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

OCT 23 1996

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OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

MEMORANDUM

**SUBJECT:** Registration of Foli-R-Fos 400 (EPA File Symbol 069579-R) Fungicide Containing 45.5% Mono-and Di- Potassium salt of Phosphorous Acid as its Active Ingredients: Chemical No. 076416; Case No. 046750: Review of Product Chemistry Data. MRID Nos. 439058-01, -02, and -03; Submission No.: S505790; DP Barcode: D226397

**FROM:** Freshteh Toghrol, Ph.D., Chemist *F. Toghrol*  
Biopesticides & Pollution Prevention Division

**THRU:** James Thomas McClintock, Ph.D., Team Leader *JTM*  
Biopesticides & Pollution Prevention Division *10/23/96*

**TO:** Rita Kumar, Regulatory Action Leader  
Biopesticides & Pollution Prevention Division

ACTION

U.I.M. Agrochemicals (Aust.) PTY. LTD, requests registration of an end-use product, Foli-R-Fos 400 (EPA File Symbol 069579-R), containing 45.5% mono-and di-potassium salt of phosphorous acid as its active ingredients, to be used as a systemic fungicide to suppress *Phytophthora* and *Pythium* in ornamentals and bedding plants, conifers and turf. To support this registration, Agrochemicals has submitted product chemistry data (MRID Nos. 439058-01, -02, and -03) which has been reviewed by Oak Ridge Laboratories and has been revised by BPPD to reflect the Division policies.

## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

3. With the exception of storage stability and corrosion characteristics studies that are in progress, the submitted product chemistry data (MRID No. 439058-03) satisfy the physical chemical characteristics of Foli-R-Fos® 400 data requirements.
2. The submitted data (MRID No. 439058-01) satisfy the data requirements for product identity, manufacturing process, and discussion of the formation of unintentional ingredient (151B-10, 151B-11, and 151B-12).
3. The active ingredients in the formulation are  $\text{KH}_2\text{PO}_3$  and  $\text{K}_2\text{HPO}_3$ . The submitted data (MRID No. 439058-02) satisfy the data requirements for analysis of samples and certification of ingredients limits (151B-13 and 151B-15). CSF (dated 12/29/95) is acceptable.
4. The submitted product chemistry data supports registration of Foli-R-Fos® 400.

### (151-10) Product Identity: MRID 439058-01

Product identity and disclosure of ingredients for Foli-R-Fos were submitted (MRID 439058-01). The end-use product contains 45.5% mono-and di- potassium salt of phosphorous acid as the active ingredients.

cc: T. McClintock, F. Toghrol, John Tice, BPPD Subject file.  
F. Toghrol, CS#1: BPPD: Tel (703) 308-7014:10/21/96

FOLI-R-FOS® 400

Physical and Chemical Characteristics (151B-17)

EPA Reviewer: Freshteh Toghrol, Ph.D.  
Biopesticide & Pollution Prevention Division (7501W)

F. Toghrol Date: 10/21/96

### DATA EVALUATION REPORT

STUDY TYPE: Physical and Chemical Properties (151B-17)

CASE NO.: 046750

PC CODE: 076416

MRID NO.: 43905803

TEST MATERIAL: Foli-R-Fos® 400

SYNONYMS: None provided

STUDY NUMBER: 95021

SPONSOR: U.I.M. Agrochemicals (Aust.) Pty. Ltd., 30-42 Railway Terrace, Rocklea, P.O. Box 72, Brisbane Market QLD, Australia, 4106

TESTING FACILITY: Compliance Services International, 1112 Alexander Avenue, Tacoma, WA 98421

TITLE OF REPORT: Foli-R-Fos® 400 - product chemistry volume III physical and chemical properties

AUTHOR: Stephen O. Jacobson

REPORT ISSUED: November 2, 1995

EXECUTIVE SUMMARY: The physical and chemical characteristics of Foli-R-Fos® 400 were presented (MRID 43905803). The only missing data were storage stability and corrosion characteristics. The studies for these data were in progress, however, the absence of these data was not considered to be a problem.

Classification of the study - Acceptable.

A. PHYSICAL AND CHEMICAL PROPERTIES (151B-17)

Color	Colorless @22°C
Physical state	Liquid @22°C
Odor	Slight @22°C
Melting point	Not applicable
Boiling point	Approximately 100°C
Density/Specify gravity	1.36 g/mL @23°C
Solubility	Soluble in water and hydrophilic solvents Insoluble in organic solvents
Vapor pressure	Same as water
pH	5.08 @22°C
Stability	Stable when exposed to iron, copper, or aluminum for 14 days, 24-hour exposure to natural sunlight, or 14 days at 54°C in the dark
Flammability	Not applicable (Product is an aqueous solution.)
Storage Stability	Study in progress and it will be submitted upon completion.
Viscosity	14.4 cSt@22°C
Miscibility	Not applicable (Not an emulsifiable liquid)
Corrosion Characteristics	Study in progress and it will be submitted upon completion.
Octanol/Water Partition Coefficient	Not applicable (The product is a highly polar inorganic.)

B. DISCUSSION

All of the data was present, except for storage stability and corrosion characteristics. However, the stability of the product in storage was not considered to be problematic since the product is a buffered phosphite solution, and the product was not anticipated to cause any corrosion in the plastic storage containers (MRID 439058-01).

C. STUDY DEFICIENCIES

None.

Classification: Acceptable

FOLI-R-FOS® 400

Product Identity and Disclosure of Ingredients (151B-10)  
Manufacturing Process (151B-11)  
Discussion of the Formation of Unintended Ingredients (151B-12)

EPA Reviewer: Freshteh Toghrol, Ph.D.  
Biopesticide & Pollution Prevention Division (7501W)

F. Toghrol Date: 10/21/96

**DATA EVALUATION REPORT**

STUDY TYPE: Product Identity and Information on Ingredients (151B-10)  
Manufacturing Process (151B-11)  
Discussion of the Formation of Unintentional Ingredients (151B-12)

CASE NO.: 046750

PC CODE: 076416

MRID NO.: 439058-01

TEST MATERIAL: Foli-R-Fos 400®

SYNONYMS: None provided

STUDY NUMBER: 95038

SPONSOR: U.I.M. Agrochemicals (Aust.) Pty. Ltd., 30-42 Railway Terrace, Rocklea, P.O. Box 72, Brisbane Market QLD, Australia, 4106

TESTING FACILITY: Compliance Services International, 1112 Alexander Avenue, Tacoma, WA 98421.

TITLE OF REPORT: Foli-R-Fos® 400 - product chemistry volume I: product identity, manufacturing process, and discussion of the formation of unintentional ingredients

AUTHOR: Stephen O. Jacobson

REPORT ISSUED: November 2, 1995

EXECUTIVE SUMMARY: The components of Foli-R-Fos® 400 were identified as [redacted] [2] phosphorous acid, and [redacted] (MRID 439058-01). The manufacturing process of Foli-R-Fos® 400 was provided. Based on maximum values for [redacted] and [redacted] in their specification sheets, their percentages as contaminants in the final product could be [redacted] but this was not expected to be a problem.

Classification of the study: Acceptable

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

A. PRODUCT IDENTITY AND DISCLOSURE OF INGREDIENTS (151B-10)



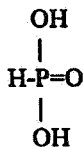
PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED  
INERT INGREDIENT INFORMATION IS NOT INCLUDED

2. Phosphorous acid

Classification: active ingredient  
Common Names: not provided  
Chemical Name: not provided  
CAS Registry Number: 13598-36-2  
Molecular Formula: H<sub>3</sub>PO<sub>3</sub>  
Molecular Weight: 82  
Percentage composition: not provided  
Certified limits: not specified

Source: [REDACTED]

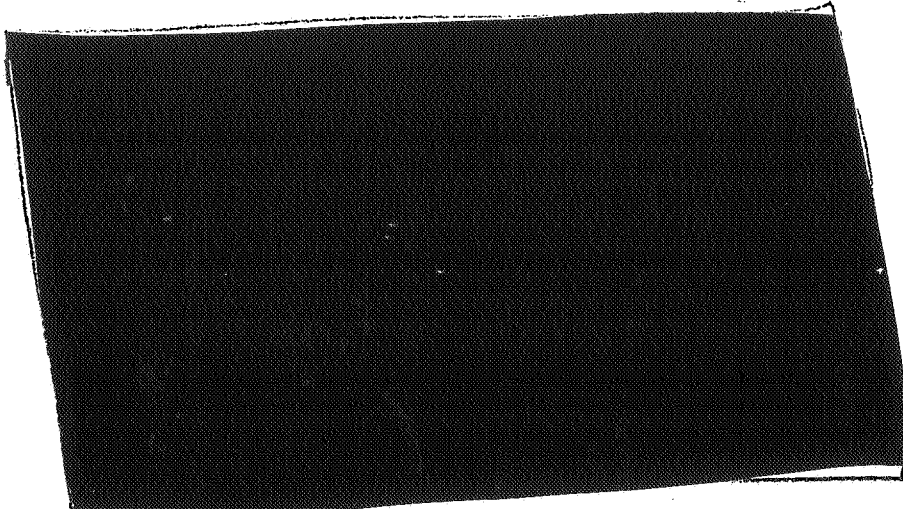
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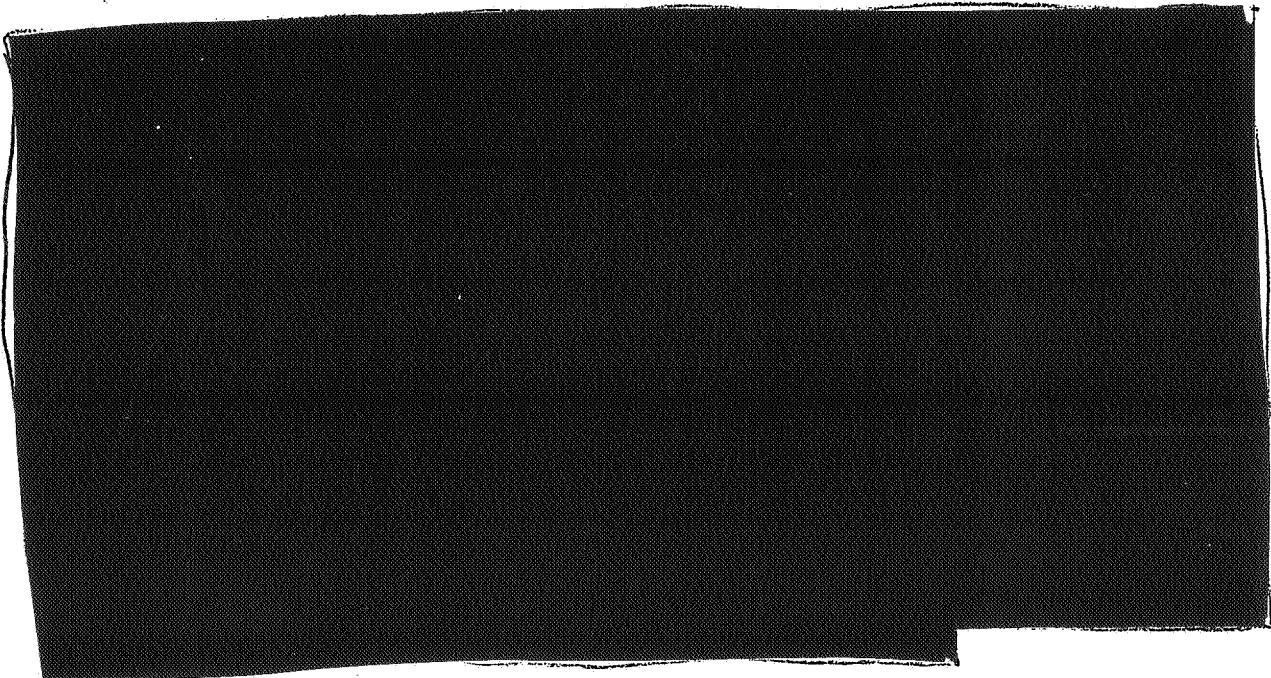
MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED

FOLI-R-FOS® 400

Product Identity and Disclosure of Ingredients (151B-10)  
Manufacturing Process (151B-11)  
Discussion of the Formation of Unintended Ingredients (151B-12)



**B. MANUFACTURING PROCESS (151B-11)**



NEXT INGREDIENT INFORMATION IS NOT INCLUDED

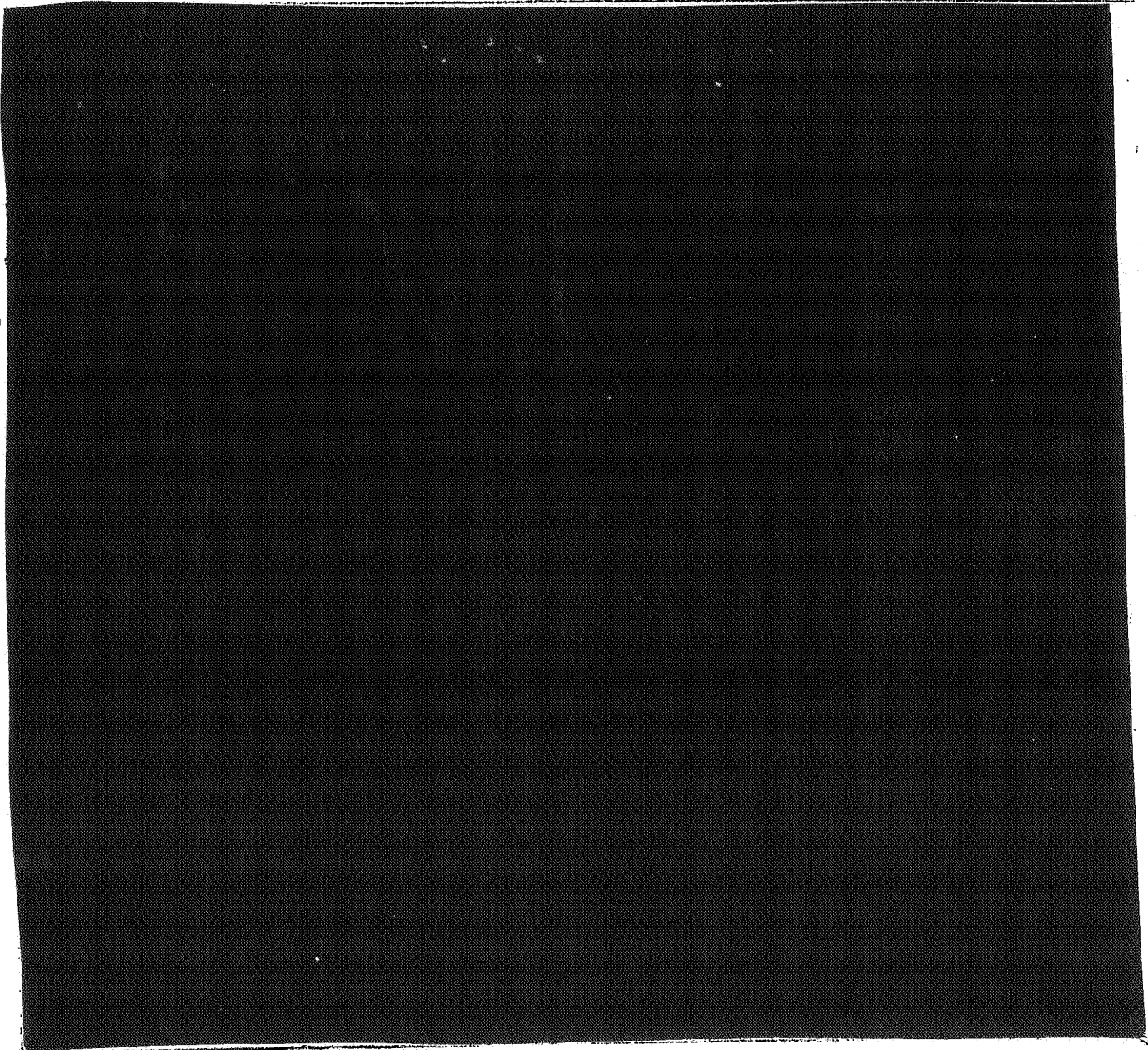
**C. DISCUSSION OF THE FORMATION OF UNINTENTIONAL INGREDIENTS (151B-12)**

No single impurity was expected to account for more than 0.1 weight percent in the final product. The specification sheets for [redacted] and phosphorous acid were included. The phosphorous acid specification sheet disclosed that 0.1% (by weight) was phosphate, however, that amount would be much lower in the final product because of the addition of [redacted] and the [redacted] and [redacted] were recorded on the specification sheet for [redacted] as being present at a maximum [redacted]. If [redacted] were present as the maximum percentage of [redacted], then the maximum theoretical percent in

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the final product would be [REDACTED] The report author felt that these percentages would have no deleterious effects. In Table 1, the concentrations of contaminants in the final products are listed.



MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED

INGREDIENT INFORMATION IS NOT INCLUDED  
UNINTENDED INGREDIENT INFORMATION IS NOT INCLUDED

Data taken from p. 6, MRID 43905801.

- <sup>1</sup>Based on analysis by Incite Laboratories
- <sup>2</sup>Based on specifications sheet provided by supplier
- <sup>3</sup>Based on calculations by UIM Chemicals Group
- <sup>4</sup>Based on analysis by Analabs

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FOLI-R-FOS® 400

Product Identity and Disclosure of Ingredients (151B-10)  
Manufacturing Process (151B-11)  
Discussion of the Formation of Unintended Ingredients (151B-12)

NA:Not Analyzed

D. DISCUSSION

Foli-R-Fos® 400 contained [1] [REDACTED] [2] phosphorous acid, and [3] [REDACTED] (MRID 43905801). The manufacturing process of Foli-R-Fos® 400 was provided. Based on maximum values for [REDACTED] in their specification sheets, their percentages as contaminants in the final product could be [REDACTED] but this was not expected to be a problem.

E. STUDY DEFICIENCIES

None.

Classification: Acceptable

INERT INGREDIENT INFORMATION IS NOT INCLUDED MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED

FOLI-R-FOS® 400

Analysis of Samples (151B-13)  
Certification of Ingredients Limits (151B-15)

EPA Reviewer: Freshteh Toghrol, Ph.D.  
Biopesticide & Pollution Prevention Division (7501W)

F. Toghrol Date: 10/2/96

### DATA EVALUATION REPORT

STUDY TYPE: Analysis of Samples (151B-13)  
Certification of Ingredients Limits (151B-15)

CASE NO.: 046750

PC CODE: 076416

MRID NO.: 439058-02

TEST MATERIAL: Foli-R-Fos® 400

SYNONYMS: Not provided

STUDY NUMBER: 95019

SPONSOR: U.I.M. Agrochemicals (Aust.) Pty. Ltd., 30-42 Railway Terrace, Rocklea, P.O.  
Box 72, Brisbane Market QLD, Australia, 4106

TESTING FACILITY: Compliance Services International, 1112 Alexander Avenue, Tacoma,  
WA 98421

TITLE OF REPORT: Foli-R-Fos 400® - product chemistry volume II analysis of samples and  
certification of limits

AUTHOR: Stephen O. Jacobson

REPORT ISSUED: November 2, 1995

EXECUTIVE SUMMARY: Foli-R-Fos® 400 was analyzed for [1] phosphorous acid (reported  
as phosphite), [2] [REDACTED] and [3] [REDACTED] (MRID 43905802). The average concentrations  
and standard deviations were determined from (1) [REDACTED] and (2) [REDACTED]  
of each component from three different batches. These concentrations demonstrated that  
the formulation components had very close percentages in the products tested. From the  
data in the latter analyses, the precision and accuracy were calculated. The certification  
limits were also presented for Foli-R-Fos® 400.

Classification of the study - Acceptable.

September 1996

MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED

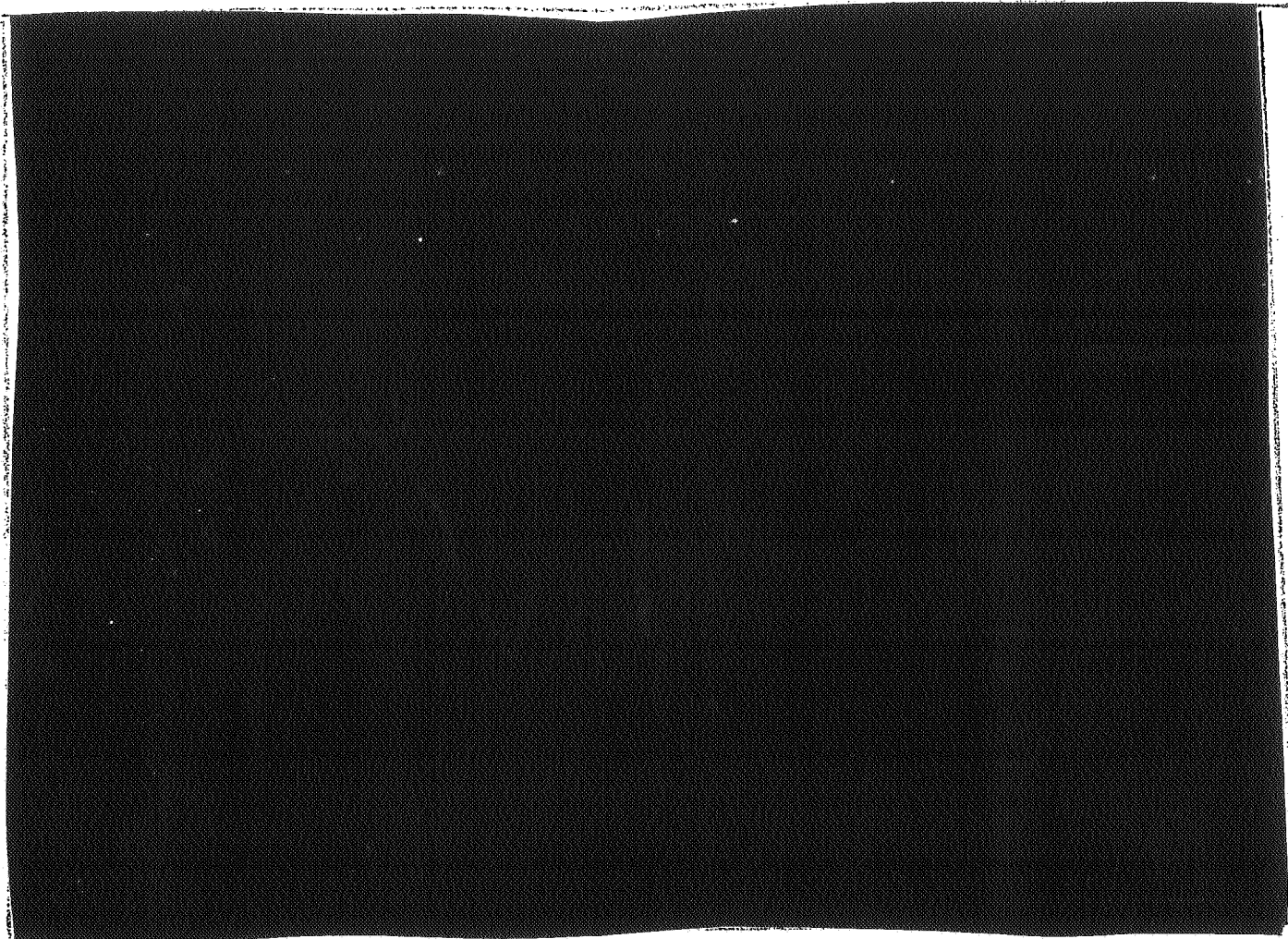
INERT INGREDIENT INFORMATION IS NOT INCLUDED

FOLI-R-FOS® 400

Analysis of Samples (151B-13)  
Certification of Ingredients Limits (151B-15)

QUALITY CONTROL PROCEDURE INFORMATION IS NOT INCLUDED

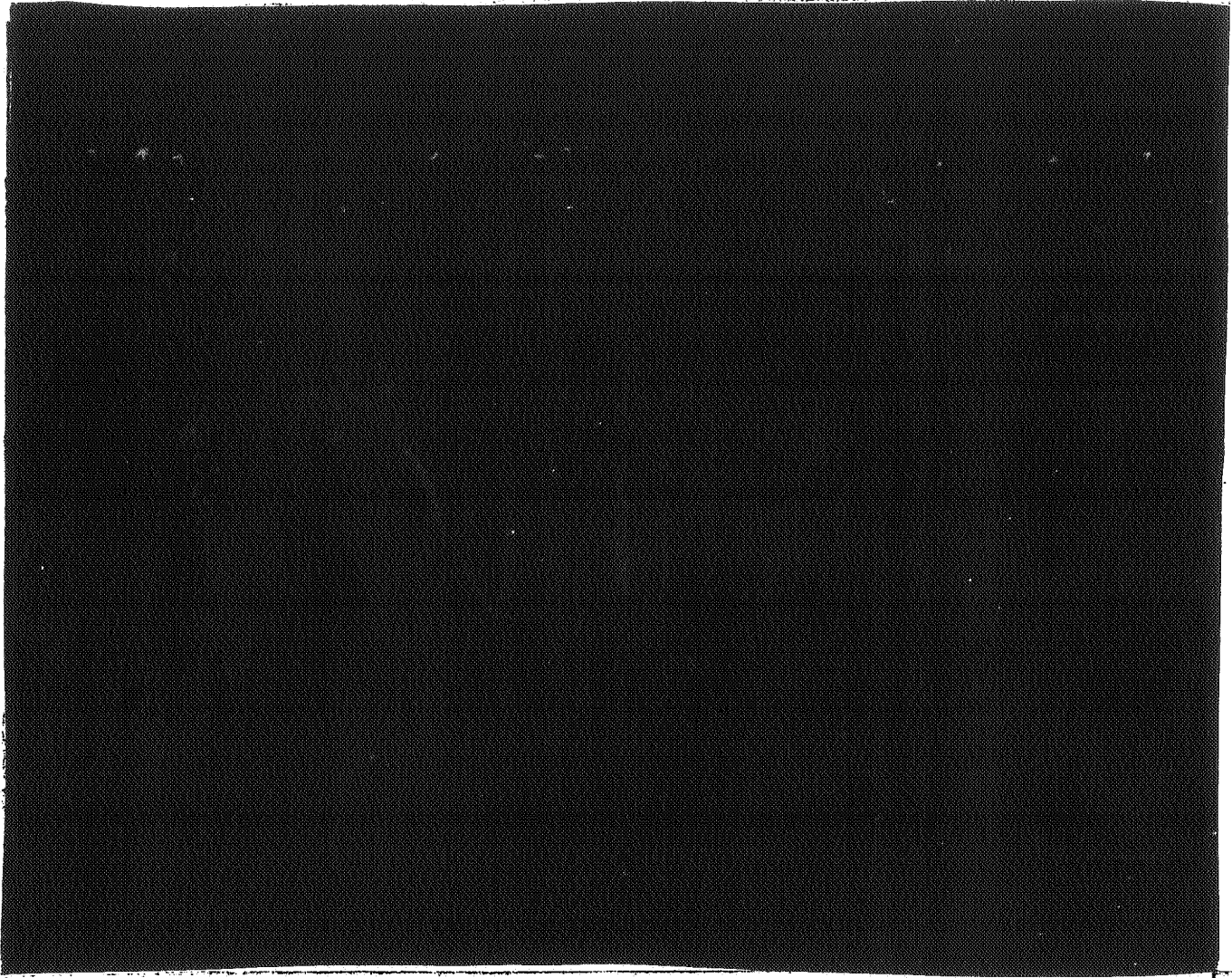
A. ANALYSIS OF SAMPLES (151B-13)



Data taken from p. 6, MRID 43905802.

<sup>1</sup>Potassium phosphite is the sum of the phosphite and potassium and represents the active ingredient in Foli-R-Fos 400®.

The accuracy and the precision of the three methods were calculated by analyzing 10 samples from 1 production batch of Foli-R-Fos® 400 (Table 2).



QUALITY CONTROL PROCEDURE INFORMATION IS NOT INCLUDED

Data taken from p. 7, MRID 43905802.

<sup>1</sup>Precision was 100 x (Standard deviation/Average)

<sup>2</sup>Nominal weight percent component was calculated from the specific batch records supplied by the manufacturer.

<sup>3</sup>Accuracy was 100 x (Average/Nominal weight percent of component)

B. CERTIFICATION OF INGREDIENT LIMITS (151B-15)

The upper and lower limits for Foli-R-Fos® 400 were derived from preliminary analyses (Table 3).

INERT INGREDIENT INFORMATION IS NOT INCLUDED

TABLE 3. Certified limits of the components in Foli-R-Fos® 400		
Components	Certified Upper Limit (%)	Certified Lower Limit (%)
KH <sub>2</sub> PO <sub>3</sub> + K <sub>2</sub> HPO <sub>3</sub>	46.0	45.0
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

Data taken from p. 31, MRID 43905802.

C. DISCUSSION

The sample analyses and the certification limits were presented for Foli-R-Fos® 400. Of the samples analyzed, the concentrations demonstrated that the formulation components had very close percentages in the products tested. This information was sufficient for the guidelines of this submission.

D. STUDY DEFICIENCIES

None.

Classification: Acceptable