













Pollination-dependent crops in NY ¹					
Crop Type	Harvested Acres	Value of Production (\$)			
Apples	40,000	240,355,000			
Alfalfa	290,000	160,602,000			
Soybeans	327,000	144,207,000			
Beans	9,800	52,137,000			
Squash	4,300	31,371,000			
Pumpkins	5,200	20,493,000			
Peach	1,600	12,640,000			
Cucumber	1,700	10,091,000			
Strawberries	1,000	7,520,000			
Pears	1,000	3,472,000			
Cherries	700	3,042,000			
Blueberries	700	2,800,000			
Total	683,000	1,157,963,000			
		1. New York State Agricultural Overview. 2014. US			

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- NY	S Dept. A	g & Market	s (2015)	
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Outline

1. Pesticide risk to bees in New York

- a) Day-to-day normal conditions
- b) During pollination of apple
- c) Interactions between pesticides and disease

2. Recommendations for reducing risk









	13 most prevalent compounds:				
Compound	Compound Type	# Positive Detections	% Positive Detections	Mean residue (ppb)	
Piperonyl butoxide	Synergist	196	99%	6.44	
Fenpyroximate	Insecticide	120	61%	7.52	
Metolachlor	Herbicide	115	58%	2.84	
Azoxystrobin	Fungicide	104	53%	5.39	
Coumaphos	Miticide	100	51%	80.95	
Pyraclostrobin	Fungicide	76	38%	10.49	
Cyprodinil	Fungicide	59	30%	8.68	
Trifloxystrobin	Fungicide	51	26%	3.40	
Fluopyram	Fungicide	36	18%	8.41	
Atrazine	Herbicide	34	17%	10.83	
Pyrimethanil	Fungicide	27	14%	23.88	
Difenoconazole	Fungicide	22	11%	13.97	
Propiconazole	Fungicide	20	10%	41.36	



Synergisms not accounted for in risk estimate							
13	13 most prevalent compounds:						
Known synergist	Compound	Compound Type	# Positive Detections	% Positive Detections	Mean residue (ppb)		
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163	163/198 (82%) colonies contained pesticide combinations known to be synergistic						
	Wheeler, Mullen, Cappy & McArt 2017						

































		Mean		Hazard
	Compound	residue	Positive	Quotient
Compound	Туре	(ppb)	detections	(Risk)
Thiamethoxam	Neonicotinoid	21.5	5	21486.0
Cyfluthrin	Pyrethroid	93.3	6	10981.6
Carbaryl	Carbamate	69.9	11	5126.4
Indoxacarb	Oxadiazine	557.1	2	4285.4
but all wei	re sprayed	in the	e previo	ous 2 y











What predicts disease and range contractions in
Luited States bumble bees?Image: States bumble bee









Compound	Class	Chemical	family	Total application in 2009 (kg)
Chlorothalonil	Fungicide	Aromatic		4,101,408
Mancozeb	Fungicide	Dithiocarbamate		2,720,704
Captan	Fungicide	Dicarboximide		1,577,117
Pyraclostrobin	Fungicide	Pyrazole		812,365
Maneb	Fungicide	Dithiocarl	pamate	575,012
Ziram	Fungicide	Zinc		533,063
Propiconazole	Fungicide	Conazole		512,490
Azoxystrobin	Fungicide	Strobiluri	า	479,867
Thiophanate-Methyl	Fungicide	Benzimida	azole precursor	323,038
Metiram	Fungicide	Dithiocar	pamate	309,132
			https://water.usgs.ge	ov/nawqa/pnsp/usage
Br	avo	<u>Echo</u>	<u>Daconil</u>	
	52			









Outline

- **1. Pesticide risk to bees in New York**
 - a) Day-to-day normal conditions
 - b) During pollination of apple
 - c) Interactions between pesticides and disease

2. Recommendations for reducing risk

Develop an integrated pest management (IPM) plan that reduces pesticide usage

- 1. Incorporate habitat that encourages natural enemies (and pollinators!)
- 2. Plant disease- and pest-resistant crops
- 3. Crop rotations
- 4. Monitor pest levels to determine when you need to spray
- 5. Alternate pest control methods
 - pheromone lures, biological control, etc.











When using pesticides...

- 1. Spray at night and when air is calm.
- 2. Avoid spraying during bloom.
- 3. Choose a pesticide of lowest toxicity to bees that provides the needed pest control. If all available pesticides are highly toxic, choose the one with the shortest residual period.

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- 3. Choose a pesticide of lowest toxicity to bees that provides the needed pest control. If all available pesticides are highly toxic, choose the one with the shortest residual period.
- Reduce planting dust for treated seeds: use wax treated seeds, deflectors on machinery, be aware of dry/windy conditions.



Consult your local beekeeping club to identify nearby beekeepers

Contacts for all NYS beekeeping clubs can be found at our Pollinator Network website:

http://pollinator.cals.cornell.edu/

Summary

- **1)** Pesticide risk to bees can be high, especially during crop pollination
- **2)** Reduce risk via IPM, choosing safest pesticides, and following labels
- 3) Keep fungicides on your radar they're not harmless (**booklet info next!**)
- 4) Communicate with beekeepers



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