

100-848

ACCEPTED
JAN 27 2000
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 100-848

1/27/2000

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Zorial



RAPID 80[®] HERBICIDE

For control of grass and broadleaf weeds in cotton, peanuts, soybeans, and alfalfa

EPA Reg. No. 100-848 EPA Est. 55618-SC-001
NCP 848A-L1A 0599

Active Ingredient:
Nertflurazon: 4-chloro-5-(methylamino)-2-(*tert*,*tert*-trifluoro-*m*-tolyl)-3-(2*H*)-pyridazinone 78.6%*


Inert Ingredients: 21.4%

Total: 100.0%

* Technical ingredient analysis by isomer specific method AM-0878-1.
Previously 80% by method T-4295

**KEEP OUT OF REACH OF CHILDREN.
CAUTION**
See additional precautionary statements and directions for use inside booklet.

**10 POUNDS
NET WEIGHT**



DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

IMPORTANT: Read the entire **Directions for Use** and the **Conditions of Sale and Warranty** before using this product. If terms are not acceptable, return the unopened product container at once.

CONDITIONS OF SALE AND WARRANTY

The **Directions for Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application all of which are beyond the control of Novartis Crop Protection, Inc. or the Seller. All such risks shall be assumed by the Buyer.

Novartis warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions for Use** subject to the inherent risks referred to above. **Novartis makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty. In no case shall Novartis or the Seller be liable for consequential, special, or indirect damages resulting from the use or handling of this product.** Novartis and the Seller offer this product, and the Buyer and user accept it, subject to the foregoing **Conditions of Sale and Warranty**, which may be varied only by agreement in writing signed by a duly authorized representative of Novartis.

DIRECTIONS FOR USE

Use pesticides properly! Read and follow label directions.

This labeling must be in the possession of the user at the time of the pesticide application.

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN CROP INJURY, POOR WEED CONTROL, AND/OR ILLEGAL RESIDUES.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours. Exception: If the product is soil-injected or soil-incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls
- Waterproof gloves
- Shoes plus socks

Zorial Rapid 80 is a preemergence herbicide for the control of certain grass, broadleaf, and sedge weeds in cotton, peanuts, soybeans, and alfalfa (see specific use directions for each crop). Zorial Rapid 80 must be applied and incorporated by tillage, irrigation, or rainfall before weeds germinate. Susceptible weeds may emerge and turn white before dying.

USE PRECAUTIONS

1. Do not apply this product through any type of irrigation system.
2. Follow directions for each geographic region, soil type, and crop. Applications in geographic regions not specifically mentioned should follow directions for use for mid-South, Southeast, and TX (east of I-35).
3. Do not graze or feed cotton forage. Do not graze or harvest soybean forage or hay within 90 days of last Zorial Rapid 80 application.

Multiple Applications

Multiple or sequential applications can be made in certain geographic areas, 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. Follow **Special Directions** for each geographic region, soil type, and crop.

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

Mixing Instructions

Zorial Rapid 80 may be tank mixed with other herbicides and liquid fertilizer. Herbicides that may be tank mixed with Zorial Rapid 80 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.

Herbicide Formulation	Amount of Herbicide to Add to One Pt. of Spray Carrier (Assuming Volume is 25 Gals. per Acre)	
	Rate Per Acre	Level Teaspoons
Dry	1 lb.	1.5
Liquid	1 pt.	0.5

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 pts./100 gals. 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 bypass 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.

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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 granules 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: In addition, Zorial Rapid 80 may not always be compatible with other formulations of dinitroaniline (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.

Application Equipment

Ground Application: Apply the recommended rate of Zorial Rapid 80 in 10 or more gals. of water per acre. Apply accurately with a fixed-boom sprayer. Equip sprayer with fan-jet nozzle tips or equivalent for broadcast application. Use nozzle tips which provide uniform coverage 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:

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

$$\frac{\text{band width in inches}}{\text{row width in inches}} \times \text{broadcast volume per treated acre} = \text{band volume per planted acre}$$

The solution should be mixed to the maximum label rate and at no point on the field should the solution be applied at a concentration any higher than this rate.

Aerial Application: Apply the recommended rate of Zorial Rapid 80 in 5 or more gals. of water per acre. To minimize drift, use Zorial Rapid 80 with a drift control agent such as Nalco-Trol®.

Aerial Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses, or to applications using dry formulations.

1. The distance of the outermost nozzles on the boom must not exceed $\frac{3}{4}$ the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the **Aerial Drift Reduction Advisory Information** section below.

Aerial Drift Reduction Advisory Information

Information on Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see **Wind, Temperature and Humidity**, and **Temperature Inversions**).

Controlling Droplet Size

- **Volume** – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** – Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles** – Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** – Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** – Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length

For some use patterns, reducing the effective boom length to less than $\frac{3}{4}$ of the wingspan or rotor length may further reduce drift without reducing swath width.

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Application Height

Applications should not be made at a height greater than 10 ft. above the top of the largest plants, unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downward. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.)

Wind

Drift potential is lowest between wind speeds of 3-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 3 mph due to variable wind direction and high inversion potential. Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

This pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, nontarget crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Application Methods

Preplant Incorporated Application (PPI) and Preplant Applications (PPA) for cotton: Apply Zorial Rapid 80 at the recommended rate prior to planting. Incorporate PPI applications within one week after application and not deeper than 2-3 inches.

Preemergence Surface Applications (PRE) for cotton, soybeans, and peanuts: Apply Zorial Rapid 80 at the recommended rate prior to the emergence of the crop and weeds. Do not apply when the crop is at or near emergence (soil cracking). Emerged weeds must be controlled by tillage prior to application or tank mixing with a postemergence herbicide, such as Gramoxone® or Roundup®.

Split Application – The Zorial Split™ for cotton and soybeans: First apply 1/2 of the Zorial Rapid 80 rate preplant incorporated, then apply the remaining 1/2 of the Zorial Rapid 80 rate preemergence surface as recommended above.

The soil surface should be free of clods and existing weeds prior to Zorial Rapid 80 application. Use tillage or a postemergence herbicide to control emerged weeds.

Dry Bulk Fertilizer/Zorial Rapid 80 Blends for Use in Cotton

Zorial Rapid 80 may be coated onto dry bulk granular fertilizers for fall or spring early preplant surface, preplant incorporated, or preemergence applications. Coating may be conducted by either an in-plant bulk system or the on-board system. Individuals or agents selling Zorial Rapid 80 in dry bulk fertilizer blends are responsible for following all state and local regulations regarding fertilizer/herbicide blending. Rate recommendations, restrictions, and weeds controlled are the same as for the sprayable product.

Slurry the desired amount of Zorial Rapid 80 in an adequate amount of water (3 pts. water per lb. of Zorial Rapid 80) required to uniformly cover the fertilizer particle. Apply slurry to fertilizer, using any closed rotary-drum mixer or other commonly used dry fertilizer blender. Spray nozzles must be positioned to provide uniform coverage of Zorial Rapid 80 onto fertilizer during mixing.

Addition of a drying agent may be necessary if the fertilizer/herbicide blend is too wet for uniform application due to high humidity, high urea concentration, and/or low fertilizer use rate. Slowly add the drying agent to the blend until a flowable mixture is obtained. Drying agents are not recommended for use with on-board systems.

Apply 200-750 lbs. of fertilizer/herbicide blend per acre. Application must be made uniformly to the soil to prevent possible crop injury and to assure satisfactory weed control. Coated fertilizer spread at 1/2 rate and overlapped to obtain a full rate will insure a more uniform distribution. A shallow (1 to 2-inch) incorporation is desirable for improved weed control. Deeper incorporation may result in unsatisfactory weed control.

Formula to determine herbicide used per ton of fertilizer:

$$\frac{\text{lbs. of product per acre}}{\text{lbs. of fertilizer per acre}} \times 2000 = \text{lbs. of herbicide per ton of fertilizer}$$

Geographic Information

The following geographic regions are described in this label:

Mid-South, Southeast, and TX (East of I-35), which includes the states of AL, AR, FL, GA, LA, MS, MO (boot heel only), NC, SC, TN, and TX (east of I-35).

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

TX (West of I-35), Southwest OK, and NM which includes the states of NM, OK (west of I-35 and south of I-40), and TX (west of I-35).

Precaution: Zorial Rapid 80 may not be used in conventional or conservation tillage cotton systems in areas with more than 65% sand. Zorial Rapid 80 should only be applied as a preemergence application as part of a program in sequence with Prowl® or in combination with Caparol® 4L.

AZ (includes all areas within state boundaries)

Precaution: Zorial Rapid 80 may be applied only as a preplant incorporated application. Shallow incorporation is required. When cotton is irrigated up, do not exceed 0.60 lbs./A preplant incorporated when applied prior to listing and irrigate every other furrow. Do not exceed 0.60 lbs./A on soils with 65% or more sand. Do not apply by air in AZ.

Weeds Controlled

Zorial Rapid 80 at recommended rates is effective for

Controlling the following weeds:

Common Name	Scientific Name
Anoda, Spurred (Cottonweed)	<i>Anoda cristata</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>
Bluegrass, Annual	<i>Poa annua</i>
Brome, Downy	<i>Bromus tectorum</i>
Carpetweed	<i>Mullugo verticillata</i>
Cheat	<i>Bromus secalinus</i>
Chickweed	<i>Stellaria media</i>
Crabgrass	<i>Digitaria</i> spp.
Croton, Tropic	<i>Croton glandulosus</i>
Flixweed	<i>Descurainia sophia</i>
Foxtails	<i>Setaria</i> spp.
Goosegrass*	<i>Eleusine indica</i> *
Johnsongrass (seedling)	<i>Sorghum halepense</i>
Junglerice	<i>Echinochloa colona</i>
Mustards	<i>Brassica</i> spp.
<i>Panicum</i> spp.	<i>Panicum</i> spp.
Pigweeds	<i>Amaranthus</i> spp.
Purslane	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Rescuegrass	<i>Bromus catharticus</i>
Ryegrass, Italian (Annual Ryegrass)	<i>Lolium multiflorum</i>
Shepherdspurse	<i>Capsella bursa-pastoris</i>
Sida, Prickly	<i>Sida spinosa</i>
Signalgrass	<i>Brachiaria platyphylla</i>
Velvetleaf	<i>Abutilon theophrasti</i>

*Including dinitroaniline (DNA)-tolerant goosegrass

Suppressing the following weeds:

Common Name	Scientific Name
Beggarweed, Florida	<i>Desmodium tortuosum</i>
Bermudagrass	<i>Cynodon dactylon</i>
Cocklebur, Common	<i>Xanthium strumarium</i>
Fiddleneck	<i>Amsinckia intermedia</i>
Groundsel	<i>Senecio vulgaris</i>
Henbit	<i>Lamium amplexicaule</i>
Johnsongrass (rhizome)	<i>Sorghum halepense</i>
Kochia	<i>Kochia scoparia</i>
Mallow, Venice	<i>Hibiscus trionum</i>
Malva	<i>Malva</i> spp.
Morningglory	<i>Ipomoea</i> spp.
Nutsedge, Yellow	<i>Cyperus esculentus</i>
Nutsedge, Purple	<i>Cyperus rotundus</i>
Ragweed, Common	<i>Ambrosia artemisiifolia</i>
Sage, Lanceleaf (Mintweed)	<i>Salvia retroflexa</i>
Sandbur	<i>Cenchrus</i> spp.
Senna, Coffee	<i>Cassia occidentalis</i>
Sesbania, Hemp	<i>Sesbania exaltata</i>
Sicklepod	<i>Cassia obtusifolia</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Sowthistle	<i>Sonchus oleracea</i>
Spurge, Spotted	<i>Euphorbia maculata</i>
Thistle, Russian	<i>Salsola iberica</i>

Crop Safety

If the cotton, peanut, 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.

Replacement and Rotational Crops

For 16 months following the last Zorial Rapid 80 application, treated acreage must only be rotated to alfalfa, cotton, soybeans, or peanuts. Visual symptoms of injury (loss of pigment [whitening] in the leaf-veins) and stand reduction may occur in rotational crops of soybeans or peanuts in TX (west of I-35), southwest OK, and NM planted within 16 months following the last Zorial Rapid 80 application. In AZ, treated acreage must only be rotated to cotton.

Peanuts can be planted as a replacement crop (e.g., following hail damage) 30 days after the last Zorial Rapid 80 application. Soybeans can be planted as a replacement crop 45 days after the last Zorial Rapid 80 application. In areas of the mid-South, Southeast, and TX (east of I-35), a light reworking of the soil is recommended to remove existing plant material and maintain herbicidal activity. Zorial Rapid 80 treated acreage may be planted to a cover crop to control soil erosion. Cover crops should be plowed under and not grazed or harvested for 16 months following the last application of Zorial Rapid 80. Small grain cover crops should be broadcast planted rather than drilled to reduce risk of injury.

If replanting to cotton, peanuts, or soybeans is necessary, a light reworking of the topsoil will retain the herbicidal activity of Zorial Rapid 80. In AZ replanting will mean irrigating up, so irrigation must be every other furrow.

SPECIFIC COTTON DIRECTIONS

Zorial Rapid 80 can be used for weed control in all cotton producing states, except CA.

The specific Directions for Use of Zorial Rapid 80 are given below for each geographic region of use (see Replacement and Rotational Crops for description of geographic regions). Select the rate of Zorial Rapid 80 to be used based on soil texture and application type within each geographic region from the sections listed below. Follow the Special Directions sections for specific recommendations and precautions.

Do not graze or feed cotton forage. Zorial Rapid 80 must be applied and incorporated by tillage, irrigation, or rainfall before weeds germinate.

Special Directions for the Mid-South, Southeast, and TX (East of I-35)

Cotton Broadcast Rates in Lbs. of Zorial Rapid 80 Per Acre*

Soil Texture	PPI	PRE	Split PPI/PRE
clay loam, silty clay loam, silty clay, clay	2.5	2.5	1.25/1.25
loam, silt loam, silt, sandy clay loam, sandy clay	1.9	1.9	0.95/0.95
Coastal Plains soils (Southeastern states)	1.25***	1.9**	0.95**/0.95**
sand, loamy sand, sandy loam	1.25	1.25	0.625/0.625

*Rates shown are for broadcast or treated acres. Be sure to adjust amount of product per planted acre if using a band application (see the Application Equipment section).

**Higher recommended rates are listed for improved control on coarse-textured Coastal Plains soils of Southeastern states.

***Do not use rates higher than 1.25 lbs. PPI on coarse-textured Coastal Plains soils of the Southeast.

Special Directions for TX (West of I-35), Southwest OK, and NM

Broadcast Rates in Lbs. of Zorial Rapid 80 Per Acre*

Soil Texture	PRE
FINE clay loam, silty clay loam, silty clay, clay	0.6-1.0**
MEDIUM loam, silt loam, silt, sandy clay loam, sandy clay	0.6-1.0**
COARSE sandy loam	0.6

*Rates shown are for broadcast or treated acres. Be sure to adjust amount of product per planted acre when using a band application (see the Application Equipment section).

**Applications must be made on a 10 to 14-inch band for Zorial Rapid 80 rates above 0.6 lb./A. The 0.6 lb./A rate may be applied as a banded or broadcast application.

Visual symptoms of injury (loss of pigment [whitening] in the leaf veins) and stand reduction may occur in rotational crops of soybeans or peanuts in TX (west of I-35), southwest OK, and NM planted within 16 months following the last Zorial Rapid 80 application.

At the recommended rates for this geographic region, Zorial Rapid 80 should be applied preemergence in a tank mix with one of the herbicides listed below in order to give an adequate spectrum of weed control. Zorial Rapid 80 should be applied alone only at the 1.0 lb./A rate and only as a sequential overlay following a PPI treatment of Prowl or Treflan®. See below for tank mix options.

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Shallow incorporation with finger tines on the planter (scratch incorporation) at planting is recommended for all banded preemergence Zorial Rapid 80 applications.

Rotate only to cotton, soybeans, or peanuts within the first 16 months after the last application.

Do not use on soil with greater than 65% sand content. Do not use on cotton planted in furrow bottom. Do not use on glandless cotton varieties.

Special Directions for AZ

Zorial Rapid 80 may be applied as a preplant incorporated (PPI) herbicide for added suppression of nutsedge and morningglory when used in tank mixtures with Caparol herbicide. A banded preplant incorporated application can be made. Be sure to adjust the amount of product per planted acre when using a band application (see the Application Equipment section). In AZ, apply Zorial Rapid 80 preplant incorporated only.

Broadcast Rates in Lbs. of Zorial Rapid 80 Per Acre

Soil Texture	PPI
FINE clay loam, silty clay loam, silty clay, clay	1.25
MEDIUM loam, silt loam, silt, sandy clay loam, sandy clay	0.95
COARSE sand, loamy sand, sandy loam	0.625

Do not exceed 0.60 lb./A on soils with 65% or more sand. Shallow incorporation to a depth of 1-2 inches is required. Seed placement must be below incorporation zone.

Cotton irrigated up should receive irrigation in every other furrow following planting to avoid crop injury.

Cotton replanted following Zorial Rapid 80 application should receive irrigation in every other furrow only.

Zorial Rapid 80 can be tank mixed with Caparol 4L, Treflan HFP, or Prowl as part of a PPI program. Follow labels of tank mix herbicide for specific rate recommendations, timing, and use precautions.

In AZ, treated acreage must only be rotated to cotton.

Do not use on glandless cotton varieties.

Failure to observe these directions may result in temporary whitening of cotton or stand thinning.

Zorial Rapid 80 Combinations in Cotton

Zorial Rapid 80 tank mix or overlay combinations approved for cotton are Bladex®, fluometuron (Cotoran®), Meturon®, Gramoxone, Lorox®, Prowl, Roundup, trifluralin (Treflan HFP, Trilin®), and Caparol. Read and follow the Mixing Instructions section. Follow labels of tank mix herbicide for specific rate recommendations, timing, and use precautions.

Zorial Rapid 80 + Caparol 4L Tank Mix

Special preemergence tank mix for improved suppression of Annual Morningglory, Lanceleaf Sage, Prairie Sunflower, Annual Black Nightshade, and Nutsedge.

Areas of TX (West of I-35), Southwest OK, and NM

Observe all precautions listed under Special Directions for Areas of TX (West of I-35), Southwest OK, and NM. Do not use Zorial Rapid 80 tank mix as a PPI or split application.

Zorial Rapid 80 Broadcast Tank Mix Rate per Treated Acre*

Soil Texture	Zorial Rapid 80 (lbs./A)	+	Caparol 4L** (pts./A)
FINE clay loam, silty clay loam, silty clay, clay	0.6-1.0	+	2.4
MEDIUM loam, silt loam, silt, sandy clay loam, sandy clay	0.6-1.0	+	2.4
COARSE sand, loamy sand, sandy loam	DO NOT USE		

* Applications must be made on a 10 to 14-inch band for Zorial Rapid 80 rates above 0.6 lb./A. The 0.6 lb./A rate may be applied as a banded or broadcast application. Rates shown are for tank mix broadcast (treated) acres. Be sure to adjust amount of product per planted acre when using a band application (see the Application Equipment section).

**Do Not Use Zorial Rapid 80 tank mix with Caparol 4L on soils containing more than 50% sand.

These combinations may be tank mixed with Prowl and applied preemergence or applied as a sequential overlay following a trifluralin or Prowl application. Shallow incorporation with finger tines on the planter (scratch incorporation) at planting is recommended for all banded preemergence Zorial Rapid 80 tank mix combinations.

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Areas of the Mid-South, Southeast, TX (East of I-35), and AZ

Zorial Rapid 80 may also be tank mixed with Caparol in areas of the mid-South, Southeast, TX (east of I-35), and AZ. **Note:** Caparol has special restrictions as regards soil type. Carefully read and observe all the directions for use, precautions, and limitations on the Caparol label.

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 with Zorial Rapid 80 in conservation tillage programs:

1. Do not use in TX (west of I-35), southwest OK, and NM in conservation tillage programs where the soil is greater than 65% sand.
2. Use a postemergence herbicide, such as Gramoxone or Roundup, prior to application of Zorial Rapid 80 or tank mix Zorial Rapid 80 with these products to control emerged weeds.
3. 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.
4. Cotton seed should be planted at least 1 inch 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 inch of soil following the planter press wheel. Avoid situations where water will pond over the seed row. Crop injury will occur if seed is not adequately covered with soil or water ponds over the seed row.

SPECIFIC SOYBEAN DIRECTIONS

Zorial Rapid 80 can be used for weed control in soybeans in the states of AL, AR, FL, GA, KY, LA, MS, MO, NC, OK, SC, TN, TX, and VA.

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 TX (west of I-35) or southwest OK, or NM.

Do not graze or harvest soybean forage or hay within 90 days of last Zorial Rapid 80 application.

Zorial Rapid 80 must be applied and incorporated by tillage, irrigation, or rainfall before weeds germinate.

Soybean Broadcast Rates in Lbs. of Zorial Rapid 80 Per Acre*

Soil Texture	PRE	Split PPI/PRE
clay loam, silty clay loam, silty clay, clay	2.5	1.25/1.25
loam, silt loam, silt, sandy clay loam, sandy clay	1.9	0.95/0.95
Coastal Plains soils (Southeastern states)	1.25	DO NOT USE

*Rates shown are for broadcast or treated acres. Be sure to adjust amount of product per planted acre if using a band application (see the **Application Equipment** section).

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

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 HFP, Trilin). See tank mix product label for recommended rate, application timing, and precautions. Read and follow the **Mixing Instructions** section.

Special recommendations for certain Zorial Rapid 80 combinations are as follows:

Zorial Rapid 80 + 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 tank mix of Zorial Rapid 80 + 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.

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Broadcast Product Use Rates

Soil Texture	Zorial Rapid 80 lbs./A	Scepter pts./A	Canopy oz./A
Mississippi Delta only (fine-textured soil)	1.25-1.50*-1.90	See Scepter or Canopy for specific rates	
clay loam, silty clay loam, silty clay, clay	1.25-1.50*-1.90		
loam, silt loam, silt, sandy clay loam, sandy clay	1.25-1.50		
Coastal Plains soils (coarse-textured soils – SE)	1.25		

*optimum rate

Zorial Rapid 80 Preemergence + 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 morning-glories. 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 + Sencor or Lexone – Preemergence Tank Mix

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

Apply a tank mix of Zorial Rapid 80 + 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	Zorial Rapid 80 lbs./A	Sencor DF/Lexone DF lbs./A		
		less than 2% OM	2-4% OM	over 4% OM
Mississippi Delta only (fine-textured soil)	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, silt 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 (coarse-textured 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 2/3 the amount of Sencor 4 or Lexone 4L. For example, 1.0 pt. of Sencor 4 or Lexone 4L equals 2/3 lb. of Sencor DF or Lexone DF.

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

SPECIFIC PEANUT DIRECTIONS

Zorial Rapid 80 can be used for weed control in peanuts in the states of AL, FL, GA, MS, NC, NM, OK, SC, TX, and VA.

Zorial Rapid 80 will control certain grass and broadleaf weeds when applied preemergence at planting (see the **Weeds Controlled** section). Only one application per crop is allowed in peanuts and this application must be made at planting. Zorial Rapid 80 must be applied and incorporated by tillage, irrigation, or rainfall before weeds germinate.

For use only in the states of AL, FL, GA, MS, NC, NM, OK, SC, TX, and VA on runner type or Virginia-type peanut cultivars, including 'Florunner', 'GK-7', 'GA-Runner', 'Southern Runner', 'NC 7', 'VA 93B', 'NC 9', 'NC-V11', 'VA-C 92R', 'AgraTech VC-1', and 'NC 10C'.

Do not use Zorial Rapid 80 in other states or on spanish peanut cultivars. Crop tolerance of cultivars not listed on this label may not be acceptable.

Rate Selection

Broadcast Rate

East of the Mississippi River	1.5-1.8 lbs. of Zorial Rapid 80 per treated acre (Apply preemergence only)
West of the Mississippi River	0.5 lb. of Zorial Rapid 80 per treated acre (Apply preemergence only)

Use the higher recommended rate when Zorial Rapid 80 is used alone or on fine-textured soils, or where populations of susceptible weeds are very heavy. Use of rates higher than 0.5 lb. of Zorial Rapid 80 west of the Mississippi River will result in crop injury and is not recommended.

Apply as a preemergence surface application immediately after planting and before weeds or crop emerge.

Use Precautions

- Do not use on peanuts that were treated preplant incorporated with Vernam®, as crop injury will result. Do not apply Zorial Rapid 80 when peanuts are near cracking, at cracking, or emerged, as crop injury may result. Make only one application per year.
- Crop injury may result from the use of Zorial Rapid 80 following Dual when used on very coarse-textured soils, such as sand.
- Delaying applications of postemergence herbicides, such as Starfire®, may be advisable if severe crop whitening is observed (greater than 50%). Do not apply in areas with poor drainage.

Temporary whitening of the peanut leaves may occur. If the peanut plant is not stressed by adverse environmental factors or diseases, this whitening generally dissipates within 4-6 weeks after planting. Early season whitening of peanuts from Zorial Rapid 80 does not result in significant crop stunting, stand reduction, or yield loss, if the plants are not stressed by environmental conditions, improper cultural practices, or diseases. High levels of seedling disease, adverse environmental stress, or improper application may result in increased levels of crop whitening or injury.

Sequential Applications/Tank Mixes in Peanuts

Read and follow all label directions for other herbicides listed below used in either sequential applications or as tank mix partners with Zorial Rapid 80 for specific rate recommendations, application timing, and precautions.

Application of Zorial Rapid 80 to freshly tilled soil will give optimum weed control with crop safety. However, if weeds are emerged at the time of application, use a suitable burndown agent, such as Starfire (paraquat), to control emerged weeds. The burndown herbicide may be applied prior to or tank mixed with the Zorial Rapid 80 treatment.

Zorial Rapid 80 is especially useful for control of Florida beggarweed when in weed control programs that utilize cultivation or both preemergence and postemergence herbicides.

Zorial Rapid 80 can be applied as a sequential overlay treatment following a preplant incorporated application of Balan® DF, Sonalan® HFP, Prowl, or Dual. Do not apply Zorial Rapid 80 to peanuts that have been treated with Vernam because of increased potential for crop injury. Zorial Rapid 80 tank mixes with Lasso and Dual will increase preemergence control of the "difficult to control species", such as Florida beggarweed and yellow nutsedge, and will broaden the spectrum of species controlled. Zorial Rapid 80 may be applied as a preemergence tank mix with Lasso and/or Dual.

Under most conditions, a burndown application of Starfire (or tank mixes of Starfire and Basagran and/or 2,4-DB) applied early postemergence will improve residual control of Florida beggarweed obtained with Zorial Rapid 80 by removing Florida beggarweeds that germinated or emerged prior to the activation of Zorial Rapid 80. Sequential applications of Classic, Pursuit®, and Butoxone® (2,4-DB) may be used following Zorial Rapid 80 to control tolerant weeds.

SPECIFIC ALFALFA DIRECTIONS

Zorial Rapid 80 can be used for weed control in alfalfa in the states of AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NV, OK, OR, SC, TN, TX, WA, and the portions of CO, KS, and MO south of I-70.

Use Precautions

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

Zorial Rapid 80 is only recommended for preemergent weed control in established alfalfa; do not apply to seedling alfalfa until it has emerged and been actively growing for 5 months.

Do not apply Zorial Rapid 80 within 28 days of harvest.

Soil disturbances, such as rodent burrowing and fire ant mounding, may result in temporary bleaching or reduced growth in alfalfa treated with Zorial Rapid 80.

Do not apply to alfalfa planted with small grain or grass companion cover, unless injury to the companion crop is acceptable. Alfalfa seed germinating after Zorial Rapid 80 is activated in the soil will not become established.

Application Timing and Rates

Zorial Rapid 80 may be applied to healthy stands of established alfalfa at 1.25 lbs./A; do not apply to seedling alfalfa until it has emerged and been actively growing for 5 months. An additional 1.25 lbs./A may be applied later in the first crop year to extend late season weed control.

Application in each of the following crop years may be made at 1.25-2.5 lbs./A, depending upon weed pressure, soil texture, and cultural practices:

- Use the lower rate on coarse soils (sand, foamy sand, sandy loam) and when low populations of easily controlled annual weeds are expected.
- Use the higher rate on medium- to fine-textured soils (sandy clay through clay) and when heavier weed pressure is expected. The 2.5 lb. maximum annual rate may be applied in a single application or in split applications.

Do not apply more than 2.5 lbs./A per calendar year.

Incorporation by rainfall, irrigation, or tillage (for example, by spring tine, disk, or spike tooth harrow) is necessary to activate Zorial Rapid 80 in soil before weed seeds germinate and emerge. A minimum of 1/2-1 inch of rainfall or irrigation is necessary to incorporate Zorial Rapid 80.

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Application may be made during dormancy, as long as soil is not frozen or in actively growing stands. On nondormant alfalfa, application should always follow mowing and removal of hay to ensure spray reaches the soil surface. In nonirrigated areas which have less than 15 inches annual moisture (rainfall and snow combined) or less than 4 inches spring rainfall, fall or winter applications are recommended. Fall or winter applications are necessary for control of winter annual weeds.

Zorial Rapid 80 will not control emerged weeds. Established weeds or weeds that emerge before activation may be controlled with postemergent herbicides that bear labeling for use in the culture of alfalfa.

Tank Mixes

Zorial Rapid 80 may be tank mixed with any of the following products that bear labeling for use on alfalfa. Read and follow directions for use, precautionary statements, and rates of application of these tank mix partners.

Trademark	Active Ingredient
Butyrac®	2,4-DB
Gramoxone	paraquat
Pursuit	imazethapyr
Velpar®	hexazinone
Sinbar®	terbacil
Lexone, Sencor	metribuzin
Treflan, Trilin	trifluralin
Eptam®	EPTC
Poast®	sethoxydim
Kerb®	pronamide
Karmex®	diuron

Rotational Crop Restrictions for Alfalfa

Soils with less than 65% sand in AZ and CA and all soils in AL, AR, FL, GA, LA, MS, NC, NM, OK, SC, TN, TX, and the portions of CO, KS, and MO south of I-70 treated with Zorial Rapid 80 may only be rotated to cotton, soybean, peanut, or asparagus within 16 months after application. Soybean and peanut may show pigment loss (bleaching in leaf veins) and/or stand reduction in TX (west of I-35), southwest OK and NM if planted within 16 months following the last Zorial Rapid 80 application.

Soils with 65% sand or more in AZ and CA and all soils in ID, NV, OR, and WA treated with Zorial Rapid 80 may only be rotated to cotton, soybean, peanut, or asparagus within 16 months with a minimum of two summer periods after application. Additionally, intended rotational crops must be bioassayed prior to planting. Rotational crops may be planted when no signs of phytotoxicity (bleaching or pigment loss in leaf veins) are observed in bioassay plantings for 4 months following emergence.

Alfalfa stands treated with Zorial Rapid 80 should be irrigated as in normal production the year prior to rotation in AZ, CA, eastern OR, and eastern WA.

STORAGE AND DISPOSAL

Storage

Do not contaminate water, food, or feed by storage or disposal.

Pesticide Disposal

Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If waste cannot be disposed of by use according to label instructions, contact your state pesticide or environmental control agency or hazardous waste representative at the nearest EPA Regional Office for guidance.

Container Disposal

Completely empty and triple rinse container into application equipment. Then dispose of empty container in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

CAUTION

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 or if available by administering syrup of ipecac. 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 **inhaled**: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

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Personal Protective Equipment

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Control Statements

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

Do not contaminate water when disposing of equipment wash water. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not allow this material to drift onto neighboring crops or noncrop areas or use in a manner or at a time other than in accordance with label directions because animal, plant or crop injury, illegal residues, or other undesirable results may occur.

Norflurazon can contaminate surface water through spray drift. Under some conditions, norflurazon may also have a high potential for runoff into surface water (primarily via dissolution in runoff water) for several months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas overlaying extremely shallow ground water, areas with in-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas overlaying tile drainage systems that drain to surface water.

This chemical is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

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Balan® DF trademark of United Agri Products

Basagran®, Blazer®, Poast®, and Storm® trademarks of BASF Corporation

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