

RACHEL CARSON COUNCIL, INC.

An Association for the Integrity of the Environment



Rachel Carson
Photograph by Erich Hartmann
Magnum Photos

DDT, Political Pesticide

by Dr. Diana Post, Rachel Carson Council, Inc.

In 1962 even before *Silent Spring* first appeared in print, the book and Rachel Carson were repeatedly attacked by chemical companies and their supporters. Attacks continue today - possibly from different sources than those of 45 years ago.

We are responding to recent statements from several Rachel Carson detractors whose accusations, concerning DDT and malaria, have received wide distribution in the press. We are addressing DDT's human health effects, only, not the chemical's various modes of action, overall toxic profile, its extended life time (spanning generations) nor its considerable hazard to wildlife and the environment. Based on our previous reports and other writing we find that there are significant potential dangers associated with use of DDT. These hazards include direct health effects in people, indirect health effects through loss of ecosystem services due to wildlife damage and its migration and persistence in the environment making its use, even temporarily, highly questionable (please see Footnote #1 at end for sources of additional information).

Some of the unfounded accusations appearing in the mainstream media include: blaming Rachel Carson for DDT's worldwide ban and citing the DDT ban as responsible for malaria related fatalities in Africa (Farenthold, D. A., "An Environmental Icon's Unseen Fortitude," *The Washington Post*, 5-18-07). Both claims are inaccurate.

First, on the issue of a worldwide DDT ban and Carson's responsibility for it: There never has been an outright ban on DDT for use in mosquito control, particularly in Africa. Also Rachel Carson died in 1964 before the USEPA existed and as far as we know there is no evidence that she advocated the complete banning of DDT.

Second, on lack of DDT use as the sole cause of high malaria deaths: The decline in DDT use, when it occurred in parts of the developing world, has resulted from decisions involving health strategies, emergence of drug/insecticide resistance, economics, preferences by the local populations and other issues.

Further, other effective means of reducing malaria do indeed exist.

In Managua, Nicaragua biological mosquito controls and an educational program were used to lower the malaria rate below that achieved when a chemical insecticide (not DDT) was used. ("Zapping mosquitoes with biopesticides," *Pesticides News*, 54, Dec. 2001).

In Oaxaca, Mexico a program reduced malaria by 30% through incorporating the following elements: early identification and treatment of malaria cases, personal and household hygiene improvements, use of bed nets, painting calcium hydroxide (a mosquito repellent) on house walls, eliminating mosquito breeding sites, using fish to control mosquito larvae, etc ("DDT - the Mexican alternative," *Pesticides News*, 76, June 2007).

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Trends in Malaria Control/Brief Review

In the 1950s the Global Malaria Eradication Program using DDT was launched and pursued up until 1969, when World Health Organization (WHO) officials abandoned the eradication effort in favor of using drug therapy against the parasite. Through the 1970s and 80s on the advice of the World Health Organization most countries changed from insecticide applications for mosquitoes to treating people with chloroquine, a drug that acts against the malaria parasite. Data from Dr. Robert Snow "head of the malaria group at the Wellcome Trust/Kenya Medical Research Institute in Nairobi," indicates that malaria deaths in Africa declined from 18% before 1960 to 12% between 1960 and 1989, while chloroquine was effective. During the 1990s the malaria parasite developed resistance to chloroquine and although bed nets were added to malaria control in Africa, malaria-related deaths increased to 30% (Weir, Kirsten, "Rachel Carson's birthday bashing," www.salon.com/news/feature/2007/06/29/rachel_carson/). The problem of malaria is complex due to the need to control the mosquito carrier, and the Plasmodium parasite as well as to give support to the general health status of very young children, the population most vulnerable to the disease in sub-Saharan Africa.

DDT Availability and The Stockholm Convention

The Stockholm Convention aka the Persistent Organic Pollutants (POPS) Treaty, an international agreement is administered by the World Health Organization. It calls for persistent organic pollutants (DDT and others) to be phased out world-wide. DDT, however, has been given a special status and is allowed for use indoors for malaria control where countries request it. It has not been phased out, yet. And since the POPS Treaty was signed in 2001, the amount of DDT in use world-wide has doubled. At a recent conference in Senegal, however, Dr. Neira of the WHO stated that in accordance with the POPS Treaty, reliance on DDT would be reduced and eventually eliminated and that the WHO is concerned about the health consequences of DDT use ("DDT use doubles - WHO supports phase out under POPS treaty," *Pesticides News* #76, June 2007).

Cost of DDT Use

DDT advocates promote the chemical's low price tag for mosquito control. However, the health costs resulting from the predicted hazardous side effects in people, the costs required for adequately monitoring its use to make certain that diversion to agriculture does not take place, and the costs to wildlife resources from drift/contamination, or diversion to agriculture use as well as disposal of unused chemical, if all were to be counted, could add significantly to the overall price tag associated with DDT use. In addition, crops grown for export could lose market share if found to be contaminated with DDT at higher than background levels.

RCC Comment:

To imply as do the latest batch of Carson detractors, that malaria can be solved with DDT applications - while at the same time overlooking the chemical's downside - is to oversell its capacity. These people uniformly fail to discuss or even acknowledge the currently available information on adverse effects of DDT.

Were she alive today, we cannot know with certainty how Rachel Carson might view the present use of DDT against malaria in Africa (in light of DDT's serious side effects and proposed eventual phase-out). What we can point to, unequivocally, with respect to this insecticide, would be her insistence on full disclosure of the chemical's potential side effects in people. We believe, moreover, she would want this information to be available both to decision makers and to those individuals directly impacted by the chemical's application. She would also, no doubt, want information on alternative methods of mosquito control to be available.

John Tierney, a recent detractor writing in *The New York Times*, stated that studies have “failed to **prove** [DDT’s] harm to humans” (Tierney, J., “Fateful voice of a generation still drowns out real science,” *The NYT*, June 5, 2007) (see Footnote #2 at end for discussion of “**prove**”). In their publication, *Recognition and Management of Pesticide Poisoning*, Drs. Reigart and Roberts have identified symptoms of DDT poisoning in people. They are listed below in the section, “DDT and Adverse Effects.”

DDT and Cancer

In the June 5, 2007 article Mr. Tierney also opined: “DDT became taboo even though there wasn’t evidence that it was carcinogenic...” As stated in *Silent Spring*: An expert on environmental cancer, Dr. Hueper, gave “DDT the definite rating of a chemical carcinogen.” Laboratory studies **proving** (in the scientific/medical sense - see Footnote #2) the carcinogenicity of DDT and its transformation products, DDD and DDE have taken place in rodents. Tumors of the liver, lung, and thyroid were found to be caused by one or more of these chemicals in rats and/or mice. Now DDT is classified as a probable human carcinogen by the US Environmental Protection Agency (USEPA).

Based on epidemiological studies the National Cancer Institute (NCI) has found associations between DDT and increased leukemia, lymphoma, pancreatic cancer and lung cancer in people. (Post, D., “Looking at DDT 30 Years after the U.S. Ban” 2002) An association between a higher rate of human liver cancer and DDT has been found recently in China.

Pesticides and Cancer

In attempting to further discredit Rachel Carson, John Tierney stated “the cancer death rate was falling in the decade before “*Silent Spring*” and it kept falling in the rest of the century” (Tierney, J., “Fateful voice of a generation still drowns out real science,” *The NYT*, June 5, 2007). This, however, is a misleading statistic. Death rates can indicate the response to treatment of cancer, not the rate at which cancers develop, aka their incidence rates. The death rates for certain cancers could be declining due to better modes of treatment even while their incidence rates could be increasing. The associations between pesticides and human cancers are well established. For example, childhood cancers (leukemia, lymphoma, brain tumor, neuroblastoma, Wilm’s tumor and Ewing’s sarcoma) have been associated with pesticide exposure. “Moreover, the International Agency for Research on Cancer (IARC) [which uses controlled epidemiological studies in determining cancer risks from pesticides] considers the “spraying and application of non-arsenical insecticides entailing exposures” to be, as a whole, probably carcinogenic in humans.” (Menegaux, F., et al, “Household exposure to pesticides and risk of childhood acute leukemia,” *Occup Environ Med*, 63, pp131-134, 2006). (For additional data see RCC’s “Cancer and Pesticides 2001”).

DDT and Adverse Effects

Associations between DDT and adverse effects in people have been published in the scientific literature. These include: “sensory disturbances ... headache, dizziness, nausea, vomiting, incoordination, mental confusion and [in more serious cases], seizures (Reigert, J. R., & Roberts, J. R., *Recognition and Management of Pesticide Poisoning*, USEPA, 5th ED, 1999).

Additional examples of adverse effects in people taken from the scientific literature are: Developmental neurological delays due to early DDT exposure; Impaired semen quality associated with environmental DDT exposure in young men living in a malaria area in the Limpopo Province, South Africa; Reduced immune function in DDT workers; Increases in sugar diabetes associated with DDT body burdens; Increased numbers of low birth weight babies, as well as significant shortening of the lactation cycle - time that human mothers can produce milk for their babies, linked to DDT exposure.

Based on reports for both premature births and reduced lactation cycles, scientists have predicted that regular DDT exposure could increase the possibility of higher levels of infant mortality for women in Africa who live in treated environments (Karaim, Reed, "Not So Fast with the DDT" *The American Scholar*, Summer 2005).

RCC Comment:

The possible risks to pregnant women and other individuals from continuous exposure to DDT, should be communicated to decision makers in Africa and to program participants. The costs in terms of environmental damage from contamination especially if there is diversion to agriculture of DDT intended for use in malaria programs and the consequences of environmental contamination and/or high levels of DDT in export crops that might result in their losing market share should also be communicated to residents of treatment areas. Reliance on DDT should be replaced by malaria control programs adopting an "Integrated Vector Management approach that combines engagement with local communities; knowledge of local factors that influence disease transmission; and use of a range of interventions..." (Dr. Lucien Manga in "DDT use doubles - WHO supports phase out under POPS treaty," *Pesticides News*, #76, June 20, 2007)

References available from RCC on request - July 30, 2007

Footnote 1

For general background information see: "DDT 30 Years After the Ban," (RCC. For information on DDT wildlife toxicity please see: "Pesticides" by D. R. Nemmo & L. C. McEwen in *Handbook of Ecotoxicology* (in two volumes) P. Calow editor, 1994, Blackwell Scientific, contact RCC for additional references.

Footnote 2:

Tierney's use of the term "prove" in a medical/scientific context not familiar to most of the public is quite misleading and it introduces a level of evidence not required to establish that DDT can be hazardous to human health. Proving harm to people would most likely require using the most vulnerable subjects in experiments and administering toxic doses of DDT to them over time. Deliberately subjecting pregnant women and very young children to high levels of DDT would not be considered acceptable by most people. What is acceptable in showing a pesticide's hazard to humans is evidence from human epidemiologic studies of pesticide toxicity that finds "an association between the pesticide and the toxic effect" or that the results "support the hypothesis" on which the study is based. By Mr. Tierney's standards, no doubt some could still argue that smoking cigarettes has not been proven to cause cancer in people.