

US EPA ARCHIVE DOCUMENT



Spray Drift In Human Health and Ecological Risk Assessment

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Jeff Dawson, U.S. EPA
Office of Pesticide Programs



Overview

- Scenario
- Assessment Process
- Key Inputs
- Example
- Risk Mitigation
- Related Issues
- Path Forward

<http://www.epa.gov/pesticides/factsheets/spraydrift.htm>

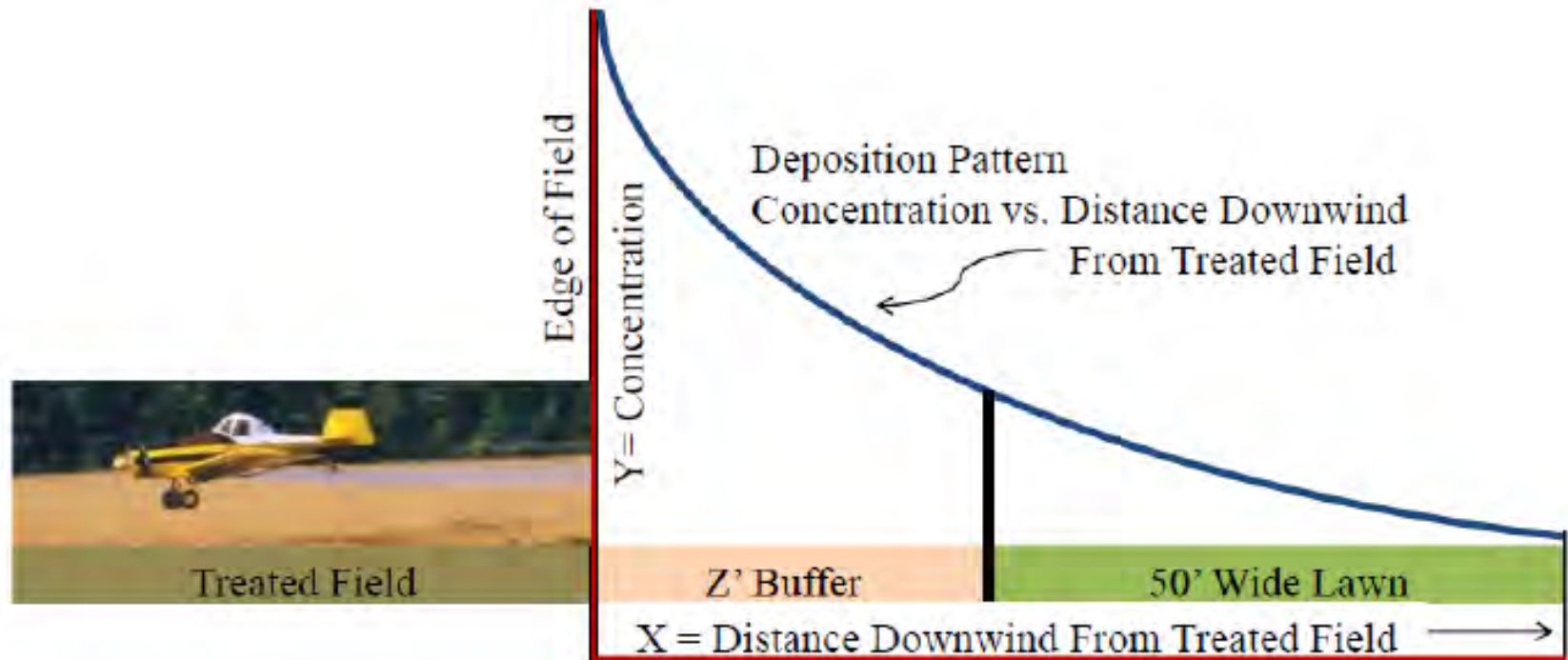


Spray Drift Scenario

- Opportunity for human and environmental exposures via spray drift
 - Humans: Census shows ~90 million live in rural and small urban clusters
 - Ecosystems: Many forms of environments considered in ecological risk assessment
- Data indicate incidents occur
 - Impacts vary
 - Causes vary
- Approach assumes proper use and compliance with WPS



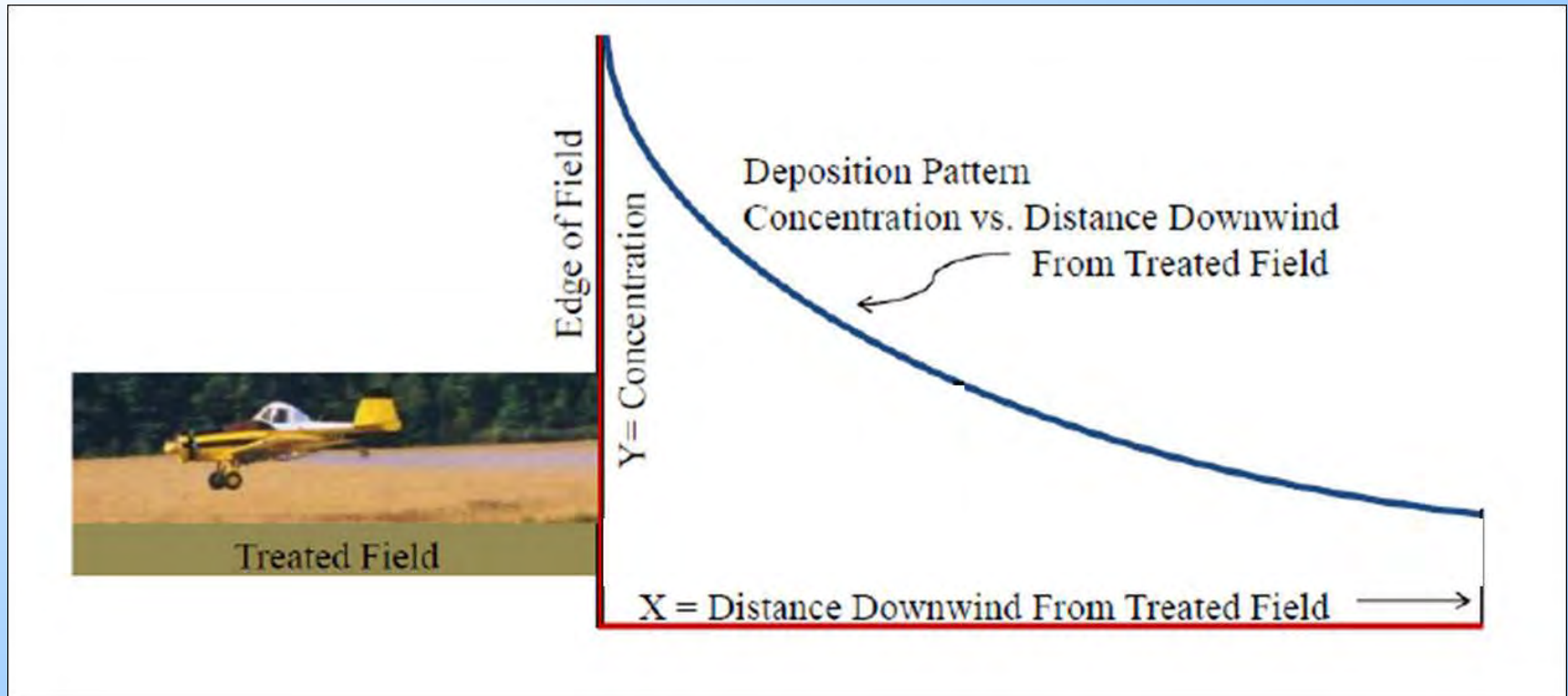
Scenario – Human Health



Exposures occur from contact with impacted lawns (e.g., children playing)



Scenario – Environmental



Exposures occur to terrestrial and aquatic organisms

- from ingestion of treated plants
- water deposition (1 acre pond, 6.5 ft deep)



Assessment Process

- Scoping

- Information Gathering

- Use information (crops, where and how applied, formulation, spray quality)
- Does turf use exist? Are there turf residue data?

- Scenario development

- Quantitative only for groundboom, aerial, airblast
- Tier 1 AgDrift (consistent with EFED) and residential exposure SOP for turf uses
- Additional options also included (e.g., label spray quality statements requiring larger droplets)



Assessment Process – Human Health

- Qualitative Approach Can Be Used At Times
 - no potential for drift
 - e.g., banding liquid with soil incorporation
 - if a turf chemical and the application rate to turf exceeds drift potential
 - drift potential = highest expected residues from non-turf uses



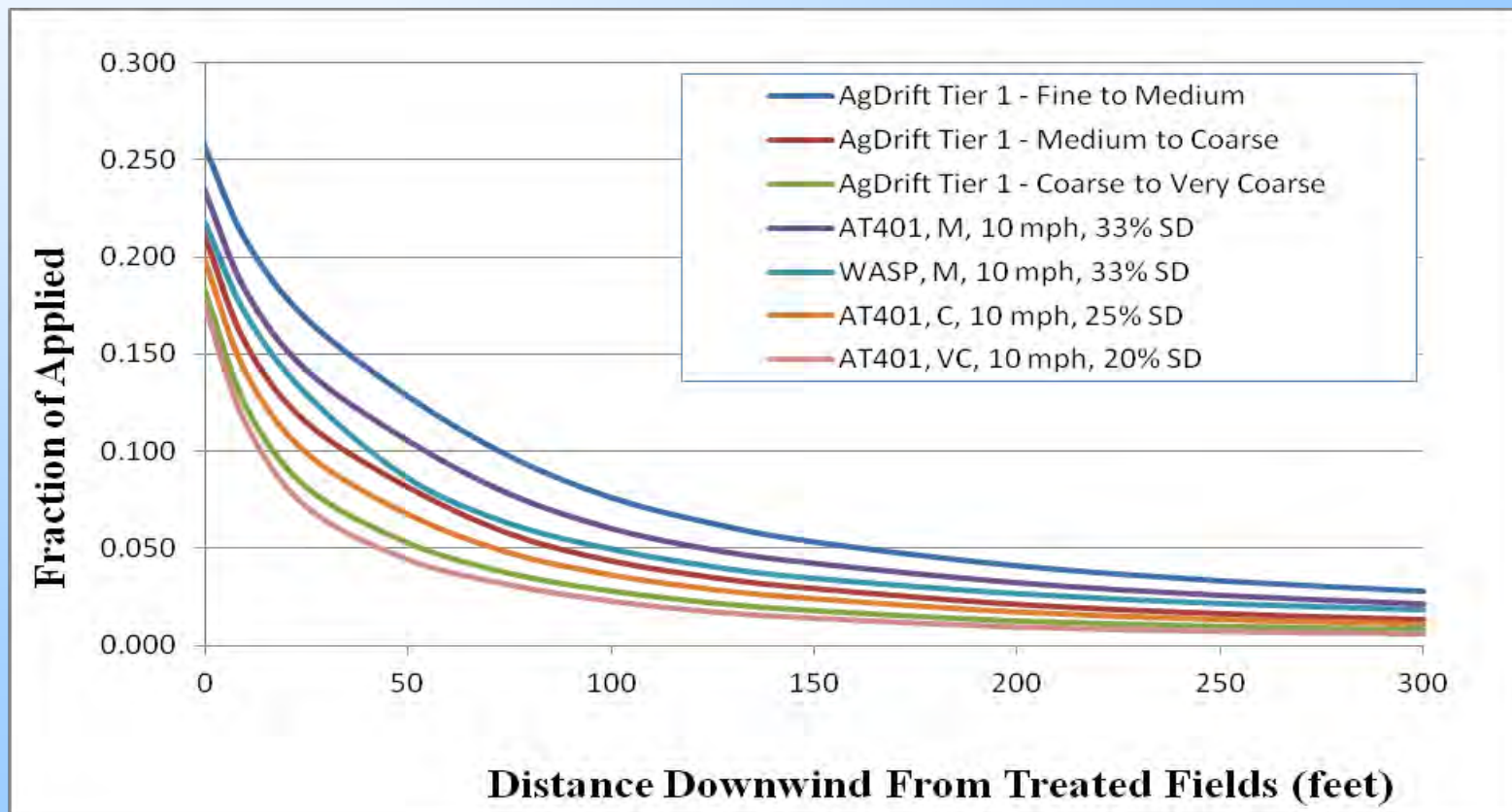
Assessment Process – Human Health

- Quantitative Method
 - Turf SOP for 1-2 year olds and adults
 - Adjust residue for drift onto adjacent lawns
 - Only for 3 application methods (aerial, ground, airblast)
 - Drift based on 50 feet wide lawns
 - Consistent with previous assessments
 - Census supports dimensions for lawn
 - Average residue over lawn as children can play anywhere



Assessment Process

Drift Fractions For Aerial Applications





Assessment Process

- Issues For Consideration
 - Description of key factors such as uncertainty
 - e.g., application method, seasonality
 - Possible impacts on findings
- Risk Management Option Issues
 - Buffers have tremendous impact
 - Managing Spray quality via Drift Reduction Technology (DRT)
 - Many ways to achieve



Key Inputs

- Label and Use Information
 - Application rate
 - Application methods
 - Seasonality
 - Mode of action (e.g., systemic or contact insecticide)
- Toxicity
 - Same as typical risk assessment



Key Inputs

- Defining how much drift deposits on lawns
 - AgDrift v2.1.1 <http://www.agdrift.com/>
 - CRADA with EPA & Spray Drift Task Force (SDTF)
 - Addresses major application methods
 - Ground, aerial, and orchard sprays
 - Tiered approach, offers mitigation options
 - Peer reviewed by FIFRA SAP
- Tier 1 inputs used
 - Location (e.g., sparse trees for orchards)
 - Climate (e.g., air all downwind and highest speed)
 - Spray quality



Key Inputs - AgDrift Tier 1

Application Type	Tier I AgDRIFT Parameters
Aerial	Fine to medium ($D_{v0.5}$ - 255 μ m) Release height-10 ft Wind Speed – 10 mph Spray volume – 2 gallon Swath Displacement-37%
Ground	Very fine to fine ($D_{v0.5}$ - 175 μ m) High boom (50") Data - 90 th %ile
Airblast	Sparse canopy (young and dormant)



Key Inputs

- Quantifying risk from lawn residues
 - *SOPs For Residential Exposure Assessment*
<http://www.epa.gov/pesticides/science/residential-exposure-sop.html>
 - Method for turf products used with adjustment for amount of spray drift
 - SOPs Peer reviewed by FIFRA SAP
- Can be refined if chemical specific residue data are available on turf



Key Inputs/Assessment Summary

- Drift can occur and have an impact
 - Scenario: children on lawn for human health
 - Amount which drifts: AgDrift model
 - Exposure from drift: Residential SOPs
 - Risk: calculated based on chemical specific toxicity information
 - Characterize: discuss the uncertainties and the overall issues which should be considered



Example Tier1 Output

Appl. Rate	Application Type	Spray Type	Dermal and Oral Combined MOEs										
			At Edge	10 Feet	25 Feet	50 Feet	75 Feet	100 Feet	125 Feet	150 Feet	200 Feet	250 Feet	300 Feet
0.1	Aerial	F to M	51	63	78	102	135	174	209	244	322	388	471
	Groundboom	HB VF to F	71	142	236	377	528	660	776	942	1199	1649	1885
	Airblast	Sparse	92	158	298	660	1199	1940	2932	4123	7330	11995	16493
0.5	Aerial	F to M	10	13	16	20	27	35	42	49	64	78	94
	Groundboom	HB VF to F	14	28	47	75	106	132	155	188	240	330	377
	Airblast	Sparse	18	32	60	132	240	388	586	825	1466	2399	3299
1	Aerial	F to M	5	6	8	10	13	17	21	24	32	39	47
	Groundboom	HB VF to F	7	14	24	38	53	66	78	94	120	165	188
	Airblast	Sparse	9	16	30	66	120	194	293	412	733	1199	1649
5	Aerial	F to M	1	1	2	2	3	3	4	5	6	8	9
	Groundboom	HB VF to F	1	3	5	8	11	13	16	19	24	33	38
	Airblast	Sparse	2	3	6	13	24	39	59	82	147	240	330

- Combined MOEs based on dermal and oral PODs = 1 mg/kg/day
- F = Fine, M = Medium, VF = Very Fine, HB = High Boom



Risk Mitigation

- Various options are available but require label changes
 - Buffer zones around treated areas
 - Spray quality (e.g., coarser sprays)
 - Application conditions
 - Equipment type
 - Crop canopy
 - Refinement (e.g., specialty nozzles, adjuvants)



Related Issues

- Volatilization of conventional pesticides

<http://www.epa.gov/scipoly/sap/meetings/2009/120109meeting.html>

- *Farmworker Justice/Earth Justice* petition
(Docket EPA-HQ-OPP-2009-0825)
- DRTs
 - Data development
 - Applicability
- Federal partnerships



Path Forward

- 60 day comment period for both ecological and human health documents
- Finalize methods (or SOPs) but timing will depend on level of comments received
- Considered in Registration Review during PRA development



Thank You