Gorse biocontrol testing near completion

Two new biological control insects are undergoing testing in the new quarantine lab on the Oregon State University campus in Corvallis. A sap feeding thrips (*Sericothrips staphylinus*), and a tip feeding moth (*Agonopterix umbellana*) are being tested for the first time on the mainland US. These insects have already been introduced into New Zealand, Australia, and Hawaii.

The main purpose of this study is to complete host specificity testing, that is, to determine whether or not the insects will affect plants other than gorse. Test plants include crops and threatened and endangered species.

Host specificity testing of the gorse thrips (*S. staphylinus*) has progressed rapidly and is near completion. The thrips appears to be very host specific.

In a lab setting, we demonstrated that the gorse thrips will kill 2 inches of gorse seedlings in 45 to 65 days. We also found that larger bushes exposed to the gorse thrips exhibited significantly reduced growth compared to bushes without thrips.

Mortality took much longer for the larger plants (test is still in progress). These results suggest that the gorse thrips could be particularly effective at controlling the flush of new seedlings that typically arises from the seed bank following clearing of stands. Previous research demonstrated that control at the seedling stage is a key to reducing gorse populations. However, mechanical, chemical, or burning treatments may still be needed for the initial clearing of larger shrubs.

We improved our rearing and testing methods for the gorse moth (*A. umbellana*) and carried out choice tests on 6 plant species so far. We expect that testing of the moth should proceed more quickly now that we have built up a larger colony of this species.

We made additional collections of *Agonopterix nervosa*, an accidentally introduced tip moth occurring on both gorse and scotch broom. Unlike last year, we found that up to 50% of the population was parasitized by one species of wasp. It looks like two natural enemies of this insect are keeping the populations down. The wasp emerges from late stage larvae and then pupates outside the host. This wasp may eventually use *A. umbellana* as a host if it is released as a biological control agent.

We also carried out predator exclusion tests. Each week, presence or absence of the larvae, developmental stage, and any evidence of parasites or predators was recorded.

Coos and Curry Counties have been chosen as sites for Oregon

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Coastal Pasture Lime Project

Lime applications are generally recommended for western Oregon pastures when soil pH is below 5.5. Addition of lime is expensive, however, costing more than $60/ton. Addition of more than two to three tons of lime/acre is commonly recommended and considered a long-term investment. Before livestock producers make such an investment, the probability for economic return should be clear.

Lime rates were calibrated with soil from the Willamette Valley and bordering foothills. No calibration data is available for coastal pasture soils. Producers have commented that they apply lime and measure no change in soil pH or production. Since many coastal soils have higher organic matter content than do soils in the Willamette Valley, we wanted to measure any differences.

The cation exchange capacity provided by the organic matter may buffer soil pH change from lime addition. If this is the case, we may need to revise recommendations.

The objective of this study is to determine the amount of lime needed to change soil pH for commonly occurring coastal pasture and forage production soil series.

We collected bulk soil samples from 20 soils commonly used for pasture and forage production in coastal Oregon. Soils sampled from our area included: Chetco, Kirkendall, Quosatana, Nehalem, Chismore, and Nestucca.

We are determining soil chemical properties that will be used to calculate lime rates. Results will help determine whether or not adding lime to specific soil types is cost-effective.

The liming project was funded by the Oregon State University Forage/Livestock Fund and should be completed by the end of the year.

-Amy Peters

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releases. We have already begun to collect pre-release data.

The estimated economic cost of gorse due to losses in production of pastures and timberland is $997,000 per year within the state of Oregon alone. This does not take into account the immeasurable losses to recreation, wildlife, and aesthetics.

Control of gorse is particularly difficult because it spreads rapidly and re-sprouts from seeds and roots following cutting, fire, or chemical treatment. Seeds remain viable for 30 years in the soil, with one report of viability after 70 years. The plant frequently infests sensitive habitats or rugged terrain where herbicide applications and other treatments are difficult or restricted. Although traditional control methods have been used successfully at some sites, they have been too costly to apply at a regional scale and gorse has continued to spread.

“control at the seedling stage is a key to reducing gorse infestations”

This challenging and widespread weed is, therefore, a good target for classical biological control.

Past economic analysis of weed biological control shows a 1:14 ratio of cost to benefit. For every dollar spent on biological control, fourteen dollars are returned.

Hopefully we will find the right combination of biological control agents to help reduce gorse infestations and keep the plant in check.

-Amy Peters and Fritzi Grevstad, OSU Botany and Plant Pathology

Pair of gorse shoots with larvae; one caged and one exposed to predators.
With alfalfa hay prices climbing higher and higher, it may be time to think about changing your grazing strategy to produce more quality grass.

**Getting started**—One way to begin management intensive grazing is to subdivide existing pastures with one or two electrified high-tensile wires. Managing these divisions will give you and the animals a chance to try out the system. Your skills will develop as the animals become familiar with the changes.

**Maps**—An aerial map of the farm can be useful in determining fencing location, water supplies, and existing forage resources to aid in developing a plan. Management-intensive grazing requires subdividing the land into paddocks, providing access to water, adjusting stocking rates, and monitoring grazing duration.

**Fencing**—Proper fencing is essential to improved grazing management and pasture production. Design and construct a cost-efficient fencing system that will keep the cattle in and be easy to manage. A low-impedance, high-voltage charger will be needed. Check the internet, your local farm store or manufacturer catalogs to get an idea of products available and compare prices. High-tensile wire is most often used, offering a more permanent solution than polywire. One wire can be used for interior fences with good perimeter fences. The wire should be strung about shoulder-level of the animal. At this height, calves can go into the next field to graze more abundant, higher quality feed and cows will clean up feed under the fence.

**Training**—Animals need to be trained to electric fences. A small area can be used to help animals learn to respect the electric fence. Once that is accomplished, electric fences become more of a psychological rather than physical barrier.

**Laneway**—Construction of a solid laneway that will not turn to mud when the rains come or to dust during the dry season will improve cattle access to pasture year around and decrease respiratory problems caused by dust. Many producers have found this to be an important part of a successful management-intensive grazing system.

**Water**—Watering system design is also important. Design a watering system that ensures cattle have an adequate supply of fresh water at all times. It may pay off to design the system for future expansion. Portable water systems are often used which can provide flexibility in location and reduce the problems associated with an accumulation of nutrients such as parasites, disease, erosion, and weed problems around permanent water sources. Heavy livestock traffic around ponds, springs, and streams can destroy vegetation and have a detrimental effect on water quality. Piping water to troughs away from these areas provides livestock with higher-quality water and reduces these problems.

**Management**—A well-designed system still needs to be managed and adjusted as forage supplies change seasonally. Cattle should be moved quickly through paddocks during periods of rapid plant growth. As plant growth slows, delayed rotations will give plants adequate time to rebuild root reserves and regrow. Management-intensive grazing is very labor intensive compared to other systems. There are often competing demands for labor resources in a livestock operation and this should be considered when choosing a grazing system.

**Conclusions**—Improving your pastures and grazing management system will result in more, higher quality feed produced. Remember that one of the goals of grazing management is to maximize intake. To accomplish this, continuously monitor and manage grasses in the vegetative state, graze when appropriate, initiate irrigation early enough in the season to keep plants growing, and fertilize according to soil test results. Monitor fields regularly to ensure consumption and production of forages are in balance. Walk each field at least every 10 days making careful observations. Make sure that the plants are always in a growing state. Proper grazing management that includes a plan of action will pay off with more higher quality feed.

-Amy Peters
Blackberry Rust Fungus Investigations

A major objective for this part of the Himalaya blackberry control project was to establish infection of Himalaya blackberry by *Phragmidium violaceum*, a rust pathogen, under controlled conditions in a containment greenhouse. Our hypothesis was that good infection would occur with the right combination of blackberry clone and fungus isolate.

It has been a challenge to produce the infection in a controlled environment. This has slowed research on development of *P. violaceum* as a biological control agent.

We collected diseased Himalaya blackberry plants from Oregon and sent them to the USDA lab in Ft. Detrick, Maryland for testing. Infected leaves were separated and spores from rust pustules were harvested and stored. Attempt was also made to root canes from infected plants. Ultimately, a collection of known susceptible plant clones and their associated rust isolates would be assembled. Also gathered during this process were clones of blackberry classified as resistant (or at least not diseased at the time of receipt).

As a result, several combinations of blackberry plant specimens and their associated rust isolates have been gathered. They represent a diversity of geographic locations in Oregon. Inoculation of several blackberry accessions with their isolates was made. Included in inoculations were representatives of other blackberry clones to broaden the probability for discovery of compatible host-pathogen combinations. A significant part of this were from a very heavily-infected site in Curry County. All available blackberry accessions were inoculated with this isolate. Additional isolates have been established and preliminary inoculations have been made.

We found that the rust isolate from Curry County caused very good infection on Himalaya Blackberry accession from Lincoln City. This has been repeated several times, and the isolate has been increased and stored. Also, isolates from Coos and Douglas counties have been established.

The basic process of inoculation, increase, and storage of *P. violaceum* has been established. Experiments now can be run to refine these procedures and to identify an optimal set of factors, e.g., dew period, dew temperature, plant age, etc., to be used in a standard inoculation protocol.

Evidence from preliminary tests suggests that cut canes develop much more infection than canes on potted plants. This too is being quantified and refined. We have preliminary evidence that clones susceptible to a specific isolate exist throughout the state.

Laboratory testing needs to be completed in order to release the Blackberry Rust Fungus as a biological control agent.

-Amy Peters, OSU Extension, William L. Bruckart, III and Farivar Eskandari USDA, Ft. Detrick, Maryland
Reduce Stress: Dehorn Calves with Paste

It’s a good idea to dehorn cattle that live in confined areas to prevent injuries to humans and other animals. Of the various dehorning methods, dehorning with paste is easy, effective, and economical as well as low-stress to the animal.

Here are the main points to consider when using dehorning paste:

- Apply dehorning paste before calves are 2 days old. After 2 days, calves have figured out how to scratch their heads against something to rub the paste off, and they can also stand on three legs to scratch with the other.
- Using too much paste is the most common mistake beginners make. The result is a big bald spot around the horn area (although the hair will grow back in time). The amount of paste to apply on each horn is about the size of a dime, as indicated in the package insert.
- Don’t let the calves get wet for 24 hours after applying the paste. If rain falls on active dehorning paste, it can run off into the eyes and blind the calf. The paste dries in 1 day, after which it is no longer necessary to keep calves dry.
- Apply paste just before feeding the calves with a bottle. It takes a couple of minutes for the paste to start burning, so if you apply it immediately before feeding, calves are kept busy working on the bottle, and they forget about their discomfort. By the time they are done with the bottle, the paste is almost done with the dehorning process, and they will not notice it that much.

Additionally, research performed with human babies shows that giving breast milk, glucose, or sucrose before a single painful procedure significantly reduces heart rate and crying time compared to using distilled water, a pacifier, or swaddling. So, applying the paste immediately before feeding milk with the bottle may help in two ways: the calves are so busy working on the bottle that they forget their discomfort, and the sugar in the milk may help reduce the pain.

Producers who have switched to using paste to dehorn calves at birth report great success with no complications, and they like that calves are “done” without showing obvious signs of pain. Only minor head shaking was reported.

- Aurora Villarroel, OSU Extension Veterinarian
Message from Amy

In this issue, I have provided updates on applied research projects important to our region. These studies were designed to answer your questions and help you make more economical decisions.

In the following columns, I have listed new publications that may be of interest as well as helpful websites.

On a personal note, I am finally getting back to a more regular schedule after being out on medical leave. I look forward to working with you this year. Thank you for your continued support.

Sincerely,
Amy Peters, Livestock Agent

New Publications:
- Forage Value of Pasture Weeds in Southwestern Oregon, Oregon Beef Cattle Library, BEEF 001.
- Grazing Management of Improved Pastures, Oregon Beef Cattle Library, BEEF 042, http://beefcattle.ans.oregonstate.edu/
- Livestock Pests of Sheep and Goats, Pacific Northwest Insect Management Handbook
- Agriculture and Natural Resources in Coos County, OSU Extension Service

Helpful Websites:
- Beef Cattle Sciences http://beefcattle.ans.oregonstate.edu/
- Livestock Marketing Information Center http://www.lmic.info/

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