**Table 1.** Effects of four grazing treatments on Canada thistle stem density at three study locations across two years. Treatments evaluated include 1) an herbicide application followed by rotational grazing for two years (H-Rgraze 2 yrs), 2) rotational grazing for two years (Rgraze 2 yrs), 3), Mob grazing for one year followed by one year of rotational grazing (Mob/Rgraze) and 4) Mob grazing for two years (Mob 2 yrs). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Canada thistle stem density (shoots/m2) | | | | | | | | | | | | | | |
|  | Hollandale | | | |  | Prairie Du Sac | | | |  | Lancaster | | | |
|  |  | | |  |  | | |  |  | | |  |
| Treatment | F ‘12 | S ‘13 | F ‘13 | S ‘14 |  | F ‘12 | S ‘13 | F ‘13 | S ‘14 |  | F ‘12 | S ‘13 | F ‘13 | S ‘14 |
| H-Rgraze 2 yrs | 0.6 b | 1.8 b | 2.3 b | 0.4 b |  | 0.9 b | 1.3 c | 2.5 b | 1.3 b |  | 0.4 c | 0.3 b | 3.6 b | 5.7 b |
| Mob/Rgraze | - | - | 3.5 b | 0.9 b |  | - | - | 7.1 ab | 4.1 ab |  | - | - | 23.9 a | 21.9 a |
| Mob 2 yrs | 0.4 b† | 9.5 a† | 14.2 a | 5.5 a |  | 0.1 c† | 11.6 a† | 12.5 a | 7.3 a |  | 4.5 b† | 14.3 a† | 12.9 ab | 16 ab |
| Rgraze 2 yrs | 1.7 a | 7.6 a | 4.3 b | 0.8 b |  | 4 a | 4.2 b | 3.4 b | 0.9 b |  | 17.4 a | 15.4 a | 24.9 a | 24 a |
| p-value | <0.01 | <0.01 | <0.01 | <0.01 |  | <0.01 | <0.01 | <0.01 | 0.01 |  | <0.01 | 0.03 | 0.02 | 0.02 |

† Mob 2 yrs measurements for Fall ’12 and Spring ’13 are pooled data from Mob 1 year and Mob 2 year plots as treatments were identical during the first year of study. Fall 2013 measurements are separated with “Mob 1yr, Rotational” representing a rotational grazing treatment following one year of Mob Grazing and “Mob 2yr” representing two consecutive years of Mob Grazing

**Table 2**. Effects of four grazing treatments on forage biomass production, forage utilization, and percent utilization in temperate pastures at Hollandale, WI in 2012. Treatments evaluated include 1) an herbicide application followed by rotational grazing for one year (H-Rgraze), 2) rotational grazing for one year (Rgraze), and 3) Mob grazing for one year (Mob). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2012 forage productivity and utilization | | | | | | | | | | | | | | | | | | |
|  |  |  |  | |  | | | | | | | | | | | | |  |
|  | Forage available (kg/ha) | | | | | | |  | Forage utilized (kg/ha) | | | | | |  | | % utilization | |
|  |  | | | | | | |  |  | | | | | |  | |  | |
| Treatment | Grass | Clover | | CT | | Other | Total |  | Grass | Clover | CT | Other | Total |  | | Total | | C. thistle |
| H-Rgraze | 3701 a | 0‡ | | 51 b | | 146 b | 3898 b |  | 2738 a | 0‡ | 30 b | 136 b | 2903 |  | | 76 a | | 43 |
| Mob§ | 2793 b | 1896 a | | 595 a | | 525 a | 5809 a |  | 994 b | 1365 | 266 a | 378 a | 3002 |  | | 51 b | | 47 |
| Rgraze | 3335 ab | 684 b | | 461 a | | 627 a | 5106 ab |  | 2292 a | 548 | 299 a | 364 a | 3503 |  | | 69 a | | 65 |
| p-value | 0.09 | 0.09 | | <0.01 | | <0.01 | 0.06 |  | <0.01 | NS | <0.01 | 0.02 | NS |  | | <0.01 | | NS |

‡Not included in the ANOVA statement as no variability was present

§Pooled Mob 1 year and Mob 2 year treatments as protocols were identical the first year of study.

**Table 3.** Effects of four grazing treatments on forage biomass production, forage utilization, and percent utilization in temperate pastures at Hollandale, WI in 2013. Treatments evaluated include 1) an herbicide application followed by rotational grazing for two years (H-Rgraze 2 yrs), 2) rotational grazing for two years (Rgraze 2 yrs), 3), Mob grazing for one year followed by one year of rotational grazing (Mob/Rgraze) and 4) Mob grazing for two years (Mob 2 yrs). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2013 forage productivity and utilization | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
|  | Forage available (kg/ha) | | | | |  | Forage utilized (kg/ha) | | | | |  | % utilization | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Treatment | Grass | Clover | CT | Other | Total |  | Grass | Clover | CT | Other | Total |  | Total | C. thistle |
| H-Rgraze 2 yrs | 6827 | 9 b | 241 b | 111 b | 7188 ab |  | 4608 | 6 b | 91 | 73 b | 4778 |  | 67 a | 38 |
| Mob/Rgraze | 6619 | 132 b | 405 b | 257 ab | 7415 ab |  | 4500 | 103 b | 220 | 206 ab | 5030 |  | 68 a | 49 |
| Mob 2 yrs | 7426 | 68 b | 1196 a | 470 a | 9160 a |  | 3734 | 55 b | 478 | 402 a | 4669 |  | 51 b | 37 |
| Rgraze 2 yrs | 5604 | 699 a | 328 b | 413 ab | 7045 b |  | 3342 | 540 a | 150 | 311 ab | 4344 |  | 61 a | 43 |
| p-value | NS | <0.01 | <0.01 | 0.07 | 0.08 |  | NS | <0.01 | NS | 0.07 | NS |  | <0.01 | NS |

**Table 4..** Effects of four grazing treatments on forage biomass production, forage utilization, and percent utilization in temperate pastures at Prairie Du Sac, WI in 2012. Treatments evaluated include 1) an herbicide application followed by rotational grazing for one year (H-Rgraze), 2) rotational grazing for one year (Rgraze), and 3) Mob grazing for one year (Mob). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2012 forage productivity and utilization | | | | | | | | | | | | | | | | | |
|  |  |  | |  | |  |  |  |  |  |  |  | |  |  |  |  |
|  | Forage available (kg/ha) | | | | | | |  | Forage utilized (kg/ha) | | | | | |  | % Utilization | |
|  |  | |  | |  |  |  |  |  |  |  |  |  | |  |  |  |
| Treatment | Grass | | Clover | | CT | Other | Total |  | Grass | Clover | CT | Other | Total | |  | Total | C. thistle |
| H-Rgraze | 2840 ab | | 1 | | 24 c | 217 b | 3081 b |  | 2205 | 1 | 19 b | 145 | 2368 b | |  | 76 ab | 79 ab |
| Mob§ | 3538 a | | 48 | | 321 a | 616 a | 4524 a |  | 2981 | 42 | 278 a | 534 | 3748 a | |  | 83 a | 88 a |
| Rgraze | 2727 b | | 26 | | 129 b | 829 a | 3710 b |  | 1983 | 25 | 52 b | 429 | 2485 b | |  | 67 b | 40 b |
| p-value | 0.06 | | NS | | <0.01 | 0.03 | <0.01 |  | NS | NS | <0.01 | NS | <0.01 | |  | 0.06 | 0.04 |

§Pooled Mob 1 year and Mob 2 year treatments as protocols were identical the first year of study.

**Table 5.** Effects of four grazing treatments on forage biomass production, forage utilization, and percent utilization in temperate pastures at Prairie Du Sac, WI in 2013. Treatments evaluated include 1) an herbicide application followed by rotational grazing for two years (H-Rgraze 2 yrs), 2) rotational grazing for two years (Rgraze 2 yrs), 3), Mob grazing for one year followed by one year of rotational grazing (Mob/Rgraze) and 4) Mob grazing for two years (Mob 2 yrs). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2013 forage productivity and utilization | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Forage available (kg/ha) | | | | |  | Forage utilized (kg/ha) | | | | |  | % Utilization | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Treatment | Grass | Clover | CT | Other | Total |  | Grass | Clover | CT | Other | Total |  | Total | C. thistle |
| H-Rgraze 2 yrs | 4808 b | 13 ab | 47 c | 163 | 5031 b |  | 2921 b | 13 | 28 b | 99 | 3056 b |  | 62 ab | 40 ab |
| Mob/Rgraze | 4651 b | 19 ab | 254 b | 463 | 4787 b |  | 2683 b | 15 | 78 b | 425 | 3200 b |  | 67 ab | 43 ab |
| Mob 2 yrs | 7603 a | 2 b | 580 a | 183 | 8368 a |  | 5869 a | 2 | 504 a | 168 | 6543 a |  | 79 a | 87 a |
| Rgraze 2 yrs | 4403 b | 34 a | 109 bc | 220 | 4766 b |  | 2474 b | 31 | 41 b | 89 | 2612 b |  | 55 b | 29 b |
| p-value | <0.01 | 0.09 | <0.01 | NS | <0.01 |  | <0.01 | NS | <0.01 | NS | <0.01 |  | 0.03 | 0.10 |

**Table 6.** Effects of four grazing treatments on forage biomass production, forage utilization, and percent utilization in temperate pastures at Lancaster, WI in 2012. Treatments evaluated include 1) an herbicide application followed by rotational grazing for one year (H-Rgraze), 2) rotational grazing for one year (Rgraze), and 3) Mob grazing for one year (Mob). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2012 forage productivity and utilization | | | | | | | | | | | | | | | |
|  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |
|  | Forage available (kg/ha) | | | | | |  | Forage utilized (kg/ha) | | | | |  | % Utilization | |
|  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |
| Treatment | Grass | Clover | | CT | Other | Total |  | Grass | Clover | CT | Other | Total |  | Total | C. thistle |
| H-Rgraze | 6250 | 79 c | | 0‡ | 22 b | 6357 b |  | 4921 a | 76 c | 0‡ | 12 b | 4995 ab |  | 80 a | 0‡ |
| Mob§ | 7612 | 1320 b | | 1642 | 68 b | 10618 a |  | 2681 b | 924 b | 1058 | 67 ab | 4921 b |  | 46 c | 68 a |
| Rgraze | 6364 | 1945 a | | 1793 | 213 a | 10314 a |  | 4020 ab | 1502 a | 581 | 182 a | 6285 a |  | 61 b | 41 b |
| p-value | NS | <0.01 | | NS | 0.01 | <0.01 |  | 0.02 | <0.01 | NS | 0.06 | 0.09 |  | <0.01 | 0.03 |

‡Not included in the ANOVA statement as no variability was present

§Pooled Mob 1 year and Mob 2 year treatments as protocols were identical the first year of study.

**Table 7.** Effects of four grazing treatments on forage biomass production, forage utilization, and percent utilization in temperate pastures at Lancaster, WI in 2013. Treatments evaluated include 1) an herbicide application followed by rotational grazing for two years (H-Rgraze 2 yrs), 2) rotational grazing for two years (Rgraze 2 yrs), 3), Mob grazing for one year followed by one year of rotational grazing (Mob/Rgraze) and 4) Mob grazing for two years (Mob 2 yrs). Treatments were replicated four times at each site. Letter codes indicate significance of pairwise tests within columns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2013 forage productivity and utilization | | | | | | | | | | | | | | | | | |
|  |  |  | |  | |  | |  |  |  |  |  |  |  |  |  |  |
|  | Forage available (kg/ha) | | | | | | | |  | Forage utilized (kg/ha) | | | | |  | % Utilization | |
|  |  | |  | |  |  |  | |  |  |  |  |  |  |  |  |  |
| Treatment | Grass | | Clover | | CT | Other | Total | |  | Grass | Clover | CT | Other | Total |  | Total | C. thistle |
| H-Rgraze 2 yrs | 6914 b | | 559 c | | 85 b | 105 | 7662 c | |  | 4308 a | 473 b | 12 b | 62 | 4781 b |  | 62 | 14 b |
| Mob/Rgraze | 4799 c | | 2988 a | | 1384 a | 235 | 9405 bc | |  | 2860 b | 2020 a | 249 b | 111 | 5144 b |  | 54 | 18 b |
| Mob 2 yrs | 8454 a | | 1400 b | | 2734 a | 159 | 12747 a | |  | 4287 a | 1031 b | 1827 a | 158 | 7303 a |  | 57 | 68 a |
| Rgraze 2 yrs | 4999 c | | 3184 a | | 1739 a | 351 | 10272 b | |  | 3005 b | 2280 a | 629 ab | 261 | 6176 ab |  | 60 | 35 ab |
| p-value | <0.01 | | <0.01 | | <0.01 | NS | <0.01 | |  | 0.01 | <0.01 | <0.01 | NS | 0.04 |  | NS | <0.01 |