US Environmental Protection Agency
Office of Pesticide Programs

Petition for Etoxazole -
Tab E - Reduced Risk Petition/
OP Replacement Petition
MRID 45630502 -
GNEEC Simulations

August 11 , 2010

GENEEC Simulation – Propargite on Cotton

RUN No. 1 FOR Propargite ON Cotton * INPUT VALUES *

RATE (#/AC) ONE(MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPB)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
1.600(4.754)	3 7	2963.0	620.0	GRHIFI(6.6)	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
504.00	2	N/A	140.00-17360.00	114.00	113.26

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
81.04	80.06	76.05	67.83	62.31

GENEEC Simulation – Profenofos on Cotton

RUN No. 1 FOR Profenofos ON Cotton * INPUT VALUES *

RATE (#/AC) ONE(MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPM)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
1.000(2.518)	5 5	840.0	28.0	GRHIFI(6.6)	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
8.00	2	14.60	.00- .00	.00	14.60

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
60.82	55.39	38.49	20.11	14.03

GENEEC Simulation – Dicofol on Cotton

RUN No. 1 FOR Dicofol ON Cotton * INPUT VALUES *

RATE (#/AC) ONE(MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPM)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
1.500(1.500)	1 1	5868.0	1.3	AERL_B(13.0)	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
43.00	2	2.70	30.00- 3720.00	.00	2.70

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
20.19	12.62	3.73	1.31	.87

GENEEC Simulation – Aldicarb on Cotton

RUN No. 1 FOR Aldicarb ON Cotton * INPUT VALUES *

RATE (#/AC) ONE(MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPM)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
16.500(33.000)	2 0	30.0	6000.0	GRHIFI(6.6)	.0	2.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
30.00	2	N/A	11.90- 1475.60	.00	1475.60

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
954.04	953.15	949.36	940.73	934.16

GENEEC Simulation – Etoxazole on Strawberry

RUN No. 1 FOR SECURE ON STRAWBERRY * INPUT VALUES *

RATE (#/AC) ONE(MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPB)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
.135(.215)	2 21	17150.0	70.0	GRHIFI(6.6)	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
28.00	2	161.00	17.40- 2157.60	.00	149.82

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
2.53	2.51	2.41	2.21	2.07

GENEEC Simulation – Hexythiazox on Strawberry

RUN No. 1 FOR Hexythiazox ON Strawberry * INPUT VALUES *

RATE (#/AC) ONE(MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPB)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
.190(.190)	1 1	6200.0	50.0	AERL_B(13.0)	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
35.00	2	N/A	16.60- 2058.40	.00	2058.40

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
3.03	3.03	3.02	3.00	2.99

GENEEC Simulation – Fenbutatin-oxide on Strawberry

RUN No. 1 FOR Fenbutatin oxide ON Strawberry * INPUT VALUES *

RATE (#/AC) ONE (MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPB)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
1.500(4.500)	3 0	2300.0	13.0	AERL_B(4.2)	125.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
180.00	2	N/A	100.00-12400.00	.00	*******

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
13.00	13.00	13.00	13.00	13.00

GENEEC Simulation – Propargite on Strawberry

RUN No. 2 FOR Propargite ON Strawberry * INPUT VALUES *

RATE (#/AC) ONE (MULT)	No.APPS & INTERVAL	SOIL Koc	SOLUBIL (PPB)	APPL TYPE (%DRIFT)	NO-SPRAY (FT)	INCORP (IN)
1.920(3.785)	2 21	2963.0	620.0	GRHIFI(6.6)	.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
504.00	2	N/A	140.00-17360.00	114.00	113.26

GENERIC EECs (IN MICROGRAMS/LITER (PPB))

PEAK GEEC	MAX 4 DAY AVG GEEC	MAX 21 DAY AVG GEEC	MAX 60 DAY AVG GEEC	MAX 90 DAY AVG GEEC
64.36	63.58	60.39	53.87	49.49

Summary of Acute Aquatic Toxicity Data for Selected Active Ingredients[1]
(all values in ug/l; ppb)

Test Species (Study Length)	Clofentezine	Etoxazole	Pyridaben	Hexythiazox	Fenbutatin-oxide	Propargite	Profenofos	Dicofol	Aldicarb
Acute Toxicity – Fish (LC_{50} values shown)									
Bluegill sunfish (96 hr)	>24,000	1400	1.8	530	4.8	31	41	510	50
Rainbow trout (96 hr)	>14.6	2800	0.63	>1000	1.7	118	25	124	560
Sheepshead minnow (96 hr)		>160	13.3		20.8	60		370	72
Acute Toxicity – Invertebrate (EC_{50} values shown except for mysid shrimp which is LC_{50})									
Daphnia magna (48 hr)	>0.84	7.1	0.47	740	31	74	0.93	140	411
Mysid shrimp (96 hr)		4.4	0.67		2.8	101	2.4	140	
Oyster – shell Deposition (96 hr)		1.2			0.4		263	15.1	

Summary of Chronic Aquatic Toxicity Data for Selected Active Ingredients[1]
(all values in ug/l; ppb)

Test Species (Study Length)	Clofentezine	Etoxazole	Pyridaben	Hexythiazox	Fenbutatin-oxide	Propargite	Profenofos	Dicofol	Aldicarb
Chronic Toxicity – Fish (NOEC)									
Rainbow trout early life stage	7.0	15.0	<0.56		0.31		2.0	1.0	
Fathead Minnow		-				16.0	2.0	2.75	
Chronic Toxicity – Invertebrates (NOEC)									
Daphnia magna Life-cycle (21 d)	120	0.20	<0.086	500	16	9.0	0.20		
Mysid shrimp Life-cycle (28 d)		0.32	0.13				0.22		

Aquatic Acute Risk Quotients for Pome Fruit Products

Freshwater Fish

Active Ingredient	GEEC[1] (ppb)	Lowest LC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
CLOFENTEZINE	1.23	>14.6	0.084	Minimal
Etoxazole	2.68	1400	0.002	Minimal
Pyridaben	5.28	0.63	8.38	High
Hexythiazox	3.03	530	0.006	Minimal
Fenbutatin-oxide	13.0	1.7	7.65	High

Saltwater Fish

Active Ingredient	GEEC[1] (ppb)	Lowest LC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Clofentezine	1.23			
Etoxazole	2.68	>160	0.017	Minimal
Pyridaben	5.28	13.3	0.40	Potential
Hexythiazox	3.03			
Fenbutatin-oxide	13.0	20.8	0.625	Potential

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 4-d average value.
[2] Risk Quotient (RQ) = $GEEC/LC_{50}$

Aquatic Acute Risk Quotients for Pome Fruit Products

Freshwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest EC_{50} (ppb)	Risk Quotient[2]	EPA Classification of Risk
Clofentezine	1.23	0.84	1.46	High
Etoxazole	2.68	7.1	0.377	Potential
Pyridaben	5.28	0.47	11.2	High
Hexythiazox	3.03	740	0.004	Minimal
Fenbutatin-oxide	13.0	31	0.419	Potential

Saltwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest EC_{50} (ppb)	Risk Quotient[2]	EPA Classification of Risk
Clofentezine	1.23			
Etoxazole	2.68	1.2	2.23	High
Pyridaben	5.28	0.67	7.88	High
Hexythiazox	3.03			
Fenbutatin-oxide	13.0	0.40	32.5	High

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 4-d average value.
[2] Risk Quotient (RQ) = $GEEC/EC_{50}$

Aquatic Chronic Risk Quotients for Pome Fruit Products

Fish

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Clofentezine	1.23	7.0	0.014	Minimal
Etoxazole	3.02	15.0	0.157	Potential
Pyridaben	5.28	0.56	0.93	Potential
Hexythiazox	3.03			
Fenbutatin-oxide	13.0	0.31	41.9	High

Freshwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Clofentezine	1.23	120	0.002	Minimal
Etoxazole	2.58	0.20	12.9	High
Pyridaben	5.28	0.086	17.3	High
Hexythiazox	3.03	500	0.006	Minimal
Fenbutatin-oxide	13.0	16	0.813	Potential

Saltwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Clofentezine	1.23			
Etoxazole	2.58	0.32	8.06	High
Pyridaben	5.28	0.13	11.46	High
Hexythiazox	3.03			
Fenbutatin-oxide	13.0			

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 60-d average value for fish and 21-d value for invertebrates.
[2] Risk Quotient (RQ) = GEEC/NOEC

Aquatic Acute Risk Quotients for Cotton Products

Freshwater Fish

Active Ingredient	GEEC[1] (ppb)	Lowest LC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	0.924	>1400	0.001	Minimal
Propargite	80.1	31	2.58	High
Profenofos	55.4	25	2.22	High
Dicofol	12.6	124	0.102	Potential
Aldicarb	953	50	19.1	High

Saltwater Fish

Active Ingredient	GEEC[1] (ppb)	Lowest LC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	0.924	>160	>0.006	Minimal
Propargite	80.1	60	1.33	High
Profenofos	55.4			
Dicofol	12.6	370	0.034	Minimal
Adicarb	953	72	13.24	High

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 4-d average value.
[2] Risk Quotient (RQ) = $GEEC/LC_{50}$

Aquatic Acute Risk Quotients for Cotton Products

Freshwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest EC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	0.924	7.1	0.130	Potential
Propargite	80.1	74	1.08	High
Profenofos	55.4	0.93	59.6	High
Dicofol	12.6	140	0.090	Minimal
Aldicarb	953	411	2.32	High

Saltwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest EC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	0.924	1.2	0.770	High
Propargite	80.1	101	0.79	Potential
Profenofos	55.4	2.4	23.1	High
Dicofol	12.6	15.1	0.84	Potential
Aldicarb	953			

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC 2; 4-d average value.
[2] Risk Quotient (RQ) = $GEEC/EC_{50}$

Aquatic Chronic Risk Quotients for Cotton Products

Fish

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	0.814	15.0	0.054	Minimal
Propargite	80.1	16	4.24	High
Profenofos	55.4	2	10.06	High
Dicofol	12.6	1	1.31	High
Aldicarb	953			

Freshwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	0.889	0.2	4.45	High
Propargite	80.1	9	8.45	High
Profenofos	55.4	0.2	192.5	High
Dicofol	12.6			
Aldicarb	953			

Saltwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Etoxazole	0.889	0.32	2.78	High
Propargite	80.1			
Profenofos	55.4	0.22	174.9	High
Dicofol	12.6			
Aldicarb	953			

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 60-d average value for fish and 21-d value for invertebrates.
[2] Risk Quotient (RQ) = GEEC/NOEC

Aquatic Acute Risk Quotients for Strawberry Products

Freshwater Fish

Active Ingredient	GEEC[1] (ppb)	Lowest LC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	2.51	1400	0.002	Minimal
Hexythiazox	3.03	530	0.006	Minimal
Fenbutatin-oxide	13	1.7	7.65	High
Propargite	63.6	31	2.05	High

Saltwater Fish

Active Ingredient	GEEC[1] (ppb)	Lowest LC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	2.51	>160	<0.016	Minimal
Hexythiazox	3.03			
Fenbutatin-oxide	13	20.8	0.625	Potential
Propargite	63.6	60	1.06	High

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 4-d average value.
[2] Risk Quotient (RQ) = $GEEC/LC_{50}$

Aquatic Acute Risk Quotients for Strawberry Products

Freshwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest EC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	2.51	7.1	0.354	Potential
Hexythiazox	3.03	740	0.004	Minimal
Fenbutatin-oxide	13	31	0.419	Potential
Propargite	63.6	74	0.859	Potential

Saltwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest EC_{50} (ppb)	Risk Quotient[2]	EPA Classification Of Risk
Etoxazole	2.51	1.2	2.09	High
Hexythiazox	3.03			
Fenbutatin-oxide	13	0.40	32.5	High
Propargite	63.6	101	0.63	High

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 4-d average value.
[2] Risk Quotient (RQ) = $GEEC/EC_{50}$

Aquatic Chronic Risk Quotients for Strawberry Products

Fish

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Etoxazole	2.21	15.0	0.147	Potential
Hexythiazox	3.03			
Fenbutatin-oxide	13	0.31	41.9	High
Propargite	63.6	16	3.37	High

Freshwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Etoxazole	2.41	0.20	12.05	High
Hexythiazox	3.03	500	0.006	Minimal
Fenbutatin-oxide	13	16.0	0.81	High
Propargite	63.6	9.0	6.71	High

Saltwater Invertebrates

Active Ingredient	GEEC[1] (ppb)	Lowest NOEC (ppb)	Risk Quotient[2]	EPA Classification of Risk
Etoxazole	2.41	0.32	7.53	High
Hexythiazox	3.03			
Fenbutatin-oxide	13			
Propargite	63.6			

[1] GEEC = Generalized Estimated Environmental Concentration calculated with GENEEC; 60-d average value for fish and 21-d value for invertebrates.

[2] Risk Quotient (RQ) = GEEC/NOEC

Terrestrial Estimated Environmental Concentration (EECs)[1]

	Clofentezine	Etoxazole	Pyridaben	Hexythiazox	Fenbutatin-oxide	Propargite	Profenofos	Dicofol	Aldicarb
Pome Fruit Products									
Maximum Appl. Rate (lbs. a.i./A)	0.25	0.135	0.50	0.19	1.0	-	-	3.0	
Peak EEC (ppm)	60	32	120	46	240	-	-	720	
Cotton Products									
Maximum Appl. Rate (lbs. a.i./A)	-	0.045	-	0.16	-	1.6	1.0	1.5	20
Peak EEC (ppm)	-	11	-	38	-	384	240	360	4800
Strawberry Products									
Maximum Appl. Rate (lbs. a.i./A)	-	0.135	-	0.19	1.5	-	-	2.0	
Peak EEC (ppm)	-	32	-	46	360	-	-	480	

[1] Derived from Kenaga (1973) using short range grass values

Summary of Avian Toxicity for Selected Active Ingredients (ppm)[1]

Test Species	Clofentezine	Etoxazole	Pyridaben	Hexythiazox	Fenbutatin-oxide	Propargite	Profenofos	Dicofol	Aldicarb
Acute Oral Toxicity (LD_{50} values shown)									
Bobwhite quail	>750	-	>2250		>2510	3401	70	265	2.0
Mallard duck	>3000	>2000	>2500	>2510		>4640	56		1.0
Acute Dietary Toxicity (LC_{50} values shown)									
Bobwhite quail	>20,000	>5200	>5620	>5620	>5620	3401	57	3010	71
Mallard duck	>20,000	>5200	>4688	>5620	>5620	>4640	1646	1651	594
Avian Reproductive Toxicity (NOEC values shown)									
Bobwhite quail	<90	1000	1000		150	85	10	120	
Mallard duck	270	1000	<500		150	43	30	<10	

Summary of Avian Risk Quotients[1] For Pome Fruit Products

Test Species	Clofentezine	Etoxazole	Pyridaben	Hexythiazox	Fenbutatin-oxide	Dicofol
Acute Oral Toxicity (LD_{50} values shown)						
Bobwhite quail	>0.077	-	>0.053	>0.096	2.72	
Mallard duck	>0.019	>0.016	>0.048	>0.018	-	-
Acute Dietary Toxicity (LC_{50} values shown)						
Bobwhite quail	>0.0029	>0.006	>0.021	>0.008	>0.043	0.239
Mallard duck	>0.0029	>0.006	>0.026	>0.008	>0.043	0.436
Acute Reproductive Toxicity (NOEC values shown)						
Bobwhite quail	<0.64	0.032	0.12		1.60	6.00
Mallard duck	0.21	0.032	<0.24		1.60	72.0

[1] Risk Quotient id defined as RQ = EEC/Toxicity data (i.e., LD_{50}, LC_{50}, or NOEC)

Summary of Avian Risk Quotients[1] For Cotton Products

Test Species	Etoxazole	Hexythiazox	Propargite	Profenofos	Dicofol	Aldicarb
Acute Oral Toxicity (LD_{50} values shown)						
Bobwhite quail			0.113	3.43	1.36	2400
Mallard duck	0.006	>0.015	>0.083	4.29		4800
Acute Dietary Toxicity (LC_{50} values shown)						
Bobwhite quail	>0.002	>0.0068	0.113	4.21	0.120	67.6
Mallard duck	>0.002	>0.0068	>0.083	0.146	0.218	8.08
Acute Reproductive Toxicity (NOEC values shown)						
Bobwhite quail	0.011		4.52	24.0	3.00	
Mallard duck	0.011		8.93	8.00	36.0	

[1] Risk Quotient id defined as RQ = EEC/Toxicity data (i.e., LD_{50}, LC_{50}, or NOEC)

Summary of Avian Risk Quotients[1] For Strawberry Products

Test Species	Etoxazole	Hexythiazox	Fenbutatin-oxide	Dicofol
Acute Oral Toxicity (LD_{50} values shown)				
Bobwhite quail			>0.143	1.81
Mallard duck	>0.016	>0.018		
Acute Dietary Toxicity (LC_{50} values shown)				
Bobwhite quail	>0.006	>0.008	>0.064	0.159
Mallard duck	>0.006	>0.008	>0.064	0.291
Acute Reproductive Toxicity (NOEC values shown)				
Bobwhite quail	0.032		2.40	4.00
Mallard duck	0.032		2.40	48.0

[1] Risk Quotient id defined as RQ = EEC/Toxicity data (i.e., LD_{50}, LC_{50}, or NOEC)

APPENDIX IV: EFFICACY DATA

A listing of products tested for efficacy with etoxazole by trade name and active ingredient is provided in the following table:

Active Ingredients of Key Products Tested

Trade Name	Active Ingredient
Apollo	Clofentezine
Avid, Agrimek, Zephyr	Abamectin
Capture	Bifenthrin
Comite, Omite	Propargite
Danitol	Fenpropathrin
Kelthane	Dicofol
Mesa	Milbemectin
Ovasyn	Amitraz
Pirate, Alert	Chlorfenapyr
Provado	Imidacloprid
Pyramite, Nexter, Sanmite	Pyridaben
Savey	Hexythiazox
V-1283	Etoxazole

TEST # COOPERATOR LOCATION	CROP VARIETY PESTS	RESULTS	COMMENTS
1996VHICK220 Swart, J. Commerce, TX	Cotton - TAM 173-90 Twospotted Spider Mite	A damaging population did not develop and no data was obtained. Trial will be repeated in 1997.	

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1996MANSO063 Corkins, J. Visalia, CA	Cotton – Maxxa Twospotted Spider Mite	V-1283 .03 V-1283 .045 S1283+Danitol 03+.1 Nexter .19 Kelthane 1.5 UTC	7/31 8/14 8/21 Mites/lf 27.7 b 7.7 b 1.3 b 25.0 b 7.7 b 1.0 b 14.7 c 2.7 c 1.0 b 21.3 bc 17.7 bc 0.3 b 23.7 bc 14.7 c 0.7 b 73.0 a 48.3 a 15.7 a	1 appl - 7/24 20	Handheld None	V-1283 at both rates gave good control of mites through 28 days after treatment equal to Kelthane and Nexter. The addition of Danitol to V-1283 gave a quicker knockdown of mites than V-1283 alone.
1996MANSO064 Kukas, R. Visalia, Ca	Cotton – Maxxa Twospotted Spider Mite	V-1283 .03 V-1283 .045 S1283+Danitol 03+.1 Nexter .12 Avid .1 UTC	7/8 7/26 8/12 Mites/lf 4.0 b 2.5 b 3.3 b 0.3 c 4.0 b 1.8 b 0.3 c 9.8 b 2.8 b 0.3 c 10.8 b 3.8 b 0.5 c 1.8 b 2.0 b 17.8 a 80.0 a 24.3 a	1 appl - 7/5 76	Handheld Cotton oil @ 0..5% v/v	V-1283 at both rates gave excellent residual control of mites up to 42 days after treatment equal to Avid or Nexter. V-1283 at the higher rate and the low rate with Danitol also gave good initial knockdown of mites.
1997MANSO019 Kukas, R. Visalia, CA	Cotton - Phytogen 33 Silverleaf Whitefly Cotton Aphid	UTC 1283 36SC .045 Knack 18 gms	Egg 1-3Nymph Adult Aphid* 72b 92.5a 257ab 9.8a 81b 71.5a 325a 2.0b 3.5d 4.5b 247a-c 3.0b * #'s / leaf disc 21 DAT	1 appl - 7/21 25.5	Tractor sprayer	V-1283 did not provide control of whitefly different than the UTC. V-1283 did provide significant reduction in aphids vs the check.
1997MANSO061 Kukas, R. Visalia, CA	Cotton - Phytogen 33 Twospotted Spider Mite	UTC 1283 36SC .03 1283 36SC+C .03 1283 36SC+L .03 Kelthane 1.0	6/5 6/19 7/2 7/11* 38.5a 50.3a 86.5a 26.8b 3.5b 3.3b 63.5a 44.0ab 1.5b 4.8b 65.8a 33.5b 1.8b 2.5b 71.5a 36.3ab 0.3b 6.0b 81.0a 58.0a * adults & nymphs / leaf	1 appl - 5/29 15	Handheld sprayer C=cotton oil @ 1 qt/a L=LatronB(nis) @ 6 ozpr/a	V-1283 gave excellent control of mites. Addition of oil or non-ionic surfactant numerically improved residual control vs V-1283 without adjuvant. Mite buildup on 7/2f followed a Provado + Orthene treatment for thrips control.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1997VHICK227 Phillips, R. Hearne, TX	Cotton – DPL 20 Carmine Spider Mite	 UTC S1283 .03 lb S1283 .045 lb Capture .08 lb Pirate .01 lb Danitol .2 lb	% Control 8/19 8/26 9/2 0 f 0 f 0 f 58.3 d 55.5 c 53.3 c 79.5 b 81.0 b 79.3 b 65.0 c 46.0 d 39.5 d 100 a 98.3 a 97.3 a 31.3 e 27.0 e 20.3 e	1 application 8/12 20 gpa	Tractor sprayer None	V-1283 gave good control of mites superior to Capture or Danitol but not equal to Pirate which was the best treatment. There was a rate response with V-1283.
1997JCRAN056 Bradley, J. Raleigh, NC	Cotton – DES119 Twospotted Spider Mite	 Capture .06 lb V1283 .03 lb V1283 .045 lb Kelthane 1 lb UTC	# / Leaf 6/24 7/1 7/8 2.56b 1.16b 24.85b 2.41b 2.48b 26.81b 2.13b 3.00b 28.31b 2.41b 6.50b 16.00b 15.04a 23.79a 149.31a	1 application 6/10 7.88 gpa	Backpack sprayer None	All treatments significantly reduced mite numbers vs the UTC. There were no differences among treatments.
1998MANSO025 Wright, S. Visalia, CA	Cotton – Maxxa Spider Mite	 V1283 36SC .03 lb V1283 80WP .03 lb V1283 36SC .045 lb Comite 1.64 lb Zephyr .47 lb Alert .1 lb Savey 1.17 lb UTC	Motiles / Leaf 7/14 7/25 8/7 8/21 0 1 3 2 0 1 3 2 0 1 1 0 1 1 2 1 2 0 1 1 1 3 5 2 1 1 3 3 2 2 1 0	1 appl – 6/11 20 gpa	Tractor sprayer None	Very low pressure in the trial. There was a slight trend for the 0.045 lb rate to perform better than the 0.03 rate. There were no apparent differences between the EC and WP formulations at 0.03 lb. V-1283 was equal to the other standards in the test.
1998MANSO026 Godfrey, L. Five Points, CA	Cotton – Maxxa Twospotted Spider Mite	 V1283 36SC .045 lb V1283 80WP .045 lb Kelthane 1.5 lb Zephyr .15 lb Alert 2.0 lb Capture .1 lb Comite 1.22 lb Savey 1.17 lb UTC	Motiles/Leaf 7/20 8/10 141.75abc 322.5cde 211.25ab 539.5b-e 18.5c 110.0e 127.5abc 246.0de 202ab 860.75b-e 150.25abc 1845.0a 109.5abc 963.75bcd 70.25abc 390.0cde 180.25abc 1063.25bc	1 appl – 7/13 15 gpa	Tractor sprayer None	Although statistically equal, V-1283 did not provide control of mites equal to Kelthane. Control was equal to the other standards. The EC formulation tended to provide better control than the WP. Both formulations gave significantly higher yield than the check and again the EC was better than the WP.
1999MANSO032 Kukas, R. Visalia, CA	Cotton – BXN 47 Twospotted Spider Mite Cotton Aphid	 UTC V1283 80WP .03 lb V1283 36SC .03 lb Zephyr .01 lb + Provado 3.75 oz	7/27 TSSM Motile/Lf 7/13 Aphid Nymphs/Lf 25.8 a .3 a .8 b 0 a 1.5 b 0 a 3 b 0 a	1 appl – 6/29 71.2 gpa	Backpack sprayer None	All treatments significantly reduced mites vs the check. Aphid pressure was very low and there were no significant differences between any treatments. There were no differences between V-1283 formulations.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1999MANSO031 Wright, S. Visalia, CA	Cotton – DD 5415 RR Twospotted Spider Mite	 V1283 80WP .4 lb Zephyr .01 lb Comite 1.64 Savey 1 lb UTC	7/6 Motiles / Leaf 8/5 0 0 0 0 0 0 0 0 .3 .8	1 appl - 7/1 20 gpa	Tractor sprayer None	Mite populations remained very low throughout the trial. All treatments kept mite numbers at 0 through the test.
2000MANSO047 Marsh, B. Shafter, CA	Cotton – Maxxa Twospotted Spider Mite	 Savey 1.2 lb Zephyr .005 lb V1283 .065 lb V1283 .045 lb UTC	Motiles/Leaf 6/5 6/9 6/29 7 1.7 0 25.7 0 0 8.3 .33 0 9.7 .67 0 15 1.7 0	1 appl – 6/2 15 gpa	Tractor sprayer None	Populations were low and check numbers dropped after initial application. Savey and V1283 gave initial knockdown of mites.
2000MANSO038 Kukas, R. Visalia, CA	Cotton – BXN Nova Twospotted Spider Mite Western Flower Thrips	 UTC Zephyr 4 oz V1283 .045 lb V1283 .045 lb + Cotton oil 1 qt V1283 .045 lb + Silwet .05% v/v V1283 .045 lb + Methylated oil 1 qt V1283 .045 lb + Agridex 1 qt V1283 .045 lb + NIS .25% v/v	Motiles/Leaf 5/24 5/28 6/1 6/15 18ab 21a 17.5a 3.8a 17ab 1.3b 1.5b 0b 15b 2b .3b 0b 23.5a .5b 0b 0b 17ab .3b 1.3b .5b 18ab .8b 1.3b 0b 14.5b 1.5b .3b 0b 14.8b 1.8b .8b 0b	1 appl – 5/24 33 gpa	Handheld sprayer See treatments	All treatments significantly reduced mites vs the check with no differences between treatments. There was no significant advantage between V-1283 with any adjuvants or without an adjuvant.
2000MANSO037 Wright, S. Visalia, CA	Cotton – Twospotted Spider Mite	 V1283 .045 lb V1283 .065 lb Savey .006 lb Savey .009 lb Kelthane 1 lb Zephyr .005 lb Comite 1.6 lb Savey 1.2 lb UTC	% Infested 6/2 6/7 6/14 6/21 44 19 4 1 41 23 4 0 38 21 4 0 35 14 10 3 48 5 10 0 49 11 7 3 54 0 1 1 25 8 0 0 48 21 10 5	1 appl – 5/31 20 gpa	Tractor sprayer None	Kelthane, Comite and Savey all gave good initial knock down of mites at the 7 day rating. By the 14 day rating all treatments except Savey showed mite knockdown and Kelthane had started to rebound. There was no difference between the 2 V-1283 rates.
2000JBRAU039 Phillips, M. Uvalde, TX	Cotton – SG125 Carmine Spider Mite	 V1283 .045 lb Kelthane 1.5 lb UTC	Adults Nymphs 8/8 8/21 8/8 8/21 2.3b .7b 6b 1b 1.3b .3b 5.7b 0b 5.7a 9.3a 15.7a 8.3a	1 appl – 8/5 3.39 gpa	Aerial application None	V-1283 and Kelthane performed equally and gave good control of carmine mite significantly above the check. V-1283 is effective applied aerially.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
2000JCRAN048 Bradley, JR Raleigh, NC	Cotton – DP436RR Twospotted Spider Mite	 Capture .08 lb Danitol .2 lb V1283 .03 lb V1283 .045 lb V1283 .065 lb V1283 .03 lb + Danitol .15 lb Kelthane 1.25 lb + Latron B .5 % v/v UTC	Total Mites/Leaf 7/17 113.78 bc 159.13 ab 66.98 cd 51.63 cd 59.95 cd 83.80 cd 41.78 d 194.20 a	1 appl – 7/12 12 gpa	Backpack sprayer None	Mite populations in this test collapsed after the first rating due to a fungal pathogen. All treatments except Danitol alone gave significant initial reduction in mites vs the check. V-1283 alone was numerically better than V-1283 + Danitol. There was no significant differences between the V-1283 rates.
1999JBRAU039	Cotton – Spider Mite	 UTC V1283 .03 lb V1283 .045 lb V1283 .065 lb V1283 .09 lb V1283 .03 lb + Danitol .1 lb Pirate .1 lb	Adults/Leaf 7/19 7/29; Nymphs/Leaf 7/19 7/29 17.3a 1.7a 21.0a 7.67a 6.3b .13b 5.3b 1.2b 5.3b .13b 0.0b 1.13b 7.0b .23b 3.0b 0.17b 6.3b .30b 0.3b 0.0b 4.3b .30b 0.7b 1.73b 1.0b .23b 2.0b 0.9b	1 appl – 7/15 20 gpa	 None	V-1283 at all rates gave significant reduction of mites vs the check and was equal to the standard. The 0.03 rate of V-1283 was somewhat slower in reducing nymph numbers vs the other rates at the 4 day rating but was equal after 1 week.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1997TBEAN040 Ramsdell, D. Germansville, PA	Apple – Empire European Red Mite	UTC 1283 36SC@a .045 1283 36SC@a .09 Savey @a .188 1283 36SC@b .045 1283 36SC@b.09 Pyramite @b .165	6/26 7/10 7/23 8/12* 7.0a 70.3a 92.8a 19.8ab .75b 3.3b 15.7bc 33.4a .5b 1.8b 17.7bc 26.7ab .5b 1.5b 20.4b 21.7ab 6.2ab 1.6b 5.1bc 9.6b 5.5ab 3.0b 3.3c 5.5b .5b 2.1b 11.85bc 33a * motiles / leaf	1 appl a = 5/23 or b = 6/19 2 gal/tree	Hydraulic handgun	V-1283, especially at the later application date (threshold for mites), gave good control of mites equal to the standards. There was a positive rate response. At the later application date, Pyramite gave a slightly quicker knockdown but was not as good as V-1283. Chart 97TBEAN040
1997LWELC047 Calkin, J. Sweet Home, OR	Apple – Jonagold Braeburn European Red Mite	UTC S1283 .045 lb A S1283 .090 lb A Sanmite .02 lb B	# Nymphs + Adults/20 Leaves 5/16 6/6 7/11 35.8 a 399.3 a 469.3 a 0 b 0 b 5.8 b 0 b 0 b 14.3 b 3.5 b 26.5 b 104.5 b	A – 4/25 B –5/12 100 gpa	Backpack sprayer None	V-1283 applied once provided excellent control of red mite for ca 2.5 to 3 months after application superior to the standard Sanmite.
1998TBEAN045 White, T. Rome, PA	Apple – Empire European Red Mite Twospotted Spider Mite	V1283 WP .065 lb V1283 WP .09 lb V1283 WP .135 lb Pyramite 4.4 oz UTC	ERM 2SSM 6/30 7/22 6/30 7/22 1.6ab .2b .5b .2b 1.3ab .2b .3b 0b 1.8ab .2b 1.4ab 0b 0b .3b 0b 4.4a 6.4a 10.4a 2.8a 3.4a	1 appl – 6/24 200 gpa Ratings are motiles/leaf	Handheld sprayer None	Pyramite gave better initial knockdown of red mite than V-1283, but knockdown was equal for spider mite. V-1283 gave better residual control for both mite species than Pyramite.
1999LWELC034 Britt, R. Zillah, WA	Apple – Red Delicious Golden Delicious Twospotted Spider Mite European Red Mite Western Predatory Mite	V1283 80WP.065 lb V1283 80WP .09 lb V1283 80WP .135 lb V1283 80WP .045 lb + Danitol .2 lb Agrimek 16 oz UTC	Motiles/ Leaf on 8/23 TSSM ERM WPM 3.76b .6b 0b 2.12b .92b 0b 1.8b .92b 0b 3.48b .18b 0b 22.48a 4.24a .08ab 19.52a 5.76a .28a	1 appl – 7/26 100 gpa	Mist blower Oil @t 1 gal/a added to all treatments	All rates of V-1283 + oil gave significant reduction of Twospotted and European mites vs the check or the standard. There was a rate response with V-1283 for Twospotted mite control but it was not significant. V-1283 did have a significant negative effect on the predatory mite vs the check.
1999LWELC038 Fischer, V. Hood River, OR	Pear – Twospotted Spider Mite Pear Psylla	V1283 80WP.065 lb V1283 80WP .09 lb V1283 80WP .125 lb Pyramite 8 8 oz Agrimek 16 oz + Oil 1 g/a UTC	8/18 TSSM/Lf Psylla/Lf 0c .5ab .1c 1ab .1c .7ab 4.5a .4ab .3c 0b 4.3ab 1.6a	1 appl – 7/8 75 gpa	Hydraulic handgun None	V-1283 at all rates significantly reduce Twospotted mites vs the check or Pyramite and were equal to Agrimek. Under low Psylla pressure V-1283 numerically reduced nymphs but only Agrimek did so significantly.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1999TBEAN037 ACDS Lyons, NY	Apple – Golden Delicious European Red Mite ERM Apple Rust Mite ARM Predaceous Mite PM	 UTC V1283 .065 lb V1283 .09 lb V1283 .135 lb V1283 .065 lb + Danitol .2 lb Pyramite .188 lb V1283 .065 lb + Pyramite .094 lb	Motiles / Leaf PM8/16 ERM7/20 ARM7/20 .2ab 2.6a 96.3a .1b .1b 73.9ab 0b .1b 54.8bc 0b .1b 45.6bc .1b .2b 47.8bc .3a 0b 11.1d .1a .1b 32.8cd	1 application 6/30 100 gpa	Airblast sprayer None	V-1283 gave excellent control of red mite equal to Pyramite, but did not control rust mite equal to Pyramite. There was a rate response from V-1283 for rust mite control. The addition of Danitol or Pyramite to V-1283 did not enhance control of either mite species. Predaceous mite numbers were very low and there were no significant differences between treatments.
1999JCRAN046 Walgenbach, J. Fletcher, NC	Apple – Delicious European Red Mite Apple Rust Mite Mite Predator	 V1283 .065 lb A V1283 .09 lb A V1283 .135 lb A V1283 .045 A + Danitol .2 lb A Apollo .125 lb A + Provado .05 lb B UTC	Cumulative Mite Days ERM ARM Predator 34a 243.2a 6.1a 26.3a 234.7a 1.8a 26.2a 253.1a 7.9ab 34.1a 147.3a 1.8a 61.9a 185.3a 8.5ab 766.5b 292.1a 14.5b	A-4/9, B-5/5 100 gpa	Hydraulic handgun None	All treatments significantly reduced red mite vs the check. V-1283 alone or + Danitol were similar in control and these were numerically better than Apollo + Provado. There were no significant differences for rust mite control but V-1283 + Danitol did have numerically the lowest cumulative mite days, followed by Apollo + Provado followed by V-1283 alone. Predatory mite numbers were low and little difference between treatments can be deduced.
1999TDEWI063 Attaway, J. Ukiah, CA	Pear – Bartlett Twospotted Spider Mite	 V1283 .065 lb V1283 .09 lb V1283 .135 lb Agrimek 10 oz UTC	% Control 7/16 8/3 8/17 51.6a 97.4a 75.8a 72.6a 90.3a 91.1a 71.8a 92.9a 98.5a 68.2a 90.7a 74.7a 0b 0b 0b	1 application 7/13 250 gpa	Handheld sprayer None	All treatments significantly reduced mites vs the check. V-1283 was equal to Agrimek. The 2 higher rates of V-1283 provided better residual control of mites at ca. 30 days after application than the V-1283 low rate or Agrimek.
1999TDEWI062 Campbell, J. Watsonville, CA	Apple – Red Delicious European Red Mite Western Predatory Mite	 V1283 .065 lb V1283 .09 lb V1283 .135 lb V1283 .045 lb + Danitol .2 lb Pyramite .4 oz UTC	Motiles/Leaf Predator # 7/23 8/27 7/23 8/27 .8a .2a .2a 0a 1.1a .1a .3a .2a 1.5a .2a 0a 0a .7a .1a 0a 0a .8a .3a .1a .1a 2.4a 17.8b .1a .7b	1 application 7/17 150 gpa	Handheld sprayer None	All treatments provided significant residual control of mites vs the check. V-1283 at all rates was equal to Pyramite. All treatments also significantly reduced predatory mites vs the check at ca. 40 days after treatment.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1999AKURT036 Wise, J. Fennville, MI	Apple – Red Delicious European Red Mite Apple Rust Mite	 UTC Apollo 4 oz A Apollo 4 oz C V1283 80WP .9lb A V1283 80WP .065lb A V1283 80WP .9lb C + Danitol .3 lb C V1283 80WP .9lb C	ERM 7/15: 66.4a; 1.5def; 2.1def; 6.4bcd; 4.9b-e; .4f; 3.6c-f ERM 8/4: 53.2a; 30.8ab; 5.8ef; 31.2abc; 32.6abc; 5.1ef; 13.6b-e ARM 6/30: 5.4a; 1.6b-e; 3.3a-d; 5.5ab; 5.5ab; .7de; .9cde ARM 8/4: 26.4a; 7.8a-d; 5.4cd; 31.6abc; 15.8a-d; 35.8ab; 14.25a-d	A-4/30 tight cister C-6/4 1st cover 100 gpa ERM=motiles/leaf ARM=adults/leaf	Airblast sprayer None	V-1283 applied early gave good reduction of red mites through the 7/15 rating but then control began to break. Control was equal to Apollo. V-1283 applied at 1st cover gave control equal to Apollo through the 8/4 rating. The addition of Danitol in the cover spray numerically improved control but was statistically equal to V-1283 alone. V-1283 did have some initial knockdown of rust mite but did not provide adequate residual control.
1999LWELC039 Hilton, R. Medford, OR	Pear – Seckel Twospotted Spider Mite Pear Psylla Pear Rust Mite Mite Predator	 Bifenazate .75 lb V1283 .065 lb V1283 .09 lb V1283 .135 lb Agrimek 20 oz + Oil Savey 4 oz Pyramite 13.2 oz UTC	TSSM: .9ab; 4.2bc; 4.1bc; 4.7bc; .9ab; 6.9bc; 4.4abc; 26.4d PS: .3def; .1abc; .2c-f; .1a-d; .2b-e; 0a; 0a; .1abc PRM: 2.3bc; 0a; 0a; .5ab; .3ab; .3ab; .3ab; 0a MP: .1a; .1a; .1a; .1a; .3a; .2a; 0a; 1.7b	1 application 6/30 200 gpa TSSM-#/leaf 7/23 PS-#/leaf 7/30 PRM-#/leaf 7/23 MP-#/leaf 7/23	Hydraulic handgun None Oil at .25% v/v	V-1283 gave good control of spider mites equal to Savey or Pyramite but not as good as Bifenazate or Agrimek + oil. V-1283 did not give any reduction of psylla or rust mite vs the check. All treatments reduced mite predators vs the check.
2000LWELC048 Reidl, H. Hood River, OR	Apple – European Red Mite Twospotted Spider Mite Apple Rust Mite Western Predatory Mite	 Acramite .75 lb Acramite 1.0 lb V1283 .065 lb + V1283 .09 lb + V1283 .135 lb + Pyramite 6.6 oz Agrimek 16 oz + UTC	8/1 ERM: 4.1a-d; 2.2bcd; .7cd; 6.1abc; .4d; 1cd; 1.5bcd; 9.8a 8/1 TSSM: 3.8abc; .7cd; .6cd; 2.1cd; .2d; 2.9bcd; 6.9a; 3.7a-d 8/28 ARM: 67ab; 28c; 91a; 63ab; 44bc; 24c; 28c; 69ab 8/28 WPM: .08bcd; 0d; .04cd; .32a; 0d; .04cd; .05bcd; .21ab	1 appl – 7/7 400 gpa	Hydraulic handgun + Orchex 796 (petroleum oil) at .25% v/v added	V-1283 at 0.06 and .135 gave excellent control of red mite and spider mite (for an unknown reason the .09 rate did not perform as well as the other rates) and was the best treatment in the trial for these mites. V-1283 did not reduce rust mites vs the check and was not equal to the high rate of Acramite, Pyramite or Agrimek..
2000TDEWI052 Attaway, J. Ukiah, CA	Pear – Bartlett Twospotted Spider Mite Western Predatory Mite Pear Psylla	 V-1283 .065 lb V-1283 .09 lb V-1283 .135 lb V-1283 .065 lb + Danitol .2 lb Agrimek .135 lb + Volck 4 gal UTC	2SSM 6/3: 1.83b; .95bc; 1.78b; .11c; 1.15bc; 3.3a 2SSM 6/28: .4b; .67b; .3b; .05b; .65b; 6.15a WPM 6/28: 0; 0; 0; 0; 0; 0 PS 6/16: 85.3a; 76a; 85a; 80a; 80.3a; 82.3a	1 appl – 5/31 200 gpa 2SSM & WPM are #/20 leaves PS is % infested leaves/shoot	Hydraulic handgun Silwet at .25% v/v added to all V1283 alone treatments	All treatments significantly reduced mites vs the check. The addition of Danitol to V-1283 did appear to improve control. There were no predatory mites in any treatment or the check. None of the treatments reduced psylla vs the check.

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data			Application GPA	Equipment Adjuvant	Comments
2000MANSO051 Holtz, B. Madera, CA	Apple – Granny Smith Twospotted Spider Mite Western Predatory Mite		2SSM 7/24 Motile/Lf	Egg/Lf	WPM 7/24 Motile/Leaf	1 appl – 7/18 150 gpa	Mist Blower	Mite populations were low and declining in this trial making conclusions difficult. All treatments except Valero reduced motiles vs the check at the 7/24 rating.
		Bifenazate .375 lb	1.4	0	.05			
		Bifenazate .5 lb	.95	.05	0			
		Kelthane 2 lb	1.3	.5	0			
		Pyramite .33 lb + Silwet .03% v/v	1.3	.05	.15			
		Savey .125 lb + Saftside .67% v/v	1.75	.05	0			
		Valero 3 qt + Rnasi100 .03% v/v	2.25	.35	.15			
		Valero 4 qt + Rnasi100 .03% v/v	3.45	0	0			
		V12883 .135 lb	1.1	0	0			
		UTC	3.75	.05	.05			
2000LWELC024 Peryea, B. Wenatchee, WA	Apple – Fuji Twospotted Spider Mite Apple Rust Mite Western Predatory Mite		2SSM	7/19 ARM	PM	1 appl – 7/13 75 gpa	Airblast sprayer + is Orchex at 0.25% v/v ++ is Orchex at 1 gal	All treatments except BAJ2740 gave significant reduction in mites vs the check. V-1283 was equal to Agrimek, Pyramite or Acramite for mite control. There were no significant differences between any treatments or the check for rust mite or predatory mite counts.
		Mesa 25 oz +	4.12bcd	135.5a	.15a			
		Mesa 30 oz +	9.45abc	129.5a	.05a			
		Mesa 35 oz +	4.2bc	139a	.18a			
		Agrimek 12 oz ++	2.05cd	133a	.03a			
		BAJ2740 14 oz	10.78ab	144.5a	.1a			
		Pyramite 8.8 oz	5.68bcd	112.5a	.15a			
		V1283 .065 lb +	5.55bcd	141.5a	.03a			
		V1283 .09 lb +	2.05cd	135a	.00a			
		V1283 .135 lb +	2.1cd	177a	.03a			
		Acramite .25 lb	2.85bcd	145.5a	.00a			
		Acramite .375 lb	1.6cd	93.5a	.03a			
		Acramite .5 lb	3.68bcd	178a	.05a			
		UTC	17.42a	238.5a	.03a			
2000TBEAN024 Hull, L. Biglerville, PA	Apple – European Red Mite Mite Predator – HV Mite Predator – SP		ERM CumMiteDays	8/14 #/Leaf HV	8/7 SP	1 appl – 6/20 100 gpa	Tractor sprayer None	All treatments reduced cumulative mite days vs the check. V-1283 alone was equal to Pyramite. The addition of Danitol to V-1283 had a deleterious effect and was not as efficacious as V-1283 alone. There were no significant differences between treatments for predatory mite numbers.
		V1283 .09 lb	203.3	0a	2.4a			
		V1283 .125 lb	299.4	.2a	1.8a			
		V1283 .18 lb	252.8	.4a	1.2a			
		Danitol 0.2 lb + V1283 .0[illegible] lb	505.1	.08a	3.8a			
		Pyramite 2/5	294.3	.08a	1.6a			
		UTC	1652.5	.04a	3.2a			

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data			Application GPA	Equipment Adjuvant	Comments
2000JCRAN046 Walgenbach, J. Fletcher, NC	Apple – Rede European Red Mite Apple Rust Mite Mite Predator		CMD 8/9 ERMa	ERMI	ARM	A-5/5, B-6/2 150 gpa	Hydraulic handgun None a-adults i-immatures	V-1283 gave excellent reduction of red mite and was equal to Apollo and superior to Pyramite. There was a rate response for V-1283. The addition of Danitol did not enhance V-1283 activity. V-1283 at .135 was the best treatment in the test. V-1283 did not give significant control of red mites compared to the check and was inferior to Apollo and Pyramite. There was no significant differences between treatments for predatory mite numbers and the check had significantly more cumulative predatory mite days than any treatment.
		V1283 .065 A	49.6bcd	93.1abc	1314.3d			
		V1283 .09 lb A	32.4ab	65.7ab	924.8cd			
		V1283 .135 lb A	24a	38.5a	866.7bcd			
		V1283 .065 lb A + Danitol 0.2 lb A	65bcd	113.1abc	497.8abc			
		Apollo .125 lb A	35.5abc	54.2a	429.3a			
		Pyramite .165 A	101.4cde	133.2bc	256.7a			
		Pyramite .165 lb B	128.3de	186.5c	416.9ab			
		UTC	677.9f	1731.7d	2037.2d			
2000AKURT053 Wise, J. Fennville, MI	Apple – Rede European Red Mite Apple Rust Mite		ERM Motiles/Leaf 7/12	7/26	Adults/Lf ARM 7/26	A-4/26, B-5/15 C-6/24, D-7/14 100 gpa	Airblast sprayer None	V-1283 gave excellent control of red mite equal to the standards. V-1283 and Apollo were more efficacious when applied early (4/26) than when applied later (7/14). V-1283 alone was equal to V-1283 + Danitol. V-1283 alone did not provide effective control of rust mite, plus Danitol control was better but still not equal to the standards.
		UTC	25.3ab	81.6a	279.2ab			
		Apollo 4 oz A	.4c	5.5c	206.9a-d			
		Apollo 4 oz D	10.9abc	17.2bc	173b-f			
		Apollo 4 oz D + Valero 3 oz D	27.2a	29.9bc	73.6fg			
		Valero 3 oz D	6.4bc	15bc	142c-g			
		Agrimek 10 oz C + Sunoil 1 gal C	1.2c	4.7c	43.3g			
		Pyramite 4.4 oz B	2.5c	7.6c	53.8g			
		Pyramite 4.4 oz D	8abc	5.8c	79.7efg			
		Bifenazate 8 oz D	10.3abc	30.5bc	93.8efg			
		V1283 .065 lb A	.7c	5.5c	289.9a			
		V1283 .09 lb A	.5c	4.7c	187a-e			
		V1283 .065 lb A + Danitol .2 lb D	.8c	.4c	102.4d-g			
		V1283 .065 lb D	6.2bc	15.7bc	219.4abc			

TEST # COOPERATOR LOCATION	CROP VARIETY PESTS	RESULTS	COMMENTS
1996TDEWI067 Plant Sciences Watsonville, CA	Strawberry - Seascape Twospotted Spider Mite	V-1283 at .018 or .03 alone or + Danitol .2 vs Agrimek .15 or Sanmite .19. V-1283 + Danitol generally gave the best initial knockdown of mites (3 DAT) and residual control through 4 weeks and was superior to the standards. V-1283 alone also gave good control of mites equal to the standards through 3 weeks and superior through 5 weeks. Reduction in eggs followed the same pattern.	1 appl - 6/13 Backpack sprayer, 200 gpa
1996TDEWI068 Pacific Ag Res Arroyo Grande, CA	Strawberry - Camrosa Twospotted Spider Mite Predatory Mite	V-1283 at .018 or .03 alone or + Danitol .2 vs Agrimek 12 oz ai/a or Sanmite .3. All treatments significantly reduced mites vs the UTC with no statistical differences between treatments. at 6 weeks after treatments V-1283 .03 and V-1283 .018 + Danitol were still providing 95% control. All treatments showed some reduction in mite predators vs the UTC, but there was generally no differences between treatments.	1 appl - 5/28 Handheld sprayer, 100 gpa
1996TDEWI085 Sances, F. Arroyo Grande, CA	Strawberry - Silva Twospotted Spider Mite Mite Predator	V-1283 at .03 vs Agrimek at 12 oz/a or Sanmite at .3. All treatments provided only approximately 50% control at 2 weeks after treatment. Agrimek increased to 96% at 6 weeks, V-1283 to 65% and Sanmite to 46%. All treatments showed some reduction in mite predators vs the UTC, but generally no differences between treatments.	1 appl - 7/18 Handheld sprayer, 100 gpa

Test # Cooperator Location	Crop – Variety Pests	Treatments (ai/a)	Data	Application GPA	Equipment Adjuvant	Comments
1997TDEWI043 Welch, N. Watsonville, CA	Strawberry – Selva Twospotted Spider Mite		Mites/Leaflet 4/16 4/26 5/6	1 application 4/8 200 gpa	Backpack sprayer None	All treatments significantly reduced mites vs the UTC. Numerically, Sanmite was the least effective and Alert the most effective. There did not appear to be any benefit in adding Danitol to V-1283 over V-1283 alone.
		V1283 .018 lb	.75a 1.44a 5.46a			
		V1283 .03 lb	1.85a .79a 6.25a			
		V1283 .018 lb + Danitol .2 lb	.7a .83a 6.9a			
		Alert .15 lb	.28a .17a .96a			
		Sanmite .5 lb	5.88b 5.55a 20.88a			
		Agrimek .019 lb	.99a 3.49a .81a			
		UTC	10.41c 26.16b 76.13b			
1997TDEWI018 Welch, N. Watsonville, CA	Strawberry – Selva Twospotted Spider Mite		Mites/Leaflet 4/21 5/12 5/19	1 application 4/14	Backpack sprayer None	Mite pressure was very low. All treatments significantly reduced mites vs the UTC. There was no benefit in adding Danitol to V-1283 over V-1283 alone.
		V1283 .018 lb	.57a .5a .25			
		V1283 .03 lb	.26a .26a .33			
		V1283 .018 lb + Danitol .2 lb	.57a .83a .87			
		Alert .15 lb	.17a .28a .29			
		Sanmite .5 lb	.60a 1.03a .82			
		Agrimek .019 lb	.34a .51a .27			
		UTC	4.82b 2.63b 1.14			
1999TDEWI065 Zalom, F. Davis, CA	Strawberry – Selva Twospotted Spider Mite		Cumulative Mite Days 6/30 7/7 7/14 7/21	A-6/17, B-6/24 200 gpa	Tractor sprayer None	All treatments reduced cumulative mite days vs the check. V-1283 at .09 was the best treatment in the test followed by V-1283 + Danitol , Agrimek, and then V-1283 at .045.
		UTC	1834 3090 4558 5961			
		V1283 .045 lb A	594 967 1655 2567			
		V1283 .09 lb A	507 662 780 921			
		V1283 .03 lb A + Danitol .2 lb A	739 826 968 1612			
		Agrimek .019 lb AB	553 707 1092 1587			
1998LWELC068 Calkin, J. Corvalis, OR	Strawberry – Totem Twospotted Spider Mite		# Motiles / Leaf 7/12 7/23 8/12	1 appl – 7/8 100 gpa	Tractor sprayer None	There were no significant differences between any treatments. Mite populations were in decline during the test. V-1283 at .268 lb did not result in any phytotoxicity.
		UTC	1.38 .5 .13			
		V1283 .067 lb	1.58 .45 .04			
		V1283 .134 lb	1.42 .25 .05			
		V1283 .268 lb	1.15 .3 .03			
		Agrimek 16 oz	1.05 .1 .03			
2000TDEWI054 Zalom, F. Davis, CA	Strawberry – Cama Twospotted Spider Mite		Mites/Leaf 3/22 3/30 4/6 4/21	1 appl – 3/23 250 gpa	Backpack sprayer None	V-1283 at both rates provided excellent control of spider mites superior to Agrimek in knockdown and equal in residual control.
		UTC	27 14 13 1			
		Agrimek .018 lb	18 25 1 0			
		V1283 .045 lb	9 4 2 1			
		V1283 .09 lb	12 4 2 0			

APPENDIX V: SUPPORT LETTERS

RON BRITT
ENTOMOLOGIST • PEST CONSULTANT

January 18, 2002

Ron Britt
Ron Britt & Associates, Inc.
P.O. Box 8336
Yakima, WA 98908

Jim Pensyl
Etoxazole Registration Project Manager
Valent USA
1333 N. California Blvd. #600
Walnut Creek, CA 94596-8025

Dear Jim Pensyl:

Over the last few years, Ron Britt and Associates has been actively researching the efficacy of the chemical referred to as Etoxazole. Results have proven to be exceedingly positive for Etoxazole. The efficacy of this chemical on the Two-Spot Spider Mite complex and the European Red Mite when applied to apples and pears was consistent. Etoxazole has also proven to be safe on predator mites and non-toxic to honey bees.

As a pest consultant in the Pacific Northwest, helping fruit growers reduce pesticide use, the registration of this product on apples and pears is strongly advised. The mode of action of this compound enables fruit growers to target only the damaging mites and establish an integrated pest management program. This could result in an overall reduction of synthetic pesticides throughout the season. Its utility as a miticide for progressive growers using a selective integrated pest management program is very high. Etoxazole would prove to be a very useful tool in many of the IPM programs throughout the northwest.

Sincerely,

Ron Britt, BCE

RON BRITT AND ASSOCIATES • P.O. BOX 8336 • YAKIMA, WA 98908 • PHONE 966-0681

Columbia Ag Research, Inc.

5601 Binns Hill Rd.
Hood River, OR 97031

Phone (541) 387-3052
Fax (541) 387-4428

January 19, 2002

Jim Pensyl
Valent USA
1333 N. California Blvd. #600
Walnut Creek, CA 94596-8025

RE: Support Letter for Secure Miticide

Dear Jim Pensyl:

This letter is to serve as support for Secure Miticide under development by Valent USA. Columbia Ag Research, Inc. has conducted replicated field trials for control of Tetranychus spp. mites on pears since 1999. All field trials were performed in the Hood River, OR area.

Field studies have shown Secure miticide as an effective miticide for use on pears. Its efficacy is at least as effective as any currently available miticide labeled for use on pears. Secure Miticide appears to have little or no effect on predator mite species as well as other beneficial insects.

It is my opinion Secure Miticide has a good commercial fit for mite control in pears. It's proven efficacy towards Tetranychus mite species and ease on beneficial insects will provide a good alternative miticide for resistance management.

Sincerely,

Vernon Fischer, Jr.
President
Columbia Ag Research, Inc