

EEE BRANCH REVIEW

DATE: IN _____ OUT _____ IN _____ OUT _____ IN 7-27-78 OUT 8-17-78
FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR (REG. NO.) 100-590 (Bicep 4.5L), 100-L~~0~~T (Dual 8E)

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED 7-12-78

DATE OF SUBMISSION 6-30-78

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCTS(S): I, D, (H,) F, N, R, S Herbicide

DATA ACCESSION NO(S). 234407 - 234416

PRODUCT MGR. NO. Henry Jacoby - 24, Bob Taylor - 25

PRODUCT NAME(S) Bicep 4.5L, Dual 8E

COMPANY NAME Ciba-Geigy

SUBMISSION PURPOSE: Add use on sorghum to both labels.

CHEMICAL & FORMULATION metolachlor = 2-chloro-N-(2-ethyl-6-methyl-phenyl)-N-(2-methoxy-1-methylethyl)acetamide (86.5%) 8#ai/gallon Dual 8E - 86.5%

Bicep 4.5L - metolachlor + atrazine (4.5 #ai/gallon)
Atrazine = 20.8
atrazine related compounds = 1.1
metolachlor = 27.5

49.4%

200.0 Introduction

Ciba-Geigy has submitted efficacy, crop tolerance, yield and compatibility data to support use of Dual 8E alone; Dual 8E plus AAtrex (80W, Nine-O, 4L and 4LC); Dual 8E plus Igran 80W (Reg. No: 100-LOT) and Bicep 4.5L (Reg. No. 100-590) for preplant incorporated (PPI) or preemergent (Pre) weed control in sorghum.

200.1 Uses

Refer to attached use sheets

200.2 Background information

Bicep 4.5L is a Dual plus AAtrex package mix for use on corn. In previous reviews, the Dual 6E/AAtrex Nine-O, 4L, 4LC or 80W tank mix was found biologically comparable to

Dual 6E is presently registered for PPI or Pre weed control in corn and soybeans. In previous reviews, Dual 6E was found biologically comparable to Dual 8E at equal #ai/A applied in water or fluid fertilizer carrier. Dual 6E/AAtrex 80W, Nine-O, 4L or 4LC tank mix is presently registered for PPI or Pre weed control in corn. Bicep 4.5L at equal #ai/A applied in water or fluid fertilizer carrier. Compatibility data were previously submitted and found acceptable at the maximum proposed use rates for the following: Dual 6E plus fluid fertilizer; Dual 8E plus fluid fertilizer; Dual 6E or 8E plus AAtrex 80W, Nine-O, 4L or 4LC in water; Dual 6E or 8E plus AAtrex 80W, Nine-O, 4L or 4LC plus fluid fertilizer; and Bicep 4.5L plus fluid fertilizer. Igran 80W is presently registered (Reg. No. 100-496) for PPI and Pre weed control in certain sorghum producing states (dependent on soil texture.).

201.0 Data Summary

201.1.1 Brief description of data submitted:

The majority of the data submitted were from small plot replicated tests. Comparison data were submitted from side-by-side plots comparing Dual 6E and 8E with and without CGA-43089 and comparing Dual alone with Dual plus AAtrex and Dual plus Igran 80W. No antagonistic or synergistic problems were noted from use of the proposed tank mixes. Previously submitted efficacy data for corn and

soybeans were referenced where identical weeds and #ai/A are claimed.

Severe sorghum stand and yield reductions were noted in tests where the sorghum seed was not properly pretreated with CGA-43089 prior to planting. The "proper" method of seed treatment must be more clearly defined on the label. In the data submitted, the recommended CGA-43089 rate of 2 oz. ai/100#seed afforded adequate seed protection in the majority of the tests. No data were submitted to support use of up to 1.2 #ai Igran on sandy soils.

202.0 Conclusions:

202.1 Claims supported by the data submitted and referenced

A. Dual 8E Alone

1. Efficacy data submitted and referenced at 1.5 #ai/A Dual on coarse soils and 2.0 #ai/A on medium and fine soil textures will support PPI and Pre control of: Barnyard-grass, common purslane, crabgrass, cupgrass, fall panicum, giant foxtail, green foxtail, redroot pigweed, signalgrass (Brachiaria), smooth pigweed, witchgrass, yellow foxtail, and yellow nutsedge; Pre only control of carpetweed and goosegrass; and partial control of seedling johnsongrass, shatter-cane and volunteer sorghum from PPI or Pre treatments.
2. Crop injury and yield data submitted will support use of the maximum proposed Dual 8E alone tests provided the Sorghum seed is pretreated with 2 oz. ai CGA-43089 per 100 # seed prior to planting. Without the seed treatment, severe sorghum stand and yield reductions will occur.
3. Compatibility data referenced and submitted will support use of Dual 8E alone in fluid fertilizer applied PPI or Pre provided

constant agitation is maintained throughout the tank filling and spraying operations. The proposed label adequately reflects this need.

B. Dual 8E/AAtrex (80W, Nine-O, 4L or 4LC) tank mix and Bicep 4.5L:

1. Efficacy data submitted and referenced comparing Dual alone, AAtrex alone, Dual/AAtrex tank mix and Bicep at equal #ai/A in side-by-side tests will support use of the minimum proposed Dual/AAtrex and Bicep 4.5L rates for control of: Barnyardgrass, common cocklebur, common lambsquarters, common purslane, common ragweed, crabgrass, cupgrass, giant foxtail, green foxtail, Penn. smartweed, puncturevine, redroot pigweed, smooth pigweed, velvetleaf, yellow foxtail and yellow nutsedge from PPI or Pre treatments; Pre only control of carpetweed, goosegrass, signalgrass (Brachiaria), tall morningglory and witchgrass; and partial control of shattercane and volunteer sorghum from PPI or Pre treatments.
2. Crop injury and yield data submitted will support use of the maximum proposed rates provided the sorghum seed is pretreated with 2 oz. ai CGA-43089 per 100# seed prior to planting. Without seed treatment, severe sorghum stand and yield reductions will occur.
3. Compatibility data submitted and referenced will support the following combinations provided constant agitation is maintained throughout the tank filling and spraying operations:
 - a. Dual 8E plus AAtrex (80W, Nine-O, 4L or 4LC) in water
 - b. Dual 8E plus AAtrex (80W, Nine-O, 4L or 4LC) in fluid fertilizer

c. Bicep 4.5L in fluid fertilizer

C. Dual 8E/Igran 80W tank mix:

1. Efficacy data submitted comparing Dual alone Ingran 80W alone and Dual/Igran tank mix in side-by-side tests will support control of: barnyardgrass, carpetweed, common lambsquarters, common purslane, common ragweed, crabgrass, cupgrass, fall panicum, green foxtail, kochia, Penn. smartweed, puncturvine, redroot pigweed, signalgrass (Brachiaria), smooth pigweed, tall morning-glory, velvetleaf, witchgrass, yellow foxtail, yellow nutsedge and partial control of seedling johnsongrass, shattercane and volunteer sorghum from use of the minimum proposed rates applied PPI and Pre.
2. a. Crop injury and yield data submitted will support use of up to 1.25# ai Dual 8E plus 1.2#ai Igran 80W/A on loamy sand soils in the desert areas of Calif. and Ariz, OK, NM and TX (at up to 1.2# ai Igran/A, see the Igran label) and in Eastern Colorado, Ill., Ia., KS, Minn., NB, and SD (at up to 2.0# ai Igran/A, see the Igran label).
- b. Crop injury and yield data submitted will support use of up to:
 - 1.5 #ai Dual 8E plus 1.6#ai Igran/A on sandy loam soils
 - 1.75 #ai Dual 8E plus 1.8# ai Igran/A on medium soils (Sil, L, Si)
 - 2.0 #ai Dual 8E plus 2.0# ai Igran/A on fine soils (SiCL, SCL, CL, SiC, C).

These rates are acceptable for use in all sorghum producing states throughout the U.S. All sorghum seed must be pretreated with 2 oz. ai CGA-43089 per 100 # seed prior to planting or severe sorghum stand and yield reductions will occur.

3. Compatibility data submitted will support use of the maximum proposed Dual/Igran rates applied in water or fluid fertilizer provided Unite compatibility agent is added at 3 pts./100 gallons spray mixture. Continuous agitation is required throughout the tank filling and spraying operations. Resuspendability after 24 hrs. and water temperature and hardness variations were evaluated after the addition of Unite with no serious difficulties.

202.2 Claims not supported by the data submitted or referenced

- A. Bicep 4.5L - Efficacy data will not support control of morningglory spp. Data were acceptable for preemergent control of tall morningglory.
- B. Dual 8E/AAtrex (80W, Nine-O, 4L or 4LC) tank mix and Bicep 4.5L:

Efficacy data will not support PPI control of witchgrass.

- C. Dual 8E/Igran 80W tank mix:

1. No crop injury and yield data were submitted to support use of 1.25 #ai Dual plus 1.2#ai Igran 80W/A on sandy soils. Igran alone is presently limited to use of up to 0.8 #ai/A on sandy soils in the desert regions of Calif., and Ariz; Kansas, Oklahoma, New Mexico and Texas.
2. No crop injury and yield data were submitted to support use of 1.25 #ai Dual plus 1.2 #ai Igran 80W/A on loamy sand soils in the following sorghum producing states: Nevada, non-desert areas of Calif., Arkansas, North Carolina, Mississippi, Alabama, Georgia, Tennessee, Kentucky, Louisiana, South Carolina, Indiana and Virginia.

202.3 Additional data required to support claims and achieve registration:

- A. Bicep 4.5L - Submit efficacy data at the minimum proposed Bicep 4.5L rates (as based on soil texture and organic matter percentage) to support control of all morningglory species (except Pre control of tall morningglory) from PPI and Pre treatments; or delete these claims.
- B. Dual 8E/AAtrex (80W, Nine-O, 4L or 4LC) tank mix and Bicep 4.5L: Submit efficacy data at the minimum proposed rates (as based on soil texture and organic matter percentage) to support PPI control of witchgrass; or delete this claim.
- C. Dual 8E/Igran 80W tank mix:
 - 1. Submit crop injury and yield data to support use of 1.25 #ai Dual plus 1.2 #ai Igran 80W/A applied PPI or Pre on sandy soils; or restrict the proposed tank mix from use on sandy soils. Data submitted may be small plot replicated tests comparing sorghum injury and yields from use of the recommended Dual/Igran tank mix rates with injury and yields from similar rates of each component alone. Data must support use on sandy soils throughout the various sorghum producing areas of the U.S. Ensure that the major sorghum varieties are evaluated. Injury to sorghum resulting from improperly safened seed must be determined in the data submitted.
 - 2. Submit crop injury and yield data to support use of 1.25 #ai Dual plus 1.2 #ai Igran 80W/A applied PPI or Pre on loamy sand soils in sorghum producing areas representative of the following states: non-desert areas of Calif., Nev., Ark., NC, Miss., Ala., Ga., Tenn., Kty., La., S.C., Ind. and Va. Otherwise, restrict tank mix from use on loamy sand soils in these areas. Small plot replicated data may be used to compare sorghum injury and yields from use of the

recommended Dual/Igran tank mix rates with injury and yields from similar rates of each component alone. Ensure that the major sorghum varieties grown in these areas are evaluated. Injury to sorghum resulting from improperly safened seed must be determined in the data submitted.

203.0 Label comments - to be resolved prior to registration:

A. Dual 8E label:

Under the headings "Dual 8E Plus AAtrex Tank Mixture" and "Dual 8E Plus Igran 80W Tank Mixture" the statement "Controls several weeds not controlled by Dual 8E alone" is incorrect in that the majority of the weeds listed are controlled by Dual 8E alone. These statements should specifically list those weeds not controlled by Dual 8E alone or revise them to read "Controls the following weeds:".

B. Bicep 4.5L label:

In the "Precaution:" statement, 1st page, delete "or in tank mixtures" as no tank mixes are claimed on the label.

C. Dual 8E and Bicep 4.5L labels:

1. The "proper" pretreatment of sorghum seed with CGA-43089 must be more specifically defined on the labels. Shaker bag treatments appear ineffective in the data submitted.
2. Labels must indicate the maximum amount of time before planting that seed can be treated with CGA-43089.

204.0 Compatibility data

In future compatibility data submissions include data describing the physical compatibility (precipitates, cloudiness, oily layers etc.) of the

mixture at each time period evaluated; data describing the various water temp., pH and hardness evaluated; order-of-addition of components; resuspendability after 24 hrs; minimum screen and nozzle sizes through which the mixture will pass and whether or not continuous agitation is required.

Comment:

The proposed Dual 8e and Bicep 4.5L labels will be acceptable after resolution of comments under 202.3 and 203.0 above.



Richard C. Petrie
Room 315-B
F.H.B.

REM
8/31/78

Atrazine: 2-chloro-4-ethylamino-6-isopropylamino-s-triazine, 20.8%
 Atrazine related compounds 1.1%

Formulation: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)-acetamide 27.5%

USE	Tolerance	RATE		Amendment to Reg.	No: 100-590
		Actual lbs/acre	Formulation		
sorghum	pdm		DO NOT USE	Coarse Soils - (S,LS,SL) Medium Soils - (L, SI, Sil) Less than 1.5% O.M. 1.5% O.M. or Greater Fine Soils - SiCL, SCL,CL SC, SiC, C	dry weather following preemer- gence treatment may reduce effectiveness. Cultivate if weeds develop
Weeds Controlled PPI			DO NOT USE		
or Pre: barnyardgrass (watergrass)*carpetweed		2:7	2.4 qts./A		
common cocklebur, common lambquarters, common					Do not use Bicep 4.5L unless the sorghum seed has been treated with 2 oz. ai CGA- 43089 per 100 # seed or severe crop injury will occur.
purslane, common ragweed, crabgrass, cupgrass, fall panicum, giant foxtail, *goosegrass, green foxtail,		2.7	2.4qts./A	Less than 1.5% O.M. 1.5% OM or Greater Use directions PPI:	
morningglory, Penn. smartweed, puncturevine, redroot pigweed,*signalgrass (Biacharia), smooth pigweed,		3.2 - 3.6	2.8-3.2qts/A in a minimum of 15 dallons water or fluid ferti-	Apply to soil and incor- porate not more than 2" deep within 14 da. before planting, using a disc, harrow, rolling cultivation or similar implement. Use PPI if furrow irrigation	Use on highly alkaline soils or on eroded areas where calcareous subsoils are exposed may result in sorghum injury.
*tall morningglory, velvetleaf, witchgrass, yellow foxtail, yellow nutsedge.			Refer to label for compatibility test direc-	is used or when a period of dry weather after treatment is expected. If crop is planted in beds, apply and incorporate after bed formation. Use Direc-	Refer to label for rota- tional crop directions and restrictions.
*controlled with preemergence treatments only			tions		
*Bicep 4.5L Herbicide Ciba-Geigy					
(4.5 #ai/gallon)					

EMULATION:

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DECLARATION

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USE	Tolerance	RATE		APPLICATION	LIMITATIONS & REMARKS
		Actual lbs/acre	Formulation		
Weeds controlled by PPI or Pre in addition to those controlled by Dual 8E alone: Common cocklebur common lambs-quarters, common ragweed	PDM	1.5 + 1.2	DO NOT USE DO NOT USE 1.5pts Dual 8E + 80W/A 1.5#Aatrex	Dual 8E plus Aatrex Apply PPI or Preemergence Coarse Soils (S,LS,SL) Medium Soils (L,Si,SIL) w/ less than 1.5% O.M. Greater than 1.5% O.M.	Applications of Dual 8E + Aatrex on highly alkaline soils or on eroded areas where calcareous subsoils are exposed may cause sorghum injury.
Penn. smartweed puncture vine *tall morningglory velvetleaf		1.5 +	1.5pts Dual 8E +	Fine Soils-(SiCL,SCL,CL, SC,SiC,C) Less than 1.5% O.M.	
*controlled with preemergence treatments only.		1.2 1.75-2.0 +	1.5#Aatrex Dual 8E 1.75-2.0pts +	80W/A Greater than 1.5% O.M.	
		1.4-1.6	1.75-2.0 #Aatrex in a minimum of 15 gallons water or fluid fertilizer.	Aatrex 80W/A When using Aatrex, Nine-O, 4L or 4LC use equivalent rates.	

USE	Tolerance	RATE		APPLICATION	LIMITATIONS & REMARKS
		Actual lbs/acre	Formulation		
Weeds controlled	DDM			Dual 8E plus Aatrex	Applications of Dual 8E + Aatrex on highly alkaline soils or on eroded areas where calcareous subsoils are exposed may cause sorghum injury.
PPI or Pre in addition to those controlled by				Apply PPI or Preemergence Coarse Soils (S,LS,SL) Medium Soils (L,Si,SiL) w/ less than 1.5% O.M. Greater than 1.5% O.M.	
Dual 8E alone: Common cocklebur common lambs-quarters, common ragweed		1.5	DO NOT USE Dual 8E 1.5pts Dual		
		+	80W/A		
Penn. smartweed		1.2	1.5#Aatrex	Fine Soils-(SiCL,SCL,CL, SC,SiC,C)	
puncture vine		1.5	8E 1.5pts.Dual	Less than 1.5% O.M.	
*tall morningglory		+	+		
velvetleaf		1.2	1.5#Aatrex	80W/A	
*controlled with		1.75-2.0	Dual 8E 1.75-2.0pts	Greater than 1.5% O.M.	
preemergence treatments only.		+	+		
		1.4-1.6	1.75-2.0 #Aatrex	80W/A	
			in a minimum	When using Aatrex, Nine-O,	
			of 15 gallons	4L or 4LC use equivalent	
			water or fluid	rates	
			fertilizer.		

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4 USE

Tolerance	RATE		APPLICATION	LIMITATIONS & REMARKS
	Actual lbs/acre	Formulation		
Needs Controlled PPI or Pre:			Dual 8E + Igran 80W	See label for rotational crop restrictions and directions.
Those weeds on Dual 8E			Apply PPI or preemergence	
alone label plus:	1.25	1.25 Dual 8E	Course Soils	
lambquarters.	+	+	S, LS	
Common ragweed, Kochia,	1.20	1.5# Igran 80W/A		Use Direction - Pre:
penn. smartweed,	1.25 - 1.5	1.25 - 1.5 pts.	Dual 8E SL	Apply to the soil surface at planting or after planting but before weeds or crop emerge.
puncturevine, tall	+	+		and after planting but before
morningglory and velvetleaf	1.2 - 1.6	1.5-2.0# Igran 30W/A		
	1.5-1.75	1.5-1.75 pts	Dual 8E Medium Soils (L, Si, Sil)	
	+	+		
	1.6 - 1.8	2-2.2 #Igran 80W/A		
	1.75-2.0	1.75-2.0 pts	Fine Soils (SiCL, SCL, CL, SC, SiC, C)	
	+	+		
	1.8-2.0	2.2-2.5#Igran 80W/A		
		in a	Use Directions - PPI:	
		minimum of	Apply to soil and shallow	incorporate
		15 gallons	no more than 2" within 14	days before planting using
		of water or	a disk, harrow, rolling culti-	validator or similar imple-
		fluid ferti-	ment. Use PPI treatment if	furrow irrigation is
		lizers.	used or when a period of dry	weather after appli-
			cation can be expected. If	crop is bedded, apply
			and incorporate after bed	formation.