ENVIRONMENTAL TOXICOLOGY

Treaty Takes a POP At the Dirty Dozen

Last month's talks to mitigate global warming may have flopped, but this week brought some consolation to those concerned about the planet's environmental health: the first-ever global agreement to abolish a class of dangerous industrial chemicals. The treaty, finalized by representatives of 122 countries meeting in Johannesburg, South Africa, also spells out a process to determine the next chemicals to be proscribed.

The treaty on persistent organic pollutants, or POPs, as they're known, will ban or phase out 12 long-lived pesticides and other toxic chemicals still used in many developing countries. These chemicals are slow to break down, and they accumulate in body fat. Concern about the toxicity of POPs "goes all the way back to Rachel Carson's" warning about DDT and eggshell thinning in birds, notes reproductive biologist Louis Guillette of the University of Florida, Gainesville. To the relief of some public health experts, the treaty permits one exemption: the limited use of DDT to control malaria, a practice still common in Africa, Latin America, and Asia. Government officials, environmental groups, and malaria researchers who had wrangled over the treaty for 2 years pronounced themselves satisfied with the results.

The POPs treaty was organized by the United Nations Environment Program to address the "dirty dozen" (see table). These substances get carried by global weather patterns to the polar regions, where they've been blamed for a variety of problems in wildlife and people. High levels of polychlorinated biphenyls (PCBs) in the breast milk of Inuit women, for example, have raised concerns about possible immunological and intellectual deficits in children. And according to one controversial theory, trace levels of POPs acting as "endocrine disrupters" may contribute to problems such as lower sperm counts and cancer in the general population.

The United States and most other developed countries banned PCBs and most POP pesticides years ago. However, they're still widely used in places such as India and Latin America. The treaty finalized last week would ban eight of these pesticides immediately. Two industrial byproducts on the list, dioxins and furans, will be reduced right away and eventually eliminated "where feasible," for example, by clamping down on open trash burning. PCBs, used in electrical transformers, will be allowed until 2025 as long as equipment is maintained to prevent leaks. To help developing countries destroy stockpiles and develop alternatives, delegates also agreed to an estimated $150 million annual fund run by the U.N.'s Global Environment Facility. The treaty will be signed in May in Stockholm and goes into effect once 50 countries have ratified it.

Reprieve. Treaty allows use of DDT to control malaria.

Ironically, the new treaty makes an exception for the most well-known and infamous of the "dirty dozen": DDT. After intense pressure from a group of malaria experts, who argued that there was no effective substitute, the convention decided to allow the limited use of DDT for mosquito control. Roger Bates of Africa Fighting Malaria, a loose coalition of DDT supporters in South Africa, says that banning DDT now would be like "crossing a street with heavy traffic to avoid a crack in the pavement." His group gained support earlier this year from the World Health Organization.

Despite that exemption, Bates says the treaty "is not 100% wonderful." Its tone may embolden donor agencies to pressure developing countries to abandon DDT, he says, adding that it is already more difficult to come by. Under the treaty, countries must also report their DDT use in a special register, raising its cost and revealing its users. "All the green groups in the world are going to know who is using DDT and where," he says.

Another major sticking point were the rules for adding chemicals to the list. European countries and environmentalists argued for incorporation of the "precautionary approach," which says that it may be necessary to take action against an environmental threat even when the scientific evidence is incomplete. But U.S. officials and the chemical industry worried that such an approach would ignore risk analysis, which bans chemicals only if enough data show that they're dangerous.

In the end, delegates compromised by explaining that precaution would be "an integral part of—and not separate from—the overall scientific process," according to a statement from U.S. State Department negotiator Brooks Yeager. According to Kip Howlett of the American Chemistry Council, which represents chemical manufacturers, a key step was to reference a definition agreed on at the 1992 Rio Earth Summit, which requires cost-benefit analysis. The rules preclude a ban based on persistence and bioaccumulation alone, Howlett says, an approach that is gaining ground in Europe (*Science*, 1 December, p. 1663).

That interpretation will be put to the test in analyzing the next round of chemicals. Scientists say that there are a number of obvious candidates, such as the pesticide dicophol and perfluorooctane sulfonate. The latter was used in Scotchgard fabric protector products until 3M pulled them off the market in May even without evidence of harmful effects in people. Another category is fire retardants containing brominated compounds that are similar to PCBs. Some animal studies have shown that they affect the thyroid hormone, but "data are really limited," says Linda Birnbaum, a dioxin toxicologist at the U.S. Environmental Protection Agency. However, concentrations have been rising for two decades in women's breast milk in Sweden, and more recent data from a New York State study not yet released will show "levels that are really high," Birnbaum says.

If the POPs treaty can finger such poisons and lower their concentrations, it may rank with efforts to curb ozone-destroying fluorocarbons as a major environmental health triumph. Like those pollutants, POPs "have consequences in parts of the globe far from where they're released," Guillette says. "The treaty is arguing the same kind of thing: Somebody has to take responsibility."

–JOCELYN KAISER AND MARTIN ENSERINK

Status of POPs in Six Countries

	U.S.A.	China	India	Mexico	U.K.	Canada
DDT	Banned	Severely restricted	Severely restricted	Severely restricted	Banned	No registered uses
Aldrin	Banned	Not banned	Not banned	Banned	Banned	No registered uses
Dieldrin	Banned	Not banned	Severely restricted	Banned	Banned	No registered uses
Endrin	Banned	Not banned	No registered uses	Banned	Banned	No registered uses
Chlordane	Severely restricted	Severely restricted	Not banned	Not banned	Banned	No registered uses
Heptachlor	Severely restricted	Not banned	Not banned	No registered uses	Banned	No registered uses
Hexachlorobenzene	Banned				Banned	No registered uses
Mirex	Banned	Severely restricted		Severely restricted		Banned
Toxaphene	Banned	Not banned	Banned	Banned	Banned	No registered uses
Dioxins/Furans	BP	BP	BP	BP	BP	BP
PCBs	Banned			Not banned	Severely restricted	Severely restricted

Banned · Severely restricted · No registered uses · Not banned · BP Still produced as byproduct

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