

MSU Extension specialist explains nitrogen fertilizer management to minimize loss

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Summary: A new online presentation explains the processes that lead to nitrogen fertilizer loss to the air and presents nitrogen fertilizer management practices to reduce this loss.

A high-resolution photo to accompany this story is available on the Web at:
<http://www.montana.edu/cpa/news/pressroom.php?id=16910>

Caption: A new online presentation by MSU Extension and Soil Fertility Specialist Clain Jones explains the processes that lead to nitrogen fertilizer loss to the air and presents nitrogen fertilizer management practices to reduce this loss.

BOZEMAN – Soil scientists with Montana State University Extension are encouraging farmers to use management practices that minimize ammonia volatilization (ammonia loss to the air) from nitrogen fertilizers. These practices can increase yields, be a financial boost to producers and reduce release of ammonia gas.

Clain Jones, soil fertility specialist with MSU Extension and the MSU College of Agriculture's Department of Land Resources and Environmental Sciences, has a new presentation on the MSU soil fertility website (<http://landresources.montana.edu/soilfertility/>) describing conditions that contribute to volatilization, management options to reduce volatilization and the impact on crop production.

"We noticed that our presentations on volatilization were often viewed online, yet with several there, it was hard for a viewer to know which one to look at," said Jones. "This new presentation consolidates and updates information from our previous ones."

Until about 2010, urea (46-0-0) fertilizer broadcast on frozen or snow covered ground was considered relatively safe from volatilization. Based on recent Montana research led by Rick Engel, associate professor of nutrient management in LRES, up to 44 percent of the applied nitrogen could be lost from urea broadcast between October and April. A moist soil surface, even if frozen at time of application, or light rainfall after application can cause large volatilization losses.

Urea fertilizer can be protected against ammonia loss by applying it in a sub-surface band at least two inches below the surface, using tillage to incorporate fertilizer granules into the top three inches, and timing applications in front of precipitation events that exceed a half-inch or adding a "urease inhibitor" to applied urea, according to Jones.

"According to research, other conditions that increase losses are wind, warm temperature and crop residue or thatch," Jones said. "If possible, don't broadcast urea if high winds or temperatures above 70°F are in the forecast. On thatch, banded urea ammonium nitrate (UAN; 32-0-0, 28-0-0) loses less ammonia than UAN applied as a spray or broadcast urea."

Various soil and climate factors interact to affect volatilization, according to Jones. Understanding these factors can help producers select nitrogen fertilizer management practices to minimize substantial volatilization, he said.

The MSU soil fertility website has more information on the factors that affect volatilization and the best management practices to minimize volatilization and increase nitrogen use efficiency.

The new presentation, two bulletins titled "Factors Affecting Nitrogen Fertilizer Volatilization" and "Management to Minimize Nitrogen Fertilizer Volatilization" and two condensed versions of these bulletins known as soil scoops are available online at <http://landresources.montana.edu/soilfertility/> under presentations, Extension publications and soil scoop, respectively.

For more information, contact Jones at (406) 994-6076 or clainj@montana.edu.

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