



# Yield Map Assessment

By Dale Cowan, CCA-ON

The harvest for 2005 is almost wrapped up and then it will be time for the post-harvest review of the seasonal events that shaped the outcome. Yield maps can be compared to a report card which illustrates where the yield came from, the amount and spatial distribution across the landscape. An examination of the yield and yield variances is best done while memories are fresh. The yield maps alone reveal very few answers as to why the yield has occurred the way it has.

Now is the time to measure yield differences in the refugia, different varieties at field scale and treatments that have been set up with a zero check. This is valuable information for your own operation. Setting up these comparisons provides learning opportunities and really determine the value of owning a yield monitor. This year's output can be next year's input as you start to plan for another season.

## As with most data, a historical perspective is of most value.

Comparing past yields and yield patterns may show trends and highlight definite field areas, or fertility zones. With appropriate software skills, the collected data can be queried to reveal areas of similar yield that may be consistent and linked to field attributes.

Management by field zones requires the zones to be stable, consistent from year to year and contain measurable attributes that are also manageable. Measurable attributes can include topography, soil test values and changes in soil type and texture. The identification and analysis can produce information that may lead to knowledge based decisions involving a host of management opportunities. However an understanding of what influences yield is important: planting dates, varieties, slope positions, depth of

topsoil or depth to solum layer, organic matter, CEC, soil structure, bulk density, air filled porosity, soil water characteristics, soil fertility and pH in various combinations.

## Identifying just one factor responsible for yield is elusive and finding one strong correlation can be misleading.

For those of us who have highly organized GIS data bases with multiple years of yield maps and soil data layers properly indexed, we can look at multiple layers of information on top of the yield and drill down to look for relationships to explain yield. GIS software is a powerful tool, however it does require knowledge and experience to interpret the data.

## Simple correlations to yield can reveal themselves.

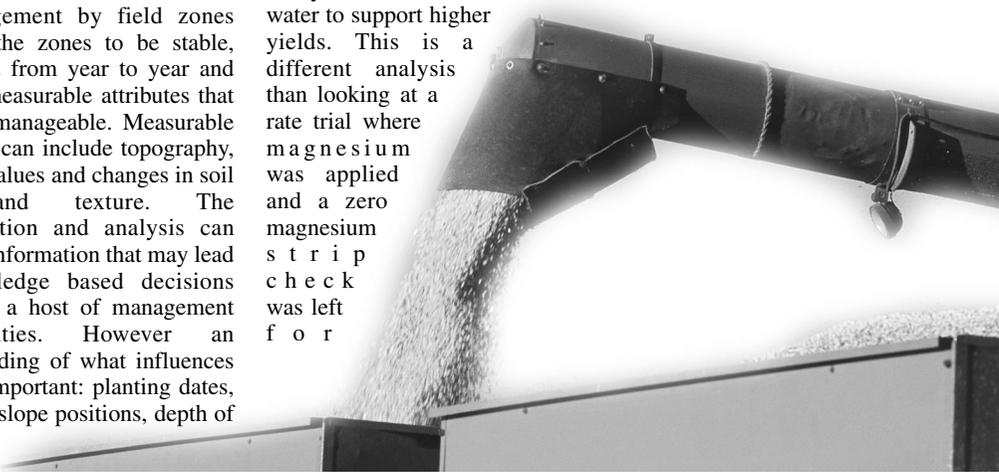
For example, a strong relationship between magnesium and yield occur in most fields. One would be tempted to apply more magnesium, because as magnesium soil test increased, so did yield. However, this is a perfect example of where agronomic skill is required to look a little closer. High magnesium is associated with a higher clay content and therefore likely more available water to support higher yields. This is a different analysis than looking at a rate trial where magnesium was applied and a zero magnesium strip check was left for

comparison. Here a simple measure of yield response may reveal a whole different opportunity. Checks and treatment analysis can, for the most part, be straight forward - you either had a positive, negative or neutral response.

## Sometimes cation exchange capacity (CEC) can give high and low yields.

Low CEC sandy soils have high hydraulic conductivity and low moisture holding capacity and can be drought stressed. Conversely, high CEC clay soils have low hydraulic conductivity and high moisture holding capacities and may have compacted layers restricting root development and nutrient uptake. In dry years the high yields may be on clay, in wet years it may be the sandy areas. There are other areas that can simply be improved with additional organic matter to improve moisture holding capacities or improve soil structure.

While the analysis proposed above may seem confusing it is worth doing. Yield maps are excellent at reporting on what happened, but a further analysis is required to provide all the reasons why it occurred as it did. Seek the advice of a Certified Crop Adviser, whose skill in crop production is second to none.



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*There are over 500 Certified Crop Advisers (CCA) in Ontario. Each CCA has demonstrated their knowledge about Ontario crop production by passing the required exams. In addition, they have the crop advisory experience, the education, the commitment to continuing education and have signed a comprehensive code of ethics, which places the grower's interests first.*



*This industry driven program helps ensure that Ontario crop producers are well served by those providing their crop production advice. This article was written by one of those CCA's.*