## Soil Disturbance Impacts on Spring Wheat Yield and Quality

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## Introduction

Excavation and replacement of soil is a necessity for the installation of utilities and infrastructure. Soil excavation and replacement can greatly impact soil physical characteristics. If the soil is not replaced to its respective depth/horizon, soil function may change and impact crop growth and yield.

## **Materials and Methods**

To better understand soil impacts from soil disturbance, soil was excavated and immediately replaced to the same hole. Plot dimensions were 5ft by 20ft. Soil was disturbed to a depth of 5 ft. The four treatments were undisturbed (Check); soil was removed and replaced by soil horizon (Good); the top six inches was replaced to its initial location while all B horizon material was mixed (Poor); and all soil was removed and mixed while being replaced (Very Poor). The soil disturbance and replacement occurred approximately two weeks before planting. The experiment was set up as a complete randomized block design with four replications. Barlow hard red spring wheat was planted on May 8, 2019 at 1.25 million live seeds/ac. Potash and urea was applied by mid-row band at 30 and 60 lbs/ac respectively. Monammonium phosphate was applied with seed at 30 lbs/ac. The crop was managed using local best management practices. Plots were harvested by plot combine, cleaned in the lab; and analyzed for protein, test weight, and yield.



Figure 1. Visual conception of soil disturbance and replacement. Red lines indicate the different depths of soil replacement.

## Results

Soil replacement methods did not impact yield, protein (Table 1), and test weight (not reported). The 2019 growing season was abnormally dry. During the excavation process, the Btk horizon did have moisture (not tested). Whereas, the topsoil was dry. Soil moisture content was never recorded. It is possible the Very Poor treatment had a greater surface soil moisture content that impacted spring wheat growth.

Soil will be tested this spring at specific depths for pH, nutrients, moisture and bulk density. This site will be monitored using a "typical" crop rotation to track crop and soil trends over the next few years.

treatment.		
	Yield	
Treatment	(bu/ac)	Protein (%)
Check	2	16.6
Good	1	17.0
Poor	1	16.7
Very Poor	4	16.5
P-value	0.263	0.404
Variance	3.213	0.145
CV	80.9	2.2

Table 1. Grain	yield and protein of eac	h
treatment.		