

We are continuing the trials for another season with winter plots at Mansfield, Ritzville, and The Dalles, OR, and spring trials at Walla Walla, Ralston, and Davenport.

Many thanks to our cooperators: David Brewer, Jesse Brunner, Rob Dewald, Jesse Brunner, Curtis Hennings, Ross Jordan, Douglas Poole, Mark & Brendan Sherry, and Traig Weishaar.

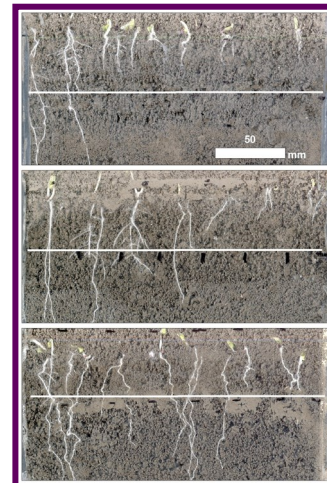
Seed provided by Bayer CropScience, BrettYoung, Caldbeck Consulting, CPS, Croplan by Winfield, Dow AgroSciences, Kansas State University, Rubisco Seeds, Spectrum Crop Development, and University of Idaho.

Selecting Nitrogen Source to Minimize Damage Caused by Free Ammonia



ISAAC MADSEN AND WILLIAM PAN
DEPT. OF CROP AND SOIL SCIENCES, WSU

When planning N fertilizer application, the source of the fertilizer should be considered in order to optimize nutrient availability as well as to avoid damaging seedling root systems. Canola root systems have been shown to be sensitive to urea banded below the seeds. The two primary considerations when choosing a safe source of N fertilizer are the salt toxicity and ammonia/ammonium toxicity. The conversion of ammonium to free ammonia is primarily controlled by the initial pH of the fertilizer reaction. A high pH will lead to more free ammonia than ammonium. Free ammonia has been shown to be extremely toxic to plant cells. Therefore, fertilizers with a high pH would be expected to release more free ammonia and consequently have a higher level of toxicity. Urea, Anhydrous Ammonia, and Aqua Ammonia all have pH greater than 8 in solution. Fertilizers with a pH lower than 8 are Ammonium Sulfate, Mono-Ammonium Phosphate, and Di-Ammonium Phosphate. In this study we compared the application of ammonium sulfate (AS) (pH = 5-6, partial salt index = 3.52), urea (pH = 8.5-9.5, partial salt index = 1.61), and urea ammonium nitrate (UAN) (pH = 7, partial salt index = 2.22). The fertilizer was banded below the seed at incrementally increasing rates from left to right. Urea (top) showed the most damage, followed by AS (middle) and UAN (bottom). The images from this study are currently being evaluated to develop 'safe' planting guidelines for banding N fertilizers below canola seeds.



Take away points: It was determined that canola roots are more sensitive to urea than ammonium sulfate or UAN. This is likely because urea would produce higher levels of free ammonia following dissolution.

Soil Microbial Community Response with Canola Introduced into a Long-Term Monoculture Wheat Rotation



JEREMY HANSEN¹, BILL SCHILLINGER², TARAH SULLIVAN², AND TIM PAULTZ¹
¹USDA-ARS; ²DEPT. OF CROP AND SOIL SCIENCES, WSU

With increasing acreage of canola (*Brassica napus* L.) in the Inland Pacific Northwest (PNW) of the USA, we investigated the effect of this relatively new rotational crop on soil microbial communities and the performance of the subsequent wheat (*Triticum aestivum* L.) crop. A relevant objective for the use of rotation crops is to increase the performance of subsequent crops. The degree of influence on soil biological properties and crop productivity is, however, crop specific. Canola plants contain glucosinolates, which upon cell rupture and during the decay of residue, hydrolyze to produce isothiocyanates. The production of isothiocyanates is the mechanism responsible for the biofumigation effect, which can reduce the inoculum of soilborne pathogens. However, the non-selectivity of isothiocyanates has potential to also impact beneficial soil organisms.