Methyl Bromide under Fire
Methyl bromide is one of the most widely used pesticides in the world, a broad-spectrum fumigant effective in controlling insects, nematodes, fungi, and bacteria. Methyl bromide is also highly toxic to humans. In December 1993, the EPA listed methyl bromide as a stratospheric ozone-depleting substance subject to phase-out. The final rule, issued 1 January 1994, freezes U.S. production and importation of methyl bromide at 1991 levels, with a phase-out of production and consumption by the year 2001. The ban has been loudly protested by industry and agriculture, who say it will impose severe hardship on farmers without yielding a significant benefit to the global environment.

Roughly 59 million pounds of methyl bromide were used in the United States last year—43% of worldwide use—with Florida and California accounting for nearly two-thirds of domestic consumption.

Methyl bromide is a pre-emergent pesticide: it is applied to soil before planting fruit and vegetable crops. It is also applied after harvest to numerous commodities such as grains, raisins, and walnuts.

Humans are mainly exposed to methyl bromide by inhaling it and absorbing it through the skin. The EPA classifies methyl bromide as a category 1 acute toxin, the most deadly category of substances. From 1982 to 1990, 15 deaths and 216 illnesses related to eye, skin, and throat irritation were attributed to methyl bromide exposure in California alone, according to the California Department of Pesticide Regulation. Long-term health effects from chronic exposure to methyl bromide include permanent neurological damage, muscle aches, impaired motor coordination, and abnormal kidney and liver function.

In addition to its immediate toxicity, methyl bromide is a potent destroyer of stratospheric ozone. A 1992 assessment by the United Nations Environmental Program (UNEP) attributes 5–10% of the current loss of atmospheric ozone to methyl bromide. Destruction of the ozone layer leads to increased exposure to ultraviolet radiation (UV-B), which in turn may result in far-reaching adverse effects on human health and the environment, including increased incidence of nonmelanoma skin cancer, cataracts, blindness, and possible effects on both cutaneous and systemic immune function.

Industry, however, is not satisfied with the available data on methyl bromide. “Given how little we know about the sources and sinks of methyl bromide, we feel the ban was premature,” says Tom Duafala, director of research for Trical, Inc., a California-based applicator of methyl bromide. “Estimates of the contribution of agricultural use of methyl bromide to total ozone destruction are small and appear to be shrinking. Further, the lifetime of methyl bromide in the atmosphere is at most two years. So why not wait for more definitive information before imposing a severe hardship on agriculture?”

Methyl bromide in the atmosphere comes from both natural and anthropogenic sources. Total source strength is estimated to be between 75–210 gigagrams per year (Gg/year). Thirty-three gigagrams (10^9) per year, or between 16 and 44%, is estimated to come from direct application as a pesticide, according to the UNEP report.

Scientists have recently focused on methyl bromide resulting from the burning of biomass (the dry weight of living organisms) as a potential major source of ozone depletion. Wildfires of African savannas, chaparrals, and boreal forests, as well as agricultural fires to clear land for planting or to burn off post-harvest residues, emit high concentrations of methyl bromide. A recent study by Stein Mano and Meinrat O. Andreae of the Max Planck Institute for Chemistry in Germany, published in Science, estimates that emissions of methyl bromide from such fires range from 10 to 50 Gg/year, with a best estimate of 30 Gg/year. The high degree of uncertainty reflects the limited data set available on this source; however, this amount is comparable to that produced by ocean emissions and pesticide use and may equal as much as 30% of stratospheric bromine.

Some scientists believe a primary natural source of methyl bromide is production by marine plankton. One study by M.A.K. Khalil and colleagues, published in the Journal of Geophysical Research, estimates oceanic contribution to be about 35 Gg/year, with an uncertainty of ±50%. However, it has also been proposed that the oceans serve as a sink as well as a source for methyl bromide, and that a reduction in anthropogenic emissions might result in...
a corresponding flux from the ocean to the atmosphere. This effect might lessen or negate the benefits to stratospheric ozone from a reduction in anthropogenic emissions of methyl bromide.

In terms of costs to society from the ban, the California Department of Pesticide Regulation estimates growers in its state stand to lose $340 million per year in crop damage. Duafala says no single alternative exists that will replicate the range of uses of methyl bromide. He says there are nematicides (1,3-dichloropropene) and fungicides (methyl isothiocyanate) that effectively perform some of the functions but that these are not as versatile as methyl bromide.

Bill Thomas, methyl bromide program coordinator for the EPA, agrees that there is no single alternative for methyl bromide, but asserts that the ban—phased in over a period of seven years—will allow for the development of alternatives. "The cost of finding alternatives is an issue, but not a monumental barrier," Thomas says.

Vets May Be Compensated

U.S. veterans suffering from Persian Gulf syndrome may soon be able to receive disability payments. The Clinton administration has endorsed a bill introduced by Congressman G.V. "Sonny" Montgomery (D-Mississippi) that would authorize payments to afflicted veterans for a three-year period.

"Persian Gulf syndrome" is the name given to an illness of unknown etiology that includes a broad range of symptoms such as diarrhea, muscle aches, and fatigue and affects perhaps thousands of Gulf War veterans (see Focus, p. 747). So far, researchers have not been able to pinpoint the cause of Persian Gulf syndrome, although many suspect chemical and biological warfare agents.

Veterans Affairs Secretary Jesse Brown called the proposal to compensate these veterans "unprecedented" because the government usually requires that payments be based on clearly defined illnesses that can be directly linked to active military service. "We left veterans of Vietnam hanging out there for 10 years," said Montgomery. "We cannot always wait on research."

Objections to the bill have already been raised. Senator John D. Rockefeller IV (D-West Virginia) said in a letter to Brown that the VA already has authority to compensate veterans for any "disability resulting from personal injury suffered or disease contracted in the line of duty." Proponents of the bill say that the VA has refused to invoke this authority.

"We simply have different interpretations," said VA spokesperson Jim Holley. "It is our position that we need legislation to award compensation and that is a firm position."

To qualify for any disability benefits, a veteran has to be examined by the VA and found to be at least 10% disabled by the illness or injury. Montgomery’s bill would set a one-year claim period. Compensation would depend on the extent of disability. According to Brown, a typical payment would be about $166 per month, based on a veteran who is 20% disabled. The annual cost of compensation is estimated at $45 million.

Congressman Lane Evans (D-Illinois) objects to the bill’s three-year limit on benefits. Evans noted that the VA had never offered new benefits to veterans on a short-term basis. Brown said that if the government is unable to define Persian Gulf syndrome by the end of the third year, Congress should extend the benefits.

The United States is not the only country debating the health effects of the Gulf War. The Czechoslovakian military has claimed evidence of chemical discharges during the war. However, Great Britain’s Surgeon General, Sir Peter Beale, said in a letter to the British Medical Journal, “We have no evidence to support the claim that a medical condition exists that is peculiar to those who served in the Gulf conflict.” Whatever the verdict, it is certain, as Brown said, that “The Persian Gulf was a dirty war, environmentally speaking.”

Poland’s Environmental Docs

One of the most important issues that has emerged during recent years in Poland is the shortage of sufficiently trained health professionals to deal with environmental health problems. In 1993, the Polish Ministry of Health and Social Welfare, in conjunction with the WHO European Centre for Environment and Health in Blichoven, launched the Environmental Physician Scheme (EPS) to address this shortage.

The ultimate objective of the EPS is to create a network of environmental physicians that can provide public health facilities, government agencies, and scientific institutes in Poland with expertise on the health effects of pollution. The EPS is centered at the Institute of Occupational Medicine and Environmental Health in Sonnowiec, Upper Silesia, where industrialization and urbanization have led to serious deterioration of the environment.

Recruitment of trainees began in spring 1993. From 102 applicants, 15 were selected to participate in the EPS. Trainees are enrolled in a three-year curriculum which began in January consisting of theory, practice, and individual research. The main body of the course is provided through the Institute of Occupational Medicine and Environmental Health, and lecturers have been invited from research institutes, universities, and government agencies in Poland and the Netherlands.

Courses in environmental health theory form the foundation of the curriculum. The theory portion of the curriculum was developed by Dutch experts on the basis of experience gained through environmental physician training in the Netherlands, where an environmental physician network has been in place for a number of years.

The practical segment is designed to gradually build skills in handling typical environmental health problems. An important aspect of this portion of the curriculum is training abroad. The goal of international training is to familiarize physicians with the methods other countries use to address environmental illnesses as well as to gain knowledge of the organization and legislation of environmental health services around the world.

The third part of training, individual research, is concentrated in the last semesters of the curriculum. The research will be based on practical application and guided by individual mentors. The individual research portion of the program gives trainees an opportunity to produce a doctoral thesis. According to Jerzy A. Sokal, director of the Institute of Occupational Medicine and Environmental Health, the planners of the program are hoping that it will help to establish the environmental