ASSESSMENT OF ROLLING IN NON-STONY FIELDS

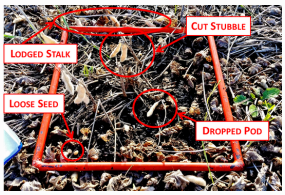
INTERIM RESEARCH UPDATE

FEBRUARY 2019

Project Description

While land rolling is a practice proven to reduce risk of machinery damage in stony fields, it is often performed where the risk of damage is negligible. It is hypothesized that in such cases rolling offers no benefit and may have negative consequences. The goal of this project is to evaluate the ***economic*** and ***agronomic*** outcomes of rolling stone-free land.

- Quantify the cost of rolling (machinery, operation, depreciation, draft load, power, etc.
- Quantify economic gain of rolling (based on cost analysis and yield results)
- Quantify the difference in harvest (yield, efficiency, operator experiences)



Figures 1 & 2. Roller setup (left) and harvest loss square used to measure category losses (right)

Methods

PAMI collected data from rolling operations at three sites (East Selkirk, Elm Creek and Dencross), as well as harvest data at three sites (Elm Creek, Dencross, and Altona).

Spring Field Activities:

- Only smooth rollers were used (50 ft width)
- All of the sites were considered non-stony.
- Treatments: Rolled and unrolled (3 reps)
- Travel time, fuel consumption, draft load, seed to soil contact, and seed depth were measured
- Rental/owenership costs were calculated based on equipment type and work rate

Fall Field Activities:

Collected data on combine harvest speed, combine rock trap collection, combine header losses, plant and pod heights, and harvester fatigue to assess the effect of rolling during combining.

Trials and analysis will be expanded in Year 2.

Preliminary Results

- Average cost of rolling is $3.53/ac (MB Rental Guide).
- Taller plants in unrolled plots at Altona and Elm Creek; no difference at the Dencross site.
- Average lowest pod height was 0.2 to 0.8 cm higher off the ground in the unrolled plots at all sites.
- Avg. combine operating speed for both treatments was 2.5 mph at Altona and 3.5 mph at Elm Creek.
- Combine operators indicated that there was no noticeable difference in handling of equipment between treatments.

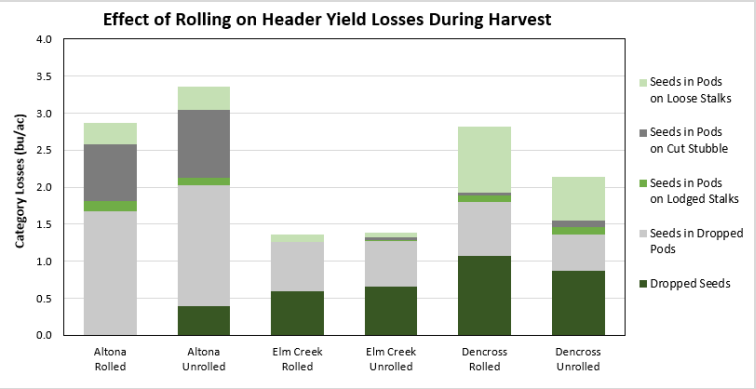


Table 1: Year 1 Summary of Roller Operation

Location	Tractor Power (hp)	Roller Diameter (in)	Roller Width (ft)	Fuel Consumption (L/hr)	Speed (km/hr)	Draft Force (lbf)	Draft Force (kN)	Power Req (hp)	Work Rate (ac/hr)	Fuel Consumption (L/ac)
Elm Creek	280	42	50	-	12.7	2157	9.6	45.4	47.7	-
Dencross	200	36	50	17.7	13.0	1683	7.5	36.3	49.0	0.36
Selkirk	450	36	50	30.0	15.8	1670	7.4	43.8	59.6	0.50

Acknowledgements

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