

JUL 17 1991

**BEST AVAILABLE COPY**

Mr. Melvin M. Graben  
Sandoz Crop Protection Corporation  
1300 East Touhy Avenue  
Des Plaines, IL 60018

Dear Mr. Graben:

Subject: Zorial Rapid 80  
EPA registration No. 55947-77  
Application Dated February 1, 1991 and Resubmission  
Dated July 9, 1991 and FAXed Revision Dated  
July 11, 1991.

The subject proposed amended labeling has been review  
and is acceptable under the Federal Insecticide, fungicide  
and Rodenticide Act as amended, provided that you:

1. Revise the Environmental Hazards statement by adding  
the following statement: "Do not apply directly  
to water, to areas where surface water is present  
or to intertidal areas below the mean high water mark".

If this condition is not complied with, the registration  
will be subject to cancellation in accordance with FIFRA,  
Section 6(e). Your release for shipment of the product  
constitutes acceptance of this condition.

A stamped copy of the labeling is enclosed for your records.

Sincerely your,

Joanne I. Miller  
Product Manager (23)  
Fungicide/Herbicide Branch  
Registration Division (H-7505C)

Enclosure

E.Wilson: Diskette # 0007b: '7-16-91

**ZORIAL RAPID 80®**

**FOR CONTROL OF GRASS AND BROADLEAF WEEDS IN COTTON AND SOYBEANS**

**ACTIVE INGREDIENT:**

norflurazon [4-chloro-5-(methylamino)-2-(alpha, alpha, alpha-trifluoro-m-toyl)-3(2H)-pyridazinone]. . . . .	80%
INERT INGREDIENTS. . . . .	20%
	100%

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

**PRECAUTIONARY STATEMENTS**

**HAZARDS TO HUMANS**

Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes or clothing. In case of skin or eye contact, flush with plenty of water.

**STATEMENT OF PRACTICAL TREATMENT**

**If swallowed:** Call a physician or poison control center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

**If on skin:** Wash with plenty of soap and water. Get medical attention if irritation persists.

**If in eyes:** Flush eyes with plenty of water. Get medical attention if irritation persists.

**ENVIRONMENTAL HAZARDS**

Do not apply directly to any body of water. Do not apply when weather conditions favor run-off or drift from treated areas. Do not contaminate water by cleaning of equipment or disposal of wastes.

EPA Reg. No. 55947-77  
EPA Est. No. 39578-TX-1  
U.S. PAT No. 3,644,355 and 3,834,889  
Net: 5 pounds

ZORIAL RAPID 80 and ZORIAL SPLIT are Registered Trademarks of Sandoz Ltd.

ACCEPTED  
with COMMENTS  
EPA Letter Dated  
*July 17, 1997*  
1997  
Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the pesticide  
registered under EPA Reg. No.  
55947-77

WARRANTY AND CONDITIONS OF SALE

Sandoz Crop Protection Corporation warrants that the chemical composition of this product conforms to the chemical description on the label and is reasonably fit for the purpose stated on the label when used in accordance with directions under normal conditions of use. Sandoz makes no other warranty, express or implied, concerning the use of this product other than as indicated on the label. Buyer assumes all risks of use, storage or handling of this material not in strict accordance with directions given on the label.

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## **I. GENERAL INFORMATION**

ZORIAL RAPID 80 is a preemergence herbicide for the control of certain grass, broadleaf and sedge weeds in cotton and soybeans. Zorial must be applied and incorporated by tillage, irrigation or rainfall before weeds germinate. Susceptible weeds are controlled as they germinate and emerge white before dying.

Do not apply this product through any type of irrigation system.

### **A. REPLACEMENT AND ROTATIONAL CROPS**

For 16 months following the last ZORIAL RAPID 80 application, treated acreage may only be rotated to cotton, soybeans or peanuts.

Peanuts can be planted as a replacement crop 30 days after ZORIAL RAPID 80 application. Prior to planting, a light reworking of the topsoil is recommended to remove existing plant material and to retain herbicidal activity. Do not graze replacement peanut fields with livestock for ten weeks following planting.

Do not graze treated cotton fields with livestock or feed treated cotton forage to livestock. Cover crops planted after harvest should be plowed under and not grazed or harvested. Small grain cover crops should be broadcast planted rather than drilled, to reduce risk of injury.

Multiple or sequential applications can be made, but the total quantity of ZORIAL RAPID 80 applied in a year must not exceed the broadcast rate in pounds per acre for a given soil type.

Read mixing, application and specific crop sections for additional recommendations and precautions.

### **B. MIXING INSTRUCTIONS**

ZORIAL RAPID 80 is approved as a tank mix with other herbicides and liquid fertilizer. Herbicides approved for tank mixes with Zorial are listed in each crop section. All tank mix products must be approved for use on the respective crop.

Predetermine the compatibility of labeled tank mixes under local conditions by mixing small proportional quantities in advance.

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**Amount of Herbicide to Add to One Pint of Spray Carrier  
(Assuming Volume is 25 Gallons per Acre)**

<u>HERBICIDE FORMULATIONS</u>	<u>RATE PER ACRE</u>	<u>LEVEL TEASPOONS</u>
Dry	1 lb.	1-1/2
Liquid	1 pt.	1/2

If herbicide(s) do not ball-up or form flakes, sludge, gels, oily films, layers or other precipitates, then the tested spray mix is compatible. Incompatibility in any of the above described forms will occur within 5 minutes after mixing.

If components are incompatible, the use of a compatibility agent approved for agricultural use on the respective crop is recommended. Rerun the above COMPATIBILITY TEST with a suitable compatibility agent (1/4 teaspoon is equivalent to 2 pints per 100 gallons of spray carrier).

Clean and calibrate the sprayer. Add ZORIAL RAPID 80 to the spray tank already filled with 1/4 the required volume of the water. This will eliminate or minimize foaming. Maintain agitation while filling and spraying. If a by-pass line is used, discharge at the bottom of the tank to minimize foaming.

Do not allow ZORIAL RAPID 80 spray mixture to remain in the spray tank overnight because settling could occur and resuspension would be difficult.

Begin adding wettable powders, flowable liquids, emulsifiable concentrates, and surfactants after the spray tank is 3/4 full. Continue agitation during the addition of all the materials and while filling and spraying.

Products should be added to the spray tank in the following order:

1. Wettable powders and water dispersible granules. Wettable powders should be premixed in a small amount of water. Water dispersible granulars should be added during filling. Allow both to disperse before other products are added. The order of addition is not important.
2. Flowable liquids.
3. Emulsifiable concentrates.
4. Surfactants.

NOTE: ZORIAL RAPID 80 is not compatible with Treflan M.T.F. In addition, ZORIAL RAPID 80 may not always be compatible with other formulations of DNA herbicides. Always predetermine tank mix



compatibility by mixing small proportional quantities in a quart jar or other small container. If after vigorous shaking there are large flakes, gel, sludge, or other signs of incompatibility, do not spray the combination. Always follow the order of addition given in the mixing instructions section of this label.

**C. APPLICATION EQUIPMENT**

Ground Application: Apply the recommended rate of ZORIAL RAPID 80 in 10 or more gallons of water per acre. Apply accurately with a fixed boom sprayer. Equip sprayer with 8002 to 8006 fan-jet nozzle tips or equivalent for broadcast application. Use 8002E to 8006E nozzle tips or equivalent for band applications. Use screen size 50 mesh or larger.

Be sure to calculate the correct amount of product per acre for band applications. Use the following formulas to determine the appropriate rate and volume per treated acre needed for band applications:

$$\begin{array}{rcl} \text{Band Width} & & \text{Broadcast} \\ \text{in Inches} & \times & \text{Rate} \\ \text{Row Width} & & \text{per treated acre} \\ \text{in inches} & & \end{array} = \begin{array}{r} \text{Band Rate} \\ \text{per planted acre} \end{array}$$

$$\begin{array}{rcl} \text{Band Width} & & \text{Broadcast} \\ \text{in Inches} & \times & \text{Volume} \\ \text{Row Width} & & \text{per treated acre} \\ \text{in inches} & & \end{array} = \begin{array}{r} \text{Band Volume} \\ \text{per planted acre} \end{array}$$

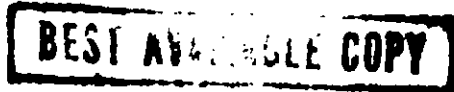
Aerial Application: Apply the recommended rate of ZORIAL RAPID 80 in 5 or more gallons of water per acre. To minimize drift, use ZORIAL RAPID 80 with a drift control agent such as Nalco-Trol®. Do not apply during periods of gusty winds or winds in excess of 5 mph. Aerial spray equipment, flying speed and flying height should be carefully adjusted to provide a uniform application to the soil surface. Use markers to avoid overlapping and possible crop injury.

**II. GENERAL COTTON AND SOYBEAN DIRECTIONS**

A waiting interval of 90 days after the last ZORIAL RAPID 80 application is required before grazing or harvest of soybean forage or hay.

LOCATION OF USE

ZORIAL RAPID 80 can be used for weed control in soybeans in the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia, and in cotton producing states.



**A. APPLICATION INFORMATION**

ZORIAL RAPID 80 can be applied preplant incorporated, preemergence surface, or as a split application in areas with 35 inches or more annual rainfall. In areas with less than 35 inches rainfall, apply only as a preplant incorporated or split application unless irrigation is available for incorporation. ZORIAL RAPID 80 may be used in conventional or conservation (i.e. no-till, reduced till) tillage systems.

Preplant Incorporated Application (PPI): Apply ZORIAL RAPID 80 at the recommended rate prior to planting. Incorporate within one week after application and not deeper than 2-3 inches.

Preemergence Surface Application (PRE): Apply ZORIAL RAPID 80 at the recommended rate at the time of planting and preemergence to weeds. Do not apply when crop is at or near emergence. Emerged weeds must be controlled by tillage prior to application or tankmixing with a postemergence herbicide such as Gramoxone® or Roundup®.

Split Application - THE ZORIAL SPLIT™: First apply one half of the ZORIAL RAPID 80 rate preplant incorporated, then apply the remaining half of the ZORIAL RAPID 80 rate preemergence surface as recommended above.

The soil surface should be free of clods and existing weeds prior to application. Use tillage or a postemergence herbicide to control emerged weeds.

If replanting of cotton or soybeans is necessary, a light reworking of the topsoil will retain the herbicidal activity of ZORIAL RAPID 80.

Crop Safety: If the cotton or soybean plant is stressed during early development, application of ZORIAL RAPID 80 at the label rate may result in temporary bleaching or chlorosis of the leaves from which the plant will recover. Do not apply in areas with poor drainage.



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**B. WEEDS CONTROLLED**

ZORIAL RAPID 80 Herbicide at recommended rates is effective for:

Controlling the following weeds:

Anoda, Spurred (Cottonweed)  
Barnyardgrass  
Carpetweed  
Crabgrass  
Pusley, Florida

Anoda cristata  
Echinochloa crus-galli  
Mullugo verticillata  
Digitaria spp.  
Richardia scabra

Croton, Tropic  
Foxtails  
Goosegrass  
Johnsongrass (seedling)  
Panicum spp.  
Pigweeds  
Purslane  
Sida, Prickly  
Signalgrass  
Velvetleaf

Croton glandulosus  
Setaria spp.  
Eleusine indica  
Sorghum halepense  
Panicum spp.  
Amaranthus spp.  
Portulaca oleracea  
Sida spinosa  
Brachiaria platyphylla  
Abutilon theophrasti

Suppressing the following weeds:

Beggarweed, Florida  
Bermudagrass  
Cocklebur, Common  
Johnsongrass (rhizome)  
Kochia  
Mallow, Venice  
Morningglory  
Nutsedge (Yellow and  
Purple)  
Ragweed, Common  
Sage, Lanceleaf (Mintweed)  
Senna, Coffee  
Sesbania, Hemp  
Sicklepod  
Smartweed, Pennsylvania  
Spurge, Spotted  
Thistle, Russian

Desmodium tortuosum  
Cynodan dactylon  
Xanthium strumarium  
Sorghum halepense  
Kochia scoparia  
Hibiscus trionum  
Ipomoea spp.  
Cyperus esculentus  
C. rotundus  
Ambrosia artemisiifolia  
Salvia retroflexa  
Cassia occidentalis  
Sesbania exaltata  
Cassia obtusifolia  
Polygonum pensylvanicum  
Euphorbia maculata  
Salsola iberica

1. Including DNA resistant goosegrass.

### III. SPECIFIC COTTON DIRECTIONS

Select the rate of ZORIAL RAPID 80 to use based on soil texture and application type from the following table (Read sections following for additional recommendations and precautions):

#### BROADCAST RATES IN POUNDS OF ZORIAL RAPID 80 PER ACRE<sup>1</sup>

SOIL TEXTURE	PPI	PRE	-----split-----	
			ppi	pre
clay loam, silty clay loam, silty clay, clay	2.5	2.5	1.25	1.25
loam, silty loam, silt, sandy clay loam, sandy clay	1.9	1.9	0.95	0.95
Coastal Plains Soils (Southeastern States)	1.25 <sup>3</sup>	1.9 <sup>2</sup>	0.95 <sup>2</sup>	0.95 <sup>2</sup>
sand, loamy sand, sandy loam	1.25	1.25	0.625	0.625

1. Rates shown are for broadcast or treated acres. Be sure to adjust amount of product per planted acre if using a band application (See section I-C).
2. Higher recommended rates are listed for improved control on coarse textured Coastal Plains soils of Southeastern States.
3. Do not use rates higher than 1.25 lbs. PPI on coarse textured Coastal Plains Soils of Southeast.

#### Special Directions for Conservation Tillage Programs:

ZORIAL RAPID 80 may be used in conservation tillage programs such as no-till, minimum till or reduced till. The following additional directions should be followed to avoid crop injury and obtain optimum weed control when using ZORIAL RAPID 80 in conservation tillage programs:

- \* Use a postemergence herbicide such as Gramoxone or Roundup prior to application of ZORIAL RAPID 80 or tankmixed with ZORIAL RAPID 80 to control emerged weeds.
- \* Any cover crop must be killed using an appropriate postemergence herbicide prior to planting. Poor weed control may result if the cover crop is incompletely killed or excessive plant debris is present when ZORIAL RAPID 80 is applied.

- \* Cotton seed should be planted at least 1" deep using a planter having a bubble or ripple type coulter with a straight leading edge and press wheel (a fluted coulter should not be used). The seed must be covered with at least 1" of soil following the planter press wheel. Avoid situation where water will pond over the seed row. Crop injury will occur if seed is not adequately covered with soil.

#### **Special Directions for West Texas and Southwest Oklahoma:**

Apply ZORIAL RAPID 80 PPI, PRE or as a Split (PPI and PRE) application. For best results, incorporate ZORIAL RAPID 80 on flat disced soil at labeled rates for control of spurred anoda, annual grasses and suppression of nutsedge. Destroy furrowed or bedded seed rows from previous year by discing perpendicular to rows ("cross-discing"). A single one inch rain or its equivalent in sprinkler irrigation or shallow mechanical incorporation is necessary within 7 days of a preemergence application.

Soybeans can be planted as a replacement crop 45 days after last application prior to planting cotton.

Do not use on sandy soils (soils with greater than 60% sand content). Do not use ZORIAL RAPID 80 on cotton planted in furrow bottom or on glandless cotton varieties as severe injury may result. Do not use in Gaines County, Texas.

#### **IV. ZORIAL RAPID 80 COMBINATIONS IN COTTON**

ZORIAL RAPID 80 herbicide tank mix or overlay combinations approved for cotton are Bladex®, fluometuron (Cotoran®, Meturon®), Gramoxone®, Lorox®, Probe®, Prowl®, Roundup and trifluralin (Treflan®, Trilin®), Caparol® (see specific use directions for this tank mix below). Read and follow mixing instructions listed in section I-A. See labels of tank mix herbicide for specific rate recommendations, application timing and precautions.



## V. SPECIFIC SOYBEAN DIRECTIONS

Soybeans should be planted to a depth of 1-2 inches and soil firmly packed above and around the seed bed.

Do not use in sand, loamy sand, or sandy loam soils, except in the Coastal Plains area of the Southeast (Do not use PPI or split treatments for soybeans in the Coastal Plains area). In other areas, do not use the PPI treatment for soybeans unless as part of the split application treatment. Do not use in soybeans in West Texas or Southwest Oklahoma.

### BROADCAST RATES IN POUNDS OF ZORIAL RAPID 80 PER ACRE<sup>1</sup>:

Soil Texture	PRE	ppi	Split
			pre
clay loam, silty clay loam, silty clay, clay	2.5	1.25	1.25
loam, silty loam, silt sandy clay loam, sandy clay	1.9	.95	.95
Coastal Plains Soils (SE)	1.25	--- Do Not Use ---	

1. Rates shown are for broadcast or treated acres. Be sure to adjust amount of product per planted acre if using a band application (See section I-C).

Tank mix or overlay combinations may provide improved control of hard to control broadleaf weeds. See combination sections for specific recommendations.

## VI. ZORIAL RAPID 80 COMBINATIONS IN SOYBEANS

Approved ZORIAL RAPID 80 tank mix or overlay combinations for soybeans include acifluorfen (Blazer®, Tackle®), alachlor (Lasso®), Basagran®, Canopy®, Classic®, Dual®, Gramoxone, Lorox, metribuzin (Lexone®, Sencor®), Prowl, Roundup, Scepter®, Storm® and trifluralin (Treflan, Trilin). See tank mix product label for recommended rate, application timing and precautions. Read and follow mixing instructions in section I-A.

Special recommendations for certain ZORIAL RAPID 80 combinations are as follows:

### ZORIAL RAPID 80 plus Scepter or Canopy Preemergence Tank Mix

These combinations can be used alone PRE or as part of the SPLIT application. They are especially recommended for improved control of cocklebur, annual morningglories, hemp sesbania, sicklepod, smartweeds and common ragweed.

Apply a tankmix of ZORIAL RAPID 80 plus Scepter or Canopy preemergence at the rate per treated acre listed in the following table. Refer to respective Scepter or Canopy label for specific directions, rates and restrictions.

Broadcast Product Use Rates

Soil Texture	ZORIAL RAPID 80 Pounds/Acre	Scepter Pints/Acre	Canopy Ounces/Acre
Mississippi Delta Only (Fine Texture Soils)	1.25-1.50*-1.90		See Scepter
clay loam, silty clay loam, silty clay, clay	1.25-1.50*-1.90		or Canopy
loam, silty loam, silt sandy clay loam, sandy clay	1.25-1.50		Label for Specific Rates
Coastal Plains Soils (Coarse Texture Soils-SE)	1.25		

\* Optimum rate

ZORIAL RAPID 80 Preemergence plus Scepter or Classic Postemergence Overlay

Postemergence overlay treatments of Classic or Scepter following ZORIAL RAPID 80 preemergence are recommended for increased control of problem broadleaf weeds such as cocklebur and annual morningglories. Apply ZORIAL RAPID 80 preemergence or as a Split application at the combination rates listed above. Apply Scepter or Classic at the proper rate and postemergence timing as directed by its respective use directions. Refer to overlay product label for specific use directions and restrictions.

ZORIAL RAPID 80 plus Sencor or Lexone Preemergence Tank Mix

This combination is recommended for improved control of hemp sesbania, common ragweed and Venice mallow and other broadleaf weeds.

Apply a tank mix of ZORIAL RAPID 80 plus Sencor or Lexone preemergence surface at the rates per acre (broadcast) recommended in the following table. These rates represent optimum ZORIAL RAPID 80 rates and 1/2 of the normal metribuzin rate. Use the metribuzin use rates (grower use rates) most applicable to local soil type and growing conditions.

Soil Texture	Broadcast Rates			
	Pounds ZORIAL Per Acre	Sencor DF / Lexone DF Pounds Per Acre		
		Less than 2%	2-4%	Over 4%
Mississippi Delta Only	1.25-1.50*-1.90	0.50-1.0	0.58-1.17	0.665-1.33
clay loam, silty clay loam, silty clay, clay	1.25-1.50*-1.90	0.33-0.83	0.425-1.0	0.50-1.17
loam, silty loam, silt sandy clay loam, sandy clay	1.25-1.50	0.25-0.66	0.33-0.83	0.425-1.0
Coastal Plains Soils (SE)	1.25	Do not use	0.25-0.50	0.33-0.66

\* Optimum rate

When using Sencor 4 or Lexone 4L convert to equivalent rates. The amount of Sencor DF or Lexone DF equals two thirds the amount of Sencor 4 or Lexone 4L. For example, one pint of Sencor 4 or Lexone 4L equals 2/3 pound Sencor DF or Lexone DF.

Refer to the ZORIAL RAPID 80 RAPID 80 and Sencor or Lexone labels for further directions and precautions.

Prowl and Scepter are trademarks of American Cyanamid.  
 Basagran and Storm are trademarks of BASF Wyandotte Corp.  
 Cotoran and Dual are trademarks of Ciba-Geigy.  
 Bladex, Canopy, Classic, Karmex, Lorox and Lexone are trademarks of E. I. DuPont de Nemours and Co.  
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