EFAO 2018: High density grazing in Ontario

Does ultra high density grazing as part of adaptive multi-paddock grazing have merit in Ontario?

PASTURE REGENERATION

Farmer-Researcher

Tony McQuail

Meeting Place Organic Farm - West

Project Timeline:

June 2018 - October 2019

In A Nutshell

Adaptive multi-paddock (AMP) grazing uses short grazing intervals followed by long rest periods. By doing so, this system allows for plant recovery, promotes optimal plant communities, protects against erosion and leads to net carbon storage in the soil (Stanley et al 2018).

To optimize his grazing, Tony assessed the benefits of ultra high density grazing as part of his AMP approach. Specifically, he tested whether a single pass of mob grazing would provide a "hit and boost" to his pastures.

Key Findings

- The amount of forage consumed was the same, irrespective of standard or ultra high density grazing.
- Tony found no difference in pasture recovery between standard and ultra high density grazing.
- Tony will graze these areas in a similar way next year to see if a second year of a "hit and boost" has benefits.

METHODS

Specific Questions

Does stocking density affect the amount of forage consumed?

Does pasture recovery differ between standard and high density grazing?

Design

To test high density grazing as part of his AMP approach, Tony would move cattle through a 3-day sequence:

- **Standard stock density**, 1 paddock/day (control 1)
- **Ultra high density**, 6 paddocks/day (treatment)
- **Standard stock density**, 1 paddock/day (control 2)

He repeated this 3-day sequence over 5 areas in the pasture. Tony's **ultra high density paddocks had over 100,000 lb bodyweight per acre**, and he achieved these densities with many smaller paddocks throughout a single day. The same set of 15 paddocks got a second pass, all with standard stocking densities (**Table 1**).

Table 1

Range and mean stocking density and paddock size for the two control and ultra high density paddocks

Treatment	Stocking density (lb bodyweight per acre)	Paddock size (acres)
Ultra High Density	317,147 - 634,295 Mean: 389,888	0.059 - 0.118 Mean: 0.087
Control 1	8743 (for a heifer group) - 79,287 Mean: 42,211	0.376 - 1.438 Mean: 0.792
Control 2	45,078 - 77,121 Mean: 57,377	0.169 - 0.725 Mean: 0.489

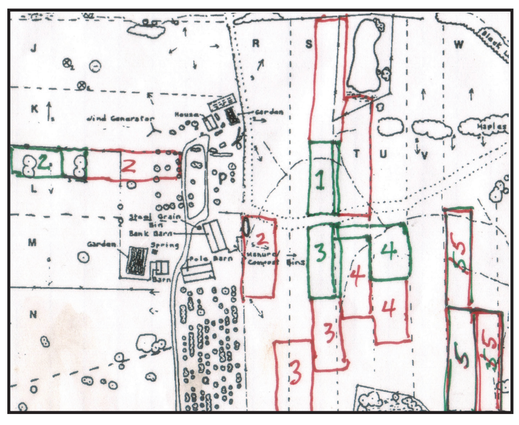

Figure 1. Areas used for the 5 moves. Each move included an ultra high density area that was divided into smaller paddocks (green) and two standard density paddocks (controls, red)

Measurements

Using a FarmWorks F400 rising plate meter (photo), Tony estimated the amount of standing biomass before and after the cattle entered a paddock, and estimated forage consumed by subtracting them. For ultra high density grazing, he took a representative sample across all 6 paddocks that combined for a daily move.

A FarmWorks F400 rising plate meter that Tony used to estimate pasture height and density. For each measurement, Tony took 34-36 estimates of standing biomass across a pasture.

RESULTS

Rising Plate Meter

- The rising plate meter consistently underestimated the amount of daily forage consumed when compared to estimates based on animal units consuming 30 lb dry matter (**Figure 2**).
- This is likely due to lack of calibration with the specific pastures. Nevertheless, we can use Tony's numbers to estimate relative change in biomass.

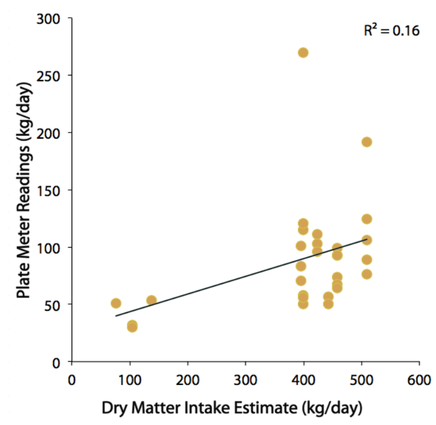

Figure 2. Correlation between the rising plate meter reading and daily forage estimates from animal units x 30 lb dry matter.

Forage consumed

Total forage per paddock before - total forage per paddock after

- There was a lot of variation in forage consumed from paddock to paddock but these differences can not be attributed to stocking density (P=0.42; **Figure 3**).

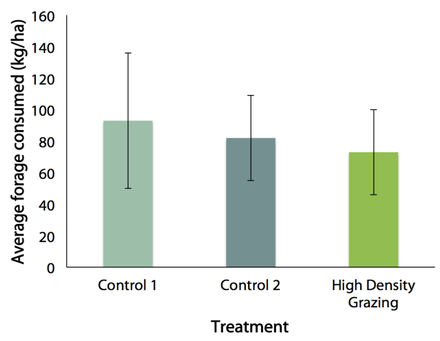

Figure 3. Forage consumed in the two control sections and the ultra high density sections. Means (bars) +/- 1 standard deviation (lines) are shown (n=5 replicates).

Recovery

Standing biomass before second pass (i.e. recovery) - standing biomass after grazing first pass

- Recovery did not differ between the control and ultra high density grazing (P=0.49; **Figure 4**).
- Tony suspects very dry conditions (**Figure 5**) in the beginning and middle of the growing season stunted any potential response.

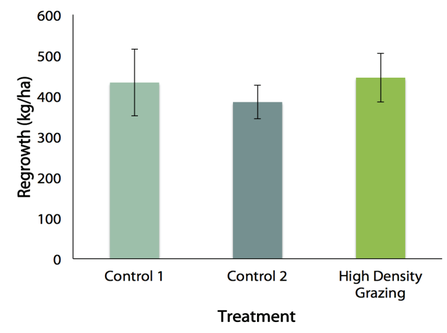

Figure 4. Pasture recovery in the two control sections and the ultra high density sections. Means (bars) +/- 1 standard deviation (lines) are shown (n=5 replicates).

Rain fall

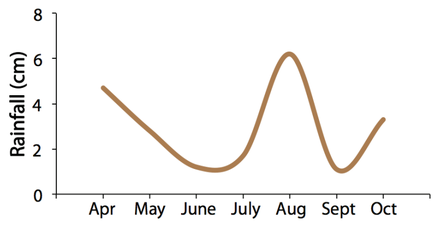

Figure 5. Monthly total rainfall at Meeting Place Organic Farm in 2018. Historical monthly averages exceed 7 cm for these months.

TAKE HOME MESSAGE

Tony's finding that his cattle consumed the same amount of forage, irrespective of standard or ultra high density grazing, provides evidence that ultra high density grazing provides enough biomass for the animals. This is contrary to thoughts from those that oppose ultra high density grazing.

While Tony found no difference in recovery, the dry season may have contributed to this. He will continue to graze in this pattern next year and record forage biomass.

Ecological Farmers Association of Ontario

LIVESTOCK RESEARCH REPORT

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