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OFFICE OF
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Case:819393

MEMORANDUM

SUBJECT: Review of environmental fate data requirements for amitraz degradates

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THRU: Mr. Henry Jacoby, Branch Chief Henry Jacoby
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TO: Mr. Mario Fiol, PM Team Reviewer
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**General:** EFGWB requested additional environmental fate data on parent amitraz and its degradates 2,4-dimethylformanilide (BTS 27919), N-2,4-dimethylphenyl-N-methylformamidine (BTS 27,271), and 2,4-dimethylaniline (BTS 24868). Environmental fate data were requested because the amitraz degradates, BTS 27271, BTS 27919, and possibly BTS 24868, may pose an ecotox risk.

This memorandum provides a review of minutes of a telephone conversation between Paul Mastradone, Meredith Johnson, Mario Fiol, Ian Kelley, Jacob Vukich and myself regarding the environmental fate data requirements of the amitraz degradates.

EFGWB believes the environmental fate data (including hydrolysis, aerobic soil and aquatic metabolism, and field dissipation) as presented in Nor-Am's environmental fate assessment (EFGWB# 91-0025, 92-0349) should provide reliable data for BTS 27271 and BTS 27919. (Please refer to attached data table.)

Nor-Am believes the mobility of the degradates was adequately addressed in aged soil column leaching studies (MRID No. 40931501) and field dissipation studies (MRID 41637301) ~~(Please see attached memorandum.)~~ The registrant believes the aged soil leaching studies provide a more realistic profile of mobility because parent amitraz is hydrophobic (log $K_{ow}$ = 5.5) and hence should bind to organic matter and then degrade to form BTS 27271 and BTS 27919. Because BTS 27271 and BTS 27919 are strong bases and hence should be in a cationic form in the environment, they are likely to bind rapidly and strongly to negatively charged soil particles. The registrant believes that batch equilibrium studies may indicate the degradates are potentially mobile because the degradates are hydrophilic (*e.g.*, low $K_{ow}$). However, aged soil column leaching studies provide more realistic mobility data because aged residues are adsorbed to or close proximity to the soil particles when leaching begins.

It is important to note that the aged residue portion of the leaching/adsorption-desorption data requirement has been fulfilled using soil column leaching studies (MRID 40931501). These studies indicate BTS 27919 and BTS 27271 <u>appear</u> to be relatively immobile; aged residues (75 to 82% of applied pesticide) were found in the surface 10 cm of the soil leaching column. In addition, residue leaching did not <u>appear</u> to be a route of dissipation in field studies. Because BTS 27919 and BTS 27271 are secondary amines with a high $pK_a$ ($pK_a$ > 9), they <u>should</u> be in a cationic form in most environments and hence electrostatically bind to soil, sediment, and organic matter. However, unidentified radiolabeled residue was detected in the leachate of aged soil column studies and apparent false positive residue detections of BTS 27271 and BTS 27919 were observed in deep soil layers of field studies. These observations are noted in previous data reviews (EFGWB# 91-0025 and 92-0349).

EFGWB believes the mobility of a compound cannot be completely assessed using the $K_{ow}$, especially for ionic compounds. The mobility of ionic species should be dependent on the $pK_a$ of the functional groups of the pesticide and soil CEC. Based solely on physicochemical properties, Nor-Am contends that BTS 27271 and BTS 27919 are in a cationic state and should bind to soil. However, the agency does not have batch equilibrium data to support this contention or hypothesis. EFGWB, therefore, believes that batch equilibrium studies would better quantify the mobility of the primary amitraz degradates BTS 27919 and BTS 27271. Without such batch equilibrium data, EFGWB may have to estimate $K_d$s for these compounds in any future environmental fate and transport assessments.

The anaerobic soil metabolism study (MRID 40798003) was deemed as supplemental and was stated as such in the List A data call-in (9/23/91). Upon further review, EFGWB acknowledges the anaerobic soil metabolism study (MRID 40798003) was accepted in a previous review (EFGWB# 90028, 90021, 90216, 80987) because parent amitraz degrades rapidly ($t_{1/2}$ < 1 day) by hydrolysis. This chemical degradation reaction is expected to occur in most environments. Therefore, EFGWB believes that no additional information on parent amitraz degradation can be obtained by repeating the anaerobic soil metabolism study.

Because both EEB and HED have expressed minimal concern about BTS 24868, EFGWB believes that no additional environmental fate data are needed on this compound at this time (see attached memoranda).

Field volatility experiments were required in the List A data call-in because the amitraz degradates have vapor pressures greater than $10^{-6}$ mm Hg. Upon further review of an acceptable laboratory volatility study (MRID# 40780518), BTS 24868 and $CO_2$ were identified as the only volatile degradates. Similar volatile degradates were identified in aquatic and soil metabolism studies. Because BTS 24868 appears to be of minimal human and ecological toxicological concern, EFGWB believes the data requirement should be reserved at this time.

cc: Dennis Edwards, RD (H7505C)
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Hank Jacoby, EFGWB (H7507C)
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Status of Data Requirements for Parent Amitraz and Primary Degradates

| DATA REQUIREMENT | STATUS |
|---|---|
| Hydrolysis (161-1) | Satisfied1 |
| Photodegradation in water (161-2) | Satisfied |
| Photodegradation on soil (161-3) | Satistied |
| Photodegradation in air (161-4) | N/A |
| Aerobic Soil Metabolism (162-1) | Satisfied1 |
| Anaerobic Soil Metabolism (162-2) | Satisfied1 |
| Anaerobic Aquatic Metabolism (162-3) | N/A |
| Aerobic Aquatic Metabolism (162-4) | N/A1 |
| Leaching/Adsorption-Desorption (163-1) | Satisfied1 |
| Laboratory Volatility (163-2) | Satisfied1 |
| Field Volatility (163-3) | Reserved2 |
| Terrestrial Field Dissipation (164-1) | Satisfied1 |
| Confined Rotational Crop (165-1) | Not Satisfied3 |
| Bioaccumulation in Fish (165-4) | Not Satisfied4 |
| Droplet Size Spectrum (201-1) | Not Satisfied5 |
| Field Drift Studies (202-2) | Not Satisfied5 |

1- Acceptable studies have been submitted to address the environmental fate and transport of BTS 27919 and BTS 27271. It is important to note that an acceptable aged soil column leaching studies, supplemental unaged soil column leaching studies and field dissipation studies have been submitted to address the mobility of BTS 27271 and BTS 27919. These studies indicate unidentified radiolabeled residue was detected in the leachate of aged soil column studies and apparent false positive residue detections of BTS 27271 and BTS 27919 were observed in deep soil layers of field studies. EFGWB believes that batch equilibrium studies are necessary to better quantify the mobility of the primary amitraz degradates BTS 27919 and BTS 27271.

2-Because BTS 24868 appears to be of minimal human and ecological toxicological concern, EFGWB believes the data requirement should be reserved at this time.

3-Confined rotational crop studies are required to support a conditional registration to use amitraz on cotton. This data requirement does not apply to reregistration of amitraz because it is used on a non-rotatable crop (*e.g.*, pears).

4-Supplemental bioaccumulation in fish studies have been submitted. The data requirement may be fulfilled by providing additional information on TLC separation efficiencies.

5-Spray drift studies are required for aerially applied insecticides (*e.g.*, air blast, etc.) with Tox 1 or Tox 2 classifications; or if the insecticide is deemed as posing an environmental hazard. EFGWB is aware that NOR-AM is a member of the NACA Spray Drift Task Force. Hence, the spray drift data requirements may be fulfilled using generic data.

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