

## Evaluation of CRP for Cellulosic Biomass Production, 2008

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**T**he adoption of fertility management in pastures and non-legume hayland has been somewhat limited in this region. This study was conducted as a preliminary investigation to determine the potential of CRP for cellulosic biomass production thru increased nitrogen (N) fertility management. The study was conducted in Foster County, ND. The site was CRP that had not been fertilized for many years. The site was a warm and cool season grass mixture. The nitrogen rates were 0 lbs., 50 lbs., and 100 lbs. N/acre broadcast as urea fertilizer on May 22. The peak standing harvest was cut on September 4 and baled on September 7. The killing frost harvest was cut on October 29 and baled October 31.

Harvest timing did not have a significant impact on yield this year (Table 1) however, it may impact stand and yield as the study progresses. As expected, fertilization rate increased biomass yield (Table 2). The 0 lbs. of N added treatment was significantly higher for the peak standing harvest versus the killing frost harvest (Table 3). The trend continued with the higher N treatments due to degradation of the canopy as weathering caused breakage of stems and harvest loss. In conclusion, increasing N fertilization increased yield, however, exceeding 50 lbs. of N with current yields, N prices, and grass hay prices is cost prohibitive. Harvest timing may have an impact on quality of the feedstock and stand longevity as the study progresses.

**Table 1. Biomass production at harvest.**

| Harvest       | Biomass Weight<br>Dry T/ac |
|---------------|----------------------------|
| Peak standing | 1.2                        |
| Killing frost | 1                          |
| Mean          | 1.1                        |
| C.V. (%)      | 21.6                       |
| LSD 0.05      | NS                         |

**Table 2. Nitrogen fertility effect on biomass production.**

| N Fertility<br>lb/ac | Biomass Weight<br>Dry T/ac |
|----------------------|----------------------------|
| 0                    | 0.7                        |
| 50                   | 1.1                        |
| 100                  | 1.6                        |
| Mean                 | 1.1                        |
| C.V. (%)             | 21.6                       |
| LSD 0.05             | 0.3                        |

**Table 3. Effect of harvest timing and N fertility on biomass production.**

| Harvest       | N Fertility<br>lb/ac | Biomass Weight<br>Dry T/ac |
|---------------|----------------------|----------------------------|
| Killing frost | 0                    | 0.5                        |
| Killing frost | 50                   | 1.1                        |
| Killing frost | 100                  | 1.4                        |
| Peak standing | 0                    | 0.8                        |
| Peak standing | 50                   | 1.2                        |
| Peak standing | 100                  | 1.7                        |
| Mean          |                      | 1.1                        |
| C.V. (%)      |                      | 21.6                       |
| LSD 0.05      |                      | 0.4                        |