



Idaho State Department of Agriculture  
 Division of Agricultural Resources  
 Southern Idaho Ground Water Pesticide  
 Response Monitoring, 2001 Sampling



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ISDA Technical Results Summary #11

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## Introduction

During the summer of 2001, Idaho State Department of Agriculture (ISDA) ground water personnel conducted ground water monitoring for pesticide detections of concern in southern Idaho. This work was in response to previous elevated ground water detections of atrazine, dacthal, and simazine. The testing was completed following the response protocol as outlined in the draft *Idaho State Pesticide Management Plan (PMP) for Ground Water Protection (Draft 2001)*. Funding was provided by the Environmental Protection Agency (EPA) Region 10 as a discretionary project.

The purpose of the monitoring was to determine the extent of contamination surrounding each well where the original detections have been found. Areas of focus were northwest Ada County, northwest Owyhee County, southwest Washington County, northern Cassia County, and southern Minidoka County. Each area was studied to determine the area of impact relative to atrazine, dacthal, or simazine. The majority of detections of

concern were related to dacthal in Ada, Owyhee, and Washington Counties.

## Methods

Follow-up monitoring was conducted in the vicinity of 16 wells in which historical pesticide detections were at or near 20% of a health standard. A total of 63 samples (including Quality Assurance/Quality Control (QA/QC)) were collected from 54 wells located in five separate geographical areas. Monitoring efforts were completed on August 27, 2001. All samples were collected following ISDA sampling procedures and sent to the University of Idaho Analytical Sciences Laboratory (UIASL) in Moscow, Idaho for analysis. A summary of the type of testing methods and quality assurance is located in Table 1. ISDA Quality Assurance Project Plan and Standard Operating Procedures were followed and successfully completed. UIASL Quality Assurance procedures were followed and successfully completed by laboratory personnel.

**Table 1.** Summary of discretionary fund ground water pesticide testing.

| County     | EPA Method     | Wells | Duplicates | MS/MSD* | Samples |
|------------|----------------|-------|------------|---------|---------|
| Ada        | 515.1          | 22    | 2          | 1       | 25      |
| Cassia     | 515.1, 507/508 | 18    | 2          | 1       | 21      |
| Owyhee     | 515.1          | 5     | 1          | -       | 6       |
| Minidoka   | 507/508        | 6     | 1          | -       | 7       |
| Washington | 515.1          | 3     | 1          | -       | 4       |
| Totals     | -              | 54    | 7          | 2       | 63      |

\*MS/MSD—Matrix Spike/Matrix Spike Duplicate

**Table 2.** Summary of discretionary fund testing coupled with ISDA regional efforts (where applicable).

| County     | Pesticide | Median Concentration (µg/L) | Maximum Concentration (µg/L) | Range (µg/L) | # of Detections |
|------------|-----------|-----------------------------|------------------------------|--------------|-----------------|
| Ada        | Dacthal   | 12                          | 30                           | 0.14—30      | 13              |
| Cassia*    | Atrazine  | 0.08                        | 0.45                         | 0.03—0.45    | 28              |
| Owyhee*    | Dacthal   | 0.82                        | 67                           | 0.08—67      | 19              |
| Owyhee*    | Atrazine  | 0.06                        | 0.08                         | 0.03—0.08    | 4               |
| Minidoka*  | Simazine  | 0.10                        | 0.40                         | 0.03—0.40    | 8               |
| Washington | Dacthal   | 23                          | 27                           | 19—27        | 3               |

\* Statistics based on discretionary fund testing and ISDA regional monitoring.

## Results

### Overall Results

The UIASL completed all analytical testing. Analytical laboratory reports were subsequently delivered to the ISDA by November 2001. A written summary of results with statistical findings and GIS maps was completed and included in various ISDA Pesticide Applicator Update publications and other newsletters and seminars.

Multiple detections were found in all five geographical areas (Table 2). Results suggested declining pesticide concentrations in four of the five

**Table 3.** Dacthal statistics from May 2001 sampling of ground water in northwest Owyhee County.

| Category                                 | Concentrations (µg/L) or Number of Detections |
|--|---|
| Number of Detections                     | 19  |
| Range of Detections                      | 0.08—67 (µg/L)                                |
| # of Detections > 20% of Reference Point | 3   |
| Mean Concentration                       | 9.7 (µg/L)                                    |
| Median Concentration                     | 0.82 (µg/L)                                   |
| Health Reference Point (Reference Dose)  | 100 µg/L                                      |

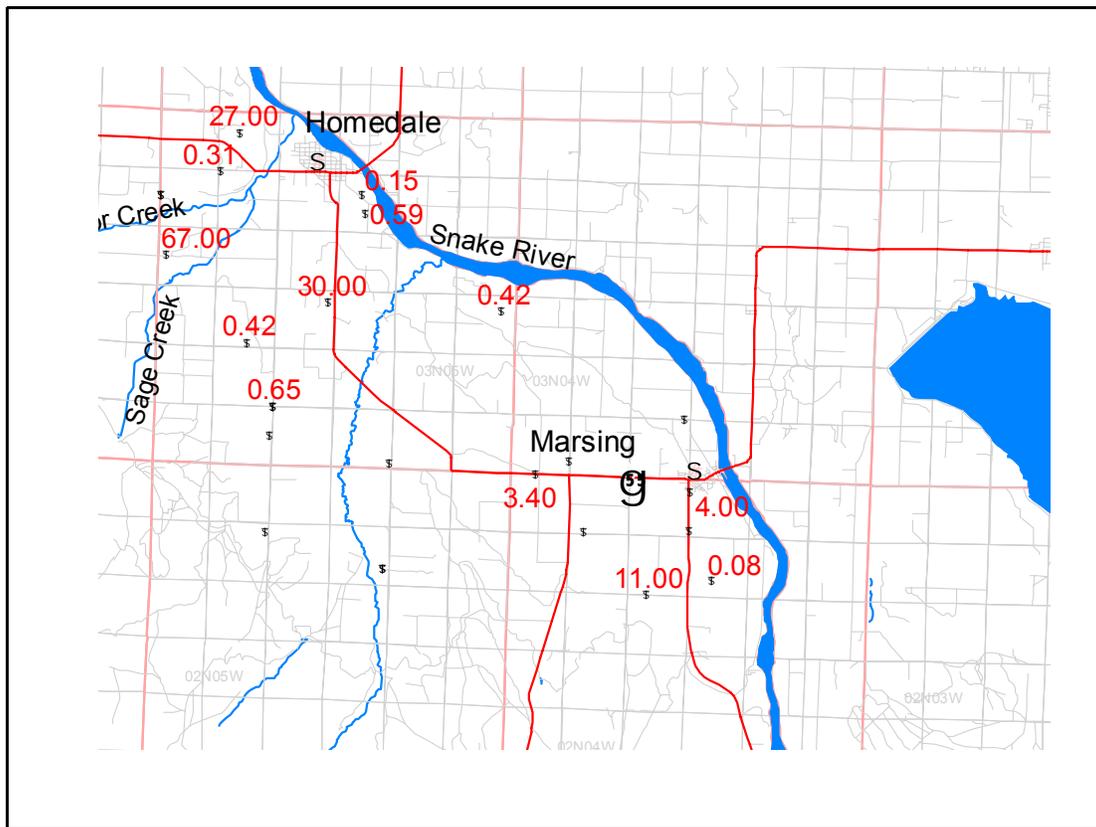
**Table 4.** Dacthal concentrations in wells 8601101 and 8602801 located southwest of Homedale.

| Well ID | Sampling Date  | Concentrations (µg/L) |
|---------|----------------|-----------------------|
| 8601101 | April 7, 1999  | 65                    |
|         | June 22, 2000  | 48                    |
|         | May 9, 2001    | 67                    |
| 8602801 | April 19, 1999 | 41                    |
|         | June 22, 2000  | 47                    |
|         | May 8, 2001    | 27                    |

areas. Increases were detected in the Owyhee County area.

### Northwest Owyhee County

Numerous dacthal detections were located in northwest Owyhee County near Homedale and Marsing, an area of loam to sandy loam soils with shallow vulnerable ground water (Figure 1). The detections ranged from 0.08 to 67 micrograms per liter (µg/L) (Table 3). The mean concentration for the 19 sites with detections was 9.7 µg/L (Table 3).



**Figure 1.** Dacthal detections ( $\mu\text{g/L}$ ) from 2001 ground water sampling in northwest Owyhee County, Idaho.

There were three detections greater than  $20 \mu\text{g/L}$ , including the two wells that were the initial wells of focus (Table 3 & 4). Wells 8601101 & 8602801 were the two wells of original focus (Table 4) (Figure 1). These wells have detections greater than 20% of the reference dose three years consecutively.

Detections are commonly found throughout the northwest Owyhee County study area (Figure 1). Dacthal detections in the Marsing and Homedale area appear to be coming from nonpoint source legal applications. Leaching into shallow ground water is potentially occurring at the field level. Detection frequency and longevity of the pesticide in ground water are of concern. Based on other ISDA work, this area is susceptible to nitrate contamination from agricultural sources.

### Northwest Ada County

ISDA has studied dacthal concentrations in northwest Ada County west of Eagle since 1995. This is an area of sandy soils and shallow vulnerable

**Table 5.** Dacthal statistics from August 2001 sampling of ground water in northwest Ada County.

| Category                                 | Concentrations ( $\mu\text{g/L}$ ) or Number of Detections |
|--|--|
| Number of Detections                     | 13   |
| Range of Detections                      | 0.14—30  |
| # of Detections > 20% of Reference Point | 3  |
| Mean Concentration                       | 11.9   |
| Median Concentration                     | 12   |
| Health Reference Point (Reference Point) | 100  |

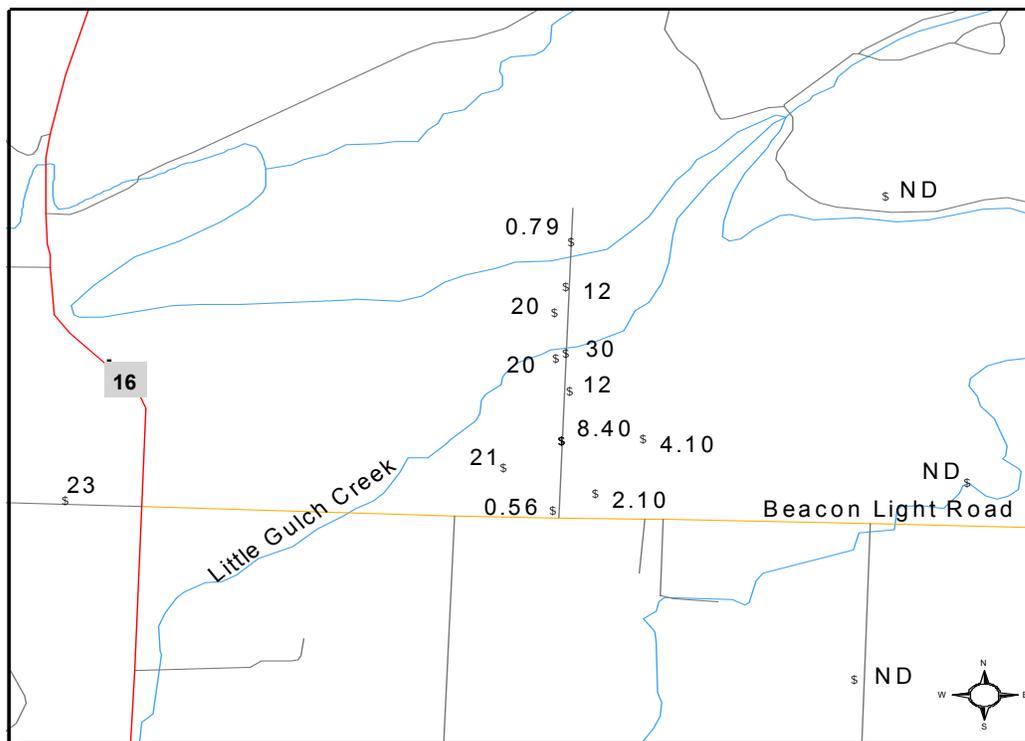
**Table 6.** Dacthal detections ( $\mu\text{g/L}$ ) of significance for select wells sampled over a six year period in northwest Ada County.

| Well ID | Sampling Date    | Concentrations ( $\mu\text{g/L}$ ) |
|---------|------------------|------------------------------------|
| 5300601 | March 29, 1995   | 11                                 |
|         | August 22, 2001  | 23                                 |
| 5302501 | July 27, 1995    | 38                                 |
|         | August 27, 2001  | 12                                 |
| 5302701 | July 27, 1995    | 110                                |
|         | August 27, 2001  | 12                                 |
| 5303401 | August 23, 1995  | 82                                 |
|         | August 22, 2001  | 21                                 |
| 5303701 | November 1, 1995 | 57                                 |
|         | August 23, 2001  | 8.4                                |
| 7600601 | March 29, 1995   | 120                                |
|         | July 27, 1995    | 110                                |
|         | August 27, 2001  | 20                                 |

ground water. Numerous dacthal detections of concern were located in northwest Ada County about seven miles west of Eagle (Table 5, (Figure 2). The detections ranged from 0.14 to 30  $\mu\text{g/L}$  (Table 5). The mean concentration for the 12 sites with detections was 11.9  $\mu\text{g/L}$  (Table 5). There were four detections greater than 20  $\mu\text{g/L}$ , including some of the wells that were the initial wells of focus in 1995 (Table 6). Most wells that had elevated dacthal in 1995 were found to have reduced concentrations in 2001.

### Southwestern Washington County

ISDA has studied dacthal concentrations in southwestern Washington County west of Weiser for a number of years. This is an area of loam soils with shallow ground water. In May 1999, ISDA detected dacthal at well 7104101 west of Weiser at a concentration of 20  $\mu\text{g/L}$  (Table 7). Sampling of the same well in 2000 yielded a concentration of 42  $\mu\text{g/L}$ . In 2001, ISDA again tested the well and an additional three wells in the area. Well 7104101



ND = Nondetect

**Figure 2.** Ground water wells with dacthal detections ( $\mu\text{g/L}$ ) in northwest Ada County in 2001.

had a 2002 detection of 27 µg/L (Table 7). Three of the four wells returned positive detections for dacthal. The three wells with positive detections are located in close proximity to each other and are tapping the same shallow ground water system.

**Table 7.** Dacthal detections (µg/L) at wells sampled in 2001 west of Weiser in Washington County.

| Well ID | Sampling Date  | Concentrations (µg/L) |
|---------|----------------|-----------------------|
| 7104101 | May 5, 1999    | 20                    |
|         | May 8, 2000    | 42                    |
|         | April 26, 2001 | 27                    |
| 7107101 | April 26, 2001 | 19                    |
| 7107201 | April 26, 2001 | 23                    |

## Educational and Outreach

As a part of this project ISDA water program personnel have accomplished education and outreach efforts. This work has been related to atrazine, dacthal, and simazine. These activities took place from the fall of 2001 to the spring of 2002.

- ISDA Field Staff Meeting (State Office)
- Great American Farm Show (Ada County)
- Owyhee Soil Conservation District Pesticide Applicator Recertification Training (Owyhee County)
- Idaho Agricultural Ground Water Quality Coordination Committee Meeting (State Office)
- Idaho Crop Producers Association Annual Conference (Statewide Event held in Jackpot, Nevada)
- Scott Creek/Mann Creek Ground Water Quality Advisory Committee (Washington County)
- Weiser River Soil Conservation District Board Meeting (Washington County)
- Burley Irrigation Scheduling Workshop

(Cassia and Minidoka Counties)

- Minidoka County Soil and Water Conservation District Board Meeting (Minidoka County)
- Pesticide Updates (ISDA’s Certification and Training Newsletter)

ISDA will continue to work with state and local officials, pesticide dealers, pesticide applicators, and homeowners to address these pesticide and ground water protection issues. A focus will be placed on dacthal in Ada, Owyhee, and Washington Counties.

## Conclusions and Recommendations

Through monitoring and evaluation of existing data it is apparent that atrazine, dacthal, and simazine have the potential to leach into ground water from legal application and use. Of these three, dacthal is the pesticide of most concern. The areas of concern in Owyhee, Washington, and Ada Counties all have shallow ground water and soils that range from loam to sand. Numerous detections occur above 20% of the reference point of 100 µg/L. This is the level at which ISDA’s PMP process calls for additional monitoring, monitoring wells, pesticide use and record keeping evaluation, work with registrants and dealers, implementation of Best Management Practices (BMPs), and possible regulations.

ISDA would like landowners, pesticide applicators, dealers, and consultants to work toward or continue sound pesticide planning, handling, mixing, loading, application, and disposal techniques to minimize potential for impact to ground water. Planning, management, and following the pesticide label are key to minimizing impacts to ground water. Also, proper irrigation management and scheduling is a key to successful protection of ground water especially when leachable compounds are chosen for crop protection needs.

In the future, planning and decision making processes also may warrant using alternative chemicals in place of pesticides such as dacthal. Future efforts will be made to inform applicators on use and protection and to create an Idaho Pesticide Management Plan (PMP) for dacthal and potentially other pesticides.