

Appendix A

Product Formulations Containing Multiple Active Ingredients

The Agency does not routinely include, in its risk assessments, an evaluation of mixtures of active ingredients, either those mixtures of multiple active ingredients in product formulations or those in the applicator's tank. In the case of the product formulations of active ingredients (that is, a registered product containing more than one active ingredient), each active ingredient is subject to an individual risk assessment for regulatory decision regarding the active ingredient on a particular use site. If effects data are available for a formulated product containing more than one active ingredient, they may be used qualitatively or quantitatively^{1 2}.

Acute oral toxicity data (i.e., LD50 values) from mammalian studies for formulated products that contain 2,4-D and one or more additional active ingredients are summarized below.

Currently, the Agency's guidance for assessing the potential risk of chemical mixtures is limited to human health applications (USEPA, 2000). However, the guidance includes principles for evaluating mixtures to assess potential interactive effects that are generally applicable. Consistent with EPA's Overview Document (USEPA, 2004), the Agency's mixture guidance (USEPA, 2000) discusses limitations in quantifying the risk of specified mixture when there is differential degradation, transport and fate of chemical components following environmental release or application. The LD50 values are potentially useful only to the extent that a wild mammal would consume plants or animals immediately after these dietary items were directly sprayed by the product. Increasing time post application, the differential rates of degradation, transport, etc. for the active ingredients in the formulation only permit a qualitative discussion of potential acute risk (USEPA 2004).

As discussed in USEPA (2000) a quantitative component-based evaluation of mixture toxicity requires data of appropriate quality for each component of a mixture. In this mixture evaluation LD50s, with associated 95% confidence intervals, are needed for the formulated product. The same quality of data is also required for each component of the mixture. Given that many of the formulated products do not have LD50 values of the required quality and since LD50 values are not available for all the components of these formulations a quantitative analysis of potential interactive effects is not possible. In the case of 2,4-D, no multi-active ingredient product had LD50 values with 95% confidence intervals for all components in the mixture. However; a qualitative examination of the trends in LD50 values, across the range of percent active ingredient, show no discernable trends in potency that would suggest synergistic (i.e., more than additive) or antagonistic (i.e., less than additive) interactions.

¹ Overview of the Ecological Risk Assessment Process in the Office of Pesticide Programs, Environmental Protection Agency (January 2004) (Overview Document).

² Memorandum to Office of Prevention, Pesticides and Toxic Substance, US EPA conveying an evaluation by the U.S. Fish and Wildlife Service and National Marine Fisheries Service of an approach to assessing the ecological risks of pesticide products (January 2004).

Pesticide Products Formulated with 2,4-D and Other Pesticide Active Ingredients

2,4-D PRODUCTS^{3,4}

PRODUCT/TRADE NAME	EPA Reg.No.	% 2,4-D	PRODUCT		ADJUSTED FOR ACTIVE INGREDIENT	
			LD 50 (mg/kg)	CI (mg/kg)	LD50 (mg/kg)	CI (mg/kg)
RIVERDALE TRIPLET MC DRI WEED AND FEED	000228-00318	0.501	No Data	No Data	N/A	N/A
RIVERDALE 638 BROADLEAF HERBICIDE	000228-00320	12	>500	N/A	N/A	N/A
RIVERDALE MILLENNIUM ULTRA TM WEED AND FEED	000228-00376	0.861	>5000	N/A	N/A	N/A
RIVERDATE TSC TB-3 PREMIUM SELECTIVE HERBICIDE	000228-00383	7	>500 & <5000	N/A	N/A	N/A
RIVERDALE SWEET SIXTEEN WEED AND FEED WITH VIPER	000228-00401	0.182	>5000	N/A	N/A	N/A
VIPER WEED AND FEED (18#/5M)	000228-00412	0.162	>5000	N/A	N/A	N/A
VIPER WEED AND FEED (20#/5M)	000228-00413	0.146	>5000	N/A	N/A	N/A
SCOTTS LAWN WEED CONTROL	000538-00009	2.95	>5000	N/A	N/A	N/A
TURF BUILDER PLUS 2	000538-00028	1.49	>5000	N/A	N/A	N/A
SCOTTS PROTURF 36-0-0 FERTILIZER PLUS DICOT WEED CONTROL	000538-00033	1.37	>5000	N/A	N/A	N/A
SCOTTS SUPER TURF BUILDER PLUS 2 FOR GRASS	000538-00072	0.68	>5000	N/A	N/A	N/A
SUPER PLUS 2 WEED CONTROL PLUS LAWN FERTILIZER	000538-00167	1.42	>5000	N/A	N/A	N/A

³ From registrant submitted data to support registration. Compiled by Office of Pesticide Programs Registration and Health Effects Divisions.

⁴ 2,4-D: LD50= 699 mg/kg

PRODUCT/TRADE NAME	EPA Reg.No.	% 2,4-D	PRODUCT		ADJUSTED FOR ACTIVE INGREDIENT	
			LD 50 (mg/kg)	CI (mg/kg)	LD50 (mg/kg)	CI (mg/kg)
SCOTTS IMPROVED SUPER TURF BUILDER PLUS 2	000538-00168	1.6	>5000	N/A	N/A	N/A
SUPER PLUS 2 FOR GRASS	000538-00175	1.377	>5000	N/A	N/A	N/A
SCOTTS TURF BUILDER PLUS 2 FOR GRASS	000538-00179	0.99	>5000	N/A	N/A	N/A
PROTURF FERTILIZER PLUS DICOT WEED CONTROL III	000538-00186	1.22	>5000	N/A	N/A	N/A
SCOTTS LAWN PRO WEED & FEED WEED CONTROL PLUS LAWN FERTILIZER	000538-00205	1.22	No Data	No Data	N/A	N/A
FERTILIZER PLUS WEED CONTROL	000538-00208	1.22	>5000	N/A	N/A	N/A
TURF BUILDER W/PLUS 2 FOR LAWNS PLUS LAWN FERTILIZER	000538-00209	1.22	>5000	N/A	N/A	N/A
SCOTTS TURF BUILDER PLUS 2 FOR LAWNS PLUS LAWN FERTILIZER	000538-00210	1.22	>5000	N/A	N/A	N/A
LAWN PRO BROADLEAF WEED AND FEED/WEED CONTROL PLUS LAWN FERTILIZER	000538-00211	1.22	>5000	N/A	N/A	N/A
SCOTTS LAWN PRO WEED AND FEED	000538-00215	1.18	>5000	N/A	N/A	N/A
PRIVATE LABEL WEED AND FEED	000538-00220	1.49	No Data	No Data	N/A	N/A
PRIVATE LABEL FEED AND WEED	000538-00236	1.49	No Data	No Data	N/A	N/A
FERTILIZER WITH WEED CONTROL	000538-00251	0.25	>5000	N/A	N/A	N/A
LAWN PRO WEED AND FEED FOR LAWNS	000538-00270	1.18	>5000	N/A	N/A	N/A
MIRACLE-GRO (R) WEED & FEED	000538-00279	1.16	>5000	N/A	N/A	N/A
SUPER TURF BUILDER PLUS 2 (R)	000538-00280	1	>5000	N/A	N/A	N/A
WINTERIZER WITH PLUS 2 WEED CONTROL	000538-00281	1.04	>5000	N/A	N/A	N/A
TURF BUILDER PLUS 2 (R)	000538-00282	1.21	>5000	N/A	N/A	N/A
SUPER WINTERIZER WITH PLUS 2 WEED CONTROL	000538-00283	1.03	>5000	N/A	N/A	N/A

PRODUCT/TRADE NAME	EPA Reg.No.	% 2,4-D	PRODUCT		ADJUSTED FOR ACTIVE INGREDIENT	
			LD 50 (mg/kg)	CI (mg/kg)	LD50 (mg/kg)	CI (mg/kg)
TURF BUILDER PRE/POST 2	000538-00299	0.69	No Data	No Data	N/A	N/A
TRIMEC DMB MIX NO. 1	002217-00508	10	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEED & FEED 15	002217-00563	0.34	No Data	No Data	N/A	N/A
TRIMEC D.M.B. #2 TURF HERBICIDE	002217-00566	45.59	720	582-891	328	265-406
TRIMEC D.M.B. #3 TURF HERBICIDE	002217-00567	11.6	No Data	No Data	N/A	N/A
ST.AUGUSTINEGRASS WEED & FEED 580 20-10-5 LAWN FERTILIZER PLUS TRIMEC	002217-00568	0.175	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEED & FEED 30 24- 4-8	002217-00579	0.69	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEED & FEED 20	002217-00580	0.456	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEED & FEED 24	002217-00581	0.55	No Data	No Data	N/A	N/A
TRIMEC D.M.B #4 TURF HERBICIDE	002217-00593	10.96	No Data	No Data	N/A	N/A
GORDON'S ST. AUGUSTINEGRASS LAWN WEEDER & FEEDER	002217-00594	0.082	No Data	No Data	N/A	N/A
TRIMEC DMB MIX NO. 1-4X MANUFACTURING CONCENTRATE	002217-00615	37.6	No Data	No Data	N/A	N/A
DM MIX #1 TURF HERBICIDE	002217-00621	26.9	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEEDER GRANULES	002217-00640	1.37	>5015	N/A	N/A	N/A
GORDON'S TRIMEC WEED AND FEED 24B	002217-00643	0.55	>5050	N/A	N/A	N/A
GORDON'S TRIMEC WEED AND FEED 27	002217-00658	0.62	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEED & FEED 33 1/2	002217-00660	0.76	No Data	No Data	N/A	N/A
DM 899 LIQUID WEED & FEED 20-0-0	002217-00742	4.51	>5000	N/A	N/A	N/A
TRIMEC 973 WEED & FEED	002217-00754	0.5	No Data	No Data	N/A	N/A
GORDON'S TRI-GUARD 20-10-5	002217-00793	0.62	No Data	No Data	N/A	N/A
GORDON'S GRANULAR 33 1/2	002217-00794	0.76	No Data	No Data	N/A	N/A
GORDON'S TRIPLEX 24-4-8	002217-00795	0.69	No Data	No Data	N/A	N/A
GORDON'S TRIMEC WEED & FEED 2001	002217-00801	0.46	No Data	No Data	N/A	N/A
GORDON'S TRIPLE PLAY	002217-00805	1.37	No Data	No Data	N/A	N/A
EH1314 HERBICIDE	002217-00814	45.5	720	582-891	328	265-405
EH1352 WEED & FEED	002217-00819	0.84	No Data	No Data	N/A	N/A

PRODUCT/TRADE NAME	EPA Reg.No.	% 2,4-D	PRODUCT		ADJUSTED FOR ACTIVE INGREDIENT	
			LD 50 (mg/kg)	CI (mg/kg)	LD50 (mg/kg)	CI (mg/kg)
EH-1397 HERBICIDE	002217-00851	45.59	720	582-891	328	265-406
EH-1400 HERBICIDE	002217-00856	0.64	>2000	N/A	N/A	N/A
EH-1402 HERBICIDE	002217-00858	0.64	>2000	N/A	N/A	N/A
EH-1401 HERBICIDE	002217-00859	0.64	>2000	N/A	N/A	N/A
EH-1407 HERBICIDE	002217-00868	0.64	>2000	N/A	N/A	N/A
MUP CODE 243	002217-00870	45.5	No Data	No Data	N/A	N/A
TECHNICAL ISOPROPYL ESTER OF 2,4-D	005481-00144	1.7	440	275-704	8	5-12
HM-2025	005905-00553	11.4	>2000 & <5000	N/A	N/A	N/A
HM-0335A	005905-00564	24.62	No Data	No Data	N/A	N/A
FERTI LOME WEED KILLER PLUS LAWN FOOD	007401-00242	0.64	No Data	No Data	N/A	N/A
PARAMOUNT BW HERBICIDE	007969-00152	60	>1000 & < 2000	N/A	N/A	N/A
ACE LAWN FOOD WITH WEED CONTROL 22-6-8	008660-00170	0.94	No Data	No Data	N/A	N/A
DEEP GREEN VIGORO 23-3-7 LAWN FERTILIZER & WEED CONTROL	008660-00172	0.68	No Data	No Data	N/A	N/A
GRO-TONE 18 WEED & FEED	008660-00184	0.61	No Data	No Data	N/A	N/A
GRO-TONE 20 WEED & FEED	008660-00185	0.55	No Data	No Data	N/A	N/A
PAR EX SLOW RELEASE FERTILIZER	008660-00212	0.66	No Data	No Data	N/A	N/A
SCOTTS PROTURF 36-0-0 FERTILIZER PLUS DICOT WEED CONTROL II	009198-00180	1.37	No Data	No Data	N/A	N/A
WEED & FEED FOR NORTHERN TURFGRASSES	032802-00074	0.55	No Data	No Data	N/A	N/A
ACME VEGETATION KILLER	033955-00454	1	3129	1750-5000	31	18-50
TOP GUN	034704-00817	71.2	1011	749-1365	720	533-972
ALBAUGH D-638	042750-00036	13.8	1698	No Data	N/A	N/A
BWII	042750-00100	24.62	2613	1250-5000	643	308-1231
SCORPION III	062719-00264	50	No Data	No Data	N/A	N/A

PRODUCT/TRADE NAME	EPA Reg.No.	% 2,4-D	PRODUCT		ADJUSTED FOR ACTIVE INGREDIENT	
			LD 50 (mg/kg)	CI (mg/kg)	LD50 (mg/kg)	CI (mg/kg)
ESTERON 638	062719-00330	13.8	1608	No Data	N/A	N/A
WEEDONE 638 BROADLEAF HERBICIDE	071368-00003	13.8	No Data	No Data	N/A	N/A
WEEDONE 638 SOLVENTLESS BROADLEAF HERBICIDE	071368-00019	13.8	2126	1671-2704	293	231-373
RECOIL BROAD SPECTRUM HERBICIDE	071368-00035	11.38	>2000	N/A	N/A	N/A
RD 1646	071995-00043	0.182	>5000	N/A	N/A	N/A
TRIMEC GRANULAR HERBICIDE PLUS LAWN FERTILIZER	072155-00020	0.761	No Data	No Data	N/A	N/A
TRIMEC + PRODIAMINE GRANULAR HERBICIDE PLUS LAWN FERTILIZER	072155-00060	0.69	>5000	No Data	N/A	N/A