Vietnam Turns Back A ‘Tsunami of Pesticides’

Convincing Vietnamese rice farmers to use less pesticide came down to letting them see the benefits for themselves

For years, the entomologists at Vietnam’s Southern Regional Plant Protection Center in Long Dinh had tried to sell rice farmers on the benefits of reducing pesticide use—to little effect. So in 2001, they took a different tack: They challenged 950 farmers to try for themselves.

In one plot, the farmers grew rice using their usual amounts of seed and fertilizer, spraying insecticide whenever they thought it was needed—which was often. In a nearby plot, they didn’t spray at all for 40 days after planting and used less seed and fertilizer as well. To the farmers’ surprise, the yield from the experimental fields was as good or better, while costs were lower, generating 8% to 10% more net income. From then on, they were convinced, recalls Chien Van Ho, who collaborated on the project.

The exercise, designed with colleagues at the International Rice Research Institute (IRRI) of Los Baños, Philippines, was the first step in a campaign that Chien says has led Mekong Delta farmers to cut insecticide spraying from five times per crop cycle to once—or even none at all. Experts are now trying to replicate that success throughout Southeast Asia.

Clean as a swimming pool

The Green Revolution of the 1960s and '70s introduced sturdier plants that could support the heavier grain loads resulting from intensive fertilizer use. Rice production in Asia more than doubled. But it left farmers believing more is better—whether it’s seed, fertilizer, or pesticides.

Rice farmers became accustomed to spraying soon after planting, when they first saw signs of the leaf folder, which appears early in the crop cycle. That bug causes only superficial damage that doesn’t reduce yields. Worse, early spraying also takes out the frogs, spiders, wasps, and dragonflies that prey on the brown planthopper, which arrives later and is far more dangerous.

Instead of “landing in a sea of sharks,” planthoppers find something as “clean as a swimming pool,” Heong says. What’s more, tests have shown that killing planthoppers now takes pesticide doses 500 times greater than in the past. More and more plant-hoppers survive to suck sap from the young rice plants, causing them to wither.

As early as the 1980s, IRRI and the FAO convinced some Southeast Asian governments that with so-called integrated pest management (IPM), natural predators could control planthoppers. In 1986, Indonesia banned 57 pesticides and completely stopped subsidizing their use. But progress was reversed in the 2000s, when growing production capacity, particularly in China, unleashed a “tsunami of pesticides,” says FAO entomologist Peter Kenmore. Even some in the agrochemical industry concur. “We all agree that in Vietnam, farmers have overapplied pesticides in some production environments,” says Kee Fui Kon, who oversees rice-related R&D at the Swiss agrochemical giant Syngenta.

Radio soap opera

In Vietnam, the Mekong Delta trial helped change conventional wisdom among farmers and agricultural officials. The study led
Brown planthoppers have become the farmers’ foe. Brown planthoppers have become increasingly resistant to insecticides.

In Rural Asia, Locking Up Poisons to Prevent Suicides

Pesticide ingestion accounts for one-third of the world’s suicides. Can a simple plastic lockbox keep toxic chemicals out of desperate people’s hands?

When Flemming Konradsen arrived in Sri Lanka’s North Central Province in 1993, he aimed to find new ways to control malaria and Japanese encephalitis. But Konradsen, an environmental health biologist at the University of Copenhagen, quickly realized that these mosquito-borne diseases were hardly the region’s worst health problem. As others documented in a paper a few years later, people who had intentionally swallowed pesticides occupied far more beds in a provincial hospital than did patients with any one disease.

Farmers in the area used insecticides and herbicides liberally, giving them and their family members ready access to very toxic chemicals at moments of stress. The prevalence of self-poisoning was “very difficult to ignore,” Konradsen recalls. Before long, he had shifted his research from mosquitoes to self-harm. Twenty years later, he and colleagues have embarked on a massive study to find out if a specially developed lockbox can reduce the suicide rate by keeping pesticides out of the hands of desperate people.

A little-known problem in the Western world, pesticide ingestion is the leading global means of suicide, accounting for roughly one-third of the estimated 1 million cases annually. Scientists say the easy availability of pesticides contributes to rural Asia’s high suicide rates. Asians who kill themselves often have no discernible mental illness; rather, they make impulsive decisions during brief periods of emotional distress (Science, 23 November 2012, p. 1025). In the United States, a loaded gun in the home makes adolescents significantly more likely to die by suicide; in Asia, people “don’t have guns—they have pesticides,” says toxicologist Michael Eddleston of the University of Edinburgh in the United Kingdom.

Reducing access to highly toxic pesticides, Eddleston and colleagues say, is critical to lowering the region’s suicide rate. But until recently, international discourse was “dominated by the view that pesticides were an environmental and maybe an occupational issue,” Konradsen says.

Fatal gulps

During the Green Revolution of the 1970s, countries like Sri Lanka turned to organic chlorines and organic phosphates to boost crop production. Suicide rates also shot up, Eddleston says: “People taking poison would say ‘I’m going to go do a Folidol’”—a brand of methyl parathion, a potent insecticide. With some pesticides, as little as 50 milliliters—a few gulps—can be fatal. Depending on the chemical, death can be triggered by convulsions, respiratory failure, or organ or lung damage.

Drawing attention to this problem was far from easy. Two major treaties governing hazardous pesticides don’t mention self-harm at all. Environmental activists don’t often address the misuse of pesticides as poison because it makes it “more difficult to highlight the responsibility of the producer,” Konradsen says.

Nonetheless, Sri Lanka phased out imports of all World Health Organization (WHO) hazard class I pesticides—the most...