

US EPA ARCHIVE DOCUMENT



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 *ysr*
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 *ET*
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 signal 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 interval: ---	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.) -----	65.0	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

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 APPLICATION(S)

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

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 BIFENTHRIN 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 gloves.

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

6

REF.4. APPLICATION METHOD AND EQUIPMENTS:

*** 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

(continued on next page)

REF.12. PROJECTED PARAMETERS AND DATA FOR APPLICATION EXPOURSE

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		
		1 APPLI	ONE	
		-CATION	SEASON	
	DAY			
# 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. Requested by HED
- 2.,5. FMC proposed label for Capture 2 EC and supporting document. June 1985
- 6.-12. Calculated by Ng, 1988
FMO Fundamentals of Machine Operation-Crop Chemicals,
Deere Company, 1976