

The Grazier



Livestock Johnny Appleseeds Reseed Western Ranges

Cattle, sheep and goats can take on the role of Johnny Appleseed, spreading seed on western ranges where farm machinery can't go, say U.S. Department of Agriculture scientists.

In New Mexico, steers were fed gelatin capsules. Within the capsules were seeds of the plants that USDA scientists want to establish on remote and poor quality rangeland.

"Just like the kind of gelatin capsules we swallow, these also dissolve in the stomach. In our case, medicine is released, but in the steers, seeds were released. The seeds were excreted with manure on the land two to three days later," says plant geneticist Jerry Barrow with USDA's Agricultural Research Service.

"Some cattle graze areas so rough and inaccessible that no conventional seeding equipment or technique could be used to improve the land," says Barrow. "But, cattle can spread seed."

"These cattle are reminiscent of John Chapman, better known as Johnny Appleseed, who planted apple seeds as he roamed the American frontier of the early 1800s," adds Barrow.

Seeding rangeland from conventional farm machinery or airplanes is prohibitively expensive for most ranchers, says range scientist Kris Havstad, Barrow's colleague at the Jornada Experimental Range near Las Cruces.

Havstad says costs sometimes exceed the value of the land. And, even after seeding, there's no guarantee the seed will germinate and become established on land that gets less than 10 inches of rain in a year.

"When cattle deposit seed on the range, it's in the middle of manure droppings that contain moisture and all the nutrients plants need to start growing," says Havstad. "It would be hard to create a more ideal growing environment for this seed — 50 percent germinates." Ranchers in arid regions would feed the seed to livestock during their rainy season to ensure more grass survival.

Barrow and Havstad tested four plants native to the Southwest. They found that about half of the seed from fourwing saltbush, alkali sacaton and blue panicgrass passed through the steers' digestive tract. Another grass seed, sideoats grama, was completely digested.

"We need to find ways to improve our rangelands for domestic animals and wildlife. This method is one possible approach because it is inexpensive and doesn't disrupt the environment. The downside is that it will take longer to have an impact compared to mechanical seeding," says Havstad.

"In many areas, we can't use mechanical seeding equipment because it might disturb threatened or endangered plants and animals. Other areas must be protected because they are archaeologically important."

The seed-carrying capsules were used in the tests to ensure that cattle got seed. Other ways to do this — such as mixing seed in feed — could be used for livestock or wildlife, including birds. According to the researchers, the key is to use seed that won't be digested and is adapted to the local area.

Fescue Hay Ergot Suspected in Low Pregnancy Rates

High levels of ergot, a substance suspected of causing low conception rates in cattle, have been found in fescue hay tested by animal scientists at the University of Missouri-Columbia.

Up to 50 percent of the tall fescue hay tested from Missouri farms contained ergot, a fungus that develops in the seedheads and is different from the endophytic fungus in tall fescue.

The animal scientists received widespread reports of low pregnancy rates in beef herds this past winter, according to David Lalman, MU Extension beef nutrition specialist.

"Cattle producers have reported pregnancy rates as low as 50 percent in some herds and rates as low as 70 percent are common in many herds," Lalman said. In well-managed herds, owners should ex-

pect pregnancy rates of up to 94 percent.

"The spring of 1991 was uncommonly wet and warm, setting up perfect conditions for ergot development in seedheads of grasses," Lalman said. Ergot spore in the air must get into flower blossoms to produce ergot bodies in place of grass seed.

Compounding the problem, wet weather prevented farmers from mowing fescue pastures to clip the seed heads. Mowing is a recommended practice to remove fescue seedheads which are infected with endophyte fungus and which also affect cattle health.

The ergot showed up when hay samples from Missouri farms were analyzed for alkaloids produced by fungi in a study being conducted by MU researchers.

The samples were taken as part of a study to determine the nutritive value of feeds used by Missouri farmers. The Extension Commercial Agriculture program had sponsored the testing to compare actual value of feeds with the "book" values recommended for ration development by the National Research Council.

An unexpected finding from the nutrition study was the high levels of ergot.

"Of the fescue hay sampled, 50 percent contained significant levels of ergotamine," Lalman said. Ergotamine is an alkaloid known to be associated with ergot poisoning.

Symptoms of the ergot poisoning are similar to the symptoms from consumption of ergovaline, the alkaloid suspected of causing fescue toxicity and produced by the endophytic fungus in tall fescue.

Both compounds cause elevated body temperature, rough hair coats and constricted blood flow to the extremities, which causes loss of tails and hooves. The common name for the disease is "fescue foot," usually detected when cattle begin to limp.

While the effect of ergotamine on cattle reproduction is not clear, Lalman said, the compound is used in clinical settings to cause abortion in dogs.

Research has shown that elevated body temperatures will reduce conception rates and may reduce embryonic survival rates.

Ergovaline also reduces forage intake,

contributing to poor condition of the cattle. Many producers reported that their cows were thin last fall, going into the winter, Lalman said. If cows were not eating enough to both produce milk and maintain body weight during the breeding season, conception rates would have been reduced. Cows should be gaining weight during the breeding season.

Producers who are feeding fescue hay suspected of containing the ergot can take several steps to improve nutrition:

- Cows should receive enough nutrition to be gaining weight going into the breeding season.

- Dilute hays suspected of containing either ergovaline or ergotamine. Legumes, non-infected grass hay, or grain supplements can be used.

- Ergot intake can be reduced by unrolling big bales of hay on the ground so that the ergot bodies can fall out. If hay is put in feeders, frequently cleaning out the bottom of the feeders where the ergot bodies accumulate is recommended.

- Graze cows on pastures free of endophyte and ergot during June-July when the seed formation occurs.

- Prevent seedhead formation by mowing or intensively grazing pastures,

— **Duane Dailey**
University of Missouri Extension

Forage Management Tip

Q: How do you frost seed red clover in spring on established grass pastures or hayfields?

A: Broadcast 10 pounds inoculated red clover seed per acre in March (even on snow) and up to April 15 on a closely-grazed or cut grass field. Buy locally produced common red clover even if it has some weed seeds since it will be lower priced than at retail in a seed company,

The red clover will germinate with approximately four inches of rain in April and three inches in May. The soil should be a sandy loam or heavier. The grass must not have more than 10 to 20 percent quackgrass — it is too competitive.

You should also reduce grass competition by rotational grazing in three to four fields or haying starting in late May to early June and every six to eight weeks thereafter. The red clover which germinated in spring needs sunlight and water. Excessive grass growth will kill the seedlings.

The next step is to fertilize with about 200 pounds of 0-0-60 or 0-14-42 per acre sometime in summer. The current cost of these fertilizers is approximately \$150 and \$165 per ton, respectively. This translates to a cost of 12.5 cents/lb for potassium and 22 cents/lb for phosphorus.

Reseed every two years in spring since

red clover lives only two years. This will give the pasture or hayfield a permanent red clover stand. Frost seeding of red clover will add nitrogen to the grass. It will double the production of grass alone. In addition, the red clover has more protein (20 percent) than grasses (10-15 percent). Livestock prefer clovers over grasses and produce greater gains per acre and per animal on legumes such as red clover than on grasses.

— **M.B. Tesar**
Professor Emeritus
Michigan State University

The Horn Fly: Strategies for Managing Pyrethroid Resistance

The horn fly — a cattle pest especially abundant in the South — is becoming resistant to pyrethroid insecticides. The problem, first noted in the mid-1980s in Florida, now afflicts every major cattle producing area of the United States, including Hawaii and parts of Canada.

Strategies for combating the flies while minimizing further buildup of resistance have been put together by a federal-state-industry committee of researchers with the USDA's Agricultural Research Service, land-grant university research and Extension specialists and chemical

industry representatives.

Introduced into the United States during the late 1800s, horn flies spread rapidly across North America. Both sexes have needlelike beaks and suck blood from cattle and other animals. If enough flies are present, this can reduce weight gains or feed efficiency of cattle. Females lay eggs in dung pats ("cowpies") where immature forms develop. The first of a year's several to many generations of flies appears from early spring to June.

If you see hundreds of horn flies per animal within days or weeks after using a recommended amount of pyrethroid—whether in ear tags or other formulations—the pests have become resistant.

Most researchers agree that fewer than 200 horn flies per animal don't cause measurable losses. Knowing this threshold or injury level—which can vary from place to place—allows managers to make informed decisions on whether and when to treat. It also means control does not have to be perfect.

If pyrethroid resistance exists in your area, applying any pyrethroid at any concentration in any formulation is not advised.

Pyrethroid ear tags can be used where the fly has not become resistant. But even if they remain effective, consider switching to an organophosphate ear tag or a

bolus treatment for the peak fly season.

Cattle producers can get further information and assistance from Cooperative Extension specialists, located in most county seats or at land-grant universities.

Suggested Control Strategies

Any of the strategies can be used singly or in combination with any of the others.

- Do not treat at all for horn flies. Cattle can tolerate moderate levels of horn flies (up to 200 per head, at least in the South), so not treating at all is an option throughout much of the United States. This will likely have the greatest effect on reducing or slowing insecticide resistance. Fly traps that cattle walk through can be built, and use no insecticide.

- Separate mature animals from calves. There is no evidence that horn flies affect mature cattle other than lactating cows. Calves should be treated to obtain the most efficient feed conversion. Cows without calves probably should not be treated.

- Delay control until flies exceed the injury level. Economic thresholds and injury levels are good concepts to follow for integrated pest management. To avoid wasting insecticide and getting poor results, do not apply any until horn flies appear in the spring. Show cattle or other special animals, however, may require in-

tensive treatment.

- Treat periodically with organophosphate (OP) sprays or dusts to reduce early build-up of fly populations. Insecticide resistance can be delayed or reduced by periodic treatments that give high levels of immediate control, followed by a period of no control during which the pest population again builds up.

One or two such treatments in the early summer may delay the need for more sustained controls, which might include OP ear tags, dust bags, or backrubbers or oilers. If OP tags have been used for two years or so, a bolus containing an insect growth regulator (IGR) can be used to limit any organophosphate resistance.

- Treat with IGR boluses. IGR's are the newest insecticides available to combat the horn fly. They kill flies differently from OP or pyrethroid insecticides, by preventing immature flies from becoming adults. IGRs do not affect adult behavior that may influence insecticide resistance.

- Treat late in the season. This should begin before the horn fly enters its overwintering phase. If adult flies are a problem after October, treat periodically with OP sprays or dust, or bolus (if not used earlier in the season). Any effort to reduce the number of flies that overwinter may hold down the initial level of flies the following spring.

For late-season control, use an insecticide in a class different from the one used during peak time. Another option, if the flies are not a problem late in the season, is to skip late-season control.

- Remove ear tags in fall. This should reduce the chance of very low insecticide levels that foster resistance.

Farmers Have Manure Management Alternatives

Manure nourishes crops, improves soil structure and reduces fertilizer costs. But manure applied excessively or improperly can cause environmental problems such as killing fish in streams and contaminating groundwater with nitrate.

"Sometimes farms have too much manure," says Robert Graves, professor of agricultural engineering in Penn State's College of Agriculture. "If these farms don't have extensive cropland for spreading manure, disposal becomes a problem."

Farmers in this situation have potential alternatives, including marketing, composting, burning, refeeding and producing methane. "All of these are possibilities, but each has drawbacks, risks and difficulties that might make it inappropriate for an individual farm," Graves says. "Marketing and composting probably are more feasible for most farmers than burning, refeeding and producing methane."

Because of manure's value as a fertilizer, farmers may be able to move excess amounts to other farms, home gardens, landscape operations, nurseries, and other agricultural and non-agricultural operations. "Factors affecting this alternative include transportation costs, the manure's nutrient content and its ease of handling, which depends on available equipment and the manure's moisture level," Graves says.

Composting is another alternative. "This biological process uses microorganisms to convert the manure into a dry, light, odor-free soil-like product," Graves says. "When other products, such as woodchips, are added, finished manure compost makes a good mulch. It can be sold either in bags or in bulk as a soil conditioner."

Buyers of manure compost include homeowners, landscapers and nursery owners. Compost also may be used on the farm as a soil conditioner or livestock bedding.

"Manure also can be used as an alternative energy source," Graves says. "Poultry litter, for instance, can be burned as solid fuel." Penn State researchers have found that poultry litter can contain more than half the heat value of coal. Under certain conditions, a ton of litter is equivalent to 58 gallons of fuel oil, or 7,620 cubic feet of natural gas. "There may be some

problems with the burned litter producing slag, and questions remain about gas emissions and ash use," Graves says.

Another option for using manure for energy is methane production. "A methane digester uses methane-producing bacteria to biologically convert parts of the manure into biogas, a combination of methane and carbon dioxide," says Graves. "The necessary bacteria are present naturally in the manure."

"The gas produced by methane digesters can be burned for space heating, drying, cooking, or heating water," Graves says. "It also may be used to run an engine and generator to produce both heat and electricity." Methane digestion reduces manure odors. The digested manure is in a liquid form and contains most of the original fertilizer nutrients and must be handled accordingly.

Refeeding is another option. "Certain manures can be fed to livestock as a small portion of the ration," he says. "Poultry manures contain substantial amounts of fiber and non-protein nitrogen and are better suited for cattle feed than other manures."

The manure needs to be processed to increase palatability, improve storage and handling characteristics and destroy pathogens. "Proper processing eliminates the possibility that disease will be spread to the animals who eat it, or to their meat or milk," Graves says. Ensiling with forages, drying, composting and treating with chemicals are possible processing methods.

"As manure management becomes more important, these alternatives may provide solutions to farmers with excess manure," Graves says. "Each farm is unique, so farmers need to evaluate their options very carefully before using an alternative manure management strategy."

New Products for the Farm

Xenodine® Spray Now Available Over-the-Counter

Xenodine® Spray — a fast-acting, non-irritating anti-microbial solution used for many years by veterinarians as an aid in the treatment of topical wounds and infections — is now available over-the-counter for use in cattle, swine, sheep, horses and other farm animals. The product also will continue to be sold through veterinarians.

Xenodine Spray contains Polyhydroxydine®, a safe, gentle, tissue-penetrating, broad-spectrum microbicide that has proved to be effective against bacteria, molds, yeasts, fungi and some viruses.

The product is commonly recommended to aid in the treatment of abscesses, udder rot, foot rot, topical bacterial infec-

tions, cattle and equine ringworm, and equine thrush. In addition, Xenodine is a popular aid in treating bacterial wounds and common antiseptic procedures such as castration and navel dipping.

For more information, contact your veterinarian or animal health store.

Bovimatic 106 Hand-Held Ultrasonic Data Tool

Bovimatic 106 is a technological breakthrough in ultrasonic beef recordkeeping and genetic selection for purebred breeders. The ultrasonic data-logger measures backfat and ribeye depth.

These very accurate fat-depth and muscle-depth readings are automatically stored along with up to 32 user-defined animal records on up to 500 head, or 16 user-defined records on 1,000 head. The user can record the animal number, weight, age, sex, pen location, visual quality scores, etc.

The Bovimatic 106 connects directly to a computer or printer, downloads and uploads data, or can send data via phone modem.

Contact Cotran Corporation, Newport, RI, (401) 849-4449, or fax (401) 849-8835 for more Bovimatic 106 information.

First Defense for Scours

Cattlemen can now help prevent the two most common types of scours with a single capsule administered to calves.

The new preventive treatment, First Defense[®] from ImmuCell Corporation, is the first to offer antibody-based, two-way scours protection in a single capsule.

Each First Defense capsule contains guaranteed antibody levels against E.coli and coronavirus, which are estimated to represent 80 percent of all scours infections. One capsule is administered orally to a calf within the first 12 hours of birth.

Economic losses due to calf scours have been estimated to cost dairy and beef producers about \$100 million annually. Death losses from scours average 5 percent, while nonfatal cases of diarrhea require additional medication and management expenditures.

Calves suffering from scours within the critical first two weeks are 2.5 times more likely to come down with respiratory disease within the first three months. Heifers also tend to calve one and a half months later. Studies show that poor early health can affect later performance, especially critical with purebred breeders selling bulls based on average daily gain.

First Defense is available through your veterinarian. For more information on First Defense, telephone ImmuCell at 1-800-486-0627, or write First Defense, ImmuCell Corporation, P.O. Box 452, Waukesha, WI 53187-0452.