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

DEC 18 1987

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP#5F3252/FAP#6H5479 Quizalofop Ethyl (Assure®) on Soybeans (RCB Nos. 2806, 2807, 2810, and 2811) Amendment Dated August 31, 1987 - MRID Nos. 403224-01 through 403224-13, 403362-01, and 403371-01

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and

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Background

The petitioner, E.I. du Pont de Nemours and Company, has submitted an amendment to PP#5F3252/FAP#6H5479 concerning the proposed tolerances for the combined residues of the herbicide ethyl 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy]propanoate (quizalofop ethyl, Assure®, DPX-Y6202, NC-302) and its metabolite 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy] propanoic acid (quizalofop, DPX-Y6202 acid, NC-302 acid) all expressed as quizalofop ethyl in or on soybeans at 0.05 ppm and a food additive tolerance for soybean soapstock of 0.10 ppm.

The petitioner is also proposing tolerances on animal commodities be established for the combined residues of the herbicide ethyl 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy]

propanoate (quizalofop ethyl, Assure®, DPX-Y6202, NC-302) and its metabolites 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy] propanoic acid (quizalofop, DPX-Y6202 acid, NC-302 acid) and methyl 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy] propanoate (quizalofop methyl, ME-DPX-Y6202, NC-302 methylester) all expressed as quizalofop ethyl in or on cattle, goats, hogs, sheep, horses, and poultry fat at 0.05 ppm; cattle, goats, hogs, sheep, horses, and poultry meat at 0.02 ppm; cattle, goats, hogs, sheep, horses, and poultry meat byproducts at 0.05 ppm; milk at 0.01 ppm and eggs at 0.02 ppm.

Summary of Deficiencies That Need Resolution

1. Deficiency No. 4 concerning animal metabolism is not resolved. RCB defers to the Toxicology Branch concerning whether DPX-Y6202 pentanoic acid should be included in the tolerance expression for poultry meat byproducts (0.0046 ppm in liver expected from the proposed use which accounts for 57 percent of the total activity or 71 percent of the characterized residue).

2. Deficiency No. 5 concerning methodology has not been resolved. Results from the EPA method tryouts (MTOs) are needed. Additionally, information on the effectiveness of overnight enzymatic hydrolysis to release conjugated residues is required. A discussion on whether any other pesticides will interfere with the analysis of DPX-Y6202 residues is also necessary.

3. Deficiency No. 7a concerning the residue data on soybeans has not been resolved because of Deficiency No. 5 above.

4. Deficiency No. 8a concerning the soybean processing study has not been resolved because of Deficiency No. 5 above and the need for a revised Section F with food additive tolerances reflecting residues found in the first fractionation study.

5. Deficiency No. 9 concerning secondary residues in animal commodities has not been resolved. In the revised Section F, a tolerance for DPX-Y6202 and its metabolites of 0.05 ppm in milk fat is needed.

Recommendation

1). At this time, RCB continues to recommend against establishment of the proposed DPX-Y6202 tolerances for soybeans, soybean fractions, and animal commodities for the reasons cited in Deficiencies No. 4, 5, 7a, 8a, and 9 summarized above.

2). Note to PM: TOX and the petitioner should be informed of RCB Comments/Conclusions re: Deficiency No. 3a that follows in this review. Also, the petitioner should be aware of RCB Comments/Conclusions re: Deficiency No. 3b.

Present Submission

1. Revised Tolerance Proposals

In RCB's reviews of November 29, 1985, and February 21, 1986 (PP#5F3252/FAP#6H5479, memorandums of M. Firestone), the petitioner was advised that proposed feed/food additive tolerances on soybean hulls, soybean meal, soybean flour, and soybean soapstock of 0.2, 0.5, 0.5, and 1.0 ppm, respectively were not adequately supported by the soybean processing study, since the study did not include analysis of residues of DPX-Y6202 acid conjugates and three possible phenol metabolites. Accordingly, the petitioner has conducted a new soybean processing study (including analyses of these moieties) which indicates concentration in soybean soapstock only. Consequently, FAT's on soybean hulls, soybean meal, and soybean flour have been dropped in the revised Section F.

Further in RCB's review of November 29, 1985 (PP#5F3252/FAP#6H5479, memorandum of M. Firestone) the petitioner was also advised that animal metabolism studies would be required since the proposed use includes several animal feed items. Accordingly, the petitioner has conducted the appropriate animal metabolism studies and proposed tolerances on animal commodities in the revised Section F.

The petitioner has elected to drop cotton from this petition. Data to support tolerances and registration on cotton will be filed as a new petition at a later date. The petitioner erred in their revised Section F by including the proposed tolerance on soybeans with the proposed tolerances on animal commodities (i.e., parent plus two metabolites). Narrative discussion contained elsewhere in their submission and the plant metabolism data, indicates this was unintended. Accordingly, the corrected Section F should read as follows:

Section F

Tolerance Proposal

It is proposed that tolerances be established for the combined residues of quizalofop (2-[4-(6-chloroquinoxalin-2 yl oxy)phenoxy]propanoic acid) and quizalofop ethyl (ethyl-2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy propanoate) all expressed as quizalofop ethyl as follows:

Commodities	Parts per Million (ppm)
Soybeans	0.05
Soybean Soapstock (FAT)	0.10

It is proposed that tolerances be established for the combined residues of quizalofop (2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy]propanoic acid), quizalofop ethyl (ethyl 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy propanoate) and quizalofop methyl (methyl 2-[(4-(6-chloroquinoxalin-2-yl oxy) phenoxy]propanoate), all expressed as quizalofop ethyl as follows:

Commodities	Parts per Million (ppm)
Cattle, fat	0.05
Cattle, meat	0.02
Cattle, mbyp	0.05
Eggs	0.02
Goats, fat	0.05
Goats, meat	0.02
Goats, mbyp	0.05
Hogs, fat	0.05
Hogs, meat	0.02
Hogs, mbyp	0.05
Horses, fat	0.05
Horses, meat	0.02
Horses, mbyp	0.05
Milk	0.01
Poultry, fat	0.05
Poultry, meat	0.02
Poultry, mbyp	0.05
Sheep, fat	0.05
Sheep, meat	0.02
Sheep, mbyp	0.05

2. Additional Data

The present submission includes metabolism studies in goats and chickens, feeding studies in cattle and chickens, storage stability data, soybean residue data, a new soybean processing study, a revised label, and several analytical methods for the parent, metabolites and conjugates.

Detailed Consideration

The deficiencies cited in RCB's review of July 29, 1987 (PP#5F3252/FAP#6H5479 memorandum of G. Otakie) and RCB's reviews of February 21, 1986 and September 25, 1985 (PP#5F3235/FAP#6H5479, memorandums of M. Firestone) will be restated below followed by the Petitioner's Response and RCB's Comments/Conclusions. The numbering of the deficiencies follows that of the July 29, 1987, February 21, 1986, and September 25, 1985 reviews.

Deficiency No. 2

The petitioner will need to revise Section B/proposed label so that the total amount of herbicide applied per season (not to exceed 4 oz ai or 2.5 pints Assure per acre) is clearly stated. Also, the proposed label should stress that only EPA approved oil concentrates and surfactant should be used.

Finally, the Directions for Use on soybeans should include the restriction:

Do not apply after pod-set

and the Directions for Use on cotton should also include a growth stage restriction in addition to a postharvest interval (PHI), considering the long (80-day) PHI proposed.

Petitioner's Response to Deficiency No. 2

The petitioner has submitted a revised label deleting the use on cotton, requiring use with only EPA approved oil concentrates and surfactants, prohibiting application after pod-set, and prohibiting application of more than 40 oz of product per acre per season (product contains 9.5% ai). The petitioner is also "proposing" a use rate of 6.4 oz maximum ai/A/season on page 3 of Attachment II to their amendment.

RCB's Comments/Conclusions re: Deficiency No. 2

The label revisions required by RCB except for use on cotton which has been deleted from the label, have been made.

Deficiency No. 2 has been resolved for the proposed use as specified on the label; this involves a maximum application rate of 4 oz ai/A/season, a PHI of 80 days and no application after pod-set. A response to the petitioner's intent to raise the maximum application rate from 4 oz ai/A/season to 6.4 oz ai/A/season is included under RCB Comments/Conclusions re: Deficiency No. 3b below.

Deficiency No. 3a

At this time, RCB considers the nature of the residue in soybeans and cotton treated according to the proposed use (i.e., maximum application of 4 oz ai/A/season with an 80-day PHI) to be adequately understood.

With certainty, the residues DPX-Y6202 and its acid metabolite 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy]propanoic acid (free plus conjugates) should be included in the tolerance

expression. The need to include any of the phenol metabolites in the tolerance expression cannot be determined until the petitioner generates residue data for the following compounds (both free plus conjugates);

Phenol 1 = 4-(6-chloroquinoxalin-2-yl oxy)phenol;
Phenol 2 = 6-chloroquinoxalin-2-ol; and
Phenol 4 = 2-(4-hydroxyphenoxy) propanoic acid.

Petitioner's Response to Deficiency No. 3a

The petitioner has generated the required residue data on the Phenol 1, Phenol 2, and Phenol 4 metabolites plus conjugates. Refer to Petitioner's Response to Deficiency No. 7c below for a detailed summary of these data.

RCB Comments/Conclusions re: Deficiency No. 3a

The residue data on the phenol metabolites is discussed in detail under RCB Comments/Conclusions re: Deficiency 7a below. In summary, since no residues of the phenol metabolites were found in the soybean field trials, if TB considerations permit, RCB will not recommend that the phenols be included in the tolerance expression for the proposed use of 4 oz ai/A/season. However, if the petitioner still intends to raise the proposed use to 6.4 oz ai/A/season wherein more plant residues need to be characterized and if this characterization should indicate a greater percentage of phenolic compounds in the terminal residues, then a formal deference to TB will be made on this issue.

Therefore, RCB will conclude that Deficiency 3a is resolved for the present proposed use (4 oz ai/A/season) only if TB's considerations permit. TB and the petitioner should be informed of this conclusion.

Deficiency No. 3b

Should the use pattern on cotton or soybeans change so as to increase the likely level of residues on the raw agricultural commodities (RAC), additional metabolism studies will be required reflecting higher rates of ^{14}C-DPX-Y6202 treatment. Much more of the unidentified residues in/on soybean seeds and cottonseeds will then need to be characterized.

Petitioner's Response to Deficiency No. 3b

Although the petitioner has submitted a revised label complying with RCB's requirement for a maximum application rate not be exceed 4 oz ai/A/season, the petitioner is also "proposing" a higher application rate of 6.4 oz/A/season

based on new field trial data (reflecting the results from the analyses of 7 terminal residues) utilizing an application rate of 6.4 oz/A/season. No additional plant metabolism studies reflecting higher application rates of ^{14}C-DPX-Y6202 treatment and characterizing unidentified residues have been submitted.

RCB Comments/Conclusions re: Deficiency No. 3b

RCB has previously concluded that should the use pattern on cotton or soybeans change so as to increase the likely level or residues on the RAC, additional metabolism studies will be required reflecting higher rates of ^{14}C-DPX-Y6202 treatment. Much more of the unidentified residues in/on soybean seeds and cottonseeds will then need to be characterized (see M. Firestone memorandum of September 25, 1985 re: PP#5F3252). For example, after 3 weeks, 62 to 75 percent of the ^{14}C-terminal residue in the cotton foliage was not identified. Fifty-two days after treatment, the unidentified ^{14}C terminal residues were as high as 65.6 percent. Therefore, more identification work needs to be done for higher use rates. Deficiency 3b is moot at this time; the petitioner should be informed.

Deficiency No. 4

No animal metabolism data have been presented in support of the subject petition. The proposed use involves several animal feed items:

soybean hulls, meal, oil, and soapstock;
cottonseed hulls, meal, oil, and soapstock.

Until issues involving the analytical methodology (see Conclusion 5) and the maximum likely level of residues (parent plus metabolites) in/on various animal feed items have been resolved (see Conclusions 6, 7, and 8), RCB remains unable to reach any final conclusion regarding the need for animal (ruminant, poultry, and/or swine) metabolism data in support of the subject petition.

Petitioner's Response to Deficiency No. 4

Although RCB postponed a decision whether to require animal metabolism studies, the petitioner conducted these studies to avoid delays in the registration process. The petitioner also conducted feeding studies which are discussed under Deficiency No. 9. RCB discussion on the submitted goat and poultry metabolism studies follows.

Goat Metabolism (MRID No. 403224-13)

Separate metabolism studies were performed on two goats with feeding of either ^{14}C-phenyl or ^{14}C-quinoxalinyl labeled DPX-Y6202. Each goat was dosed twice, daily for seven days with a gelatin capsule administered orally utilizing a balling gun with approximately 1.40 mCi either ^{14}C-phenyl or ^{14}C-quinoxalinyl labeled DPX-Y6202 which was mixed with nonlabeled compound to yield a total dose of 350 mg. Utilizing previous proposed tolerances dated October 1986 (i.e., soybeans, 0.3; hulls, 0.3; meal, 0.5; and soapstock, 0.6 ppm) or September 1985 (i.e., soybeans, 0.05; hulls, 0.2; meal, 0.5; and soapstock, 1.0 ppm) and the maximum percentage of these soybean feed items from the Pesticide Assessment Guidelines Subdivision O, results in the 50 ppm dosage rate representing either 193X or 238X, respectively. Each goat was sacrificed approximately 24 hours after the last dose. Samples of urine, feces, milk, intestinal contents, ruminant contents, blood, lungs, liver (including gall bladder), pancreas, kidneys, heart, fat samples (back, omental, peripheral, and renal) and muscle (flank, loin, and leg) were analyzed. All samples were stored in a freezer at -15 °C, except blood samples which were refrigerated.

The petitioner indicates that milk, urine, and gall bladder contents, solvent extracts and TLC scrapings were directly assayed by scintillation counting with Aquosol®-II scintillation cocktail (New England Nuclear). Fecal and tissue samples were assayed for total radioactivity with Packard Model 306 tissue oxidizer. All tissue samples were throughly hand mixed and minced before analysis. All scintillation counting was conducted with Mark III scintillation counters (TM analytic) with automatic data conversion from CPM to DPM.

The distribution of the total radioactivity for the ^{14}C-phenyl and ^{14}C-quinoxalinyl dosed goats was 2.1 and 1.2% respectively, in the blood, tissue, fat, intestinal, and ruminant contents combined; and 72.7 and 83.8 percent, respectively for the day 1 through day 7 urine and fecal samples combined; and 0.5 and 0.8 percent, respectively in milk; thus 75.3 and 85.8 percent, respectively of the total dose was recovered.

Milk samples were proportionally pooled based on volume for each 24-hour collection period. An enzyme digestion/ethyl acetate extraction procedure was utilized and extracted 80 to 98 percent of the milk radioactivity. The extracted radioactivity was analyzed by TLC and the results are summarized as follows:

PPM In Milk of ^{14}C-Quinoxalinyl (Q) or ^{14}-Phenyl (P) Labeled DPX-Y6202

	DPX-Y6206 Acid		ME-DPX-Y6202		Unknown		DPX-Y6202	
Sample	Q	P	Q	P	Q	P	Q	P
Day 1	0.04	0.05	0.01	0.02	0.01	0.02	0.01	--
Day 2	0.12	0.10	--	0.02	0.01	0.03	--	0.01
Day 3	0.10	0.09	0.03	0.03	0.02	0.03	0.01	< 0.01
Day 4	0.11	0.11	0.03	--	0.02	0.03	0.02	--
Day 5	0.10	0.09	0.03	0.03	0.02	0.03	0.01	0.01
Day 6	0.10	0.12	0.03	0.02	0.02	0.02	0.01	0.01
Day 7	0.11	0.09	0.04	0.04	0.02	0.03	0.01	0.01

The major metabolites in milk were DPX-Y6202 acid followed by ME-DPX-Y6202 and an unknown metabolite (R_f of 0.380) with small amounts of the parent also found. The milk unknown did not co-migrate with any metabolite standard used; however, it decreased substantially when milk extracts were digested with nonspecific esterase enzymes and was designated as the milk ester unknown.

Tissue solvent extraction data for the ^{14}C-phenyl and ^{14}C-quinoxalinyl samples were 85 and 63 percent, respectively for one liver set, 79 and 53 percent, respectively for another liver set (repeated extraction done from the initial extraction which prevented subsequent digestions); 83 and 74 percent, respectively for the kidney; and 93 percent and insufficient radioactivity, respectively for the flank muscle. Accordingly, muscle samples for the ^{14}C-quinoxalinyl dosed goat were not analyzed due to low concentrations of radioactive residues. Several digestion procedures were also conducted to release nonextractable radioactivity from liver and kidney solid residues.

Multiple extraction steps were conducted with fat samples. The solvent extraction data for the first phase extraction of ^{14}C-phenyl and ^{14}C-quinoxalinyl samples were 82 and 81 percent, respectively, for ethyl acetate and 18 and 19 percent, respectively, for chloroform:methanol. Preliminary data indicated insignificant radioactivity levels remained in solid fat residue following sequential extractions with ethyl acetate and chloroform. However, second phase separation and

silica column fractionation distribution revealed differences between fat samples from the two goats. In fact, fat contamination of radioactivity was never sufficiently removed from the ^{14}C-quinoxalinyl fat samples to permit TLC analysis. Fat radioactivity from the ^{14}C-phenyl samples which was methanol extractable contained only DPX-Y6202 acid, while activity fractionated through the silica column also contained a small amount of DPX-Y6202.

The following table summarizes the extraction of radioactivity:

Sample	Percent Extracted (%) P-Label	Q-Label
Milk	80-98	90-96
Liver	85	6
Liver Repeat Extraction	79	53
Kidney	83	74
Muscle	93	--
Fat	40*	--

*Although 100 percent of the activity in fat was extracted in the first phase, after silica column separation only 40% was identifiable with the remaining activity refractory to analysis.

The distribution of TLC-analyzed radioactivity in liver, kidney, muscle, and fat extracts from lactating goats dosed with either ^{14}C-phenyl (P) and ^{14}-quinoxalinyl (Q) DPX-Y6202 were as follows:

	Percent Distribution(%)		Residue (ppm)	
Liver	DPX-Y6202 Acid	Unknown	DPX-Y6202 Acid	Unknown
P	72	29	0.03	0.01
Q	73	28	0.02	0.01
Kidney				
P	100	--	0.14	--
Q	96	4	0.10	< 0.01
Muscle				
P	87	14	0.02	< 0.01
Fat				DPX-Y6202
P (MEOH)	10	--	0.01	--
P (Silica)	81	19	0.01	< 0.01

The goat liver, kidney, and muscle unknowns had R_f values of 0.20, 0.40, and 0.19, respectively. HPLC analyses demonstrated that the goat liver unknown actually consisted of at least three separate components and that any single component represented less than 0.01 ppm. Because of these extremely low levels, identification of any of the unknown liver components was not feasible. Although the TLC-analyzed radioactivity in fat was primarily DPX-Y6202 acid, this residue represented only 40 percent of the total residue in fat, with the remaining activity refractory to analysis.

Poultry Metabolism (MRID No. 403224-02)

Metabolism studies were performed on groups of 15 or 3 White Leghorn laying hens dosed orally for 6 or 3 days, respectively, with ^{14}C-quinoxalinyl labeled DPX-Y6202, at a rate equivalent to 50 ppm. The 15-bird group was sacrificed within 24 hours of the final dose while the 3-bird group was sacrificed approximately 4 hours after the final dose. The 3-bird study was conducted with a shorter sacrifice period, after the 15-bird study, to produce higher tissue residues to allow characterization of unidentified metabolites and unextractable radioactivity found in the 15-bird study. Utilizing the proposed tolerances derived from the second fractionation study (i.e., soybeans, 0.05; hulls, 0.05; meal, 0.05; and soapstock, .10 ppm) and the percentage feed items in the diet specified in EPA Pesticide Guidelines Subdivision O results in an estimated dietary burden of .04 ppm or 1250X for the 50 ppm feeding level.

The 15-bird study included 3 subgroups of 5 treated birds per group and a control group of 5 birds. The average concentration of radioactivity in the eggs of the treated birds rose to a high of .04 ppm as equivalents of DPX-Y6202, on the sixth day of treatment. The ^{14}C-residues in the eggs from the 3-bird study, after 3 days of treatment averaged .106 ppm compared to .187 ppm in eggs from the 15-bird study, after 3 days.

Following column chromatography of egg extracts from the 15-bird study, TLC analysis showed a more complex metabolite profile then was observed for tissues. At least four nonpolar metabolites (R_f greater than 0.2) represented 92 percent of the total activity in eggs. One of the nonpolar compounds was identified as DPX-Y6202 acid (20%) with the second, third, and fourth metabolites accounting for 39, 17, and 16 percent, respectively of the total radioactivity. The third metabolite had an R_f similar to that of ME-DPX-Y6202. A lipase enzymatic

treatment of the nonpolar fraction from a silica column and partitioning of the aqueous buffer with ethyl ether yielded approximately 66 percent (48% of total) in the organic fraction and 34 percent (24% of total) in the aqueous fraction. TLC of the ether fraction showed most of the radioactivity as DPX-Y6202 acid analog. No further analysis of the aqueous fraction was performed because of low radioactivity.

To further characterize the residue in eggs, ova samples from the 3-bird study were separated into nonpolar and polar fractions using column chromatography. The only metabolite identified in the polar fraction, which contained 36 percent of the total activity, was DPX-Y6202 acid; this acid accounted for 24 percent of the total activity. A lipase enzymatic treatment of the nonpolar silica column fraction of ova was conducted. Since it appeared that the lipase may not have hydrolyzed the material present, an aliquot was subjected to an additional lipase treatment. The samples were hydrolyzed, acidified, and partitioned with ethyl ester with most of the radioactivity organosoluble. TLC analysis showed at least three nonpolar (R_f greater than 0.2) compounds that represented approximately 50 percent of the total radioactivity in ova. From the radiochromatogram the three nonpolar compounds were tentatively identified as DPX-Y6202 acid (16% of total) ME-DPX-Y6202 (20%) and DPX-Y6202 pentanoic acid (14%).

The following table summarizes the average radioactivity expressed as equivalents of ppm of DPX-Y6202 in the samples from the 15- and 3-bird studies:

	Residue (ppm)	
Sample	15-Bird Study	3-Bird Study
Liver	1.93	6.85
Kidney	2.16	21.3
Fat	.40	.13
Egg	.40	.11
Ova	--	.71
Blood	.50	2.5
Breast	.11	--
Thigh	.08	--

The excreta from the 15-bird study contained 88 to 97 percent of the total radioactivity with DPX-Y6202 acid accounting for 57 percent of the total activity. Residues of radioactivity in kidneys, liver, and eggs accounted for 0.2 percent or less of the total activity for each tissue. Three metabolites (and/or their conjugates) of DPX-Y6202 were detected in the tissues. The major metabolite in the kidney and eggs was DPX-Y6202 acid, while ME-DPX-Y6202 was also detected in the kidney. The major metabolite in the liver

(1.10 ppm, 71% of characterized residue) and a minor metabolite in muscle (< 0.01 ppm, 12% of characterized residue) was identified by NMR as 4[4-(6-chloroquinoxalin-2-yl-oxy)phenoxy]-pentanoic acid or DPX-Y6202 pentanoic acid, which was previously found as a trace metabolite in the rat metabolism study. The parent was the only moiety detected in fat, with a small amount also found in liver. Ova from the 3-bird study contained DPX-Y6202 acid, ME-DPX-Y6202 and DPX-Y6202 pentanoic acid. The following table summarizes the residue characterized from the 15-bird study dosed at 50 mg/kg for 6 days:

Moiety	Residue (ppm) Liver	Kidney	Fat	Eggs
DPX-Y6202	0.02	N.D.	0.22	N.D.
DPX-Y6202 acid	0.37	0.89	N.D.	0.08
ME-DPX-Y6202	N.D.	0.17	N.D.	N.D.
DPX-Y6202-pentanoic acid	1.10	0.35	N.D.	N.D.
Unidentified metabolites	N.D.	N.D.	N.D.	0.29
Uncharacterized Radioactivity	0.06	0.19	0.18	0.03
Total	1.55	1.60	0.40	0.40

N.D. = none detected; all moieties and residues not included.

The metabolites in the muscle extracts (39% of the total activity) were DPX-Y6202 (0.01 ppm), DPX-Y6202 acid (0.01 ppm), and DPX-Y6202 pentanoic acid (< 0.01 ppm) accounting for 26, 19, and 12 percent, respectively of the characterized residues with 43 percent unknown.

The following table summarizes the distribution of activity in the fractions from the 15-bird study expressed as ppm DPX-Y6202.

Fraction	Liver	Kidney	Fat	Eggs	Muscle
Organosoluble Hexane petroleum ether	0.08	0.04	0.18		
Acetonitrile	1.54	1.60	0.22		
Other				0.40	0.03
Water soluble	.02	0.04			0.01
Unextracted (solids)	.29	0.48			0.04
Total	1.93	2.16	0.40	0.40	0.08

Metabolites detected in the 5-bird study were the same as those detected in the 15-bird study. Ratios were changed in that percentages of DPX-Y6202 acid were much higher. In summary, DPX-Y6202 acid accounted for 64, 81, 41, and 24 percent of the total activity in liver, kidney, eggs, and ova, respectively. DPX-Y6202 pentanoic acid accounted for only 22 percent of the total activity in liver. Ova contained DPX-Y6202 acid, ME-DPX-Y6202, and DPX-Y6202 pentanoic acid.

RCB Comments/Conclusions re: Deficiency No. 4

Goat Metabolism

Only minor differences in the distribution of TLC-analyzed radioactivity in the milk, liver, and kidney extracts from the ^{14}C-phenyl (P) and ^{14}C-quinoxalinyl (Q) DPX-Y6202 dosed goats were found. Because of extraction problems, muscle and fat samples from the ^{14}C-quinoxalinyl dosed goat could not be analyzed. The primary metabolite in milk, liver, kidney, muscle, and fat is DPX-Y6202 acid.

The primary metabolite in milk is DPX-Y6202 acid accounting for 60 and 53 percent, respectively, of the extractable residue in day 7 milk for the Q and P dosed goats; with ME-DPX-Y6202, DPX-Y6202, and unknown accounting for 20, 6, and 13 percent, respectively, in day 7 milk from the Q dosed goat; and 24, 4, and 19 percent, respectively, in day 7 milk from the P dosed goat. The primary metabolite in the liver, kidney, and muscle is DPX-Y6202 acid accounting for 72, 100, and 87 percent, respectively, in extracts from the P dosed goat. DPX-Y6202 acid accounted for 100 percent of the extractable residue in fat from the P dosed goat, which represented only 40 percent of the total activity in fat, because of extraction difficulties. Adequate extraction of the total activity from the other samples from the P dosed goat were obtained, with extractions for milk, liver, kidney, and muscle of 80 to 98, 79, 83 and 93 percent, respectively. The largest percentage of unknown in the extractable residue was 29 percent in the liver of the P dosed goat, and the unknown consisted of three separate unknown moieties. These moieties would represent a negligible amount of residues resulting from the proposed use.

Based on the radiolabeled goat metabolism study, RCB concludes that the nature of the residue in ruminants is adequately understood resulting from the proposed use on soybeans and that the residue of concern consists of DPX-Y6202 acid (2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy]propanoic acid), ME-DPX-Y6202 (methyl 2-[(4-(6-chloroquinoxalin-2-yl oxy)phenoxy] propanoate) and DPX-Y6202 (ethyl 2-[4-(6-chloroquinoxalin-2-yl oxy)phenoxy)propanoate.

Poultry Metabolism

The characterized residues from the 15-bird study (liver 80% of total, kidney 74%, muscle 39%, fat and eggs 99%) in the liver consisted of 71% DPX-Y6202 pentanoic acid, 24% DPX-Y6202 acid and small percentages of the parent and unknowns; in the kidney consisted of 56% DPX-Y6202 acid, 22% DPX-Y6202 pentanoic acid, 11% MED-PX-Y6202 with 12% unknown; in the muscle consisted of 26% parent, 19% DPX-Y6202 acid, 12% DPX-Y6202 pentanoic acid, and 43% unknown; in the fat consisted of 55% parent and 45% unknown; and in eggs 20% DPX-6202 acid and 73% as three unknowns. Ova from the 3-bird study was analyzed to characterize egg residues. The ova nonpolar fraction accounted for 64% of the total activity while TLC analysis accounted for 50% of the total activity in ova and consisted of 32% (16% of total) DPX-Y6202 acid, 40% (20%) ME-DPX-Y6202, and 28% (14%) DPX-Y6202 pentanoic acid while the polar fraction which accounted for 36% of the total activity, contained primarily DPX-Y6202 acid (24% of total).

In view of the fact that the highest concentration of any of the moieties identified in the poultry metabolism study was a value of 1.10 ppm of DPX-Y6202 pentanoic acid in liver (71% of the characterized residue) and since this metabolite is not listed in the current tolerance expression, RCB defers to TB concerning whether DPX-Y6202 pentanoic acid should be included in the tolerance expression for poultry meat byproducts (0.0046 ppm in liver expected from the proposed use). Only very small amounts of DPX-Y6202 pentanoic acid would be expected in muscle (.0000079 ppm) and ova (.0004 ppm) with no residues in fat.

Utilizing 1985 proposed tolerances (i.e., soybeans, 0.05; hulls, 0.02; meal, 0.05; and soapstock, 1.0 ppm) derived from the first fractionation study (i.e., worst case) and the maximum percentage of feed items specified in the diet for broilers, resulted in an estimated feeding level from the current proposed use on soybeans of 0.21 ppm. Accordingly, the 50 ppm dosage level used in the metabolism study would represent 238X and linearly extrapolating the 1.10 ppm residue value in liver would result in an anticipated residue of DPX-Y6202 pentanoic acid in liver of 0.0046 ppm from the proposed use. This level would probably not be quantifiable if currently proposed methodology for other similar metabolites of DPX-Y6202 were used. However, DPX-Y6202 pentanoic acid accounted for 22 and 57 percent of the total activity in the liver from the 3-bird (3 daily doses and 4-hour sacrifice) and 15-bird (6 daily doses and 24-hour sacrifice) studies, respectively. These two data points (3 days vs. 6 days dosing) may indicate a propensity for DPX-Y6202 pentanoic acid to account for an even larger portion of the total residue in liver (i.e. $\geq$ 71% of the characterized residue), with the longer feeding intervals likely in actual practice.

Based on the radiolabeled poultry metabolism study, RCB concludes that the nature of the residue in poultry is adequately understood for the proposed use on soybeans and that the residues of concern consist of DPX-Y6202, DPX-Y6202 acid, ME-DPX-Y6202, and DPX-Y6202 pentanoic acid. Although only 0.0046 ppm of the DPX-Y6202 pentanoic acid is expected in chicken liver from the proposed use, a deference to TB has been made concerning whether DPX-Y6202 pentanoic acid should be included in the tolerance expression for poultry meat byproducts since that level represents ca. 22 to 56 percent of the terminal residue. Accordingly, the petitioner should be aware that appropriate methodology for measuring DPX-Y6202 pentanoic acid may be required for either the current proposed use on soybeans (depending on RCB's deference to TB) or for future proposed uses. Additionally, RCB notes that only 20 and 22 percent, respectively, of the total activity in eggs and muscle was positively identified, although residue data in ova were better characterized (i.e., 74%). Future uses may require a more complete characterization of egg and muscle residues.

Deficiency No. 5

The proposed regulatory method (Method No. AMR-153-83 Revision A) is not considered adequate for enforcement purposes because it is not designed to quantitate residues of DPX-Y6202 acid conjugates. Depending on the results from the requested residue studies (see Conclusions 7 and 8), methodology for some of the phenol metabolites (free plus conjugates) may need to be submitted and reviewed for regulatory purposes.

The petitioner will need to develop such methodology along with appropriate validation data (fortification/recovery data, control values, representative chromatograms, etc.), for analysis of both cottonseed and soybeans.

Also, the petitioner will need to examine whether any other pesticides registered for use on soybeans and cotton will interfere with the analysis of DPX-Y6202 and its acid and phenol metabolites of concern (free plus conjugates).

At such time as RCB considers the methodology acceptable, it will be sent to EPA's Analytical Chemistry Laboratory (ACS/COB/BUD) for a MTO.

Petitioner's Response to Deficiency No. 5

The petitioner has submitted several anaytical methods to quantitate DPX-Y6202 and its metabolites in both plant and animal commodities.

Method No. AMR-153-83 Revision 3 (MRID No. 403224-10) was used to generate the residue data in soybeans and soybean fractions for DPX-Y6202, DPX-Y6202 acid and DPX-Y6202 acid conjugates, submitted in response to Deficiency No. 7a. In brief, soybean or soybean fraction samples (except oils) are extracted with a mixture of acetone, water, and glacial acetic acid. After the acetone is evaporated the remaining aqueous phase is adjusted to a pH of 5.0 with base. Soybean oil fractions are dissolved in hexane and the residues extracted into acetonitrile; after the acetonitrile is evaporated, the residue is redissolved in pH 5.0 buffer. The DPX-Y6202 acid conjugate is converted to DPX-Y6202 acid, for all samples, by incubating with a mixture of B-glucosidase and cellulase enzymes.

DPX-Y6202 and DPX-Y6202 acid are next extracted from the aqueous solution into chloroform and the chloroform evaporated. Samples are both cleaned up and separated into DPX-Y6202 and DPX-Y6202 acid on a medium pressure LC system. The DPX-Y6202 acid is converted to the methyl ester (ME-DPX-Y6202) with Methyl-8® reagent. The DPX-Y6202 and ME-DPX-Y6202 are quantitated by a normal-phase multidimensional HPLC with spectrophotometric detection at 335 nm. The detective limit is reported as 0.05 ppm for both compounds in all matrices except soapstock which is 0.10 ppm. The following is a summary of the fortification/recovery data reported for DPX-Y6202 and DPX-Y6202 acid:

	Fortification (ppm)		Recovery (Range/Avg %)	
Sample	DPX-Y6202	DPX-Y6202 Acid	DPX-Y6202	DPX-Y6202 Acid
Soybeans	0.05-0.30	0.05-0.25	62-108/85	66-110/91
Soybean flour	0.05-0.25	0.05-0.25	80-92/88	84-116/102
Soybean hulls	0.05-0.25	0.05-0.25	88-46/92	96-112/104
Soybean oil	0.05-0.25	0.05-0.25	80-100/92	60-100/77
Soybean soapstock	0.05-0.25	0.05-0.25	--*	73-103/88

*DPX-Y6202 was hydrolyzed to DPX-Y6202 acid due to sodium hydroxide present in soapstock.

Method No. AMR-153-83 Revision 4 (MRID No. 403362-01) can be used to generate residue data for DPX-Y6202 and DPX-Y6202 acid (without DPX-Y6202 acid conjugates). In brief, soybean or soybean fraction samples (except oils) are extracted with a mixture of acetone, water, and glacial acetic acid and then partitioned into chloroform. Soybean oil fractions are dissolved in hexane and the residue extracted into acetonitrile.

After evaporation of the organic solvent, each sample is cleaned up on a medium pressure LC system which also separates the DPX-Y6202 from the DPX-Y6202 acid. Both the DPX-Y6202 and DPX-Y6202 acid are then quantitated by normal-phase multi-dimensional HPLC with spectrophotometric detection at 335 nm. The quantitation limit is reported as 0.05 ppm for both compounds in soybeans. The following is a summary of the fortification/recovery data reported (Note: Recoveries were not obtained for soybean fractions):

Sample	Fortification (ppm) Phenol 1	Fortification (ppm) Phenol 2	Recovery (Range/Avg. %) Phenol 1	Recovery (Range/Avg. %) Phenol 2
Soybeans	0.050	0.050	84-110/92	59-96/74
Soybeans	0.10	0.10	73-130/95	61-126/88

Method No. AMR-586-86 Revision (MRID No. 403224-12) was used to generate the residue data for the DPX-Y6202 metabolite Phenol 4 and its conjugates submitted in response to Deficiency No. 7a. In brief, Phenol 4 is extracted from soybeans with acetonitrile:water solvent. The water extract is separated from the acetonitrile and is hydrolyzed with B-glucosidase and cellulase to break down any residue conjugates of Phenol 4. The organic extract and the extract from the hydrolysis step are combined and the combined extract is partitioned with hexane to remove oil. The residue is separated from major interfering sample components with the use of a 2 gram preparative C18 column. Phenol 4 is quantified by reverse phase high performance liquid chromatography. The quantitation limit is reported as 0.02 ppm on soybeans. The following is a summary of the fortification/recovery data:

Sample	Fortification (ppm) DPX-Y6202	Fortification (ppm) DPX-Y6202 Acid	Recovery (Range/Avg %) DPX-Y6202	Recovery (Range/Avg %) DPX-Y6202 Acid
Soybeans	0.02-0.10	0.02-0.10	78-118/94	60-114/85
Soybean flour	0.02-0.10	0.02-0.10	80-115/93	48-115/76
Soybean hulls	0.02-0.10	0.02-0.10	80-87/84	90-110/100
Soybean oil	0.02-0.05	0.02-0.05	65-150/94	55-121/83
Soybean soapstock	0.02-0.05	0.02-0.05	--	73-103/180*

*DPX-Y6202 was hydrolyzed to DPX-Y6202 acid due to sodium hydroxide present in soapstock.

Method No. AMR-550-86 Revision 1 (MRID No. 403224-11) was used to generate the residue data for DPX-Y6202 metabolites Phenol 1 and Phenol 2 and their conjugates submitted in

response to Deficiency No. 7a. In brief, both compounds are extracted with an 80% acetonitrile/20% water solution. The sample is washed with hexane to remove oil and the hexane is discarded. The water is separated from the acetonitrile by the addition of chloroform. Residual water is removed by passing the acetonitrile/chloroform solution through sodium sulfate. The acetonitrile/chloroform solution is evaporated and the aqueous phase is treated with enzymes to release any conjugated residues. After the enzyme treatment, any phenols in the aqueous layer are extracted into chloroform, the chloroform layer combined with the previously evaporated acetonitrile/chloroform solution and evaporated. Phenol 1 and 2 are quantified by reverse-phase multidimensional HPLC with spectrophotometric detection at 335 nm or by fluorescence detection for Phenol 2. The excitation wavelength is 350 nm. The following is a summary of the fortification/recovery data reported.

Sample	Fortification (ppm) Phenol 4	Recovery (Range/Avg. %) Phenol 4
Soybeans	0.20	80-100/92
Soybeans	0.25	88-104/97
Soybeans	0.50	83-104/93

Method No. AMR-627-86 (MRID No. 403224-04) was used to generate the tissue residue data for DPX-Y6202, DPX-Y6202 acid, and ME-DPX-Y6202 in response to Deficiency No. 9. Tissue samples were extracted with methanol and the methanol then evaporated. The oily residue was then hydrolyzed with a mixture of lipase and esterase enzymes to disassociate the fat and also convert DPX-Y6202 and ME-DPX-Y6202 to DPX-Y6202 acid. The DPX-Y6202 acid was then extracted from the aqueous enzyme solution with chloroform and cleaned up on a silica cartridge. The level of DPX-Y6202 acid was determined by multidimensional HPLC with spectrophotometric detection at 335 nm. The detection limits were reported as 0.05 ppm for liver and kidney and 0.02 ppm for muscle. The following is a summary of the fortification/recovery data reported:

	Tissue			
	Fortification (ppm)		Recovery (Range/Avg. %)	
Sample	DPX-Y6202	DPX-Y6202 Acid	DPX-Y6202	DPX-Y6202 Acid
Chicken Kidney	0.05-0.10	0.05-0.10	76-81/81	80-88/85
Chicken Liver	0.05-0.10	0.05-0.10	74-80/78	78-86/82
Chicken Muscle	0.02-0.05	0.05-0.10	70-90/80	85-88/86
Cow Kidney	0.05-0.10	0.05-0.10	58-83/71	81-86/83
Cow Liver	0.05-0.10	0.05-0.10	74-86/81	64-96/81
Cow Muscle	0.02-0.10	0.02-0.10	79-97/86	84-100/90

Method No. AMR-515-86 Revision A (MRID No. 403224-08) was used to generate the milk residue data for DPX-Y6202, DPX-Y6202 acid, and ME-DPX-Y6202 in response to Deficiency No. 9. Milk or skim milk was extracted with acetonitrile and the acetonitrile evaporated. The oil residue was hydrolyzed with a mixture of lipase and esterase enzymes to disassociate the fat and also convert DPX-Y6202 and ME-DPX-Y6202 to DPX-Y6202 acid. The DPX-Y6202 acid was then extracted from the aqueous enzyme solution with chloroform which was evaporated. The level of DPX-Y6202 acid was determined by multidimensional HPLC with spectrophotometric detection at 335 nm. The procedure was validated using a sample of milk from a goat treated with ^{14}C-DPX-Y6202. Although a specific limit of detection was not declared for the three compounds in milk, the sample chromatograms indicate a limit of detection of 0.01 ppm. The following is a summary of the fortification/recovery data reported:

Milk

Compound	Fortification (ppm)	Recovery (Range/Avg. %)
DPX-Y6202	0.01-0.10	75-100/87
DPX-Y6202 acid	0.01-0.10	66-92/78
ME-DPX-Y6202	0.01-0.05	70-89/81

Skim Milk

Compound	Fortification (ppm)	Recovery (Range/Avg. %)
DPX-Y6202	0.01-0.05	87-98/93
DPX-Y6202 acid	0.01-0.05	85-90/88
ME-DPX-Y6202	0.01-0.02	70-92/81

Method No. AMR-845-87 (MRID No. 403224-09) was used to generate the cream residue data for DPX-Y6202, DPX-Y6202 acid and ME-DPX-Y6202 in response in Deficiency No. 9. Cream samples were extracted with a solution 1.0% glacial acetic acid in acetone and the solvent then evaporated. The oily rsidue was then hydrolyzed with a mixture of lipase and esterase enzymes to disassociate the fat and convert DPX-Y6202 and ME-DPX-Y6202 to DPX-Y6202 acid. The DPX-Y6202 acid was then extracted from the aqueous enzyme solution with chloroform and cleaned up on a silica cartridge. The level of DPX-Y6202 acid was determined by multidimensional HPLC with spectrophotometric detection at 335 nm. The procedure was validated using a sample of cream from a goat treated with ^{14}C-DPX-Y6202. The minimum quantifiable level reported for all three compounds was 0.05 ppm.

The following is a summary of the fortification/recovery data reported:

Cream

Compound	Fortification (ppm)	Recovery (Range/Avg. %)
DPX-Y6202	0.04-0.40	66-100/88
DPX-Y6202 acid	0.05-0.40	86-100/94
ME-DPX-Y6202	0.05-0.40	64-95/82

Method No. AMR-623-86 (MRID No. 403224) was used to generate egg residue data for DPX-Y6202, DPX-Y6202 acid and ME-DPX-Y6202 in response to Deficiency No. 9. Egg samples were extracted with a solution of 0.5% glacial acetic acid in acetone and the solvent then evaporated. The oil residue was then hydrolyzed with a mixture of lipase and esterase enzymes to disassociate the fat and also convert DPX-Y6202 and ME-DPX-Y6202 to DPX-Y6202 acid. The DPX-Y6202 acid was then extracted from the aqueous enzyme solution with chloroform, and cleaned up on a silica cartridge. The level of DPX-Y6202 acid was determined by multidimensional HPLC with spectrophotometric detection at 335 nm. The procedure was validated using samples of eggs from chickens treated with ^{14}C-DPX-Y6202. Although a specific limit of detection was not declared for the three compounds in milk, the sample chromatograms indicate a limit of detection of 0.01 ppm. The following is a summary of the fortification/recovery data reported.

Eggs

Compound	Fortification (ppm)	Recovery (Range/Avg. %)
DPX-Y6202	0.02-0.10	80-100/88
DPX-Y6202 acid	0.02-0.10	75-100/94
ME-DPX-Y6202	0.02-0.10	67-95/87

Method No. AMR-846-87 (MRID No. 403224-05) was used to generate residue data in fats for DPX-Y6202, DPX-Y6202 acid, and ME-DPX-Y6202 in response to Deficiency No. 9. Fat samples were extracted with a mixture of 50 parts 98% acetone/2% glacial acetic acid and 50 parts hexane. The solvent was evaporated, and fat residue was hydrolyzed with a mixture of lipase and esterase enzymes, and then exposed to pH 12 to complete the conversion of DPX-Y6202 and ME-DPX-Y6202 to DPX-Y6202 acid. The DPX-Y6202 acid was extracted from the aqueous enzyme solution with chloroform. The chloroform was evaporated and an acetonitrile/hexane partitioning was done. DPX-Y6202 acid now in acetonitrile, was cleaned up first on a silica column and then either a diol or an amino solid phase extraction cartridge. The concentration of DPX-Y6202 was determined

by multidimensional HPLC using UV absorbance detection at 335 nm. The method was validated using samples of goat and chicken fat from goats and chickens treated with ^{14}C-DPX-Y6202. Although a specific limit of detection was not claimed for the three compounds in fat, the sample chromatograms indicate a limit of detection of 0.05 ppm. The following is a summary of the fortification/recovery data reported:

Sample	Fortification (ppm)	Recovery (Range/Avg. %)
	DPX-Y6202 in Cow Fat	
Renal fat	0.05-0.20	66-110/90
Omental fat	0.05-0.10	82-85/84
Subcutaneous fat	0.10-0.20	79-84/82
	DPX-Y6202 Acid in Cow Fat	
Renal fat	0.05-0.20	77-108/97
Omental fat	0.10	84-85/84
Subcutaneous fat	0.10-0.20	81-84/92

Sample	Fortification (ppm)	Recovery (Range/Avg. %)
	DPX-Y6202 in Chicken Fat	
FAT	.05-0.20	71-101/85
	DPX-Y6202 Acid in Chicken Fat	
FAT	0.05-0.20	56-86/75

Method No. AMR-281-84 Revision A (MRID No. 403371-01) was used to determine the amount of DPX-Y6202 in gelatin capsules. The capsules are dissolved in a solution of 50% acetonitrile in pH 2.2 phosphoric acid. The amount of DPX-Y6202 in the capsule is then determined by reversed phase HPLC with absorption detection at 335 nm.

Interference--the petitioner indicates that the analytical methods used are highly selective and employ high resolution HPLC such that it is unlikely that residues of other pesticides used on soybeans would interfere with the analysis for DPX-Y6202.

RCB Comments/Conclusions re: Deficiency No. 5

RCB will await the conclusions of MTOs currently being conducted by EPA Labs before making final conclusions on the proposed methods.

RCB (M. Firestone, review of September 25, 1985) has indicated that a study (Accession No. 07347, Document No. 33) of the effectiveness of various hydrolytic techniques showed that hydrolysis with cellulase was more effective in releasing conjugated residues than treatment with B-glucosidase, NaOH (0.1 to 0.2 N) or HCl (0.25 to 1.0 N). However, in these enzyme hdyrolytic techniques, samples were incubated for a 24-hour period and no recovery data on conjugated residues were presented. Additionally, the plant metabolism studies indicate problems in releasing conjugated residues with enzyme hydrolysis. Data on the effectiveness of releasing conjugated residues in soybeans by the proposed technique are required. Also, the petitioner has not submitted any data on whether any other pesticides will interfere with the analysis of DPX-Y6202 and its acid and phenol metabolites of concern (free plus conjugates).

RCB will not recommend that the petitioner be required to carry out the FDA multiresidue method Protocols I, .I, III, and IV for the proposed use on soybeans. However, for any future use or a change in the application rate for DPX-Y6202 on soybeans, the petitioner will need to subject DPX-Y6202 to these protocols (see FEDERAL REGISTER/Vol. 51, No. 187/Friday, September 26, 1986).

Deficiency No. 6

Storage stability data will need to be generated for residues of DPX-Y6202 acid and the phenol metabolites of DPX-Y6202.

Petitioner's Response to Deficiency No. 6

Freezer storage stability studies were conducted with DPX-Y6202, DPX-Y6202 acid, Phenol 1, Phenol 2, and Phenol 4. Samples of these compounds were added at the 0.10 ppm level to chopped soybeans and stored in a glass freezer storage jar at -20 °C until analysis. At each storage interval two freezer fortifications, one unfortified control and one control sample freshly fortified, were analyzed. The analytical methods used were AMR-153-83 Revision 3 for DPX-Y6202 and DPX-Y6202 acid, AMR-550-86, Revision 1 for Phenol 1 and Phenol 2 and AMR-586-86 Revision 1 for Phenol 4.

The following is a summary of the storage stability data corrected for freshly fortified recoveries:

DPX-Y6202 Stability (Average %)

Months	0	6	18	24	36	48

Fortification (100 ppb)	93	79	73	75	94	97

DPX-Y6202 Acid Stability (Average %)

Months	0	12	18	24	30	36
Fortification (100 ppb)	96	89	100	105	95	95

Phenol 1 Stability (Average %)

Months	4	5	11	13
Fortification (100 ppb)	97	94	105	90

Phenol 2 Stability (Average %)

Months	6	13
Fortification (100 ppb)	62	91

Phenol 4 Stability (Average %)

Months	5.5
Fortification (100 ppb)	107

All controls of DPX-Y6202 and DPX-Y6202 acid and Phenol 4 were shown as less than 20 ppb, and for Phenol 1 and Phenol 2, were shown as less than 0.50 (units not identified).

The level of detection from the method used for DPX-Y6202 and DPX-Y6202 acid is claimed as 0.05 ppm or 50 ppb.

The petitioner indicates that freezer storage studies on soybeans will continue for several years.

RCB Comments/Conclusions Re: Deficiency No. 6

The storage stability data indicates that DPX-Y6202, DPX-Y6202 acid, Phenol 1, Phenol 2, and Phenol 4 are relatively stable when stored in soybeans at -20 °C for 48, 36, 13, 13, and 5.5 months, respectively.

Deficiency No. 6 has been resolved.

Deficiency No. 7a

Considering the lack of residue data reflecting residues of DPX-Y6202 acid conjugates and the phenol metabolites, and considering limited storage stability of DPX-Y6202 in frozen samples, the petitioner will need to conduct new field trials for soybeans and cottonseed in which the parent compound, and its acid and phenol metabolites (both free and conjugated) are quantitated (i.e., reanalysis of reserve samples is not considered acceptable at this time).

Petitioner's Response to Deficiency No. 7a

Soybean field samples and processed soybean fractions from field trials were analyzed for DPX-Y6202, DPX-Y6202 acid, Phenol 1 and Phenol 2, Phenol 4, and conjugates of these metabolites utilizing Method Nos. AMR-153-83 Revision 3, AMR-550-86 Revision 1, and AMR-586-86 Revision 1, respectively. These analytical methods are discussed in detail under the petitioner's response to Deficiency No. 5.

The following is a summary of the recoveries obtained on soybeans utilizing these methods:

Compound	Fortification (ppm)	Recovery (Range/Avg. %)
DPX-Y6202	0.05-0.25	85-105/92
DPX-Y6202 Acid	0.05-.125	85-110/92
Phenol 1	0.05-1.0	73-130/95
Phenol 2	0.05-0.10	59-126/75
Phenol 4	0.02-0.05	74-100/84

One field trial was conducted at each of seven locations (Jackson, TN; Oakland, NE; Cochran, GA; Fayettville, NC; Greenville, MS; New Holland, OH; and Chesapeake City, MD) with soybeans treated at the new proposed maximum use rate of 6.4 oz ai/A (2X normal use rate). Soybeans were treated before pod-set, as specified in label directions, and PHIs ranged from 72 to 80 days. Residue samples from all field trial locations were negative for DPX-Y6202, DPX-Y6202 acid, Phenol 1, Phenol 2, and Phenol 4. The level of quantitation was 0.05 ppm for all of the compounds, except Phenol 4 which had a level of quantitation of 0.02 ppm.

RCB Comments/Conclusions re: Deficiency No. 7a

RCB will defer a conclusion on the acceptability of the field trial data until questions concerning the analytical methods used (i.e., RCB Comments/Conclusions Re: Deficiency No. 5) are resolved.

Deficiency No. 7b

RCB can reach no conclusion regarding the acceptability of the supplemental cottonseed residue data submitted in a September 10, 1985 amendment until a detailed description of Method No. AMR-154-83A, as well as representative chromatograms, are submitted. If Method No. AMR-154-83A does not contain an acceptable hydrolysis step capable of releasing conjugated DPX-Y6202 acid residues, the supplemental cottonseed residue data will probably be considered inadequate. (Note: Plant metabolism studies indicate that the hydrolysis step is needed to release conjugated DPX-Y6202 acid residues.)

In any case, the petitioner will still be required to submit residue data for the following three phenol metabolites (free plus conjugates) cited under Deficiency 3a generated on treated cottonseed and soybeans:

Phenol 1 = 4-(6-chloroquinoxalin-2-yl oxy) phenol;
Phenol 2 = 6-chloroquinoxalin-2-ol; and
Phenol 4 = 2-(4-hydroxyphenoxy) propionic acid.

Petitioner's Response to Deficiency No. 7b

The petitioner has dropped the use on cottonseed from PP#5F3252/FAP#6H5479 and will submit a separate petition for cottonseed. Accordingly, a detailed description of Method No. AMR-154-83A and new field trial data on cottonseed have not been submitted under this petition.

RCB Comments/Conclusions re: Deficiency No. 7b

Since the use on cotton has been deleted from this petition, this deficiency is moot at this time.

Deficiency No. 8a

With regard to the soybean processing study:

1. The data are considered inadequate since they do not reflect residues of DPX-Y6202 acid conjugates and the three possible phenol metabolites of concern.

2. Depending on resolution of the issue of storage stability (see Deficiency No. 6), either reanalysis of reserve samples should be performed (in which case information concerning the length of storage between harvest, processing, and analysis should be submitted), or a new soybean processing study will be needed in which analysis includes DPX-Y6202, its acid metabolite (free plus conjugates) and Phenols 1, 2, and 4 (free plus conjugates).

3. The petitioner should submit a copy of Method No. AMR-153-83, Revision A, Appendix A, which was not included in the original petition.

Petitioner's Response to Deficiency No. 8a

The petitioner has conducted a new soybean processing study. Soybeans for the study were treated at 8.0 oz ai/A after pod-set (beginning seed) to ensure the presence of residues for the fractionation study. The analytical methods used were the same as those used for generating the field

trial data. Soybean and processed soybean fractions were analyzed by the following methods: AMR-153-83, Revision 3 for DPX-Y6202, DPX-Y6202 acid and its conjugates: AMR-550-86 Revision 1 for Phenol 1, Phenol 2, and their conjugates; and AMR-586-86 Revision 1 for Phenol 4 and its conjugates.

The following is a summary of the fortification/recovery data obtained utilizing these methods in the soybean fractionation study:

DPX-Y6202

Fraction	Fortification (ppm)	Recovery (Range/Avg. %)
Soybeans	0.02-0.10	88-105/97
Hulls	0.02-0.10	94-100/96
Full fatted flour	0.02-0.10	55-64/59
Crude oil	0.02-0.10	70-118/88
Desolventized meal	0.02-0.10	71-110/91
Defatted flour	0.05-0.10	93-96/95
Refined oil	0.02-0.10	85-100/93
Refined bleached oil	0.02-0.10	75-101/87
Refined bleached deod. oil	0.02-0.10	60-84/69
Soapstock	0.05-0.10	Converted to acid

DPX-Y6202 Acid

Soybeans	0.02-0.10	80-112/96
Hulls	0.02-0.10	85-99/91
Full fatted flour	0.02-0.10	55-128/96
Crude oil	0.02-0.10	80-108/93
Desolventized meal	0.02-0.10	78-105/94
Defatted flour	0.05-0.10	82-97/90
Refined oil	0.02-0.10	57-65/61
Refined bleached oil	0.02-0.10	80-99/90
Refined bleached deod. oil	0.02-0.10	90-110/101
Soapstock	0.02-0.10	68-80/74

Phenol 1

Soybeans	0.05-0.10	88
Desolventized meal	0.05	92
Full fatted flour	0.10	86
Defatted flour	0.05	68
Crude oil	0.10	97
Refined bleached oil	0.05	62
Refined bleached deodorized oil	0.10	83

Phenol 2

Fraction	Fortification (ppm)	Recovery (Range/Avg. %)
Soybeans	0.05-0.10	96-113/105
Desolventized meal	0.05	100
Full fatted flour	0.10	88
Defatted flour	0.05	120
Crude oil	0.10	78
Refined oil	0.02	75
Refined bleached oil	0.05	76
Refined bleached deodorized oil	0.10	82

Phenol 4

Soybeans	0.02-0.05	87-94/91
Hulls	0.05	88
Desolventized meal	0.05	82-85/94
Full fatted flour	0.02-0.05	82-97/87
Crude	0.02-0.05	73-97/85
Refined oil	0.50	73
Soapstock	0.50	77

The following table summarizes the residue data from the soybean fractionation study:

Concentration (ppm)

Process Fraction	DPX-Y6202	DPX-Y6202 (Acid)	Phenol 1	Phenol 2	Phenol 4
Soybean	< 0.05	0.14	< 0.05	< 0.05	< 0.02
Hulls	< 0.05	0.06	---	---	0.02 0.03
Desolventized meal	< 0.05	0.16	< 0.05	< 0.05	0.05
Defatted flour	< 0.05	0.15	< 0.05	< 0.05	< 0.02 0.04
Full fatted flour	< 0.05	0.19	< 0.05	< 0.05	0.04
Crude oil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02
Refined oil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02
Refined - bleached oil	< 0.05	< 0.05	< 0.05	< 0.05	---

Concentration (ppm) (cont'd)

Process Fraction	DPX-Y6202	DPX-Y6202 (Acid)	Phenol 1	Phenol 2	Phenol 4
Refined - bleached - deodorized oil	< 0.05	< 0.05	< 0.05	< 0.05	---
Soapstock	< 0.05	0.25	---	---	< 0.05

RCB Comments/Conclusions re: Deficiency No. 8a

The second fractionation study (submitted in this amendment) analyzed processed fractions of soybeans that contained field treated residues of 0.14 ppm DPX-Y6202 acid, well above the proposed tolerance level of 0.05 ppm; and included analysis of DPX-Y6202 acid and phenol metabolites (both free plus conjugates). The study appears acceptable, however, RCB must defer a final decision on the acceptability of this fractionation study pending a resolution of the questions on the methodology (Reference: RCB Comments/ Conclusions re: Deficiency No. 5). The data from the second fractionation study indicate that residues in soybeans of DPX-Y6202 acid and conjugates do not concentrate appreciably in processed soybean fractions, except for soapstock with a 2X concentration factor. No detectable residues of DPX-Y6202, Phenol 1 or Phenol 2 were found in any of the fractions. Although Phenol 4 can concentrate in meal $\geq$ 3X, and hulls, and flour at $\geq$ 2X, Phenol 4 residues in all fractions would be significantly lower than levels of DPX-Y6202 acid.

However, the petitioner should note that, although RCB concluded that the first fractionation study was inadequate since it did not include residue data on DPX-Y6202 acid conjugates and phenol metabolites and their conjugates, the study cannot be totally discarded in evaluating whether or not DPX-Y6202 acid concentrates in processed soybean fractions. Data from the first fractionation study which showed concentration of DPX-Y6202 acid in soybean hulls, meal, and flour and more concentration (e.g., more than the second fractionation study) in soapstock cannot be overlooked. Additional data on DPX-Y6202 acid conjugates and phenol metabolites and conjugates were required only to determine if additional concentration would occur if these other moieties were included. Now the second fractionation study shows only a minor concentration of Phenol 4 with no appreciable concentration of DPX-Y6202, DPX-Y6202 acid, Phenol 1 or Phenol 2.

The significant variation in the results of the two fractionation studies cannot be accounted for by the laboratory processing procedures utilized, since both fractionation studies referenced and used the same laboratory soybean processing procedures. One has to question the significant variations in concentration of DPX-Y6202 acid in the processed fractions of the two studies, yet the data submissions for both studies contain neither laboratory notes nor actual readings for important parameters (e.g., temperature, time, flake washing procedures, any minor differences in the laboratory equipment, etc.), which might account for the variation in results. Further, the concept of utilizing laboratory scale processing procedures to represent full scale soybean processing is hypothetical and thus their results subject to interpretation. Consequently, there are two soybean processing studies, one representing the best-case and the other the worst-case for concentration of DPX-Y6202 acid in processed soybean fractions, utilizing laboratory procedures.

Accordingly, in the absence of representative pilot scale soybean processing data, the petitioner should submit a revised Section F reflecting the first fractionation study (i.e., worst-case) and identical to tolerances and FATs proposed in September 1985 (i.e., soybeans, 0.05; hulls, 0.02; meal, 0.5; flour, 0.5; and soapstock, 1.0 ppm). Since no residues of the phenol metabolites were found in the soybean field trials, if TB considerations permit, RCB will not recommend that phenols be included in the tolerance expression (see RCB Comments/Conclusions re: Deficiency No. 3a). Additionally, the methodology question has to be resolved (reference: RCB Comments/Conclusions re: Deficiency No. 5) so that a final conclusion concerning the concentration of DPX-Y6202 acid conjugates can be made. The petitioner should also provide information on the basis of tolerance proposals (soybeans, 0.3; hulls, 0.3; meal, 0.5; and soapstock, 0.6) referenced in an October 14, 1986 letter from Tony Catka.

Deficiency No. 8b

The petitioner will still need to conduct a cottonseed processing study in which the treated samples contain field weathered detectable residues (this may require treatment at exaggerated rates and PHIs of less than 80 days), and the residues to be analyzed include DPX-Y6202, its acid metabolite (free plus conjugates), and its three possible phenol metabolites of concern (free plus conjugates).

Petitioner's Response to Deficiency No. 8b

The petitioner has deleted the proposed use on cotton from PP#5F3252/FAP#6H5479 and will submit a separate petition for cotton.

RCB Comments/Conclusions re: Deficiency No. 8b

Since the use on cotton has been deleted from this petition, this deficiency is moot at this time.

Deficiency No. 9

At this time, RCB is unable to reach any conclusions concerning the likelihood of secondary residues in animal commodities until issues involving soybean and cottonseed (RAC plus processed fractions) residue data, analytical methodology, and possibly animal metabolism of DPX-Y6202 have been resolved.

Petitioner's Response to Deficiency No. 9

The petitioner has submitted metabolism studies in goats and poultry (reference RCB Comment/Conclusions re: Deficiency No. 4). Additionally, the petitioner has submitted cattle and poultry feeding studies which are summarized as follows:

Cow Feeding Study (MRID No. 403224-07)

Twelve healthy lactating cows were divided into four groups of three cows, consisting of one untreated control group and three treated groups which received the equivalent of either 0.1, 0.5, or 5.0 ppm encapsulated DPX-Y6202. Utilizing proposed tolerances derived from the second fractionation study (i.e., soybeans 0.05; soybean hulls 0.05; meal 0.05; and soapstock .10 ppm) and the percentage of feed items in the diet specified in EPA Pesticide Assessment Guidelines Subdivision O, the three dosing levels represent 2.5X, 12.5X, and 125X, respectively, when compared with an estimated feeding level of 0.04 ppm DPX-Y6202. After 28 days of treatment, two animals from each group were sacrificed, and samples collected for chemical analysis. The remaining animals were fed a normal diet without DPX-Y6202 for an additional 7 days, after which they were sacrificed and samples collected.

The analytical procedures utilized were AMR-815-86 Revision A, AMR-845-87, AMR-627-86, and AMR-846-87 for milk, cream, tissue, and fat, respectively. These analytical procedures and recoveries obtained are discussed in detail under Petitioner's Response to Deficiency No. 5.

Note that these methods convert any DPX-Y6202 and ME-DPX-Y6202 to DPX-Y6202 acid and accordingly all residue data are presented as DPX-Y6202 acid. All milk, cream, tissue, urine, and feces samples were stored in screw cap plastic jars at -20 °C until analyzed. Freezer stability data for DPX-Y6202 and DPX-Y6202 acid in milk, liver, skeletal muscle and fat were generated. Freezer stability tests were not done for ME-DPX-Y6202 since it was judged unlikely that its stability would differ from DPX-Y6202. Frozen and fresh samples were fortified at a level of 0.10 ppm. Frozen storage recoveries were corrected with fresh samples recoveries. These data are summarized as follows:

Samples	Storage (Months)	Corrected Avg. DPX-Y6202	Recovery (%) DPX-Y6202 Acid
Whole milk	20.5	90	83
Liver	4.5-5.0	88	85
	10	88	111
Muscle	20	95	85
Fat	26	75	88

All fresh spiked sample recoveries exceeded 70 percent with the exception of two liver samples analyzed for DPX-Y6202 acid, where recoveries were 64 and 45 percent. Also, the low 45 percent recovery was not included in the recoveries listed under Method AMR-627-86. This storage stability study adequately supports the sample analyses since milk, liver, muscle, and fat samples were stored less than 10, 8, 8, and 13 months, respectively, before analysis.

Both a.m. and p.m. milk samples were collected and once a week milk was separated into skim milk and cream. All milk, skim milk, and cream samples from the control and the 0.1 and 0.5 ppm dosage levels were negative when analyzed for DPX-Y6202 acid at a quantitation limit of 0.01 ppm in milk and skim milk and 0.05 ppm in cream.

Whole milk residues from the 5.0 ppm dosage level plateaued at 0.02 ppm, within 4 days after dosing with residue levels in all samples from day 2 through 29 varying from 0.01 to 0.02 ppm. The skim milk and cream residue data indicate residues of DPX-Y6202 acid partition into cream since skim milk samples from all dosage levels and cream samples from the 0.1 and 0.5 ppm dosage levels were negative; while levels in cream for three cows from the 5.0 ppm dosage level plateaued at 0.26, 0.28, and 0.31 ppm after 2, 3, and 4 weeks, respectively.

Skeletal muscle, fat, liver, and kidney tissue samples from all dosage levels were negative when analyzed for DPX-Y6202 acid at a quantitation limit of 0.02 ppm for skeletal muscle and 0.05 ppm for fat, liver, and kidney samples; with the exception of a residue of 0.05 ppm in one kidney sample from a cow in the 5.0 ppm dosage group.

Assuming a feeding level of 0.04 ppm (derived from the second fractionation study) and using residue data from the highest dosage level of 5.0 ppm, the following table depicts both the DPX-Y6202 acid residue concentration (or quantitation limit) and the extrapolated residue (assuming a linear regression) for dosing cattle:

Sample	Highest Residue (ppm)	Extrapolated Residue (ppm)
Whole milk	0.02	0.00016
Skim milk	< 0.01	< 0.00008
Cream	0.31	0.0025
Kidney	0.05	0.0004
Liver	< 0.05	< 0.0004
Skeletal muscle	< 0.02	< 0.00016
Fat	< 0.05	< 0.0004

A comparison of the residue levels in the goat metabolism study (divided by 10 to extrapolate from a 50 ppm to a 5 ppm dosage level) and the DPX-Y6202 acid residue levels in the cow feeding study, at the 5.0 ppm dosage level, was made by combining the DPX-Y6202 acid, DPX-Y6202 and ME-DPX-Y6202 residue levels in the goat metabolism study.

	Residue (ppm)		
Sample	P Label	Q Label	Cow
Whole milk	0.02	0.02	0.02
Kidney	0.01	0.01	< 0.05-0.05
Liver	0.003	0.002	< 0.05
Muscle	0.002	--	< 0.02
Fat	0.003-0.007	0.002-0.005	< 0.05

Poultry Feeding Study (MRID No. 403224-01)

Eighty single-comb White Leghorn laying hens were divided into four test groups of 20 birds each and each test group subdivided into four subsets of five birds each. The four test groups consisted of a control and three treated groups that received DPX-Y6202 at levels equivalent to 0.1, 0.5, and 5.0 ppm in the diet (e.g., 0.063, 0.0316, or 0.316 mg/kg) for a 28-day treatment interval.

The dosage levels were based on proposed tolerances derived from the second fractionation study (i.e., soybeans 0.05; hulls 0.05; meal 0.05; and soapstock .10 ppm) and the percentage of feed items in the diet specified in EPA Pesticide Assessment Guidelines Subdivision O, which results in an estimated dietary level of 0.04 ppm DPX-Y6202 or 2.5X, 12.5X, and 125X respectively, for the 0.1, 0.5, and 5.0 ppm feeding levels. The test material was contained in a sealed gelatin capsules administered to each bird once daily. Three subsets of 15 birds for each test group were sacrificed on the 28th day, with the remaining subsets sacrificed after another 7 days. Tissues from each subset were pooled together for analysis.

The analytical methods used were Method Nos. AMR-627-86, AMR-623-86, and AMR-846-87 for tissues, eggs, and fat, respectively. These methods are discussed in detail under Petitioner's Response to Deficiency No. 5. All samples were stored frozen at -20 °C until analyzed. Freezer stability data for milk, liver, muscle, and fat were discussed previously under the Cow Feeding Study. In eggs, corrected average recoveries for DPX-Y6202 were 96 percent at 3.5 months and 105 percent at 10 months and for DPX-Y6202 acid were 98 percent at 3.5 months and 96 percent at 10 months. All fresh spiked sample recoveries exceeded 86 percent for DPX-Y6202 and DPX-Y6202 acid.

No residues of DPX-Y6202 acid were found in the breast and thigh muscle or liver at the method quantitation limits (i.e., 0.05 ppm in liver and 0.02 ppm in muscle) in the control or the 0.1, 0.5, and 5.0 ppm treatment groups. Kidney samples from the control and the 0.1 and 0.5 ppm treatment groups were also negative at a quantitation limit of 0.05 ppm. However, at the 5.0 ppm treatment level one subset (e.g., five birds) had a pooled concentration of 0.09 ppm DPX-Y6202 acid in the kidney, while the other three subsets' kidney samples, treated at 5.0 ppm, were negative.

All egg samples (e.g., subsets) from the control and the 0.1, 0.5, and 5.0 ppm treatment groups were negative for DPX-Y6202 acid at a quantitation limit of 0.02 ppm; except one subset in the 5.0 ppm treatment group which had a pooled concentration of 0.02 ppm. All fat samples (e.g., subsets) from the control and the 0.1 and 0.5 ppm treatment groups were negative for DPX-Y6202 acid at a quantitation limit of 0.05 ppm. In the 5.0 ppm treatment group, fat samples from two subsets were negative and fat samples from the remaining two subsets contained either 0.05, or 0.06 ppm DPX-Y6202 acid.

RCB Comments/Conclusions re: Deficiency No. 9

Meat, Milk, Poultry, and Eggs

As the petitioner indicated, animal diets may contain significant amounts of the following soybean commodities:

Soybean Seeds	Beef Cattle	Dairy Cattle	Turkey Broilers	Laying Hens	Boars, Sows	Finishing Animals
Seed	10	25	20	50	20	20
Meal	25	25	30	20	20	20
Hulls	20	10			10	5
Soapstock	5	5	5	5	5	5

Utilizing tolerances proposed in September 1985, (i.e., soybeans 0.05; meal 0.5; hulls 0.2; and soapstock 1.0 ppm) reflecting concentration from the first fractionation study and the above percentages of feed, give a maximum feeding level from the proposed use on soybeans of 0.21 ppm for dairy cattle and turkey broilers and .18 ppm for laying hens.

In the cattle feeding study cows were fed a diet containing either 0.1, 0.5, and 5.0 ppm DPX-Y6202, representing approximately 5X, 2.4X, and 23.8X for dairy cattle. All milk, skim milk, and cream samples from the 0.1 and 0.5 ppm feeding levels were negative when analyzed for DPX-Y6202 acid at a quantitation limit of 0.01 ppm in milk and 0.05 ppm in cream. Whole milk residues from the 5.0 ppm dosage level plateaued at 0.02 ppm within 4 days after dosing; and cream residues plateaued at 0.26, 0.28, and 0.31 ppm after 2, 3, and 4 weeks, respectively in the three groups (3 cows in each group) treated, while skim milk samples were negative. Skeletal muscle, fat, liver, and kidney samples from all dosage levels were negative when analyzed for DPX-Y6202 acid at a quantitation limit of 0.02 ppm for skeletal muscle and 0.05 ppm for fat, liver, and kidney samples; with the exception of one kidney sample from the 5.0 ppm dosage level which had a residue of 0.05 ppm.

Assuming a feeding level of .21 ppm from the proposed use on soybeans and using residue data from the highest dosage level of 5.0 ppm (23.8X), the following table depicts the residue (as DPX-Y6202 acid) concentration (or quantitation limit) and the extrapolated residue (assuming a linear regression) for dairy cattle:

Sample	5.0 ppm Dosage Highest Residue (ppm)	Proposed Use Extrapolated Residue (ppm)
Whole milk	0.02	.0008
Skim milk	< 0.01	< .0004
Cream	0.31	.0130

Sample	5.0 ppm Dosage Highest Residue (ppm)	Proposed Use Extrapolated Residue (ppm)
Kidney	0.05	0.0021
Liver	< 0.05	< .0021
Skeletal muscle	< 0.02	< .0008
Fat	< 0.05	< .0021

In the poultry feeding study, laying hens were fed a diet containing either 0.1, 0.5, or 5.0 ppm DPX-Y6202 acid representing either .5X, 4.8X, and 23.8X for turkey broilers or .6X, 2.8X and 27.8X for laying hens. All breast and thigh muscle and liver samples were negative at all the dosage levels and all kidney samples from the 0.1 and 0.5 ppm dosage levels were negative for DPX-Y6202 acid at a quantitation level of 0.02 ppm in muscle and 0.05 ppm in the liver and kidney. However, one kidney sample from the 5.0 ppm dosage level had a concentration of 0.09 ppm DPX-Y6202 acid. All egg samples were negative for DPX-Y6202 acid at a quantitation limit of 0.02 ppm, with the exception of one sample in the 5.0 ppm dosage group which had a concentration of 0.02 ppm.

Fat samples from the 0.1 and 0.5 ppm dosage levels were negative at a level of quantitation of 0.05 ppm. In the 5.0 ppm dosage group fat samples ranged from negative to 0.06 ppm DPX-Y6202 acid.

Assuming a feeding level of .21 ppm for turkey broilers and .18 ppm for laying hens (i.e., for egg residues only) from the proposed use on soybeans, and residue data from the dosage level of 5.0 ppm (23.8X for turkey broilers or 27.8X for laying hens) the following table depicts the residue concentration or quantitation limit and the extrapolated residue (assuming a linear regression) for turkey broilers and eggs from laying hens:

Sample	5.0 ppm Dosage Highest Residue (ppm)	Proposed Use Extrapolated Residue (ppm)
Thigh	< 0.02	< .0008
Breast	< 0.02	< .0008
Liver	< 0.02	< .0008
Kidney	0.09	.0038
Fat	0.06	.0025
Eggs	0.02	.0007

Accordingly, RCB considers the following proposed animal tolerances to be acceptable for supporting proposed use on soybeans, with the exception that a tolerance of 0.05 ppm (the level of quantitation) on milk fat is required:

Commodities	Parts Per Million
Cattle, goats, hogs, sheep, horses, and poultry fat	0.05
Cattle, goats, hogs, sheep, horses, and poultry meat	0.02
Cattle, goats, hogs, sheep, horses, and poultry meat byproducts	0.05
Milk	0.01
Eggs	0.02

The petitioner should submit a revised Section F which includes a proposed tolerance on milk fat. RCB will await a decision by TB before determining whether a separate tolerance for DPX-Y6202 pentanoic acid should be included in the tolerance expression for poultry meat byproducts.

Other Considerations

An International Residue Limit Status sheet is included in this review as Attachment 1. Since no Codex, Canadian, or Mexican limits/tolerances have been established for DPX-Y6202 on soybeans, there are no compatibility problems at this time.

Attachment: International residue Limit Status Sheet

cc: PP#5F3252/FAP#6H5479, Reviewer-Otakie, RF., Circu., PM #25, TOX, PMSD/ISB
TS-769C:RCB:G. Otakie:Rm.800B:x7484:Typist Kenco:12/8/87:Edited by MT:12/16/87
RDI:J. Onley, 11/18/87:R.D. Schmitt, 11/18/87

INTERNATIONAL RESIDUE LIMIT STATUS

E. Kwei
11/9/87

CHEMICAL Quizalofop Ethyl (Assure®, DPX-Y6202)

CODEX NO. ____

CODEX STATUS:

☑ No Codex Proposal Step 6 or above

Residue(if Step 8): ____

Crop(s)	Limit (mg/kg)

PROPOSED U.S. TOLERANCES:

Petition No. PP# 5F3252/FAP# 6H5479

RCB Reviewer E. OTANIE

*Residue: 2-[4-6-chloroquinoxalin-2-yl oxy) phenoxy] propanoate and its acid metaboli

Crop(s)	Limit (mg/kg)
Soybeans	0.05 PPM
Soybean Soapstock	0.10
Cattle, goats, hogs, sheep horses and poultry fat	0.05
Cattle, goats hogs, sheep horses, and poultry meat	0.02
Cattle, goats, hogs, sheep horses and poultry MBYP	0.05
milk	0.01
Eggs	0.02

CANADIAN LIMITS:

☑ No Canadian limit

Residue: ____

Crop(s)	Limit (mg/kg)

MEXICAN LIMITS:

☑ No Mexican limit

Residue: ____

Crop(s)	Limit (mg/kg)

330

* NOTES:
2-[4-(6-chloroquinoxalin-2-yl- oxy) phenoxy] propanoic acid on plant commodities; and the parent, acid metabolite and methyl ester metabolite methyl 2-[4-(6-chloroquinoxalin-2-yl oxy) phenoxy] propanoate on animal commodities.