|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *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.gifhttp://its.uvm.edu/medtech/design/UVM_logo.jpghttp://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 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 vetchMycorrhizal 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 LossMycorrhiza 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 |  |