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PASTURE MANAGEMENT GUIDE

Coastal Pastures in Oregon and Washington

F. Lundin

The coastal regions of Oregon and Washington have different climate and soils than other parts of the states. Rainfall is high, ranging from 70 inches in southern Oregon to more than 100 inches in the coastal mountains.

Temperature is moderated by the Pacific Ocean, resulting in long seasons and mild temperatures. Astoria, Oregon, for example, averages 276 frost-free days and 50°F. Inland areas can have shorter seasons and more severe weather.

This moderate climate is ideal for growing grass. Grasses dominate all coastal pastures, with perennial ryegrass, tall fescue, and orchardgrass usually the preferred species.

Rainfall on the coast is seasonal, with 70 percent falling between October and March, and the rest falling from April through September (Table 1). There is little grass growth during the winter; the best growth occurs in the spring. In fact, half the total grass production is produced from late April to early June. This is a challenge to livestock producers who want to optimize pasture-based livestock production.

Pasture is a crop, and, like other crops, benefits from the use of improved varieties, fertilization, weed control, and grazing management. Grasses respond well to increased management, rewarding the producer with higher production. To be successfully utilized, pastures must be managed properly for the goals of each producer.

Table 1.—Temperature and precipitation, Astoria, Oregon 1953–1993.

	Temperature (°F) Average High	Average Low	Precipitation (inches)
January	47.8	35.9	10.00
April	56.0	40.3	4.60
July	67.5	52.4	1.15
October	61.1	44.0	5.73
Total	58.3	43.4	66.40

Data from NOAA Technical Memorandum, NWS-236, January 1996.

Pasture renovation

Renewing an old pasture is easier than establishing a new one. Often, pastures can be brought back into good condition by controlling weeds, fertilizing, and managing stock.

The first step in improving a pasture is to take an inventory of what is there:

- Identify the grasses, forbs, and legumes, taking note of any that are toxic to livestock.

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- Assess fencing and livestock water systems, and their impact on the current status of the pasture.
- Test soil to determine fertilizer needs.

Second, improve the pasture through better grazing management, clipping, fertilizer application, and pasture rest:

- Control undesirable plants by clipping, animal grazing, or chemical control.
- Fertilize to stimulate existing desirable plants.
- Improve pasture usage by adding water sources and/or changing fencing.
- Overseed the existing pasture with improved grasses and legumes.

Divide the pasture into the smallest possible units, depending on the management level available. The smaller the unit and the more intensively it is grazed, the better the production.

Destroy existing vegetation only as a last resort. Livestock utilize a wide variety of plant species, and pastures can be reclaimed more cheaply than they can be reseeded.

Pasture establishment

Fall planting is preferable because pastures become established and usable by late spring. Plant seed before fall rains or as soon as possible after fall rains begin. This allows the grass to germinate and mature enough to withstand cold winter weather. The later the stand is established in the fall, the greater the chance of winter injury.

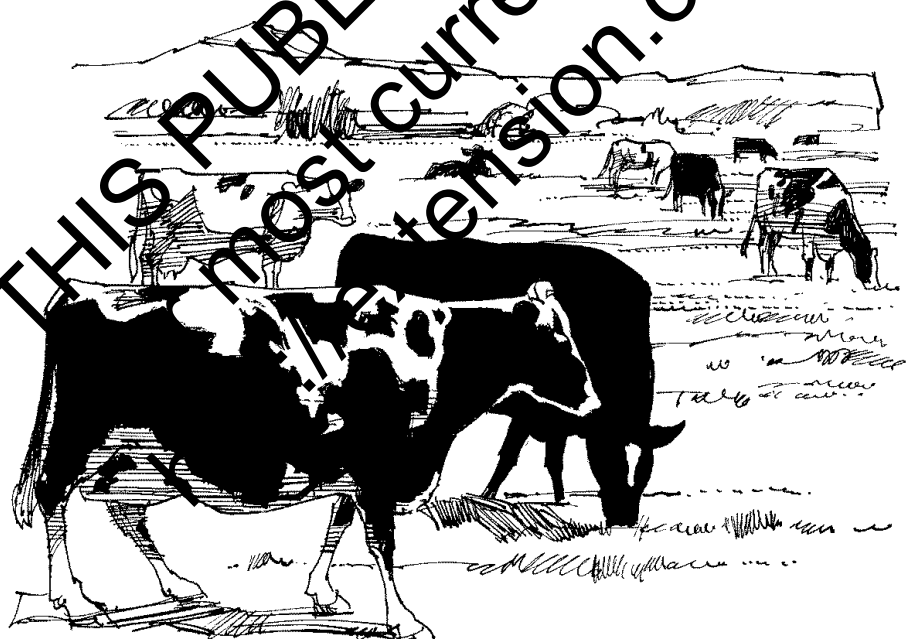
Planting in the spring is possible if the ground can be worked, but rainy weather frequently prevents field work. Late spring planting is effective if irrigation is available.

The first step in coastal pasture establishment is weed control. Weeds often outcompete new grass and defeat the best attempts at pasture renovation.

One method is to seed an annual crop such as oats or other grain the winter or spring before planting. A second is to let the field lie fallow and to control weeds mechanically. A third is to apply an herbicide before working the field.

If tillage is used, develop a fine, firm seedbed. A rule of thumb is that if your heel sinks more than a half inch into the soil, the bed is too soft for seeding. It is not necessary to till deeply, since perennial grasses are capable of sending roots into untilled soil.

No-till seeding is another way of establishing a perennial pasture. It is especially economical when the field is heavily sodded. Applying an herbicide before drilling the grass seed has proved an effective and economic way to renovate pastures when compared with the cost of fuel, equipment, and time of conventional tillage.



A soil test of the upper 4 to 6 inches of soil gives important information about nutrient and lime requirements. Perform a soil test well before seeding, since lime should be incorporated 4 to 6 months prior to seeding (see "Fertilization").

Clean seed is a must. The seed tag gives a lot of information about the seed, such as germination percentage. Obtain seed with the highest germination rate possible. Planting certified seed prevents introducing certain noxious weeds and guarantees varietal purity.

The biggest reason for failure during seeding is the failure to put the seed in contact with the soil, thus allowing the seed to dry out. Plant seed deeply enough that it has good seed/soil contact, about ¼ inch. If planting into a firm seedbed, the ground should be moist. If no-till planting, make sure the seed is drilled below the sod and into the soil, but no deeper than necessary for soil contact.

Including a legume has advantages and disadvantages. It reduces the amount of fertilizer needed due to nitrogen fixation by the legume. It also provides a source of protein in forage and increases production in summer, when grasses grow slowly.

Bloat problems can occur, however, if legumes exceed 50 percent of the total forage mix. In addition, broadleaf weed control in mixed stands can be difficult without damaging the legume.

If you plant a legume, inoculate the seed. Use a fresh inoculant that has been properly stored, and be sure it is specific to the species you are planting. If the legume is not properly inoculated, it may not thrive, and you lose the benefit of including a legume in the pasture.

Mixing two grasses is not recommended, unless intensive grazing is practiced. With less intensive management, livestock graze selectively, and one species thrives while the preferred species is grazed out.

Fertilization

Coastal pastures typically require nitrogen, phosphorus, sulfur, and lime, though other nutrients are needed occasionally. Soil acidity (pH) determines the availability of many plant nutrients.

Nitrogen is the nutrient needed in largest amounts. It must be added frequently, since it is mobile in the soil, and excess amounts leach through the soil with rains.

A soil test is necessary to determine not only pH but also soil phosphorus, potassium, and other elements. Do not check nitrogen in a soil test of coastal pastures, since it is very mobile and the results are meaningless due to nitrogen leaching when it rains.

Coastal bottomland soils should receive 4 tons of lime per acre if the soil pH is below 5.5. Incorporate lime into the top 2 inches of soil 4 to 6 months prior to seeding. It is essential to place lime in the rooting zone where it can do the most good. Top-dressing lime in a no-till program has had variable results.

Also add phosphorus before seeding since it, too, needs to be incorporated into the soil. Incorporate sufficient P to meet the needs based on a soil test. Banding is an excellent way to apply fertilizers such as phosphorus.

Other nutrients can be topdressed. Apply 40 lb N/a at planting time. Plan on applying 40–60 lb N/a in the fall and 30–60 lb N/a in late February or early March. Use the lower amount in the cooler, northern counties, and the higher amount in the south. Apply N in late spring or summer only if irrigation is available, or in a very wet year.

You can use fertilization to control the amount of forage produced. For example, cool-season pasture grasses typically produce most of their growth in late spring. By fertilizing in early fall and late winter and eliminating early spring fertilization, you can reduce forage supply in times

of excess and increase it in times of need. However, this may reduce the total amount of forage produced.

On the other hand, adding early spring fertilization to fall and winter fertilization can maximize production, especially if the extra forage can be captured with heavier stocking rates or other harvest means.

The economic return on fertilization depends on species, pH, management, time of fertilization, and the need for fertilization. For an excellent discussion of pasture fertilization, see FG 63, a fertilizer guide for western Oregon and western Washington pastures produced by Oregon State University and Washington State University Extension personnel.

Forage species

The species of grass to plant depends on the intended livestock species and the level of pasture management. Pastures intended for a high level of management can effectively use a species such as perennial ryegrass, while low-management pastures are better suited to tall fescue.

Grasses

Perennial ryegrass is the preferred species for dairies and sheep operations. It is a very high producer, adapted to the coastal environment. It is unequaled for digestibility and, of all the forage grasses, produces the most milk or meat.

Ryegrass is more shallow-rooted and less winter-hardy than either orchardgrass or tall fescue. In summer, it becomes dormant without irrigation, while in winter it continues to grow while other species are less productive.

Because it is very palatable, in mixed pastures, livestock often overgraze ryegrass and undergraze other species. Thus, perennial ryegrass will not persist unless it is intensively managed.

Orchardgrass is well adapted to the coastal environment and is excellent for cattle and horse pastures. It is more tolerant of heat and drought than ryegrass, timothy, or bluegrass, but less so than tall fescue. It requires at least moderately good drainage.

Orchardgrass responds very well to high management, although it also persists well under low. Tall fescue can compete with orchardgrass only under low fertility conditions. Because it gets a slow start in the spring, orchardgrass matures later than fescue, which makes it a better choice for hay production in the coastal environment.

Of all the desirable species, tall fescue is the toughest pasture grass in the coastal region. It makes excellent cattle and horse pasture. It is tolerant of poor drainage, particularly in the winter. It also is more drought-tolerant than any other grass species adapted to moist environments. It responds well to fertilizer, but also tolerates poor fertility.

However, digestibility and palatability decline rapidly with maturity. Another problem is tall fescue toxicosis, a problem associated with an endophytic fungus (see *Tall Fescue/Endophyte, Animal Relationships*, Oregon Tall Fescue Commission). Be sure to choose fescue varieties that are endophyte-free. There are several new varieties that are both more palatable and endophyte-free. Finally, fescue is slow to establish and may produce less forage during the summer than orchardgrass.

For flooded pasture areas, reed canarygrass is ideal. While it is difficult to establish, it produces abundant forage in coastal climates while tolerating the worst conditions.

If allowed to become too mature, the quality of the forage declines sharply. But if it is used while young (less than 18 inches tall), it produces excellent, high-quality forage. *One caution:* Reed canarygrass can become an

invasive weed in wetlands and riparian areas, and should not be used near them.

Other grass species may be used, but these four are the best adapted to the coastal environment.

Legumes

Big trefoil is a legume that is ideal for coastal pastures. It is particularly well adapted to the poorly drained, strongly acid soils found here, although it is hard to establish. Seed may be difficult to obtain, but if a legume is included in the pasture mix, big trefoil is a good choice. It generally is seeded in the spring.

New Zealand white clover also is well adapted to lowland coastal pastures and is the most common clover found in pastures on the Oregon coast. It is vigorous and has more slug resistance than other white clovers, including Ladino. Ladino stands may disappear in pasture mixtures after as few as 2 years due to slug damage, thus greatly reducing pasture yields.

Subterranean (sub) clover works well in drier, upland pastures. It is tolerant of acid soils, but requires removal of dead overburden material to allow for reseeding. It isn't recommended for the wetter north coastal areas.

Seeding recommendations

Seeding rates depend on conditions at seeding time and on the variety of grass. Consult your local Extension agent for recommendations for your pasture. Fact sheets on individual species of pasture grass are available from county Extension offices.

While pasture seeding recommendations vary depending on conditions and proposed use, you can use Table 2 as a guideline.

Increase the rate of seeding if the seedbed conditions are less than optimum. For example, use the smaller quantity if drilling seed and the larger quantity if broadcasting. If heavy clay or light sand soils exist, increase the seeding rate comparably.

If adding subclover to the mixture, use 8–10 lb/a.

Mixing numerous species of grasses and legumes is not recommended. Each forage species has its own optimum management conditions, and mixing several species complicates pasture management. One grass species fertilized with nitrogen is simplest to manage. One grass and one legume, as listed in the seeding recommendation table, takes advantage of the quality and nitrogen-fixing capabilities of legumes while keeping management simple.

Combining several grass and legume species can be successful, however, if livestock are managed to assure uniform grazing. This can be done with management-intensive grazing involving short-duration grazing and adequate regrowth periods.

Table 2. Seeding recommendations (per acre).

Mixture 1
- 15–25 lb perennial ryegrass
- 2–3 lb New Zealand white clover *or* 6–10 lb big trefoil

Mixture 2
- 12–20 lb orchardgrass
- 2–3 lb New Zealand white clover *or* 6–10 lb big trefoil

Mixture 3
- 15–20 lb tall fescue
- 2–3 lb New Zealand white clover *or* 6–10 lb big trefoil

Mixture 4 (wet pastures)
- 15–25 lb reed canarygrass
- 6–10 lb big trefoil

Grazing management

As a grass plant changes from vegetative to reproductive, it becomes increasingly less palatable and less nutritious. Established pastures should be grazed while they are still young and succulent for highest production. Grazing should occur before excess forage is produced.

If left on their own in large pastures, livestock graze selectively, choosing the same plants continually, repeatedly grazing the new, succulent growth and ignoring the aging plants next to them. The result is a pasture with large clumps of mature grass and areas of overgrazed and weak grass. This leads to weed infestation, reduced production, and decreased forage quality.

Since grass does not grow uniformly throughout the year, it usually pays to harvest some mechanically in the spring, when growth is highest. This is difficult in coastal counties due to wet weather, but can be done by ensiling the forage instead of haying it. On smaller operations, where owned equipment would not be economical, custom round bale haylage, with its wider window of timeliness, can be very successful. Another method of harvesting the spring abundance is to stock more heavily during that time.

For optimal plant growth, intensive grazing management is needed. This entails stocking pastures with enough livestock so that forage is uniformly grazed to 2 to 6 inches in 3 to 7 days. For dairy operations, maximum forage and milk production occur when 50 percent of available forage is used within 12 to 24 hours.

Research from New Zealand shows that perennial ryegrass/white clover pastures produce the most dry matter (grow the fastest) after they have reached 2 to 3 inches in height and before they become so tall they begin to shade lower leaves—between 5 and 8 inches, depending on variety.

Intensive grazing management involves using very small pastures and moving animals often. It requires allowing the animals free access to water at all times. For success, intensive grazing must be coordinated with intensive fertility management. It also requires much more fencing, observation time, and a livestock watering system.

An intensive grazing system maximizes the fertilizer value of manure. It has the added benefit of helping maintain a solid stand, thus limiting weed infestations. Since all of the forage is used, competition from other species is minimal. The stand will last much longer than one that is managed at a lower level.

Be advised that intensive grazing can select against weaker animals, since they must compete for forage. Watch weaker animals closely.

It is possible to compromise between minimal management and intensive management. For example, mowing can be substituted for grazing. Mowing a pasture when weeds are tall and the pasture grass gets rank helps control weeds and encourages new growth. A resting period helps, especially if the grass can be allowed to go to seed so it can regenerate the pasture.

The degree of management given to a pasture depends on the goals of the producer, the species of animal being grazed, and the time available for management. The more intensively the pasture is managed, the higher the return on your investment.

Weed management

Any plant that is not wanted in the pasture is considered a weed, although most benign undesirable plants are eliminated with proper fertilization and grazing management. Some plants, however, are so bad that every effort must be made to eradicate them. For example, tansy ragwort, common groundsel, and brackenfern are toxic to livestock to some extent.

You can control weeds mechanically by mowing, culturally by intensively grazing, biologically with insects, or chemically with herbicides. For current control recommendations, call your county Extension agent, or consult the current edition of the *Pacific Northwest Weed Control Handbook* (see "For more information").

Insect management

The European crane fly can be a serious pest of pastures. The larvae feed heavily on the roots, crowns, stems, and leaves of pasture grasses, and can kill large areas of pasture. The adult is a large true fly and resembles a large mosquito. It emerges briefly in August or September to reproduce.

Presence of the adult does not indicate an economic threshold to treat. Control is recommended in April if there are at least 15 larvae per square foot in the pasture. See EM 8411, *The European Crane Fly: A Serious Pasture Pest in Tillamook County,* for more information.

The sod webworm also can wipe out established stands. Adults are snout moths about ½ inch long. Larvae are small and active and feed in the soil on roots, crowns, and leaves of grasses. Adults fly with a low, jerky flight as you walk across the pasture. Damaged pastures show browning and appear water-stressed beginning in the summer. Identification and control of these pests is essential to good management.

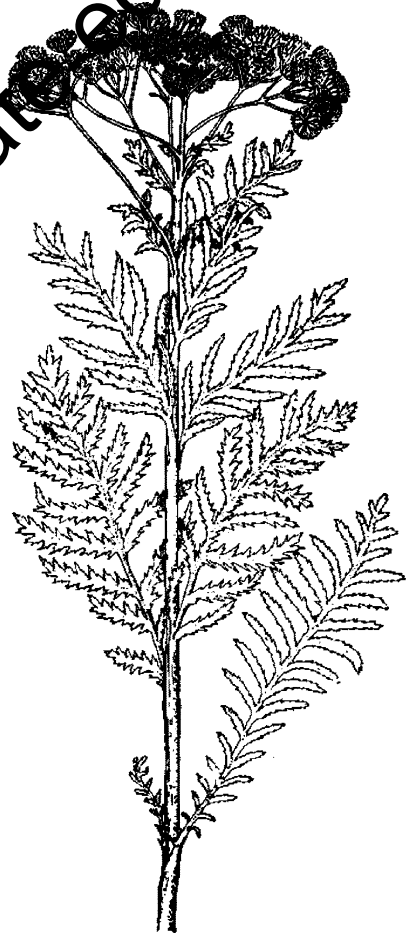
Summary

To successfully utilize your pastures, you must manage them properly based on your goals. Grasses respond well to increased management, rewarding the producer with higher production.

The first step in improving a pasture is to take an inventory of what is there. Second, improve the pasture through better grazing management, clipping, fertilizer application, and pasture rest.

Some pastures may be too poor to renovate and you may need to reseed. Choose an appropriate forage variety or mix for your site. Each variety has advantages and disadvantages, depending on your goals and growing conditions.

Recognize that pastures do not produce evenly throughout the year. Maximize forage production by harvesting overproduction in the spring and avoiding overgrazing in the late summer.



For more information

OSU Extension publications available from Publication Orders

Fertilizer Guide for Pastures in Western Oregon and Western Washington, FG 63, by J. Hart, G. Pirelli, L. Cannon, and S. Fransen (Oregon State University, Corvallis, 1995). No charge

Pacific Northwest Weed Control Handbook (revised annually by Oregon State University, Washington State University, and the University of Idaho). $19.50

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OSU Extension publications available from selected county offices

The European Crane Fly: A Serious Pasture Pest in Tillamook County, EM 8418, by J. Williams, R.C. Eichelberger, and G.C. Fisher (Oregon State University, Corvallis, reprinted 1995). Contact the OSU Extension Service Tillamook County office.

Endophyte Toxins in Grass Seed Fields and Straw: Effects on Livestock, EM 8598, by S. Aldrich-Markham and G. Pirelli (Oregon State University, Corvallis, 1995). Contact your county Extension office for availability.

Other publications

- *Tall Fescue/Endophyte/Animal Relationships* by D. Ball, et al. (Oregon Tall Fescue Commission, Salem).

Use pesticides safely!

Wear protective clothing and safety devices as recommended on the label. Bathe or shower after each use.

- Read the pesticide label—even if you've used the pesticide before. Follow closely the instructions on the label (and any other directions you have).
- Be cautious when you apply pesticides. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.

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