



# Department of Pesticide Regulation



Brian R. Leahy  
Director

## MEMORANDUM

Edmund G. Brown Jr.  
Governor

TO: Dr. Marylou Verder-Carlos  
Assistant Director

FROM: John S. Sanders, Ph.D., Environmental Program Manager II  
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*[Original signed by J. S. Sanders]*

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SUBJECT: CARBOFURAN MITIGATION

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In January 2006, the Department of Pesticide Regulation (DPR) completed a Risk Characterization Document (RCD) for carbofuran. Using margins of exposure (MOEs) of less than 100 from the RCD as benchmarks, the concerns were for short-term, seasonal and chronic exposure for most work tasks associated with groundboom, aerial, chemigation and dip/slurry application methods (Table 1). There were also concerns (MOEs of less than 100) for three field worker reentry scenarios: scouting cotton, scouting alfalfa and scouting potatoes (Table 2). There were concerns (MOEs less than 100) for bystander (application site) exposure (Table 3). The purpose of this memorandum is to review the U. S. Environmental Protection Agency's (U.S. EPA) actions on carbofuran, and determine if additional mitigation measures are needed to be developed beyond what U.S. EPA has proposed.

**Table 1.** DPR Margins of Exposure (MOE) for Activities Associated with Carbofuran Applications.

Work Task	Acute MOE		Seasonal MOE		Annual MOE	
	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
<b><u>Groundboom</u></b>						
M/L	<1	3	2	100	11	1000
Applicator	<1	<1	1	14	8	100
<b><u>Aerial</u></b>						
M/L	<1	1	<1	50	4	333
Applicator	<1	<1	<1	6	<1	33
Flagger	<1	<1	<1	33	2	100
<b><u>Chemigation</u></b>						
M/L	<1	<1	<1	25	1	100



Work Task	Acute MOE		Seasonal MOE		Annual MOE	
	Dermal	Inhalation	Dermal	Inhalation	Dermal	Inhalation
<u>Low pressure handwand</u> M/L/A	5	200	167	5000	1000	10,000
<u>Dip/slurry</u> M/L A	5 <1	333 10	---- ----	---- ----	---- ----	---- ----

**Table 2.** DPR Margins of Exposure (MOE) for Fieldworker Reentry Scenarios.

Reentry Scenario	Acute MOE	Seasonal MOE	Annual MOE
Scouting cotton	1	111	1000
Scouting	<1	1	8
Scouting potatoes	1	10	50

**Table 3.** DPR Margins of Exposure (MOE) for Bystander Exposure.

	Acute MOE - 1-hr maximum exposure	Acute MOE - 24-hr TWA exposure
Infants	18	22
Adults	101	46

U.S. Environmental Protection Agency Actions

U.S. EPA completed their Interim Reregistration Eligibility Decision of carbofuran in August 2006. In this document, U.S. EPA proposed to cancel all uses of carbofuran with a four-year phase-out for uses on artichokes, chile peppers, cucurbits, spinach grown for seed, sunflowers and pine seedlings. In May 2009, U.S. EPA issued a final rule to revoke all tolerances for carbofuran effective December 31, 2009. During the objection period, the registrant (FMC Corporation) and three grower associations requested an administrative hearing on the action. In October 2009, U.S. EPA determined that the regulatory standard for holding a hearing was not met. FMC Corporation and the grower associations challenged the U.S. EPA action on carbofuran in Federal Court. FMC Corporation and the grower associations lost their final appeal when the Supreme Court declined (May 2011) to hear the request by FMC and the grower associations to review U.S. EPA's decision to revoke all domestic tolerances. In September 2011, U.S. EPA announced the cancellation of Furadan 10 G, Furadan 4F, Furadan 15 G, Furadan LFR, as requested by the registrant.

Carbofuran Use in California

As U.S. EPA has taken action to revoke tolerances and product cancellations proceed, carbofuran use in California has drastically declined (Table 4).

**Table 4.** Carbofuran Use in California from 2006 – 2010.

<b>CROP</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Alfalfa	15,262	18,262	7,499	2,976	4
Artichoke	3,455	92	87	0	0
Corn	128	0	0	0	0
Grape	2,988	4,377	7,542	6,623	0
Nursery	1,319	1,522	738	0	0
Potato	229	0	0	0	0
Oat	0	53	0	0	0

Carbofuran-related Illnesses in California

Between 1992 and 2008, California's Pesticide Illness and Surveillance Program (PISP) database reported 77 illness/injury cases that were definitely, probably, or possibly related to carbofuran use. All but two of the cases were from agricultural use. No cases involving carbofuran were reported after 2001.

Assessment of Need for Additional Mitigation Measures

Use of carbofuran in California has declined to the point that only four pounds were used on alfalfa in 2010. U.S. EPA has revoked all domestic tolerances and has cancelled almost all products. There are no active product registrations in California. No carbofuran-related illnesses have been reported in California since 2001. I recommend that DPR consider carbofuran mitigation complete.

cc: Linda O'Connell, Environmental Program Manager I, WHS Branch  
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Kevin Solari, Senior Environmental Scientist, WHS Branch  
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Attachment (References)

### References

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