BE AWARE OF THE FOLLOWING POTENTIAL ANOMALIES

1) **Abnormally high TEC's:** These are usually going to be due to the presence of excess salts and/or carbonates in the soil. TEC is calculated by using the concentrations of cations measured. Therefore, if we have more cations present due to the extractant dissolving salts and carbonates we will see erroneously high TEC's.

2) **High OM levels in oxisols:** Soils that tend to be high in iron oxides will give a false high OM level. This is mainly due to structural water molecules that are not removed at 105 degrees C, but are removed at 360 degrees C. This increased water removal influences the weight of the sample, which is high OM is determined using the loss on ignition method. If you want a "true" estimate of organic carbon request a S139. Such soils are common in the KZN midlands and other regions with highly weathered soils with low pH and consequently high aluminium.

3) **Differences between Bray II and Mehlich III:** Bray II is a strong acid extractant (pH of 1.5) that is poorly buffered. When the soil pH gets to 7 or slightly above it starts to not perform well due to its low buffer capacity. In addition, the Bray II test has got such a low pH because it is trying to estimate not only plant available P, but approximately 10 to 15% of the additional P that could be plant available (i.e. rock phosphate) in the coming years. Mehlich III on the other hand, has a pH of 2.5 and is well buffered. As a result, it will perform at high soil pH's too. It only estimates plant available P. So one can see that there could be potentially large discrepancies between the two tests. In fact, there is no relationship between the two.

4) **Aluminium reported as an extractable minor**: Some countries (Canada) and some areas of the U.S. (North Carolina) require producers to report P indexes. In order to calculate these indexes they need to use a Mehlich III extractable aluminium. If one wants to truly look at extractable soil aluminium a potassium chloride extraction is needed (found in the S007 package or by itself is test code S106). **In the majority of cases in South Africa this figure should be ignored**. Ideally, we would prefer to not have it on the test sheet but it is difficult to differentiate data between different countries.

5) **Emphasis on Fe**: There is no good soil test for Fe!!!!!!!!! Iron is ubiquitous throughout the environment and in fact, is difficult to test for in plants. Typically, iron is only going to be deficient in high pH soils that are calcareous and possibly in sandy soils.

6) **ENR:** First, I want to say this about the ENR calculation. It is just that…a mathematical calculation and not an actual measurement. The calculation was based on Missouri soils with their climate back some 40 or 50 years ago. It does work out well for Missouri soils, but as one moves further from this area it quickly loses relevance. In fact, most guys (even in Ohio, which is only about 400 miles or about 650 km away) do not use this calculation at all. The climate in South Africa varies greatly from that of Missouri; therefore, it is not certain how much to trust such an estimate.

We do not use density in the calculation. Below are several organic matter levels where I calculated the ENR at two depths (15 and 30 cm). All results are in kg/ha. As you can see there is quite a bit of variation. Depth is the only real factor besides organic matter that would change these values. The only thing that could have happened is that Marta messed up entering the depth in some of the past samples, which would cause the discrepancy, but again I would not recommend using this value anyway in South Africa since the interpretation equation was not developed there. Again, we see discrepancies here in Ohio and we have a more similar climate.

Organic Matter (%)	15 cm depth	30 cm depth
0.5	22.4	44.8
1.0	44.8	89.6
2.0	67.2	134.4
3.0	89.6	179.2
4.0	100.8	201.6

We are currently working on another testing procedure to actually measure potential nitrogen release in soil. We call it the PNA test (Potential Nitrogen Assessment test). Currently, we are not offering the test, except to a select few who want to participate in a corn study in the USA. Eventually, we hope to make this test available to all consultants. Not only does the test consider organic matter content, but also the health of the soil because it is measuring the microbial community and its health to estimate nitrogen release. This would be a far better option than ENR, since ENR was developed in Missouri and was made to be used on Missouri soils in Missouri's climate. We are working on it and will hopefully have an actual measurement in the very near future. However, it will be a separate test from an S001 or S007 and will cost more given the labour involved, but it is something to consider looking into the future.

Zylem cc
Tel: 033 347 2893
Email: admin@zylemsa.co.za
www.zylemsa.co.za
Fax: 086 682 3677