

US EPA ARCHIVE DOCUMENT

EEE BRANCH REVIEW

DATE: IN _____ OUT _____ IN 12/16/75 OUT 1/8/76 IN _____ OUT _____
FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 100-EUP
PETITION OR EXP. PERMIT NO. 661708
DATE DIV. RECEIVED 11/25/76
DATE OF SUBMISSION 11/13/76 (?)
DATE SUBMISSION ACCEPTED _____
TYPE PRODUCT(S): I, D, (H) F, N, R, S _____
PRODUCT MGR. NO. SRS
PRODUCT NAME(S) Dual GEC
COMPANY NAME Ciba-Geigy Corp.
SUBMISSION PURPOSE EUP on Soybeans
CHEMICAL & FORMULATION 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)acetamide (CGA 24705)

- 1.0 Introduction
- 1.1 Dual is a new name for CGA-24705
- 1.2 CGA-24705 was reviewed twice before for use on corn; 5G1553 (3/5/75) and 5F1605 (6/24/75)
- 1.3 This is a soybean use
- 1.4 Dual 6EC is 66.7% active ingredient
- 1.5 This permit calls for the use of 3600 lbs. (600 gals.) on 1920 acres (= average 1.875 lbs./acre) in 30 states either alone or tank mixed with Lorox (linuron) or Sencor, Lexone (metribuzin).
- 1.6 Active ingredient per gallon is 6.0 lbs.
- 2.0 Directions for use
- 2.1 Apply either pre-plant incorporated or pre-emergent at the following rates:

Soil texture	Broadcast* rate per acre	
	Less than 3% organic matter	3% organic matter or greater
COARSE: Sand, loamy sand, sandy loam	2-2 2/3 pts.	2-2 2/3 pts.
MEDIUM: Loam, silt loam, silt	2-3 1/3 pts.	2 2/3-3 1/3 pts.
FINE: Silty clay loam, Sandy clay loam, silty clay, sandy clay, clay loam, clay	2 2/3-3 1/3 pts.	3 1/3-4 pts.

*The amount of Dual 6EC needed for band treatment may be calculated by the formula:

$$\frac{\text{band width in inches}}{\text{row width in inches}} \times \text{broadcast rate per acre} = \text{amount needed per acre}$$

2.2 Environmental Hazards statements for Dual alone.

Basic cautions include keep out of water, avoid runoff, avoid contamination by cleaning or disposal and avoid drift.

Rotational crop precautions are separate from the above. They include:

- 1) If treated crop is lost, soybeans or corn may be replanted immediately without second broadcast, but with second band applications if replanted in untreated row middles.
- 2) Fall seeded small grains may be planted after soybean harvest.
- 3) Any rotational crop may be planted the following spring.

2.3 Tank mixes:

Apply as above but at the following rates:

2.3.1. For metribuzen:

	Broadcast rates per acre			
	0.5-3% organic matter		Over 3% organic matter	
	Sencor 50% W.P.		Sencor 50% W.P.	
Soil texture*	Dual 6EC	or Lexone	Dual 6EC	or Lexone
COARSE:				
Loamy sand (over 2% organic matter), sandy loam	1.67 pts.	0.5 lb.	1.67 - pts.	0.75 lb.
MEDIUM:				
silt loam, silt	2 pts.	0.75 lb.	2.67 pts.	1 lb.
FINE:				
Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2.67 pts.	1 lb.	2.67 - 3.33 pts.	1 lb.
<u>Mississippi Delta only</u> Silty clay, clay	2.67 pts.	1.5 lbs.	2.67 - 3.33 pts.	1.5 lbs.

* Do not use on any sand, on loamy sand with less than 2% organic matter, or on muck.

2.3.2 For Lorox

Soil Texture*	Broadcast rates per acre			
	0.5-3.0% organic matter		Over 3% organic matter	
	Dual GEC	Lorox	Dual GEC	Lorox
COARSE: Sandy loam	1.67 pts.	1 lb.	1.67 - 2 pts.	1 - 1.5 lbs.
MEDIUM: Loam, silt loam, silt	2 pts.	1 - 1.5 lbs.	2.67 pts.	1.5 - 2 lbs.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2.67 pts.	2 lbs.	2.67 - 3.33 pts.	2.5 - 3 lbs.

* Do not use on sand, gravelly soils, or exposed subsoils. Do not use on loamy sand, except in the northeastern U.S. the tank mix may be used on loamy sand with over 1% organic matter at the same rates as listed for sandy loam in the table.

2.3.3 The following additional precautions accompany tank mix instructions:

2.3.3.1 For metribuzin. Do not use treated vines for feed or forage. Do not use tank mix with soils <0.5% O.M. or pH >7.4. If heavy rain occurs soon after application crop injury may result especially if water stands for days.

Additional rotational crop precautions besides those in 2.2 above include a restriction against planting fall seeded small grains less than 4 months following treatment.

2.3.3.2 For linuron. Do not use on soil with <0.5% organic matter.

Rotational crop restrictions are the same as for metribuzin.

- 3.0 Review of data
- 3.1 The following were submitted and were previously reviewed:
- 3.1.1 Metabolism
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|---|-------------------------------|
| The Uptake and Distribution of β - ¹⁴ C-CGA-24705 in Field Grown Corn | GAAC-74022 |
| The Metabolism of CGA-24705 in Corn | GAAC-74050 |
| A Comparison of β - ¹⁴ C-CGA-24705 Corn Biosynthesized Metabolites with those in the Excreta of Goats Fed the ¹⁴ C-Corn | GAAC-74055 |
| Uptake, Translocation and Degradation of CGA-24705 in Corn Grown Under Controlled Conditions | Basle Report
AC 2.52, 8/74 |
| Metabolism and Balance Study of β - ¹⁴ C-CGA-24705 in a Lactating Goat | GAAC-74020 |
| Counselman, C. J., Biological Report, Goat Metabolism Study with β - ¹⁴ C-CGA-24705 and β - ¹⁴ C-CGA-17020 | Sept. 17, 1973 |
| Metabolism and Balance Study of β - ¹⁴ C-CGA-24705 Corn Biosynthesized Metabolites in a Goat | GAAC-74046 |
| Distribution, Degradation and Excretion of CGA-24705 in the Rat | Basle Report
AC 2.52, 1/74 |
| Metabolism of CGA-24705 in the Rat | Basle Report
AC 2.52, 7/74 |
- 3.1.2 Residues in milk, meat, eggs etc.
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| CGA-24705; Total Residues in Chicken Tissues and Eggs | Basle Report
RYA 88/74
July 1, 1974 |
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3.1.3 Analytical Methodology

Ion-Exchange Characterization of Metabolites of Radioactive Pesticides	AG-156
Biphasic Extraction of Radioactive Metabolites from Treated Biological Material	AG-214
Measurement of Total Organic ¹⁴ C in Soils by Combustion	AG-218
Extraction of CGA-10832 Residues from Soil	AG-219
Blending of Soils and Homogenization of Biological Materials for Radioassay and Extraction	AG-223
Extraction of CGA-10832 Residues from Soil	AG-254
Extraction of Triazine Residues from Soil	AG-255
Gas Chromatographic Determination of Residues of CGA-24705 Metabolites in Corn as CGA-37913.	AG-264
Analytical Method for the Determination of Residues of CGA-24705 Corn Metabolites as CGA-37913 and CGA-49651 by Acid Hydrolysis	AG-277

3.2 New studies. The following are new and pertinent to experimental use of Dual on soybeans.

3.2.1 Metabolism in plants and soil.

Studies GAAC-74015 and 75012 on corn show that Dual is metabolized in corn to form many products. Those which have been identified include a variety of conjugates, especially uronic acids. Report No. 13/74 indicates that corn converts Dual to metabolites with an intact substituted phenyl ring.

Additionally these studies show that Dual applied to soil leaches and dissipates such that unextractable ¹⁴C residue predominate by eight weeks.

3.2.1 Metabolism in plants and soil. (continued)

Metabolism in soybeans (GAAC-75039) shows very similar patterns to those observed in corn. Very little loss from soil occurs in eight weeks. There is a relatively sharp drop in residues between eight and twelve weeks, but no further loss from 12 to 16 weeks. Leaching is indicated, as above, by the appearance of increasing amounts of ¹⁴C residues in the 3-6 and 6-9 inch layers of soil. Extractability decreased rapidly as was observed with soil from the corn growing experiments.

3.2.2 Animal metabolism. Report Biometrics.

A-1004 antedates #GAAC-74046 which covered the same data in greater detail and was reviewed previously. Therefore, no further review is needed for goat metabolism. Metabolites in rats (AC 2.52, 12/74) are primarily intact rings with substituents on the nitrogen as the variants.

3.2.3 Two reports on analytical methodology are new and germane to this review. Method AG-286, a modification of previously reviewed methods AG-265 and AG-277, is for residues in soybeans. Method is sensitive to 0.03 ppm or 0.05 ppm.

The principles are identical to those of method AG-277 but sensitivity using metabolites CGA-49751 is 0.1 ppm using AG-277 and corn while 0.05 using AG-286 and soybean.

Report AC 2.53, 12/11/74 described the structure of a previously unidentified product, "metabolite X", by means of spectroscopy. The product was shown to be N(2-ethyl-5-methylphenyl)-2-hydroxy-5-methyl-3-oxomorpholine. This is a corn plant metabolite.

3.2.4 All other studies submitted with this application for EUP are considered not germane to the concerns of the Environmental Chemistry Section for this use.

4.0 Conclusions

4.1 Our conclusions concerning the fate of Dual remain essentially the same as previously reported. The additional data submitted do not add materially to our understanding of the pesticides environmental fate.

4.2 The tank mix with Sencor is not supported by rotational crop data either with metribuzin or Dual.

5.0

5.1

Inefficient data have been submitted with respect to rotational crops to support the proposed rotation interval. The only acceptable rotation interval for any crop at this time is 18 months from last application. Such restrictions are needed on the label in lieu of appropriate data.

5.2

Environmental Chemistry data specified under Section 3 of the regulations will be required prior to registration of this pesticide.

R. E. Ney 1/14/76

Ronald E. Ney, Jr.

January 8, 1976

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Environmental Chemistry Section
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