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

AUG 11 1993

MEMORANDUM:

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

SUBJECT: Chlorpropham, Reregistration. Registrant Pin Nip, Inc. Submission of Supplemental Data: Magnitude of the Residue in Postharvest Potatoes and Potato Processed Commodities.
No MRID No. CBRS No. 12273. DP Barcode No. D193416.

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E.R. Butts International, Inc., on behalf of registrant Pin Nip, Inc., and in support of reregistration, has submitted supplemental data on magnitude of the residue in potatoes treated post-harvest and potato processed commodities.

Tolerances are established for combined residues of the plant regulator and herbicide chlorpropham, isopropyl m-chlorocarbanilate (CIPC), and its metabolite 1-hydroxy-2-propyl 3'-chlorocarbanilate, calculated as CIPC, in or on potatoes (post-harvest) at 50 ppm, and soybeans at 0.2 ppm (40 CFR 180.181). Chlorpropham is a List A Chemical. A Registration Standard (Guidance Document) was issued 12/87; an Update to the Residue Chemistry Chapter was issued 10/16/91.

Conclusions

1. The analytical method used showed acceptable recoveries of residues of chlorpropham and 3-chloroaniline from fortified samples of potato commodities, at residue levels comparable to those detected in treated samples. Conclusion 1 in the previous review (CBRS 11008, 4/16/93, J. Abbotts) is resolved.

2. Judgment is reserved on submitted 3-chloroaniline residue data until the analytical methodology employed has been validated for its ability to detect conjugated 3-chloroaniline residues. Such validation can best be conducted using radiolabeled samples from metabolism studies. This conclusion is unchanged from the previous review.

3. The present submission reported residue data for wet peel on the basis of peel weight. Maximum residues in wet peel were 44.5 ppm chlorpropham, and 1574 ppb 3-chloroaniline. Conclusion 3 in the previous review is resolved.

4. In cases where residues in control, untreated samples were significant compared to residues detected in treated samples, residues reported in treated samples were uncorrected for the control levels. Conclusion 4 in the previous review is resolved.

5a. The performing laboratory claimed that residues in skins dried in the laboratory are higher than residues that would be expected from commercial processing methods. However, in the absence of adequate data from potatoes processed by commercial methods, the data from skins dried in the laboratory must represent the basis for establishing tolerances.

5b. Maximum residues of parent chlorpropham in or on potato commodities, based on data submitted by Pin Nip, are 11.4 ppm for whole potatoes, 44.5 ppm for wet peel, 129 ppm for dry peel, and 129 ppm for processed potato waste. Residues of parent chlorpropham concentrate during processing of treated potatoes in wet peel, dry peel, and potato processed waste.

6. Maximum residues of 3-chloroaniline detected were 398 ppb in whole potato, 1574 ppb in wet peel, 4600 ppb in dry peel, and 4600 ppb in potato processed waste. Although judgment on 3-chloroaniline residues is reserved in accordance with Conclusion 2, these data indicate that residues of 3-chloroaniline concentrate during processing of treated potatoes in wet peel, dry peel, and potato processed waste.

7. Other Conclusions in the previous review imposed no requirements on registrant, and are not in dispute.

Recommendations

The submitted study can be upgraded to an acceptable status if Conclusion 2 above is resolved for residues of 3-chloroaniline. Data from registrant Pin Nip on residues of parent chlorpropham in or on potato and potato processed commodities are acceptable. Uses supported by other registrants are expected to require higher tolerances than the use supported here.

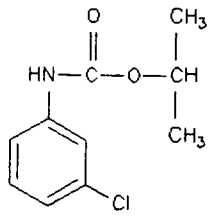
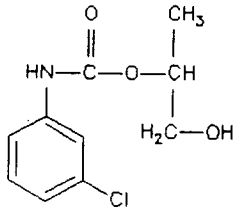
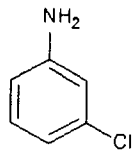
Background

E.R. Butts International, Inc., on behalf of registrant Pin Nip, Inc., submitted residue data on potatoes and potato processed commodities which were previously reviewed (CBRS 11008, 4/16/93, J. Abbotts). On behalf of Pin Nip, E.R. Butts International has submitted supplemental data to respond to the conclusions of the previous review. The submission consists of a cover letter and attached Document 1:

Response from Pin Nip, Inc. to April 16 1993 EPA Review Memorandum Regarding - Final Report - Chlorpropham and 3-Chloroaniline Residue Study on Potatoes, Potato Skins, Potato Chips, and Potato Granules after Post Harvest Fumigation (MRID Number 42425668-01) [sic], Hibbs Analytical Laboratory, Project 92-001, July 12, 1993.

No MRID was assigned to the present submission. We note that the correct designation of the original submission was MRID 42566801. Structures of parent chlorpropham, the metabolite presently included in the tolerance expression, and 3-chloroaniline are shown in Table 1.

Table 1. Chlorpropham and Metabolites.

Chemical Names (Common names)	Chemical Structure
isopropyl m-chlorocarbanilate isopropyl 3-chlorocarbanilate (chlorpropham; CIPC)	
1-hydroxy-2-propyl-3'-chlorocarbanilate (40 CFR 180.181) hydroxyisopropyl-N-(3-chlorophenyl) carbamate (isopropyl-OH-CIPC)	
3-chloroaniline (chloroaniline)	

Registrants have voluntarily canceled all uses except post-harvest treatment of potatoes. Consistent with the conclusions of the HED Metabolism Committee, residue data for potato commodities are required only for parent chlorpropham, 3-chloroaniline, and conjugates of 3-chloroaniline (Memo, 3/31/93, J. Abbotts).

Present Submission.

The present submission responded to each of the conclusions of the previous review (CBRS 11008, 4/16/93, J. Abbotts). The material below is organized in the order: Previous Conclusion, Registrant Response, CBRS Comment. Present conclusions have been numbered consistent with previous conclusions, to the extent practicable.

Previous Conclusion 1. Residues in fortified samples for method validation were reported as µg or ng. The adequacy of the method cannot be evaluated until registrant reports weights of fortified samples, so residues in ppm or ppb can be calculated and compared with the residues in treated samples.

Registrant Response. EPA requests fortified sample weights. Revised Tables 74 and 75 contain two new columns which list sample weights and the amount of chlorpropham or 3-chloroaniline added per gram of sample. These tables are included in the attached Document 1 ....

CBRS Comment. The previous review found that method recoveries represented an acceptable range, pending data on fortification levels in ppm or ppb. For chlorpropham, the lowest residue levels in fortified samples tested were: 0.78 ppm in potato pulp, 15.6 ppm in potato peel, 28.1 ppm in dried skins, 1.45 ppm in potato chip, and 1.93 ppm in granules. For 3-chloroaniline, the lowest residue levels in fortified samples tested were: 4.6 ppb in potato pulp, 122 ppb in potato peel, 201 ppb in dried skins, 105 ppb in potato chip, and 12.9 ppb in granules. With the exception of chlorpropham in granules, these levels were comparable to those found in treated samples in the previous submission (MRID 42566801). In addition, chlorpropham residues in granules were consistently lower than residues in whole potato, and the maximum residues in whole potato were nearly 12 ppm chlorpropham. The method is therefore acceptable for its recovery of residues of chlorpropham and 3-chloroaniline from fortified samples of potato commodities, at levels comparable to those found in treated samples.

Present Conclusion 1: The analytical method used showed acceptable recoveries of residues of chlorpropham and 3-chloroaniline from fortified samples of potato commodities, at residue levels comparable to those detected in treated samples. Conclusion 1 in the previous review is resolved.

Previous Conclusion 2. Judgment is reserved on submitted 3-chloroaniline residue data until the analytical methodology employed has been validated for its ability to detect conjugated 3-chloroaniline residues. Such validation can best be conducted using radiolabeled samples from metabolism studies.

Registrant Response. EPA expresses reservation on accepting the 3-chloroaniline residue data because the analytical method used to measure 3-chloroaniline levels has not been shown to detect and measure conjugated 3-chloroaniline. Both free 3-chloroaniline and a glucuronide conjugate of 3-chloroaniline would have been carried through the cleanup steps with similar efficiency. No step was added to the procedure to hydrolyze a potential conjugate because previously published studies on chlorpropham metabolism reported only free 3-chloroaniline formation. However, if present, the polar conjugate would have eluted just after the void volume of the column (solvent peak) and before the internal standard, 3-chloroaniline. An examination of the chromatograms reveal no peaks in the appropriate region.

The lack of appropriate peaks is most probably due to the inability of the potato to conjugate 3-chloroaniline during storage. Two recently published studies on the metabolism of chlorpropham by stored potatoes found no conjugated 3-chloroaniline (Coxon and Filmer, the Fate and Distribution of Chlorpropham When Applied to Stored Potatoes, Pestic. Sci. 16:355-363, 1985, and Woroby and Sun, Isolation and Identification of Chlorpropham and Two of Its Metabolites in Potatoes by GC-MS, Chemosphere 16:1457-1462, 1987). For this reason, we did not attempt to measure conjugated 3-chloroaniline.

CBRS Comment. CBRS reiterates comments made in the previous review: In contrast to the literature cited above, a metabolism study submitted by registrants Chlorpropham Task Force detected conjugated residues of 3-chloroaniline, and the ratio of conjugated:free 3-chloroaniline was approximately 2:3 (CBRS 8942, 9137, 9166, 9171, 3/10/93, J. Abbotts). The HED Metabolism Committee concluded that judgment is reserved on the magnitude of 3-chloroaniline residues pending validation of a method adequate for detecting bound residues in potato commodities (Memo, 3/31/93, J. Abbotts). Recent submissions on analytical method by the Chlorpropham Task Force have indicated difficulties in recovering residues of 3-chloroaniline from fortified samples of potato commodities, which a performing laboratory attributed to the ability of 3-chloroaniline to form conjugates or bind to matrices (CBRS 11217, 11422, 11428, 6/21/93, J. Abbotts; CBRS 11948, 7/8/93, J. Abbotts). The inability of a method to recover residues of 3-chloroaniline from even fortified samples does not provide confidence in the ability to recover residues from treated samples or processed commodities, where metabolism would be more extensive and the formation of covalently-bound

conjugates might occur. The conclusion of the HED Metabolism Committee remains in effect, and Conclusion 2 of the previous review is not altered.

Present Conclusion 2: Identical to Previous Conclusion 2 (see above).

Previous Conclusion 3. It is assumed that the performing laboratory reported residues in peel and pulp which actually represented ppm or ppb equivalent for whole potato weight, and then added these values to obtain the residues reported for whole potato. In the absence of residue data on wet peel from processing samples, registrant should report residue data for peels in terms of both wet peel weight and equivalent whole potato weight. The latter expression can be used in calculating residues in or on whole potato.

Registrant Response. EPA suggests residue data should be reported in terms of wet peel from processing samples, if possible. This would aid in calculating residues in or on whole potatoes. In the orginal report, chlorpropham and 3-chloroaniline levels in potato waste were presented in Table 14. To provide additional detail, Tables 5 and 6 have been revised to show chlorpropham and 3-chloroaniline levels on a wet peel weight basis, as suggested by EPA. These tables are included in the attached Document 1 ....

CBRS Comment. In the present submission, residue data for wet peel were reported on the basis of peel weight. Maximum residues in wet peel were higher than maximum residues previously reported for whole potato, which is not a surprising result, considering that the treatment is post-harvest (CBRS 11008, 4/16/93, J. Abbotts). Maximum residues in wet peel were 44.5 ppm chlorpropham, and 1574 ppb 3-chloroaniline.

Present Conclusion 3: The present submission reported residue data for wet peel on the basis of peel weight. Maximum residues in wet peel were 44.5 ppm chlorpropham, and 1574 ppb 3-chloroaniline. Conclusion 3 in the previous review is resolved.

Previous Conclusion 4. In untreated samples, residues of chlorpropham in potato waste and chlorpropham and 3-chloroaniline in dried skins represented a significant portion of residues detected in treated samples; for these commodities, residues in untreated samples should not be subtracted as background. For these commodities, registrant should confirm that residues reported in treated samples were uncorrected for residues in untreated samples, or adjust reported residues accordingly.

Registrant Response. EPA states residues from untreated potatoes should not be subtracted as background when presenting residue

levels from treated potatoes, and requests confirmation that levels reported were uncorrected for residue levels identified in untreated samples. We are pleased to confirm that in the reported residue study, residues found in untreated samples were not subtracted as background from the treated sample residue data.

CBRS Comment. This response is acceptable.

Present Conclusion 4: In cases where residues in control, untreated samples were significant compared to residues detected in treated samples, residues reported in treated samples were uncorrected for the control levels. Conclusion 4 in the previous review is resolved.

Previous Conclusion 5. The performing laboratory claimed that residues in skins dried in the laboratory are higher than residues that would be expected from commercial processing methods. However, in the absence of adequate data from potatoes processed by commercial methods, the data from skins dried in the laboratory must represent the basis for establishing tolerances.

Registrant Response. EPA states that residue data from skins dried in the laboratory must be used to set tolerances because the data from commercial processing methods were not obtained under GLP. We agree with EPA but felt it was important to point out, in the report, the order of magnitude difference in residue levels obtained from laboratory dried skins and commercially dried skins, the latter data obtained using good scientific methods but not under GLP conditions. It is also important that EPA know the crude peel drying process used in the analytical laboratory is very different from the specialized process used commercially. This processing difference most probably accounts for the levels of 3-chloroaniline reported in this study for dried skins.

CBRS Comment. As indicated in the previous conclusion, the data from dried skins were considered the best available in the absence of adequate data from commercial processing. Our previous review (CBRS 11008) noted that pending data to upgrade the submitted study, tolerances on potato commodities should reflect the following residue levels for parent chlorpropham: 12 ppm in whole potatoes and 140 ppm in dry peel. Subsequent to that review, other registrants (Chlorpropham Task Force) submitted residue data based on commercial processing methods, using potatoes which were subjected to a somewhat different post-harvest treatment than that supported by Pin Nip. Acceptance of those data requires the resolution of deficiencies, but pending additional material to upgrade the study, tolerances on commodities of potatoes treated by the applications supported by the Chlorpropham Task Force should reflect the following levels for parent chlorpropham: 30 ppm in whole potatoes, 135 ppm in wet

peel, 330 ppm in dry peel (CBRS 11217ff, 6/21/93, J. Abbotts). Thus, the 12X concentration of chlorpropham residues in skins dried in the laboratory is consistent with the 11X concentration in dried skins from commercial processing. Referring to the data in the previous Pin Nip submission (CBRS 11008) and in Present Conclusion 3, above, we note that the concentration factor in wet peel is 3.9X (44.5 ppm v. 11.4 ppm in whole potatoes) based on the Pin Nip data, compared to 4.4X based on the data from commercial processing methods provided by the Chlorpropham Task Force. Previous Conclusion 5 is not altered.

Material in the previous review of Pin Nip data (CBRS 11008, 4/16/93, J. Abbotts) should be corrected. Feed additive tolerances for processed potato waste should be based on the maximum concentration factor observed for residues in or on granules, wet peel, or dry peel. In the present case, the maximum residues are detected on dry peel, and the same residue levels will be assumed for potato processed waste. Based on the data previously submitted by Pin Nip (CBRS 11008, Ibid.) and revised data, the maximum residues for potato commodities are reported below.

Present Conclusion 5a: Identical to Previous Conclusion 5 (see above).

Present Conclusion 5b: Maximum residues of parent chlorpropham in or on potato commodities, based on data submitted by Pin Nip, are 11.4 ppm for whole potatoes, 44.5 ppm for wet peel, 129 ppm for dry peel, and 129 ppm for processed potato waste. Residues of parent chlorpropham concentrate during processing of treated potatoes in wet peel, dry peel, and potato processed waste.

Previous Conclusion 6. Maximum residues of 3-chloroaniline detected were 398 ppb in whole potato, 4600 ppb in dry peel, and 622 ppb in potato processed waste. Although judgment on 3-chloroaniline residues is reserved in accordance with Conclusion 2, these data indicate that residues of 3-chloroaniline concentrate during processing of treated potatoes in dry peel and potato processed waste.

Registrant Response. EPA suggests 3-chloroaniline levels concentrate during potato processing based on maximum reported residues of 398 ppb in the whole potato, 4600 ppb in the dry peel, and 622 ppb in potato process waste. These maximum residues were found in samples obtained two hours after chlorpropham application. Subsequent samples had far lower 3-chloroaniline levels. Taking into consideration the weight of water lost during the drying process, one would expect a five fold increase in residues during the conversion of wet peel to dry skin. Therefore, while some concentration of 3-chloroaniline is evident, it is far less than a comparison of the 2 hour residue levels would suggest.

CBRS Comments. As indicated above (see comments on Conclusion 5), there does not seem to be a drastic difference in concentration factors for processed commodities between data submitted by Pin Nip or the Chlorpropham Task Force. Based on data submitted by the Task Force, concentration factors for residues of 3-chloroaniline during processing were 2.8X in wet peel and 16.2X in dry peel (CBRS 11217ff, 6/21/93, J. Abbotts). Conclusion 6 here is updated for the supplemental Pin Nip data (Conclusion 3 above), and the corrected approach to potato processed waste.

Present Conclusion 6: Maximum residues of 3-chloroaniline detected were 398 ppb in whole potato, 1574 ppb in wet peel, 4600 ppb in dry peel, and 4600 ppb in potato processed waste. Although judgment on 3-chloroaniline residues is reserved in accordance with Conclusion 2, these data indicate that residues of 3-chloroaniline concentrate during processing of treated potatoes in wet peel, dry peel, and potato processed waste.

Previous Conclusion 7. Residue data were submitted to support the use of an RTU formulation applied by aerosol/fogger at an application rate of 0.017 lb ai/1000 lb potatoes. Registrations, including SLN labels, which specify higher rates, other application methods, or other formulations, should be canceled, if other registrants do not submit data to support them.

Previous Conclusion 8. Data on residues other than parent and 3-chloroaniline are not required for potatoes treated post-harvest.

Previous Conclusion 9. While not a requirement, if methods development is pursued, method sensitivity might be improved with HPLC conditions which provide better separation of interfering matrix peaks from peaks of the residues to be regulated.

Registrant Response. Registrant Pin Nip noted that no response was necessary to Conclusions 7 and 8. With regard to Conclusion 9, registrant noted: EPA suggests that for future chlorpropham/ 3-chloroaniline residue studies, a more sensitive analytical method with improved resolution be used. We agree with this suggestion.

CBRS Comment. These conclusions are not in dispute.

Present Conclusion 7: Other Conclusions in the previous review imposed no requirements on registrant, and are not in dispute.

Previous Recommendations. The submitted study can be upgraded to an acceptable status if additional information is provided to resolve CBRS Conclusions 1, 2, 3, and 4 above. Consistent with Conclusion 7, registrations not supported by the data submitted or other registrants should be canceled.

Additional information in response to the Conclusions may alter residue data. In addition, uses supported by other registrants may require higher tolerances than the use supported here. However, based on the data provided, tolerances on potato commodities should reflect the following residue levels:

For parent chlorpropham, 12 ppm in whole potatoes, 140 ppm in dry peel, and 40 ppm in potato processed waste.

CBRS Comments. As indicated in the Present Conclusions above, Conclusions 1, 3, and 4 in the previous review are resolved, and data from registrant Pin Nip on residues of parent chlorpropham in or on potato and potato processed commodities are acceptable. As indicated above (see comment on Conclusion 5), uses supported by other registrants are expected to require higher tolerances than the use supported here.

Present Recommendations: The submitted study can be upgraded to an acceptable status if Conclusion 2 above is resolved for residues of 3-chloroaniline. Data from registrant Pin Nip on residues of parent chlorpropham in or on potato and potato processed commodities are acceptable. Uses supported by other registrants are expected to require higher tolerances than the use supported here.

cc:Circ, Abbotts, RF, Reg. Std. File, SF
RDI:SVHummel:8/10/93:EZager:8/10/93
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