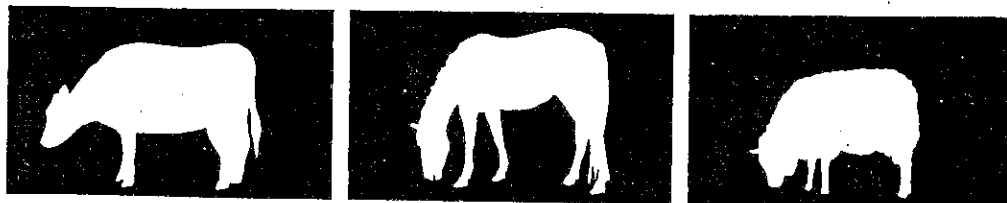


PASTURE  
MANAGEMENT  
FOR  
SMALL  
LANDOWNERS  
IN WESTERN  
WASHINGTON



EB0820

COOPERATIVE EXTENSION



Washington State University

TERMINOLOGY

**Adjuvant**—Any substance in a herbicide formulation which enhances the effectiveness of the herbicides, such as a spreader-sticker.

**Alternate grazing**—Grazing of two or more pastures in succession.

**Animal day**—One day's tenure upon a pasture by one animal.

**Continuous grazing**—The grazing of a pasture by livestock throughout a year or grazing season.

**Deferred grazing**—Delay or discontinuance of livestock grazing on an area for an adequate period of time to provide for plant reproduction, establishment of new plants, or restoration of vigor.

**Grass**—Any plant of family *Gramineae*.

**Legume**—Plant member of the family *Leguminosae*, with the characteristic of forming nitrogen-fixing nodules on its roots, in this way making use of atmospheric N possible.

**Nitrogen (N)**—A fertilizer element needed in large amounts by growing forages. It promotes growth of leaf and stem and increased plant vigor. It insures a dark, healthy, green color in grass. An important component of protein.

**Overseeding**—The practice of spreading seed over an existing pasture without prior seedbed preparation.

**Paddock**—A small fenced field used for grazing purposes.

**Palatability**—The relative attractiveness of a forage; pleasant to the taste.

**Pasture**—Fenced area of domesticated forages, usually improved, on which animals are grazed.

**Pasture Carrying Capacity**—Number of animals a given pasture will support at a given time or for a given period of time.

**Pasture renovation**—Improvement of a pasture by the partial or complete destruction of the sod, plus liming, fertilizing, seeding, and weed control as may be required to establish desirable forage plants.

**Phosphorus (P)**—Designated as  $P_2O_5$ , phosphoric oxide, in fertilizer. It is an element that promotes rapid growth, hastens maturity, and stimulates flower, seed, and fruit production. Absolutely necessary in every plant cell.

**Potash ( $K_2O$ )**—A term designating potassium oxide ( $K_2O$ ) and often used interchangeably with the word "potassium" (K). Potassium stimulates root growth and the growth of strong stems, imparts resistance to disease, and improves winter survival and persistence of legumes.

**Rotational grazing**—System of pasture utilization embracing periods of heavy stocking followed by periods of rest for herbage growth recovery during the same season.

**Silage**—Forages preserved in a succulent condition by partial fermentation.

**Stocking rate**—Number of animal units per unit of land area at a specific time.

## PASTURE MANAGEMENT FOR SMALL LANDOWNERS IN WESTERN WASHINGTON

Most pastures can be greatly improved with the application of good management practices. Fertilization, drainage, rotational grazing, regular clipping, chemical weed control, pasture renovation, re-seeding or a combination of these management techniques will often improve pasture productivity and provide flexibility to a forage program. The lack of any of these or *overstocking* or *overgrazing* will limit pasture production, but, more important, the pastures will be invaded by rush, moss, buttercup, tansy ragwort, thistle, or other weed species. The presence of these weeds are symptoms of poor pasture management. The inclusion of good management in the pasture program is costly and it may not be economical to improve pastures on small acreages.

Before deciding on the degree of pasture management to follow, determine forage needs and establish the limits of your inputs. Ask yourself some questions. Do you have enough land to support at least one animal? If not, can you defer animal grazing or remove the animals from the pasture to allow the pasture plants to regrow? How many animal days grazing do you need? How much grazing can you use? Is it possible to preserve excess forage you grow? Is baling harvest or silage harvest possible or available? Do you have hay storage? Are you willing to invest in seeding or clipping machinery or can you hire pasture clipping and seed bed preparation? Consider these needs and the possible investments and then decide if it is better to buy forages. It may be that you will want an improved pasture program for the pride in doing a job well, regardless of the cost.

### SELECTION OF MANAGEMENT TECHNIQUES

Pasture improvement can begin in steps. Begin with moderate fertilization, pasture clipping, rotational grazing, and controlled stocking rate to avoid the need to reseed.

First, control the stocking rate. The carrying capacity of forage land varies with soil fertility, moisture availability, drainage, and other factors, but the following table will *guide* you on *land requirement* for livestock in western Washington for *productive pastures*. Naturally, an improved management program may change these requirements.

TABLE 1. General land requirement ranges for different classes of grazing animals in western Washington for small farms.

Animal type	Acres per animal*		
	Dry upland	Marsh valley	Irrigated
Horse	3-5	2-3	1-2
Cow	2-3	1-3	1-2
Calf (over 6 months)	1-1.5	0.5-1.5	0.5-1
Sheep	0.2-0.5	0.2-0.5	0.2-0.3

\*Actual grazing area excluding buildings, fence rows, and run areas.

Horses require more grazing area because they do not graze evenly since they trample considerable forage area, and require much more running area than other livestock. If this minimum land requirement is not available, other temporary grazing or run area must be provided or a good pasture is not possible.

Second, use controlled grazing. Some type of rotational or alternate grazing makes pasture and animal management easier. The total grazing area should be divided into three or more equal-sized pastures. Graze one paddock down to 3-6 inches, and move the animals to the next pasture. Then, clip the old pasture and refertilize. Irrigate if available. The best plan is to stock heavily to remove forage in 10-14 days, allow plants to regrow for a period of about four weeks and then regraze. Remember, stocking rates must be determined by forage availability during mid-summer or overgrazing can result. Overgrazing will reduce productivity and allow weeds to establish, particularly in the fall. Excess forage during peak growth times will need to be preserved by baling, silage, deferred grazing, or by renting pastures to neighbors. Deferred grazing of spring-grown forage results in very poor quality and in very high forage loss. You can establish your stocking rate for early summer growth but then you will need to remove animals from the pastures in mid-summer.

Grazing during wet periods may cause soil compaction, resulting in poor aeration and moisture penetration and reduced plant growth. *Do not let animals graze pastures during periods when soils are wet.*

**Third, provide adequate fertilization.** The fertilizer needs are best determined by soil tests. A soil test may be obtained from Washington State University. Request soil sampling instructions from your local county Cooperative Extension office. Obtain the "Standard Test plus Special Test for Lime Needs and Boron." A soil test every 3-5 years should save dollars in fertilizer costs through buying only fertilizer elements needed.

In the absence of a soil test, pastures with a good legume population should annually receive 40 lb N, 80 lb  $P_2O_5$  and 80 lb  $K_2O$  per acre (400 lb 10-20-20). This should be made in two applications, one during spring and the other in late summer or prior to fall rains. If no vigorous clover is present in the pasture, the additional application of 40 to 60 lb N (200-300 lb of 21-0-0) every 4-6 weeks will keep the pasture productive. Adequate fertilization will increase the protein value of the forage raised. Do not apply fertilizer in summer if moisture is unavailable. Lime should be applied at seeding time and worked into the seedbed, but for pastures that are not reseeded, agricultural lime flour should be applied at about 1-2 tons per acre every 3-5 years. The best time to apply lime is in late summer or fall.

**Fourth, clip and drag the pasture regularly.** Regular clipping and dragging after grazing are two of the more important practices needed to maintain forages in leafy condition for best animal preference, to encourage forage tillering and new growth, and to control weeds.

A small tractor with rotary mower should be the highest priority machinery investment for a good pasture management program. A pasture harrow or short section of weighted fence can serve as a drag.

### RENOVATING OR RESEEDING A PASTURE

Renovation and complete reseeding of pastures is costly and should be undertaken only when the possibility of success is high. Ideally, it would be best to plow the pasture and grow an annual crop such as corn or oats for one year and reseed the next year. Growing an annual crop prior to reseeding a pasture helps remove the broadleaf and grass weeds with strong root systems, destroys mole runs, breaks down the compacted sod and allows the preparation of a good seedbed while levelling the pasture prior to seeding with pasture seeding equipment.

For best results, the land should be plowed following the cleanup crop, then disced several times and harrowed to form a clean, fine, and firm seedbed. When the seeding is made in mid-April, the best a

most dependable establishment will be achieved. Late seedings in May and early June are less dependable, often fail, and are more subject to drought and weed problems. In many cases, seedings made in late May or early June do not establish deep enough root systems to survive summer moisture stress. Also, bacterial nodulation of legumes fails during moisture stress. Do not make mid-summer seedings without irrigation.

On seedbeds that are clean and on land that does not puddle or retain water in winter, early to mid-September seedings can be very successful even though the success of these seedings is somewhat dependent upon the timing and sequence of rains in the fall. Generally success is very good for early to mid-September seedings. Orchardgrass and tall fescue often establish poorly if seeded in early October while ryegrass may do well.

Small landowners often cannot use a cleanup crop. The expense of tillage equipment rental may limit land preparation to one season or one period. An alternative method to the one outlined above is to rotovate the pasture in late fall and leave tilled over winter, then work a new seedbed in the spring by rotovation or plowing followed by dragging into a smooth, firm seedbed. It is important that all past plants be buried so they do not regrow. Usually it is more desirable to rotovate an old pasture prior to plowing in order to achieve more complete burial of the old sod.

When seeding a pasture it is important to provide some coverage of the seed. This is best accomplished by cultipacker seeders or drills with press wheels. This equipment may not be available to small landowners.

An alternative system is to wind or hand broadcast the seed on the surface and then drag the area with a light harrow so the seed is covered about 1/4 to 1/2 inch. Hand raking or possibly dragging with a makeshift fencing material may substitute if done carefully. Loose soil surfaces should be firmed by rolling with a garden or turf roller. A rolled surface is particularly important with later seedings.

Overseeding or spreading seed over an existing pasture normally does not improve pasture species composition. The existing grasses provide too much competition for the establishment of new species seeded. Sometimes if the pasture is disced, broadcast seeded, and dragged or harrowed, some species improvement can be achieved, but the system is not dependable. This method is not recommended and should be used only as a last option.

Fertilizer and lime should be worked into the tilled seedbed at rates suggested by the soil test. In the absence of a soil test, 2-3 tons of agricultural lime flour plus 25 lb N, 100 lb  $P_2O_5$ , and 100 lb  $K_2O$  per acre (500 lb of 5-20-20) should be worked into the seedbed. Manure may be plowed down at the rate of 10 tons per acre to replace the fertilizer need; however, an additional application of 22 lb N and 96 lb  $P_2O_5$  per acre (200 lb 11-48-0) should be applied in the final seedbed preparation to aid in establishment of the young forage seedlings and supplement the soil phosphorus levels.

#### SUGGESTED PASTURE MIXES

Orchardgrass and tall fescue are the best adapted grasses to long-term pasture in western Washington. Perennial ryegrass can be used to supplement the other grasses but will not persist for the long permanent pasture periods that are needed by small landowners. Although timothy can be included in the pasture mix, it does not persist well under grazing conditions.

Tall fescue should be used by small landowners where soil drainage is poor. Orchardgrass, which is more acceptable to livestock than tall fescue, does well on moderately drained to well-drained sites. Tall fescue can also be used on dry, well-drained locations and persists better than orchardgrass under the trampling of horses. Tall fescue is less palatable than orchardgrass. The varieties Fawn and Alta tall fescue are suggested.

Late maturing orchardgrass varieties such as Pennlate or Latar combine well with late-growing clovers. 'Grassland Huia' New Zealand white clover should be included in nearly all pasture seedings and the proper legume inoculant should be applied to the seed just prior to seeding. The following table outlines three grass seed mixes that are best for most grazing conditions for horses or beef cattle.

TABLE 2. Suggested grass seed mixes for most grazing conditions.

Forage species*	Soil drainage		
	Well drained**		Poorly drained***
	Mix 1	Mix 2	Mix 3
	lb seed/acre		
Perennial ryegrass	8	8	8
Orchardgrass	12		
Tall fescue		12	12
New Zealand White Clover	3	3	3

\* Timothy can be added to all mixes at 3-4 lb/acre. If timothy, sub clover, alsike clover, or trefoil are added to these mixes, a reduction in the amount of primary grass or clover in the mix should be made.

\*\* Sub clover may be added at 4 lb/acre.

\*\*\* Alsike clover may be added at 3 lb/acre or Marshfield Big trefoil can be added at 4 lb/acre.

## CHEMICAL CONTROL OF WEEDS IN PASTURES

Most weeds are controlled in pastures through pasture management practices. Good drainage, regular clipping and fertilization, rotational or alternate grazing, and controlled stocking provide control for most weeds and moss by favoring growth of pasture species. However, weedy conditions can occur in pastures where complete management practices cannot be maintained. Spot control of specific weeds with herbicides is sometimes necessary. The following weeds can be controlled with the accepted-use herbicides listed below for each weed. CAUTION: *If the decision is to use a herbicide, read, study, and follow the label.* (ae=acid equivalent.)

### Canada Thistle or Dock in Established Plantings

2,4-D amine or  
MCPA amine

1 lb ae/A applied at early bud stage of Canada thistle and again when Canada thistle regrowth is 4 to 6 inches tall; apply before flower stalk of dock elongates.

Use only when forage legumes are white or ladino or New Zealand white clover. Other forage legumes such as alfalfa, alsike, red, crimson, and sub clovers, etc., are injured by 2,4-D and MCPA. A 50% kill of dock is average; treatment must be repeated. Do not graze dairy animals on treated areas within 7 days after application of 2,4-D.

**Bogrush in Established Plantings**

2,4-D ester

3 lb ae/A applied before bloom of bogrush.

Pasture legumes (clovers, alfalfa, etc.) will be seriously injured or eliminated from pastures and hay fields at this rate of application. This treatment should be applied with oil or with an adjuvant in a water mixture since bogrush is difficult to wet. Do not apply to new seedlings. Do not graze dairy animals on treated areas within 7 days after application. Do not disturb (plow) until plants are obviously dead.

**Tall Field Buttercup in Established Plantings**

MCPA amine

1 lb ae/A applied at bud stage of buttercup.

Use only when legumes are white or ladino or New Zealand white clover. Other species of buttercup (creeping buttercup, tuberous buttercup, etc.) are not satisfactorily controlled by this treatment.

**Tansy Ragwort in Established Plantings**

2,4-D amine

2 lb ae/A applied at the seedling or rosette stage of growth in early spring and again in the fall after fall rains have started.

Tansy ragwort becomes resistant to 2,4-D after the flower stalk emerges from the rosette stage. Flowering plants are virtually immune to 2,4-D treatment. Pasture legumes (clover, alfalfa, etc.) will be seriously injured at this rate of application. Tansy ragwort control will be helped by addition of an adjuvant (spreader-sticker). Best kills of tansy ragwort will be attained with 2,4-D under sunny conditions. Do not graze dairy animals on treated areas within 7 days after application.

2,4-D amine +  
dicamba (Banvel)

1.5 lb ae/A plus 0.5 ae/A applied in spring through mid-July and again in the fall after fall rains have started.

May be used either as a tank mix or as the formulated proprietary mixture sold under the trade name of "Weed Master." This mixture is more effective than 2,4-D alone after the flower stalk elongates and flowers are formed. Addition of a non-ionic adjuvant will enhance control—1 pt/50 gal of spray mix. Do not use as a broadcast spray in pastures and hay fields containing forage legumes. Dicamba will cause extensive injury to forage legumes. Do not graze meat animals in treated fields within 30 days of slaughter. Do not harvest treated forage for hay within 37 days after treatment. Do not graze dairy animals within 7 days after treatment.

Dicamba (Banvel)

.05 lb ae/sq rod applied in the spring or fall during periods of expected rain-fall.

Apply the granular formulation as a spot treatment to individual tansy ragwort plants. Do not apply dicamba granules under desirable trees, other plants. Do not apply dicamba granules under desirable trees, other plants, or areas where the roots might extend, or where dicamba might be washed into the root area. Pasture and rangeland grasses may be grazed by dairy animals 60 days after treatment. Do not harvest hay for dairy animals within 90 days of treatment. Do not graze meat animals in treated fields within 30 days of slaughter.

Additional information on tansy ragwort control can be obtained from PNW0175, *Chemical Control of Tansy Ragwort*.

**Annual Broadleaf Weeds in New Seedings**

2,4-D amine or           0.5 lb ae/A applied when pasture grasses have 3 leaves.  
MCPA amine           Do not use 2,4-D amine or MCPA amine in new seedings that contain  
forage legumes. Best kills of annual broadleaf weeds will be obtained when  
2,4-D and MCPA are used under sunny conditions. Do not graze dairy  
animals on treated areas within 7 days after application of 2,4-D.

Additional information on new seeding weed control can be obtained from EB1063, *Annual Weed Control in New Forage Seedings*.

**Blackberry in Established Plantings**

Refer to EB1327, *Blackberry Control with Systemic Herbicides*.

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