See 080803

EE BRANCH REVIEW

6-26-80
IN 6-12-80 OUT 7-16-80

FILE OR REG. NO. 100-439,-497,-535,-585,-473,-590,-496,-522,-597,-604

PETITION OR EXP. PERMIT NO.

DATE DIV. RECEIVED

DATE OF SUBMISSION

DATE SUBMISSION ACCEPTED

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

DATA ACCESSION NO(S). 242535

PRODUCT MGR. NO. Taylor (25)

PRODUCT NAME(S) AAtrex, Evik, Bicep, Igran, Sancap, Dual, Milocep

COMPANY NAME Ciba-Geigy

SUBMISSION PURPOSE Incremental risk assessment for proposed conditional registration amendments.

CHEMICAL & FORMULATION

AAtrex 80W	Atrazine	080803
AAtrex 4L	Atrazine	"
AAtrex 4LC	Atrazine	"
AAtrex Nine-0	Atrazine	
Evik 80W	Ametryn	080801
Bicep	Atrazine + Metolachlor	(080803 + 108801)
Igran 80W	Terbutryn	090813
Sancap 80W	Dipropetryn	104401
Dual 8E	Metolachlor	108801 ←
Milocep	Metolachlor	108801 + Propazine

100.0 Pesticide Use

To control weeds in potatoes.

100.1 Application Methods/Directions/Rates (Dual 6E&8E)

Apply Dual 6E and 8E either preplant incorporated, postplant incorporated, or preemergence after planting and before emergence of the crop and weeds - or after final drag-off if this operation is part of the normal cultural practice - using the appropriate rate from Table 1.

Incorporated: Apply Dual 6E and 8E to the soil and incorporate into the top 3 inches before planting using a finishing disk, harrow, rolling cultivator, or similar implement. Planting and later cultural practices should not bring untreated soil to the surface. Postplant incorporated application may be made any time after planting to drag-off or hilling, but before potato emergence. Use an implement that evenly distributes Dual in the top 2 inches of soil. Do not damage potato seed pieces or sprouts with incorporation equipment. Effectiveness will be reduced if later cultural practices expose untreated soil.

Tank Mixtures: Fill the spray tank one-half to three-fourths full with water, add AAtrex, Lexone, Lorox, or Sencor and allow it to become dispersed, then add Dual 8E or 6E, and finally the rest of the water. Agitate during mixing and application to maintain a uniform suspension. For tank mixtures with AAtrex, Lexone, Lorox, or Sencor, fluid fertilizers may replace all or part of the water as carrier.

To determine the compatibility of Dual 8E or 6E alone or tank mixtures in fluid fertilizer, pour the products into a small container of fluid fertilizer in the proportions shown below.

Preemergence: Apply Dual 6E after planting as a preemergence, delayed preemergence or after drag-off treatment, but before the crop or weeds emerge. Effectiveness will be reduced if later cultural practices expose untreated soil.

Table 1: Dual 6E Alone

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 2/3 pts.
MEDIUM: Loam, silt loam, silt	2 2/3-3 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.
muck or peat soils	DO NOT USE	

Note: If cool, wet soil conditions occur after application, Dual may delay maturity and/or reduce yield of Superior and other early maturing potato varieties. Do not use on sweet potatoes or yams.

6E or 8E Alone Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	common purslane
crabgrass	Florida pusley	sandbur
cupgrass	pigweed	seedling johnsongrass
fall panicum		volunteer sorghum
foxtail millet		
giant foxtail		
goosegrass		
green foxtail		
red rice		
signalgrass (Brachiaria)		
witchgrass		
yellow foxtail		
yellow nutsedge		

Table 1: Dual 8E Alone

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

Dual 6E or 8E + Sencor®/Lexone® Tank Mixture - Potatoes

Weeds Controlled		Weeds Partially Controlled
barnyardgrass	carpetweed	cocklebur
crabgrass	Florida pusley	common purslane
fall panicum	hemp sesbania	jimsonweed
giant foxtail	lambsquarters	sandbur
goosegrass	pigweed	seedling johnsongrass
green foxtail	prickly sida	volunteer sorghum
signalgrass (Brachiaria)	ragweed	
southwestern cupgrass	smartweed	
witchgrass	velvetleaf	
yellow foxtail	Venice mallow	
yellow nutsedge	wild mustard	

100.2 Purpose of Submission

To add potato to the label as a weed control.

100.3 Precautionary Labeling

Precaution: Do not use Dual + Sencor or Lexone on potatoes in Kern County, California. Do not apply to sweet potatoes or yams.

Precaution: Do not use on soil with less than 0.5% organic matter or crop injury may occur.

Precautions: 1) Do not use the tank mix or sequential application on soil with less than 0.5% organic matter or on alkaline soil with a pH over 7.4 or crop injury may occur. 2) If heavy rain occurs soon after application, crop injury may result, especially in poorly drained areas where water stands for several days.

101.0 Chemical and Physical Properties

101.1 Chemical Name:

Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl) acetamide

101.2 Common Name Dual

101.3 Molecular Weight

283.80

101.4 Physical State

Liquid/white to tan/odorless

101.5 Solubility

See review by R. Balcomb on 2-13-78.

104 Hazard Assessment

See review by C. Laird for peanut on 3-12-80.

104.1.1 Likelihood of Non-Target Exposure

The proposed use does not present any unreasonable hazard to wildlife.

104.1.2 Endangered Species Consideration

See review by C. Laird on peanut on 3-12-80.

104.1.3 Adequacy of Toxicity Data

No new data are reviewed.

104.1.4 Additional Data Required

None

107 Conclusion

Due to previously registered similar uses, and potatoes not being the largest crop acreages for such a use, the conditional registration ruling dated May 11, 1979, section 162.18-4 is applicable. The Ecological Effects Branch recommends the amended use for conditional registration.

Curtis E. Laird
Curtis E. Laird
Fishery Biologist
Ecological Effects Branch/HED

David L. Coppage
David L. Coppage
Head, Section #3
Ecological Effects Branch/HED

6/4/80
Clayton Bushong
Chief
Ecological Effects Branch/HED

100 Pesticide Use

To control weeds in sorghum.

100.1 Application Methods/Directions/Rates

Mixing Instructions

Dual 6E or 8E Alone: Mix Dual 6E or 8E with water or fluid fertilizer and apply as a spray. Fill the spray tank one-half to three-fourths full with water or fluid fertilizer, add the proper amount of Dual 6E or 8E, then add the rest of the water or fluid fertilizer. Provide sufficient agitation during mixing and application to maintain a uniform emulsion.

Tank Mixtures: Fill the spray tank one-half to three-fourths full with water, add AAtrex, Banvel, Bladex, Dyanap, Lexone, Lorox, or Sencor and allow it to become dispersed, then add Dual 6E or 8E, then add ORTHO Paraquat CL if this product is being used, and finally the rest of the water. Agitate during mixing and application to maintain a uniform suspension. For tank mixtures with AAtrex, Banvel, Bladex, Lexone, Lorox, or Sencor, fluid fertilizers may replace all or part of the water as carrier, except in the AAtrex postemergence tank mix. Tank mixtures with Bladex should not be allowed to stand without agitation.

To determine the compatibility of Dual 6E or 8E alone or tank mixtures in fluid fertilizer, pour the products into a small container of fluid fertilizer in the proportions shown below.

Sorghum: Do not graze or feed sorghum hay or forage.

Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	common purslane
crabgrass	Florida pusley	sandbur
fall panicum	pigweed	seedling johnsongrass
foxtail millet		volunteer sorghum
giant foxtail		
goosegrass		
green foxtail		
red rice		
signalgrass (Brachiaria)		
southwestern cupgrass		
witchgrass		
yellow foxtail		
yellow nutsedge		

Apply Dual 8E or 6E either preplant incorporated or preemergence using the appropriate rate from Table 1. Preplant incorporated: Apply Dual 8E or 6E to the soil and incorporate into the top 2 inches of soil within 14 days before planting using a finishing disk, harrow, rolling cultivator, or similar implement capable of providing uniform 2 inch incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If corn or soybeans are planted on beds, apply and incorporate Dual 8E or 6E after bed formation. Preemergence: Apply Dual 8E or 6E during planting (behind the planter) or after planting but before weeds or crop emerge.

Table 1: Dual 8E Alone — Sorghum

	Broadcast rate per acre	
Soil texture	Less than 3% organic matter	3% organic matter or greater
COARSE: Sand, loamy sand, sandy loam	1 1/2-2 pts.	2 pts.
MEDIUM: Loam, silt loam, silt	2-2 1/2 pts.	2-2 1/2 pts.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2-2 1/2 pts.	2 1/2-3 pts.
muck or peat soils	DO NOT USE	

Table 1: Dual 6E Alone — Sorghum

Soil texture	Broadcast rate per acre: Less than 3% organic matter	Broadcast rate per acre: 3% organic matter or greater
COARSE: Sand, loamy sand, sandy loam	2-2/2-3 pts.	2 2/3 pts.
MEDIUM: Loam, silt loam, silt	2 2/3-3 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.
muck or peat soils	DO NOT USE	

Tank Mixture with AAtrex Postemergence

Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	jimsonweed	cocklebur
crabgrass	kochia	morningglory
fall panicum	lambsquarters	yellow nutsedge
giant foxtail	mustard	
green foxtail	pigweed	
yellow foxtail	prickly sida	
	purslane	
	ragweed	
	smartweed	
	velvetleaf	

Apply early postemergence using the appropriate rates from Table 3. Apply this tank mixture before grass and broadleaf weeds pass the 2-leaf stage and before corn exceeds 5 inches in height. Application to weeds larger than the 2-leaf stage will generally give unsatisfactory control. Occasionally some corn leaf burn may result, but this should not affect later growth or yield. Do not apply this postemergence tank mixture in fluid fertilizer, as severe crop injury may occur.

Table 7: Dual 6E + Sencor or Lexone - Soybeans

	Broadcast rates per acre			
	0.5% to less than 3% organic matter		3% organic matter or greater	
Soil texture**	Dual 6E	Sencor 50WP* or Lexone	Dual 6E	Sencor 50WP* or Lexone
COARSE: Loamy sand (over 2% organic matter). sandy loam	1 2/3 pts.	1/2 lb.	2 pts.	1/4 lb.
MEDIUM: Loam. silt loam, silt	2 pts.	3/4 lb.	2 2/3 pts.	1 lb.***
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2 2/3 pts.	1 lb.	2 2/3-3 1/3 pts.	1 lb.
Mississippi Delta only: Silty clay, clay	2 2/3 pts.	1 1/2 lbs.	2 2/3-31/3 pts.	1 1/2 lbs.
muck or peat soils	DO NOT USE			

Table 7: Dual 8E + Sencor or Lexone - Soybeans

	Broadcast rates per acre			
	0.5% to less than 3% organic matter		3% organic matter or greater	
Soil texture**	Dual 8E	Sencor 50WP* or Lexone	Dual 8E	Sencor 50WP* or Lexone
COARSE: Loamy sand (over 2% organic matter). sandy loam	1 1/4 pts.	1/2 lb.	1 1/2 pts.	3/4 lb.
MEDIUM: Loam. silt loam, silt	1 1/2 pts.	3/4 lb.	2 pts.	1 lb.***
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2 pts.	1 lb.	2-2 1/2 pts.	1 lb.
Mississippi Delta only: Silty clay, clay	2 pts.	1 1/2 lbs.	2-2 1/2 pts.	1 1/2 lbs.
muck or peat soils	DO NOT USE			

101 Chemical and Physical Properties

See review by C. Laird for peanut on 3-12-80.

102 Behavior in the Environment

See review by R. Balcomb on 2-13-78.

103 Toxicological Properties

See review by R. Balcomb on 2-13-78.

104 Hazard Assessment

See review by C. Laird on 3-12-80.

107 Conclusion

Due to previously registered similar uses, and sorghum not being the largest crop acreage for such a use, the Conditional registration ruling dated May 11, 1979, section 162.18-4 is applicable. The Ecological Effects Branch recommends the Amended use for Conditional registration.

Curtis E. Laird
Fishery Biologist
Ecological Effects Branch/HED

David Coppage
Head, Section #3
Ecological Effects Branch/HED

Clayton Bushong 6/4/80
Chief
Ecological Effects Branch/HED

100.0 Pesticide Use

To control weeds in sorghum.

100.1 Application Methods/Directions/Rates

Application: Apply Bicep preplant incorporated or preemergence using the appropriate rates from Table 1 or Table 2. Preplant incorporated: Apply to the soil and incorporate into the top 2 inches of soil within 14 days before planting using a finishing disk, harrow, rolling cultivator, or similar implement capable of providing uniform 2 inch incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop is to be planted on beds, apply and incorporate after bed formation. Preemergence: Apply to the soil surface at planting (behind the planter), or after planting but before weeds or crop emerge.

Bicep may be applied on sorghum in water or in fluid fertilizer with conventional ground sprayers.

Dry weather following preemergence application of Bicep or a tank mixture may reduce effectiveness. Cultivate if weeds develop in conventional tillage corn or sorghum..

Mixing Instructions

Shake well before using. Bicep is a liquid to be mixed with water or fluid fertilizer and applied as a spray.

Bicep Alone: Fill the spray tank one-half to three-fourths full with water or fluid fertilizer, add the proper amount of Bicep, then add the rest of the water or fluid fertilizer. Provide sufficient agitation during mixing and application to maintain a uniform suspension.

Tank Mixtures on Corn: Fill the spray tank one-half to three-fourths full with water or fluid fertilizer, add the proper amount of Bicep, then add ORTHO Paraquat CL or Roundup, and finally add the rest of the water or fluid fertilizer. Provide sufficient agitation during mixing and application to maintain a uniform suspension.

Apply Bicep in a minimum of 10 gals. of spray mixture per acre unless specified otherwise.

Sprayer Equipment: Use conventional ground sprayers equipped with nozzles that provide accurate and uniform application. Screens and strainers should be no finer than 50-mesh. Rinse sprayer thoroughly with clean water immediately after use.

Bicep Applied Alone
Corn or Grain Sorghum

Preplant Incorporated or Preemergence

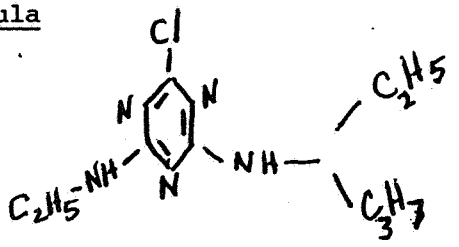
Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	sandbur
browntop panicum	cocklebur	seedling johnsongrass
crabgrass	common purslane	volunteer sorghum
fall panicum	Florida pusley	
giant foxtail	lambsquarters	
goosegrass	morningglory	
green foxtail	pigweed	
red rice	ragweed	
signalgrass (Brachiaria)	smartweed	
southwestern cupgrass	velvetleaf	
witchgrass		
yellow foxtail		
yellow nutsedge		

101.0 Chemical and Physical Properties

Atrazine: 2-chloro-4-ethylamino-6-isopropylamino-s-triazine

Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)acetamide

101.1 Structural formula



101.2 Common Name

Atrazine

101.3 CHEMICAL Name

2-chloro-4-ethylamino-6-isopropylamino-s-triazine

101.4 Molecular Weight

215.5

Table 2: Bicep - Grain Sorghum†

Soil texture	Organic matter	Broadcast rate per acre
COARSE: Sand, loamy sand, sandy loam	any level	DO NOT USE
MEDIUM AND FINE: Loam, silt loam, silt, sandy clay loam,	less than 1%	DO NOT USE
clay loam,	1-1.5%	2.4 qts.
silty clay loam, sandy clay, silty clay, clay	more than 1.5%	2.8-3.2 qts.

†Do not use in NM, OK, or TX except in northeast OK and Texas Gulf Coast areas. Do not apply preplant incorporated in AZ or the Imperial Valley of CA.

101.6 Solubility

33 ppm in water at 20-25°C

103.0 Toxicological Properties

See review by O'Brien on 3/9/78

104.0 Hazard Assessment

Atrazine is highly toxic to Daphnia M. (0.11 and 0.25 ppm) in LC_{50} terms. The application rates call for 2 to 4 quarts of Bicep/A to be preplant or preemergence incorporated into the top 2 inches of soil. Consequently most wildlife utilizing the treated area should not be exposed to hazard through contact. There is a possibility that some animals may receive indirect exposure through feeding on terrestrial invertebrates in treated areas or runoff for aquatic species after new application.

107.0 Conclusion

The use of this product will not cause a significant increase in the risk based on previous registered use, the Conditional registration ruling dated May 11, 1979, section 162.18-4 is

applicable. The Ecological Effects Branch recommends the Amended use for Conditional registration.

Curtis E. Laird
Curtis E. Laird
Aquatic Biologist
Ecological Effects Branch/HED

David L. Coppage
David L. Coppage
Head, Section #3
Ecological Effects Branch/HED

Clayton Bushong 6/4/80
Clayton Bushong
Chief
Ecological Effects Branch/HED

EEB/HED:LAIRD:RAVEN-479-2018:DCR-49774:05/30/80:pa1345P

100.0 Pesticide Use

To control weeds in sorghum (milo and sweet sorghum).

100.1 Application Methods/Directions/Rates

Application: Apply Milocep either preplant incorporated or preemergence at the appropriate rate from the following rate table. Preplant incorporated: Apply to the soil within 14 days before planting and incorporate into the top 2 inches, using a finishing disk, harrow, rolling cultivator, or similar implement capable of uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If sorghum is to be planted on beds, apply and incorporate after bed formation. Preemergence: Apply to the soil surface at planting; or after.

Apply Milocep in water or in fluid fertilizer in a minimum of 15 gals. of spray mixture per acre.

Sprayer Equipment: Use conventional spray equipment that provides accurate and uniform application. Screens and strainers should be no finer than 50-mesh. Rinse sprayer thoroughly with clean water immediately after use.

Mixing Instructions: Shake well before using. Fill the spray tank one-half to three-fourths full with water or fluid fertilizer, add the proper amount of Milocep, then add the rest of the water or fluid fertilizer. Provide sufficient agitation during mixing and application to maintain a uniform suspension.

Soil texture	Broadcast rate per acre
COARSE	
Sand, loamy sand.	DO NOT USE
sandy loam	3-3.5 pts.
MEDIUM	
Loam, silt, silt loam	3.5-4.5 pts.
FINE	
Silty clay loam, sandy clay loam, clay loam, sandy clay, silty clay, clay.	4.5-5 pts.

100.2 Purpose of Submission

To add sorghum to the label as a weed control.

100.3 Precautionary Labeling

Precautions: 1) If sorghum seed is not properly pretreated with Concep, Milocep will severely injure the crop. 2) Under high soil moisture conditions prior to sorghum emergence, temporary injury may occur following the use of Milocep. The crop will normally outgrow this effect. 3) Do not use under dry mulch tillage, or injury may occur.

Keep out of any body of water. Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes. Do not apply when weather conditions favor drift from areas treated.

101 Chemical and Physical Properties

101.1 Chemical Name

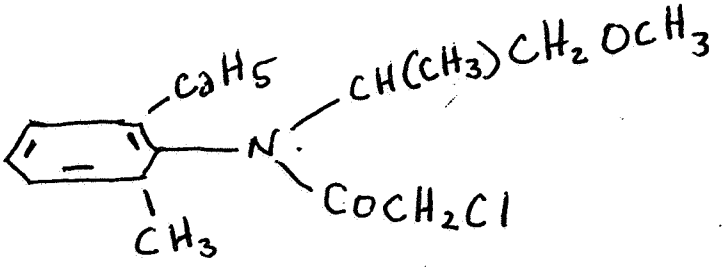
Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl-N-(2-methyloxy-1-methylethyl)Acetamide 36.3%

Propazine: 2-chloro-4,6-bis(isopropylamino)-s-triazine 18.7%

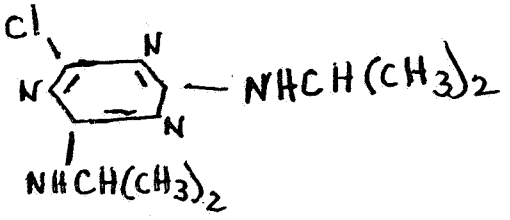
101.2 Common Name

Milocep

101.3 Chemical structure



Metolachlor (Dual)



Propazine (Melograde)

101.4 Molecular Weight and Physical State

1. Metolachlor 283.5 Odorless, white to tan liquid.
2. Propozine 194.0 Colorless, Crystalline solid.

101.5 Solubility

See review by L. Turner on 1/11/79.

102.0 Behavior in the Environment

See review by M. Nawar on 6/7/79.

103.0 Toxicological Properties

See review by L. Turner on 1/11/79.

104.0 Hazard Assessment

104.1 Discussion

See review by L. Turner on 1/11/79.

104.1.1 Likelihood of Exposure to Non-target Organisms

104.1.2 Endangered Species Consideration

Because of the low toxicity and sorghum not being a large acreage crop, no hazard is expected for endangered species.

104.1.3 Adequacy of Toxicity Data

No new data were reviewed for this submission. All of the minimum required studies for Metolachlor have been reviewed as Core. All of the minimum required studies for Propozine have been reviewed as Core, except avian acute oral LD_{50} for one species of wild waterfowl or one species of upland game bird.

Invertebrate acute toxicity LC_{50} for one species of aquatic invertebrate, i.e., Daphnia.

107.0 Conclusion

The proposed use of this product will not cause a significant increase in the risk based on previous registered use and information in EEB files. The Conditional registration ruling dated May 11, 1979, section 162.18-4 is applicable. The

Ecological Effects Branch recommends the Amended use for Conditional registration.

Curtis E. Laird
Fishery Biologist
Ecological Effects Branch/HED

David L. Coppage
Head, Section #3
Ecological Effects Branch/HED

Clayton Bushong 4/4/80
Chief
Ecological Effects Branch/HED

100.0 Pesticide Use

For weed control in peanuts.

100.1 Application Methods/Directions/Rates

Directions for Use

General

(+Dyanap) Dual 6E is a selective herbicide recommended as a preplant or postplant incorporated or preemergence surface-applied treatment for control of most annual grasses and certain broadleaf weeds in peanuts.

Dual 6E Applied Alone - Peanuts

Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	common purslane
crabgrass	Florida pusley	sandbur
fall panicum	pigweed	seedling johnsongrass
foxtail millet		volunteer sorghum
giant foxtail		
goosegrass		
green foxtail		
red rice		
signalgrass (Brachiaria)		
southwestern cupgrass		
witchgrass		
yellow foxtail		
yellow nutsedge		

Apply Dual 6E either preplant or postplant incorporated or preemergence using the appropriate rate specified below. Preplant Incorporated: Apply Dual 6E to the soil and incorporate (shallow; not more than 2 inches) within 14 days before planting. Use a finishing disk, harrow, rolling

Dual 6E + Dyanap Sequential Application

Dual 6E + Dyanap controls several weeds not controlled by Dual 6E alone or Dyanap alone.

Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	sandbur
crabgrass	Florida pusley	seedling johnsongrass
fall panicum	pigweed	volunteer sorghum
foxtail millet	chickweed	black nightshade
giant foxtail	lambsquarter	coffeeweed
goosegrass	ragweed	sicklepod
green foxtail	purslane	
red rice	velvetleaf	
signalgrass (Brachiaria)	cocklebur	
southwestern cupgrass	groundcherry	
witchgrass	mustards	
yellow foxtail	shepherdspurse	
yellow nutsedge	galinsoga	
	morningglory	
	beggarweed (beggarlice)	
	teaweed (prickly sida)	
	jimsonweed	
	smartweed	
	wild sunflower	

Apply Dual 6E incorporated or preemergence according to the directions for use alone and follow with a Dyanap preemergence to cracking time treatment using 6 qts. per acre as specified for use alone on that label.

If 1/2-1 inch of rainfall does not occur within 7 days after application, shallow incorporation (1/2-1 inch) is recommended. Cultivate if weeds develop. Refer to the Dyanap label for planting details and information on all other factors affecting its use.

Note: Dual alone or the sequential treatment with Dyanap may be applied as directed after any of the following preplant incorporated herbicides when used according to their label recommendations. Balan^{R} at 3-4 qts. per acre; Cobex^{R} at 1 1/2-3 pts. per acre; Treflan at 1 pt. per acre; or Vernam^{R} at 2 1/3-3 pts. per acre.

Directions for Use

General

Dual 8E is a selective herbicide recommended as a preplant or postplant incorporated or preemergence surface-applied treatment for control of most annual grasses and certain broadleaf weeds in peanuts.

Dual 8E Applied Alone - Peanuts

Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	common purslane
crabgrass	Florida pusley	sandbur
fall panicum	pigweed	seedling johnsongrass
foxtail millet		volunteer sorghum
giant foxtail		
goosegrass		
green foxtail		
red rice		
signalgrass (Brachiaria)		
southwestern cupgrass		
witchgrass		
yellow foxtail		
yellow nutsedge		

Apply Dual 8E either preplant or postplant incorporated or preemergence using the appropriate rate specified below. Preplant Incorporated: Apply Dual 8E to the soil and incorporate (shallow; not more than 2 inches) within 14 days before planting. Use a finishing disk, harrow, rolling

Dual 8E + Dyanap Sequential Application

Dual 8E + Dyanap controls several weeds not controlled by Dual 8E alone or Dyanap alone.

Weeds Controlled		Weeds Partially Controlled
barnyardgrass (watergrass)	carpetweed	sandbur
crabgrass	Florida pusley	seedling johnsongrass
fall panicum	pigweed	volunteer sorghum
foxtail millet	chickweed	black nightshade
giant foxtail	lambsquarter	coffeeweed
goosegrass	ragweed	sicklepod
green foxtail	purslane	
red rice	velvetleaf	
signalgrass (Brachiaria)	cocklebur	
southwestern cupgrass	groundcherry	
witchgrass	mustards	
yellow foxtail	shepherdspurse	
yellow nutsedge	galinsoga	
	morningglory	
	beggarweed (beggarlice)	
	teaweed (prickly sida)	
	jimsonweed	
	smartweed	
	wild sunflower	

Apply Dual 8E incorporated or preemergence according to the directions for use alone and follow with a Dyanap preemergence to cracking time treatment using 6 qts. per acre as specified for use along on that label.

If 1/2-1 inch of rainfall does not occur within 7 days after application, shallow incorporation (1/2-1 inch) is recommended. Cultivate if weeds develop. Refer to the Dyanap label for planting details and information on all other factors affecting its use.

Note: Dual alone or the sequential treatment with Dyanap may be applied as directed after any of the following preplant incorporated herbicides when used according to their label recommendations. Balan^{R} at 3-4 qts. per acre; Cobex^{R} at 1 1/2-3 pts. per acre; Treflan^{R} at 1 pt. per acre; or Vernam^{R} at 2 1/3-3 pts. per acre.

Apply Dual 6E or 8E along or in tank mixtures in a minimum of 10 gals. of spray mixture per acre unless otherwise specified.

Dry weather following preemergence application of Dual 6E may reduce effectiveness. Cultivate if weeds develop.

Rotational Crops: 1) If treated crop is lost, peanuts, corn, or soybeans may be planted immediately. Do not make a second broadcast application of Dual 6E. If the original application was banded and the second crop is planted in the untreated row middles, a second banded treatment may be applied. 2) Small grains may be planted 4 1/2 months following treatment. Peanuts, corn, soybeans, root crops, and small grains may be planted the spring following treatment. Do not graze or feed forage or fodder from small grains or soybeans to livestock. All other rotational crops may be planted 18 months after application.

Rotational Crops: Refer to the crop rotation instructions for Dual 6E or 8E alone on this label and for Dyanap alone on the Dyanap label.

Table 1: Dual 8E Alone - Peanut

	Broadcast rate per acre	
Soil texture	Less than 3% organic matter	3% organic matter or greater
COARSE: Sand, loamy sand, sandy loam	1 1/2-2 pts.	2 pts.
MEDIUM: Loam, silt loam, silt	2 2 1/2 pts.	2-2 1/2 pts.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2-2 1/2 pts.	2 1/2-3 pts.
muck or peat soils	DO NOT USE	

Table 1: Dual 6E Alone - Peanut

Soil texture	Broadcast rate per acre	
	Less than 3% organic matter	3% organic matter or greater
COARSE: Sand, loamy sand, sandy loam	2-2/3 pts.	2 2/3 pts.
MEDIUM: Loam, silt loam, silt	2 2/3-3 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.
muck or peat soils	DO NOT USE	

Soil texture	Broadcast rate per acre			
	Less than 3% organic matter		3% organic matter or greater	
	Dual 8E	AAtrex 80W*	Dual 8E	AAtrex 80W*
COARSE: Sand, loamy sand, sandy loam	1 1/4 pts.	1.25 lbs.	1 1/2 pts.	1.5 lbs.
MEDIUM: Loam, silt loam, silt	1 1/2 pts.	1.5 lbs.	2 pts.	2 lbs.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2 pts.	2 lbs.	2-2 1/2 pts.	2-2.5 lbs.
muck or peat soils	DO NOT USE			

	Broadcast rate per acre			
	Less than 3% organic matter		3% organic matter or greater	
Soil texture	Dual 6E	AAtrex 80W*	Dual 8E	AAtrex 80W*
COARSE: Sand, loamy sand, sandy loam	1 2/3 pts.	1.25 lbs.	2 pts.	1.5 lbs.
MEDIUM: Loam, silt loam, silt	2 pts.	1.5 lbs.	2 2/3 pts.	2 lbs.
FINE: Silty clay loam, sandy clay loam, silty clay, sandy clay, clay loam, clay	2 2/3 pts.	2 lbs.	2 2/3-3 1/3 pts.	2-2.5 lbs.**
muck or peat soils	DO NOT USE			

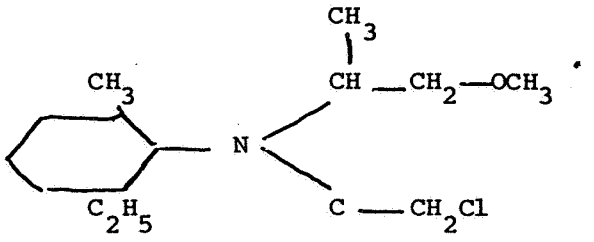
101.0 Chemical and Physical Properties

101.1 Chemical Name:

2-chloro-N-(2 ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl) acetamide

101.2 Common Name: Dual

101.3



101.4 Molecular Weight

283.80

101.5 Physical State

Liquid/White to tan/odorless.

101.6 Solubility

See review by R. Balcomb on 2-13-78.

102 Behavior in the Environment

See review by R. Balcomb on 2-13-78.

102.4 Special Note: Fish Accumulation

See review by R. Balcomb 2-13-78.

103.0 Toxicological Properties

See review by R. Balcomb on 2-13-78.

104.0 Hazard Assessment

104.1 Discussion

The toxicity of metolachlor to birds and mammals is low and given the rates of application (<2.4 ppm in 2" soil sample) and the methods of application (preplant incorporated or pre-emergence broadcast) little contamination of food or habitat should occur.

Testing data also raise little concern over this chemical hazard to aquatic invertebrates: Daphnia magna 48 hour LC_{50} = 25.1 ppm.

A potential problem does exist for this chemical, however, concerning its tendency to bioaccumulate in fish. Metolachlor is only moderately toxic to fish in acute toxicity terms (5-15 ppm - 96 hour) but its stability in soil and water coupled with its bioaccumulative properties require that we assess the hazard carefully. Chronic toxicity to the fathead minnow, One-Generation Reproduction Study - Bobwhite Quail, and One Generation Reproduction Study - Mallard Duck was reviewed by R. Felthousen on 10-2-79 and found to be adequate to support registration. Based on personal contact with Emily Dionne on 3-4-80 of EG&G, Bionomic stating the mortalities in Control "A" fishes were due to bacteria infection throughout fish body.

104.1.1 Likelihood of Non Target Exposure

EEB's greatest concern is the chronic hazard to fish (NEL to Fathead is 1.6 ppm). In order to assess the potential exposure the following calculations were performed.

a. The average size farm pond in Georgia where peanuts are grown

2.6 acres
4.0 feet in depth
17 acres drainage basin minimum
30 acres drainage basin average
50 acres drainage basin maximum
1A = 43,560 square feet

Therefore, considering these dimensions, it is reasonable to assume that in the "worst case" the entire drainage basin would be treated.

b. The volume of the pond was calculated in cu. ft.

43,560 sq. ft./A X 2.6 acres surface X 4.0 ft. (average depth) = 453,024 cu. ft. of water in pond.

c. The weight of the water in pond calculated in pounds:

453.024 cu. ft. X 62.42 lbs of H_2O/cu. ft.^{3}
=28,277,758 lbs of H_2O in pond.

d. The pounds of Dual applied to treated area:

50 A of treated drainage basin X 4 lbs/A of Dual
=200 lbs of Dual applied to drainage basin.

e. (1) 200/28,277,758 = 0.00000 71=7.1 ppm in drainage basin area if 100% run off

(2) 7.1 ppm X 5% = 0.355 ppm in pond if 5% run off

(3) 7.1 ppm X 20% = 1.42 ppm (The "worst case" situation by Pierce 1969).

f. Spray drift results

Chronic no effect level to fathead minnow

Drift est.	
1.6	CL
4.	Al
2.	HT
5.	W
3.	

Drift minimal

1.6	CL
4.	AL
10.	HT
5.	W
3	

The proposed use does not present any unreasonable hazard to fish and wildlife.

104.1.2 Endangered Species Conderations

Based on current personal contract with some of the states (New Mexico, Texas, Alabama and N.C.) involved, and information in EEB files, the proposed use of this product will result in a minimal exposure to endangered species.

104.1.3 Adequacy of Toxicity Data

No new data was reviewed

104.1.4 Additional Data Required

None

107 Conclusion

Due to previous registered similar uses, and peanuts not being the largest crop acreage for such a use, the conditional registration ruling dated May 11, 1979, section 162.18-4 is applicable. The ecological Effects Branch recommends the amended use for conditonal registration.

Curtis E. Laird
Curtis E. Laird
Fishery Biologist
Ecological Effects Branch/HED

David L. Coppage
David L. Coppage
Head, Section #3
Ecological Egffects Branch/HED

Clayton Bushong 6/4/80
Clayton Bushong
Chief,
Ecological Effects Branch/HED

SPRD:PARSONS:pal342P:RAVEN-479-2018:DCR-46579:06/01/80