UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

September 19, 1980

OFFICE OF TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Advisory Opinion on Carbaryl

FROM: Dr. H. Wade Fowler, Jr.
Executive Secretary
FIFRA Scientific Advisory Panel (TS-766)

H. Wade Fowler Jr

TO: Deputy Assistant Administrator
for Pesticide Programs (TS-766)

A Special Subcommittee of the FIFRA Scientific Advisory Panel convened on July 23, 1980, to review scientific findings by the Agency on carbaryl. The Panel completed their assigned task in an open meeting held in Arlington, Virginia, on the same day.

Attached is a report of findings by the Panel.

Attachment
Report

cc: Mr. Conlon
Dr. McGrath
Ms. Marcia Williams
Dr. Gandhi

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT (FIFRA)

SCIENTIFIC ADVISORY PANEL

Subcommittee on Carbaryl

ADVISORY OPINION ON CARBARYL

In response to a request by the Agency, the FIFRA Scientific Advisory Panel convened a special subcommittee to review scientific findings by the Agency on carbaryl. The subcommittee completed this assigned task in an open meeting held in Arlington, Virginia, on July 27, 1980. The meeting was announced in the Federal Register on July 17, 1980. In addition, telephonic messages and special mailings were sent to members of the public who had previously expressed a desire to be informed of activities of the Panel.

Written and oral statements were received from technical staff and representatives of the Environmental Protection Agency; and from representatives of the Agricultural Products Company, Inc. of Union Carbide.

STATEMENT OF ISSUES AND DISCUSSION TOPICS

In a special letter to the Panel, the Agency stated that the briefing on carbaryl would be primarily informational with attention focused on several areas of special concern to the Agency. The following specific questions were presented to the Panel:

1. Are the oncogenicity studies adequate to allow decision-makers to determine with high confidence whether or not an oncogenicity problem exists?

2. How would the Panel interpret and apply the results of the viral enhancement studies in determining human risk? Would these data provide supplemental information to the onco, muta, or terata risk areas?

3. How would the Panel qualitatively rank the human teratogenic and mutagenic risk potential of carbaryl compared with other RPAR chemicals and known human teratogens/mutagens?

SUBCOMMITTEE REPORT

In consideration of all matters brought out during the meeting and careful review of all documents submitted by the Agency, the sub-committee, except where specifically noted, unanimously submits the following report:

Carbaryl is probably the most widely applied insecticide in the United States and is used on many agricultural crops, forest, ornamentals, home gardens, livestock, and pets. There is therefore widespread human exposure. The Panel carefully examined data presented by EPA indicating potential adverse human health effects that might result from such exposure. It is clear that carbaryl possesses weak mutagenic activity in some bacterial and mammalian cell test systems. Carbaryl showed teratogenic action in one mammalian species studied.

From consideration of the toxicological data presented, the Scientific Advisory Panel has the following recommendations relative to carbaryl:

Oncogenicity - The Panel does not recommend that additonal oncogenicity studies be performed. The Panel is of the opinion that current data are adequate to indicate that carbaryl is not carcinogenic.

Mutagenicity - The data indicate that carbaryl is a weak mutagen in some bacterial and mammalian test systems. Further evaluation of mutagenicity is not recommended. The Scientific Advisory Panel believes that additional testing would only reinforce the finding that carbaryl is a weak mutagen and would thus be an unnecessary expenditure of resources.

Teratogenicity - Two independent studies with beagle dogs showed carbaryl to be teratogenic with a NOEL somewhere about 2-3 mg/kg/day. However, the raw data from these two studies was not available to the Panel for verification of the conclusions. Teratological studies in other species of laboratory animals were negative. In view of the diversified types of terata found in the beagle dog studies at relatively low levels of exposure, the Panel recommends an additional teratogenic study be performed with this species.

Sperm Abnormalities - The Panel recommends followup studies of the reported changes in human sperm morphology in workers involved in carbaryl manufacture. The Scientific Advisory Panel appreciates the difficulty in performing such a study. However, the effort should be made. In addition, the Panel recommends a study be carried out examining the effect of varying doses of carbaryl on testicular morphology and the development and morphology of sperm in an appropriate rodent species.

Reproductive Toxicity - The Panel believes sufficient studies of the reproductive toxicity of carbaryl have been conducted. The current data do not suggest reproductive toxicity in experimental animals exposed to carbaryl.

Viral Enhancement - The Scientific Advisory Panel believes the carbaryl mediated enhancement of viral replication noted in tissue culture is an interesting observation. The Panel believes this observation should be pursued with other strains of virus and in an *in vivo* model. The Panel is of the opinion the current data does not dictate a regulatory action on the part of the Agency.

Epidemiology - The Scientific Advisory Panel does not believe additional epidemiology studies of the type previously conducted would add materially to the information concerning the potential toxicity to man of carbaryl.

Wildlife Studies - The Panel requests the opportunity to review studies of the effect of carbaryl on wild rodent populations if, in fact, such studies have been conducted. If appropriate studies have not been conducted, then the Scientific Advisory Panel would recommend that such studies be performed.

Exposure Data - The Panel urges that proper experiments be done to determine the rate of absorption of various preparations of carbaryl through human skin.

Label Changes[1] - In view of the clearly defined teratogenic effects shown by carbaryl at relatively low dosages when fed to beagle dogs in two independent studies, EPA should consider the following label change for carbaryl:

> "Women of childbearing age should not be involved in the mixing, loading or application of carbaryl. Exposure to carbaryl during pregnancy should be avoided".

FOR THE CHAIRMAN:

Certified as an accurate Report of Findings:

H. Wade Fowler, Jr.

H. Wade Fowler, Jr., Ph.D.
Executive Secretary
FIFRA Scientific Advisory Panel

Date: September 19, 1980

1. Note: This statement and recommendation was adopted by a majority of the membership.