|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Fertility Correlations with Elevation*  *Before and After a Saturation*  *1=May 3, 2012: after snowmelt*  *2=Oct 18, 2012: before Saturation*  *3=April 5, 2013: before saturation*  *4=July 4, 2013: after saturation*  \*The closer the value is to zero, the closer the relationship is for that particular element and elevation.  Notes:   |  | | --- | |  | |  | |  | |  | |  | |  | |  | |  | This Research and Field Day Made Possible by:  http://www.nnfp.org/Images/Logos/SARELogoSide.gif  http://its.uvm.edu/medtech/design/UVM_logo.jpg  http://2.bp.blogspot.com/_iWmLVtIdRIs/S-yy1xK4zII/AAAAAAAAAO4/PLtbywXIdGw/s320/nofa+logo+smaller.jpg      Questions or Comments? Please feel free to e-mail Lindsey Ruhl at [lruhl@uvm.edu](mailto:lruhl@uvm.edu) or visit  *www.floodedsoils.wordpress.com* |  | Cover Crops to Cope with the Effects of Flooding on Soil Fertility |
| **Two Ways Flooding Affects Soils** |  | **Known Cover Crop Remediation** |  | **Experimental Cover Crops** |
| Soil Fertility Loss  *Nitrogen (N*)  N becomes mobilized during flooding and is lost to the atmosphere as N2, or leached as nitrite (NO2) and nitrate (NO3)  *Phosphorus (P)*  Phosphorus is one of the slowest geochemical processes. Phosphorus forms a strong bond with iron. In anaerobic soils, the iron is reduced and releases P. The P may than be leached.  *Potassium (K)*  Potassium is water soluble. The amount of potassium in the soil solution is in equilibrium with exchangeable pools of K ions bound to the soil. |  | Super-Hero Powers!  *Hairy Vetch* is the most cold tolerant of all the vetch species. It’s nodules are able to are able to convert atmospheric nitrogen to ammonium (NH4).  *White Lupine* acidifies the rhizosphere, and mobilizes phosphorus with its proteoid roots. Phosphorus deficiency can result in a 10-15% yield reduction.  *Mixes*  Weed Suppression: rye, crimson clover, and hairy vetch  Mycorrhizal Colonization and P Uptake:  rye and oats |  | |  | | --- | | Arethusa Farm: May 10, 2013  *Average Concentration in Treatments* |      |  | | --- | | Adam’s Berry Farm: May 3, 2013  *Average Concentration in Treatments*  *Average Concentration and Plot Placement* | |
| Mycorrhizae Loss  Mycorrhiza is a fungus that has a symbiotic relationship with plants. If the amount of active roots decrease, as they can under flooded conditions, the mycorrhiza loses abundance. In flooded soils, a combination of decreased available P and lowered mycorrhizae colonization can cause noticeable P deficiency.  http://4.bp.blogspot.com/_XOG1qq4IjfA/SpIHNVrKYoI/AAAAAAAAAFs/lhxPGWlCJlg/s320/4.JPG |  | Mycorrhizae Colonization  *Winter Rye*  This hardy grain is an excellent host for mycorrhizae because it is able to provide living root matter during the winter.  *Mycorrhizae*  The fungus increases the ability of roots to uptake nutrients. One study shows that cassava plants without mycorrhizae depleted phosphorus in the soil 1-2 mm and with mycorrhizae 20-40 mm from root surfaces.  http://scholar.lib.vt.edu/ejournals/JARS/v34n1/MycorrihizalDrawing.jpg |  |