

PRECISION MANURE MANAGEMENT: IT MATTERS WHERE YOU PUT YOUR MANURE

M.E. Moshia

University of Pretoria, South Africa

R. Khosla, J. Davis, and D.G. Westfall

Colorado State University, Fort Collins, CO 80523-1170

ABSTRACT

“*Precision fertilizer management*” has been around for more than a decade and is practiced widely in Colorado and elsewhere. By precision, we mean application of fertilizer at the right time, in the right place, and in the right amount. However, “*Precision Manure Management*” is a relatively new concept that converge the best manure management practices with precision nutrient management practices, such as variable rate nutrient application across site-specific management zones.

The objective of this project was: Could we strategically apply differential rates of manure across site-specific management zones such that they improve the yield of the low and medium producing areas of the field?

Recently, we completed three years of a “precision manure management” study at Colorado State University. We conducted experiments to evaluate two different precision manure management strategies along with the fertilizer based precision fertilizer management strategy. The manure application rates were 10, 20 and 30 tons/acre for low, medium and high management zones or vice-versa depending upon the precision manure management strategy. No additional nitrogen fertilizer was applied in any management zone. Grain yield response to application of variable rates of manure on low, medium and high management zones was evaluated for three years (2006, 2007 and 2008) under limited irrigation.

Quite interestingly, in two (2006 and 2008) out of three years, the grain yield responded to variable rate manure application as expected. Grain yield did increase in the low management zones when a higher manure application rate (30 tons/acre) was applied. While, the grain yield response corresponded to our expectation, the grain yields were still lower than those observed for the precision nitrogen (fertilizer) management strategy for those two years (2006 and 2008). It is interesting to note that in 2007, with above normal precipitation, grain yield levels under precision manure management out performed the grain yield levels under precision fertilizer management in all the management zones.

What can we learn from this study? It matters where you apply manure within a field. However, manure alone applied at 30 tons/ac was not sufficient in

two out of three years, to meet the complete crop nutritional needs. It is our understanding that nitrogen side-dressing based on either pre-sidedress soil nitrate test (PSNT) or in-season crop canopy sensing can be coupled with precision manure management to coincide and meet the peak nitrogen requirement of the crop.