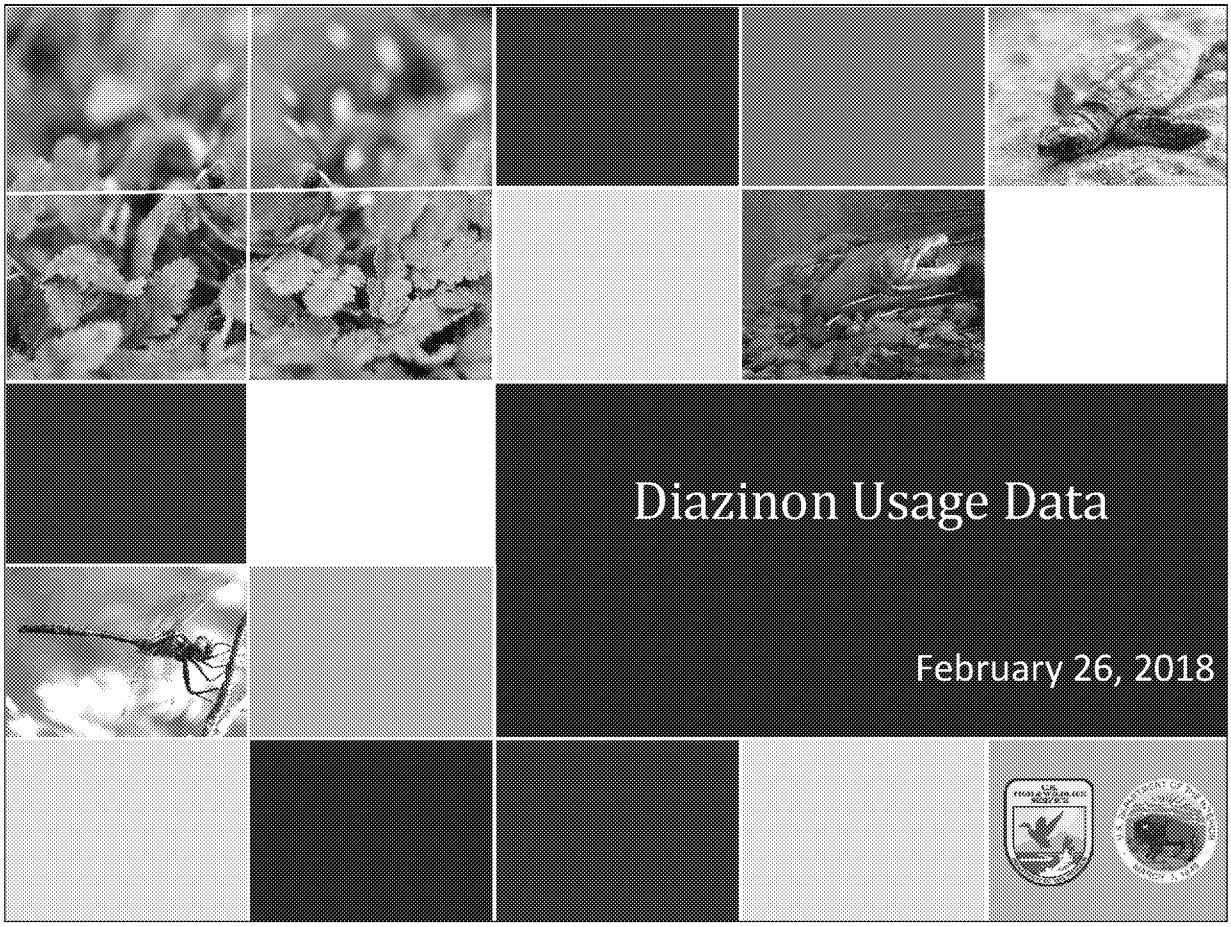
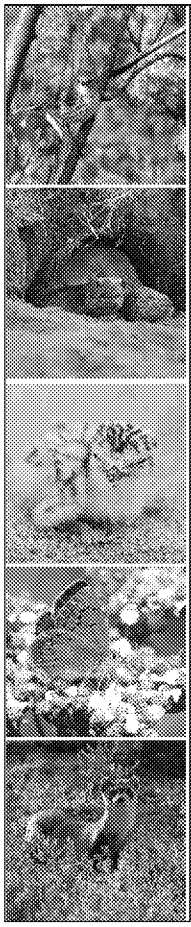


Diazinon Usage Data

February 26, 2018



Data Presented in Diazinon Usage Summary Report

- National data
  - For each crop reports avg. annual pounds AI applied, average annual total acres treated, average AI rate (lb AI/acre), max labeled rate (lb AI/acre)
- State-level data
  - For each crop: reports annual average crop acres grown, annual average lbs AI applied per state, min annual percent crop treated (PCT), max annual PCT, and avg. annual PCT at the state level.

National Data

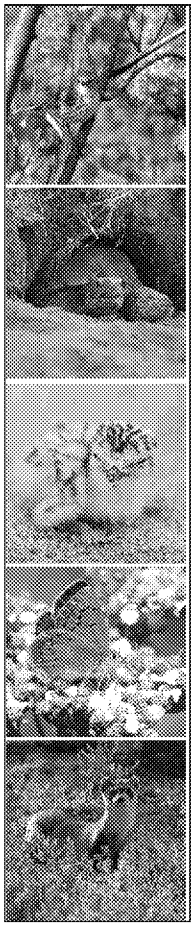
Table 1. National Diazinon Agricultural Usage by Crop. Data Averaged Over Reported Years.

Crop	Survey Status	Avg. Annual Pounds AI Applied*	Avg. Annual Total Acres Treated†	Avg. AI Rate (lb AI/A)	Max Labeled Rate (lb AI/A)
Almonds	MRD (2010-2014)	3,780	2,016	1.87	3.0
Apples	MRD (2010-2014)	26,030	22,900	1.14	2.0
Apricots	MRD (2010-2014)	Insufficient number of reports to establish an estimate.			2.0
Beans (Snap, Bush, Pole, String)	MRD (2010-2014)	Insufficient number of reports to establish an estimate.			4.0

State-level Data

Table 2. Diazinon Agricultural Usage by Crop and State.

Crop	Survey Status	State	Avg. Annual Crop Acres Grown?	Avg. Annual Total Lbs. AI Applied	Min. Annual PCT	Max. Annual PCT	Avg. Annual PCT
Almonds	MRD (2010-2014)	California	947,400	3776	0	0.5	**0.2**
Apples	MRD (2010-2014)	Virginia	13,200	1,670	0	53	**21**
		California	18,700	4,117	7	31	**16**
		Pennsylvania	23,600	4,612	5	24	**15**
		Washington	164,000	14,627	1	10	**5**
		Oregon	5,400	(S)	0	38	**8**
		New York	49,200	724	0.2	3	**2**
		Ohio	5,000	(S)	0	2	**0.3**
		Michigan	44,000	(S)	0	0.2	**0.05**
		NC, WV	Surveyed but no usage reported				
Apricots	MRD (2010-2014)	California	10,800	(S)	0	11	**3**
Beans (Snap, Bush, Pole, String	MRD (2010-2014)	California	9,500	(S)	0	3	**0.6**
		New York	26,800	(S)	0	0.9	**0.2**
		FL, GA, IL, ID, MI, NC, OR, PA, TN, TX, WI	Surveyed but no usage reported				
	MRD						



Nurseries

- Data reported for nurseries
  - State, average annual total lbs. AI applied, percent of operations 2006, percent of operations 2009

Non-Agricultural Usage:

Table 3. Diazinon Non-Agricultural Usage by Site. 2009.

Crop	Survey Status	State	Avg. Annual Total Lbs. AI Applied	Percent of Operations 2006	Percent of Operations 2009
Ornamentals grown in outdoor nurseries (trees, bushes, herbs, nonflowering plants, flowers, shrubs, vines)	NASS (2006, 2009)	California	--	11	23
		Florida	--	3	3
		Pennsylvania	--	3	3
		Oregon	--	5	1
		Texas	--	14	1
		Michigan	--	2	Insufficient number of reports to establish an estimate.
Cattle	Not Surveyed				

Diazinon usage data (max PCT) for vegetables and ground fruit: by state (36) and crop (22)

		STATE																																	
CROP	Category	AL	AZ	CA	CO	CT	DE	FL	GA	ID	IL	IN	MA	MD	ME	MI	MN	MO	MS	MT	NC	ND	NE	NJ	NM	NY	OH	OK	OR	PA	SC	TN	TX	VA	WA	WI	WY
Beans	veg			3				0	0	0	0					0					0					0.9			0	0		0	0			0	
Blueberries	Veg								25							*					*			19					17						47		
Broccoli	Veg			8																																	
Cabbage	Veg		0	3	0			12	0							4					0					33							74			0	
Cantaloupes	Veg		0	35				6	0	0											0												57				
Caneberries	Veg			10																									15						10		
Carrots	Veg			22												0																	33		49	0	
Cauliflower	Veg		28	4																																	
Cranberries**	Veg												57											8					27						44	58	
Cucumbers	Veg			11				5	0					0		0		0			0										0		0		0	0	
Dry beans	Veg			6	0					0						0	0	0				0	0			0							0		0		0
Honeydew	Veg		0	0																													0				
Lettuce	Veg		0	20																																	
Lima Beans	Veg			21			0		0		0																				0				0	0	
Onions	Veg			27	8				0	0																12			1				82		10		
Peppers	Veg		0	2				1	0												0			21	0		0						0				
Potatoes	Veg			0	0			0		0.4					0	0	0			0	0	0	0			0			0	0			0	0	0	0	
Pumpkins	Veg			2		0				0	0	0	0	0		1	0	0						23	0	0	0		0	0		0	0	0	0	0	
Spinach	Veg		0	10	0																			78				34					100				
Squash	Veg			16		0		12	6				0			0					0			3		1	0		0	9	0	0	5			0	
Strawberries	Veg			14				35								0										0			0	4					24		
Tomatoes	Veg			3				27																													
Watermelon	veg	0	0	19				2	0	0								0	0		0							0			0		33				
tot # crops surveyed	23	1	8	21	5	2	1	10	10	7	3	1	3	2	1	10	3	4	1	1	9	2	2	6	2	8	3	2	9	5	4	3	14	2	11	9	1

* insufficient # of reports to establish an estimate ** no Max Annual PCT- this is Avg. Annual PCT

Diazinon usage data for orchards and vineyards (max PCT): by state (16) and crop (8)

		STATE															
CROP	Category	AL	CA	GA	IL	MI	NC	NJ	NY	OH	OR	PA	SC	TX	VA	WA	WV
Almonds	orchard		0.5														
Apples	orchard		31			0.2	0		3	2	38	24			53	10	0
Apricots	orchard		11														
Cherries	orchard		45			0					8					5	
Hazelnut	orchard										0						
Peaches	orchard	0	11	0	0	0		0				19	0	19		0	
Pears	orchard		16								0.4					0	
Plums/Prunes	orchard		4														
tot # crops surveyed	8	1	7	1	1	3	1	1	1	1	4	2	1	1	1	4	1

Crops not surveyed nationally

Swiss chard	parsley
red beet	sweet potato
radishes	ginseng
Chinese cabbage	peas
Chinese radish daikon	rutabagas
collards	turnips
endive	parsnips
kale	pineapples
mustard greens	brussel sprouts
figs	garlic
nectarines	

Agricultural and non-agricultural uses for chlorpyrifos and malathion

Chlorpyrifos

Agricultural crops (usage data for some/all crops in category)

Corn	Cotton	Soybeans	Wheat	Vegetables and Ground Fruit	Orchards and Vineyards	Other Grains	Other RowCrops	Other Crops	Pasture

Non-agricultural uses (no usage data)

	Nurseries	Developed	Managed Forests	Open Space Developed	Right of Way	Christmas Trees	Golf Courses	Mosquito Control	Wide Area Use

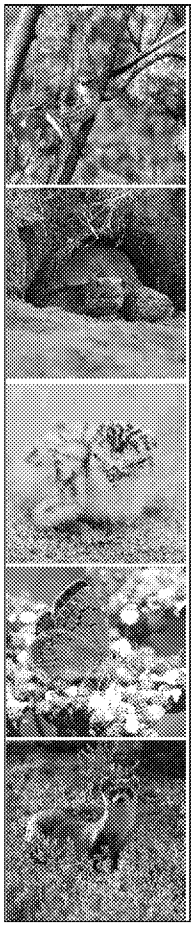
Malathion

Agricultural crops (usage data for some/all crops in category)

Corn	Cotton	Rice	Wheat	Vegetables and Ground Fruit	Orchards and Vineyards	Other Grains	Other RowCrops	Other Crops	Pasture

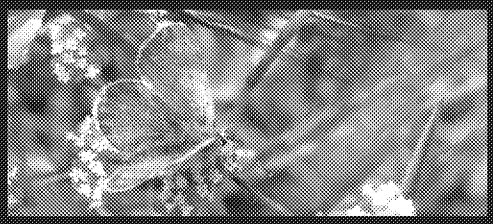
Non-agricultural uses (no usage data)

		Developed	Nurseries	Open Space Developed	Pine seed orchards	Christmas Trees	Mosquito Control		



Application of data at state level:
Challenges and information needs

- Geographic specificity of data
- Crops surveyed
- Number of growers responding per state

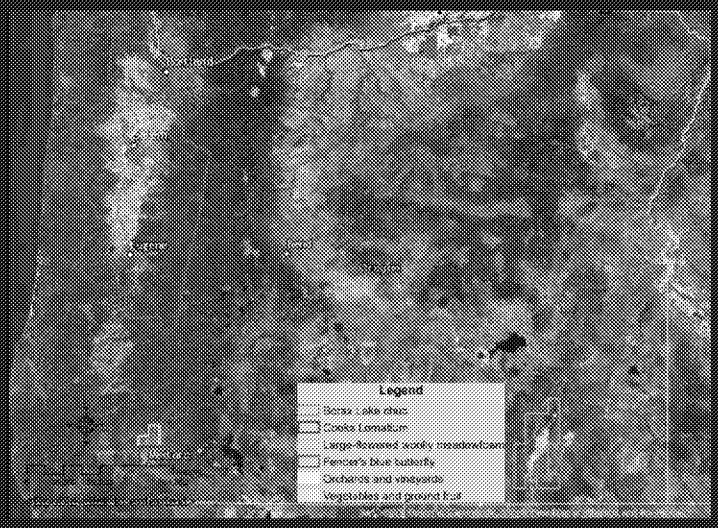


Fender's Blue Butterfly

Crop	% crop treated
Apples	38
Cherries	8
Hazelnut	0
Pears	0.4
Beans	0
Blueberries	17
Caneberries	15
Cranberries	27
Onions	1
Potatoes	0
Pumpkins	0
Squash	0
Strawberries	0

Geographic specificity

- Species ranges at county level or more refined; usage data not spatially explicit beyond the state level



Diazinon use sites and species ranges: Oregon

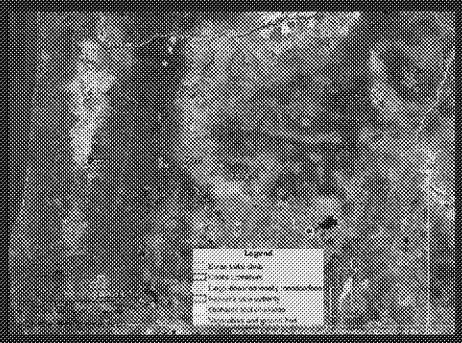
Crops surveyed

- Represents a subset of the crops for which diazinon is registered

Crop	% crop treated
Apples	38
Cherries	8
Hazelnut	0
Pears	0.4
Beans	0
Blueberries	17
Caneberries	15
Cranberries	27
Onions	1
Potatoes	0
Pumpkins	0
Squash	0
Strawberries	0

Information needed:

- List of diazinon-registered crops grown in state
- Acreage for each crop



Based on 2012 NASS data:

- 29 crop types grown in state for which diazinon is registered
- 13 crop types were surveyed
- No usage data for 16 crop types

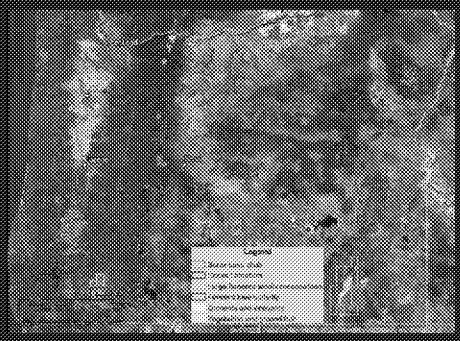
Number of growers responding per state

- Represents a subset of pesticide acreage and users

Crop	% crop treated
Apples	38
Cherries	8
Hazelnut	0
Pears	0.4
Beans	0
Blueberries	17
Caneberries	15
Cranberries	27
Onions	1
Potatoes	0
Pumpkins	0
Squash	0
Strawberries	0

Information needed:

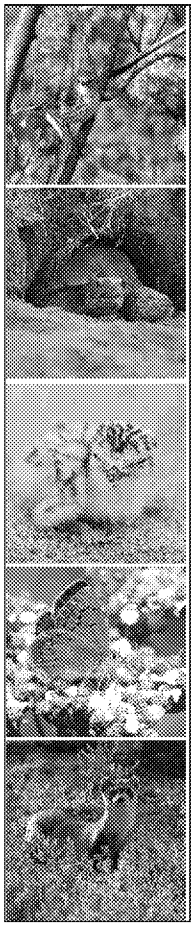
- How many acres/growers per state
- How many responded to surveys



Based on 2012 NASS data:

- Potatoes, 0 PCT (616 farms, 41,667 acres)
- Hazelnuts, 0 PCT (827 farms, 37,097 acres)

- Extreme Max PCT nationwide: 100 PCT for spinach in TX (100 farms, 2131 acres)



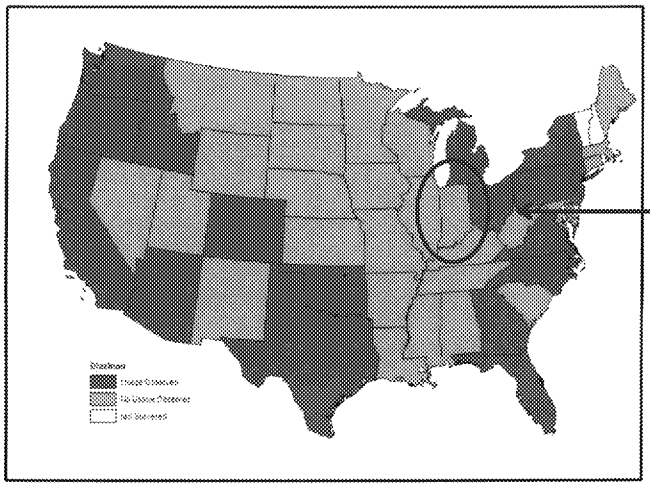
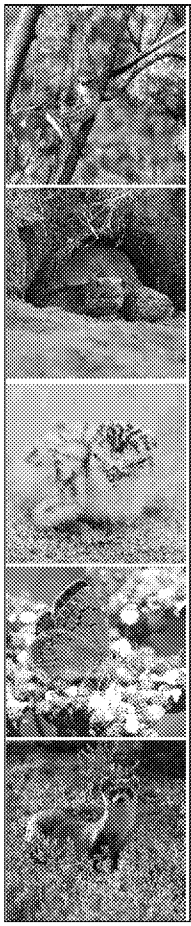


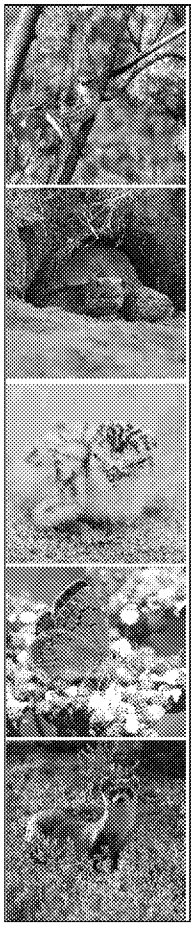
Figure 2. States with observed Diazinon usage (2010-2014).
Source: *Market Research Data (MRD)* 2010-2014
*AK, HI, and US Territories are not surveyed.

Several states were categorized as "No usage observed"



Indiana – "no usage observed"

- Crops surveyed in Indiana
  - 1 crop (pumpkins: 469 farms, 3518 acres; 2012 NASS)
  - Unknown how many farms/acres surveyed
- Crops grown in Indiana (2012 NASS)
  - Vegetables and ground fruit – 32 crops
  - Orchards and vineyards – 8 crops
  - Nurseries
  - Total acreage = 35,005 acres (+ nurseries)
- % of acreage not surveyed $\geq$90%



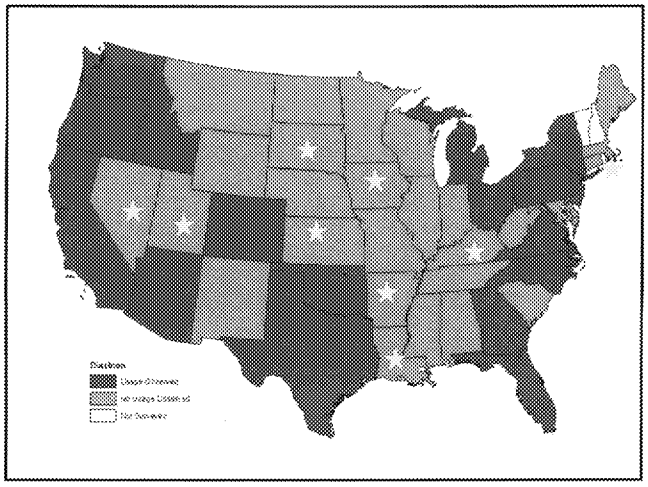
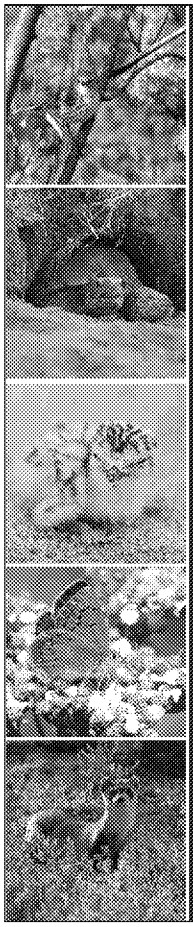
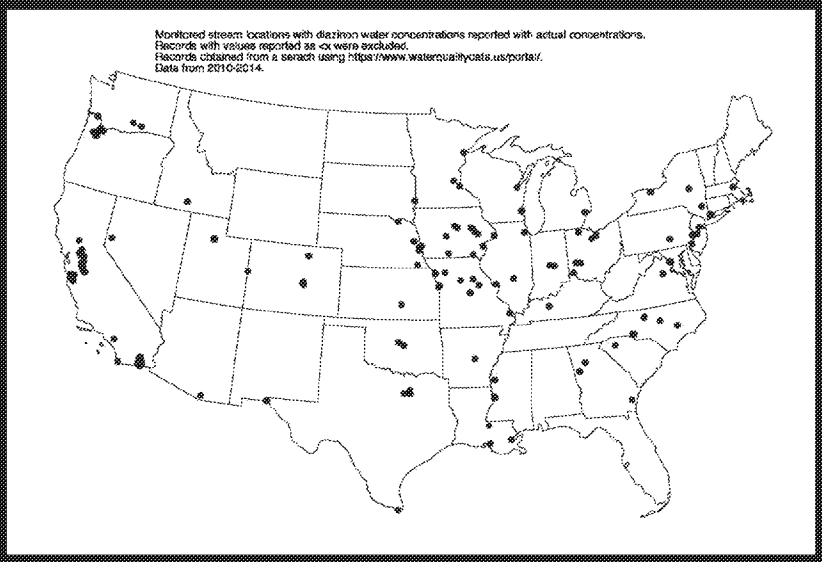


Figure 2. States with observed Diazinon usage (2010-2014).
Source: *Market Research Data (MRD)*, 2010-2014
*AK, HI, and US Territories are not surveyed.

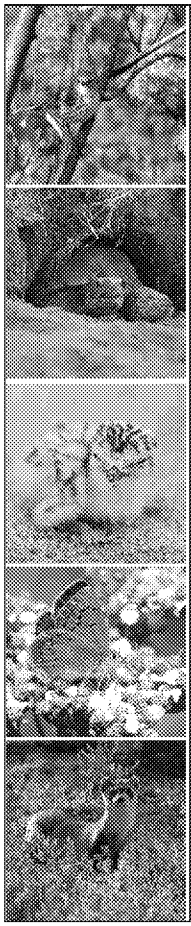
Some states labeled "no usage observed" appear to not be surveyed for any diazinon-registered crops

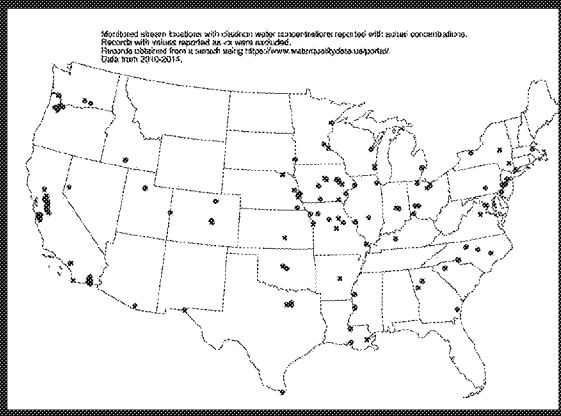


Diazinon detection in streams 2010-2014



Ambient water quality data obtained from National Water Quality Monitoring Council
https://www.waterqualitydata.us/portal/





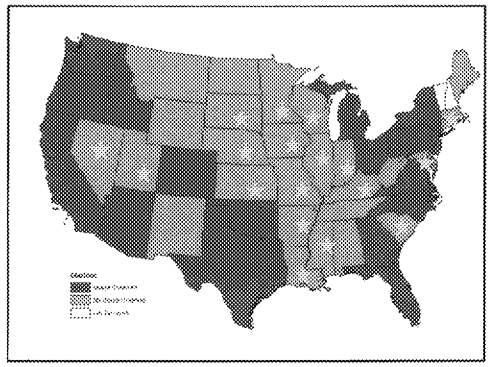
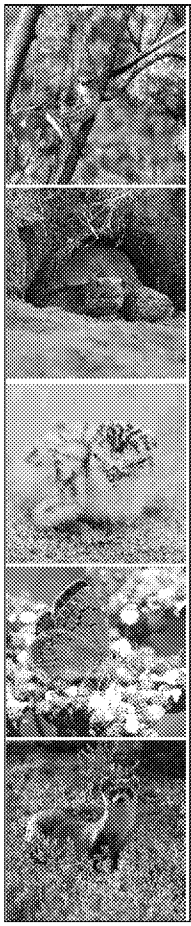


Figure 2. States with observed Diazinon usage (2010-2014).

Source: *Market Research Data (MRG), 2010-2014*

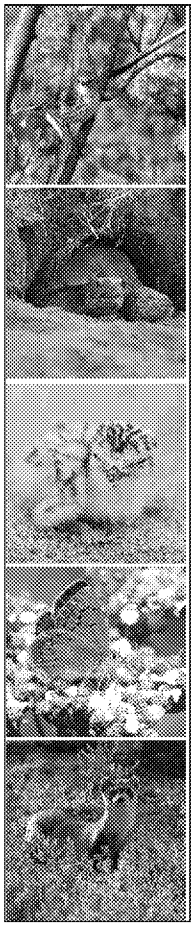
*AK, HI, and US Territories are not surveyed



California Pesticide Use Reporting (PUR)

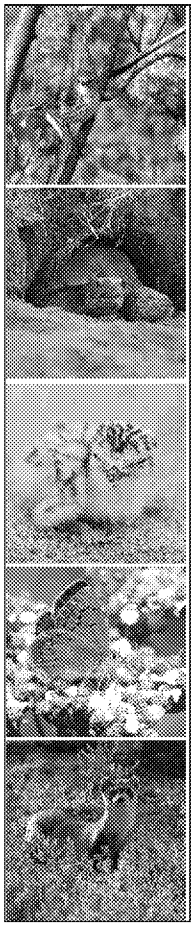
California PUR data more robust

- Mandatory reporting for agricultural crops
  - Broad legal definition of "agricultural use" including parks, golf courses, rangeland, pastures, and rights-of-way
- Primary exceptions to reporting requirements:
  - Home and garden uses
  - Industrial and institutional uses
- Geographic specificity to 1 sq mile
- Self-reporting



Discussion Questions

- Can we increase our understanding of geographic specificity?
  - Are there more data available on diazinon usage?
  - Can the current data be provided at a finer geographic scale?
- What is the most appropriate application of the data we have?
  - How do we address non-surveyed crops?
  - How do we address non-surveyed states?
  - How do we info to risk assessment?



End