

INSTITUTE OF CURRENT WORLD AFFAIRS

DGD-8
The Red Peril

P.O. Box 1615
Kathmandu, Nepal
October 18, 1979

Mr. Peter Martin
Institute of Current World Affairs
4 West Wheelock Street
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Dear Peter,

Several weeks ago my night watchman came to me with a special request. He asked me to help him to obtain an insecticide and spray applicator so that he might spray his 0.4 hectares of rice paddy. His rice plants were dying, he told me, and he was sure it was the fault of the small red caterpillars that he had discovered at the base of the yellow seedlings. Like so many urban workers in Kathmandu Valley, the watchman found it necessary to supplement his meager wage with the produce of a small plot of land. During the summer growing season, most of the land in the valley is planted to rice paddy, corn fields or vegetable gardens. The harvest of the watchman's land, I knew, would go to feed his wife and six small children plus several other relatives in his large extended family. I told the watchman, Hem Bahadur by name, that I would be glad to help him if I could. It would be wise to take a sample of the villainous insect with me, I thought, so that proper identification could be made and the most effective remedy procured. Thus, I told Hem Bahadur that if he would bring me a few of the red caterpillars the following day, I would attend to securing the appropriate insecticide and applicator.

The next morning, armed with a small bottle of the red thread-size creatures, appearing to me more in the class of worm than caterpillar, I set off with my housekeeper, Nirmala, to the pesticide store in the center of town. The shopkeeper seemed to have neither knowledge of nor interest in the minute animals we displayed in our vial. He assured us, though, that the insecticide he presented us would kill the offenders. As I unwrapped the instruction booklet from around the dark brown bottle, I noticed that it was damp with the poison that had leaked through the improperly sealed cap. According to the pamphlet, the liquid contained in the bottle was a powerful systemic poison which I am sure would have killed the small red creatures in our jar, plus many other living things in and about Hem Bahadur's rice paddies.

As I continued to read the instruction booklet I was horrified. The manufacturer strongly recommended that the user of the insecticide wear rubber gloves, high rubber boots and preferably goggles and a air purification mask. When incredulously I asked if the shop rented or sold this equipment or if it could be purchased in Kathmandu, the several men behind the counter laughed heartily. The pamphlet also cautioned the user to take care not to contaminate water supplies and to avoid the treated areas for several weeks. To me these precautions seemed impossible to heed given the organi-

zation of farming operations that I have observed in Kathmandu Valley. In most instances the cropland extends right to the edge of the homestead. Small levees that separate the individual plots and contain the irrigation water also serve as footpaths. Although the rural people may walk some distance to obtain their drinking water from a piped water supply or a local spring, the washing of clothes and people often takes place in the very same stream that is diverted to flood the paddy fields. Farm animals and their wild cousins quench their thirst in these waters. At the streamside pigs and ducks root for food. Buffaloes, dogs and children enjoy a dip in the cool river on a hot summer day. A particularly heavy summer shower may send the narrow streams overflowing so that rivulets running onto the road carry small fishes to one's feet. The children scramble to catch these fingerlings for a tasty fish fry. How could one spray a flooded rice paddy without contaminating the water? I did not want to be even partially responsible for introducing a powerful poison into this environment; Nirmala and I retreated without a purchase.

I knew of only one other distributor of insecticides in the valley, the Agricultural Inputs Corporation (AIC), a government enterprise organized to provide seeds, fertilizers and pesticides to farmers at reasonable prices. After a considerable walk we reached the AIC compound at the edge of Kathmandu. The two men in the insecticide division to whom we spoke were not familiar with the small red creatures we presented to them. Furthermore, their colorfully illustrated guidebook to the pests of the rice plant did not picture anything similar. They suggested that we take our specimens to the scientists at the government agricultural research station at Khumaltar, just south of Kathmandu. Actually, earlier in the day I had considered that action myself, however, I had discarded the idea as the research station is quite far from the city. It now appeared to be our only option. Before making the journey, though, I decided that we needed to regroup our forces.

Upon returning home I sent Hem Bahadur with a large plastic bag to collect a proper sample of the ailing rice plant—an entire stalk together with mud and parasites. While Nirmala prepared lunch, I telephoned the research station in order to make an appointment with an entomologist that afternoon. After lunch Hem Bahadur, Nirmala and I climbed into a taxi and headed for Khumaltar. As we rode through the city with the diseased rice plant encased in plastic on Hem Bahadur's lap, I had the sense of escorting an ailing family member to the hospital. The attention being given that rice plant however, was certainly more than is given to many of the urchins which roam the streets of Kathmandu.

At the experiment station we were greeted by Dr. Pradhan to whom we explained our problem. She led us to her laboratory where she examined under the microscope the rice plant as well as the red worm and the paddy soil. After several minutes she announced that the much maligned red creature was a positive agent in the rice paddy. Moreover, she could identify no malicious insects in the specimen we produced. She agreed that the yellow-brown rice plant did not look well and guessed that its infirmity was due to a pathogen rather than a parasite. Thus, she recommended that we consult her colleague, Dr. Krishna, across the road in the Department of Plant Pathology. Dr. Krishna was

not at all puzzled by the appearance of the rice plant and immediately identified its affliction as a fungus. She explained that the disease was spreading throughout the valley, but that the government had initiated a spraying program designed to control it. After recommending a certain fungicide she detailed the location of the agricultural extension office that was in charge of the spray program.

Our persistent efforts had paid off. We were elated with our progress and returned to the city and the store we had visited earlier that morning. There we bought a fungicide, not the one that the good doctor had prescribed, but the only one available. Subsequently we proceeded to the government agricultural extension office to arrange for the application of the potion. As we arrived at the correct street address, I noticed that I lacked the small change necessary to pay the cab driver. I sent Nirmala and Hem Bahadur ahead to tell our saga while I waited with the taxi for change.

When I walked into the extension office, three men were shouting angrily at Hem Bahadur who was backed against the wall. With my entrance the tone of the conversation changed markedly. One man reached to pull up a chair for me and politely and calmly inquired as to the purpose of my visit. I replied that I was accompanying my friends here whom he had just met, and that we were seeking to have a few paddy fields sprayed with a fungicide. I presented him with the instructions that Dr. Krishna had given us. After a brief glance at the note he directed us to check with the local agricultural services office in the vicinity of the rice paddy we wanted treated. I requested him to write for us a brief note of introduction that we might present to the field officer in charge of the local center. When we left the office I handed the note he had prepared to Hem Bahadur. As it was already quite late in the day, I told him that he himself should go to present the note to the man in charge of the agricultural services office near his home. I promised that should he run into any problems with the field staff I would be glad to offer my presence and assistance to secure the necessary sprayer.

Several days later Nirmala told me that the local agricultural extension agent had balked at helping Hem Bahadur. The man had argued that the note Hem Bahadur had presented although displaying the signature of his superior, did not exhibit the official government seal. Hem Bahadur was persistent in his demands, however, and after threatening him with an exaggeration of the influence and capabilities of his memsahib, the reluctant government official agreed to spray Hem Bahadur's rice. The following day three men, two supervisors and a man with a backpack sprayer, arrived to administer to the diseased rice seedlings. The treatment appears to have been a success as the rice recovered and is rapidly ripening to harvest.

This anecdote illustrates a few interesting points about life in Nepal, and probably many other developing countries as well. Hem Bahadur's request for assistance stemmed from the fact that it is very difficult for the average farmer to obtain the tools of modern agriculture. The farmers complain that the scarce agricultural inputs that the government distributes at reduced prices benefit for the most part the richer and more influential farmers. Despite the availability of improved technologies and the establishment of government offices

responsible for their introduction, inadequate communications and transportations systems and the lack of proper equipment and trained personnel may severely handicap their dissemination. For instance, by the time news of an epidemic reaches Kathmandu and aid can be dispatched, the besieged population most likely will have succumbed or survived of its own strength. Alternatively, the necessary veterinary vaccine may be in hand, but not the storage refrigerators, the syringes nor the administering technicians. Likewise with the fungicide in the story above, its application was much more difficult to arrange than its purchase. Unfortunately even if the distribution system is fairly well established, the demands are so great relative to supplies of most articles that nepotism, bribery and black markets become the rationing mechanisms. The inequitable distribution of agricultural inputs will result in widening the gap between the rich and poor farmers. In the case of pesticides, to the extent that natural predators are destroyed and fish and livestock die due to misapplication of pesticides or contaminated water runoff, the poorer farmers may be bearing a heavy burden of environmental costs. On the other hand, if a pesticide-resistant variety of insect evolves without natural predators, all farmers may suffer decreased yields until a new chemical control may be developed. The environmental and health hazards of improper use of pesticides though difficult to measure in financial terms are nonetheless substantial.

In theory the average Nepali must present an authorization slip from his employer in order to obtain a pesticide. As I stood in the store discussing the merits of the insecticide the shopkeeper was pushing, I noticed several Nepalis came in seeking a pesticide. To every customer he recommended the same poison he had offered me. As Nirmala and I walked out of the shop I saw several of the instructional leaflets from these bottles littering the ground. The illustrated pamphlet wrapped around the bottle was printed in Nepali as well as English. Roughly eighty percent of the population of this mountain kingdom is illiterate. Moreover, field research has shown that even diagrammed instructions can be misunderstood by rural villagers with little experience with pictorial representation of common objects. Should the purchaser comprehend the the precautionary measures recommended, it would be all but impossible to buy or rent the equipment necessary to carry out the instructions. Lacking a clear understanding of the content and actions of the magic potion they have bought, farmers tend to use it in excess, thinking, no doubt, that if a little is good, a lot is better. In my own yard, despite my many explanations of the working of the nicotine-detergent insecticide employed, I have seen the gardener often spray various insects until they literally drown in the insecticide. Certainly the pesticide dealer takes no interest in the proper use of his merchandise, and trained government technicians are too few and far between to be effective on a broad scale.

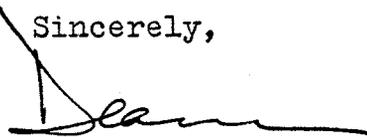
A study conducted by a University of California team of scientists for USAID* in 1973 discovered 25 parts per million (ppm) of DDT in samples of human tissues taken in Pakistan and India. Similar studies

* United States Agency for International Development

in Europe and the United States showed amounts of 2 ppm and 9.5ppm respectively. Although in Pakistan less than 10 percent of the total cultivated land area is treated with pesticides, researchers concluded that the high rate of DDT accumulation in human tissue was the result of improper use of insecticides on horticultural and agricultural crops. For the human consumer pesticide residues may be ingested directly with the diet's fruits and vegetables or indirectly through the consumption of meat and other products of scavengers that subsist on agricultural wastes. Such animals include fish, pigs, ducks, chickens, goats, buffaloes and cows. Outright poisoning and death may occur with the improper handling of pesticides during application. A recent book*on environmental issues points out that "the problem of occupational poisoning in pesticide application has been exacerbated as countries move away from the persistent pesticides to those that are more easily degradable but much more lethal..." In the lesser developed unexperienced seasonal labor, an absence of agricultural labor unions, indifferent government attitudes plus high illiteracy rates combine to provide the perfect climate for the very dangerous misuse of the technology of chemical pest control.

Most certainly I have neither the background or the training to debate the values of pesticides. My recent experiences, however, have compelled me to review what too often I see is considered an easy solution to increasing Third World agricultural productivity. Pesticides are not simple panaceas. Chemical pest control is a high level technology which to be utilized safely and effectively requires a complicated support system. This means not only a responsive and equitable distribution network, but also proper equipment, well maintained, adequately trained technicians with a teaching mandate and environmental protection codes backed by a genuinely concerned government. Lacking this milieu, the indiscriminate dissemination of powerful poisons is grossly irresponsible, endangering the well-being of both present and future populations.

Sincerely,



Deanna G. Donovan
Forest and Man Fellow

* Pearson, Charles and Anthony Pryor. 1978. Environment: North and South. John Wiley & Sons. New York.