Data Evaluation Report on the Acute Dietary Toxicity of AMPA to Avian Species, *Colinus virginianus*  
PMRA Submission Number {......}  
EPA MRID Number 43334710

Data Requirement:  
PMRA Data Code {......}  
EPA DP Barcode Not Provided  
OECD Data Point {......}  
EPA MRID 43334710  
EPA Guideline OPPTS 850.2200 (71-2a)

Test material: Aminomethyl Phosphonic Acid  
(Glyphosate Degradate)  
Purity: 87.8%

Common name: AMPA  
Chemical name: IUPAC: Not Reported  
CAS name: Not Reported  
CAS No. Not Reported  
Synonyms: None Reported

Primary Reviewer: John Marton  
Staff Scientist, Cambridge Environmental Inc.  
Signature:  
Date: 1/12/07

Secondary Reviewer: Teri S. Myers  
Senior Scientist, Cambridge Environmental Inc.  
Signature:  
Date: 2/12/07

Primary Reviewer: Stephen Carey  
EPA Biologist, OPP, EFED, ERBIII  
Date: 7/18/07

Secondary Reviewer(s): {..........................}  
{EPA/OECD/PMRA}  
Date: {..........}

Reference/Submission No.: {..........}

Company Code {......} [For PMRA]  
Active Code {......} [For PMRA]  
Use Site Category: {......} [For PMRA]  
EPA PC Code 417300 (Parent Compound) & 207800 (Degradate Compound)

Date Evaluation Completed: July 18 2007


**DISCLAIMER:** This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute dietary toxicity of a pesticide to avian species. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.
Data Evaluation Report on the Acute Dietary Toxicity of AMPA to Avian Species, *Colinus virginianus*

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**EXECUTIVE SUMMARY:**

The subacute dietary toxicity of AMPA (Glyphosate Degradate) to 10-d-old Northern Bobwhite Quail (*Colinus virginianus*) was assessed over 8 days. AMPA was administered to the birds in the diet at 0 (vehicle control), 493, 878, 1563, 2774 and 4934 mg ai/kg dw of diet; verification of these dose levels was provided in MRID 43334712 and showed that all values were within 93-109% of target (see Reviewer’s Comments section for details). The 8-day acute dietary LC₅₀ was >4934 mg ai/kg diet. The 8-day NOAEC of AMPA based on the lack of treatment-related mortality and sub-lethal effects was 4934 mg ai/kg diet. According to the US EPA classification, AMPA (Glyphosate Degradate) would be classified as practically non-toxic to Northern bobwhite quail on a subacute dietary basis at a nominal concentration of 4934 mg ai/kg diet.

One mortality was observed on Day 2 in the 493 mg ai/kg diet treatment group; however, this was not considered to be treatment related. Furthermore, the test material did not significantly impact weight gain or food consumption.

This toxicity study is classified as scientifically sound and does satisfy the guideline requirement for a subacute dietary toxicity study with Northern bobwhite quail.

**Results Synopsis**

Test Organism Size/Age(Mean Weight): 10 Days; 20 (18-22) g

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC₅₀:</td>
<td>&gt;4934 mg ai/kg diet</td>
<td>N/A</td>
</tr>
<tr>
<td>Probit slope:</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>NOAEC:</td>
<td>4934 mg ai/kg diet</td>
<td>N/A</td>
</tr>
<tr>
<td>Endpoint(s) affected:</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
I. MATERIALS AND METHODS:

GUIDELINE FOLLOWED: This study was conducted following guidelines outlined in Section 71-2 of the Environmental Protection Agency Registration Guidelines, Pesticide Assessment Guidelines, FIFRA Subdivision E, Hazard Evaluation, Wildlife and Aquatic Organisms; and upon ASTM Standard E857-87, “Standard Practice for Conducting Subacute Dietary Toxicity Tests with Avian Species.” The following deviation from OPPTS 850.2200 was noted:

The physiochemical properties of the test material were not reported.

This deviation did not impact the acceptability of the study.

COMPLIANCE: Signed and dated No Data Confidentiality, GLP and Quality Assurance statements were provided. This study was conducted in compliance with GLP standards as published by the U.S. EPA in 40 CFR, Part 160; OECD, ISBN 92-84-12367-9; and Japan MAFF, 59 NohSan, Notification No. 3850, Agricultural Production Bureau.

A. MATERIALS:

1. Test Material

   Description: Aminomethyl Phosphonic Acid (Glyphosate Degradate)

   Lot No./Batch No.: PIT-9008-2407T

   Purity: 87.8%

   Stability of Compound Under Test Conditions: Samples of the test diets were taken to verify the test concentrations administered and to confirm the stability and homogeneity of the test substance in the diets. Samples were frozen and transferred to Monsanto Environmental Health Laboratories for analysis. The results of this analysis are provided in a separate report, MRID 43334712. They revealed that the test material levels taken on days 0 and 5 ranged from 88-105% of target.

   Storage Conditions of Test Chemicals: Stored at room temperature.
Physicochemical properties of AMPA.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water solubility at 20EC</td>
<td>Not Reported</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not Reported</td>
<td></td>
</tr>
<tr>
<td>UV absorption</td>
<td>Not Reported</td>
<td></td>
</tr>
<tr>
<td>pKa</td>
<td>Not Reported</td>
<td></td>
</tr>
<tr>
<td>Kow</td>
<td>Not Reported</td>
<td></td>
</tr>
</tbody>
</table>

*(OECD recommends water solubility, stability in water and light, pKa, Pow, and vapor pressure of test compound)*

2. Test organism:

**Species (common and scientific names):** Northern bobwhite quail (*Colinus virginianus*)

*(EPA recommends using either bobwhite quail or mallard duck.)*

**Age at study initiation:** 10 Days

*(EPA recommends: 10-14 days old)*

**Weight at study initiation (mean and range):** 20 (18-22) g

**Source:** On-site Production Flock.

B. STUDY DESIGN:

1. Experimental Conditions

   a. Range-finding Study: No range-finding studies were reported.

   b. Definitive Study:

   **Table 1: Experimental Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acclimation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period:</td>
<td>Continuous</td>
<td>Food and water from the town of Easton public water supply were provided <em>ad libitum.</em></td>
</tr>
<tr>
<td>Conditions: (same as test or not)</td>
<td>Same as test</td>
<td></td>
</tr>
<tr>
<td>Feeding:</td>
<td>Game bird ration formulated to Wildlife International Ltd.'s specifications</td>
<td></td>
</tr>
<tr>
<td>Health: (any mortality observed)</td>
<td>Not reported; however, birds exhibiting abnormal behavior or physical injury were not used in the definitive test.</td>
<td></td>
</tr>
</tbody>
</table>
## Data Evaluation Report on the Acute Dietary Toxicity of AMPA to Avian Species, *Colinus virginianus*

PMRA Submission Number [......]  
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen size and construction materials</td>
<td>Thermostatically controlled brooding pens had floors that measured approximately 72 x 90 cm and ceiling height was approximately 23 cm. External walls, ceilings and floors were constructed of galvanized steel wire and sheeting.</td>
<td>Recommended pen size is about 35 x 108 x 24 cm</td>
</tr>
<tr>
<td>Test duration</td>
<td>5 days with treated feed and 3 days with untreated feed</td>
<td>Recommended test duration is 5 days with treated feed and at least 3 days observation with &quot;clean&quot; feed.</td>
</tr>
<tr>
<td>Test concentrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nominal:</td>
<td>0 (vehicle control), 493, 878, 1563, 2774 and 4934 mg ai/kg dw of diet</td>
<td>The reviewer corrected the nominal concentrations for the purity of the test material (87.8%). The results from the analysis of the test material in the feed were provided in MRID 43334712.</td>
</tr>
<tr>
<td>measured:</td>
<td>Measured samples of dose levels showed them to be 93-109% of target.</td>
<td>Five or six test concentrations should be used in a geometric scale, unless the LC₅₀ &gt; 5000 mg ai/kg diet.</td>
</tr>
<tr>
<td>Solvent/vehicle, if used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>type:</td>
<td>Corn Oil</td>
<td>Recommended solvents include distilled water, corn oil, propylene glycol, 1% carboxymethylcellulose, or gum arabic. The solvent should not be more than 2%.</td>
</tr>
<tr>
<td>amount:</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Diet preparation and feeding</td>
<td>Test diets were prepared by mixing the test substance into the diet with corn oil. Mixing was done with a Hobart mixer. Diets were prepared on the day of test initiation and sufficient feed was prepared for the duration of the treated feed period.</td>
<td>The control was treated with 2% corn oil only. The control group should be tested with a diet containing the maximum amount of vehicle used in treated diets.</td>
</tr>
<tr>
<td>Feed withholding period</td>
<td>None reported</td>
<td></td>
</tr>
<tr>
<td>Stability and homogeneity of test material in the diet determined (Yes/No)</td>
<td>Samples were shipped to Monsanto Environmental Health Laboratories for analysis; the results of these analyses are described in another study report, MRID 43334712 (see Reviewer's Comments section for</td>
<td></td>
</tr>
</tbody>
</table>
# Data Evaluation Report on the Acute Dietary Toxicity of AMPA to Avian Species, *Colinus virginianus*

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EPA MRID Number 43334710

## Parameter Details Remarks

### Number of birds per replicate/groups
- for negative control: N/A
- for vehicle control: 10
- for treated: 10

The recommended number of birds per replicate is a minimum of ten.

### Number of replicates/group (if used)
- for negative control: N/A
- for vehicle control: 3
- for treated: 1

### Test conditions
- temperature: Brooding Compartment 35±2°C
- Room 25±2°C
- relative humidity(%): 41±1%
- photoperiod: 16L:8D; 130 lux

**Recommended brooder temperature is about 35°C (95°F)**

**Recommended room temperature is 22-27°C (71-81°F)**

**Recommended relative humidity is 30-80%**

**Recommended photoperiod is a minimum of 14 hours of light.**

### Reference chemical, if used
N/A; a reference chemical was not used

## 2. Observations:

### Table 2: Observations

<table>
<thead>
<tr>
<th>Parameters measured (mortality/body weight/mean feed consumption/others)</th>
<th>Details</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Mortality</td>
<td>Feed consumption was reported as an estimate due to the unavoidable wastage of the by the birds.</td>
<td></td>
</tr>
<tr>
<td>-Average Weight Gain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Feed Consumption</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate the stability and homogeneity of test chemical in the diet
- Not reported

Indicate if the test material was regurgitated
- No regurgitation was reported

Treatments on which necropsies were performed
- No necropsies were performed

Observation intervals
- Daily

Were raw data included?
- Sufficient summarized data tables
### II. RESULTS AND DISCUSSION:

#### A. MORTALITY:

Throughout the duration of the test, a single mortality occurred in the nominal 493 mg ai/kg diet treatment group on Day 2. This one mortality was not attributed to the test material. Therefore, the resulting NOAEC and LC$_{50}$ values were 4934 and $>$4934 mg ai/kg diet, respectively.

#### Table 3: Effect of AMPA on Mortality of *Colinus virginianus*

<table>
<thead>
<tr>
<th>Treatment (mg ai/kg diet)</th>
<th>No. of Birds</th>
<th>Cumulative Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Control</td>
<td>30</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>493</td>
<td>10</td>
<td>0 1 1 1 1 1</td>
</tr>
<tr>
<td>878</td>
<td>10</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>1563</td>
<td>10</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>2774</td>
<td>10</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>4934</td>
<td>10</td>
<td>0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

NOAEC  4934 mg ai/kg diet

LC$_{50}$ >4934 mg ai/kg diet

<table>
<thead>
<tr>
<th>Reference chemical</th>
<th>mortality</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 5</th>
<th>Day 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>LC$_{50}$</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOAEC</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N/A- Not Applicable

#### B. SUB-LETHAL TOXICITY ENDPOINTS:

No differences in food consumption of body weight gain were noted at any treatment level. Furthermore, no behavioral abnormalities were noted. The resulting NOAEC and EC$_{50}$ values were 4934 and >4934 mg ai/kg diet, respectively.
Table 4: Sub-lethal Effect of AMPA on Colinus virginianus

<table>
<thead>
<tr>
<th>Treatment (mg ai/kg diet)</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Body Weight (g)</td>
</tr>
<tr>
<td></td>
<td>Day 0</td>
</tr>
<tr>
<td>Vehicle Control</td>
<td>18</td>
</tr>
<tr>
<td>493</td>
<td>20</td>
</tr>
<tr>
<td>878</td>
<td>20</td>
</tr>
<tr>
<td>1563</td>
<td>22</td>
</tr>
<tr>
<td>2774</td>
<td>21</td>
</tr>
<tr>
<td>4934</td>
<td>19</td>
</tr>
</tbody>
</table>

NOAEC 4934 mg ai/kg diet

EC50 >4934 mg ai/kg diet

<table>
<thead>
<tr>
<th>Reference chemical</th>
<th>effect</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAEL</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N/A- Not Applicable

C. REPORTED STATISTICS:

All toxicity values were determined by visual inspection of the data.

D. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method(s): The lack of treatment-related mortality precluded the statistical analysis of the data. As values for weight gain and food consumption at all treatment levels were similar to the control values, the reviewer visually determined the toxicity values. All values were determined based on the nominal concentrations which the reviewer corrected for the purity of the test material (87.8%).

LC50: >5620 mg ai/kg diet 95% C.I.: N/A
NOAEC: 5620 mg ai/kg diet
Probit Slope: N/A 95% C.I.: N/A

Adjusted for active ingredient: (Optional if over 80% ai)

LC50: >4934 mg ai/kg diet 95% C.I.: N/A
NOAEC: 4934 mg ai/kg diet
Probit Slope: N/A 95% C.I.: N/A
E. STUDY DEFICIENCIES:

There were no study deficiencies.

F. REVIEWER'S COMMENTS:

The reviewer’s results were identical to those of the study author.

Samples of the test diets were taken to verify the test concentrations administered and to confirm the stability and homogeneity of the test substance in the diets. Samples were frozen upon transfer to and for storage at Monsanto Environmental Health Laboratories. Results of these analyses are described in a separate report:


Data from this report showed that mixing was uniform (coefficient of variations <3%), as determined by high and low level mixtures of avian diet and test material. Stability of AMPA in avian diet over 5 days at room temperature was also shown (day 0 and 5 samples ranged from 88-105% of target). Adequate diet homogeneity was observed and concentrations of AMPA in avian diet were shown to accurately reflect target levels (93-109%). The analytical report additionally noted a positive diet interference problem (resulting in higher recoveries), where co-extracted amino acids from the diet matrix were possibly reacting with the derivitization agent used in the LC-UV process. To minimize this interference, some sample recovery values were corrected using the concurrently analyzed mean QC sample recoveries.

The in-life portion of the definitive toxicity test was conducted from September 6 to September 14, 1990.

G. CONCLUSIONS:

This study is scientifically sound and does satisfy the guideline requirements for a subacute dietary toxicity test with the Northern bobwhite quail. The NOAEC and LC50 values were 4934 and >4934 mg ai/kg diet, respectively.

\[
\text{LC50: } >4934 \text{ mg ai/kg diet} \\
\text{NOAEC: } 4934 \text{ mg ai/kg diet} \\
\text{95\% C.I.: N/A} \\
\text{Endpoint(s) affected: None}
\]

III. REFERENCES:


