

# From the Ground Up



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## Soil Solutions Attends FGD Conference; Atlanta GA

Kevin Heck and Bob Hecht of Soil Solutions, LLC recently attended a conference in Atlanta where gypsum research in crop production was presented for two days. It was very interesting to see that much of the research supports what we are also seeing in the field with our clients. In the coming months we will bring some of this information to you in this newsletter as well as make it available through our website.

## Gibberella and Fusarium Increasing Problem

Producers in some areas are reporting a higher incidence of Gibberella and Fusarium in their corn the past few years. Gibberella and Fusarium look very similar (pink discoloration in vascular tissue) and are difficult to distinguish. Both cause stalk rot and frequently lodging of the corn. These



diseases are both worse in continuous corn and when leaf diseases are present. Dry conditions early in the season followed by more normal moisture conditions later in the growing season favor the development of these two diseases. A management practice that may help is selecting a variety that has less susceptibility and also has better resistance to leaf diseases. Balanced fertility programs are beneficial. Higher sulfur levels will also help in decreasing disease incidence.

There is some research that would suggest that Glyphosate applications have increased the level of Fusarium which survives in the root rhizosphere. There has been a correlation to previous glyphosate applications and Fusarium disease incidence in small grains. Less tillage and more crop residue coupled with higher plant populations all create a more favorable environment also for the development of these diseases.

## Calcium sulfate Detoxifies Glyphosate

Recent research reported by Dr. Don Huber at Purdue University shows that glyphosate is absorbed by the leaf tissue of glyphosate resistant plants and then translocated down through the plant to the roots where it can be found in the root exudates. This glyphosate in the root exudates changes the rhizosphere biology to reduce the availability of iron, manganese, zinc and other essential nutrients. By applying calcium sulfate (gypsum) he

was able to detoxify this glyphosate in the root exudates by reacting the calcium with the glyphosate. Glyphosate induced manganese deficiency can compromise the plant's resistance to various fungal diseases as mentioned previously in this newsletter. If gypsum is effective in detoxifying the glyphosate, a long term benefit of reduced disease incidence can also be realized with the use of gypsum.

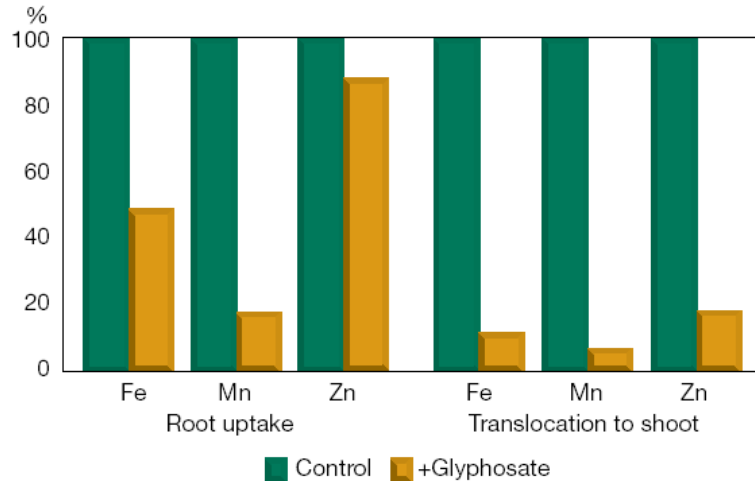


Figure 1. Effect of glyphosate\* on nutrient uptake and translocation by "non-target" plants, Eker, et al. 2006. (\* 2.5% of recommended herbicidal rate of glyphosate.)

He also has researched glyphosate induced manganese deficiency and the responsiveness of foliar applications of manganese and zinc. His research indicates that you must wait 8-12 days after the glyphosate application on soybeans and 15 days in corn to get the best yield response from these foliar applications. He believes that the glyphosate in the plant is responsible for this decreased response.

### Kip Cullers Produces Record Soybean Yield Again!!

Kip Cullers of Purdy, MO who shattered the previous record last year by raising 139 bushels per acre has done it again. This year his reported yield is a new record of 154 bushels per acre. Although you may or may not be able to put some of his practices into action on your farm it does challenge each of us to know that soybeans do have a large potential and that we may be able to fine tune some of our current management to increase our current yields.

### More Responses to Calcium Sulfate in Alfalfa Reported

Responses in alfalfa to calcium sulfate have been known for years. In as early as 1912, Washington State showed that alfalfa yields could be doubled with the use of gypsum. Of course we need to base our decisions on more up to date research to have confidence in adopting a new practice. Both Iowa State and University of Minnesota have announced that they have seen very positive responses to the use of calcium sulfate on alfalfa.

Below is research from the University of Minnesota in 2006 showing a significant response to gypsum in the second year after its establishment.

<b><u>Treatment</u></b>	<b><u>Yield, T/A</u></b>
<b>Untreated</b>	<b>7.66</b>
<b>Lime</b>	<b>8.27</b>
<b>Gypsum</b>	<b>8.84</b>

Iowa State has also recently (2006) shown positive responses from gypsum use on alfalfa as is shown in the table below:

<u>Treatment</u>	<u>Location</u>				
	<u>Wadena</u>	<u>Waucoma</u>	<u>Nashua</u>	<u>Waukon</u>	<u>West Union</u>
	-----Ton/Acre-----				
Untreated	1.32	1.85	6.73	1.39	.78
Gypsum*	2.92	3.24	7.14	3.58	1.07

\*Gypsum was applied in April at Nashua location and in May at other locations.

Our clients have also noted significant yield increases even in older stands of alfalfa and indications are that alfalfa stands will last longer where PRO CAL 40 has been applied.

If you are considering seeding alfalfa next spring now is the time to apply both gypsum and lime (they can be mixed and applied at the same time) to your soils so that you are ready to plant in the spring. If you have an existing stand of alfalfa you can also have gypsum applied to your fields. Gypsum is quite mobile and will solubilize easily as is obvious from the Iowa data where gypsum was applied as late as May.

#### Top 10 Reasons Your Soils Need Calcium Sulfate

1. Improve infiltration and enhance air/water exchange resulting in better root growth.
2. Promote a more granular soil structure in both no till and tilled soils.
3. Reclaim sodium affected soils and neutralize sodium in irrigation water.
4. Reduce the ill effects of high magnesium in soils lessening power requirements for tillage.
5. Offset the effects of high bicarbonates in high pH soils and neutralize bicarbonates in irrigation water.
6. Decreases methane production in soils that receive manure and offset high phosphorus and potassium levels in soils that have received heavy applications of manure.
7. Reduce the amount of surface sealing and cementing in soils with high lime content.
8. Increase the amount of electrolytes in the soil which become diluted with rain water.
9. Increase nutrient availability and provide a better balance of nutrients.
10. Excellent source of soluble calcium and plant available sulfur.

Calcium Sulfate is unique in that there are multiple reasons for its use as is shown above and these listed are only about ¼ of the many benefits that have been researched. Every farmer has soils that would benefit from applying calcium sulfate and all farmers can benefit from better efficiency from their existing fertility or applied nutrition given the high fertilizer prices of today.

### In-Line Ripping and Gypsum are Synergistic

Producers again this year have reported yield responses in corn of 25 bushels/acre where they have done in-line ripping. This is a practice that we have promoted for several years based on our customers' results. Companies who sell these tillage tools have also commented that the most success from these units are gained when gypsum is also surface applied. Gypsum helps keep the slots open longer and the slots help flush the unwanted cations which calcium has displaced.

### Now is The Time to Arrange an Application!!

Our fall orders from retailers and producers are larger than ever. Now is the time for you to contact your retailer or crop consultant to get your application of PRO CAL 40 lined out. If your retailer does not handle our product either encourage them to do so or call us directly and we will try to work through them. PRO CAL 40 can be applied at any time, but the sooner it is applied the faster it will go to work for you.