

## **Fallow Syndrome versus Phosphate Deficiency**

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### **It's been said that a starter application of phosphate is even more important when raising corn after sugarbeets...Is that true?**

Yes, this is a true statement. It has to do with something called Fallow Syndrome. In the soil there are Mycorrhizae (vesicular arbuscular mycorrhizae or VAM) that exist. These VAM have a symbiotic relationship with plants where they infect the roots of the plant and use the sugars and other organic compounds from the roots and the VAM help the root take up phosphate and zinc. In order for this to work, the crop must be a host crop to the VAM. Most of the crops that we raise are host crops to the VAM. If the crop raised in a particular field is a non-host crop, the VAM populations will be greatly reduced for the following year's crop. The crops that are non-host to this mycorrhizae are Canola, Mustard, and Sugarbeets. Summer fallow is also considered a non-host crop because with the ground black, there is no "host" to allow the VAM populations to sustain.

### **How is Fallow Syndrome different from Phosphate Deficiency?**

Phosphate deficiency means that the plant does not have enough phosphate. Fallow syndrome causes phosphate deficiency, but phosphate deficiency is not always caused by Fallow syndrome. There can be other reasons why phosphate deficiency can exist in a particular field. Here are some other things that can cause phosphate deficiency:

- 1) The soil does not have enough phosphate- a soil test will give you this information
- 2) Inorganic phosphate that is in the soil gets tied up by high pH soils- this is common in our area
- 3) Organic phosphate gets released when organic matter gets broken down by microbes. Soil microbes work best in "good growing conditions"- ie adequate moisture and a decent temperature. I see this process inhibited mostly in the early spring in really cold conditions (like the cool soil temperatures in the spring of 2008). Remember, that saturated soils don't help these microbes either.

### **How is the problem fixed?**

Use the proper starter program for the crops in rotation. That usually includes 20 lbs of P2O5 in furrow or in a 2X2 band. If you are following sugarbeets, remember that fallow syndrome is not something that is specific to phosphate. The VAM also help with zinc uptake. So it may be necessary to include zinc in that starter program.

### **Other Information Sources Concerning this Topic:**

<http://www.extension.umn.edu/cropenews/2001/01MNCN01.htm>

<http://www.extension.umn.edu/cropEnews/2003/03MNCN19.htm>

<http://www.ag.ndsu.edu/pubs/plantsci/soilfert/sf714.pdf>