

## Can Horses Spread Weeds?

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Each year, noxious weeds cause millions of dollars in losses to western rangelands. Since the 1990's, most hunters and recreationists have been confronted with the need to buy "certified weed seed free forages" to travel with horses in Montana's backcountry areas. Preventing new weed invasions is critical to our resources, and the Montana Noxious Weed Seed Free Forage (MNWSFF) Program was developed for this reason. Each year, the Montana Department of Agriculture coordinates an inspection and verification program to identify forages and feeds that can be packed into federal and state lands. Fields are inspected for the absence of Montana's 23 noxious weeds by qualified inspectors, and "certified" forages or feeds are then marked by a system of tags or color-coded bale twine. Each year, the Montana Department of Agriculture provides a list of MNWSFF-certified producers, so that horse and livestock owners can buy local weed-free hay or feeds. The MNWSFF Program is overseen by an advisory council comprised of hay producers, backcountry organizations, and state agencies.

The use of MNWSFF forages and feeds is becoming a successful method to restrict new weed introductions on public lands. On many privately-owned ranch, farm and subdivision properties, weeds invade many different ways. It is evident that noxious weeds were likely introduced by feeding weed-infested hay or feeds. Many current weed problems are worsening due to poor grazing practices, lack of weed control, and continual re-infestation and spread by manure and additional contaminated feeds. Currently, the MNWSFF program is being targeted to horse owners on small acreages to limit the spread of weeds on private lands. Many people are curious about how weeds are possibly spread by horses and other livestock.

Wildlife and domestic livestock can move weed seeds over long distances on their hair or skin, and in their digestive tracts. Depending on weed maturity, weed density and animal consumption, passage of viable weed seeds in animal manure is a fairly efficient method of weed seed dispersal. Passage of viable weed seeds has been documented in wild birds, deer, mice, swine, cattle, sheep, poultry and horses. In most cases, mastication and digestion reduces seed viability by over 90%. However, if a large quantity of noxious weed seeds is consumed, some viable seed will successfully pass through the digestive tract. In research at MSU by Dr. Brett Olson and coworkers, sheep and mule deer were fed alfalfa pellets and barley dosed with 5000 spotted knapweed seeds. Manure was collected daily for 10 days after feeding the weed seeds, and knapweed seeds were extracted and tested for viability. Over the 10-day period the mule deer passed 43 and sheep passed 16 viable spotted knapweed seeds (0.9% and 0.3% of the original 5000). Interestingly, seed passage through the mule deer was discontinuous – 9 viable seeds passed on day 10, compared to sheep where most viable seeds (14 of 16) had passed by day 3. The implications of this research are that grazing livestock should not be moved from weed-infested sites to non-infested sites for a minimum of 4 days, and that wildlife seed movement is a fairly high risk.

Very little has been published on horse digestion and passage rates relative to weed seed survival, which could be different from that of ruminants such as sheep and cattle. Previous MSU horse research with chemical markers indicate that over 95% turnover occurs in 72 hours. Recently, our group conducted a horse feeding trial where feed was dosed with known quantities of weed seeds. The weeds included leafy spurge, spotted knapweed, Persian dandelion, wild oat, curly dock and quackgrass. Alfalfa seed was also used in the test because of its seed coat and size characteristics, and availability. Manure was collected at nine intervals to 72

hours, and the manure was sub-sampled and grown in the greenhouse to detect passage of viable seeds. In this preliminary evaluation, total passage of viable weed seeds through 72 hours ranged from 0 to 2% (weeds) to over 10% for alfalfa. If horses eat high levels of noxious weeds, it appears that a low level of viable seeds will pass and could contaminate lots, pastures and public lands.

With the approach of hunting season in Montana, all hay and feed moved with horses into the backcountry on public lands must be MNWSFF-certified. Further, based on our preliminary results we are encouraging folks to feed their horses certified hay and grain 3 to 4 days BEFORE transporting them to the trailheads, to minimize the risk of spreading weed seeds. In Montana, certified MNWSFF hay and feed sources cost 5 to 20% more than other feeds. For horses that are fed hay on small drylots throughout the year, it is advisable to feed certified hay or feeds year-round. If combined with a diligent weed control program, the 5 to 20% premium generally pays for itself to in future weed control costs on private properties.