

MSU Ag Alert

May 3, 2017

The Schutter Diagnostic Lab is seeing a lot of nutrient deficiencies (nitrogen (N), phosphorus (P), iron (Fe)). Most of Montana was cooler than normal in April which slows release of nutrients from organic matter, reduces movement of immobile nutrients (like P and Fe), and can result in cold stress. In addition, parts of the Triangle and south central Montana received up to 3 fold normal precipitation amounts, whereas some other areas in the state had below average precipitation (<http://water.weather.gov/precip/>). Both P deficiency and cold stress can cause purpling. Too much moisture can result in root rot, further decreasing nutrient uptake, and often resulting in deficiencies of nitrogen (yellowing from bottom) and iron ("interveinal chlorosis"; see <http://landresources.montana.edu/soilfertility/pdeficiency.html>, [Plant Nutrient Functions and Deficiency and Toxicity Symptoms](#) (4449-9), or photos at end of this alert.

As temperatures warm, cold stress symptoms will likely disappear fairly quickly, but recovery from compromised root systems from root rot and excess moisture stress may continue to be a challenge. With low commodity prices, it's hard to think about a fertilizer rescue treatment, but some of these crops may need just that to not impact greatly impact yield.

Applying nutrients that may already be in the soil but aren't being taken up because of the cold, would be waste. If you've fertilized with adequate N this winter or spring, and applied both potassium (K) and sulfur (S) with your seed, that's likely the case. However, in areas with higher than normal stored moisture, and obvious N deficiency, a small amount of N fertilizer (15 - 25 lb N/acre) may be needed especially if N was applied last fall and has moved below the seedling root zone, or if N hasn't been applied this spring. Nitrate can also be lost to the air as nitrogen gas when soil is close to saturated. Similarly, if you did not apply KCl or S, then a chloride (Cl) or S 'rescue' treatment may be warranted. A rescue treatment for S is to apply 3 - 5 units of granular ammonium sulfate (21-0-0-24) or a liquid S formulation. A rescue treatment for Cl deficiency is approximately 5 lb Cl/acre as liquid or granular KCl (potash, 0-0-60).

Soil testing and tissue testing for suspected limiting nutrients, focusing on the mobile nutrients (N, S, Cl), would provide the information to know if a rescue treatment would be useful. If a nutrient is low in both soil and tissue, then contact your county Extension Agent or crop adviser about fertilizer options. Make sure to use a lab that can deliver a fast turnaround AND provide nutrient sufficiency ranges for your current crop's growth stage. See [Interpretation of Soil Test Reports for Agriculture \(Montguide MT200702AG\)](#) for a list of laboratories in the region.

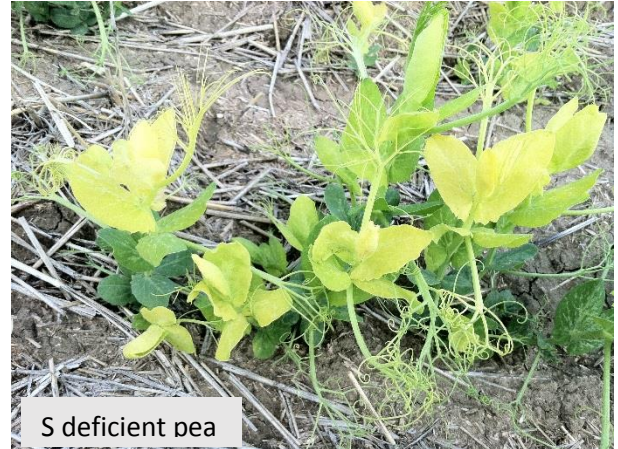
With continued high wheat protein discounts and higher yield potentials in the wetter areas of the state, it may be the perfect year to consider a 2nd N application to avoid a double blow at the elevator. Nitrogen applied before stem elongation can increase yields, while N applied near flowering can boost wheat protein. In the drier areas of the state, it's likely best to see if April's rainfall patterns are going to persist into May before considering any additional fertilization.

The MSU Extension bulletin [Practices to Increase Wheat Grain Protein \(EB0206\)](#) provides considerations to determine whether in-season N has a good chance of increasing protein as well as crop and fertilizer management practices that can increase grain protein without sacrificing yield. A recent presentation

by Clain Jones, offers additional tips for [fertilization in a down market \(pdf\)](#). Both of these can be found on the [MSU Extension Soil Fertility website](#).

If you have questions, call or email: Clain Jones, Extension Soil Fertility Specialist, clainj@montana.edu, 406-994-6076.

P deficient canola. Image from IPNI by E. Gharous.



S deficient pea



N deficient cereal from "drowning".



Cl deficient durum. Image by R. Engel.



Likely Fe deficient winter wheat. Schutter Lab