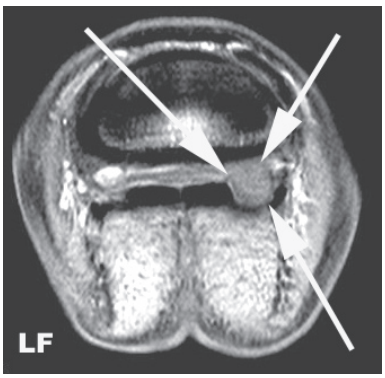
Equine NEWS

COLLEGE OF VETERINARY MEDICINE | FALL 2005 | VOLUME 2, NUMBER 3

The Use and Value of Magnetic Resonance Imaging

Buster, a four-year-old quarter horse from western Washington, was training for reining competition in the spring of 2003 when he developed lameness in his left front foot, though no traumatic event was known. When his local veterinarian radiographed the sore area, everything looked normal. As young quarter horses are often prone, attention turned to navicular disease, or inflammation of the heel, as the cause of Buster's lameness.

For an accurate diagnosis, the horse was referred to the WSU Veterinary Teaching Hospital in Pullman for analysis with the college's magnetic resonance imaging system, or MRI. With this advanced diagnostic tool, Buster's veterinarians were able to see a cystic mass growing beside his digital flexor tendon sheath in his foot. The mass was above the navicular bone, but below the level of his heel bulbs.



Magnetic resonance image of a horse's foot showing a mass beside its deep digital flexor tendon within its heel.

"The mass was not visible with either radiographic or ultrasonographic imaging," said **Dr. Sarah Sampson**, WSU veterinary resident in equine surgery specializing in orthopedics and MRI. "With MRI images, the mass was determined to be scar tissue or an encapsulated cyst causing the problem. Navicular disease would have been the wrong diagnosis for Buster, and his subsequent treatment would not have been successful.

"Before MRI technology, veterinarians could not see many problems, and for years have been forced to make assumptions when diagnosing and treating horses that have normal radiographic and ultrasonographic images," she said. "MRI enables a specific diagnosis and, therefore, the most accurate and successful treatment plan to be initiated in the majority of cases we examine."

With the aid of the several hundred MR images obtained from Buster's exam, veterinary surgeons at WSU were able to localize the problem and perform tenoscopy, a minimally invasive surgery to remove the mass from Buster's leg. After it was analyzed at the Washington Animal Disease Diagnostic Laboratory, the mass was determined to be an epidermoid cyst. "This kind of growth is usually associated with skin, but the cyst was located deep within the leg, inside the digital flexor tendon sheath. This is the first time an epidermoid cyst has been found in a synovial structure of a horse that we know of," Dr. Sampson said.

In recent years, veterinarians have evaluated many bone and soft tissue problems with MRI technology, many of which have not been diagnosed in live horses before. It has also helped eliminate the need for exploratory arthroscopy in the joints of many horses. In addition to lameness problems in the limbs of horses, neurologic disorders and tumors can also be detected by taking an MRI of a horse's head.

"We are just beginning to realize its full potential," Dr. Sampson said. For Buster, it meant that he could resume training and compete successfully in performance events after a rehabilitation program tailored for his specific problem.

Though it has been used in human medicine for years, MRI technology is relatively new in veterinary medicine. The MRI system uses magnetic energy, as opposed to x-ray radiation, to produce from 600 to 800 images of both bone structure and soft tissue. The images most commonly resemble slices of bread through a loaf, but they can be reconstructed and colorized on the computer to provide three-dimensional views as well.

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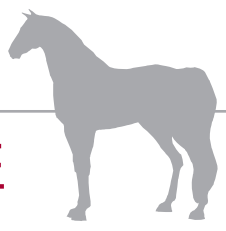

IN THIS ISSUE

WASHINGTON STATE UNIVERSITY

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The Washington State University College of Veterinary Medicine is proud to announce the Region V Arabian Horse Association sponsorship of this issue of the WSU Equine News. The association encompasses Washington, Alaska, northern Idaho, and western Montana and works to improve breeding, training, use, and showing of Arabian horses. It also promotes and manages exhibits, clinics, seminars, and shows for the participation and education of Arabian horse owners, breeders, and admirers. In addition, it coordinates and assists with activities of Arabian horse clubs affiliated with the AHA situated within Region V.

Whether for show, endurance, or dressage, horses from the Pacific Northwest are among the best. The quality and caliber of Region V horses are evident by the results of highly competitive shows such as the U.S. Nationals, Canadian Nationals, and Scottsdale. For more information about the Region V Arabian Horse Association, look online at www.regionv.com or contact Tague Johnson at 360-652-9615 or tague@whidbey.net.

If your group or club would like to sponsor an issue of Equine News, contact Lynne Haley, Assistant Director of Veterinary Development and External Relations, at 509-335-5021 or lhaley@vetmed.wsu.edu. Dr. Richard DeBowes, DVM, Chair of WSU Veterinary Clinical Sciences, may also be contacted at 509-335-0738 or debowes@vetmed.wsu.edu.

Horsemen Raise Dollars for Equine Medicine

Over 100 veterinarians and horse enthusiasts attended the first annual "Ride for Research" event sponsored by the Washington State Horse Council and member organizations on July 22–24 near Littlerock, Washington. In total, the event raised approximately $10,000 from entry fees, a live auction, and donations to the WSU College of Veterinary Medicine to support equine research programs.

Current studies in equine clinical medicine include pain management in post-operative patients, the diagnosis of navicular syndrome, evaluation of new techniques in laparoscopic surgery, the management of joint disease, and sports medicine. Across the basic science departments within the veterinary college, additional research is being pursued in equine digestive and infectious diseases, and the immune response of horses and foals to infectious disease.

This year's event was held at the Evergreen Sportsmen's Club near Littlerock, with highlights including a scenic prize ride around the club and surrounding area, live auction, and steak dinner. "There were so many donations that every participant in the ride got a prize," said Lynne Haley, WSU associate director of veterinary development and external relations. "Saddles were among the top prizes, as well as bridles, saddle blankets, and veterinary services among others. For the silent auction, there were items such as artwork, vacation packages, and a wine/cheese/chocolate basket direct from Amsterdam."

On the evening of July 23, a dinner was served, with steaks donated by Washington Beef and prepared by Washington's lieutenant governor, Brad Owens. "He is a friend, and when I told him about the event, he said he would be glad to do it," said Ed Armstrong, chair of the event and member of the WSU Equine Health Advisory Board, noting that Owens has helped cook steaks at many horse events. "The event was a huge success and an absolutely marvelous prize ride, probably the best in the state," he said.

"The event was important for several reasons, but perhaps most important in raising awareness of the needs of Washington State University's Equine Health Program in the College of Veterinary Medicine," said Dr. Richard DeBowes, chair of the WSU Department of Veterinary Clinical Sciences.

"Washington State University has an outstanding cadre of clinical and basic research scientists who have dedicated their careers to promoting the health of horses," he said. "The support of the public for their work, and for enhancing the college as a center for this vital work is gratifying and deeply appreciated."

The second annual Ride for Research to benefit equine research at WSU is being planned for the first weekend in August 2006. For those who are interested in supporting the equine research programs at the College of Veterinary Medicine, please contact Lynne Haley at 509-335-5021 or lhaley@vetmed.wsu.edu.

WSU Veterinary Teaching Hospital Switchboard

Main VTH Number / Switchboard	**509-335-0711**
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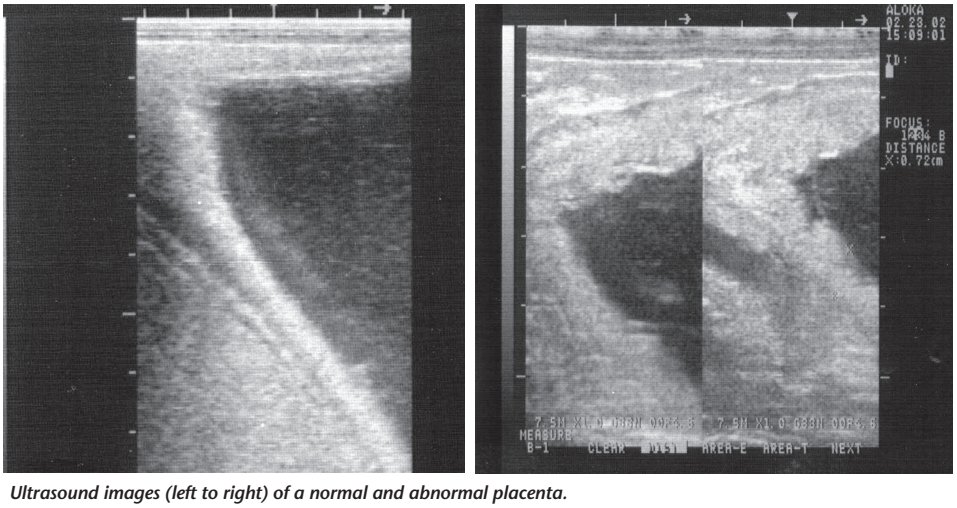
Would you like to know more about our equine clinical services, research, accomplishments, or just get directions to the college?

Please check out our equine Web site at www.vetmed.wsu.edu/depts-equine
or the WSU Veterinary Teaching Hospital Web site at www.vetmed.wsu.edu/depts-vth/equineServices.asp.
Also feel free to call 509-335-0718 for **equine appointments**
or 509-335-0711 for **emergency care.**

Prenatal Care for Pregnant Mares

During the fall, most bred mares are in their second trimester of pregnancy. Then again, some are not.

"Of all bred mares, only 75 percent at best will deliver a foal some 11 months later," **said Dr. Ahmed Tibary**, associate professor at the WSU College of Veterinary Medicine and board-certified theriogenologist (animal reproduction specialist). "For this reason, we suggest that all our clients have their mares reevaluated in the fall to make sure that the mare is still pregnant and that the foal is healthy."



Ultrasound images (left to right) of a normal and abnormal placenta.

NEEDS OF A PREGNANT MARE

During the first four months of gestation, mares often have no outward signs of problems or great demands to maintain their pregnancies. "The hard work for mares begins after this, so it becomes important during the second trimester that owners pay attention to their mares' condition," Dr. Tibary said.

This is especially true if the mare is older, is prone to medical problems like a systemic disease, or has a reproductive history of losing foals or birthing prematurely. "These mares are termed high-risk, and should be monitored more frequently with monthly fetal well-being evaluations and ultrasounds, similar to human medicine," he said.

Horse owners can do several things to better a mare's chances of delivering a healthy foal. First, exercise and nutrition should be taken into consideration. "Often this is dependent on the horse's situation before pregnancy and the management style of the owner. Each horse's needs can be discussed with a veterinarian," Dr. Tibary said.

"During the last trimester of pregnancy, a mare's nutritional intake should increase by about 20 percent," he said. "Nutrition problems are rare, but owners need to make sure the mare is eating quality feed and that she is eating the amount she was actually given.

"Special attention should also be given to minerals and trace elements in feed, as there are some very striking regional differences," he said. "Over-feeding should be avoided as well, and mares with metabolic problems should be closely monitored. Obese mares, particularly donkeys and miniature horses, are prone to developing pregnancy toxemia."

Good prenatal care also includes vaccinations against abortive diseases, such as Equine Herpes Virus-1 (or Rhinopneumonia), which should be given routinely at specific stages during pregnancy. It is also important that pregnant mares receive deworming treatments, and that owners watch for any dental, digestive, or parasitic problems. "A preventive program should be tailored for a horse owner's specific region and in consultation with his or her veterinarian."

WHAT TO WATCH FOR DURING PREGNANCY

During the mid- to late pregnancy, there are several signs horse owners can look for to tell them that something is amiss. First, suspicion should arise anytime a pregnant mare begins to display signs of colic. "Even with mild cases, a veterinarian should be called immediately. If it is caught early, both the mare and the foal have a good chance of surviving," Dr. Tibary said.

Other warning flags include if a mare begins to lactate, if she has abnormal vaginal discharge, if her abdomen fails to develop, or if she develops too rapidly. "If a mare develops too quickly, there may be too much fetal fluid, or the mare may be carrying twins which might abort or deliver prematurely. Keep in mind that twin diagnosis in late pregnancy is very difficult," Dr. Tibary said. For these cases, a veterinarian should be contacted to monitor the situation.

"A common cause of abortion is placentitis, or inflammation of the placenta," he said. "We can diagnose this condition during episodes of premature lactation or 'bagging,' and there are some good treatments available to save these pregnancies.

"If an abortion occurs, the breeder needs to find out why." Unfortunately, many abortions are not pursued and the cause is not found, which may be the result of a serious medical condition or fertility issue.

An owner that sees his or her horse in the process of an abortion should call a veterinarian immediately, who can collect samples for diagnosis at such places like the Washington Animal Disease Diagnostic Laboratory at WSU in Pullman.

"We have very good services at WSU to diagnose the cause of abortions, but my biggest challenge is when people come to me after the fact," Dr. Tibary said. "Determining the cause of abortion long after it happened is very limited, but it may be possible if the abortion was caught early or while it was actually happening. The odds greatly increase if the fetus, placenta, and samples from the mares are submitted."

Autumn is also a good time to focus on mares that failed to conceive during the spring. "We have an integrated approach to determine mare infertility at WSU," Dr. Tibary said. "We can also evaluate breeding management, determine causes of infertility, as well as treat some forms of infertility. These evaluations should be instituted early in the next breeding season."

For more information about prenatal and fertility services at WSU, contact Dr. Tibary at tibary@vetmed.wsu.edu or 509-335-1963.

Caring for Mares with Perineal Tears

Autumn may seem an odd time to address an issue that generally occurs during the spring foaling season. In fact, most horse owners must wait until fall to have their mares surgically repaired for perineal lacerations that occurred from foaling.

"These tears occur while the mare is giving birth, leaving an ugly wound between the vagina and rectum area that many horse owners want fixed right away," said **Dr. Tamara Swor,** a clinical instructor in equine surgery and head of equine emergency services at WSU. "Unfortunately, after the tear initially happens, the swelling is so bad and the tissue is so weak that it is impossible to suture a mare until at least three or four months pass. The best time for surgery, however, is five to six months after the tear occurred, and after the foal is weaned from the mare."

This injury generally occurs in mares that have had more than one foal, are excitable, or are carrying large foals and need help during the birthing process. "Perineal tears usually happen when a foal's hoof gets caught on top of the vagina, and when the mare pushes, the foal's hoof breaks through the tissue between the vagina and rectum, tearing the two parallel tracts open into one large hole instead of two separate ones," Dr. Swor said.

"If an owner happens to be present during a birth and they see a foot come out of the rectum, the best thing he or she can do is push the foot back through the hole to get it back inside the mare's vagina," she said. "This will stop the hole from tearing even farther."

Unfortunately, many people are not there when a birth happens and an owner may find the mare with a tear the next day. "The wound will look bad and there will be a lot of bleeding," Dr. Swor said. First aid for these mares should include calling a veterinarian who can administer anti-inflammatory medication, clean the wound, and give the mare a tetanus shot. "The mare will need time to heal and often uterine infections may occur from feces falling into the vagina, which can usually be treated after the tear is repaired," Dr. Swor said. "Mares should also not be bred until the tear can be repaired because of these uterine infections."

Perineal lacerations are classified into three degrees. A first-degree laceration involves tearing of the inner lining of the vagina mucosa, but without damage to the surrounding muscular tissue. A second-degree laceration describes tears to the inner tissue and some of the vaginal muscle, and the third-degree laceration describes a tear in which all the tissue is torn between the vagina and rectum. First- and second-degree lacerations can heal over time, but third-degree lacerations require surgery in order to restore a separate vagina and rectum for a mare.

"It takes four to six months for enough scar tissue to form in order to recreate a boundary to repair a perineal tear," Dr. Swor said. "Advanced veterinary hospitals like WSU are ideal for this type of surgery. Perineal surgery takes a lot of time, and the procedure may occur in stages."

Mares that come to WSU for this kind of surgery are admitted for at least two weeks. "Because of this, we prefer that foals are weaned from the mare before the procedure," Dr. Swor said. "Once admitted, the mare will receive only a small amount of food along with laxatives to produce a decreased amount of soft feces. It is much easier for her if the foal is weaned because she will not have to worry about her foal or try to produce milk on a limited diet."

Sometimes, more than one surgery is required in order for the perineal area to seal appropriately. Once repaired, mares have approximately a 75 percent chance of conceiving again. "Even though the wound looks really bad at first, a mare's prognosis is often very good, and she will likely be able to carry another foal," Dr. Swor said. "But she will need to be watched carefully when foaling again, as her risk of tearing will be greater. With the right care, most mares will come through fine."

For more information about perineal tears or to schedule an appointment, contact the WSU Veterinary Teaching Hospital at 509-335-0711, or Dr. Tamara Swor at 509-335-3079 or tswor@vetmed.wsu.edu.

Meet Dr. Jennifer Cohen, Equine Intern

If you bring your horse to the WSU Veterinary Teaching Hospital, you will likely have the opportunity to meet our outstanding intern, **Dr. Jennifer Cohen, DVM**, who is specializing in equine medicine and surgery.

As an intern of the equine service at WSU, Dr. Cohen is gaining advanced training in equine medicine and surgery for one year under the mentoring guidance of WSU's senior clinicians. Clinical internships in equine medicine and surgery are offered at select universities and private practices across the United States and Canada and, as such, are highly competitive. WSU equine interns are chosen for their outstanding skills, abilities, and knowledge. This year, Dr. Cohen will be involved in many cases that come through our doors and is crucial to the hospital's operation.

Dr. Cohen earned her DVM degree from the University of Pennsylvania in May, and her undergraduate degree in veterinary and animal sciences from the University of Massachusetts Amherst in 2000. Her major area of interest is in large animal surgery.

Dr. Cohen

Dr. Cohen brings with her a diverse range of knowledge and experience with horses and human and veterinary medicine. She has ridden sport horses most of her life and worked as a stable manager during college in Massachusetts. Before veterinary college, she gained experience in surgical research, and clinical and laboratory medicine. During veterinary college, she worked as a summer student involved with equine cardiology and ultrasound at the University of Pennsylvania's large animal hospital, among other veterinary work. "As an intern, my goal is to expand my veterinary knowledge and broaden my clinical experience with horses," Dr. Cohen said. "I believe WSU provides an excellent balance of clinical case work, research opportunities, student interaction, and good mentoring."

Chewing Disease: How Russian Knapweed and Yellow Starthistle Can Kill Horses

Yellow starthistle and Russian knapweed are not similar in appearance, but both plants cause the same deadly disease in horses, and both are commonly found throughout the Northwest.

These plants contain substances that cause lesions to develop in the brains of horses that graze on them. The result is irreversible brain damage. This disease is called equine nigropallidal encephalomalacia or "chewing disease," and horses that have it will eventually die from starvation or dehydration.

"There is no treatment for chewing disease," said **Dr. Patricia Talcott,** a Washington State University associate professor who provides a diagnostic toxicology service for the Washington Animal Disease Diagnostic Laboratory in Pullman. "Once the lesion is there, it is permanent and euthanasia becomes the most humane option for affected horses."

Only horses are susceptible to the disease, and to get it, they must eat 50 to 150 percent of their body weight of either plant over a period of one to three months. Thankfully, many horses and other livestock avoid grazing on Russian knapweed and yellow starthistle because of their bitter taste, as well as the physical discomfort that comes from eating the spines on yellow starthistle.

Horses will eat these plants, however, if a pasture or hay is heavily contaminated with them and other forage is minimal. "Exposure to chewing disease is cumulative and chronic, and initial signs can be mild and subtle, such as a horse that begins to have trouble swallowing or loses weight," Dr. Talcott said. "Significant changes seem to come on abruptly, however, and that is when most owners realize their horse is sick."

Chewing disease is well recognized, and most veterinarians are able to diagnose horses that have it. Signs that owners may notice include an acute onset of neurologic problems and assymetry to a horse's face, Dr. Talcott said. Other signs include an inability to swallow food or water or use their lips normally. Because of this, horses may spend a long time with their muzzle deep in water trying to drink. They may also look depressed, hang their head low, and make involuntary chewing movements.

"There is not a large number of cases of chewing disease throughout the Northwest, but it is not rare either," Dr. Talcott said. "It is totally preventable, so owners should really be aware of what they are feeding their horses."

PLANT CHARACTERISTICS

*The flower and bract of a yellow starthistle**

Yellow starthistle (*Centaurea solstitialis*) is a winter annual weed that is widespread throughout Washington, Oregon, and Idaho, frequently appearing on rangeland, pasture, and along crops. According to the Washington State Noxious Weed Control Board, it is widely distributed throughout eastern Washington and has spread as far north as Stevens County. It seems to grow best in deep silt loam on south-facing slopes.

Though it is called a thistle, yellow starthistle is actually a species of knapweed. It begins its growth cycle in late fall from seeds that germinate when moisture begins to collect. The plant emerges in early spring, and bolts up to three feet in height during May and June. Its flowers appear mid-summer, and by August, the plant dries and becomes an easily identifiable skeleton that is silvery gray with white cotton-like flowerheads. The base of the flower, called a bract, contains sharp, needle-like spines that can grow up to two inches long. Each plant may produce as many as 150,000 seeds, which can remain viable in the soil for several years.

Yellow starthistle plant

The flower and bract of a Russian knapweed

In contrast, Russian knapweed (*Acroptilon repens*) is a long-lived, creeping perennial that spreads mostly underground from vegetative root buds, as well as from seed, with growth characteristics similar to Canada thistle. Russian knapweed emerges in early spring, grows up to three feet tall during May and June, and flowers through the summer and fall. It regenerates by seed or by pushing up new plants from its extensive root system, which can survive for up to 75 years. As a result, it is a difficult plant to eradicate.

The Washington State Noxious Weed Control Board reports that Russian knapweed is found in Benton, Chelan, Grant, Kittitas, Klickitat, Okanogan, Spokane, Stevens, Walla Walla, Whitman, and Yakima counties. The weed prefers the heavier, saline soils of bottomlands, and subirrigated slopes and flats. In eastern Washington, it frequently appears on sites where basin wildrye grows, and competes well in pastures, hayfields, grain fields, and along roads and irrigation ditches.

Russian knapweed is only one of several knapweeds that commonly grows throughout the Northwest, including diffuse and spotted knapweed. Pasture managers may wonder how to distinguish Russian knapweed from other knapweeds. Russian knapweed has dark brown to black roots that extend downward and to the side, compared to diffuse and spotted knapweeds that are short-lived perennials with off-white taproots similar to a dandelion.

Russian knapweed plant

Russian knapweed flowers are pink to purple, similar to other knapweeds, but the bract underneath the flower is different. Russian knapweeds have green or straw-colored bracts with paper-like tips, and produce ivory-colored seeds with feather-like plumes. Spotted knapweed bracts have a vein-like appearance, usually with black spots on the tips, and produce black to brown oval seeds. Diffuse knapweeds have sharp, spiny bracts that can

**All photos from the Washington State Noxious Weed Control Board.*

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Magnetic Resonance Imaging…
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The WSU College of Veterinary Medicine pioneered the use of MRI in live horses in 1996. It is currently one of only a few veterinary hospitals in the world equipped with this technology, and has moved WSU to the forefront of veterinary medicine in the evaluation of lameness and neurological disorders.

In conjunction with the MRI, the college recently installed a new anesthesia monitoring system designed to function in the environment of the MRI's magnet. "Normal anesthesia equipment used in surgery does not work in the presence of the magnet," Dr. Sampson said. "The new equipment uses special sensors and wireless transmission of data to monitor anesthesia. With the new devise, we can monitor carbon dioxide and oxygen levels, blood pressure, and heart rate, all information surgeons need in the general anesthesia setting."

An anesthetized horse being examined in WSU's MRI.

"When one thinks of the many reasons why the WSU Veterinary Teaching Hospital stands out, the MRI and our ability to anesthetize and recover patients has to be near the top of the list," said **Dr. Harmon Rogers**, director of the veterinary teaching hospital. "Clinicians and clients can rest assured that the status of patients in the MRI can now be determined just as it is in other hospital locations."

For more information about the MRI or to make an appointment, contact the WSU Veterinary Teaching Hospital at 509-335-0711 or visit the WSU College of Veterinary Medicine Web site at www.vetmed.wsu.edu.

Chewing Disease…
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puncture skin if touched, and also have a vein-like appearance. Both diffuse and spotted knapweeds are prolific seed producers, and do not spread underground like Russian knapweed.

PREVENTION AND CONTROL

"The area these plants are found growing in is spreading," Dr. Talcott said. "So people should take time to find out what is growing in their pastures and recognize strange looking weeds in their hay."

For help identifying yellow starthistle and Russian knapweed, horse owners and land managers can contact their local extension service or a weed identification specialist. "Extension services usually have a specialist that can help a person identify weeds in a field or pasture, and can examine hay for undesirable plants," Dr. Talcott said. "They can also recommend practices to control or minimize problem weeds."

Controlling or eradicating yellow starthistle and Russian knapweed can be difficult, and may require an integrated approach. "Practices vary with individual people and the site, but a combination of multiple practices can be used, including alternative grazing, herbicide management, and reseeding with competitive desirable forage," Dr. Talcott said. "Autumn can be an ideal time to get started controlling these weeds before next spring arrives."

More information about and pictures of yellow starthistle or Russian knapweed can be found online at the Washington State Noxious Weed Control Board Web site at www.nwcb.wa.gov, or the USDA Natural Resources Conservation Service Plant Database Web site at plants.usda.gov.

For more information about chewing disease or diagnosis, contact the Washington State University Veterinary Teaching Hospital at 509-335-0711, or Dr. Patricia Talcott at 509-335-9696 or ptalcott@vetmed.wsu.edu.