UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE 26 February 1981

SUBJECT Classification of Dyfonate Granular Insecticide

FROM Richard Balcomb, Ecological Effects Branch RB

TO William Miller, PM (16), Registration Division

THRU: Harry Craven, Section Head #4, EEB

THRU: Clayton Bushong, Chief, Ecological Effects Branch

I. Submitted Studies

The following studies were received and reviewed by EEB:

(1) A simulated field study on the effect of band-incorporated Dyfonate 20-G on bobwhite quail (T-10456)

(2) A simulated field study on the effect of Dyfonate 20-G and 10-G on bobwhite quail (T-10126)

These tests meet or exceed EPA guidelines requirements for simulated field studies(Attachment).

II. Relevance of studies to classification based on potential avian hazards

(1) The submitted studies demonstrate that non-incorporated granules will be consumed by bobwhite and result in fatalities (#2 above - T-10126). Given the severity of the test exposure (i.e. confinement to treatment areas) the real threat to this species is considered marginal.

Trials that included granule incorporation did not result in bobwhite mortality or other measurable effects (#1 above - T-10456).

(2) Agency biologists believe that the birds most likely to be impacted by granular pesticides are songbirds (order Passeriformes). Recent field investigations (Balcomb et al, manuscript in preparation) document this hazard for granular carbofuran. Species feeding habits and bird body weight appear to be important in determining the extent of potential hazards.

The submitted studies do not bear on the question of potential effects to songbirds. The Agency is continuing its research in this area.

(3) The FIFRA Scientific Advisory Panel rejected the Agency's most recent proposal (March 5, 1980) that granular insecticides (including Dyfonate 10 and 20-G) be classified restricted based on avian hazards. The Panel acknowledged the potential risks outlined by EPA but called for more definitive work on avian hazards as they relate to methods of incorporation (transcript of proceedings - Acme Reporting Company).

Richard Balcom

Study Summary

Title: A Simulated Field Study of the Effect of Dyfonate 10-G and Dyfonate 20-G on Bobwhite

Author: Gary M. Booth et al. 1980. Brigham Young University.

Accession Number: 243582

Study Design:
- -27 pens (10ftx50ft) were constructed in a corn field (9 control pens and 9 pens in each treatment group).
- -8 mated pairs of bobwhite were maintained in each pen (total=432birds: 144 controls and 144 in each treatment). Birds were 16-weeks old.
- -Dyfonate 10-G and 20-G were broadcast at the rate of 4 lbs a.i./acre. (birds present)
- -Water was available ad libitum. 20 grams of feed were scattered per bird per day.
- -Study duration was 28 days

Parameters Analyzed: mortality, behavior, body weight, crop weight, fat weight, AChE activity and histopathology

Results:
- -Dyfonate 10-G did not cause significant mortality. Dyfonate 20-G caused significant mortality (7.5%), principally to females.
- -Dyfonate 10-G did not inhibit weight gain but the 20-G did.
- -Brain AChE was reduced 23% in the 10-G birds and 34% in the 20-G birds.
- -Unspecified "behavioral effects" were noted in treatment birds during the first 8-days.
- -Histopathology revealed no lesions related to the pesticide.

Validation Category: acceptable

Richard Balcom

Study Summary

Title: A Simulated Field Study of the Effect of Band-Incorporated Dyfonate 20G on Bobwhite Quail

Author: Gary M. Booth et al. 1980. Brigham Young University.

Accession Number: 243582

Study Design: -18 pens (20ftx40ft) were constructed in a corn field

-8 mated pairs of bobwhite were maintained in each pen (total=288birds: 144 controls and 144 treatment). Birds were 20-weeks old.

-Dyfonate 20-G was applied at 5 lbs/acre by a John Deere Max-emerge planter. The planter was raised in each pen area to permit a row-end spill simulation.

-Water was available ad libitum. 20 grams of feed were scattered per bird per day.

-Study duration was 28 days

Parameters Analyzed: mortality, behavior, body weight, crop weight, fat weight, brain weight and AChE activity

Results: Three control males died (4.2%) while no mortality occurred amoung treated males. Seven control females died (9.7%) as opposed to 11 in the treated groups (15.3%). Differences were not statistically significant.
The only statistically different parameter between treatment and controls was in brain weight (treatment 0.98634 g vs. 0.96489 g controls).
Researcher concluded that the pesticide did "not cause significant harm to bobwhite quail".

Validation Category: acceptable

III. Conclusions

The Ecological Effects Branch recommends that granular formulations of Dyfonate remain unclassified pending completion of ongoing Agency investigations.