

**FILE COPY**

Date Out EFB: **MAY 28 1980**

To: Product Manager Garner (23)  
TS-767

Through: Dr. Gunter Zweig, Chief  
Environmental Fate Branch

From: Review Section No. 1  
Environmental Fate Branch

*Garner*  
*M*

Attached please find the environmental fate review of:

Reg./File No.: 239-2247, 9F2265

Chemical: diquat dibromide (6,7-dihydrodipyrido (1,2-a:2', 1'-c)  
pyrazinedium dibromide

Type Product: Herbicide

Product Name: Diquat 2 Spray

Company Name: Chevron Chemical Company

Submission Purpose: Scientific Review

Potato Use

EFB# 272 Action Code 60

ZBB Code: Sec. 3

Date in: 10/3/79

Date Completed MAY 28 1980

Referrals To:

\_\_\_\_\_ Ecological Effects Branch

\_\_\_\_\_ Residue Chemistry Branch

\_\_\_\_\_ Toxicology Branch

1.0 Introduction

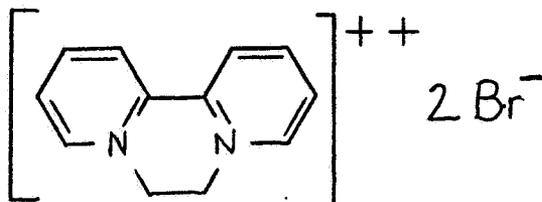
1.1 Common name: Diquat 2 Spray

1.2 Active Ingredient: Diquat dibromide [6,7-dihydrodipyrido-(1,2-a:2',1'-c) pyrazinediium dibromide] 35.3%

Inert Ingredients: 64.7%

The <sup>product</sup> following contains 2 lbs Diquat cation per gallon as 3.73 lbs salt per gallon.

1.3 Chemical Structure:



1.4 Reason for submission: Label Amendment to add claim for preharvest desiccation of potato vines.

1.5 The product is registered for use on sugarcane and aquatic weeds.

2.0 Directions for use:

The following directions for desiccation of potatoe vines will be added to the label:

Potatoes: For Desiccation of potato plants to facilitate harvest: Apply 1 pt. Diquat 2 Spray per acre (1/4 lb ai/acre) in 50 to 100 gallons of water with ground equipment or in 5 to 10 gallons with aerial equipment. Make a second application if necessary to obtain adequate desiccation where vine growth is dense. Allow a minimum of 5 days between applications. Do not apply to drought stressed potatoes. Application should be made at least 7 days before harvest. Add Orth X-77 spreader (non-ionic) at 8 to 16 fl. oz. per 100 gallons of spray mix.

3.0 Discussion of Data:

3.1 Rotational Crop Study

Leahey, J.P. and P.K. Carpenter, Diquat: Uptake of diquat and its photoproducts from soil by rotational crops. Page 322 of Acc. No. 231428

## Procedure:

Nine mature potato plants were grown to maturity and sprayed at a rate of 0.7 lbs/acre. Plants were kept in the sunlight, under a polythene shelter for three weeks. The polythene protects the plants from rain, but allows the transmission of the u.v. radiation in sunlight. At the end of three weeks, the haulm was collected and ground to be a fine powder (230g). A subsample (10g) was kept for analysis and the remainder used for the rotational crop study. The powdered haulm was incorporated into the top 15 cms of a sand loam soil (7% clay, 18% silt, 75% sand) in a wooden box and four 23 cm diameter pots.

One week after the haulm had been incorporated winter wheat seeds (Bouquet) and two spring cabbage seedlings were planted in the box. Ninety days after incorporation the four pots were transferred to a heated glass house and potatoes were planted in two pots and carrots were sown in the other two pots. The plants were grown to maturity.

## Analytical:

A sample of the potato haulm was extracted by refluxing with hydrochloric acid for two hours. The extract was filtered and the residue extracted twice more the same way. This procedure extracted 87% of the radioactivity in the haulm. This extract was analyzed by paper chromatography and autoradiography.

Samples of soil, cabbage, wheat, potatoes, carrots were dried, ground into a powder and duplicate subsamples of the powder were combusted and counted. Background for all the crops were obtained by combusting 1g samples of the same crop which had been grown in untreated soil.

## Results:

In all cases the total residue present in the edible part of the crop was 3 ppb or less. See Table 3.

Bands corresponding to Diquat and TOPPS (1, 2, 3, 4 - tetra - hydro-1-oxo-pyrido (1, 2-a) -5-pyranzinium salt were visible on the chromatograph of the extracted potato haulm. Reverse isotope dilution analysis showed that 26% of the radioactivity in the extract was due to diquat and 6% to TOPPS.

Note: Isotope dilution of the plant extracts shows that the other known photoproducts of diquat: Monopyridone of diquat, dipyridone of diquat; monopyridone of TOPPS; picolinic acid and picolinamide are not found to any significant extent on the plant. Chromatography of the extracts indicates that most of the photoproducts formed are strongly associated with brown material extracted from the plant forming a complex mixture. (Reference: Leakey J.P., Griggs R.E. and All and GB, AR 2478B (1973) Page 105 of Acc. No. 231428)

4.0 Conclusions

4.1 The submitted rotational crop study is acceptable. Data used in this evaluation are in previous EFB reviews.

5.0 Recommendation:

5.1 Diquat 2 Spray is registered on sugarcane and aquatic weeds.

5.2 An acceptable rotational crop study has been submitted.

5.3 EFB concurs with the issuance of a conditional registration of Diquat 2 Spray as a potato desiccant without a rotational crop restriction.

*Lilla Garner for  
John Harris*