

Pesticide Clearinghouse Summary for the Nebraska Department of Agriculture
Progress Report for the period October 1, 2012 to September 30, 2013

This summary of activities associated with the Nebraska Ground-water Pesticide Clearinghouse is submitted in fulfillment of a cooperative agreement between the Nebraska Department of Agriculture and the Board of Regents of the University of Nebraska.

The Database

The database currently contains 349,771 pesticide analyses for 5,338 wells. This is a 0.6% increase (approximately 2,150 results) in the quantity of pesticide data since the last progress report. Data added in the last year include 2012 results from the Papio-Missouri River Natural Resources District contributed by the USGS and 2012 results from the Lower Platte North and Lower Platte South Natural Resources Districts. The pesticide database is complete and up-to-date with respect to all agency submissions. To date, 240 pesticides and pesticide degradates have been measured in Nebraska ground water. No new pesticides or pesticide degradates were added to the database in the last year. Table 1 contains the complete list of analytes.

The pesticide data added this year had a small effect on the distribution of the data by well use (Figure 1). Monitoring well data continue to constitute the majority (62%) of the database and approximately 67% of those data are from the MSEA study. Irrigation (12%), domestic (18%), and public supply (7%) well data largely comprise the remainder of the analyses. Stock and industrial well data do not contribute significantly to the database.

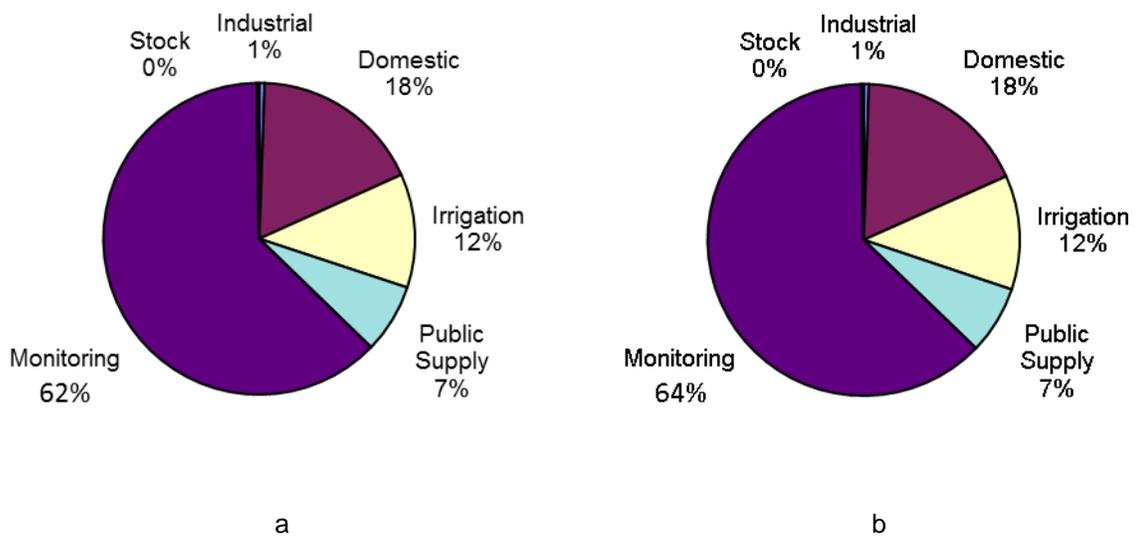


Figure 1. Distribution of the data by well use as of September 30, 2013 (a) and September 30, 2012 (b).

Figure 2 shows the relative contribution of each agency to the pesticide database. The Natural Resources Districts' contribution increased in the last year with the addition of a substantial amount of data from 2012.

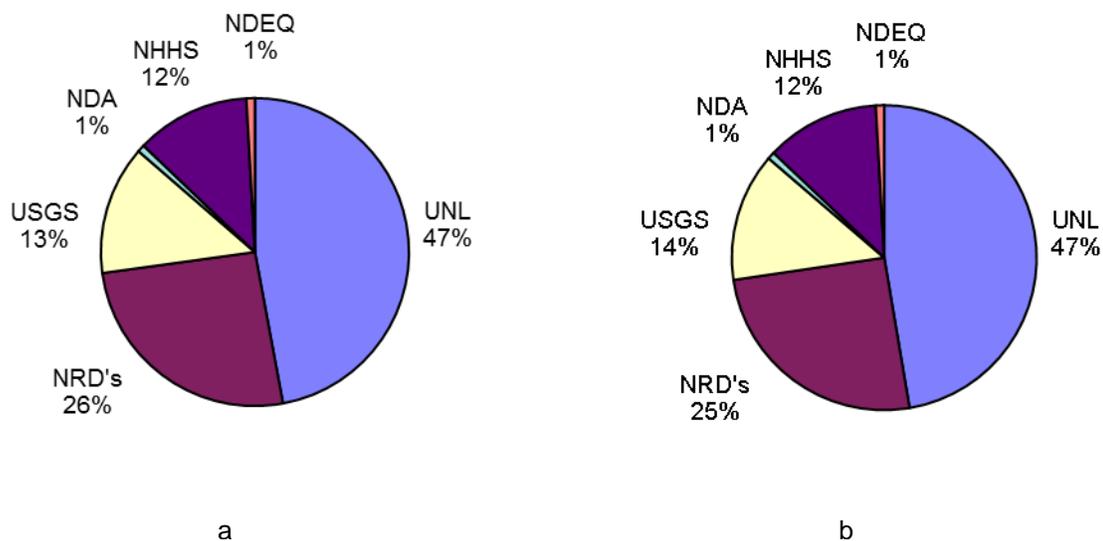


Figure 2. Sources of the pesticide data as of September 30, 2013 (a) and September 30, 2012 (b).

Since 1976, 51 pesticides and pesticide degradates have been detected at least once (Table 1). During the present decade (2003-2012), 34 pesticides and degradates have had at least one detection.

Atrazine remains the most frequently detected pesticide in Nebraska ground water. Figure 3 shows the distribution of the 683 wells sampled for atrazine in the 10-year period from 2003-2012 and the relative concentrations. While atrazine was detected during this 10 year period in 11.9% of the wells, none of the concentrations exceeded the 3 $\mu\text{g/L}$ maximum contaminant level (MCL). During the same period, the atrazine degradates deethylatrazine (DEA) and deisopropylatrazine (DIA) were detected in 9.2% and 1.4%, respectively, of the wells in which they were measured. Alachlor and metolachlor were detected in 0.3% and 1.5% of the wells, respectively. Alachlor, a regulated pesticide, did not exceed the MCL.

During the two five-year periods from 2003-2007 and 2008-2012, the incidence of atrazine detections decreased from 12.2% to 5.8% and the incidence of DEA detections decreased from 9.4% to 2.1%. The detections of DIA increased from 0.9% to 1.7% during the same five-year periods. Metolachlor detections also decreased from 1.4% to 0.7%. While alachlor was detected at an incidence of 0.3% in the five years from 2003-2007, there were no detections in the 289 samples analyzed in the last five years. Overall, there was a decrease in the number of ground water samples analyzed for each of these analytes during the five-year period from 2008-2012 relative to the preceding five-year period.

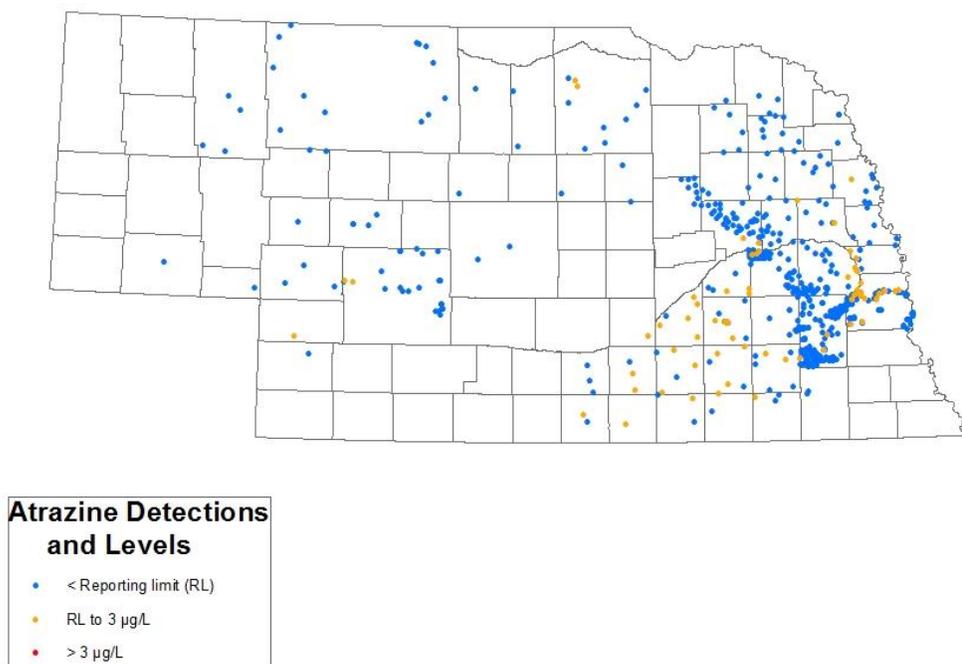


Figure 3. Locations and levels of atrazine in wells sampled 2003-2012.

The pesticide data added in the last year had quality assessment flags of 2, 4, and 5. There are significant differences in the proportions of data associated with each quality flag during the two 5-year periods (figure 4). The number of analyses declined 54% during the two periods, and the data quality declined as well. Approximately 83% of the pesticide data obtained in the 2008-2012 period are of very good quality, down from approximately 92% in the 2003-2007 period.

Summary of 2012 Activities

The 2012 NRD pesticide data were acquired from the Lower Platte South and Lower Platte North NRDs and Papio-Missouri River NRD data submitted by the USGS. These data were reviewed, assessed and incorporated into the database. These data will be uploaded to the website in November, 2013.

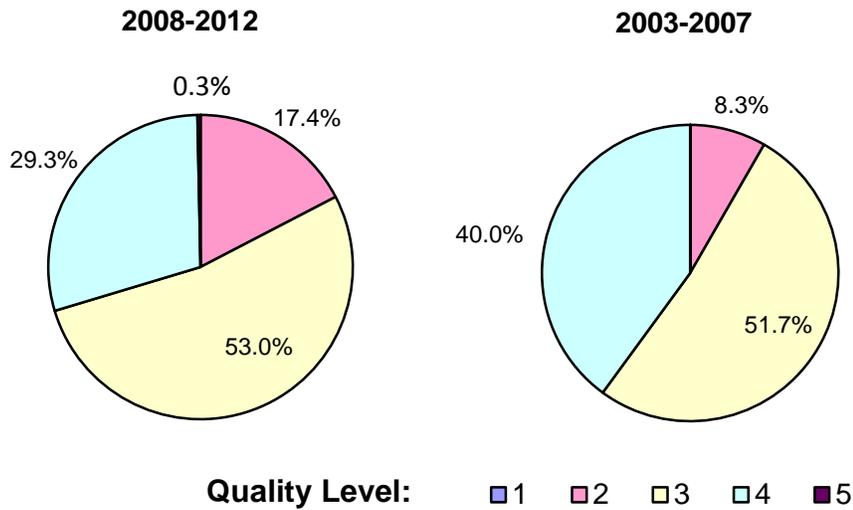


Figure 4. Percentage of analyte data for each quality assessment flag for the periods 2008-2012 and 2003-2007.

Future Activities

The coming year's focus will be the acquisition, assessment, and incorporation of 2013 NRD data into the database. Updates of the database will be submitted to the Nebraska Department of Natural Resources (NDNR) by November 1, 2014 for dissemination to the website. More frequent updates will occur as warranted. The September 2014 update will include all available data through 2013 to ensure that NDEQ and NDA year-end reports are based on the latest and most complete dataset available. We will work with the NDNR and NDA to upload the ELISA data and establish linkage to the clearinghouse website.

Table 1. Pesticide analytes and the number of wells in which the analyte was measured from 1976-2012. Analytes not analyzed in the last 10 years are highlighted in gray.

Pesticide	Number of Wells	Pesticide	Number of Wells
1,1,1-trichloroethane	33	aldicarb sulfone	236
1,2,4-trichlorobenzene	33	aldicarb sulfoxide	223
1,2-dibromo-3-chloropropane	199	aldrin*	340
1,2-dibromoethane	356	alpha-HCH	451
1,2-dichlorobenzene	33	ametryn*	791
1,2-dichloroethane**	199	atrazine**	4890
1,2-dichloropropane**	199	azinphos-methyl	328
1,3-dichloropropane	166	azinphos-methyl oxon	34
1,4-dichlorobenzene	199	bendiocarb	197
1-naphthol	77	benfluralin	645
2,4,5-T	67	benomyl	197
2,4,6-trichlorophenol	10	bensulfuron-methyl	197
2,4-D	285	bentazon	222
2,4-D methyl ester**	197	benzo(a)pyrene	56
2,4-DB	223	beta-HCH	162
2,4-dinitrophenol	10	bromacil**	575
2,6-diethylaniline	328	bromomethane	199
2-[(2-ethyl-6-methylphenyl)-amino]-1-propanol	20	bromoxynil	223
2-[(2-ethyl-6-methylphenyl)amino]-2-oxoethane sulfonic acid**	65	butachlor	619
2-chloro-2',6'-diethylacetanilide	39	butylate*	3965
2-ethyl-6-methylaniline	42	carbaryl	2617
3,4-dichloroaniline	38	carbofuran	2610
3,5-dichloroaniline	7	carbon disulfide	166
3-hydroxycarbofuran	223	carbon tetrachloride*	190
4,6-dinitro-o-cresol	26	carboxin	124
4-chloro-2-methylphenol	34	chloramben methyl ester	197
4-chloro-3-methylphenol	10	chlordane	297
4-nitrophenol	10	chlorimuron-ethyl	197
Acenaphthene	10	chloroform*	31
acetochlor**	1775	chlorothalonil	26
acetochlor ethane sulfonic acid**	108	chlorpyrifos*	3144
acetochlor oxanilic acid**	108	chlorpyrifos oxon	34
acetochlor sulfynilacetic acid	69	cis-1,3-dichloropropene	166
Acifluorfen	223	cis-permethrin	327
Acrylonitrile	195	clopyralid	223
alachlor**	4626	cyanazine*	4623
alachlor ethane sulfonic acid, secondary amide**	69	cyanazine acid**	12
alachlor ethane sulfonic acid**	557	cyanazine amide	16
alachlor oxanilic acid**	557	cycloate	322
alachlor sulfynilacetic acid	69	cyfluthrin	34
aldicarb	206	cypermethrin	34
		cyprazine	71

*Detected in at least one sample.

**Detected in the last 10 yrs.

Table 1. (continued)

Pesticide	Number of Wells	Pesticide	Number of Wells
DCPA	338	endrin	423
DCPA monoacid	233	endrin aldehyde	162
DDD	180	EPTC*	1935
DDT	180	esfenvalerate	18
dechloroacetochlor	9	ethalfuralin	645
dechloroalachlor	9	ethion	40
dechlorodimethenamid	9	ethion monoxon	34
dechlorometolachlor**	9	ethoprop	289
deethylatrazine**	2147	ethyl parathion	2553
deethylcyanazine	12	fenamiphos	39
deethylcyanazine acid**	12	fenamiphos sulfone	39
deethylcyanazine amide	12	fenamiphos sulfoxide	31
deethylhydroxyatrazine	12	fenuron	223
deisopropylatrazine**	1991	fipronil	191
deisopropylhydroxyatrazine	12	fipronil sulfide	191
delta-HCH	162	fipronil sulfone	191
demethylfluometuron	12	flufenacet	75
desulfinylfipronil	191	flufenacet ethane sulfonic acid	108
desulfinylfipronil amide	191	flufenacet oxanilic acid	108
di(2-ethylhexyl)adipate	56	flumetsulam	196
di(2-ethylhexyl)phthalate	56	fluometuron	235
diazinon**	487	fonofos**	3952
diazoxon	38	fonofos oxon	34
dicamba	263	heptachlor	340
dichlobenil	26	heptachlor epoxide**	339
dichlorprop	223	hexachlorobenzene	187
dichlorvos	34	hexachlorocyclopentadiene	187
dicrotophos	32	hexazinone	401
didealkylatrazine**	30	hydroxyacetochlor	9
dieldrin	719	hydroxyalachlor**	9
dimethenamid	443	hydroxyatrazine**	209
dimethenamid ethane sulfonic	108	hydroxydimethenamid	9
dimethenamid oxalic acid	108	hydroxymetolachlor	9
dimethoate	46	hydroxysimazine**	12
dinoseb	223	imazaquin	167
diphenamid	322	imazethapyr	195
disulfoton	437	imidacloprid	197
disulfoton sulfone	7	iodomethane	166
diuron**	451	iprodione	34
endosulfan I	169	isofenphos	333
endosulfan II	162	isoxaflutole	696
endosulfan sulfate	169		

*Detected in at least one sample.

**Detected in the last 10 yrs.

Table 1. (continued)

Pesticide	Number of Wells	Pesticide	Number of Wells
		propachlor*	2342
isoxaflutole benzoic acid**	696	propachlor ethane sulfonic acid	69
isoxaflutole diketonitrile**	696	propachlor oxanilic acid	69
lindane	712	propanil	289
linuron	302	propargite	289
malathion	366	propazine*	2044
malathion oxon	39	propham	236
MCPA	223	propiconazole	197
MCPB	223	propoxur	236
metalaxyl	224	propyzamide	328
methidathion	39	siduron	197
methiocarb	236	silvex	66
methomyl	236	simazine**	2510
methoxychlor	423	simetryn	219
methyl paraoxon	34	sulfometuron-methyl	197
methyl parathion*	2500	tebuthiuron*	329
methylene chloride	33	terbacil	415
metolachlor**	4444	terbufos	3740
metolachlor ethane sulfonic acid**	557	terbufos oxon sulfone	39
metolachlor oxanilic acid**	557	terbutylazine	57
metribuzin**	4516	terbutryn	93
metsulfuron-methyl	167	tetrachloroethene	33
molinate	289	thiobencarb	289
myclobutanil	39	toxaphene	246
naphthalene	33	trans-1,3-dichloropropene	166
napropamide	289	triallate	607
neburon	223	trichloroethene	33
nicosulfuron	197	triclopyr	223
norflurazon	223	trifluralin*	4359
oryzalin	221	vernolate	125
oxadiazon	58		
oxamyl	223		
oxyfluorfen	7		
p,p'-DDE (previously DDE)	469		
pebulate	289		
pendimethalin*	1668		
pentachlorophenol	10		
permethrin*	976		
phorate	782		
phorate oxon	34		
phosmet	34		
phosmet oxon	29		
picloram**	223		
prometon*	2345		
prometryn*	792		

*Detected in at least one sample.

†Detected in the last 10 yrs.