7-15-88

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

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

July 15, 1988

MEMORANDUM

SUBJECT: Transmittal of Exposure Parameters for Bifenthrin in Cotton

FROM: Yuen-Shaung Ng, Ph.D., Entomologist
Science Support Branch
Benefits and Use Division (TS-768-C)

TO: Michael P. Firestone, Chief
Special Review Section
Exposure Assessment Branch
Hazard Evaluation Division (TS-769-C)

THRU: E. David Thomas, Ph.D., Chief
Animal Biology and Entomology Section
Science Support Branch
Benefits and Use Division (TS-768-C)

Attached are two copies of the projected exposure parameters and data for applicators applying bifenthrin to cotton using both aerial and ground equipment.

If I can be of further assistance, please do not hesitate to call me at #557-2991, my room number is 1016E.

Attachment

cc: William Phillips, BUD
Allen Jennings, BUD
Linda Kutney, RD

1/9

PROJECTED PARAMETERS AND DATA FOR APPLICATION EXPOSURE FOR APPLYING BIFENTHRIN TO COTTON - AERIAL APPLICATION.

(NG, SSB/BUD, 557-2991) (7-14-88)

*** PARAMETERS ***	*** DATA ***
REF.1. REQUESTED EXPOSURE ASSESSMENT FOR:	
Chemical:	Bifenthrin
Trademark: (example)	Capture 2 EC (proposed)
Site:	Cotton
Pest:	Major cotton insect pests (see proposed label)
Location:	Cotton producing states
Application methods:	Aerial application
REF.2. LABEL SUMMARY:	
Formulation(s):	2 EC (2 lb ai/gal)
Active ingredient	25.1 %
Container/package (size):	-
Label singal word:	WARNING
Restricted use pesticide	No
Dosage:	
Product (avg)	5.0 oz/acre
ai (avg)	1.255 oz/acre
Max. applications/season:	Not on proposed label
Re-entry time:	Not on proposed label
Pre-harvest interval:	Not on proposed label
Feed and forage imterval:	Not on proposed label

PRECAUTIONARY STATEMENTS

Hazards to humans and domestic animals

Applicators must wear long sleeve shirt and trousers. Mixers and loaders must wear long sleeve shirt, trousers and chemical resistant gloves.

This pesticides is very highly toxic to fish and other aquatic organisms.

REF.3. ASSUMPTIONS:

1. Spray operator and mixer/loader are different persons.
2. All cotton in the avg. farm are sprayed.
3. Nurse tank is used

REF.4. APPLICATION METHOD AND EQUIMENTS:

*** A closed mixing-loading system should be used.

Type ----------	Aerial, Fixed wing aircraft	
Swath width (range): -----	-	ft.
Swath width (avg.): ------	65.0	ft
Tank capacity:		
Vol. ----------	(150-350)	gal
Avg. ----------	280.0	gal
Application speed:		
Speed: ----------	(95-150)	mph
Avg. ----------	110.0	mph
Avg. ----------	580800.0	mpft
Ferrying distance (approx.) -	26400.0	feet
Ferrying speed ----------	110.0	mph
Nurse Tank:		
Vol. ----------	1000-2000	gal
Avg. ----------	1000.0	gal
Pesticide container/package -	N/A	gal

REF.5. FIELD APPLICATION PROFILE:

Farm size (avg.): -------	241.0	acre
Season applied/stage of plant growth ----------	As needed	
Water needed to dilute the pesticide (e.g. 1 pt/100 gal. water) ----------	-	gal. water
Dosage:		
Product (range) ----------	(1.38-6.4)	oz/acre
(Avg.) ----------	5.0	oz/acre
Number of applications:		
Range: ----------	(1-5)	season
Avg. ----------	5.0	season
Vol. of finished spray:		
Range ----------	(1-5)	gal water/acre
Avg.----------	1.0	gal water/acre
Hours/day suitable for application (approx.) ----	6.0	hrs

REF.6. AREA TREATED PER A SINGLE TANKFUL:

Farm size (avg.) ---------	241.0	acre
Area treated per tankful ----	280.0	acre
Swath width (avg.) ----------	[illegible]	ft.
Length of run (approx.) -----	3240.1	ft.
swath runs/tankful Approx. ----------	57.9	

Adj. ----------	58.0	
Length of run (adj.) --------	3235.2	ft.

REF.7. APPLICATION TIME PER SINGLE TANKFUL:

# of turns ----------	57.0	
Turning time ----------	15.0	sec
Total turning time/tankful:--	14.3	min
Application time/tankful ----	19.4	min
Total time to spray full tank	33.6	min

REF.8. FERRYING TIME:

Ferrying distance (approx.) -	5280.0	ft.
Ferrying speed: ----------	110.0	mph
Ferry time (round trip) -----	1.1	min
Landing and takeoff time ----	10.0	min

REF.9. NURSE TANK:

Avg. ----------	1000.0	gal
Time to fill a nurse tank	15.0	min
Refill transfer time --------	8.0	min

REF.10. PESTICIDE CONTAINER/PACKAGE

Container/package size ------	-	gal
Time to premix/decant container package -------	2.0	min/10 lb
Pesticide needed/tankful ----	87.5	lb
Pesticide (ai) needed/tankful	21.963	lb
# Containers needed/tank ----	-	
Time for transfer (pour) pesticide into the tank --	17.5	min

REF.11. TIME FOR LOADING A FULL TANK:

Nurse tank - mixing time allocated to mixer/loader by spray tankful ---------	4.2	min
Refill-transfer time --------	8.0	min
Time for pouring pesticide into the tank ----------	17.5	min
Total ----------	29.7	min

REF.12. PROJECTED PARAMETERS AND DATA FOR APPLICATION EXPOURSE
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Farm size (avg.) ----------	241.0	acre
Area treated/tankful --------	280.0	acre
Area treated/DAY ----------	1400.0	acre
Hours/DAY suitable for application (approx.) ----	6.0	hr
# of tankful/DAY (approx.)---	4.8	
# of tankful/DAY (adj.) -----	5.0	
Hours/DAY suitable for application (adj.) -------	6.2	hr
Pesticide (ai) needed/tankful	351.400	oz
Pesticide (ai) needed/day ---	1757.0	oz
Pesticide (ai) needed/acre --	1.255	oz

TOTAL EXPOSURE TIME FOR APPLICATIOR(S)

		ONE FARM		
	DAY	1 APPLI -CATION	ONE SEASON	
# of application ----------	**	1.0	5.0	
Orchard size (avg) ----------	**	241.0	241.0	acre
Working hrs/day(adj.) -------	6.2	6.2	6.2	hr
Total area treated ----------	1400.0	241.0	1205.0	acre
Sprayer operator:				
Ferry time ----------	5.5	0.9	4.7	min
Landing and take-off time -	50.0	8.6	43.0	
Turning time ----------	71.3	12.3	61.3	min
Treatment time ----------	96.9	16.7	83.4	min
Mixer/loader				
Filling tank, transfer time ----------	61.0	10.5	52.5	min
Pesticide pouring time ----	87.5	15.1	75.3	min
Total operation time --------	372.1	64.1	320.3	min

REF. LITERATURES CITED:

1. Requested by HED
2.,5. FMC proposed label for Capture 2 EC and supporting document. June 1988
6.-12. Calculated by Ng, 1988
FMO Fundamentals of Machine Operation-Crop Chemicals, Deere Company, 1976

5

PROJECTED PARAMETERS AND DATA FOR APPLICATION EXPOSURE FOR APPLYING BIFENITHRIN TO COTTON (GROUND APPLICATION)

(NG, SSB/BUD, 557-2991) (7-14-88)

*** PARAMETERS ***	*** DATA ***

REF.1. REQUESTED EXPOSURE ASSESSMENT FOR:

Chemical: ----------	Bifenthrin
Trademark: (example) -------	Capture 2 EC (proposed)
Site: ----------	Cotton
Pest: ----------	Major cotton insect pests (see proposed label)
Location: ----------	Cotton producing states
Application methods: -------	Ground application

REF.2. LABEL SUMMARY:

Formulation ----------	2 EC (2 lb ai/gal)
Active ingredient ---------	25.1 %
Container/package (size):----	-
Label signal word:----------	WARNING
Restricted use pesticide ----	NO
Dosage:	
Range ----------	(1.3-6.4)oz/acre
Product (avg.) ----------	5.0 oz/acre
ai (avg) ----------	1.255 oz/acre
Max. applications/season: ---	Not on the proposed label
Re-entry time ----------	Not on the proposed label
Pre-harvest interval: -------	Not on the proposed label
Feed and forage interval: ---	Not on the proposed label

PRECAUTIONARY STATEMENTS

Hazards to humans and domestic animals.

Applicators must wear long sleeves shirt and trousers. Mixers and loaders must wear long sleeve shirt, trousers and chemical resistant glovers.

This pesticides is very highly toxic to fish and other aquatic organisms.

REF.3. ASSUMPTIONS:

1. Spray operator and mixer/loader are different person.
2. All cotton on in the avg. farm is sprayed.
3. Nurse tank is used

REF.4. APPLICATION METHOD AND EQUIMENTS:

*** A closed mixing-loading system should be used.

Type ----------	Ground, hydraulic sprayer .	
Swath width (range): -----	(20-60)	ft
Swath width (most common)-	50.0	ft
Tank capacity:		
Vol. ----------	(250-1000)	gal
Most common ----------	500.0	gal
Application speed:		
Speed: ----------	(2-5)	mph
Avg. ----------	4.0	mph
Avg. ----------	21120.0	mpft
Ferrying distance (approx.) -	2640.0	feet
Ferrying speed ----------	5.0	mph
Nurse Tank:		
Vol. ----------	(1000-2000)	gal
Most common ----------	1000.0	gal
Pesticide container/package -	-	lb

REF.5. FIELD APPLICATION PROFILE:

Farm size (avg.): ----------	241.0	acre
Season applied/stage of plant growth ----------	As necessary	
Field application rate (dosage):		
Range: (Product) ---------	(1.3-6.4)	oz/acre
(ai) ----------	(0.32-1.6)	oz/acre
Avg. (Product) ----------	5.0	oz/acre
(ai) ----------	1.255	oz/acre
Number of applications:		
Range: ----------	(1-5)	season
Avg. ----------	5.0	season
Vol. of finished spray:		
Range ----------	(5-10)	gal water/acre
Most common ----------	7.0	gal water/acre
Hours/day suitable for application (approx.) ----	8.0	hrs

REF.6. AREA TREATED PER SINGLE TANKFUL:

Farm size (avg.) ----------	241.0	acre
Area treated per tankful ----	71.4	acre
Swath width (avg.) ----------	50.0	ft
Length of run (approx.) ---	2640.0	ft
Swath runs/tankful		
Approx. ----------	23.6	
Adj. ----------	24.0	

7

Length of run (adj.) --------	2592.9	ft

REF.7. APPLICATION TIME PER SINGLE TANKFUL:

# of turns ----------	23.0	
Turning time ----------	15.0	sec
Total turning time/tankful:--	5.8	min
Application time/tankful ----	176.8	min
Total time to spray full tank	182.5	min

REF.8. FERRYING TIME:

Ferrying distance (approx.) -	2640.0	ft.
Ferrying speed: ----------	5.0	mph
Ferry time (round trip) -----	12.0	min

REF. 9. NURSE TANK:

Most common ----------	1000.0	gal
Time to fill a nurse tank ---	15.0	min
Refill transfer time to tank-	10.0	min

REF.10. PESTICIDE CONTAINER/PACKAGE

Container/package size ----	-	lb
Time to premix/decant container package --------	2.0	min/10 lb
Pesticide needed/tankful ----	22.3	lb
Pesticide (ai) needed/tankful	5.6	lb
# Containers needed/tank ----	-	
Time for premixing and pouring pesticide into the tank --	4.46	min

REF.11. TIME FOR LOADING A FULL TANK:

Nurse tank - filling time allocated to mixer/loader by spray tankful ---------	7.5	min
Refill-transfer time to tank-	10.0	min
Time for premixing and pouring pesticide into tank ------	4.46	min
Total ----------	22.0	min

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REF.12. PROJECTED PARAMETERS AND DATA FOR APPLICATION EXPOURSE
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Farm size (avg.) ----------	241.0	acre
Area treated/tankful --------	71.4	acre
Area treated/day ----------	142.9	acre
Hours/day suitable for application (approx.) ----	8.0	hr
# of tankful/day (approx.)---	2.2	
# of tankful/day (adj.) -----	2.0	
Hours/day suitable for application (adj.) -------	7.2	hr
Pesticide (ai) needed/tankful	5.6	oz
Pesticide (ai) needed/day ---	11.2	oz
Pesticide (ai) needed/acre --	1.255	oz

TOTAL EXPOSURE TIME FOR APPLICATOR(S)

		ONE FIELD		
	DAY	1 APPLI -CATION	ONE SEASON	
# of application ----------	**	1.0	5.0	
Farm size (avg) ----------	**	241.0	241.0	acre
Working hrs/day(adj.) -------	7.2	-	-	hr
Total hours needed ----------	7.2	12.2	60.9	hr
Total area treated ----------	142.9	241.0	1205.0	acre
Sprayer operator:				
Ferry time ----------	24.0	40.5	202.4	min
Turning time ----------	11.5	19.4	97.0	min
Treatment time ----------	353.6	596.5	2982.4	min
Mixer/loader				
Filling tank, transfer time ----------	35.0	59.0	295.2	min
Pesticide preparation time-	8.9	15.1	75.3	min
Total operation time --------	433.0	730.5	3652.4	min

REF. LITERATURES CITED:

1. 1. Requested by HED
2.,5. FMC proposed label for Capture 2 EC and supporting document, June 1988
6.-12. Calculated by Ng, 1988
FMO Fundamentals of Machine Operation-Crop Chemicals, Deere Company, 1976