

PROBLEMS IN DETERMINING IF A COMMONLY USED HERBICIDE (2,4,5-T) HAS AN EFFECT ON HUMAN HEALTH

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One has to be reminded occasionally that the roots of statistics lie in problems of inference, especially in the study of efficient and useful experimental designs from which conclusions can be drawn. I start with this reminder because many of the observations and conclusions concerning the effects of pollutants derive from experiments which "happened" more than they were designed and which "presented" their data rather than analyzed them. However, there is yet one other reason for this reminder. Problems of inference raised by studies on pollution seem to show that what is needed is not so much a study of the design of experiments but a study of the strategies of acquiring and analyzing wide ranges of observations and that the end products are not simple inferences about "states of nature" but formulations of "public policies."

Keeping these reminders in mind, we shall next turn to a review of the issues and problems surrounding the question if a commonly used herbicide, 2,4,5-T, has effects that are of concern to the large community of this country.

1. 2,4,5-T is a general pollutant

The widespread (albeit inadvertent) consequences of present practices to control animal and plant pests by use of chemical agents have been recognized only recently as a general pollution problem. In view of the known toxicity of many of the agents, industrial physicians and engineers have been concerned with the manufacture and distribution of these toxic materials and with instituting proper warning procedures so as to avoid what has been commonly called "accidents." It is recognized now that while herbicides and pesticides are designed to affect only a specific target species, their indiscriminate and widespread use creates very general pollution problems. First, all herbicides and pesticides have inadvertent effects on nontarget species. The toxic agent may be extremely widely spread by wind and water to places where it was never intended to show up. For instance, 2,4,5-T applied as a spray can be transported in the atmosphere as a drop of spray, as a gaseous state of 2,4,5-T, or adsorbed on dust or other particulate matters in the air. In this way 2,4,5-T was found adsorbed on dust in a trace of rain in Cincinnati, Ohio, presumably from applications in Texas [32].