



# Reregistration Eligibility Decision (RED)

\*\*\*Cytokinin\*\*\*





## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

### CERTIFIED MAIL

Dear Registrant:

I am pleased to announce that the Environmental Protection Agency has completed its reregistration eligibility review and decisions on the biopesticide case Cytokinin, which includes the active ingredients derived from naturally occurring Cytokinin (zeatin [6-(-4-hydroxy-3-methylbut-trans-2-enylamino)-purine], N<sup>6</sup>-menthylaminopurine, N<sup>6</sup>-dimethylaminopurine, N<sup>6</sup>-isopentenylaminopurine) and synthetic Cytokinin (Kinetin -- 6-(furfuryl amino) purine). The enclosed Reregistration Eligibility Decision (RED) contains the Agency's evaluation of the data base of these chemicals, its conclusions of the potential human health and environmental risks of the current product uses, and its decisions and conditions under which these uses and products will be eligible for reregistration. The RED includes the data and labeling requirements for products for reregistration.

To assist you with a proper response, read the enclosed document entitled "Summary of Instructions for Responding to the RED". This summary also refers to other enclosed documents which include further instructions. You must follow all instructions and submit complete and timely responses. **An Application for Reregistration is required to be submitted eight months from the date of receipt of this letter.** Complete and timely responses will avoid the Agency taking the enforcement action of suspension against your products.

If you have questions about our decision or the requirements set forth in this document, please contact the reregistration representative for the Biopesticides and Pollution Prevention Division, Richard King at (703) 308-8052.

Sincerely yours,

Janet Andersen, Acting Director  
Biopesticides and Pollution Prevention Division  
(7501W)

Enclosures



**SUMMARY OF INSTRUCTIONS FOR RESPONDING TO  
THE REREGISTRATION ELIGIBILITY DECISION (RED)**

1. **DATA CALL-IN (DCI) OR "90-DAY RESPONSE"**--If **generic data** are required for reregistration, a DCI letter will be enclosed describing such data. If **product specific data** are required, another DCI letter will be enclosed listing such requirements. If **both generic and product specific data** are required, a combined Generic and Product Specific letter will be enclosed describing such data. Complete the two response forms provided with each DCI letter (or four forms for the combined) by following the instructions provided. **You must submit the response forms for each product and for each DCI within 90 days of the date of this letter (RED issuance date); otherwise, your product may be suspended.**

2. **TIME EXTENSIONS AND DATA WAIVER REQUESTS**--No time extension requests will be granted for the 90-day response. Time extension requests may be submitted only with respect to actual data submissions. Requests for data waivers must be submitted as part of the 90-day response. Requests for time extensions should be submitted in the 90-day response, but certainly no later than the 8-month response date. All data waiver and time extension requests must be accompanied by a full justification. All waivers and time extensions must be granted by EPA in order to go into effect.

3. **APPLICATION FOR REREGISTRATION OR "8-MONTH RESPONSE"**--**You must submit the following items for each product within eight months of the date of this letter (RED issuance date).**

a. **Application for Reregistration** (EPA Form 8570-1). Use only an original application form. Mark it "Application for Reregistration." Send your Application for Reregistration (along with the other forms listed in b-e below) to the address listed in item 5.

b. **Five copies of draft labeling** which complies with the RED and current regulations and requirements. Only make labeling changes which are required by the RED and current regulations (40 CFR 156.10) and policies. Submit any other amendments (such as formulation changes, or labeling changes not related to reregistration) separately. You may delete uses which the RED says are ineligible for reregistration. For further labeling guidance, refer to the labeling section of the EPA publication "General Information on Applying for Registration in the U.S., Second Edition, August 1992" (available from the National Technical Information Service, publication #PB92-221811; telephone number 703-487-4650).

c. **Generic or Product Specific Data**. Submit all data in a format which complies with PR Notice 86-5, and/or submit citations of data already submitted and give the EPA identifier (MRID) numbers. Before citing these studies, you must **make sure that they meet the Agency's acceptance criteria** (attached to the DCI).

d. **Two copies of the Confidential Statement of Formula (CSF)** for each basic and each alternate formulation. The labeling and CSF which you submit for each product must comply with P.R. Notice 91-2 by declaring the active ingredient as the **nominal concentration**. You have two options for submitting a CSF: (1) accept the standard certified limits (see 40 CFR §158.175) or (2) provide certified limits that are supported by the analysis of five batches. If you choose the second option, you must submit or cite the data for the five batches along with a certification statement as described in 40 CFR §158.175(e). A copy of the CSF is enclosed; follow the instructions on its back.

e. **Certification With Respect to Data Compensation Requirements.** Complete and sign EPA form 8570-31 for each product.

4. **COMMENTS IN RESPONSE TO FEDERAL REGISTER NOTICE**--Comments pertaining to the content of the RED may be submitted to the address shown in the Federal Register Notice which announces the availability of this RED.

5. **WHERE TO SEND PRODUCT SPECIFIC DCI RESPONSES (90-DAY) AND APPLICATIONS FOR REREGISTRATION (8-MONTH RESPONSES)**

**By U.S. Mail:**

Document Processing Desk (**RED-SRRD-PRB**)  
Office of Pesticide Programs (7504C)  
EPA, 401 M St. S.W.  
Washington, D.C. 20460-0001

**By express:**

Document Processing Desk (**RED-SRRD-PRB**)  
Office of Pesticide Programs (7504C)  
Room 266A, Crystal Mall 2  
1921 Jefferson Davis Hwy.  
Arlington, VA 22202

6. **EPA'S REVIEWS**--EPA will screen all submissions for completeness; those which are not complete will be returned with a request for corrections. EPA will try to respond to data waiver and time extension requests within 60 days. EPA will also try to respond to all 8-month submissions with a final reregistration determination within 14 months after the RED has been issued.

**REREGISTRATION ELIGIBILITY DECISION**

**CYTOKININ**

**LIST D**

**CASE 4107**

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## **CYTOKININ REREGISTRATION ELIGIBILITY DECISION TEAM**

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## GLOSSARY OF TERMS AND ABBREVIATIONS

ADI	Acceptable Daily Intake. A now defunct term for reference dose (RfD).
AE	Acid Equivalent
a.i.	Active Ingredient
ARC	Anticipated Residue Contribution
CAS	Chemical Abstracts Service
CI	Cation
CNS	Central Nervous System
CSF	Confidential Statement of Formula
DFR	Dislodgeable Foliar Residue
DRES	Dietary Risk Evaluation System
DWEL	Drinking Water Equivalent Level (DWEL) The DWEL represents a medium specific (i.e. drinking water) lifetime exposure at which adverse, non carcinogenic health effects are not anticipated to occur.
EEC	Estimated Environmental Concentration. The estimated pesticide concentration in an environment, such as a terrestrial ecosystem.
EP	End-Use Product
EPA	U.S. Environmental Protection Agency
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FFDCA	Federal Food, Drug, and Cosmetic Act
FOB	Functional Observation Battery
GLC	Gas Liquid Chromatography
GM	Geometric Mean
GRAS	Generally Recognized as Safe as Designated by FDA
HA	Health Advisory (HA). The HA values are used as informal guidance to municipalities and other organizations when emergency spills or contamination situations occur.
HDT	Highest Dose Tested
LC <sub>50</sub>	Median Lethal Concentration. A statistically derived concentration of a substance that can be expected to cause death in 50% of test animals. It is usually expressed as the weight of substance per weight or volume of water, air or feed, e.g., mg/l, mg/kg or ppm.
LD <sub>50</sub>	Median Lethal Dose. A statistically derived single dose that can be expected to cause death in 50% of the test animals when administered by the route indicated (oral, dermal, inhalation). It is expressed as a weight of substance per unit weight of animal, e.g., mg/kg.
LD <sub>10</sub>	Lethal Dose-low. Lowest Dose at which lethality occurs.
LEL	Lowest Effect Level
LOC	Level of Concern
LOD	Limit of Detection
LOEL	Lowest Observed Effect Level
MATC	Maximum Acceptable Toxicant Concentration
MCLG	Maximum Contaminant Level Goal (MCLG) The MCLG is used by the Agency to regulate contaminants in drinking water under the Safe Drinking Water Act.
µg/g	Micrograms Per Gram
mg/L	Milligrams Per Liter
MOE	Margin of Exposure
MP	Manufacturing-Use Product
MPI	Maximum Permissible Intake
MRID	Master Record Identification (number). EPA's system of recording and tracking studies submitted.
N/A	Not Applicable
NOEC	No effect concentration
NPDES	National Pollutant Discharge Elimination System

## **GLOSSARY OF TERMS AND ABBREVIATIONS**

NOEL	No Observed Effect Level
NOAEL	No Observed Adverse Effect Level
OP	Organophosphate
OPP	Office of Pesticide Programs
PADI	Provisional Acceptable Daily Intake
PAG	Pesticide Assessment Guideline
PAM	Pesticide Analytical Method
PHED	Pesticide Handler's Exposure Data
PHI	Preharvest Interval
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PRN	Pesticide Registration Notice
$Q_1^*$	The Carcinogenic Potential of a Compound, Quantified by the EPA's Cancer Risk Model
RBC	Red Blood Cell
RED	Reregistration Eligibility Decision
REI	Restricted Entry Interval
RfD	Reference Dose
RS	Registration Standard
SLN	Special Local Need (Registrations Under Section 24 © of FIFRA)
TC	Toxic Concentration. The concentration at which a substance produces a toxic effect.
TD	Toxic Dose. The dose at which a substance produces a toxic effect.
TEP	Typical End-Use Product
TGAI	Technical Grade Active Ingredient
TLC	Thin Layer Chromatography
TMRC	Theoretical Maximum Residue Contribution
torr	A unit of pressure needed to support a column of mercury 1 mm high under standard conditions.
FAO/WHO	Food and Agriculture Organization/World Health Organization
WP	Wettable Powder
WPS	Worker Protection Standard

## EXECUTIVE SUMMARY

The Environmental Protection Agency has completed an assessment of the potential human health and environmental risks associated with the pesticidal use of Cytokinin in the United States.

Cytokinin is a group of plant regulators that promote cell division, leaf expansion and retard leaf aging. Cytokinin is comprised of four naturally occurring cytokinins (derived from aqueous extract of seaweed meal) -- zeatin [6-(4-hydroxy-3-methylbut-trans-2-enylamino)-purine], N<sup>6</sup>-methylaminopurine, N<sup>6</sup>-dimethylaminopurine, N<sup>6</sup>-isopentenylaminopurine, and synthetic cytokinin -- kinetin [6-(furfurylamino)purine]. Cytokinins (i.e. naturally occurring) in aqueous extracts of seaweed meal, are derived from the following algae: *Laminaria digitata*, *Laminaria hyperborea*, *Fucus serratus* and *Ascophyllum nodosum*. Several, if not all of these species of algal species are consumed by man and/or livestock. The extracts from these plant species (e.g. the naturally occurring Cytokinins) are exempt from the requirements of tolerances when used as plant regulators in or on many raw agricultural commodities (40 CFR 180.1042). Cytokinin is applied to growing crops (field crops, vegetable crops, small fruits, vines and tree fruit), young trees, ornamental, and golf courses to increase: fruit size, yield, blossoms, branching, healthy appearance, and other desirable growth effects.

The Agency has determined that certain uses of Cytokinin as currently registered will not cause unreasonable risk to humans or the environment. These uses are eligible for reregistration. The Agency is not requiring additional studies. However, eighteen of the uses currently on the labels are not covered by an exemption from tolerance (40 CFR 180.1042). The Agency plans to exempt from tolerance many plant regulators, including Cytokinin, when used in low doses. Until this proposed exemption from tolerance is final, these eighteen uses of Cytokinin listed in Section IV are conditionally eligible for reregistration. Pending public comment, the Agency plans to publish final rule in late 1995 or early 1996. When this proposed exemption from tolerance is final, these eighteen uses of Cytokinin will be eligible for reregistration.

Before reregistering the products containing Cytokinin, the Agency is requiring that product specific data, revised Confidential Statements of Formula (CSF) and revised labeling be submitted within eight months of the issuance of this document. These data include product chemistry for each registration and acute toxicity testing. After reviewing these data and any revised labels and finding them acceptable in accordance with Section 3(c)(5) of FIFRA, the Agency will reregister a product. Those products which contain other active ingredients in addition to Cytokinin will be eligible for reregistration only when the other active ingredients are determined to be eligible for reregistration.

## **I. INTRODUCTION**

In 1988, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) was amended to accelerate the reregistration of products with active ingredients registered prior to November 1, 1984. The amended Act provides a schedule for the reregistration process to be completed in nine years. There are five phases to the reregistration process. The first four phases of the process focus on identification of data requirements to support the reregistration of an active ingredient and the generation and submission of data to fulfill the requirements. The fifth phase is a review by the U.S. Environmental Protection Agency (referred to as "the Agency") of all data submitted to support reregistration.

FIFRA Section 4(g)(2)(A) states that in Phase 5 "the Administrator shall determine whether pesticides containing such active ingredients are eligible for reregistration" before calling in data on products and either reregistering products or taking "other appropriate regulatory action." Thus, reregistration involves a thorough review of the scientific data base underlying a pesticide's registration. The purpose of the Agency's review is to reassess the potential hazards arising from the currently registered uses of the pesticide; to determine the need for additional data on health and environmental effects; and to determine whether the pesticide meets the "no unreasonable adverse effects" criterion of FIFRA.

This document presents the Agency's decision regarding the reregistration eligibility of the registered uses of Cytokinin. The document consists of six sections. Section I is the introduction. Section II describes Cytokinin, its uses, data requirements and regulatory history. Section III discusses the human health and environmental assessment based on the data available to the Agency. Section IV presents the reregistration decision for Cytokinin. Section V discusses the reregistration requirements for Cytokinin. Finally, Section VI is the Appendices which support this Reregistration Eligibility Decision. Additional details concerning the Agency's review of applicable data are available on request.

## II. CASE OVERVIEW

### A. Chemical Overview

The following active ingredient(s) are covered by this Reregistration Eligibility Decision:

- **Common Name:** Cytokinin (four naturally occurring Cytokinins derived from aqueous extract of seaweed meal) and Kinetin (synthetic Cytokinin).
- **Chemical Name:** Cytokinin -- zeatin [6-(4-hydroxy-3-methylbut-trans-2-enylamino)-purine], N<sup>6</sup>-methylaminopurine, N<sup>6</sup>-dimethylaminopurine, N<sup>6</sup>-isopentenylaminopurine.  
Kinetin -- 6-(furfuryl amino) purine
- **Chemical Family:** Purine
- **CAS Registry Number:** 525-79-1
- **OPP Chemical Code:** 116801
- **Trade and Other Names:** CYTEX<sup>®</sup>, Nitrozym<sup>®</sup>, CYTOGEN<sup>®</sup>, and Burst Yield Booster<sup>®</sup>.
- **Basic Manufacturers:** Riverside/Terra Corp.  
Atlantic & Pacific Research  
Atlantic Lab., Inc  
Aqua-10 Corp.  
Westbridge Agricultural Products  
Stoller Enterprises Inc.  
P.B.T., Inc.  
Transagra International Inc.  
P.B. Ohrstrom & Sons Inc.  
Arcadian Seaplants Ltd.

### B. Use Profile

The following is information on the currently registered uses with an overview of use sites and application methods. A detailed table of these use of Cytokinin is in Appendix A.

For Cytokinin:



**Type of Pesticide:** Plant Regulator

**Use Sites:**

**TERRESTRIAL FOOD CROP:** anise, asparagus, banana, , broccoli, brussels sprouts, cabbage, carrot (including tops), catjang (jerusalem/marble pea), cauliflower, celery, cucumber, eggplant, fennel, garbanzos (including chick peas), garlic, leek, lettuce, melons, cantaloupe, honeydew, muskmelons, watermelons, okra, onion, parsley, peach, pepper, pepper (chili type), plantain, pumpkin, radish, shallot, spinach, squash (all or unspecified), strawberry, sweet potato, wheat, yam

**TERRESTRIAL FOOD+ FEED CROP:** apple; beans; beans, dried-type; beans, mung; beans, succulent (lima); beans, succulent (snap); beets (unspecified); citrus fruits; corn (unspecified); corn, field; corn, pop; corn, sweet; cotton (unspecified); cowpea/blackeyed pea; grapes; leafy vegetables; orange; peanuts (unspecified); peas (unspecified); peas, field; peas, pigeon; peas, southern; potato, white/irish; rice; sorghum; sorghum (unspecified); soybeans (unspecified); sugar beet; tomato; triticale; wheat

**TERRESTRIAL FEED CROP:** alfalfa, capes, lupine

**TERRESTRIAL+ GREENHOUSE FOOD CROP:** asparagus; banana; beans; broccoli; broccoli, Chinese; Brussels sprouts; cabbage; carrot (including tops); cauliflower; celery; corn, pop; corn, sweet; cucumber; cucurbit vegetables; eggplant; lettuce; melons; nectarine; onion; parsley; parsley, turnip-rooted; peach; pepper; pepper (chili type); plantain; potato, white/irish; pumpkin; radish; shallot; spinach; squash (all or unspecified); squash (winter); squash (zucchini); strawberry; sweet potato; tomato

**TERRESTRIAL GREENHOUSE FOOD CROP:** potato, white/irish, tomato

**TERRESTRIAL NON-FOOD CROP:** commercial/industrial lawns, fruits (unspecified), golf course turf, jujube, ornamental lawns and turf, ornamental sod farm (turf), recreation area lawns, small fruits

**TERRESTRIAL NON-FOOD+ OUTDOOR RESIDENTIAL:** ornamental and/or shade trees, ornamental herbaceous plants, ornamental lawns and turf, ornamental nonflowering plants, ornamental woody shrubs and vines, site term too general

**TERRESTRIAL GREENHOUSE NON-FOOD:** ornamental and/or shade trees, ornamental herbaceous plants, ornamental woody shrubs and vines

**FORESTRY:** forest plantings (reforestation programs), pine (forest/shelterbelt)

**OUTDOOR RESIDENTIAL:** ornamental lawns and turf

**INDOOR RESIDENTIAL:** ornamental trees, ornamental herbaceous plants, ornamental nonflowering plants

**Target:** Higher Plants

**Formulation Types Registered:**

MANUFACTURING PRODUCTS:

Form not identified/liquid	0.01	to	0.01%
Soluble concentrate/liquid	0.0040	to	0.0120%

END USE PRODUCTS:

Flowable concentrate	0.004	to	0.0096%
Liquid-ready to use	0.00008	to	0.00008%
Soluble concentrate/liquid	0.0003	to	0.0400%

**Method and Rates of Application:**

Equipment: Aircraft, Center pivot irrigation, Dip tank, Drip irrigation, Ground, Hand move irrigation, High volume ground sprayer, Hose-end sprayer, Irrigation, Low volume ground sprayer, Mist sprayer, Moving wheel irrigation, Not on label, Pressure sprayer, Seed treater, Soil incorporation equipment, Solid set irrigation, Sprayer, Sprinkler irrigation,

Types of Treatment: Band treatment, Bark treatment, Broadcast, Chemigation, Commercially grown nursery grass sod treatment, Dip treatment, Drench, Foliar treatment, High volume spray (dilute), Low volume spray (concentrate), Seed treatment, Soil band treatment, Soil broadcast treatment, Soil drench treatment, Soil in-furrow treatment, Soil incorporated treatment, Soil sidedress treatment, Spot soil treatment, Spray.

Timing: At first squaring (of cotton), At pegging (of peanut), At permanent flood (of rice), At pinhead square (of cotton), At planting, Bloom, Boot, Bulbs, Containerized, Crown, Cutting, Delayed dormant, Early bloom, Early tillering, Established plantings, Fall, Foliar, Fruiting, Petal fall, Pink, Plant bed, Post-thinning, Postemergence, Postharvest, Postplant, Posttransplant, Prebloom, Precutting, Preharvest, Preplant, Pretransplant, Root stock, Seed piece, Spring, Tassel, Transplant, Tuber, When needed.

**Use Practice Limitations:**

Preharvest Intervals - 14 or 21 days depending on crop.

Use Practice Limitations listed below do not apply to all uses on all products:

Do not allow rinse water to contaminate streams, ponds and lakes, as water life may be endangered.

Do not apply through any type of irrigation system.

Do not apply to any body of water.

For terrestrial uses, 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 connect an irrigation system (including greenhouse systems) used for pesticide application to public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

### **C. Estimated Usage of Pesticide**

This section summarizes the best estimates available for the pesticide uses of Cytokinin. These estimates are derived from a variety of published and proprietary sources available to the Agency. The data, reported on an aggregate and site (crop) basis, reflect annual fluctuations in use patterns as well as the variability in using data from various information sources.

The table below summarizes Cytokinin use by site.

**TABLE I: Percent of Various Crops Treated Annually with Cytokinin, 1990 - 1992**

Site/1	Acres Grown/2 (000)	Acres Treated (000)	Percent Crop Treated	Pounds AI Applied/3
Apples	480.2	50 - 75	10 - 16	2 - 5
Beans/Peas	662.9	5 - 50	1 - 8	7 - 66
Corn, field	76,482.3	1 - 5	<1 - <1	0 - <1
Cotton	13,230.2	5 - 55	0 - <1	7 - <1
Eggplant/Peppers	72.6	0 - 1	0 - 1	0 - 1
Melons	408.9	1 - 5	<1 - 1	0 - 7
Oranges	622.3	1 - 5	0 - 1	1 - 7
Potatoes	1,377.9	1 - 10	0 - 1	1 - <1
Rice	2,983.0	0 - 1	0 - <1	0 - <1
Soybeans	58,768.3	0 - 1	0 - <1	0 - <1
Tomatoes	474.7	1 - 2	0 - <1	1 - <1
Wheat, Spring	17,007.0	0 - 1	0 - <1	0 - <1
<b>TOTALS</b>		<b>66 - 211</b>		<b>19 - 93</b>

/1 - Site identification based on REFS.

/2 - Acres grown based on USDA, Agricultural Census, and state statistics.

/3 - Pounds AI based on .012% active ingredient in Foliar Triggrr.

Data based on proprietary sources, USDA, and state statistics.

Note: All other sites had either no known usage or available data. Those with no known usage data include grapes, strawberries, onions, peaches, Brussels sprouts, cauliflower, lettuce, parsley, cucumbers, celery, potatoes, broccoli, cabbage spinach, carrots and asparagus.

Those with no available data include bananas, squash, radish, okra, beets, peanuts, turf, and ornamental.

#### **D. Data Requirements**

In Phase 4 of the Reregistration Process data gaps for Cytokinin were identified and a DCI was issued in August 1993 for studies on ecological effects, environmental fate, and mammalian toxicity. These data were required to support the uses of products containing the active ingredients Cytokinin and Kinetin (i. e. naturally occurring and synthetic Cytokinin). Appendix B includes all data requirements identified by the Agency for currently registered uses needed to support reregistration.

## **E. Regulatory History**

The plant regulator, Cytokinin, was initially registered in the United States in 1978 as CYTEX<sup>®</sup> (EPA Reg. No. 35980-1) for applications to certain citrus, fruit and vegetable crops. Cytokinin acts as a plant regulator by promoting cell division; minimizing effects of stress; root stimulation; increased yield; increased vegetative growth; and increased tuber firmness.

During Phase 4 of the Reregistration Process, the data base for Cytokinin was evaluated and determined to be inadequate in satisfying certain requirements for biochemical pesticides which include plant regulators. The following were identified as outstanding data gaps and a DCI was issued in August 1993:

152B-12	Acute inhalation
152B-15	Dermal sensitization
152B-17	Genotoxicity
154B-6	Avian acute oral/toxicity
154B-7a	Avian dietary quail
154B-8a	Fish toxicity-rainbow trout
154B-9	Invertebrate toxicity
154B-11	Non-target insects

Since the DCI, the Agency's initial position about these data gaps was re-evaluated and all of these data requirements, except for 154-B-11 Non-target insects, were waived because available information indicates Cytokinin does not cause unreasonable adverse effects: (1) The principal constituents of Cytokinin, algae and seaweed, are natural components of fish diets, (2) Cytokinin has a very low acute mammalian toxicity, (3) Cytokinin is used as a dietary supplement in animal feeds, and (4) are expected to have no adverse effects to fish and wildlife.

During development of the reregistration eligibility decision (RED), the data requirements for non-target insect testing were re-examined and these data requirements were waived based on the previously mentioned rationale for ecological effects (i.e., low acute mammalian toxicity; use as a fish and animal food supplement; and lack of expected adverse effects to fish and wildlife). Therefore, the data are adequate to support the currently registered uses of Cytokinin.

This Reregistration Eligibility Decision reflects a reassessment of all data which were submitted in response to the Reregistration Process.

### III. SCIENCE ASSESSMENT

#### A. Physical Chemistry Assessment

Below are the basic physical chemistry characteristics of Cytokinin, both naturally occurring and synthetic.

<u>Characteristics</u>	<u>Results</u>
Color	Light brown
Physical State	Liquid
Odor	No characteristic odor; "pleasant, spicy".
Density	1.02 g/ml @ 20°C
pH	4.0
Viscosity	27 Zahn units @ 25°C
Corrosive characteristic	Non-corrosive

#### B. Human Health Assessment

##### 1. Toxicology Assessment

Adequate mammalian toxicology data on Cytokinin is available and will support a Reregistration Eligibility Decision (RED).

##### a. Acute Toxicity

Certain acute toxicity studies conducted with Cytokinin have been submitted and adequately satisfy the requirements as set forth in 40 CFR 158.690 -- Biochemical pesticides.

**TABLE II: ACUTE TOXICITY OF CYTOKININ**

Guideline No.	Study	Results	Category	MRID
152B-10	Acute oral tox. (rat)	LD 50> 5g/kg. Dose tested 5g/kg.	4	00142864
152B-11	Acute dermal tox. (rabbit)	LD 50> 2 g/kg	3	00138093
152B-12	Acute inhalation	Waived		
152B-13*	Eye irritation (rabbit)	Slight irritation	3	00138094
152B-14*	Dermal irritation (rabbit)	Slightly irritating	3	00074304
152B-15*	Dermal sensitization	Waived		N/A
152B-16*	Hypersensitivity	All incidents must be reported to the Agency.		N/A

\*These data are not required to support the reregistration of the TGIA.

Based on the data submitted summarized above (Table II), Cytokinin has a very low acute mammalian toxicity. Cytokinin is naturally occurring in numerous plant food sources and is a food supplement. Even with this dietary availability, no adverse effects have been reported to the Agency. The following guideline requirements have been waived: 152B-12 -- Acute inhalation; 152B-15 Dermal sensitization. All incidents of hypersensitivity must be reported to the Agency. At this time, it is the Agency's opinion that the toxicology data are adequate for reregistration of Cytokinin.

## **2. Exposure and Risk Assessment**

### **a. Dietary Exposure and Risk Assessment**

Only the four naturally occurring Cytokinins, derived from certain algal species, are exempt from the requirement of a tolerance when used as a plant growth regulator (40 CFR 180.1042). At this time, synthetic Cytokinin is not included in this tolerance exemption.

Tolerance exemptions are often based on the results of 90-Day (or longer) feeding and developmental toxicity studies submitted to support reregistration. However, it is the Agency's opinion that these studies can be waived for naturally occurring and synthetic Cytokinin because of low acute mammalian toxicity and very low use rates which would not

significantly increase dietary intake over natural consumption in foods. in The Agency, will be proposing an exemption from the requirements of a tolerance for certain Cytokinins (zeatin [6-(4-hydroxy-3-methylbut-trans-2-enylamino)-purine], N<sup>6</sup>-methylaminopurine, N<sup>6</sup>-dimethylaminopurine, N<sup>6</sup>-isopentenylaminopurine), and synthetic cytokinin -- kinetin [6-(furfurylamino)purine] for all raw agricultural commodities (RACs). The exemption will apply only when application rates do not exceed 250 grams of a.i./acre/year. The Agency believes this action does not present unreasonable risk. It is based on low acute mammalian toxicity, low use rates, exposure in the diet from numerous natural plant food sources, and minimal exposure in the diet derived from consumption of treated commodities under the proposed maximum label use rates.

The Agency has concluded that the risks from dietary exposure derived from consuming commodities that were treated with Cytokinin, either naturally occurring or synthetic, are not expected.

#### **b. Occupational Exposure and Risk Assessment**

Based on the application methods listed on the product labels, the potential for eye, dermal and inhalation exposure to agricultural workers does exist. However, since Cytokinin is in Toxicity Categories III and IV for acute oral, dermal, eye irritation and dermal irritation, these toxicity categories do not trigger any additional requirements for evaluation of reduction in worker exposure. The Agency has concluded that these occupational exposures and subsequent risks will be negligible because of Cytokinin's low acute mammalian toxicity and low use rates. Also, the proposed precautionary product labeling stipulated in Section V will sufficiently mitigate exposures and subsequent risks to agricultural workers.

#### **C. Environmental Assessment**

Cytokinin is well characterized as a plant growth regulator and has been in continuous use since 1978 without any reports to the Agency of adverse effects to humans and the environment. Cytokinin is widely known to stimulate cell division and several other specific metabolic processes in certain test systems. However, it's exact biochemical mode of action is not yet understood.

##### **1. Ecological Toxicity Data**

Cytokinin is a foliar and broadcast-applied plant growth regulator. A DCI for the following set of ecological toxicity data was issued on August 3, 1993: Avian Oral Toxicity (154B-60, Avian Dietary Exposure (quail) (154B-7a), Fish



Toxicity (154B-8a), Invertebrate Toxicity (154-B-9), and Nontarget Insect Testing (154B-11). The Agency granted waivers for the Avian Oral Toxicity (154B-6), Avian Dietary Exposure (154B-7a), Fish Toxicity 154B-8), and Invertebrate Toxicity 154B-9) on April 29, 1994. The Agency granted waivers for these studies based in part on a review of supplemental ecological toxicity data submitted in 1985 and low exposure rates (approximately 146 mg a.i./A). These data indicated that Cytokinins were "practically non-toxic" on an acute basis to birds, freshwater fish, and freshwater invertebrates. Additional data waivers were granted for Nontarget Insect Testing (154B-11) and Nontarget Plant Testing (154B-10) were grant in July of 1995 as part of the RED development process utilizing the previously mentioned rationale relating to low exposure. Based on a review of all available ecological toxicity data and exposure information, the Agency expects that Cytokinins will pose a minimal risk to non-target wildlife and fish.

## **2. Environmental Fate**

Environmental fate studies are Tier II studies for biochemicals and are not imposed unless adverse effects are observed in Tier I Environmental Data. Since no adverse ecological effects are anticipated, the Agency will not impose, at this time, any environmental fate requirements for the currently registered uses of Cytokinin.

## **IV. RISK MANAGEMENT AND REREGISTRATION DECISION**

### **A. Determination of Eligibility**

Section 4(g)(2)(A) of FIFRA calls for the Agency to determine, after submission of relevant data concerning an active ingredient, whether products containing the active ingredients are eligible for reregistration. The Agency has previously identified and required the submission of the generic (i.e. active ingredient specific) data required to support reregistration of products containing Cytokinin as the sole active ingredient. The Agency has completed its review of these generic data and has determined that the data are sufficient to support reregistration of some uses containing Cytokinin. However, the eighteen previously mentioned uses of Cytokinin do not have an exemption from tolerance. The Agency at this time will make no decision regarding the eligibility of these uses of Cytokinin. Rather, the Agency plans to proposed this Fall, an exemption from tolerance for ten plant regulators, including Cytokinin, when used in low doses. Pending public comment, the Agency plans to publish a final rule in late 1995 or early 1996. When this proposed exemption from tolerance is final, these eighteen uses of Cytokinin will be eligible for reregistration. Appendix B identifies the generic data requirements that the Agency reviewed as part of its determination of reregistration eligibility of Cytokinin, and lists the submitted studies that the Agency found acceptable.

The data identified in Appendix B were sufficient to allow the Agency to assess the registered uses of Cytokinin which have tolerance exemption and to determine that the currently registered uses would not result in unreasonable adverse effects to humans and the environment.

The Agency made its reregistration eligibility determination based upon the target data base required for reregistration, the current guidelines for conducting acceptable studies to generate such data, published scientific literature, etc. and the data identified in Appendix B. Although the Agency has found that the currently registered uses of Cytokinin are eligible for reregistration, it should be understood that the Agency may take appropriate regulatory action, and/or require the submission of additional data to support the registration of products containing Cytokinin, if new information comes to the Agency's attention or if the data requirements for registration (or the guidelines for generating such data) change.

## **1. Eligibility Decision**

Based on the reviews of the generic data for the active ingredients Cytokinin, the Agency has sufficient information on the health effects of Cytokinin and on its potential for causing adverse effects in fish and wildlife and the environment. The Agency has determined that Cytokinin products, labeled and used as specified in this Reregistration Eligibility Decision, will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, the Agency concludes that products containing Cytokinin for registered uses listed below are eligible for product reregistration.

## **2. Eligible Uses**

The Agency has determined that the uses of Cytokinin listed below are eligible for reregistration.

**TERRESTRIAL FOOD CROP:** asparagus, banana, broccoli, brussels sprouts, cabbage, carrot (including tops), cauliflower, celery, cucumber, eggplant, lettuce, melons, cantaloupe, honeydew, muskmelons, watermelons, okra, onion, parsley, peach, pepper, pepper (chili type), radish, spinach, squash (all or unspecified), strawberry, sweet potato, wheat

**TERRESTRIAL FOOD+ FEED CROP:** apple; beans; beans, dried-type; beans, mung; beans, succulent (lima); beans, succulent (snap); beets (unspecified); corn (unspecified); corn, field; corn, pop; corn, sweet; cotton (unspecified); cowpea/blackeyed pea; grapes; orange; peanuts (unspecified); peas (unspecified); peas, field; peas, pigeon; peas, southern; potato, white/Irish; rice; sorghum; sorghum (unspecified); soybeans (unspecified); sugar beet; tomato; wheat

**TERRESTRIAL FEED CROP:** alfalfa, cowpeas

**TERRESTRIAL+ GREENHOUSE FOOD CROP:** asparagus; banana; beans; broccoli; Brussels sprouts; cabbage; carrot (including tops); cauliflower; celery; corn, pop; corn, sweet; cucumber;eggplant; lettuce; melons; nectarine; onion; parsley; peach; pepper; pepper (chili type); potato, white/Irish; pumpkin; radish; shallot; spinach; squash (all or unspecified); squash (winter); squash (zucchini); strawberry; sweet potato; tomato

**TERRESTRIAL GREENHOUSE FOOD CROP:** potato, white/Irish, tomato

**TERRESTRIAL NON-FOOD CROP:** commercial/industrial lawns, fruits (unspecified), golf course turf, jojoba, ornamental lawns and turf, ornamental sod farm (turf), recreation area lawns, small fruits

**TERRESTRIAL NON-FOOD+ OUTDOOR RESIDENTIAL:** ornamental and/or shade trees, ornamental herbaceous plants, ornamental lawns and turf, ornamental nonflowering plants, ornamental woody shrubs and vines

**TERRESTRIAL GREENHOUSE NON-FOOD:** ornamental shade trees, ornamental herbaceous plants, ornamental woody shrubs and vines

**FORESTRY:** forest plantings (reforestation programs), pine (forest/shelterbelt)

**OUTDOOR RESIDENTIAL:** ornamental lawns and turf

**INDOOR RESIDENTIAL:** ornamental and/or shade trees, ornamental herbaceous plants, ornamental nonflowering plants

The following 18 uses of Cytokinin do not have a tolerance or tolerance exemption. They will become eligible for reregistration only when a tolerance exemption becomes a final rule. The Agency plans to propose such an exemption in Fall of 1995 and, pending public comment, issue a final rule in late 1995 or early 1996.

Anise	Garbanzos beans	Plantains
Catjang	Garlic	Pumpkins
Chinese broccoli	Leafy vegetables	Shallots
Citrus fruits	Leeks	Triticale
Cucurbit vegetables	Lupines	Turnips
Fennel	Nectarines	Yams

## **B. Regulatory Position**

The following is a summary of the regulatory positions and rationales for Cytokinin. Where labeling revisions are imposed, specific language is set forth in Section V of this document.

## **1. Tolerance Reassessment**

Cytokinins (i.e. naturally occurring) in aqueous extracts of seaweed meal, are derived from the following algae: *Laminaria digitata*, *Laminaria hyperborea*, *Fucus serratus* and *Ascophyllum nodosum*. Several, if not all of these species of algal species are consumed by man and/or livestock. The extracts from these plant species are exempt from the requirements of tolerances when used as plant regulators in or on many raw agricultural commodities (40 CFR 180.1042). Under the provisions of this tolerance exemption (40 CFR 180.1042), synthetic Cytokinin - kinetin is not exempted from the requirements of a tolerance.

The Agency plans to propose to exempt from the requirement of a tolerance, ten plant regulators, including Cytokinin (i.e. both naturally occurring and synthetic), for all RACs. This exemption is based on the plant growth regulator's low use rates, natural exposure in the diet from numerous plant food sources, minimal anticipated increase in dietary exposure over the naturally occurring exposure in the diet when using the maximum label rates, and low mammalian toxicity.

Naturally occurring Cytokinin (zeatin, N<sup>6</sup>-methylaminopurine, N - <sup>6</sup> dimethylaminopurine, and N<sup>6</sup>-isopentenylaminopurine), and synthetic Cytokinin -- kinetin will be exempt from the requirements of a tolerance when applied to growing crops (all RACs) at application rates not exceeding 250 grams/acre/year once the proposed tolerance exemption for plant growth regulators becomes a final rule.

## **2. Endangered Species Statement**

Based on the current use patterns, the potential for adverse effects to endangered plant and animal species from applications of Cytokinin is not expected.

## **3. Labeling Rationale**

### **Precautionary Labeling:**

The Agency has reexamined the toxicological data base for Cytokinin and concluded that the current precautionary labeling (i.e. Signal Word, Statement of Practical Treatment, and other label statements

associated with mitigating risks) adequately mitigate the risks associated with the use of this plant regulator.

### **Workers Protection Requirements:**

The 1992 Worker Protection Standards for Agricultural Pesticides (WPS) established certain worker-protection requirements (personal protective equipment, restricted entry intervals, etc.) to be specified on the label of all products that contain uses within the scope of WPS. Uses within the scope of the WPS include all commercial (non-homeowner) and research uses on farms, forests, nurseries, and greenhouses to produce agricultural plants (including food, feed, and fiber plants, trees, turf grasses, flowers, shrubs, ornamental, and seedlings). Uses within the scope include not only uses on plants, but also uses on soil or planting medium the plants are (or will be) grown in. At this time all currently registered uses of Cytokinin, except for golf course uses (greens, fairways, and tees), are within the scope of the Worker Protection Standards for Agricultural Pesticides.

Any product whose labeling reasonably permits use in the production of an agricultural plant on any farm, forest, nursery, or greenhouse must comply with the labeling requirements of PR Notice 93-7, "Labeling Revisions Required by the Worker Protection Standards WPS)", and PR Notice 93-7 and 93-11 are to be on the product label exactly as instructed in those notices.

On April 25, 1995, the Agency established a policy which allows registrants to reduce the interim WPS restricted entry interval (REI) from 12 hours to 4 hours for certain low risk pesticides. This policy identifies Cytokinin as a candidate eligible for a reduced WPS REI. The procedures for requesting a reduction in the REI are outlined in Section V.

### **Personal Protective Equipment (PPE);**

All PPE labeling requirements for products containing Cytokinin were established using the process described in PR Notice 93-7 or more recent EPA guidelines. This RED will not impose any changes to the PPE WPS labeling requirements established in PR Notices 93-7 and 93-11.

### **Restricted-Entry Intervals REI):**

Under the WPS, interim REI for all uses within the scope of the WPS were established on the basis of the acute mammalian toxicity of the active ingredient. The toxicity categories of the active ingredient for acute

dermal toxicity, eye irritation potential, and skin irritation potential were used to determine the interim WPS REI. If one or more of the three toxicity categories is classified as toxicity category I, the interim WPS REI is established at 48 hours. If none of the acute toxicity effects are in category I, but one or more of the three is classified as category III, the interim WPS REI is established at 24 hours. If none of the three acute toxicity effects are in category I or II, the interim WPS REI is established at 12 hours. The interim WPS REI for Cytokinin is 12 hours, since all of the acute toxicity categories are either III or IV.

## **V. ACTIONS REQUIRED BY REGISTRANTS**

This section specifies the data requirements and responses necessary for the reregistration of both manufacturing-use and end-use products.

### **A. Manufacturing-Use Products**

#### **1. Additional Generic Data Requirements**

The generic data base supporting the reregistration of Cytokinin for the above eligible uses has been reviewed and determined to be substantially complete. At this time, no additional data are being required. However, the Agency is requiring that a revised Confidential Statement of Formula (CSF) and revised product labeling be submitted within eight months of the issuance of this document.

#### **2. Labeling Requirements for Manufacturing-Use Products**

At this time, no additional labeling requirements are being imposed on manufacturing use products containing Cytokinin as an active ingredient.

### **B. End-Use Products**

#### **1. Additional Product-Specific Data Requirements**

Section 4(g)(2)(B) of FIFRA calls for the Agency to obtain any needed product-specific data regarding the pesticide after a determination of eligibility has been made. However, the data base supporting the reregistration of the above eligible end-uses of Cytokinin is substantially complete and no additional product specific data is being required at this time. However, the Agency is requiring that a revised Confidential Statement of Formula (CSF) and revised product labeling be submitted within eight months of the issuance of this document.

#### **2. Labeling Requirements for End-Use Products**

Worker Protection Standard Labeling:

The interim WPS REI for Cytokinin is 12 hours and is based on acute mammalian toxicity. The Agency has determined that the interim REI of 12 hours may, in certain circumstances, be reduced to 4 hours for pesticides with low acute mammalian toxicity. Cytokinin is a candidate for a reduced REI.

**If registrants of Cytokinin wish their product to be considered for a REI reduction from 12 hours to 4 hours, they must notify the Agency. For each product, the following information must be submitted:**

1. An application for Reregistration (EPA Form 8570-1).
2. One copy of the current product label, clearly marked to highlight the interim WPS REI.
3. Two copies of the revised label, clearly marked to highlight the revised WPS REI.
4. The following certification statement:

"I certify that this notification is complete in accordance with the provisions of the Agency's reduced REI Policy and that no other changes have been made to the labeling or confidential statement of formula of this product. I further understand that if this notification does not comply with the terms of the Agency's reduced REI Policy, this product may be in violation of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and I may be subject to enforcement action and penalties under Sections 12 and 14 of FIFRA. I understand that the Agency may direct a change in the REI of a product if the Agency determines that a change is appropriate, and that products may be subject to regulatory and enforcement action if the appropriate changes are not made."

Notifications should be sent to:

**By U.S. Mail:**

Document Processing Desk (WPS:95-1)(BPPD)  
Office of Pesticide Programs (7504W)  
Environmental Protection Agency  
401 M Street, S.W.  
Washington, DC 20460-0001

**By Express:**

Document Processing Desk (WPS:95-1)(BPPD)  
Office of Pesticide Programs (7504W)  
Room 266A, Crystal Mall 2  
1921 Jefferson Davis Highway  
Arlington, VA 22202

**C. Existing Stocks**

Registrants may generally distribute and sell products bearing old labels/labeling for 26 months from the date of the issuance of this Reregistration Eligibility Decision (RED). Persons other than the registrant may generally distribute or sell such products for 50 months from the date of the issuance of this RED. However, existing stocks time frames will be established case-by-case, depending on the number of products involved, the number of label changes, and other factors. Refer to "Existing Stocks of Pesticide Products; Statement of Policy"; Federal Register, Volume 56, No. 123, June 26, 1991.

The Agency has determined that registrants may distribute and sell Cytokinin products bearing old labels/labeling for 26 months from the date of issuance of this RED. Persons other than the registrant may distribute or sell such products for 50 months from the date of the issuance of this RED. Registrants and persons other than registrants remain obligated to meet pre-existing Agency imposed label changes and existing stocks requirements applicable to products they sell or distribute.



## **VI. APPENDICES**



















































































































































































































































































































































































































## **GUIDE TO APPENDIX B**

Appendix B contains listings of data requirements which support the reregistration for active ingredients within the case Cytokinin covered by this Reregistration Eligibility Decision Document. It contains generic data requirements that apply to Cytokinin in all products, including data requirements for which a "typical formulation" is the test substance.

The data table is organized in the following format:

1. Data Requirement (Column 1). The data requirements are listed in the order in which they appear in 40 CFR Part 158. The reference numbers accompanying each test refer to the test protocols set in the Pesticide Assessment Guidelines, which are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 487-4650.

2. Use Pattern (Column 2). This column indicates the use patterns for which the data requirements apply. The following letter designations are used for the given use patterns:

A	Terrestrial food
B	Terrestrial feed
C	Terrestrial non-food
D	Aquatic food
E	Aquatic non-food outdoor
F	Aquatic non-food industrial
G	Aquatic non-food residential
H	Greenhouse food
I	Greenhouse non-food
J	Forestry
K	Residential
L	Indoor food
M	Indoor non-food
N	Indoor medical
O	Indoor residential

3. Bibliographic citation (Column 3). If the Agency has acceptable data in its files, this column lists the identifying number of each study. This normally is the Master Record Identification (MRID) number, but may be a "GS" number if no MRID number has been assigned. Refer to the Bibliography appendix for a complete citation of the study.



# APPENDIX B

## Data Supporting Guideline Requirements for the Reregistration of Cytokinin

REQUIREMENT	USE PATTERN	CITATION(S)
<b>PRODUCT CHEMISTRY</b>		
151B-10	Chemical Identity	All 126747
151B-11	Start. Mat. & Mnfg. Process	All 126747
151B-12	Formation of Impurities	All 126747
151B-13	Preliminary Analysis	All 126747
151B-15	Certification of limits	All 126747
151B-16	Analytical Method	All 126747
151B-17	<b>PHYSICAL AND CHEMICAL PROPERTIES:</b>	
(a)	Color	All 126747
(b)	Physical State	All 126747
(c)	Odor	All 126747
(d)	Melting Point	All 126747
(e)	Boiling Point	All 126747
(f)	Density	All 126747
(g)	Solubility	All 126747
(h)	Vapor Pressure	All 126747
(i)	pH	All 126747
(j)	Stability	All 126747

## **Data Supporting Guideline Requirements for the Reregistration of Cytokinin**

<b>REQUIREMENT</b>		<b>USE PATTERN</b>		<b>CITATION(S)</b>
<b>(k)</b>	<b>Flammability</b>	Waived		
<b>(l)</b>	<b>Storage stability</b>	All		126747
<b>(o)</b>	<b>Corrosion characteristics</b>	All		126747
<b>(p)</b>	<b>Octanol/water partition</b>	Waived		







## **GUIDE TO APPENDIX C**

1. **CONTENTS OF BIBLIOGRAPHY.** This bibliography contains citations of all studies considered relevant by EPA in arriving at the positions and conclusions stated elsewhere in the Reregistration Eligibility Document. Primary sources for studies in this bibliography have been the body of data submitted to EPA and its predecessor agencies in support of past regulatory decisions. Selections from other sources including the published literature, in those instances where they have been considered, are included.
2. **UNITS OF ENTRY.** The unit of entry in this bibliography is called a "study". In the case of published materials, this corresponds closely to an article. In the case of unpublished materials submitted to the Agency, the Agency has sought to identify documents at a level parallel to the published article from within the typically larger volumes in which they were submitted. The resulting "studies" generally have a distinct title (or at least a single subject), can stand alone for purposes of review and can be described with a conventional bibliographic citation. The Agency has also attempted to unite basic documents and commentaries upon them, treating them as a single study.
3. **IDENTIFICATION OF ENTRIES.** The entries in this bibliography are sorted numerically by Master Record Identifier, or "MRID number". This number is unique to the citation, and should be used whenever a specific reference is required. It is not related to the six-digit "Accession Number" which has been used to identify volumes of submitted studies (see paragraph 4(d)(4) below for further explanation). In a few cases, entries added to the bibliography late in the review may be preceded by a nine character temporary identifier. These entries are listed after all MRID entries. This temporary identifying number is also to be used whenever specific reference is needed.
4. **FORM OF ENTRY.** In addition to the Master Record Identifier (MRID), each entry consists of a citation containing standard elements followed, in the case of material submitted to EPA, by a description of the earliest known submission. Bibliographic conventions used reflect the standard of the American National Standards Institute (ANSI), expanded to provide for certain special needs.
  - a. **Author.** Whenever the author could confidently be identified, the Agency has chosen to show a personal author. When no individual was identified, the Agency has shown an identifiable laboratory or testing facility as the author. When no author or laboratory could be identified, the Agency has shown the first submitter as the author.
  - b. **Document date.** The date of the study is taken directly from the document. When the date is followed by a question mark, the bibliographer has deduced the date from the evidence contained in the document. When the date appears as (19??), the Agency was unable to determine or estimate the date of the document.

- c. Title. In some cases, it has been necessary for the Agency bibliographers to create or enhance a document title. Any such editorial insertions are contained between square brackets.
- d. Trailing parentheses. For studies submitted to the Agency in the past, the trailing parentheses include (in addition to any self-explanatory text) the following elements describing the earliest known submission:
  - (1) Submission date. The date of the earliest known submission appears immediately following the word "received."
  - (2) Administrative number. The next element immediately following the word "under" is the registration number, experimental use permit number, petition number, or other administrative number associated with the earliest known submission.
  - (3) Submitter. The third element is the submitter. When authorship is defaulted to the submitter, this element is omitted.
  - (4) Volume Identification (Accession Numbers). The final element in the trailing parentheses identifies the EPA accession number of the volume in which the original submission of the study appears. The six-digit accession number follows the symbol "CDL," which stands for "Company Data Library." This accession number is in turn followed by an alphabetic suffix which shows the relative position of the study within the volume.

## BIBLIOGRAPHY

### MRID

### CITATION

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- 00074304 Hansen, K.L.; Hewett, T.A.; Beck, L.S. (1981) Primary Dermal Irritation Burst Yield Enhancer and Plant Growth Regulator: Project No. 1658-A. (Unpublished study received May 26, 1981 under 42852-2; prepared by Elars Bioresearch Laboratories, Inc., submitted by Dawn Corp., Denison, Iowa; CDL:245224-A)
- 00126747 APR Agrichemical, Inc. (19??) cChemical Study: Cytex\*. (Compilation; unpublished study received Mar 28, 1983 under 49554-1; CDL:249893-A)
- 00138091 Beck, L.; Morita, D.; Hepler, D.; et al. (19980) Rat Acute Oral Toxicity: [#8006791081]: Project No. 1055. (unpublished study received Oct 12, 1983 under 4F3020; prepared by Elars Bioresearch Laboratories, Inc., submitted by Atlantic & Pacific Research, Inc., North Palm Beach, FL; CDL:072257-C).
- 00138092 Rhoads, W.; Morita, D.; Mills, V.; et al. (1979) Cytex Primary Skin Irritation: Project No. 1055. (Unpublished study received Oct, 1983 under 4F3020; prepared by Rhoads Scientific Co., submitted by Atlantic & Pacific Research Inc., North Palm Beach, FL.
- 00138093 Rhoads, W.; Morita, D.; Mills, V.; et al. (1979) Cytex Acute Dermal Toxicity: Project No. 1055. (Unpublished study received Oct 12, 1983 under 4F3020; prepared by Rhoads Scientific Co., submitted by Atlantic & Pacific Research, Inc., North Palm Beach, FL; CDL: 072257-E).
- 00138094 Rhoads, W.; Mills, V.; Morita, D.; et al. (1979) Cytex Primary Eye Irritation: Project No. 1055. (unpublished study received Oct 12, 1983 under 4F3020; prepared by Rhoads Scientific Co., submitted by Atlantic & Pacific Research, Inc., North Palm Beach, FL;CDL:072257-F).
- 94275001 Plimpton, R. (1990) Atlantic & Pacific Research Inc Phase 3 Summary of MRID 00126747. Cytex Physical Chemistry Report: File 76-2203. Prepared by Atlantic & Pacific Research, Inc. 12 p.
- 94275005 Plimpton, R. (1990) Atlantic & Pacific Research Inc Phase 3 Summary of MRID 00138092. Cytex Primary Skin Irritation: Project 1055. Prepared by Rhoads Scientific Company. 8 p.

The following is a list of available documents for Cytokinin that may further assist you in responding to this Reregistration Eligibility Decision document. These documents may be obtained by the following methods:

**Electronic**

**File format:** Portable Document Format (.PDF) Requires Adobe® Acrobat or compatible reader. Electronic copies can be downloaded from the Pesticide Special Review and Reregistration Information System at 703-308-7224. They also are available on the Internet on EPA's gopher server, GOPHER.EPA.GOV, or using ftp on FTP.EPA.GOV, or using WWW (World Wide Web) on WWW.EPA.GOV., or contact Richard King at (703)-308-8052.

1. PR Notice 86-5.
2. PR Notice 91-2 (pertains to the Label Ingredient Statement).
3. A full copy of this RED document.
4. A copy of the fact sheet for Cytokinin.

The following documents are part of the Administrative Record for Cytokinin and may be included in the EPA's Office of Pesticide Programs Public Docket. Copies of these documents are not available electronically, but may be obtained by contacting the person listed on the Chemical Status Sheet.

1. Health and Environmental Effects Science Chapters.
2. Detailed Label Usage Information System (LUIS) Report.

The following Agency reference documents are not available electronically, but may be obtained by contacting the person listed on the Chemical Status Sheet of this RED document.

1. The Label Review Manual.
2. EPA Acceptance Criteria