U. S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

Date: June 13, 2013
Chemical: Ethanaminium (2,4-D choline salt)
PC Code: 051505
DP Barcode: 411614

MEMORANDUM

SUBJECT: Addendum to EFED Environmental Risk Assessment for Enlist (2,4-D Choline Salt), New Uses on Soybean with DAS 68416-4 (2,4-D Tolerant) and Enlist (2,4-D + Glyphosate Tolerant) Corn and Field Corn

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At the request of the Registration Division (RD), the Environmental Fate and Effects Division (EFED) has re-evaluated the spray drift buffers that would be required to protect the most sensitive taxonomic group (listed dicots) using terrestrial plant data from other 2,4-D salt and amine moieties, consistent with the approach used in the 2005 RED. In the RED, the endpoints from the ester moieties were analyzed separately from the salt, amine, and acid forms because the esters penetrate membranes more efficaciously. EFED believes it is appropriate to use a salt, amine, or acid endpoint for the 2,4-D choline salt spray drift analysis. The original spray drift buffer analysis (DP 400223+) was based on endpoints from 2,4-D ester moieties; amine/salt endpoints are generally an order of magnitude less sensitive (Table 1).

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Table 1. Terrestrial Plant Toxicity Endpoints

	EC_{25} (lb ai/A)	NOAEC (lb ai/A)	MRID
Ester monocot	0.010	0.005628	43982101
Salt/amine monocot	0.026	0.015	42389501
Ester dicot	0.00081	0.00047	43982101
Salt/amine dicot	0.0038	0.0017	47106002

Using the salt/amine endpoints, the spray drift buffers were reduced for all terrestrial plant scenarios. AgDRIFT was used to calculate buffers based solely on ground boom height and the droplet spectrum. The 2,4-D choline salt label requires a droplet spectrum of course to very course; however, the most course droplet setting for AgDRIFT is fine to medium/course. Therefore, spray drift buffer distances were also calculated using the droplet spectrum for a specific nozzle/formulation combination (AIXR 11004 nozzle and GF2726 formulation). The deposition curve was developed using Exponential Decay, Double, 4 Parameter (EDDP) equation using Sigma Plot version 10.0 (see the January 15, 2013 risk assessment for further detail – DP 400223+).

For listed dicots (the most sensitive group), buffers calculated using AgDRIFT were 886 ft (very fine to fine droplet size) and 495 ft (fine to medium/course droplet size) (Table 2). In comparison, the buffer for listed dicots for the ester-derived endpoints was > 1000 ft (fine to medium/course droplet spectrum). Buffer distances derived using EDDP were smaller and ranged from < 25 ft to 30 ft (Table 2). This compares with 202 ft for listed dicots using the ester data. In both cases, the EDDP buffers were calculated specifically for an AXIR11004 nozzle and the GF2726 formulation.

Table 2. Spray Drift Buffer Distances for Terrestrial Plants Using Amine/Salt Endpoints

	Single application rate (lb ae/A)	Fraction of applied	AgDRIFT buffer distance (ft)[1]		EDDP buffer distance (ft)[2]
			Fine to medium/course	Very fine to fine	
Listed monocots	1.0	0.015	39	164	< 25
Non-listed monocots	1.0	0.026	20	98	< 25
Listed dicots	1.0	0.0017	495	886	30
Non-listed dicots	1.0	0.0038	213	512	< 25

[1] AgDRIFT ground boom scenario with high boom (50 inches), and 90th data percentile
[2] Represents deposition data (25 to 400 ft) from AXIR11004 nozzle and GF2726 formulation at boom height of 50ft

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