

ISSUE

March
2012

TSM[®] Infarmation Agronomy Newsletter

Total Soil Management
Research Farm

Visitors Welcome

Unlock the Potential
For Higher Yields

TSM Services, Inc is dedicated to providing growers and farmers the absolute best soil fertility programs today. The TSM[®] goal is to provide a program that is agronomically sound, economically justified, and environmentally friendly. Our fertility programs are proven to meet all three standards, with 18 years of research to back all of our claims.

For further information. Feel free to call us during business hours at 1-800-626-3806, or visit us on the web at www.totalsoil.com

In this issue, continuing the
6 Steps in a Soil Fertility Program

STEP #3
ANALYSIS

IT'S HERE !!

We have a brand new germinator/starter product (7-25-3 with micros) on the market exclusive to TSM[®]. This product has a higher analysis, a lower rate/acre and a lower cost. It also carries the chemistry to keep P₂O₅ more available which is what a germinator/starter is suppose to do! To understand this new chemistry (Steric-P[™]), go to www.totalsoil.com. Remember that a germinator can be placed directly on the seed **with complete safety** or it can be used as a starter placed 2 inches down and 2 inches to the side.

For more information on "[TSM Germinator/Starters](#)" go to our website.

This website www.totalsoil.com is a "working website". It is not meant to be pretty or fancy; it is to be a library of "infarmation".

Remember that all the newsletters are on the website www.totalsoil.com . We will keep the latest 15 or 20 newsletters on this website.

How did you do on the trivia question? The trivia question had 3 parts:

- (1) How did we store rock phosphate? The material rock phosphate was a very unusual type of material. Mostly, it was stored in a concrete silo, (similar to a silage silo) with an over-head bin. The bottom of the silo (below the over-head bin) was a loading bay that you backed your spreader truck into to load. The only one that I know today that still exists (in part), is at Allerton Supply Company in Allerton, Illinois. The bottom portion of the silo still exists. The top portion has been removed. You can see this as you travel along the Allerton to Sidell road. The opening for the loading is located on the north side.

Not all storage was concrete. My dad had a steel over-head bin he used for rock phosphate.

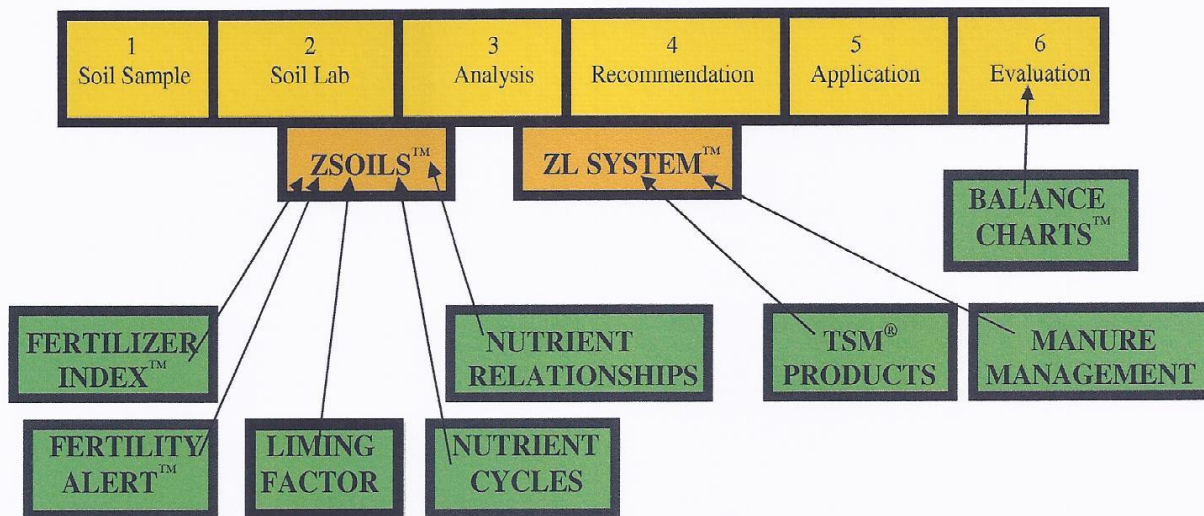
- (2) How did you load rock phosphate into your spreader truck? When you backed your spreader truck into the loading bay, you would get out and open the door on the bottom of the over-head bin. The interesting part is that very little rock phosphate would come out. You would then go over to the edge of the silo and turn on the "AIR VALVE". That is right; you would pump air into the rock phosphate material. Even then, the material would not immediately come out. You would wait and wait and wait and then, all at once, the rock phosphate would just pour out. When you pump air into rock phosphate, it will flow like a liquid.
- (3) Why did your spreader truck have "hoods" on the back for spreading the rock phosphate? The rock phosphate was a very fine material and the dust would go off into the air. Even with the hoods, you could tell where the spreader truck was spreading by just walking outside and looking into the sky. The cloud of dust would go straight up like a column.

After you had spread several loads of rock phosphate, the dust would build up or cake under the hoods. To clean this caking out, my dad would keep a list of farmers who wanted some road chips spread on their lanes. He would load up with road chips and spread the lanes which would knock off the build-up or caking and then he could spread some more rock phosphate.



The picture to the left is from the website of Senesac, Inc a fertilizer company with headquarters located in Fowler, Indiana.

The Six Steps for *Total Soil Management*[®] (*TSM*[®]) plus **8 missing links**



STEP #3 *"Analysis"*

This step is the data that comes from the soil analytical laboratory. The soil analytical laboratories two main purposes when testing soil is:¹

- 1) The analytical results which are the amounts of nutrients found in the sample.
- 2) The recommendation which is the amount of fertilizer recommended to apply based on the crops to be planted.

1/ www.spectrumanalytic.com

Purpose number one is **creation of raw data** in either parts per million (ppm) of each of the nutrients being tested or pounds per acre (lbs).

Purpose number two is the **interpretation of the raw data**. The soil laboratories may use Tri-State (Purdue, Ohio State & Michigan State), University of Illinois Agronomy Handbook or some other program.

Please keep in mind that what I am about to say is not complaining. The soil laboratories are doing an excellent job and have for years. However, if you want to take your yields to a higher level (higher than Tri-State, University of Illinois and etc.), you will need to seek out another program or people. We would like for the "other people" to be us here at TSM Services, Inc. and the "other program" to be **TOTAL SOIL MANAGEMENT**[®].

To make sure that the TOTAL SOIL MANAGEMENT[®] soil fertility programs were producing more yield, for 18 years, we compared 6 different fertility programs replicating them 4 times. To see this data, go to www.totalsoil.com and place your cursor on **"TSM[®] Soil Fertility"** this will give you a drop down list. Click on **"6 Fertility Programs Compared by Yield"** and after you have looked the data over, you may want to go to **"Description of the 6 Fertility Programs"**.

We use several soil laboratories over the market area we serve. We ask for only the data (raw data) which is the amount of nutrients found in the sample. This would be the number one purpose mentioned above. The number two purpose we have mentioned above of interpretation, TSM Services, Inc does ourselves. This allows TSM Services, Inc to provide the **TOTAL SOIL MANAGEMENT**[®] to our customers (1) giving them exclusivity and market protection, but it also allows us to (2) remove variables between soil labs.

Let's review quickly, the "ZSOILS[™]" program takes the raw data (amount of nutrients found in a soil sample) and interprets the data forming an "analysis" which is N, P₂O₅, K₂O, Ca, Mg, S, Zn, Mn, B, Cu and Fe. We will convert this "analysis" into "product" in step #4.

Currently, the commercial soil testing labs use the university programs (Tri-State, U of I Agronomy Handbook or etc.) to form this analysis. Again, this has done a good job over the years; however, if you want to reach higher levels of yield and profitability, you will want to try Total Soil Management[®]. It is one of the purposes of this newsletter to explain why and how it works.

The university programs do not use all of their agronomy (the 7 missing links) when they make interpretation of soil lab data. I will demonstrate 4 areas they do not use. If you look at the above diagram, you will see the program "ZSOILS[™]" and 4 of the 7 missing links.

The "ZSOILS[™]" program takes the university programs and adds 4 of the 7 missing links.

The first missing link we will discuss is

"Nutrient Relationships".

The conventional way of interpreting soil lab data is to consider that all nutrients are independent nutrients able to control their own destiny and this does not exist! None of the nutrients exist as independents.

Nutrient relationships mean that one nutrient influences another nutrient's availability and/or visa versa.

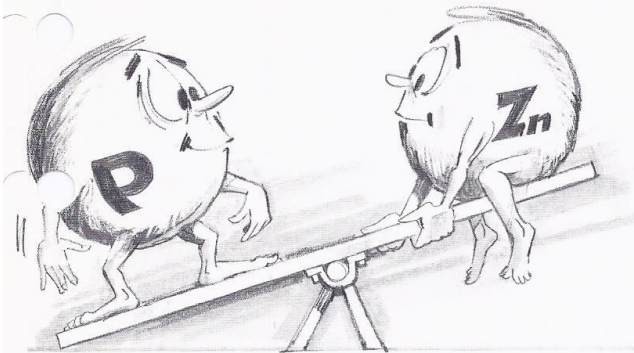
One of the questions that conventional programs of interpretation (University and soil lab programs) do not answer is "Why is a nutrient's soil test level where it is?" "What influenced this nutrient?" Until you understand these questions, how can you make a recommendation?

Let me give you an example of this, when I first came to this area of the country, I was asked to look into a large field that was not responding to fertilizer applications, especially phosphorus. I took soil samples for a soil audit and found a very high zinc level (400 ppm) and a very low P₁ test of 3. My first reaction was that it was a bad soil sample, so I took another set of sample getting the same levels. It turns out that this area many years ago was a sight of "zinc

smelt”. The question then is “Has this anything to do with low response to phosphorus fertilization?”

The answer is a very loud “YES”. We have known for years that all nutrients either influence other nutrients or are being influenced by other nutrients varying their availability. I have gone back in my “hoarding” files and will show items over 40 years old.

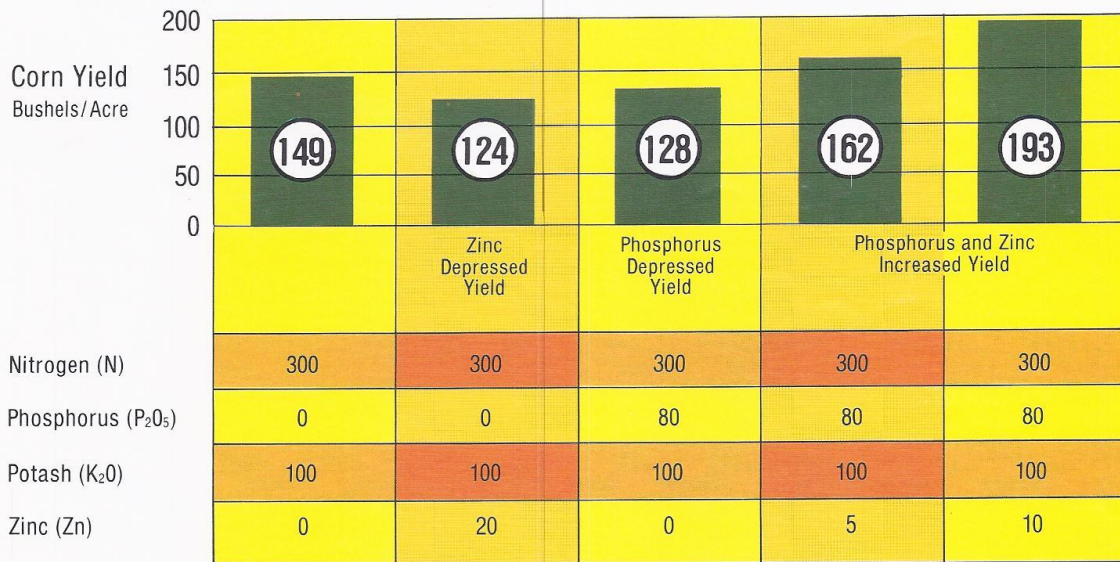
The Phosphorus-Zinc Relationship



A needed plant nutrient can depress yield if it is out-of-balance with another element. The elements phosphorus and zinc are frequently responsible for such behavior. High phosphorus availability can restrict zinc uptake. Conversely, applying zinc can depress phosphorus uptake.

Research data from Kansas provide an example of this phosphorus-zinc relationship.

Phosphorus-Zinc Teamwork Irrigated Corn



Kansas State Data

This P-Zn relationship is more sensitive when soil pH is high, at low soil temperatures and when soil compaction and/or excess moisture reduces soil porosity.

- Soils testing high in phosphorus or soils that have received high P₂O₅ applications are candidates for zinc response.
- Soils testing high in zinc or soils that have received high zinc applications are often responsive to phosphorus.

Soil Fertility Essentials: Nutrient Level & Nutrient Balance

The top paragraph on this insert “Fertilizer Basics No-28” says it all. I am going to repeat it due to its importance:

“A needed plant nutrient can depress yield if it is out-of-balance with another element. The elements phosphorus and zinc are frequently responsible for such behavior. High phosphorus availability can restrict zinc uptake. Conversely, applying zinc can depress phosphorus uptake.”

So high zinc ties up phosphorus. This is easily detected because we have an “available phosphorus” test (P_1) which tells us how much available phosphorus there is. Since the P_1 test was very low (the P_1 test was 3, due to the very high zinc levels), the soil lab report will recommend lots of phosphorus which is not the answer. The answer is not quantity of P applied but placement and timeliness of application.

Also, high phosphorus will tie up zinc. When a grower applies lots of manure raising the P_1 test into the high hundreds and the zinc test is 35 ppm (anything over 7 ppm would be considered high to very high, A & L Agronomy Handbook, page 73), would you apply zinc? Well, most would say “NO” since the zinc test is at 35 ppm. The soil lab report would indicate no zinc application needed when in fact, you may get a very good response from a zinc application. Look above on the insert, **“Soils testing high in phosphorus or soils that have received high P_2O_5 applications are candidates for zinc response.”**

My answer would be “YES” apply some zinc.

In the case of very high zinc levels, the P_1 test (available P) will indicate the lower availability; however, in the case of high phosphorus, the zinc test (total zinc both unavailable and available) will not indicate the lower availability. This is the reason you will get a response from a zinc test of 35 ppm when the phosphorus is in the high hundreds.

Our research over the last 20 years has indicated that we can meet the “sufficient levels” (reported in an earlier newsletter about Dr. J. Benton Jones, Jr) of the micronutrients by using a specifically designed dry micronutrient blend called **“TSM Pre-Mixes and the TSM Base-Mixes”** For more information on these products, go to www.totalsoil.com and go to **“TSM Product Catalog”** and then to the products.

We want you to consider trying one of the **TSM[®] soils programs** this coming season:

1. **“TSM[®]” Program** – this program uses **dry micronutrients** blended in with your phosphorus, potassium and sulfur source applied to the soil. We use 6 different grades (or analysis) of fertilizer (varying the P:K ratios) to make the recommendations. The **“Base-Mixes” need to have additional sulfur** and the **“Pre-Mixes” already have the sulfur added.**

For more information on **TSM[®] dry micronutrient products**, go to www.totalsoil.com and place your cursor on **“TSM[®] Product Catalog”**. You will get a drop down list of products.

Click on **“TSM[®] Dry Products”** and then click on

“TSM[®] Pre-Mix (A)” or

“TSM[®] Base-Mix (A)” or

“TSM[®] Pre-Mix (AA)” or

“TSM[®] Base-Mix (AA)”

The **“TSM[®] Program”** utilizes all 6 steps for a “real” soil fertility program. If an optional starter or germinator is used, micronutrients need to be included. An optional foliar may also be used containing micronutrients.

In an upcoming newsletter, I will give you the actual fertilizer recommendation for next year for the two plots: (1) yielding the highest corn yield and (2) also the highest soybean yield.

2. **“Head Start[™]” Program** – this program **does not use any dry micronutrients** in the dry blends. The blends include both your phosphate and potash sources. We still use 6 different grades of fertilizer (varying P:K ratios) to make the recommendations. The **“Head Start[™]” program** also utilizes all 6 steps for a soil fertility program. If a starter or germinator is used, micronutrients may or may not be included.
3. **“Head Start Plus[™]” Program** – this program is the same as the **“Head Start[™]” program** except with a foliar application of micronutrients.

For more information on these products, go to www.totalsoil.com and

place your cursor on **“TSM[®] Product Catalog”**.

You will get a drop down list of products.

Click on **“TSM[®] Liquid Products”**

and then click on:

“TSM[®] Micro Boost Foliar[™]” or

“TSM[®] Micro Boost MN[™]” or

“TSM[®] Micro Boost Soil[™]” or

“TSM[®] Micro Boost Pre-Mix (B)[™]” or

“TSM[®] Zinc Corn Starter[™]” or

“TSM[®] Liquid Starter-Mix (BC)[™]” or

“TSM[®] Liquid Premium Germinator (B)[™]”

Someone asked if I would show or list what a **TSM[®] soil fertility program** would look like. Here is an example of our **“GOLD” program**: (yearly soil audit and yearly application)

Broadcast or pre-plant application: (use the 6 TSM[®] grades such as **TSM[®] 5**. I will explain why we have the 6 grades and how we use them in a later newsletter.)

P₂O₅ source (we use DAP)

K₂O source (we use Potash)

Micronutrient source (we use **TSM[®] Pre-Mix (A)**) @ 8% to 20% of rate per acre

Starter/germinator: (we use as a germinator, applying directly on the seed)

Liquid NPK germinator product @ 5 GPA for corn & 3 GPA for soybeans

Liquid micronutrient product (we use **TSM[®] Micro Boost Pre-Mix (B)**) @ 1 pint/ac

Nitrogen: (we use ESN)

Post application:

Pesticide with micronutrients:

Foliar for corn (we use **TSM[®] Micro Boost “Foliar”**) @ 1 quart per acre

Foliar for soybeans (we use **TSM[®] Micro Boost “MN”**) @ 1 quart per acre

Limestone:

Pelletized limestone (to manage pH above 6.0)

Ag Limestone (to manage pH below 6.0)

Just a reminder that our liquid products have an **“EARLY ORDER DISCOUNT”** through **March 15, 2012**. Get your order in now! Call or email:

For products and customer service call Jill Schonert at 1-800-626-3806

or email jills@tmsr.com

For soil audit, soil sampling or agronomy call Larry Schonert at 1-800-626-3806

or email larrys@tmsr.com

For questions or comments on this newsletter email Kent Durbin kentd@tmsr.com

Don't forget to subscribe!

www.totalsoil.com

Coming in the New Year (2012) will be some new projects including:

Profit/loss Calculator for Corn and Soybeans

SPECIAL NOTICE

To be able to get to the profit/loss calculators, you will need to subscribe. This service is **FREE**. When you subscribe, you will be asked to create a login and password. The password you create will be known only to you (not even to us).

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You are doing well, keep those subscriptions coming!