is, not to discount the importance of the lungs and the passages leading to them. When the toxic chemical is in gaseous form, or in the form of finely divided particles of diameter in the region of a 1000th m.m. they can easily be absorbed via the respiratory passage. What is often overlooked is the fact that when in solution, or in the form of atomised particles absorption could occur through the skin.

What strikes the public are the cases of acute poisoning by pesticides. As has been pointed out, many such instances are suicidal, some accidental, and a few may even be with homicical intent. What is lost sight of are the numerous instances of chronic poisoning, leading to malfunctioning, of organs or systems of the body. It is usual for a living body to detoxify a chemical when taken into the body. In such instances, if the rate of intake is less than, or equal to the rate of detoxification, any effect produced by the chemical is only temporary. If, on the other hand, the rate of detoxification falls short of that of intake, accumulation occurs. There are also some chemicals that are deposited in selected tissues of the body where they withstand or avoid processes of detoxification. It is by these two mechanisms that some pesticide residues remain in living tissue, and thus produce either chronic affects, or/and enter the food chain.

Of 28 autopsies of proven cases of chlorinated hydrocarbon poisoning analysed by us the following were the results. In 71% of cases the lining of the stomach was damaged. The lungs showed damage in 86%, while 21% had bleeding into the lungs. 29% showed brain damage. The picture in organophosphorous poisoning is different. It produces an intense and sustained activation of a part of the nervous system leading to slowing of the heart, laboured breathing, vomiting and diarrhoea, muscular twitches, convulsions, coma and death.

Paraquat, the well known weedicide, being a strong alkali, is highly toxic to the eyes. It ulcerates the mouth and sometimes even the skin. It causes a scientifically fascinating solidification of the lungs, the precise nature of which remains a mystery. The damage it causes to the suprarenal glands (a powerful and vital structure that lies in relation to the kidney) was first described in Sri Lanka.

Arsenic deserves very special mention, partly because of its common use in agriculture, and partly because arsenic poisoning occurs in other circumstances as well. The amount required for poisoning is indeed small. When taken by mouth, the picture of acute poisoning is precisely like that of cholera. It produces vomiting and diarrhoea with abdominal pain, muscle cramps, drying up of the body, nervous dysfunction, and death within a short period of time. Chronic poisoning is more surreptitious. It first produces a picture of vague ill-health, often escaping diagnosis. There is then vague abdominal discomfort with intermittent *'indigestion"*. The

more florid cases have pigmentation of the skin, falling hair, discolouration and brittleness of nails, thickening of palms and soles, and anaemia.

Mercury is a kidney poison. Phosphorous selects the liver, killing large spans of its cell within days, producing jaundice, swelling of body, bleeding from various sites, mental confusions, coma and death. Thallium produces a syndrome, the most striking manifestation of which is falling of large locks of hair.

The manner in which pesticide poisoning occurs in this country is fairly obvious. Suicidal patients select agrochemicals partly because of their ready availability, and partly because of the knowledge of their dangerous effects. It may be argued that if they do not find insecticides, they will still choose an alternative substance. These are matters for argument, for which this may not be the right forum. What is of decided importance are the cases of accidential poisoning.

Manufacture, packeting, transport, and storage are clear instances of possible contamination. Household accidents occur due to sheer neglect. Poisoning in the field is often due to not paying heed to the advice given regarding safe use. The cases of entry into the food chain could be summed up as sheer lack of social consciousness and responsibility.

The main avenues for tackling problems of this nature are firstly restricting availability; and secondly, reducing demand. Neither of these steps can be taken with regard to pesticides. As an immediate measure controlling availability and restricting use to situations of absolute necessity are possible measures, but, what is most demanding is public education, and the right kind of knowledge and motivation for those who deal with pesticides.