From the Ground Up

Soil Solutions, LLC · 2120 Pearl Street · Onawa, IA 51040 · 712-433-0000

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Grape Colaspis?

When you first read "grape colaspis" you may think it is a term referring to a decline in the condition of vineyards. It is not. It is an insect that is mostly found in the Eastern half of the United States. Another beetle known as Iowa colaspis is very similar to the grape colaspis and has been increasing in importance in corn and soybeans over the past couple of decades in western Iowa and Eastern Nebraska. While walking in corn fields last spring in eastern Nebraska I noticed a high number of colaspis beetles. To the right is a picture of what these beetles look like.

They are about 1/16 inch long. The beetles themselves do very little damage to corn or soybeans, but by feeding on soybeans they can transmit bean pod mosaic virus. Of greater concern is the larva from these insects. These beetles will lay eggs in mid to late summer. These eggs hatch and the larva overwinter ready to begin feeding on young corn and soybean roots as the roots develop in the spring. I have seen over the years that stands can be reduced if sufficient populations of larva are present. Typically they will stress the young plant and cause it be stunted. The picture to the left of a corn field affected by grape colaspis could be confused with many other problems if not

properly investigated. Be certain to always dig up corn plants and observe the roots. Roots will be absent of the finer roots and root hairs and there could be some feeding of the main roots. The larvae are sometimes difficult to find if not looking for them since they are quite small. A picture of the larva are to the right. They are about 1/16 inch long and comma shaped. They can feed on both corn and soybeans roots so rotating crops will not eliminate this pest. This insect seems to be more prevalent in no-till fields, but could be found in tilled fields as well. Dry soil conditions will result in greater stress on the plants and the damage by this insect will be greater. If we have a dry spring this year you can expect to hear of more damage by this pest. Controls for colaspis once you have found the damage is usually not recommended since they will soon be done feeding. Planting time insecticides or seed treatments have given mixed results.

Red Root Rot

A relatively new disease has been more prevalent in corn in recent years in the plains states. First discovered in the eastern Atlantic states during the early 1980s, Red Root Rot has appeared more often in fields in Iowa, Missouri and Nebraska. Red Root Rot is caused by a group of fungi. It is suspicioned that Pythium first infects the corn roots. It damages the roots to the extent that Fusarium and Phoma terrestris are able to invade earlier.

Symptoms of Red Root Rot at the early stages may be difficult to see. The affected corn plants may begin to wilt and die prematurely. The root symptoms of the disease are usually most evident once the corn plant begins to senesce. Typically you will observe a reddish pink color within the root system (see picture to left). As the rot continues to develop, it will turn a darker red

color. The roots will also have a frayed appearance almost as though they have been fed upon by insects. The reddening will also appear in the crown of the corn plant and could be confused with Gibberella. The root mass of infected plants will be smaller and lodging may occur. Often times these plants will pull out of the ground as they are being combined.

Red Root Rot appears to be most prevalent in high yielding environments including high populations, high fertility and irrigation. The fungi responsible for this disease can survive in soils for many years and under diverse soil conditions. Rotation does seem to help, but longer term rotations such as alfalfa would be of greater benefit. Currently there is no known hybrid resistance.

Could subsoil structure be what affected your yields in 2012?

We have all read articles about the effects of sub-soil compaction on yields over the years. Most of these articles deal with wheel traffic compaction or doing tillage in fields when they are too wet. They may also discuss physical properties of soils and the affect that soil texture and/or organic matter may have on compaction of soils. You seldom read about the chemical aspect of soils and how that may affect soil compaction or soil structure?

This last growing season we had many customers who were amazed at how much their yields varied across the field. Most certainly there could be a host of explanations for these variations. Many times it is explained away as field variability, but what exactly was this variability?

I was impressed when I received a call recently from an individual who had seen a large variation in yield in his "corn growers association" corn variety plot. The yields varied from the 160 bu/A range on one end to the 40 bu/A range on the other end and was consistent across all varieties. He decided he wanted to examine what may be causing this. He took a soil sample from 0-8" to check variability between the two distinct areas of variability. To his surprise there was little difference between the two areas regarding soil nutrient levels, soil organic matter, or soil texture. He also took an 8-24" soil sample. When he took this sample he noticed that the soil in the poor area was very hard compared to the soil in the good area. Of course the soils were still very dry as this area had very little rainfall through the growing season and into fall. The results of the subsoil sample revealed very little differences between the poor area and the good area except one particular soil test level. That one was the level of magnesium. The better soil had a level of 598 ppm (18% base saturation) and the poor area had 1078 ppm (34% base saturation). Even though the analysis of particle size did not indicate any difference in soil texture the soil appeared to be a much different kind of soil when he sampled it.

This difference in soils described above would go unnoticed by many either because they would have not sampled the subsoil separately for differences or they may not have tested for magnesium (many labs do not routinely test for magnesium), or they may have not

made the association. Magnesium does affect soil structure, because it has a larger hydrated radius than the other major cations which causes the soil to become more dispersed. In layman's terms, magnesium causes the soil to be sticky when wet and "hard like a brick" when dry. Both of these conditions will reduce root development and will likely cause more drought stress especially during a late season moisture deficit.

How do we remedy a soil like that described above? The answer is to increase the calcium level of the soil. Since lime does not move very easily, it would be difficult to ever affect the level of calcium in the subsoil without some extensive tillage. Since tillage has its drawbacks as well, a better approach would be to use a more soluble calcium source such as gypsum to improve the soil's calcium level deeper into the profile and improve the soil structure.

This explanation may also be why many of our long time customers told us they saw significant improvements in their yields during this dry year where they have been using PRO CAL 40.

Gypsum and no-till: Ways to manage for a drought

The past few months I have read articles about the improvement in infiltration with the use of no-tillage and cover crops. It is true that ground covers do improve the infiltration rate. This is due to less rain drop impact, improved soil structure and slowing the runoff allowing more time for the water to infiltrate.

I found it interesting, however, when we compare the steady state infiltration rates of those published from Ohio for no-till recently to those that have been published by the USDA Soil Erosion Laboratory using gypsum. The table below compares these numbers.

Soil Treatment	Steady State Infiltration, In/hr.
Tilled soil, bare soil	0.26
No-Till bare Soil	0.11
No-Till 40% Cover	0.46
No-Till 80% Cover	1.04
No Gypsum, 40% Calcium (soil)	0.14
No Gypsum, 75 % Calcium (soil)	0.51
Gypsum Applied	1.81

Understand that the above comparison involves two different soils and two separate studies. However, you can see that gypsum applications can have similar results to adding a cover. When you incorporate no-till and gypsum applications you can even see better results. Gypsum increases infiltration by several means, but one that is beneficial in all soils is that it increases the electrolyte content of the rain water when it hits the soil surface. This results in less soil dispersion and less soil crusting, thus, greater infiltration. Rain water is naturally low in electrolytes which cause soils to disperse more easily. This

is true even in no-till soils……rain water is low in electrolytes whether it falls on tilled soil or no-till soil. Also, remember that gypsum not only increases infiltration, it also increases water holding capacity of the soil.

Fungicide Resistance-What is the Risk?

As fungicide usage grows in crop production in the Midwest is resistance something we should be concerned about? This may seem like an obvious question given the resistance that has developed to other pesticides such as insecticides and herbicides. In the vegetable and turf grass markets where fungicides have been used for decades resistance management has become very important to maintain adequate disease control and to continue to use historically effective fungicides.

The better question is what can be learned from the horticulturists that will help us to avoid resistance issues in disease control of agronomic crops? Vegetable growers in the Southeast United States have experienced resistance to fungicides firsthand. Some of the keys that they share are:

1. Fungicides with specific modes of action are at risk for development of resistance.
2. Do not rely on just fungicides. Other management practices should be implemented such as less susceptible varieties and following good cultural practices.
3. Rotate or mix fungicides with different modes of action. If a fungus survives one mode of action it will be killed with the other mode of action, thus not building resistant population.
4. Using protectant fungicides is a good practice to reduce the risk of fungicide resistance.
5. Use proper nozzles and adequate volumes of water or carrier. This is especially true for the contact fungicides.

Procidic is an agricultural fungicide and bactericide that can be tank mixed easily with your current fungicide to help in resistance management. It is currently used in vegetable production by many vegetable growers in the Southeast. It works both by contact and also systemically. Past experience has shown that it is also a good management tool for bacterial Goss's Wilt. If you don't want to abandon your current fungicide program because you have high confidence in it then consider using Procidic as a tank mix with your current fungicide program. Contact Soil Solutions about details.

Farmer's share of Retail dollar

It is no secret that food prices at the grocery store are increasing. Our urban friends often think that the farmer is the biggest reason for this increase. Recent figures released from the National Farmers Union reveal that farmers and ranchers receive only about 16 cents of every food dollar. This includes both dollars spent for food at home and that away from home.

Below are some specific examples of the farmer's share of the total cost.

Product	Retail Price	Farmer's Share
Potato Chips, Lays 10.5 oz.	$4.79	$0.21
Fresh Potatoes, 5 pounds	$4.39	$0.33
Pop, 2 liter	$1.29	$0.12
Bread	$3.59	$0.20
Cereal, 18 Oz. box	$4.69	$0.10
Eggs, dozen	$2.69	$1.13
Bacon, 1 lb.	$4.83	$0.85
Ham, 1 lb.	$3.89	$0.85
Top Sirloin Steak, 1 lb.	$8.49	$2.01
Flour, 5 lbs.	$3.09	$0.99
Milk, 1 gallon	$4.19	$1.81
Tomatoes, 1 lb.	$3.28	$0.53

This data is no surprise to you, but we need to use this information to "tell our story". Our off farm friends need to know that 80 cents of every food dollar is due to off farm costs such as processing, marketing, wholesaling, distributing and retailing. Agricultural producers continue to raise their products most efficiently and this is done through improved technology and increasing yields.

Nitrogen Management Tool is Proven

Following a dry year and with many soil tests showing a high amount of nitrogen carryover, nitrogen management may not be a high priority item with many growers for the 2013 growing season. However, nitrogen losses can occur under almost any environmental conditions. Using nitrogen stabilizers help reduce the risk of losing your nitrogen.

Nitrogen losses can occur by mainly three means, leaching, denitrification or volatilization. NZone is a nitrogen stabilizer that has been shown to reduce nitrogen loss by all three of these. It can be used with liquid UAN, Urea or anhydrous ammonia as well as with liquid manure applications.

Again in 2012 NZone Max was shown to give profitable returns. In the study below at the University of Missouri, NZone MAX increased yields when applied with urea.

Treatment*	Corn Yield, Bu/A
Check	105
100 lb. N (Urea)	142
Nzone MAX + 100 lb. N (Urea)	170

*Four Replications of treatments
Previous Crop: Soybeans
Planting Date 4/10/2012
Fert. Applied: 6/29/2012

In the Missouri study for each dollar invested in NZone MAX the farmer would have returned thirty four dollars ($6/bu. Corn).

In the study below from North Dakota State University NZone MAX also gave higher yields when it was applied with Urea.

Treatment*	Corn Yield, Bu/A
Control	173.7
160 # N, Urea	184.04
160 # N, Urea plus Nzone MAX	201.47
120 # N, Urea plus NZone MAX	181.68
*Four Replications	

In this study from North Dakota State the farmer would have had a return of $17 for each one dollar he invested in NZone MAX.

Michigan State also did a trial with urea in 2012 which showed a good response to the use of NZone. In this study the farmer would have had a return of $13 for each dollar spent on NZone MAX.

Treatment*	Corn Yield, Bu/A
80# N, Urea	114
120 # N, Urea	124
80# N, Urea plus Nzone MAX	122
120# N, Urea plus Nzone MAX	137
*Four Replications	

If you are interested in having your urea treated with NZone, contact us and we can contact your retail dealer to get it arranged.