

ENVIRONMENT

Endosulfan's Exit: U.S. EPA Pesticide Review Leads to a Ban

After a lengthy scientific review, the United States last week decided to ban the use of endosulfan, an inexpensive organochlorine pesticide that builds up in the environment. The U.S. Environmental Protection Agency (EPA) ruled that the compound—which has a variety of uses from Florida's tomato crops to California's cotton—should be phased out on a schedule to be negotiated with the manufacturer. More than 60 other countries have already opted for a ban; the holdouts—including India and China—argue that the pesticide should continue to be permitted where farmers cannot afford substitutes.

EPA concluded that endosulfan poses a hazard to both wildlife and humans, citing evidence of fish deaths downstream from treated areas and indications of neurodegenerative impacts in animals, with implications for humans, particularly farm workers. Among recent data cited by EPA is a study published online earlier this year in *Ecotoxicology* showing that fish at lower trophic levels in the Everglades may retain endosulfan in tissues and pass it on to wading birds that feed on them. (Compounds that collect in tissues and are passed to predators up the food chain are said to “bioaccumulate.”) Previous studies have detected low levels of endosulfan in Arctic animals' tissues, a key indicator of bioaccumulation. Other studies have found traces of endosulfan in human breast milk.

The current EPA review began after Bayer, endosulfan's patent holder and original maker, received permission to reregister the product in 2002, with a request for updated toxicity data from EPA. Bayer's test results, submitted in 2006, showed evidence of developmental neurotoxicity in rats and toxicity at low levels in the fetuses of pregnant rats; the agency subsequently opened its review for the withdrawal of certain uses. The next year, Bayer stopped selling endosulfan in the United States and pledged to stop selling it internationally by the end of this year. The only remaining U.S.-registered endosulfan maker today is Makhteshim Agan, an Israeli manufacturer



Exposed. A review by EPA found potential health risks for farm workers coming in contact with endosulfan.

with a branch in North Carolina.

Starting in 2007, EPA gathered public comment on endosulfan's ecotoxicological impacts and on potential economic impacts on U.S. farmers if the pesticide were banned. Last week, EPA announced that it will seek a voluntary phaseout with Makhteshim Agan.

The EPA decision seems to have already had repercussions abroad. The Australian Pesticides and Veterinary Medicines Authority, which allows some restricted uses of endosulfan, issued a statement last week saying that it does not know of any human health impacts in Australia. But the agency says it is in contact with EPA and other Australian authorities to see if it, too, should take further action on endosulfan.

Some advocates of a global ban are pushing for controls through the Stockholm Convention, which restricts the use of long-lived compounds. Endosulfan is similar in some ways to the “Dirty Dozen” persistent organic pollutants (POPs)—including chlordane and dieldrin—that were restricted when the convention went into force in 2004. Last year, the convention's scientific advisory group, the POPs Review Committee (POPRC), recommended that endosulfan be considered a POP under the treaty's definition—but they encountered dissent.

India's representative at last year's annual

meeting of POPRC argued that endosulfan is not toxic to humans or the environment at levels currently detected. India also questioned whether Indian users were the source of “long-range transport.”

Although research shows unquestionably that endosulfan travels far afield, questions do remain over whether the bioaccumulated levels in animals are high enough to be toxic, says Bert Volger of Ceres International LLC, who represented Makhteshim Agan as an observer at the 2009 POPRC meeting. The company disagrees with EPA's scientific assessment but said in a press release last week that, given the high cost of challenging EPA's decision, it will cooperate with the proposed U.S. phaseout.

When POPRC holds its next meeting in October to consider the socioeconomic impacts of restricting endosulfan use, India is expected to make the argument that a ban would harm poor farmers. (The Indian government owns the country's main producer of endosulfan, Hindustan Insecticides Ltd.) Environmental groups say China, another major endosulfan manufacturer and user, is likely to support India's position.

EPA considered economic impacts alongside environmental ones when it evaluated a ban in the United States. It concluded that a switch to safer replacements would not harm farmers' bottom lines. Alternatives like the insect-attacking bacterium *Bacillus thuringiensis* and a family of synthesized plant compounds known as pyrethroids are less toxic to humans. Many farmers in China have already made the switch to these substitutes, according to a report to the Stockholm Convention from two observing environmental activist groups, Pesticide Action Network International and the International POPs Elimination Network (IPEN). Still, China may not be ready to list endosulfan under the Stockholm Convention, according to Joe DiGangi of IPEN.

DiGangi, who has been monitoring the POPRC conversations, says IPEN has pushed these alternatives for India as well. He argues that EPA's decision could influence policies abroad in a couple of ways. DiGangi says it will add new studies to the toxicity data available to decision-makers, and it could persuade other countries that “a Stockholm Convention listing is on the horizon.” The impact on endosulfan manufacturers such as India will be limited, however, he says: “The U.S. ban will not affect the Indian industry economically,” for example, but it will make the defense of endosulfan “even more difficult.”

—NAOMI LUBICK

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