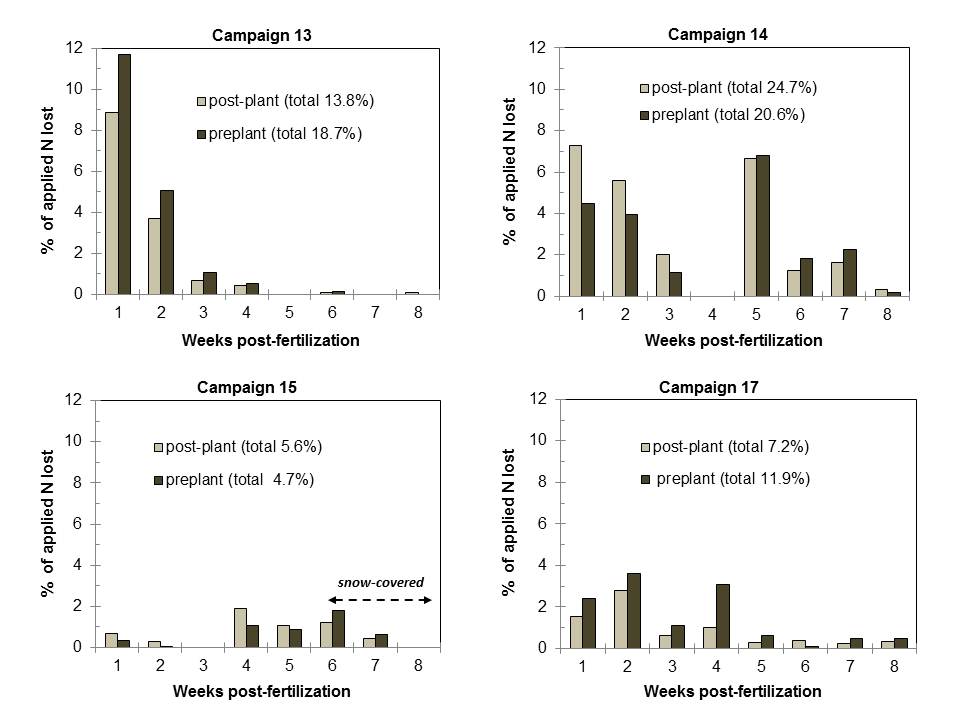
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| Campaign 13 (lower disturbance) | Campaign 14 (higher disturbance) | |
| C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 13 - McIntosh - Fall 2010\Photographs\September 15, 2010\DSC_0266.JPG | C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 14 - McCormick - Fall 2010\Photographs\September 27, 2010\DSC_0328.JPG | |
|  | | |
| **Figure 1.** Disturbance created by the air-drill differed considerably at the two sites where a similar narrow style opene was used at Campaigns 13 and 14. | | |
| C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 17 - Kremlin - Fall 2011\Photographs\Campaign 17 - September 16, 2011\DSC_0387.JPG | | |
| C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 17 - Kremlin - Fall 2011\Photographs\Campaign 17 - September 16, 2011\Before and after seeding - urea prills\DSC_0354.JPG | | C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 17 - Kremlin - Fall 2011\Photographs\Campaign 17 - September 16, 2011\Before and after seeding - urea prills\DSC_0419.JPG |
|  | |  |
| **Figure 2.** Seeding into dry soil conditions at a field site near Kremlin, Montana. September 16, 2011. Campaign 17. Soil disturbance at this site was insufficient to cover urea prills and protect against volatility losses. A narrow style opener was used at this field site. Photographs above show prills on surface before (left) and after (top) seeding from the same microsite in the field. | | |



**Figure 3**. Weekly NH3 losses from urea applied pre-plant and post-plant at north Havre (Campaign 13), Kremlin (Campaign 14), northwest Havre (Campaign 15), and Kremlin (Campaign 17) following fertilization on 15-September 2011, 27-September 2011, 07-October 211, and 16-September 2012, respectively.

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**Figure 4**. Soil water content (2.5 cm depth) vs. d post-fertilization during Campaign 13. Precipitation events and magnitude indicated by arrows.

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| --- | --- | --- | --- |
| **March 2, 2011 – fertilization application date** | | **March 9, 2011** | |
| C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 16 - Denton - Winter 2011\Photographs\March 2, 2011 - fertilization date\Urea\Denton site - urea mast (March 02, 2011).jpg | | C:\Rick's Folder- version 2\Ammonia losses\Gas Sampling Campaigns\Campaign 16 - Denton - Winter 2011\Photographs\March 8, 2011\Urea\Denton site - urea mast - (March 8, 2011).jpg | |
| **Figure 5.**  Urea was surface-applied to a snow-covered (0.89 cm water) winter wheat field site near Denton, Montana on March 2, 2011 (left). Field site 1-wk post-fertilization on March 9, 2011 (right). | | | |
|  | | | |
| **February 28, 2012 – fertilization application date** | **March 6, 2012** | |
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| **Figure 6.** Urea was surface-applied to a winter wheat field site with intermittent snow cover near Denton, Montana on February 28, 2012. Field site 1-wk post-fertilization on March 6, 2012 (right). | | |

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| **Figure 7.** Weekly NH3 losses (expressed a percentage of applied N) from surface-applied urea and Agrotain-coated urea at field sites near Denton, Montana. Fertilizer was applied on 02-March 2011 and 28-February 2012 for Campaign 16 and 20, respectively**.** |

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| C:\Rick's Folder- version 2\Ammonia losses\Green manure volatilization project\Photographs\Havre site - July 5 and 6, 2011\DSC_0233.JPG |
| C:\Users\engel\Documents\Rick's Folder- version 2\Ammonia losses\Green manure volatilization project\2012\Photographs\DSC_0005.JPG |
| **Figure 8.** Field peas were terminated at the early-pod stage in 2011 (top) and flowering in 2012 (bottom) at field sites near Havre, Montana. A mast with Leuning samplers was erected inside of the circular plots to trap NH3 loss according to the integrated horizontal flux method. |