



AGRONOMY UPDATE

February 2021

Manure Spreading - The Scoop on Poop



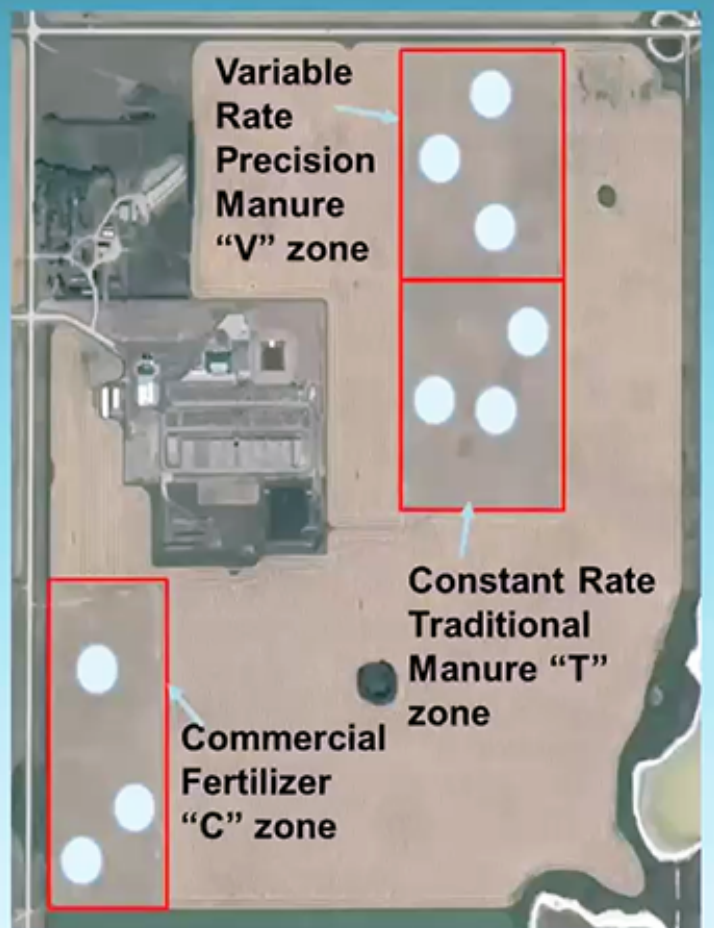
I realize that this month's topic may be of limited interest to those of you who are purely grain farmers. But having seen for myself many times that a liberal application of cattle manure has led to greatly improved soil health and productivity, I was fascinated to see some of the current work being carried out at the University of Saskatchewan where they are trying to apply the 4R's of nutrient management (right place, time, source, and rate) to solid cattle manure applications.

Dr. Jeff Schoenau from the Department of Soil Science at the U of S has been running trials since 2019 comparing commercial fertilizer to flat rate cattle manure as well as variable rate manure applications. His work shows great promise for getting more efficient use out of manure applications; maximizing yield and minimizing off site migration of nutrients.

The trial has been set up so that a single manure application provides enough phosphate for crop use in two silage barley crops, so nitrogen has been supplemented with an NH₃ application. What caught my eye was the simplicity of the creation of the VR map and how easy this would be to duplicate on farm. Dr. Schoenau looked at NDVI satellite imagery from several years as a quick and easy way to identify the eroded knolls and other places where soil water retention was poor. In most years these areas line up nicely with the poorest crop. Conversely, he identified places where water congregated in the low spots by identifying where the crop was heaviest in those years.

Experimental Design

- ▶ 3 Watersheds in each treatment zone block
- ▶ Manure spreader used set-back from watershed basin centers in variable rate application zone.
- ▶ All zones (C,T,V) received 80 kg N ha⁻¹ as anhydrous ammonia in April 2019 to account for P based rate & low N availability of fresh manure N in year of application.
- Commercial fertilizer (C zone) received 50 kg P₂O₅ ha⁻¹ as MAP at time of seeding. Other zones received no P fertilizer.



In 2019, the variable rate trial received the heaviest applications of manure on the upper slopes of the field and applied none in the potholes and lowest elevations where water and nutrients tend to migrate to. Initial impressions on the 1st year of data are promising. As compared to the other 2 treatments, the VR site tended to “smooth out” the yield, showing fewer variations in yield between the different slope positions than the other fields.

The main takeaways from the study so far are summarized below by Dr. Schoenau;

- Variable rate manure application smoothing out yield and uptake.
- Reduction or elimination of manure in depressions and basin centers did not result in yield penalty.
- Variable rate manure application resulted in significantly greater $\text{NO}_3\text{-N}$ in the upper slope position. In dry years, increasing rate on upper slopes may not always be beneficial.
- No accumulation of soil available P or nitrate at lower slope positions of variable rate manure watersheds. Points to benefit from reduced rates in these landscape positions.

This is just the initial phase of a long term study, with the next manure application set for this year, but so far the results are very encouraging. Livestock can be an essential part in soil regeneration, and by combining nutrient analysis of manure with precision technology, we should be able to greatly increase the effectiveness of this resource

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