Ryan Fieldgrove Family

The Fieldgrove family ranches in Johnson County. Leafy spurge is a problem on their ranch. In 1999, the Fieldgroves' mission to control the noxious weed leafy spurge began in effort to better manage their grass resource.

Leafy spurge is an irritant plant that causes blisters and blindness. Cattle will not graze in areas with more than 20% cover by spurge

"The weed had been a problem all of my life, and it didn't seem like we were making any headway. We had always sprayed and did the traditional chemical applications to reduce or eradicate it, but it never worked. We'd gain one year; then shortly thereafter, it would be back," Mr. Fieldgrove says.

Fieldgrove says he'd heard of using goats or sheep to control weeds, and he decided to give them a try.

"The first year, we went to Texas and purchased some crossbred Boer goats, and we built a test plot of about five acres in heavily infested leafy spurge. We thought it would take a couple months for the goats to do their work on the weeds, but it only took 10 days. They stripped every bit of plant matter and didn't touch any grass. It was apparent that goats control weeds," he comments. "It definitely did damage the spurge and almost controlled it."

The following year the Fieldgroves developed a project that included their ranch, neighboring ranches, and 500 goats for the summer. Test plots were again set up, and again, the results were positive.

photo courtesy of the Wyoming Beef Council

Through the next five years, the Johnson County Weed and Pest helped offset the cost of test plot fencing and a herder to look after the goats. Aerial spraying and biological control using flea beetles were also used in some areas.

"A drastic reduction in leafy spurge occurred, and native forages began to come back," says Fieldgrove. "We consider the goats a constant and successful tool in controlling the weed and rejuvenating native grass species."

Although the control of weeds has been a success, the goats haven't been without their challenges for the Fieldgroves.

"Ten goats seem manageable, but 500 goats is a different story. The first year, we thought we would kid 500 goats in January, so they'd be old enough to turn out on the weeds in May. Someone forgot to tell me that goats kid like

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antelope. One day you don't have any, and the next day, they're all done," says Fieldgrove.

"That first year, I tortured my family and friends, trying to figure out what to do with 500 goats that kidded in 10 days – with mainly triplets – when we only had jug space for 50. While this may have been entertaining, it was a fiasco that wouldn't be repeated," he states. "The next year, we tried kidding in June in the hills and on the weeds. That year, it was very hot and dry, and the nannies ended up abandoning many kids due to drought, or they couldn't remember which sagebrush they were hidden beneath."

photo courtesy of the Wyoming Beef Council

Fieldgrove says that year the fattest eagles in Wyoming were seen on their ranch.

"We finally decided raising that many goats wasn't within our management ability, so we resorted to buying feeder and replacement goats, which we resell each fall, and that finally worked," he says.

By the seventh year, the Fieldgroves decided to see if fewer goats would work without a herder, and that is where the ranch sits this year, its tenth year, with a herd of 100 free-range goats equipped with GPS collars to monitor their location and browsing habits.

"It's been fun to see the success because it's a lot of work. It was very expensive, and a lot of trial and error with different types of goats, and we finally found something that we think is manageable for a labor standpoint, and they truly do manage the spurge," he adds.

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Scenario 4: Alfalfa Weevil

Summary

An alfalfa farmer has discovered that there is an infestation of alfalfa weevils in their crop. The alfalfa weevil is the most serious destructive insect to alfalfa grown for hay in Wyoming. They chew holes in the stems of alfalfa plants and lay their eggs there. The emerged larvae feed on the leaves of the plant. Alfalfa is a crop that can be harvested, or cut, multiple times a season. The most destructive larval populations often coincide with the first cutting of alfalfa.

Summary of Impacts

When this species is present in an alfalfa field, both the larvae and adults feed on the alfalfa, damaging its stems and leaves. This damage lowers both the amount of the crop that can be produced and its quality as a forage crop due to leaf tissue losses.

Alfalfa weevil larva

Alfalfa weevil adult

Alfalfa weevil larval defoliation

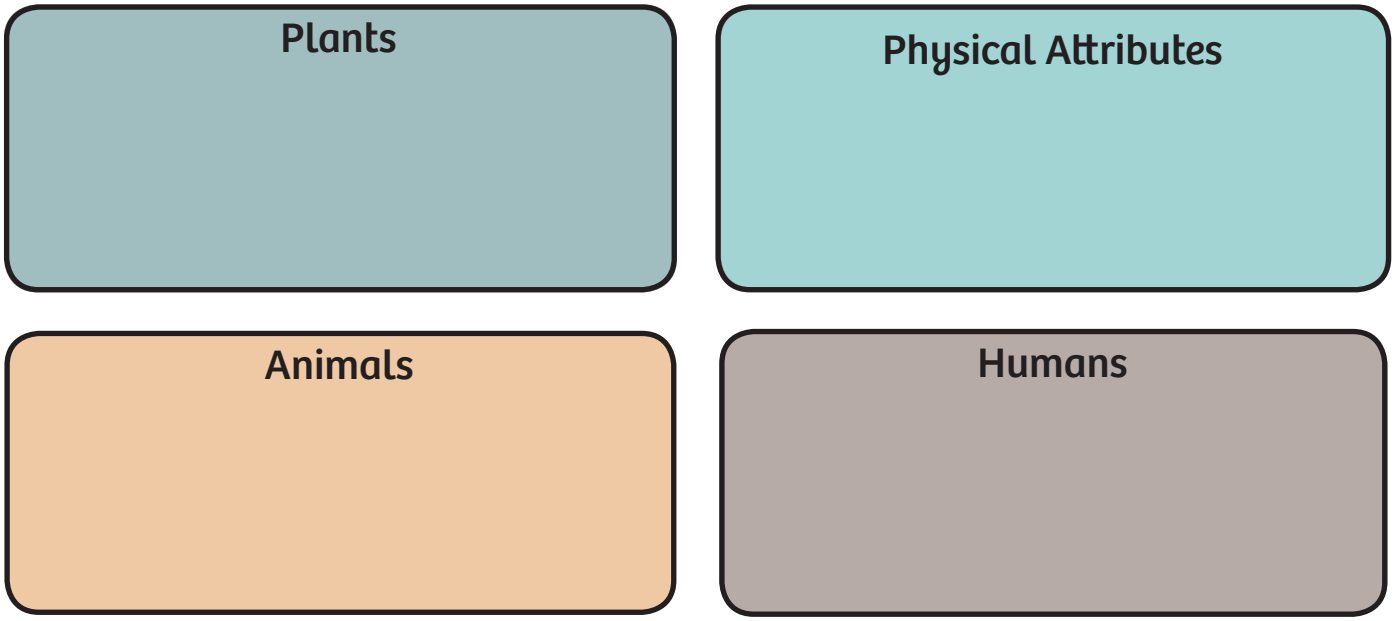
Scenario 4: Options

- **Use pesticides to control the weevil.** - If the infestation is big enough, this is one of the most effective options, but it can be very costly - to the point where it might cost more to apply the insecticide than what will be gained from increased alfalfa production. The insecticides can also harm other insects, including honey bees and some of the species that help to naturally control the weevils.
- **Cut the alfalfa early.** - Many larvae are destroyed by the harvesting process, and others are left exposed to their natural enemies, high temperatures, direct sunlight, and lack of food. Cutting before the optimum growth stage can reduce the yield, but it will probably result in higher quality than if you wait and allow the weevils to continue damaging the crop.
- **Introduce a species that feeds on the weevil.** - The small Bathyplectes wasps are parasitoids of the weevil. That means they lay their eggs in the other organism, and their young get nutrients by consuming the host (weevils). Unlike generalist predators that are found in many agricultural habitats and feed on numerous prey species, the wasps are very specific natural enemies that occur only in and around alfalfa fields and attack the alfalfa weevil. They have been reported to parasitize and kill as many as 30 to 35 percent of the larvae in certain fields.

Student Recording Sheet

Scenario 4

Place the components of the ecosystem described in the scenario on the graphic.



What is the problem in this scenario?

What impact does it have on the ecosystem?

Which potential solution are you selecting?

How does your choice change the ecosystem described in the scenario (positive and negative)?

How does it support the plant in meeting its needs?

How does it show good stewardship of the agricultural resources?