Variable Rate Technology Economic Modeling

Smart Ag Research

INTRODUCTION

Olds College is working with TELUS Agriculture on assessing the return on investment of variable rate technology of fertilizer (VRT-fertilizer) which is a precision-ag approach allowing producers to manage defined areas of their fields differently.

VRT includes tool(s) and activities that will allow producers to apply fertilizer, water, chemicals and/or seed at different rates across a field.

Objectives

- Work on an economic model to determine what level of variability is required to make investing in VRT worthwhile. For example, if producers can reduce 10% of fertilizer used on 1/3 of their acres without negative impact on yield, would it be worth investing in VRT?
- Analyze potential environmental impact resulting from VRT-fertilizer and express it in monetary value for the producer.

Study Details

Using a calculator/model to evaluate potential return on investment in a given farming scenario recognizing:

- Crop rotation, yields and production inputs
- Field variability
- VRT cost of implementation
- Potential environmental value

Preliminary Results

- Early results indicate if producers can capitalize on the reduction in environmental footprint by accessing carbon credit programs, VRT should be included as part of the normal operations on the farm.
- When focus is on reducing inputs only, it is more beneficial to increase the number of management zones; going from 3 to 5 zones reduces the step size more than going from 7 to 9.
- The impact of yield increase has a larger impact (based on reallocation of fertilizer translating into 100% yield & $30/MT CO2) as opposed to savings of fertilizer input only.

Producer Impact

Producers could potentially save money, improve yields and reduce their environmental footprint by using VRT.

Future Research

- Improve level of detail on field variability to make it more farm & field specific.
- Add different VRT options.
- Consider different crop types & their impact on value of yield increase, fertilizer reduction & environmental impact.
- Consider capital investment requirements.
- Further development of environmental components.

PROJECT PARTNER

TELUS Agriculture