

Equine Grazing Preferences and Persistence of Twelve Cool-season Grasses

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Cool season perennial grasses are the foundation of productive horse pastures in the North Central U.S. In Minnesota alone, there are over 3 million acres of permanent and improved pastures. Horses are selective grazers and tend to overgraze species of preference before moving on to a less desirable species of grass. New cool season grass varieties are being marketed for use in grazing systems, but few are evaluated for persistence and palatability under horse grazing. The objective of this research was to evaluate grazing preferences and persistence of twelve cool season grasses under horse grazing.

Research was conducted in St. Paul, MN during the 2010 growing season using stands of grasses established August 13, 2009. The experimental design was a randomized complete block with six replications. Each individual grass plot was 3 by 6 meters; total size of each grazed area was 21 by 30.5 m. Grass species included 'Barolex' tall fescue (*Schedonorus phoenix*), 'Hidden Valley' meadow fescue (*Festuca pratensis*), 'Everett' quackgrass (*Elytrigia repens*), 'Agassiz' smooth brome (*Bromus inermis*), 'Fleet' meadow brome (*Bromus biebersteinii*), 'Paddock' meadow brome (*Bromus inermis*), 'Marathon' reed canary grass (*Phalaris arundinacea*), 'Survivor' perennial ryegrass (*Lolium perenne*), 'Winneton' timothy (*Phleum pratense*), 'Ginger' Kentucky bluegrass (*Poa pratensis*), 'Garrison' creeping foxtail (*Alopecurus arundinaceus*), and 'Baridana' orchardgrass (*Dactylis glomerata*). Soil pH, phosphorus, and potassium levels were adjusted according to university recommendations and 56 kilograms of nitrogen per hectare was applied in April and June.

All experimental procedures were conducted according to those approved by the University of Minnesota Committee on Animal Use and Care. Four adult quarter horse types (1 mare, 3 geldings; 538 kg \pm 38 kg in body weight; 21.5 \pm 6.5 years of age) were grazed starting in May through October in a cafeteria style grazing trial. Grazing was initiated based on grass height and maturity. Grazing events occurred on May 18, June 16, July 19, August 16, September 14, and October 11; grasses were in the vegetative to boot stage of maturity. Horses were acclimated for 5 days in an adjacent pasture of mixed grass. Following the acclimation period, horses grazed two replicates for eight hours on day one, followed by two more replicates for eight hours on day two, and the final two replications for eight hours on the third and final day, resulting in three consecutive days of grazing each month. Horses were given *ad libitum* access to water, and when not grazing, horses were housed in a dry lot and fed *ad libitum* mixed hay. After grazing, all plots were mowed to 9 cm and allowed to regrow. Prior to each grazing, plots were visually assessed for percent ground cover on a scale of 0 (bare ground) to 100 (100% ground cover) to determine persistence. Post-grazing grass removal was assessed on a scale of 0 (no grazing activity) to 100 (100% of the plants were grazed) to determine preference. Data were analyzed using the MIXED procedure of SAS. Plots were considered the experimental units. Statistical significance was set at $P \leq 0.05$. Means are the least square means of the MIXED procedure.

Throughout the grazing season, horses demonstrated strong grass preferences ($P < 0.01$). Timothy, Kentucky bluegrass and quackgrass were most preferred grasses with average seasonal removals of 82, 81 and 71%, respectively. Meadow fescue, smooth brome grass, perennial ryegrass, tall fescue, reed canarygrass, and Garrison creeping foxtail were moderately preferred with removals of 64, 63, 62, 61, 55, and 54%, respectively. Orchardgrass and both varieties of meadow brome grass were not preferred with removals of 47 and 38%, respectively.

Grasses differed in persistence under horse grazing ($P < 0.01$). At the initiation of grazing, all grasses had stands greater than 95% ground cover. Tall fescue, orchardgrass, and meadow fescue were most persistent with average seasonal ground covers of 81, 79, and 77% respectively. Quackgrass, perennial ryegrass, and reed canarygrass also persisted well with average seasonal ground covers of 76%, and 'Fleet' meadow brome grass and Kentucky bluegrass averaged 75%. Smooth brome grass and 'Paddock' meadow brome grass had 73% ground cover, while creeping foxtail and timothy had 67 and 66% ground cover, respectively.

Mixtures of fescues, Kentucky bluegrass, smooth brome grass and perennial ryegrass should withstand grazing while being preferred by horses. Although timothy was most preferred, it did not withstand horse grazing. This information should be used along with yield, forage quality, maturity and winter hardiness when selecting optimum horse pasture mixes.