Analysis of Annual Forage Crops in the Context of a Rotational Grazing System

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Abstract

During the summer the weather will reach higher than average temperatures with below average rainfall that impacts the effectiveness of certain grass mixtures in rotational grazing situations. Managing effectiveness in this system is an important topic to address to graze your herd successfully during times when perennial species exhibit reduced growth rates. One way to buffer against the summer downward spiral of perennial grasses is to incorporate an annual crop that peaks at the times when the other mixes decline. We studied growth factors of two annual forage crop mixtures as they were fed throughout the entire summer grazing period. As forages increased in biomass, the quality of the forages decreased as seen by increasing NDF (Neutral Detergent Fiber), ADF (Acid Detergent Fiber) and lignin concentrations. These nutritive values represent the fractions of fiber in the diet. As studied, the amount of feed is of great importance but when producing a value product the quality of the feed is important to address to graze your herd successfully.

Preliminary Results

**Hypothesis**

Incorporation of an annual crop into a perennial system will provide a viable option that produces adequate or improved biomass and nutrition for animals in a rotational grazing system.

**Objective and methods**

- The objective is to analyze quality and quantity of annuals in relation to other pasture mixes in a steer and breed heifers/cow mix.
- This project was conducted with 4 annual research plots and one perennial plot.
- 2 of the 4 annual plots were grazed twice.
- Data was collected before grazing during and post collecting height (figure 1), dry matter content per meter squared unit, and biomass amount per quarter lot.
- Each quarter paddock was randomly sampled for biomass pre grazing and each half was sampled post-grazing.
- All of the samples were collected, dried and then analyzed for NDF (Neutral Detergent Fiber), ADF (Acid Detergent Fiber) and lignin. (figure 2)

**Figure 3**: Steer paddock 36-04

**Figure 4**: Triticale, hairy vetch and Winfred Brassica hay

**Figure 5**: Shows the differences in NDF and ADF which are an indicator of fiber content.

**Trial 1**: Triticale, hairy vetch, and a Winfred Brassica mix fed to 30 growing steers

**Figure 6**: Dry cows out to pasture

**Figure 7**: Average biomass per quarter paddock along with the average consumption over time.

**Figure 8**: Fiber content is relative to time.

**Figure 9**: The total consumption of pasture in kg/ha between two different paddocks grazed twice

**Conclusion**

1. Red circle – Triticale, hairy vetch and Winfred Brassica was fed to the steers should have been grazed by the dry cows due to high NDF content.
2. Yellow circle – Oats and Winfred Brassica could have been considered for the growing steers. How should farmers/producers use this information:
   - Preliminary data analysis indicates that there is a positive correlation between fiber content and time of grazing.
   - Higher fiber content is positively correlated with more total biomass per pasture.
   - Management is key to performance in properly utilizing annuals in a grazing system.
   - Understand the growth patterns of species you are using.
   - The fall triticale planted mix has a small window of opportunity in early spring too utilize. Staggering planning could extend the window of opportunity.
   - This information gives us a understanding of the importance of using the window of opportunity to minimize quality loss and maximize cost effectiveness.

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![Figure 1: Height plate reader](image1.png)  ![Figure 2: Ankon Equipment](image2.png)  ![Figure 3: Steer paddock 36-04](image3.png)  ![Figure 4: Triticale, hairy vetch and Winfred Brassica hay](image4.png)  ![Figure 5: Shows the differences in NDF and ADF which are an indicator of fiber content.](image5.png)  ![Figure 6: Dry cows out to pasture](image6.png)  ![Figure 7: Average biomass per quarter paddock along with the average consumption.](image7.png)  ![Figure 8: Fiber content is relative to time.](image8.png)  ![Figure 9: The total consumption of pasture in kg/ha between two different paddocks grazed twice.](image9.png)  ![Figure 10: Quality vs quantity comparing NDF and biomass](image10.png)  ![Figure 11: Steers moving to the new section of paddock 36-01 (Visually there is a biomass difference between the section on the left to the new one (right))](image11.png)