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Do Horses Spread Non-Native Plants on Trails?

by: Stith T. Gower, PhD

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Can plant and weed seeds contained in horse manure, hooves, and hay cause nonnative plant species (plants that were introduced to that ecosystem but do not grow there naturally) to spread along trails and into parks and forests? This is an ecological question that often arises. Stith T. Gower, PhD, of the Department of Forest Ecology and Management at the University of Wisconsin-Madison, has determined that while there are seeds from weed and non-native plant species in horse manure and hay, the plants that result don't survive or spread on trails. Therefore, horses do not appear to be a major source for the introduction of nonnative species.

"Nonnative plant species pose a serious ecological and economic threat to managed and natural ecosystems," said Gower. "Therefore, there is a great need to identify major sources for the introduction of non-native species and implement management plans to reduce or eliminate their introduction. Horses have been suggested to be an important source for the introduction of nonnative plant species along trails, but the data are largely anecdotal."

The objectives of two studies were to determine if horse hay, manure, and hoof debris samples contained seeds from nonnative species, and if so, whether their seeds would germinate and establish on the trails.

Gower took samples of horse hay, manure, and hoof debris from 12-24 horses at each of five American Endurance Ride Conference (AERC) rides held in North Carolina, Kentucky, Illinois, Wisconsin, and Michigan. Subsets of these samples were sown in potting buckets and grown outdoors in ideal conditions in Madison. In addition, samples from the horses at each ride were placed back on the horse trail.

On average, nonnative plant species germinated from 5.2% of the hay samples placed in the potting buckets, indicating horse hay contains seeds from nonnative plant species. However, only three of the 288 hay, manure, and hoof debris samples placed on the horse trail contained plants after the first growing season, and no surviving plants were observed after the second season.

Gower also did vegetation surveys along 50-meter (150-foot) survey lines perpendicular to horse and hiking (horses not permitted) trails at three of the five sites to compare species composition of native and nonnative plants. He wanted to determine if newly introduced plant species were moving into ecosystems adjacent to the horse trails and trails that prohibited horses.

Species composition and percent of total nonnative plant species did not differ between horse and hiker trails, and the nonnative plant species always occurred within 2 meters (6 feet) of the trail. Other potential sources for nonnative species might be birds, he said. "Many studies have observed that trails and roads (of all uses) facilitate the establishment of nonnative species," added Gower.

"The results of this and other studies demonstrate that horse hay and manure contains seeds of nonnative plant species, but native and nonnative plant species rarely become established on horse trails because of the adverse effects of harsh environmental conditions and frequent disturbance on seedling establishment," concluded Gower.

For more information about the study, e-mail Gower at stgower@wisc.edu. The study was funded by the American Endurance Ride Conference (www.aerc.org).

Readers are cautioned to seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.

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