589

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

NOV 10 1981

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Memorandum

SUBJECT: PP#7E1956. NAA in Citrus. Amendment of 6/19/81.

FROM: Robert S. Quick and Alfred Smith, Chemists
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: Donald Stubbs, Section Head
Emergency Response Section
Registration Division (TS-767)
and
Toxicology Branch
Hazard Evaluation Division (TS-769)

THRU: Charles L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

The amendment contains revised use directions and a revised tolerance proposal of 0.1 ppm for residues of naphthaleneacetic acid (NAA) in or on citrus fruits. (The previously proposed tolerance level was 1.0 ppm.) This amendment is in response to our reject letter (June 8, 1979, P. Critchlow, RD) in which the petitioner (IR-4) was informed of several deficiencies in the data.

Proposed Use

The use directions have been revised to extend the interval from treatment to harvest (PHI) from 21 days to 150 days. Additionally, NAA is not to be used on valencia oranges and Encore mandarins.

The purpose of the revised uses is to limit the use of NAA to those varieties of oranges, tangelos, tangors, and tangerines that are small when NAA is applied (once at 100-150 ppm) and will not mature until at least 5 months after application (150 day PHI).

Previously, NAA could be applied to trees having both mature and immature fruit on the trees at the same time. Thus, if NAA is not used on valencias, Encore mandarins, and other varieties that have mature fruits on the trees, then the much longer PHI is made possible. This condition is to result due to treatment of the citrus in the Spring (during the "June drop") when the immature fruit is small (about 5-20 mm in diameter), and harvest of the mature fruit in the Fall or Winter (more than 5 months after NAA application).

Additionally, the label directions state that NAA is not to be used on varieties where both young fruits and fruits close to maturity are present at application.

Residue Data

No new data are submitted. The petitioner submits, instead, calculations intended to show that residues deposited on immature fruit would result in residue levels in mature fruit considerable less than the initial deposits due to growth dilution.

Immature tangerines (weight of about 3 grams) were treated with NAA at the maximum proposed rate of 500 ppm. Residues were 1.57 ppm immediately after spraying. When mature (weight of about 100 mgs), the residues would have decreased about 30 times to a level of about 0.05 ppm (1.57 ppm/30).

The petitioner contends that since application and analysis occurred at about the same time, then there would be "---virtually no metabolism of the NAA taking place. Therefore, the total amount of NAA-derived residue present (1.57 ppm NAA) at zero days would represent 0.05 ppm (1.57 ppm/30 = 0.05 ppm calculated as NAA) in the mature fruit." We concur in this assessment regarding the probable residue level.

The petitioner submits another example of the effects of growth dilution on residue levels. In California experiments, immature Kinnow mandarins (about 0.47 grams) contained 3.53 ppm NAA at 1 day after application of 400 ppm NAA. The fruit weighed an average of 18 grams at 91 days after treatment. The growth dilution would result in a calculated residue level of 0.08 ppm (3.53 ppm/45; 18 grams/0.41 gms = 45, actually 43.9). The petitioner states that this level is exaggerated since Kinnow mandarin usually average about 100 grams at harvest. On this basis, the calculated residue level would be less than 0.02 ppm as a result of growth dilution.

The petitioner further contends that the residue levels in mature fruits in the above examples are exaggerated since factors other than growth dilution can contribute to a decline in residue levels.

We concur with the petitioner's conclusion that growth dilution would cause a significant reduction in the residue level noted in mature fruit when treated at the immature stage.

The petitioner presents a summary of the metabolism of NAA in fruits which shows that the residues in the mature fruit would consist of the parent compound NAA (about 50%) and its metabolites acetylaspartic acid and the glucose ester of NAA (about 40% combined). The petitioner concludes that the ratio of parent/ metabolites in citrus is similar to that ratio noted in olives (PP#1E1099). This summary is presumably to support the overall conclusion that residues would be at or below certain levels due to the proposed use.

In summary, the petitioner presents the foregoing data and estimated residues levels in citrus fruits in an effort to demonstrate that residue levels for mature citrus can be reliably estimated from residue levels noted in immature fruit.

Based on the revised Section B proposing application to fruit at the 5-20 mm diameter stage and the 150 day PHI, we concur with the petitioner contention that total residues on a calculated basis would not exceed 0.05 ppm. In fact, with weathering, residues would probably be less than 0.05 ppm.

An available citrus processing study reflected the proposed use at 250 and 500 ppm and a 156 day PHI. Residues in the fruit and fractions were reported to be less than 0.01 ppm.

In the processing study reflective of the proposed use, there was a 156 day PHI with little, if any, residues resulting on the fruit and a showing of no concentration in the processed fractions. We are basing our conclusions on this study.

Meat, Milk, Poultry and Eggs

Dried citrus pulp and molasses can be used as livestock feed items.

Based on the revised use and the citrus fraction residue data, residues in feed items derived from citrus would be much less than 0.05 ppm and probably less than 0.01 ppm.

Based on this, we would not expect a problem of secondary residues in meat, milk, poultry and eggs.

Furthermore, there is a 1 ppm tolerance for this chemical on apples. Apple pomace is a feed item. Even if residues were present in citrus by-products, the dietrary intake by livestock would be for less than that already resulting from treated apples.

Conclusions and Recommendations

1. Plant residues consist of the parent compound, and the conjugated metabolites 1-Beta-D-glucose-alpha-naphthaleneacetate and naphthaleneaspartic acid.

2. Total residues of parent compound and its metabolites would not exceed 0.05 ppm on oranges and tangerines.

3. Adequate methodology is available for enforcing a tolerance in terms of the parent compound. Methodology is not available for the metabolites.

4. Residues, if any, in citrus by-products would be expected to be less than 0.01 ppm. We would not expect a problem of secondary residues in meat, milk, poultry and eggs.

RCB can recommend for the proposed 0.1 ppm for residues of NAA on oranges and tangerines provided TOX has no objections to the tolerance being regulated in terms of parent compound. We defer to TOX on this question.

TS-769:RCB:Quick/Smith:gs:X77324:CM#2:RM810:11-9-81
cc: RF, Circ., Quick, Smith, Watts, FDA, EEB, EFB, TOX, PP#7E1956
RDI: Quick, 11/2/81: Schmitt, 11/2/81

Figure II-1: PRIORITY ASSESSMENT INFORMATION FOR HED SCIENTIFIC REVIEW

NAA
Chemical/Product

7E 1956
Registration Number

Critchlow
Product Manager/Staffer

A. Select from the following categories the ONE which describes the request for HED review:

(1) Sec. 6(a)(2) Adverse Date	
(2) Sec. 18 Exemptions	
(3) Sec. 5 EUP's	
(4) Sec. 24(c) State Reg./Local Needs	
(5) New Chemical	
(6) New Use	
(7) E (or separate) Petition for Tolerance	✓
(8) Protocol Review	
(9) Product Change	

B. Select from the following types the intended use of this service (select only ONE):

(1) Public Health/Quarantine	
(2) Substitute Chemical	
(3) Minor Use	✓
(4) Any other type of use not listed above	

C. Does seasonal concern apply? _____YES ___✓___NO

D. Is this service applicable to Innovative Pest Management? (i.e., Biological/Biorational, IPM, etc.)

_____YES ___✓___NO

E. Is this a resubmission? ___✓___YES _____NO

F. Does the request require less than 4 hours of review?

_____YES ___✓___NO

(one does, one doesn't)