Idaho Crops & Soils News

A newsletter for Idaho crop producers

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The goal of this monthly newsletter is to serve the best interests of Idaho crop producers. Correspondence and inquiries should be addressed to: Olga Walsh, Cropping Systems Extension Specialist, Southwest Research and Extension Center, 29603 U of I Lane, Parma, ID 83660, Phone: (208)722-6701 (ext. 218), Fax: (208)722-6708, Email: owalsh@uidaho.edu

<table>
<thead>
<tr>
<th>TOPICS:</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHAT’S NEW?</td>
<td></td>
</tr>
<tr>
<td>Twitter and Blog</td>
<td>2</td>
</tr>
<tr>
<td>Direct Seed Workshop</td>
<td>2</td>
</tr>
<tr>
<td>Cutting-edge technology boosts precision</td>
<td>3</td>
</tr>
<tr>
<td>Soil Health</td>
<td>4</td>
</tr>
<tr>
<td>GUEST CONTRIBUTION</td>
<td></td>
</tr>
<tr>
<td>Does Manure Land Injection Reduce Ammonia Emissions? - Lide Chen</td>
<td>5</td>
</tr>
<tr>
<td>GETTING TO KNOW ID AG</td>
<td></td>
</tr>
<tr>
<td>Research Technician position, Parma</td>
<td>6</td>
</tr>
</tbody>
</table>

University of Idaho Extension improves people's lives by engaging the University and our communities through research-based education. Our areas of expertise are Agriculture, Community Development, Family and Consumer Sciences, Natural Resources, and Youth Development.

To enrich education through diversity the University of Idaho is an equal opportunity/affirmative action employer and educational institution.
WHAT’S NEW?

We are on Twitter!
Idaho Cropping Systems team is now on Twitter – Follow us (@IDCrops) to keep up-to-date with the news, upcoming events and educational opportunities we offer.

We will be posting the links to interesting agriculture-related materials, publications, and presentations on crop and soil management.

Follow us on Twitter: @IDCrops

We are on the Web!
Our Cropping Systems Blog - ID Crops & Soils has been popular and over 60 visitors from 3 countries have viewed the blog pages since January 2015.

We will be posting presentations and articles presented at recent professional meetings and grower outreach events.
We welcome comments and questions on soil and crop management issues! So far, some of the common questions we’ve received were: “Seeding winter wheat in the spring”, and “Potential cultural practices to increase wheat yields”.
Another popular topics discussed this month was “Sustainable and efficient production of dry edible beans” and “Becoming Certified Crop Advisor”.
The questions can be submitted via blog or directly to Olga Walsh at owalsh@uidaho.edu

Direct Seed Workshop

• An interactive grower panel has been a hit among the attendees at the last workshop, where growers are exchanging their experiences and expertise in growing crops in a no-till environment - and this year’s panel will be lead by Clark Hamilton - Bonneville Co., Ken Campbell - Power Co., and “Genesee” Joe Anderson - Latah Co.
• Andy McGuire (Irrigated Cropping Systems Agronomist, Washington State University) will discuss issues associated with high residue in irrigated environments.
• **Earl Creech** *(Extension Agronomist, Utah State University)* will present alfalfa-corn rotations and herbicide use in direct-seed farming.

• **Olga Walsh** *(Cropping Systems Specialist, University of Idaho)* will address how soil moisture, nutrients and weeds can be effectively addressed in a no-till cropping systems.

• **Arash Rasheed** *(Entomology and Insect Ecology Specialist, University of Idaho)* will discuss the wireworm management strategies in no-till crop production.

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**Cutting-Edge Technology Boosts Precision**

**University of Idaho Cropping Systems program featured in Capital Press!**

“University of Idaho cropping systems agronomist Olga Walsh uses a pocket sensor to measure crop reflectance in a winter wheat field at UI’s Parma research center Feb. 27. Walsh is studying the use of cutting edge methodologies to help farmers improve water and nutrient use efficiency.” *Photo and caption credit - Sean Ellis/Capital Press.*
Soil health, also referred to as soil quality, is defined as the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans (Natural Resource Conservation Service - NRCS - has adopted the definition proposed by Pankhurst et al, 1997 in “Biological Indicators of Soil Health”).

I think that most of us can agree that the abovementioned definition is making a lot of sense and is quite acceptable. The heated discussion has mainly resulted from the fact that the NRCS and others have been utilizing the laboratory test developed by Rick Haney PhD, United States Department of Agriculture, Agricultural Research Service (USDA-ARS), Temple, TX as the base for distinguishing between “health” and “unhealthy” soils. The test is designed to access soil health by utilizing “green chemistry. It can be used on any soil type and management scenario. The “green chemistry” includes water, soil microbial indicator, and a weak organic acid (Haney test Explanation, MidWest Laboratories, Omaha, NE). The proposed advantage of the test is that using compounds naturally present in the soil (instead of harsh chemicals), we can gain better understanding of plant- and microbe-available nutrients.

The concern, however, is that the Haney soil health test has not undergone the necessary calibration process. In order for any laboratory test to be meaningful (and useful for soil nutrient management recommendations), a proper extensive calibration studies must be done. The process allows for determining the crop nutrient requirement at different soil test values.

One of the very positive outcomes of the soil health discussion at the Western Nutrient Management Conference were:

1) relating the calibration concerns to the
NRCS representatives, and 2) reaching understanding that the Haney soil health test must be properly calibrated and evaluated prior to being recommended as the “golden standard”.

GUEST CONTRIBUTION

Does Manure Land Injection Reduce Ammonia Emissions?

By Lide Chen, Assistant Professor, Extension Waste Management Engineer, Department of Biological and Agricultural Engineering, University of Idaho, Twin Falls

The volatilization of ammonia (NH$_3$) from animal manure is not only a loss of valuable nitrogen (N), but also causes air quality concerns. The land spreading of animal manure accounts for approximately one-third of the total NH$_3$ emissions from agriculture, so there has been much interest in the adaptation of dairy manure land application techniques as best management practices (BMP) to abate NH$_3$ emissions. Direct injection incorporates manure directly beneath the soil surface and thus minimizes odor and NH$_3$ emissions during application. This article provides research-based data on ammonia emissions from dairy manure injected lands.

What Did We Do? On-farm manure application trials conducted at two sites were comprised of two manure application methods: surface broadcast and subsurface injection. At each of the sites, a square plot of approximately 1 acre in the western portion of the site was used for surface broadcast and the rest of the land was used for subsurface injection. Dairy manure used for the field tests was from a lagoon, which was agitated before and during application with a floating mixing pump. Manure was pumped from the lagoon directly to the application field via drag hoses. The manure pH, total N, and calculated total N application rates are shown in Table 1.

The two manure application methods were demonstrated with the same equipment. Subsurface injection placed manure behind the equipment shanks in a band of approximately 8 in. deep. Surface broadcast was realized by lifting the shanks above ground so manure was applied on the soil surface. After manure application in the site, three towers were placed in a north-to-south orientation with approximately 50 ft spacing. The middle tower was placed at the center of the manure surface applied plot. Three towers were placed in the manure subsurface injected field parallel to the ones in the manure surface broadcasted plot and approximately 600 ft apart to avoid or minimize cross-contamination between the two manure application methods. Another three towers were placed 160 ft upwind (north) of the site. These towers were used for holding passive NH$_3$ samplers. The passive NH$_3$ samplers were used to determine the time-averaged concentrations of NH$_3$ at each sampling location. The passive NH$_3$ samplers were installed on each tower at heights of 1.6 and 3.2 ft, respectively. The passive NH$_3$ samplers were changed approximately every 24 h over a two-day period after manure application.
What Have We Learned?

Average NH$_3$ concentrations during the twoday monitoring period across both the sites and sampling heights were 0.83, 0.27, and 0.22 mg NH$_3$-N/m$^3$ for the broadcast, injection, and background, respectively. There was a 68% decrease in NH$_3$ concentration when liquid dairy manure was applied by injection vs. broadcast. Ammonia concentrations averaged over height and site were 1.01/0.65 (Surface broadcast), 0.25/0.29 (subsurface injection), and 0.28/0.16 (Background) mg NH$_3$-N/m$^3$ for the first/second day, respectively. The highest NH$_3$ concentrations were measured during the first 24 h after manure broadcast. Ammonia emissions in the broadcast fields were reduced 35% in the second day compared with the first day.

Take-home Messages

Subsurface injection can reduce NH$_3$ emissions compared with surface broadcast; therefore, applying liquid dairy manure by subsurface injection could be recommended as one of the BMPs to control NH$_3$ emissions. The highest NH$_3$ emission rate from liquid dairy manure applied to land occurs immediately after manure application and the NH$_3$ emission rate decreased dramatically within the first two days after application, indicating that immediate incorporation of manure is needed to reduce NH$_3$ emissions and the sooner the incorporation occurs, the greater are the benefits in terms of NH$_3$ loses.

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<thead>
<tr>
<th>Site</th>
<th>Manure pH</th>
<th>Manure total N concentration (mg/L)</th>
<th>Manure Total N Application Rate (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site 1</td>
<td>7.4</td>
<td>3433</td>
<td>567</td>
</tr>
<tr>
<td>Site 2</td>
<td>7.3</td>
<td>3519</td>
<td>584</td>
</tr>
</tbody>
</table>

GETTING TO KNOW ID AG

Research Technician Position, Parma, ID!

University of Idaho Parma Research and Extension Center is seeking to fill a Research Technician position to provide research support for the Cropping Systems program lead by Olga Walsh. The program is focused on improving nutrient and water use efficiency and sustainable production of crops important for Idaho agriculture.

Duties and responsibilities: Conduct field, greenhouse, and laboratory experiments; conduct extension/outreach activities

Minimum qualifications: Requires B.S. in agricultural science or physical or life sciences and approximately one year of experience in similar tasks. Additional coursework, preferably graduate, may be used to substitute for experience.

For more information, please contact Olga Walsh at owalsh@uideaho.edu. The review of applications will begin March 19.

To apply by March 19, please go to: https://uidaho.peopleadmin.com/postings/8012