

# The Turf Analysis

Winter 2011

Agronomic Information from *Spectrum Analytic Inc.*

## Happy Holidays!

As we close another year, we want to take this opportunity to say “Thank you” for your business in 2011. The Green Industry segment of our business continues to grow and we thank you for the confidence you have placed in our lab with your soil sample business.

How many times have you asked yourself, what can I do to set my business apart from the competition? You can come up with a new more colorful logo, you can try different products or you can purchase the latest and greatest technology. But, these are all things the competition can also do. What about a scientific based test that will show the homeowner an indication of the “health” of their soil? We have known about soil analysis for years and how we can amend soil pH and nutrients. What about the “health” of the soil? Read more about this in the newsletter and be the first to start putting it to work for your business and adding dollars to your bottom line.

Our on-line sample submittal continues to grow. If you have any ideas or suggestions to help make it more user friendly or any general improvements for our website, call us or send us an email.

Everyone at Spectrum Analytic wish you and your employees and families a Blessed and Merry Christmas. We hope that everyone enjoys the holidays together with friends and family and that everyone has safe travels. In the upcoming year we will be facing new challenges once again, take these challenges and convert them into an opportunity. May 2012 be a successful year for you and all your business ventures.

Spectrum Analytic participates in the National Proficiency Testing Program administered by the Soil and Plant Analysis Council. Spectrum Analytic also participates in several state quality control programs certified by the U.S.D.A. Spectrum Analytic uses soil testing methods published by the NCR-13 Committee of the U.S.D.A. Agricultural Research Service.

## Solvita® Soil Respiration Test

By Bill Urbanowicz

How many times have you asked yourself how you can differentiate your lawn care or landscape industry from your competition? In recent years, people have begun to do more soil testing to determine the soil pH as well as nutrient status levels in their lawns and gardens. Through research and demonstration plots scientists have been able to determine the soil pH range that plants grow best as well as optimal soil phosphorous and potassium levels for best growth.

Scientists have known for many years that soil health also influences plant growth and nutrient availability. Measuring soil health can be an expensive and time consuming procedure. Recently the Woods End Laboratories developed and released a new, less expensive way to measure soil health known as the Solvita soil respiration test.

“Testing Soil Respiration: The evolution of carbon dioxide from soil is one of the most fundamental dynamics of the plant. It reflects the interplay of added and biologically decomposed organic matter reflecting microbial and plant processes. By evaluation biological aspects of soil fertility, a key is found for gauging soil quality, including the amount of sequestered carbon and the potential release of plant nutrients.”

As a turf company, a professional landscaper or a person that works with soils, you may have one or more of the following reasons to make use of the Solvita Soil Respiration Test, including:

1. You wish to know how well you have provided for soil organic matter needs
2. You are experimenting with different soil management practices and wish to monitor the results
3. You wish to estimate the potential release of nitrogen for plant purposes
4. You wish to find out if a container soil is “tired” and needs to be repotted

After the test has been performed you will receive the Solvita test level with a Solvita chart like the one below.

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# Solvita® Soil Respiration Test

Continued

## SOLVITA BASIC: INTERPRETATION GUIDE

Soil Quality Curve

Color 0 - 1 Blue-Gray	1 - 2.5 Gray-Green	2.5 - 3.5 Green	3.5 - 4 Green-Yellow	4 - 5 Yellow
<p><b>VERY LOW SOIL ACTIVITY</b></p> <p>Associated with dry sandy soils, and little or no organic matter</p>	<p><b>MODERATELY LOW SOIL ACTIVITY</b></p> <p>Soil is marginal in terms of biological activity and organic matter</p>	<p><b>MEDIUM SOIL ACTIVITY</b></p> <p>Soil is in a moderately balanced condition and has been receiving organic matter additions</p>	<p><b>IDEAL SOIL ACTIVITY</b></p> <p>Soil is well supplied with organic matter and has an active population of microorganisms</p>	<p><b>UNUSUALLY HIGH SOIL ACTIVITY</b></p> <p>High/excessive organic matter additions</p>

This will give you the general health activity of the soil.

Based on the test results, you will also get a written explanation about the condition of your soil as well as recommendations for the soil care. Spectrum Analytic will not make any recommendations as far as brands of products or any other type of soil additives that have to do with amending the soil. As always, you will get lime recommendations as well as nutrient recommendations for nitrogen, phosphorous, potassium and any other secondary or micronutrients that were tested from Spectrum as long as you choose one of the turf analysis packages.

Taking the sample for Solvita is as easy as taking a soil sample for pH and soil nutrients. Just be sure that a sufficient amount of soil cores are sent in with the sample. We suggest filling the soil sample bag about an inch higher than the green line; this will insure that we have a sufficient amount of soil for the tests. If you need soil texture, soluble salts or nitrates, I would suggest filling the bag as full as possible.

We hope that you will take some time and consider adding the Solvita test to your turf evaluation program. This is another tool that can be use to set your services apart from the competition.

SOLVITA COLOR RESULT #	CONDITION OF SOIL	RECOMMENDED SOIL CARE
> 5	Soil has a very high level of microbial activity and has been recently supplied with a large quantity of either green organic matter or fresh manure, possibly excessively.	Soil is likely to release significant quantities of nitrogen from the organic reserves. Organic matter additions may be restrained.
3.5 - 4	Soil is in an ideal state of biological activity and is receiving adequate organic matter and has an active population of microorganisms.	Soil is likely to provide sufficient nitrogen for medium to heavy feeders and requires only maintenance applications of organic matter.
2.5 - 3.5	Soil is approaching or declining from an ideal state of soil respiration.	Soil may provide adequate nitrogen for light feeders but requires continued applications of microbially active organic matter.
1 - 2.5	Soil is in a somewhat depleted state of organic matter, and biological activity is low.	Soil is not likely to provide adequate nitrogen for most crops and requires medium to heavy applications of organic matter.
0 - 1	Soil is very depleted, has not received adequate organic matter additions, and contains little or no biological activity.	Soil will not provide adequate nitrogen for any crop and requires crop rotations and heavy applications of organic matter.

**Visit Spectrum Analytic's Website**  
<http://www.spectrumanalytic.com>

## How Does One pH Compare To Another?

Dr. T. Scott Murrell, Northcentral Director, IPNI

Soil pH. It is one of the most important chemical properties that affect nutrient interactions in soils and plants. It is, however, one of the most misunderstood measurements, particularly when comparing one pH value to another.

A question that is often asked is, "How many times more acid is one pH than another?" This question is not so straightforward to answer, because pH is not on a linear scale, like a ruler. Instead, it is on a negative log scale. Soils that are higher in acidity actually have smaller pH values, thanks to the negative log scale. The pH scale goes from 0 to 14. The 0 end of the scale is more acid. The 14 end is basic, and a pH of 7 is neutral, dividing acidic from basic. So we know that a pH of 5.8 is more acid than a pH of 6.6. But how many more times acid is it?

To get at the answer to this question, we must first recognize that pH is a transformed measure of the concentration of acid. To find out "how many more times acid" one pH value is than another, we have to do some mathematical manipulations to get us out of the negative log scale and back to a linear scale where such comparisons make sense.

The table below was developed from these mathematical manipulations and is provided to allow you to quickly determine how many times more acid a lower pH value

is than a higher one. To use the table, take the higher pH value and subtract the lower one. Look up the difference in the table, under the heading "pH difference." Then look at the corresponding number in the column to the right labeled "Times more acid." Using our example, we want to compare pH 5.8 and 6.6. We take the higher value and subtract the lower one:  $6.6 - 5.8 = 0.8$ . When we look up 0.8 in the table, we get 6.3. So the lower pH of 5.8 is 6.3 times more acid than the higher pH of 6.6. Using this table, you can easily determine how two pH values compare to one another, up to a difference of 3 pH units. For a more complete set of units, visit: <http://nanc.ipni.net/articles/NANC0022-EN>.

pH difference	Times more acid	pH difference	Times more acid	pH difference	Times more acid
0.1	1.3	1.1	13	2.1	126
0.2	1.6	1.2	16	2.2	158
0.3	2.0	1.3	20	2.3	200
0.4	2.5	1.4	25	2.4	251
0.5	3.2	1.5	32	2.5	316
0.6	4.0	1.6	40	2.6	398
0.7	5.0	1.7	50	2.7	501
0.8	6.3	1.8	63	2.8	631
0.9	7.9	1.9	79	2.9	794
1.0	10.0	2.0	100	3.0	1000

## Soil Probes

Soil testing starts with the taking of the sample, normally with a soil probe. You have heard us say many times that the lab results are only as good as the sample that was taken. Spectrum Analytic offers you a variety of soil probes for your soil sampling needs. We have the following probes in stock and ready for shipment.



Kleen Hole Spade Soil Probe — **\$129.80**



Oakfield LS - 36" Soil Probe w/footstep — **\$110.35**



Oakfield HA - 19" Soil Probe — **\$53.85**



36" Soil Probe w/step — **\$66.50**

## Inadequate Potassium is an Increasing Concern

By Bill Urbanowicz

Potassium is represented by the letter K, which is the first letter of Kalium, the Latin word for potassium. The term “potash” is often used to refer to potassium chloride (KCl), a common potassium fertilizer. The word potash is derived from “pot ashes” which refers to the practice of using the leachate of wood ashes as a source of potassium. The potassium in fertilizer is typically listed as  $K_2O$ , an oxide form of K. While  $K_2O$  actually is not present in fertilizers and is not utilized by plants, the term has become the accepted way of designating the amount of K in fertilizers.

Potassium shortage has been a significant and wide-spread problem for many years, but as we have noted before, there seems to be a continuing trend toward increasing problems with K shortage in many parts of the country. The International Plant Nutrition Institute (IPNI) published an extensive survey of over 4 million 2010 soil test results titled “Soil Test levels in North America” that illustrates the problem.

Figure 10 from their survey shows the median or mid-point value of the soil K tests surveyed. These results are in ppm, so if you are accustomed to lb/a, simply multiply the value by 2. While we cannot assign a quality determination to these values without knowing either the soil CEC or the soil type, and critical levels can differ between regions and states, some of this evaluation was done and is shown in their Fig. 12.

Potassium does not form a structural part of any plant component or compound. It is required for various metabolic activities and physiological functions. Some of them include the following.

- Role in photosynthesis and plant food formation.
- Role in sugar and carbohydrate production, transport, and storage.
- Important, in conjunction with Ca and B, in the proper development of cell walls.
- Controls plant cell turgor and through this the opening and closing of leaf stoma. This in turn controls the plants ability to effectively respond to drought stress.
- Improves a plants ability to combat disease, and to a lesser extent insect damage.

Soil K content varies widely. However, it is not uncommon for a soil to contain about 10 tons of K per acre (3.3 inches deep). However, very little of this K is available to plants. Plant-available K is typically only 0.1% to 2.0% of the total soil K (200 to 400 ppm). Much of the unavailable K is a structural part of various soil minerals.

We receive many phone calls during the season that lawn care companies cannot get analyzes containing the amount of potassium that is recommended. We are all seeing the effects of government regulations where phosphorous has been removed

from almost all of the fertilizers used today. We all know that a healthy lawn is one that contains the required amount of plant nutrients for both soil build up as well as nutrient removal. Why not request your fertilizer supplier to manufacture fertilizer analyzes containing higher levels of potassium similar to winterizer fertilizers which contain higher levels of potassium? This will help to make a better balanced fertilizer and in turn a healthier more lush lawn.

If you are signed up to use our internet website you will be able to download a soil test survey in January; take a look at

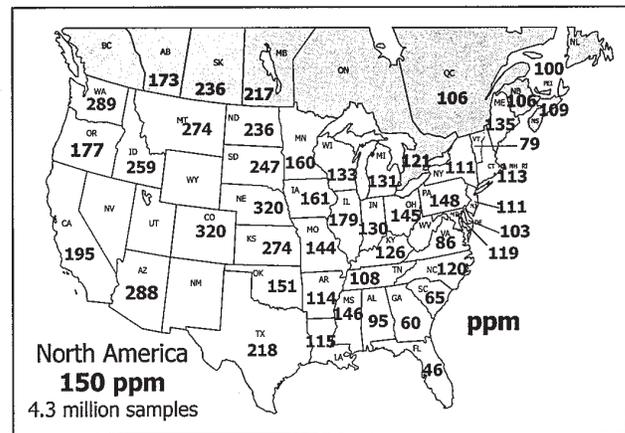


Figure 10. Median soil test K levels in 2010 (for states and provinces with at least 2,000 K tests).

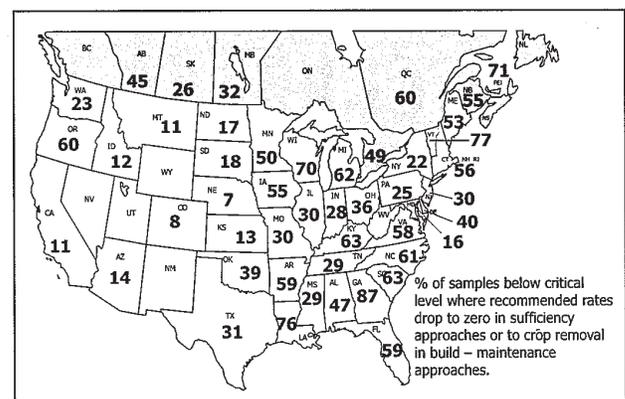


Figure 12. Percent of samples testing below critical levels for K for major crops in 2010.

your overall soil test K levels to see where you compare to the survey work done by IPNI. Next take a look at your individual soil test K:Mg ratios to make sure you are close to the 1:1 ratio. With these two tools you can more finely tune your potassium fertilizer program.