

Critical Evaluation of Cancer Risk from 2,4-D

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Chemical Name: (2,4-dichlorophenoxy)-acetic acid (Chemical Abstract Name)

CAS Registry Number: 94-75-7

Related Compound: 2,4,5-trichlorophenoxyacetic acid (2,4,5-T)

Chemical Structure:

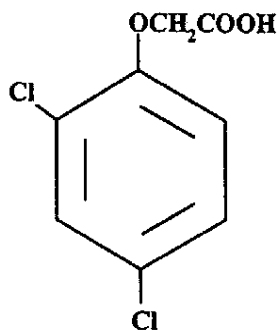


Fig. 1. Molecular structure of 2,4-D. (From Meister 1997).

I. Introduction

2,4-D [(2,4-dichlorophenoxy)-acetic acid] is a widely used postemergent herbicide. It is structurally similar to indoleacetic acid (IAA), a naturally occurring plant hormone (see Fig. 1). This similarity allows 2,4-D to mimic IAA and is the basis for its herbicidal action. The synthesis of 2,4-D was first reported in 1941 (IARC 1986). In 1945, Dow Chemical Co. discovered that a 1:1 mixture of 2,4-D and 2,4,5-T [(2,4,5-trichlorophenoxy)-acetic acid] was a more effective herbicide than either of the two chemicals alone. The mixture was widely used thereafter and referred to as Agent Orange (Lilienfeld and Gallo 1989). Exposure to 2,4-D in the past may have more often been to a mixture of herbicides rather than 2,4-D alone. 2,4-D preparations before 1975 were often contaminated with TCDD (2,3,7,8-tetrachlorodibenzo-*p*-dioxin) (IARC 1986; Johnson et al. 1992).