

US EPA ARCHIVE DOCUMENT

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105001  
SHAUGHNESSEY NO.

18  
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 12-19-83 OUT 1-30-84

FILE OR REG. NO. 241-238

PETITION OR EXP. PERMIT NO. \_\_\_\_\_

DATE OF SUBMISSION 12-7-83

DATE RECEIVED BY HED 12-19-83

RD REQUESTED COMPLETION DATE 2-1-84

EEB ESTIMATED COMPLETION DATE 2-1-834

RD ACTION CODE/TYPE OF REVIEW 450/protocol

TYPE PRODUCT(S): I, D, H, F, N, R, S Insecticide/Nematicide

DATA ACCESSION NO(S). \_\_\_\_\_

PRODUCT MANAGER NO. W. Miller (16)

PRODUCT NAME(S) Counter 15-G

COMPANY NAME American Cyanamid Company

SUBMISSION PURPOSE Submission of field study protocol for review

| SHAUGHNESSEY NO. | CHEMICAL, & FORMULATION    | % A.I.     |
|------------------|----------------------------|------------|
| <u>105001</u>    | <u>Terbufos (granular)</u> | <u>15%</u> |
| _____            | _____                      | _____      |
| _____            | _____                      | _____      |
| _____            | _____                      | _____      |



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

MEMORANDUM

2 FEB 1984

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

TO: Marilyn Mautz, PM Team 16  
Registration Division TS-767C

SUBJECT: Review of Proposed Terbufos Field Study Protocols -  
Reg. No. 241-238; Date of Submission 12-7-83.

THRU: Dave Copping, Head Sec. #3 *DC*  
Ecological Effects Branch/HED TS-769C

THRU: Clayton Bushong, Chief *CB*  
Ecological Effects Branch/HED TS-769C

We have reviewed the protocol American Cyanamid proposed to study the potential for effects on nontarget terrestrial and aquatic wildlife of applications of Counter 15-G (terbufos) a granular insecticide-nematicide registered for use on corn. This protocol was submitted in response to the issuance of the Agency's guidance package on reregistration of terbufos under a registration standard, and in response to the Agency's subsequent concerns over the proposal for a conditional registration of an unincorporated, aerial, broadcast postemergence application of Counter 15-G to corn.

We find the submitted protocol completely inadequate for purposes of providing information to study the potential effects on non-target organisms. The protocol attempts to integrate several important field studies required by the Agency into one study. We have previously commented on the advisability of such a plan and cautioned that specific protocols should be submitted prior to beginning the study (see Bascietto's terbufos review dated 11-28-83).

The work envisioned by the submitted protocol is much too limited. It gives the impression of a elementary field study of limited scope, and inadequate technique, resulting in a tabulation of acute bird mortality on a treated plot as compared to observations on a control area. The aquatic portion is completely inadequate in design, scope and technique. The application rate of the at planting treatment ("0.15 kg/1000 m") is too low. It must be corrected to conform to the maximum label authorized rate, i.e. 16 oz. product per 1000 feet of row with a minimum of 20" row spacing.

The information required to assess the potential for field effects to nontarget organisms must be gathered through studies of broader scope which focus on as many ecological parameters as are appropriate in view of the potential for exposure and the behavior of the organisms under study. Considering the extensive volume of terbufos used on a very significant portion of the corn acreage in the USA today, and its very high acute toxicity (chronic data is pending), the scope and quality of the field studies should be broad enough, and be of a caliber high enough to provide a very good degree of confidence in the results.

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We suggest a meeting of the company and EPA be held to discuss protocols for such studies. We believe the attached outlines are good initial guides with which the company may prepare protocols for discussion. Again, we stress that to decrease the possibility of an unproductive field effort, no field work should commence until details of the site, protocols, materials, methods, etc., have been agreed upon by EEB and the company.

We will be more than happy to answer any questions you or the company may have concerning data requirements and protocols. Please give us a reasonable amount of lead time to prepare our staff to meet with and discuss the details of this work with American Cyanamid.

*John J. Baschetto 1/31/84*

John J. Baschetto  
Wildlife Biologist, Sec. 3  
Ecological Effects Branch, HED TS-769C

(2) Attachments

## TERRESTRIAL ORGANISM - Potential for biological effects

### OBJECTIVE

The company provides a listing of specific objectives they intend to achieve through the study.

Generally, the objectives are to monitor potential effects on avian/mammalian species of applications of granular terbufos to corn fields. This will involve observations on birds, mammals and their prey items, after maximum label directed rates of application.

### EXPERIMENTAL METHODS

#### A. Summary of Methods

(Provided by EEB to indicate the scope of the work we expect)

The study area will consist of corn fields which are treated with Counter 15-G (terbufos) insecticide-nematicide and comparable fields which are untreated and serve as controls. The area of study for potential effects to nontargets is NOT limited to the corn fields since nontargets under study generally utilize other areas surrounding cornfields and may easily leave the fields prior to exhibiting symptoms or dying. Carcass and feather spot surveys will be conducted along transects established by generally accepted wildlife management techniques. The census techniques should be designed to determine differences between treated and untreated areas. These techniques include surveys of sightings, songs, territories and nests, to include an extensive area surrounding the treated fields. Use of radio-telemetry is used to study a portion of the exposed populations. Observations for behavior are essential in assessing potential for effects. Samples of vegetation and soil from the treated and untreated areas are taken to study exposure to residues. Studies of exposed granule numbers can also be made. Studies of earthworms and other avian dietary items found in and around fields are made. Studies of brain cholinesterase levels are made to assess acute poisoning potential. Carcass and stomach residue analyses are standard parameters for observations.

#### B. STUDY LOCATION AND FIELD DESCRIPTION

The study should be conducted in the corn belt. The exact locations are chosen by the company and reviewed by EPA prior to initiation. The experimental and control fields should be separated by significant distances so as to assure the separation of populations. Several different fields and locations for experimental and controls are expected, as this adds to statistical confidence and more closely simulates "real world" conditions. Individual corn fields should be at least 150 acres. The extended area of study (surrounding fields) should include the home range of the farthest ranging passerine species noted in the pre-treatment census, but can be reduced to include a reasonable agreed upon distance as long as a valid census can be achieved. Farther ranging species may be studied by radio-telemetry. The extended area of study includes various

## terrestrial protocol outline (con't.)

ecological niches such as forest edge, hedgerow, pasture, wind breaks, streams, ponds, oldfields, meadows, marshes, etc. .

Detailed maps of the fields and areas studied are presented in the final report. Photographs of the proposed study sites are provided to EEB prior to final approval of the study design.

### C. Treatment

Counter 15-G granular pesticide is applied according to maximum label authorized rates and minimum crop spacing, with the methods of application resulting in maximum exposure to terrestrial organisms (e.g., aerial broadcast results in more exposure than soil incorporation). No irrigation is applied unless label directed. If the company desires to study the effects of irrigation, they should make provisions to do this as a separate portion of the study in a different location. Rainfall data is collected during the entire project. Every effort is made to eliminate the use of any other pesticides during the project. If these become necessary, appropriate monitoring is instituted, but the study may be compromised beyond acceptability in this event.

### D. Sampling Skills and Equipment

1. Individuals trained in recognition skills (visual, song, nesting, and behavior) for avian species likely to be observed at the selected study site at the time of the study. This would include endemic and migratory species. Individuals trained and experienced in the use of radio-telemetry with birds will also be necessary. These individuals should also be trained in identification of mammals endemic to the area.
2. In order to provide a study of high caliber, the efficiency of surveys will have to be determined. This is also known as "study sensitivity" determination and is essential for interpreting the results of the study in a meaningful way for hazard assessment.
3. Real birds, rather than decoys will be used to determine scavenger loss as well as carcass finding efficiencies of the surveyors.
4. Company provides details on equipment to be used such as: binoculars, tape measures, stakes/flagging, sample containers for vegetation, carcass sample containers, storage/freezing methods and equipment, coolers, radio telemetry equipment, remote weather station.

Terrestrial protocol outline (con't.)

E. Sampling Procedures

1. Preparation

- a. Company provides details on the design (including the statistical rationale) and marking of transects (provide references). The transects include a strip to both sides of a line marking the mid-point and a 100 ft. corridor above the ground. The width of each transect can depend on the number of search personnel and the methods referenced for surveys. In any case, the transects must represent valid census techniques.
- b. Carcass survey efficiencies should be determined through the use of real birds which are sacrificed and distributed in various locations. This should be continued through the pretreatment phase of the study.
- c. The presence of defined bird territories should be noted.
- d. The presence of nests would be determined at this time.
- e. Description of area will include dominant vegetation height and species.
- f. Assurance is made at this time of adequate buffer between control and experimental areas.

2. Pretreatment

- a. The following schedule is a minimum for pretreatment surveys;

|      |      |       |    |           |
|------|------|-------|----|-----------|
| - 14 | days | prior | to | treatment |
| - 7  | "    | "     | "  | "         |
| - 6  | "    | "     | "  | "         |
| - 5  | "    | "     | "  | "         |
| - 4  | "    | "     | "  | "         |
| - 3  | "    | "     | "  | "         |
| - 2  | "    | "     | "  | "         |
| - 1  | "    | "     | "  | "         |

- b. Transect surveys should be conducted early in the morning to increase the opportunity for bird sightings and limit any variability associated with diurnal changes. A sufficient number of observation teams should be available to survey all transects prior to a specific time which should remain constant on all survey days. Company provides details.
- c. Survey teams are distributed in a random manner each day to reduce bias.

## Terrestrial protocol outline (con't.)

- d. Survey teams note and record on maps (photograph when possible) the locations of:
- sightings of birds and mammals (including behavior)
  - bird songs
  - carcasses of birds and mammals (including those set out for efficiency survey)
  - feather spots
  - nests - including parents, eggs, hatchlings and behavior (territories previously noted should be monitored during each of the surveys).
- e. The pre-treatment baseline data for the cholinesterase and stomach residue analysis does not necessarily have to be sampled on transect surveys, but a detailed description of the procedure used to gather these data is expected.
- f. Establish radio-telemetry field operations.

### 3. Treatment

- a. Even though applications of Counter 15-G will take some time away from the first day's observations, spot surveys and observations should be made immediately upon completion of the each application. These surveys should include any birds exhibiting signs of distress and/or carcasses, and are not limited to transect areas. Any carcasses collected should be frozen for later necropsy and residue analysis.
- b. Vegetation and soil sampling, as well as exposed granule and earthworm studies should commence. The earthworm studies should be conducted after each rain and after irrigation, if the company decides to separately study effects of irrigation. Enough replicate samples to provide valid statistical analysis must be obtained. Appropriate freezing, storage and shipping procedures are described by the company.

### 4. Post-Treatment

- a. Post-treatment surveys should be conducted on a minimum schedule of:
- 1 day after treatment
  - 2 " " "
  - 3 " " "
  - 4 " " "
  - 5 " " "
  - 7 " " "
  - 9 " " "
  - 11 " " "
  - 14 " " "
- b. water quality and residue analysis should be made on any ponds or streams in the study area at appropriate time intervals (see aquatic protocol).



## Terrestrial protocol outline (con't.)

- c. Surveys of transects and nest/territory locations should be conducted in a manner identical to that listed for pretreatment observations.
- d. Carcasses collected along transects should be placed in labeled containers and frozen. These birds are used for necropsy, cholinesterase and residue analysis.
- e. vegetation and soil sampling per company's proposals subject to EEB approval.
- f. continue residue decline studies and studies of earthworms and other avian feed items on an agreed upon schedule proposed by the company and approved by EEB.
- g. continue cholinesterase studies and radio-telemetry. The company must provide EEB with the details of these protocols.

### SAMPLE SUMMARY

Company should provide a tabulation of the sampling it intends to conduct by type of sample, treatments, dates,. This should include residue analysis studies, carcasses, necropsies when necessary, and cholinesterase samples.

### FINAL REPORT

A final report will be submitted within an agreed upon time to include:

- a. dates and times of all surveys and sample collections
- b. methods and analyses of carcass collection efficiencies.
- c. species list of all birds and mammals observed
- d. methods used for collection, preservation, and shipment of samples
- e. required atmospheric measurements
- f. details of the applications, equipment, calibration, etc.
- g. description (including maps and photographs) of the entire study area detailing transect areas, nest locations, territories and locations of carcasses and feather spots.
- h. results of necropsy, if any.
- i. observations of toxicological symptoms in birds on the days of applications
- j. evaluation of any possible terbufos effects on avian species through an appropriate statistical evaluation of survey and census data.
- k. details of the use of any other pesticide used on the study area during the project.

## AQUATIC ORGANISM - Potential for Biological Effects

### I. OBJECTIVE

The company provides a listing of specific objectives they intend to achieve through the study. Generally, the objectives are pond residue monitoring and monitoring of biological populations before and after treatments of pesticide to corn.

### II. EXPERIMENTAL METHODS

#### Summary of Methods

( This summary is provided by EEB to indicate the scope of the work we expect ).

The study should be conducted in a pond or ponds which receive drainage from treated corn fields. The area should be completely described as to its biological character and abiotic factors including soils, geology and climate, cropping practices, history of chemical treatments, and any other information which is known or becomes known during the study, which is relevant to the ecology of the area or to the outcome of the study.

The size and depth contours of the selected ponds should be determined and mapped. The drainage basin should also be mapped. Photographs of the selected area and ponds should be provided to EEB prior to final approval of the study design.

Provisions for observing runoff events either through natural or artificial means must be described. Runoff events must occur within a short time frame after applications in order to simulate a significant risk potential we can use in hazard assessment. Sufficient runoff water is needed both to assess the potential for the compound to be carried with runoff water and sediments, and to expose the pond's biological populations to the toxic material. A sufficient land area must be treated with the chemical in order to simulate "real world" conditions of potential exposure (i.e., ponds with minimal treated acreage should not be selected).

Pretreatment biological and water quality monitoring will be conducted on both control and experimental ponds to establish baseline information. (e.g., water quality, biological populations, fish brain cholinesterase). Enough samples and replicates will be taken in order to satisfy requirements of accepted statistical tests used to analyze the results of the study.

## Aquatic protocol outline (con't.)

After each application of the pesticide and during each simulated or natural runoff event, runoff water should be measured and monitored for residues of parent and metabolites; the same will be done for pond water and sediments. Fish populations will be monitored for survival, behavior, and brain cholinesterase levels.

Benthic macroinvertebrates can be sampled quantitatively by a standard benthic sampler and qualitatively by a bottom kick net. Fish population surveys will involve electro-fishing and tagging with subsequent follow-up observations. If feasible, a number of fish collected within the ponds will be caged to follow through the study. Zooplankton should be sampled. Artificial substrates can be used for macroinvertebrate colonization estimates.

### B. Study Location and Field Description

Site should be located in the cornbelt. Site is selected by the Company but must be acceptable to both the company and EPA. Drainage basin is of sufficient size to simulate "real world" corn treatments and also be of enough slope to encourage runoff events. Climate, soils, geology, and vegetation are completely described. There are no physical or ecological barriers to runoff. Ponds contain healthy populations of fish and invertebrates and are of good water quality (extensive eutrophication not acceptable).

If the chemical is known to behave differently in different soils (i.e., more or less runoff potential, leaching, absorption to organic matter, etc.,) several different sites may have to be tested.

At a minimum, photographs of the site are provided to EEB prior to final approval of the protocol. Detailed maps of the ponds and surrounding corn fields accompany the final report.

### C. Treatment

Company provides for supervision of preparation of site to grow corn and treat this crop with maximum label authorized amounts in minimum row spacing. The application of the material must be supervised by the study directors and coordinated with plans for creating runoff events. Applications are conducted in strict adherence to label directions for maximum rate, minimum spacing of crop, and intended timing of treatments, most hazardous methods of application (e.g., aerial broadcast will result in more exposure than soil incorporated). Description of equipment (and its calibration) used to apply the pesticide is provided in detail. The use of other pesticides on the control and treatment watersheds is prohibited during the study. If such use becomes unavoidable, appropriate monitoring is instituted to estimate additional effects on ponds and organisms. However, should such emergency chemical treatments become necessary, the study may be compromised beyond repair.

## Aquatic protocol outline (con't.)

Temperature, relative humidity, wind speed and direction will be monitored during the applications. Rainfall and temperature information will be collected throughout the entire project.

### D. Sampling Skills and Equipment

Company provides EEB with details of these such as:

- trained individuals to conduct the study
- sampling equipment (e.g., nets, bottom samplers, artificial substrates, electro-fishing gear, sample containers, boats, etc.)
- remote weather station

### E. Sampling Procedure

#### 1. Preparation

- Company provides details for pretreatment surveys of volume, depth, bottom contour, location of pond in watershed, shoreline and rooted aquatic plants.
- A pesticide (OC's, OP's, pyrethroids, carbamates) and metals screen should be conducted at the beginning of the project on all ponds' water and sediments.
- provide details on pretreatment water quality monitoring, residue and cholinesterase monitoring on fish.
- provide details on methods to capture and tag fish (e.g., electrofishing) as well as projected numbers needed for proper statistical evaluation.
- describe caged fish survey. Cage design and location should permit adequate nutrition sources and water quality for fish.
- describe artificial substrate devices and location as well as procedures for estimating colonization.

#### 2. Pre- and Post-treatment

A sampling schedule must be developed for both controls and experimentals which is adequate for statistical purposes and studies the appropriate

Aquatic protocol outline (cont.)

time intervals. Emphasis is placed on the immediate pretreatment period for baseline, and periods immediately following natural and/or induced runoff events.

- water quality and water and sediment residues after each natural rainfall/runoff event (runoff water volume and residues should be measured during runoff events).
- artificial runoff events (irrigation to create runoff) must be created if insufficient rainfall occurs during the study. These should be planned to occur at specific times in lieu of natural events (e.g., 2-3 days post-treatment and one at about 7 days post-treatment, depending on the nature of the chemical. Water quality and residue monitoring should follow each event. Runoff volume and residues monitored during the event.

On the designated dates the following samples are collected and observations made.

- water quality (D.O., temp., pH, conductivity, turbidity, nutrients, and residues) bottom and near surface samples.
- quantitative bottom samples for benthics.
- artificial substrate samplers will be observed for colonization the day before treatments, and new samplers put in place for collection 14 days after treatment.
- caged fish observed for mortality and health.
- fish population survey. (Caged fish should be placed in water outside of ponds during electrofishing operation).
- Kick net observations every 10 meters along shore for invertebrates.
- Cholinesterase sampling of live fish and on all dead fish found.

Any dead fish are collected and frozen. Gross necropsy is conducted on these and appropriate tissue analysis for residues of parent and metabolites.

Aquatic protocol outline (con't).

III. Sample Summary      Company provides summary of intended sampling, e.g. :

|                                | TOTAL NUMBER        |                          |
|--------------------------------|---------------------|--------------------------|
|                                | <u>Control Pond</u> | <u>Experimental Pond</u> |
| Sample type:                   |                     |                          |
| Sediments                      | x                   | x                        |
| Water                          |                     |                          |
| surface                        | x                   | x                        |
| near bottom                    | x                   | x                        |
| Fish (by species)              |                     |                          |
| cages                          | x                   | x                        |
| population survey              | x                   | x                        |
| brains for AChE                | x                   | x                        |
| Macroinvertebrate (by species) |                     |                          |
| bottom                         | x                   | x                        |
| kick net                       | x                   | x                        |
| artificial substrate           | x                   | x                        |
| Zooplankton (by species)       | x                   | x                        |

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IV. FINAL REPORT

A final report will be submitted within the agreed upon time after the completion of the work. It includes:

- A. Detailed physical description of the study ponds and surrounding fields (slope, soil types, soil infiltration rate, soil organic matter content, soil pH, water chemistry, vegetation, etc.); and climate data .
- B. Dates and times of all surveys and sample collections .
- C. Methods associated with sampling and survey efforts, including how runoff events were created, and of applications of pesticide.
- D. Species list of all aquatic macrophytes, invertebrates, and fish observed.
- E. Terbufos residues and metabolite residues in water, suspended sediments, bottom sediments.
- F. Necropsy and tissue residue results. Cholinesterase levels and statistical analysis.

Aquatic protocol outline (con't.)

- G. Evaluation of any effects on water quality, or biological populations based on baseline data and pond comparisons. Appropriate statistical evaluations are essential.
- H. Details of the pesticides found in the screen, used during the study, or used in previous croppings.

**ACCEPTED**  
 AUG 23 1983  
 This is a general insecticide,  
 Fungicide and Nematicide Act.  
 as amended, for the pesticide  
 registered under  
 EPA Reg. No. **241-238**

Bag Label

Front Label

**COUNTER®**  
 systemic insecticide-nematicide

FOR USE IN FIELD CORN, POPCORN, SWEET CORN, SUGAR BEETS AND  
 GRAIN SORGHUM

Active Ingredient:

|   |       |
|---|-------|
| Terbufos (S-[[[(1,1-dimethylethyl)thio]methyl] O,O-diethyl<br>phosphorodithioate) . . . . . | 15.0% |
| Inert Ingredients . . . . .   | 85.0% |

EPA Reg. No. 241-238

EPA Est. No.

(12 pt. type)

KEEP OUT OF REACH OF CHILDREN

(18 pt. type)



POISON-DANGER



MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH THE SKIN  
 RAPIDLY ABSORBED THROUGH SKIN  
 REPEAT INHALATION OR SKIN CONTACT MAY, WITHOUT SYMPTOMS,  
 PROGRESSIVELY INCREASE SUSCEPTIBILITY TO POISONING

See Back Panel for Antidote and Other Warnings

PELIGRO

AL USUARIO: Si usted no lee ingles, no use este producto hasta que la  
 etiqueta le haya sido explicada ampliamente.

(ENGLISH TRANSLATION)  
 DANGER

(TO THE USER: If you cannot read English, do not use this product until the  
 label has been fully explained to you.)

Net Weight: 50 lbs.  
 22.68 kg.

24696-08

D44

Lot No.: SEE BAG SEAL  
 ®Trademark

Sold by  
 AMERICAN CYANAMID COMPANY  
 AGRICULTURAL DIVISION  
 WAYNE, NEW JERSEY 07470

Made & Printed in U.S.A.



DANGER!

HAZARDS TO HUMANS and Domestic Animals

Do Not Get In Eyes, On Skin, On Clothing

Wear freshly laundered, long-sleeved work clothing daily. While transferring from package to equipment, wear a clean cap and gloves (rubber or cotton). If cotton gloves are used, they must be laundered or discarded after each day's use. Rubber gloves should be washed with soap and water after each use. Do not wear the same gloves for other work. Destroy and replace gloves frequently.

In case of contact, immediately remove contaminated clothing and wash skin thoroughly with soap and water. Launder clothing and decontaminate shoes before reuse. Wash thoroughly with soap and water before eating or smoking. Bathe at the end of the work day and change clothing.

Do Not Breathe Dust

While emptying bags into equipment, pour downwind and allow as little free fall as possible. Do not pour at face level and do not allow dust to reach the breathing zone.

Do Not Contaminate Food or Feed Products

Once a bag has been opened, use it completely. Make sure the hoppers are emptied while still in the field. Refer to STORAGE AND DISPOSAL statement for further instructions.

Keep All Unprotected Persons Out of Operating Areas.

Keep Out of Reach of Domestic Animals.

Not For Use or Storage In or Around the Home.

ENVIRONMENTAL HAZARDS

This product is toxic to fish, birds and other wildlife. Treated granules exposed on soil surface may be hazardous to birds and other wildlife. 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.

In case of an emergency endangering life or property involving this product, call collect, day or night, Area Code 201-835-3100.

Antidote: Atropine is an antidote.

CALL A PHYSICIAN AT ONCE IN ALL CASES OF SUSPECTED POISONING

FIRST AID

If swallowed, drink one or two 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. Get medical attention.

If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes and remove contaminated clothing and shoes. Wash clothing and decontaminate shoes before reuse.

NOTE TO PHYSICIANS: Warning symptoms include weakness, headache, tightness in chest, blurred vision, nonreactive pinpoint pupils, salivation, sweating, nausea, vomiting, diarrhea and abdominal cramps. Give atropine intramuscularly or intravenously, depending on severity of poisoning, 2 to 4 milligrams every 10 minutes until fully atropinized as shown by dilated pupils, dry flushed skin and tachycardia. Twenty to thirty milligrams, or more, may be required during the first 24 hours. Never give opiates or phenothiazine tranquilizers. Clear chest by postural drainage. Artificial respiration or oxygen administration may be necessary. Observe patient continuously for at least 48 hours. Allow no further exposure to any cholinesterase inhibitor until cholinesterase regeneration has taken place as determined by blood tests.

Pralidoxime chloride (2-PAM; PROTOPAM chloride) may be effective as an adjunct to atropine. Use according to label directions.

DISCLAIMER

The label instructions for the 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 use or application of the product contrary to label instructions, all of which are beyond the control of American Cyanamid Company. All such risks shall be assumed by the user.

American Cyanamid Company warrants only that the material contained herein conforms to the chemical description on the label and is reasonably fit for the use therein described when used in accordance with the directions for use, subject to the risks referred to above.

Any damages arising from a breach of this warranty shall be limited to direct damages and shall not include consequential commercial damages such as loss of profits or values or any other special or indirect damages.

American Cyanamid Company makes no other express or implied warranty, including any other express or implied warranty of FITNESS or of MERCHANTABILITY.

## STORAGE AND DISPOSAL

### Storage

Store pesticide products in a secure locked area where children, unauthorized persons and animals cannot enter. Do not store in the same area with food or feed. Do not store opened bags.

### Prohibitions

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

### Pesticide Disposal

Pesticide or spillage that cannot be used according to label instructions must be disposed of according to Federal, State or local procedures under the Resource Conservation and Recovery Act.

### Container Disposal

Completely empty bag by shaking and tapping sides and bottom to loosen any clinging material. Empty the residues into the application equipment. Dispose of bags in a sanitary landfill, or by other approved State and local procedures.

### General

Consult Federal, State or local disposal authorities for approved alternative procedures such as limited open burning.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.  
 BEFORE USING, READ PRECAUTIONARY STATEMENTS.

COUNTER should be applied with a granular pesticide applicator properly calibrated to assure accurate placement and proper dosage. Cover granules that may be exposed on the ends of the treated rows and turns and loading areas by deep discing immediately after treating fields.

| Crops                                     | Pests Controlled  | Rates of COUNTER   | Application  | Remarks  |
|---|---|--|--|--|
| FIELD CORN,<br>POPCORN, AND<br>SWEET CORN | Corn rootworms  | <u>Banded or In-Furrow</u>   | <u>Banded</u><br>Place granules in a 7-inch band directly behind the planter shoe in front of press wheel.     | For use on conventional and conservation (i.e., minimum and no-till) tillage corn. In conservation tillage systems, where excessive crop debris can prevent proper distribution of banded granular products, in-furrow applications are recommended. |
|   | Seedcorn maggots<br>Seedcorn beetles  | 8 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing).<br><br><i>7160</i><br><i>3.92 lb. a/c</i><br><i>type 1600/1000</i>   | <u>In-Furrow</u><br>Place granules directly in the seed furrow behind the planter shoe.                        |  |
| At Planting                               | Wireworms   | <u>Banded or In-Furrow</u>   | <u>Banded</u><br>Place granules in a 7-inch band directly behind the planter shoe in front of the press wheel. | Under dry soil conditions or heavy infestations, it may be necessary to apply an insecticide rescue treatment after corn emergence to control surviving cutworm larvae.  |
|   | Symphylans<br><br>Nematodes:<br>Lesion<br>Spiral<br>Stunt<br>Sting<br>Stubby root<br>Dagger<br><br>Maize billbugs<br>Southern corn billbugs | <u>Banded</u><br><i>1.2</i><br>8-16 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing).<br><br><u>In-Furrow</u><br>8 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing). | <u>In-Furrow</u><br>Place granules directly in the seed furrow behind the planter shoe.                        |  |

|   |   |  |   |   |
|---|---|--|---|---|
|   | <p>Corn flea Beetles<br/> <u>White grubs</u><br/> Suppression of Cutworms</p> |  |   |   |
| Postemergence Incorporated<br>(Same as crops above) | Maize billbugs<br>Southern corn billbugs                                      | <u>Banded</u><br>12-16 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing). | Apply in a 7-inch band over the row of seedling corn plants and lightly incorporate into the soil when billbugs or damage are observed, usually in the 1-6 leaf stage of growth. Use cultivators or other suitable implement to lightly incorporate granules into soil. | Do not graze or cut for forage within 30 days of treatment.<br>Only one postemergence incorporated or one cultivation time treatment may be used in addition to treatment at planting time.<br>Consult your state experiment station, state extension service, or specialist for proper rate and timing of application. |
| At Cultivation<br>(Same as crops above)             | Corn rootworms  | 8 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing).                      | Apply granules to base of plants or over the top of plants just ahead of cultivation shovels so as to cover granules with soil.   |   |

*Faint, illegible text or bleed-through from the reverse side of the page.*

|  |                                       |   |   |   |
|--|---------------------------------------|---|---|---|
| <p>SUGAR BEETS</p> <p>At Planting<br/>OR<br/>Postemergence</p> | <p>Sugar beet root<br/>maggots</p>    | <p><u>Banded</u></p> <p>4-8 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing).</p>   | <p><u>Banded</u></p> <p>Apply in a 5 to 7-inch band over the row and lightly incorporate into the soil.</p>   | <p><u>At Planting</u></p> <p>Do not place granules in direct contact with the seed as crop injury may occur. Power incorporation may be used. Do not incorporate deeper than 2 inches.</p> <p><u>Postemergence</u></p> <p>Apply at the time of first fly emergence. Lightly incorporate into the soil.</p> <p><u>Only one application per year may be used.</u></p> |
| <p>GRAIN SORGHUM</p> <p>At Bedding</p>                         | <p>Greenbugs<br/>Corn leaf aphids</p> | <p><u>Knifed-in</u></p> <p>8-16 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing) or no more than 26 lbs. per acre.</p>  | <p><u>Knifed-in</u></p> <p>Drill granules 1-4 inches directly below the seed OR 1-4 inches below the seed and up to 5 inches to the side of the seed.</p>   | <p>Do not place granules in direct contact with seed as crop injury may occur.</p>  |
| <p>GRAIN SORGHUM</p> <p>At Planting</p>                        | <p>Greenbugs<br/>Corn leaf aphids</p> | <p><u>Knifed-in or Banded</u></p> <p><u>Knifed-in</u></p> <p>8-16 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing) or no more than 26 lbs. per acre.</p> <p><u>Banded</u></p> <p>8-16 oz. per 1,000 ft. of row for any row spacing (minimum 20-inch row spacing).</p> | <p><u>Knifed-in</u></p> <p>Drill granules 1-4 inches directly below the seed OR 1-4 inches below the seed and up to 5 inches to the side of the seed.</p> <p><u>Banded</u></p> <p>Place granules in a 5-7 inch band directly behind the planter shoe in front of the press wheel.</p> | <p>1/ Do not use banded applications in New Mexico, West Texas and the Panhandle of Oklahoma.</p> <p><u>Only one application per year may be used.</u></p>  |

Use Rates as Pounds per Acre\*

(based on various row spacings and application rates)

Application Rates (Oz./1,000 Ft. of Row)

|     | 4 oz. | 6 oz. | 8 oz. | 10 oz. | 12 oz. | 14 oz. | 16 oz. |
|-----|-------|-------|-------|--------|--------|--------|--------|
| 40" | 3.3   | 4.9   | 6.5   | 8.2    | 9.8    | 11.4   | 13.1   |
| 38" | 3.4   | 5.2   | 7.3   | 8.6    | 10.3   | 12.0   | 13.7   |
| 36" | 3.6   | 5.4   | 7.7   | 9.1    | 10.9   | 12.7   | 14.5   |
| 34" | 3.9   | 5.6   | 7.7   | 9.7    | 11.6   | 13.5   | 15.4   |
| 32" | 4.1   | 6.1   | 8.2   | 10.2   | 12.3   | 14.3   | 16.3   |
| 30" | 4.4   | 6.5   | 8.7   | 10.9   | 13.1   | 15.2   | 17.4   |
| 28" | 4.7   | 7.1   | 9.5   | 11.8   | 14.2   | 16.6   | 18.9   |
| 26" | 5.0   | 7.6   | 10.2  | 12.7   | 15.3   | 17.9   | 20.4   |
| 24" | 5.4   | 8.2   | 10.9  | 13.6   | 16.3   | 19.1   | 21.8   |
| 22" | 5.9   | 8.9   | 11.9  | 14.9   | 17.9   | 21.0   | 24.0   |
| 20" | 6.5   | 9.8   | 13.1  | 16.3   | 19.6   | 22.8   | 26.1   |

\*See directions for specific use rates on each crop

CALIBRATION INFORMATION

FIRST READ THE LABEL.

It is important that applicator equipment be properly set to deliver the labeled rate. This chart will help determine the desired rate of application.

When label is 8 ounces per 1,000 feet of row, use these suggested starting gauge settings, regardless of row spacing.

PLANTING SPEED

| APPLICATOR                           | 3 mph              | 5 mph | 7 mph |
|--------------------------------------|--------------------|-------|-------|
| Gandy                                | 18                 | 24    | 28    |
| New Noble (Square Hole)              | 8                  | 12    | 16    |
| Old Noble (Round Hole)               | 11                 | 17    | 23    |
| International Harvester              | 1/7.0              | 2/1.5 | 2/7.5 |
| New International Harvester          | 1/9.0              | 2/6.0 | 3/2.0 |
| New John Deere (Plastic Funnels)     | 13                 | 19    | 25    |
| Newest John Deere (Aluminum Funnels) | 11                 | 15    | 19    |
| Old John Deere                       | 1/28               | 2/6   | 2/15  |
| Allis Chalmers                       | All Speeds-Gauge 7 |       |       |

NOTE: These settings should be used as starting points only. Continually check the amount of COUNTER used against a known length of row or acreage and make further adjustments accordingly. Also, check calibration occasionally to make sure equipment wear, changing moisture conditions, etc., have not caused a change in flow rate.



Side Panel

DOT-44D

POISON

6

DOT-E6296

ORGANIC PHOSPHATE COMPOUND  
MIXTURE, DRY

COUNTER<sup>®</sup>  
systemic insecticide-nematicide

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Pages 25 through 33 are not included in this copy.

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The material not included contains the following type of information:

- Identity of product inert ingredients
  - Identity of product impurities
  - Description of the product manufacturing process
  - Description of product quality control procedures
  - Identity of the source of product ingredients
  - Sales or other commercial/financial information
  - A draft product label
  - The product confidential statement of formula
  - Information about a pending registration action
  - FIFRA registration data
  - The document is a duplicate of page(s) \_\_\_\_\_
  - The document is not responsive to the request
- 

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