OREGON STATE UNIVERSITY EXTENSION SERVICE

LAND STEWARD PROGRAM | RURAL RESOURCE GUIDELINES

Photo: Jackson Soil and Water Conservation District

A pod irrigation system is a pressurized system designed for pastures. A UV-resistant thick plastic shell protects the sprinklers.

PASTURES:
Stewarding a Working Landscape

Clint Nichols and Gordon B. Jones

Whether you're growing hay for market or providing forage for livestock, a healthy pasture maintains healthy soil, produces high yields, excludes weeds and has a positive impact on the environment. Proper management — more than any amount of fertilizer, seed, water or herbicide — is the key to a healthy pasture.

Begin by taking a good look at the soil beneath your pasture.

Clint Nichols, rural natural resource planner, Jackson Soil and Water Conservation District. Gordon B. Jones, assistant professor of practice, Southern Oregon Research and Extension Center, Oregon State University.

Improve or preserve soil health

- **Know what's in your soil.** Conduct soil tests every two to three years to guide your fertilizer applications so you are not over- or underapplying amendments. Applying too much fertilizer can lead to nutrient pollution in streams. Too little can limit forage production and quality. Both over- and underapplication can waste money.
- **Manage soil fertility to your objectives.** Pastures that are well-managed and grazed by livestock recycle nutrients efficiently, while harvesting hay will remove nutrients from your soils. Adding sulfur and phosphorus can increase the amount of legumes in some pastures. Adding nitrogen will increase grass hay yield. Adding organic matter will improve the

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3 EASY STEPS

Use this document to evaluate your pastureland

1. Read *Pastures: Stewarding a Working Landscape.*
2. Use Worksheet 1: Resource assessment for pastures, page 5, to assess the condition of your resource.
3. Use Worksheet 2: Management activity assessment for pastures, page 7, to assess your current management practices and identify areas for improvement.

If you have questions, contact your local Extension office, Soil and Water Conservation District or other local resources.

About the Rural Resource Guidelines

This is one of a series developed for private landowners by the Land Steward Program of Oregon State University's Southern Oregon Research and Extension Center. This guide covers general terms and helps users assess resources and manage property in a responsible manner. This guide was developed for use in Jackson and Josephine counties but is applicable to other areas.

water-holding capacity of your pasture and boost nutrient supply.

- **Know your soil type.** Use soil survey tools listed in "References," page 4, or see other publications in this series to learn about your soil texture, rooting depth, potential productivity and other information.
- **Avoid grazing and machinery traffic on wet soils.** Wet or saturated soils are susceptible to compaction, and soil compaction makes it harder for grasses to grow. Move animals to a hardened area or better drained pastures when soils are wet.

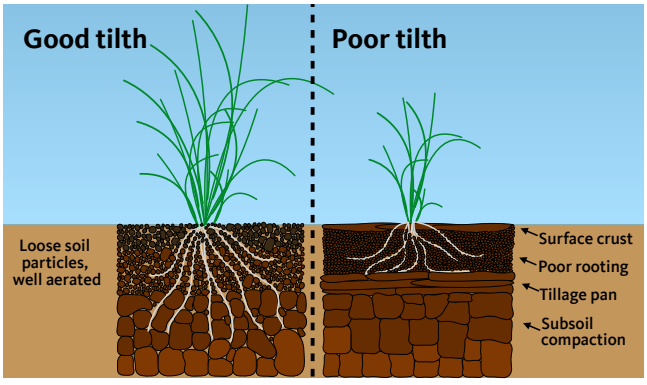

Illustration: based on *Building Soils for Better Crops* by Fred Magdoff and Harold van Es

The plant at left is growing in soil with good tilth. The plant at right, growing in compacted soil, has restricted root production.

Photo: Natural Resources Conservation Service

Paddocks separated by an electric fence. The paddock on the right has recently been grazed, and the paddock on the left has seen extended rest.

Manage forage production, grazing and hay harvest

Perennial grasslands have an important role in our landscape. In addition to providing low-cost feed for livestock, healthy pastures and hayfields can help to improve water quality, reduce erosion and provide wildlife habitat.

- **Use rotational grazing practices.** Rotational grazing means moving livestock to different areas of a pasture to prevent overgrazing. This strategy allows pasture plants to recover and grow after grazing. Rotational grazing practices can increase forage yields, reduce weedy competition, improve soil health, and minimize erosion and pollution. Divide your pasture into relatively equally spaced paddocks and move livestock from one paddock to the next to allow for controlled management of forage removal and regrowth.
- **Monitor forage height.** Do not graze your pastures much lower than 4 inches, and wait to graze until 8 inches have regrown. "In at 8 inches, out at 4 inches" is the rule of thumb for most common Oregon pasture grass species. Many irrigated pasture grasses grow more slowly in summer than in spring, so base your grazing or mowing schedule on the height of the plant rather than by some calendar date. Pastures that grow to exceed 12 inches could be taken out of the grazing rotation and harvested for hay.

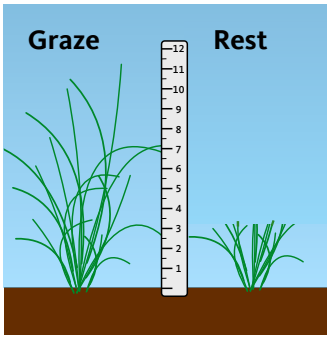

Illustration: Gordon Jones, © Oregon State University

Photo: Jackson Soil and Water Conservation District

A no-till drill seeder can plant forage seeds without disturbing the soil.

- **Document your management** by recording the dates you move animals into and out of pastures. Records of pasture quality and weed abundance can also be helpful. Measure forage yields using the clip and weigh method, grazing sticks and visual assessments. (See "References," page 4.) Record the rotation length and livestock type and numbers. Documenting this information will reveal whether the pasture is improving or declining over time and allow you to make management adjustments without relying on memory alone.
- **Seed only when necessary.** Good grazing management can improve the growth of many pastures, but sometimes few or even no desirable forage plants are present. In these cases it might make sense to reseed. Use low-impact planting methods such as broadcast seeding of legumes and a no-till drill seeder. Replanting large areas of pasture can be risky, and can take a pasture out of production for more than a year. Successful establishment depends on appropriate weather and limited weed competition.

Use integrated pest management to fight weeds

Weeds are opportunistic, and forage plants are competitive. Maintaining a thick and vigorous pasture is the best defense against weeds. Grasses tolerate repeated grazing, while many weeds do not.

- **Ensure adequate soil fertility** and uniform irrigation coverage to prevent weeds from taking hold.
- **Know your weeds**. Being able to correctly identify weeds and understand their biology is the key to integrated pest management. The only way to know if you're choosing the best combination of tools is to understand how specific weeds grow and to target weak points in their life cycles.
- **Apply herbicides judiciously and follow the label**. Herbicides, like all management tools, have potential risks in addition to their benefits.
- **Develop an integrated pest management strategy.** Rather than relying on a single tool to manage weeds, combine several practices such as mowing, tillage, hand-pulling, grazing, fire, fertilization and herbicides. The goal of an IPM approach is to use a combination of methods to manage pests or weeds by the most economical means — and with the least possible hazard to people, property and the environment.

Comparing traditional pest management and IPM

	Traditional pest management	IPM
Program strategy	Reactive	Preventive
User education	Minimal	Extensive
Potential liability	High	Low
Emphasis	Routine pesticide application	Pesticides are used when alternate methods are inadequate
Inspection and monitoring	Minimal	Extensive
Pesticide application frequency	By schedule	By need
Pesticide application target	Areawide spraying	Spot treatment

Adapted from Eric Stormer, Center for Applied Biology

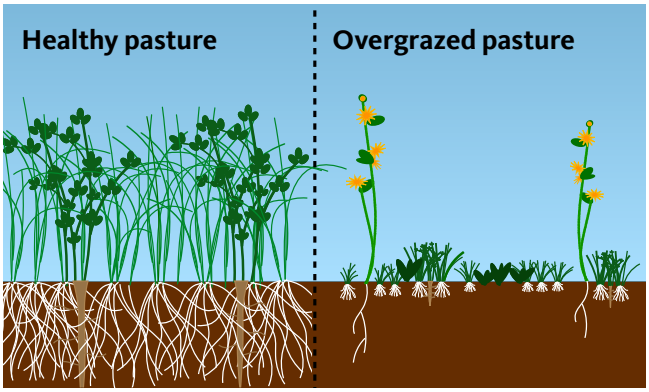

Illustration: Gordon Jones, © Oregon State University

Careful management results in healthy, resilient pastures that provide high-quality feed, outcompete weeds and recycle nutrients. Overgrazed pastures supply less forage and allow weeds to invade. Plants in overgrazed pastures have weak root systems, which makes the pasture susceptible to stress.

Protect environmental resources

Take steps to protect waterways and wildlife.

- **Minimize livestock damage to streams.** Livestock can damage riparian areas if left unmanaged. Use fencing, hardened crossings, culverts and off-channel watering facilities to control access. Refer to other publications in this series for additional information on managing these areas.
- **Consider the impact to wildlife in your land management decisions.** Many types of wildlife — from rodents and birds to deer, elk and bear — can be drawn to your property. Create fencerows for shelter and habitat, use wildlife-friendly fencing, and keep key areas of your land undisturbed to provide habitat for wildlife. Limit mowing to those periods outside of nesting and rearing seasons. See Wildlife Habitat: Nurturing a Diverse Mix of Flor and Fauna, EM 9250, *https://catalog.extension.oregonstate.edu/em9250.*

Follow the rules

Oregon's Agricultural Water Quality Management Act helps farmers and ranchers address water pollution regulated under the Clean Water Act. The act bars agricultural practices from polluting waterways.

The Agricultural Water Quality Management Area Plan describes various types of pollution potentially caused by agricultural practices. The plan does not dictate to agricultural producers how to manage their land to prevent water pollution, but instead offers a suite of best practices to address potential water pollution concerns that could result from agricultural production. Contact your local Soil and Water Conservation District for information on this plan.

Video resources

South Dakota State University Extension, *Clip and Weigh Method*, *https://www.youtube.com/watch?v=8Hp0BIIwU9g*

Noble Research Institute, *Using a Grazing Stick to Determine Stocking Rates on Small Grains Winter Pasture*, *https://www.youtube.com/watch?v=PTMYjvbwtA0*

References

AgriMet station information and links: *https://www.usbr.gov/pn/agrimet/*

National Resources Conservation Service guide to basic infiltration tests: *http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052494.pdf*

Oregon State University Extension Service pasture resources: *https://extension.oregonstate.edu/crop-production/pastures-forages*

Oregon State University Extension Service, *Pasture and Grazing Management in the Northwest*, PNW 614, https:// *catalog.extension.oregonstate.edu/pnw614*

University of California, Davis, guide to integrated pest management: *ipm.ucdavis.edu/GENERAL/whatisipm.html*

University of California, Davis, Soil Research Lab — SoilWeb Apps: *https://casoilresource.lawr.ucdavis.edu/soilweb-apps*

University of Kentucky Cooperative Extension Service, *Determining Soil Texture By Feel*, *https://uknowledge.uky.edu/anr_reports/139*

USDA United States Department of Agriculture National Institute of Food and Agriculture

WESTERN SARE Sustainable Agriculture Research & Education

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Worksheet 1: Resource assessment for pastures

Use this checklist of characteristics to assess conditions. Use extra paper if necessary.	Yes	No	Not sure	N/A
Production objectives: What is the purpose of your pasture?				
Livestock pasture				
Hay production				
Horse boarding				
Wildlife habitat				
Forage: What is the existing forage like?				
Desired forage species grazed low to the ground				
More than 30% bare ground (field average)				
Forage appears yellow, spotted with disease, largely dead or brown				
Weeds: Are any of these concerns present?				
Significant presence of weeds (such as starthistle, medusahead, foxtail)				
Undesirable riparian or aquatic plants present (rushes, sedges, blackberries)				
Infrastructure: What is the current state of fences, irrigation systems, etc.?				
Irrigation coverage is uneven, leaving dry spots or areas with standing water				
Irrigation infrastructure has leaks, overvegetated ditches, gopher holes				
Perimeter fencing in poor condition or absent				
Cross/electric fencing in poor condition or absent				
Stock water tanks in poor condition, surrounded by eroding soil or absent				
Livestock shade structure surrounded by erosion, in poor condition or absent				
Mineral supplements surrounded by erosion, in poor condition or absent				
Soil erosion or compaction where livestock congregate				
Environment: Is there the potential for negative impacts?				
Irrigation runoff returns to stream				
Buffers absent from riparian areas				
Livestock have excessive access to stream for grazing, loafing, watering				
Erosion evident along stream				
Passage across stream eroded; culverts, fords or bridges absent				
Livestock-handling facilities located near stream				
Runoff from manure piles reaches stream				

Review the results of Worksheet 1

Are there healthy conditions present? List these conditions.

Are there areas of concern? List these areas.

How would you characterize the overall condition of your pasture?

☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ Not sure

Review any questions marked "not sure." List topics to investigate further.

1.

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Worksheet 2: Management activity assessment for pastures

Use this checklist of management practices to identify activities you incorporate into your pasture management. Use extra paper if necessary.	Ongoing	Completed	Need to do	Consider	N/A or not feasible
Improve or preserve soil health					
Conduct a soil test at least once every three years					
Know the soil type(s) present: texture, rooting depth, infiltration rate, agriculture class					
Apply fertilizers to match soil nutrient deficiencies and forage need.					
Minimize heavy equipment traffic					
Cover or seed bare ground					
Use no-till seeding practices to plant vegetation with minimal soil disturbance					
Manage forage use and production					
Implement a management-intensive or rotational grazing plan					
Document time, intensity and duration of grazing per portion of pasture					
Seed desired forage into existing vegetation when needed					
Measure dry matter in spring and fall to know annual forage production					
Regularly measure forage height visually; know when grazing needs to stop					
Inspect forage for the presence of pests; implement IPM practices to limit production losses					
Use integrated pest management to fight weeds					
Identify weeds present and know their biology					
Use integrated pest management practices to control weeds and other pests					
Prevent irrigation from creating overirrigated or underirrigated areas					
Improve infrastructure to manage livestock, irrigation and equipment					
In flood irrigation systems, use ditches, berms or pipes to control water					
Convert from flood irrigation to pressurized irrigation systems					
Repair leaking sections of pipes and ditches; remove excess vegetation					

Use this checklist of management practices to identify activities you incorporate into your pasture management. Use extra paper if necessary.	**Ongoing**	**Completed**	**Need to do**	**Consider**	**N/A or not feasible**
Match sprinkler application rates with soil infiltration rates to prevent runoff					
Match irrigation application to forage needs.					
Observe set times, monitor irrigation to eliminate ponding and runoff					
Use and maintain perimeter fencing					
Use and maintain cross/electrical fencing for rotational grazing systems					
Match stock water tanks to livestock needs					
Keep mineral supplements, shade structures and stock water apart					
Develop or utilize existing shade structures for livestock					
Create hardened surface areas in places where livestock must congregate					
Suggestions for maintaining water quality and wildlife habitat					
Use ponds, reuse systems to keep return flows from entering streams					
Create appropriate buffers along streams					
Manage grazing in riparian areas with fencing, herding or off-channel watering and supplement areas					
Create hardened areas to enter and cross streams					
Replant bare ground along streams					
Keep livestock handling facilities a safe distance away from streams					
Control runoff from structures and manure piles					
Allow wildlife shelterbelts to develop along fences, riparian, wetland areas					
Follow the rules: Do your practices comply?					
Read the Agricultural Water Quality Management Area Plan					
Be aware of other state or local regulations regarding agricultural practices					

Results

Review the results of Worksheets 1 and 2. Consider any resource concerns and healthy conditions identified in Worksheet 1, and practices that you checked in the "Need to do" and "Consider" columns in Worksheet 2. What are the most important potential follow-up actions? List and briefly describe these.

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