

What Have We Learned from Grazing Alternative Forage Species in Horse Pastures?

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In the Midwest, perennial cool-season grasses (e.g., orchardgrass, Kentucky bluegrass, meadow/tall fescue) are the foundation of productive pasture systems. However, horses are known to be selective grazers and can graze forage species to a shorter height compared to other livestock, which may limit productivity and survival of some forages. Horse grazing behavior combined with adverse weather (e.g., flood, drought) and the chance of winterkill or winter injury led University of Minnesota researchers to explore grazing alternative forages in horse pastures with the goal of extending the grazing season and providing forage during emergency grazing situations.

Prior to exploring alternative forages for horse pastures, researchers first had to gain additional knowledge on perennial cool-season grasses. Results of a multi-year grazing trial found pure stands of orchardgrass, meadow fescue, endophyte-free tall fescue, and Kentucky bluegrass struck a balance between forage persistence, yield, forage nutritive value, and preference in horse pastures. Next step was to evaluate these grasses in mixtures. Research concluded horses preferred pasture mixtures containing endophyte-free tall fescue, perennial ryegrass, Kentucky bluegrass, and timothy, and had less preference for mixtures containing $\geq 30\%$ orchardgrass. Preference is an important measurement to consider, as a more preferred forage mixture will result in more uniform grazing, thus increasing forage utilization and decreasing maintenance (e.g., mowing). Mixtures containing endophyte-free tall fescue, perennial ryegrass, Kentucky bluegrass, and timothy (e.g., Agassiz CHS #4, LaCrosse BLM #4) should result in a high yielding, persistent, and preferred grass pasture for horses in the Midwest. However, these mixtures will likely transition to endophyte-free tall fescue and Kentucky bluegrass dominated pastures over time.

With a better understanding of perennial cool-season grasses, researchers started exploring forage options that could extend the grazing season or be used as emergency forage in horse pastures. In a two-year study of cool-season annual grasses, horse preference, yield, and forage nutritive values were evaluated. Based on a combination of these factors, annual ryegrass appears to be a good option for horse owners looking to extend the grazing season or in need of emergency forage. Other annual forages evaluated included spring and winter barley, spring oat, spring forage oat, spring and winter wheat, and winter rye; however, these forages did not perform as well as annual ryegrass under horse grazing. Planting annual ryegrass in separate pastures or overseeding injured areas should offer high quality forage for horses and can be used to extend the grazing season.

Following the success of exploring annual cool-season forages, the team evaluated annual warm-season grasses. Forage species included teff, sudangrass, sorghum sudan, Japanese millet, and Siberian millet. Based on results, teff showed potential as a viable option for horse pasture forage; however, it should be tested for nitrates before grazing and the calcium to phosphorus ratio should be monitored to ensure adequate calcium consumption. Although horses did consume the other warm-season species, neither Siberian nor Japanese millet survived for the entire growing season, and sudangrass has the potential for prussic acid poisoning, cystitis syndrome, and abortions in horses. High concentrations of nitrates were observed in most warm-season forages; however, toxicity was not observed, likely because the horses grazed these forages for short periods of time and in rotation with other forages. Planting teff in designated pastures could help offset the summer slump cool-season grasses frequently go through during hot and dry summer months.

Although not commonly grazed, there can be times when pure legume pastures might be beneficial for horses. In a separate trial, different varieties of alfalfa, red clover, and white clover were evaluated under horse grazing. Horses preferred the clovers over alfalfa, but alfalfa produced greater yields compared to the clovers. It was concluded legumes in a grazing system offer a high yielding, nutrient dense, and preferred forage for horses with increased energy needs (e.g., broodmares, performance horses). They have the potential to reduce the need

for grain concentrates for horses with higher nutritional requirements. However, horses at maintenance (e.g., adult, idle horses) should be monitored to avoid excessive bodyweight gain if grazing legume pastures.

Although considerable progress has been made in better understanding interactions between horses and pasture forages, and viable alternatives to perennial cool-season grasses have been identified, more work needs to be done. Future efforts will focus on the feasibility of grazing horses on cover crops. It is thought the lack of understanding on the impact horses have on cover crops (and vice versa) is limiting the use of cover crops on diversified livestock farms and in sensitive geographical areas (e.g., near water, rolling terrain, etc.).



Grazing teff.



Grazing alfalfa.