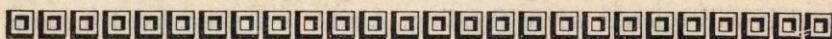


Irrigated Pastures For Central Washington

Agricultural Extension Service

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Alvin G. Law, H. P. Singleton, and I. M. Ingham¹

A good pasture is one of the most important crops on the diversified irrigated farm. It has been amply demonstrated that the use of high yielding pasture is the cheapest method of producing high quality milk, beef, and other animal products. The lack of sufficient pasture makes necessary the purchase of more grain and hay and consequently reduces the margin of profit in livestock production. Increased use of pastures greatly reduces labor requirements during periods of labor shortage and much less power, machinery, seed, and fertilizer are required as compared to cultivated crops.

Forage crops, grown on productive soils, are high in protein, minerals, and vitamins. Some of the vitamins in these green feeds are relatively unstable and disappear rapidly when the forages are stored as hay. Appreciable quantities of protein and minerals are lost when forages are field cured, hence the most efficient use of these essential foods is by grazing animals. The high palatability and nutritive qualities of pastures are particularly important in maintaining maximum dairy production.

¹Assistant Agronomist; Associate Agronomist, Washington Agricultural Experiment Station; and Extension Agronomist, Agricultural Extension Service, State College of Washington, respectively.

Legumes and Where They Can Be Used

Alfalfa is adapted to well-drained, deep soils and should not be used where flooding occurs or where the water table is close to the soil surface. The high productivity of alfalfa, together with its long life and high palatability, make it a valuable legume for irrigated land. A hardy northern common strain can be used in pastures which are to be grazed for three to five years. Hardistan or Ladak should be used if the pasture is to remain for a longer period.

Ladino and White Clover both have a shallow root system, and they do not need such deep, well-drained soils as alfalfa. These clovers require frequent irrigation for best production and both do well in mixtures with grasses. They are long lived when properly managed. Ladino is susceptible to cold and some winter injury may be encountered when severe winters occur.

Alsike clover will grow well on poorly drained, alkali soils, and it will tolerate some flooding. Alsike is a short-lived legume, lasting two years, but will reseed itself in pastures if protected from grazing during the later summer. Seed of this legume is usually relatively inexpensive.

Strawberry clover can be used on wet soils. These may be slightly alkaline, although yields will be higher on more favorable locations.

Grasses and Where They Can Be Used

Smooth brome grass is a long-lived sod former adapted to deep, fertile soils. It is resistant to grazing and tolerant to moderate flooding. When seeded with a legume, it is one of the most productive and palatable grasses for irrigated pastures.

Orchard grass has long been a part of standard pasture mixtures. It will grow on a variety of soils and is tolerant to shading. It is high yielding, vigorous and palatable if not allowed to mature. Orchard grass is susceptible to extreme cold and does not produce well during the summer months.

Tall Oat grass, with proper management, will remain productive three or four years on well-drained fertile soils. This grass is easily established and provides early spring pasture. It is well liked by the grazing animal.

Alta fescue is tolerant to wet soils and alkali. It is a strong perennial bunchgrass that becomes coarse and unpalatable as it matures. Clipping regularly helps keep this grass in a palatable state. Alta fescue is easily established in new seedings and has largely replaced meadow fescue for seeding in pasture mixtures.

Meadow Foxtail can be used on heavy, poorly drained soils. It starts growth early in the spring; and with proper management, remains green throughout the summer. Meadow foxtail is a long-lived sod former that is highly palatable. Seed of this grass is rather costly at the present time. Processed seed should be used if it can be obtained and the seeding rate reduced to one-half that of non-processed seed.

Perennial Rye grass can be used on a wide range of soil conditions and grows rapidly in new plantings. Perennial rye grass will not withstand cold temperatures, and may disappear entirely from the mixture following a severe winter. Certified perennial rye grass should be used to guard against Domestic (annual) rye grass.

Redtop has been used on low, wet soils that are subject to flooding. Used in mixtures subject to such conditions, redtop is a valuable grass. Compared with the species described above, this grass is low yielding. The use of redtop should be restricted to those conditions where the more productive species will not thrive. Redtop seed should be obtained from a source which will ensure freedom from bentgrass seed.

Reed canary grass can be used on areas that are flooded or where waste water accumulates. This long-lived sod-former becomes harsh and unpalatable as it matures. Thus it is necessary to clip Reed canary grass frequently or graze it heavily to obtain maximum utilization.

Mixtures

Alfalfa, seeded at the rate of 10 to 12 pounds per acre, is probably the most productive pasture crop in the irrigated section. However, alfalfa fields, if grazed heavily, are readily invaded by cheatgrass. Moreover, rolling areas may be subject to more damage from erosion if no grasses are included in the seeding. The inclusion of vigorous, high-yielding grasses with the legumes in a pasture may reduce the danger of bloat. Grasses seeded alone will not

yield nearly as much as legume-grass mixtures or pure legume seedings.

Some standard mixtures are suggested, which may need to be modified to fit particular conditions. The County Extension Agent should be consulted for aid in selecting good mixtures.

1. Well-drained, deep soils that can be irrigated uniformly:

a. Mixture containing alfalfa:

Alfalfa	5 lbs. per acre
Smooth brome	6 lbs. per acre
Orchard	4 lbs. per acre
Tall oat grass	4 lbs. per acre (deawned)

b. Mixture containing clover:

Ladino Clover	2 lbs. per acre
Smooth brome	6 lbs. per acre
Orchard	4 lbs. per acre
Tall Oat grass	4 lbs. per acre (deawned)

Note: Perennial rye grass (4 lbs. per acre) may be added to these mixtures.

Meadow foxtail (6 lbs. per acre) may be substituted for Smooth brome.

2. Sub-irrigated or poorly-drained soils:

Ladino clover	2 lbs. per acre
Meadow foxtail	7 lbs. per acre
Alta fescue	4 lbs. per acre

Note: Alsike clover (2 lbs. per acre) or Strawberry clover (4 lbs. per acre) may be substituted for Ladino. Redtop (4 lbs. per acre) may be added to this mixture.

3. Dry areas where water is likely to be limited in amount:

Alfalfa	6 lbs. per acre
Crested wheat grass	4 lbs. per acre
Smooth brome	6 lbs. per acre

The legume used in the mixture should be inoculated with the suitable culture of nitrogen-fixing bacteria, particularly if it is being grown on the area for the first time. Commercial cultures are not expensive and they are added insurance of high yield.

Preparation of Land for Irrigation

A system of corrugations spaced about 36 inches apart has proven the best method of irrigating pastures after they are well started. On long slopes where the gradient may be too steep for down-slope corrugations the rills should run on the contour. In

laying out the field prior to seeding, the length of irrigation run should not exceed 400 feet. In most cases, 300 foot runs will provide more uniform coverage, particularly on very light soils. Leveling of the field may be desirable to facilitate uniform irrigation. Any ponding at the lower end of the slope will destroy good pasture; therefore drains should be provided for runoff water.

Seedbed Preparation and Seeding

A good seedbed for pasture seedings should be well cultivated, weed free, and firm. A thorough irrigation before seeding will serve to firm the soil, show up any low places in the field, and provide a uniform supply of water to ensure rapid germination of the seed. A good seedbed can be prepared following a cereal or intertilled crops. Alfalfa or pasture land should be cropped at least two years before seeding down to pasture again. Fall plowing followed by disking and rolling in the spring will give a good seedbed for spring planting. Disking, harrowing, and rolling following summer tilled crops will usually be adequate for late summer seeding.

Seeding is best done by drilling. If a grain drill equipped with an agitator and alfalfa seeder attachment is available, drilling will give better stands, as the seed can be placed in the soil at a uniform depth. The grass seed mixture is placed in the grain box and the legume seeded from the alfalfa box. You may plant the grass seed and legume separately at right angles to each other for more uniform distribution. Broadcasting by hand or with a broadcast seeder, followed by a light harrowing, will give fair results if drill is not available. Regardless of the method used, the seed should be distributed evenly over the entire field and the seed should not be covered with more than one inch of soil. It is equally important to plant pure seed of high germination. Certified seed of recommended varieties will give best stands.

Spring seeding should be done between March 15 and May 15. In the lower valley the early date is recommended since the season is usually more advanced than at the higher elevations of the upper valley. The date of spring seeding must be early enough to allow the seedlings a good start before the summer heat retards their growth. Fall seeding is desirable if annual weeds are a problem. Fall seedings are ordinarily made between August 15 and

September 15. Seeding later than September 15 is risky as the winter temperatures may kill the small seedlings.

Immediately after the seed has been sown, the field should be prepared for irrigation. In general, the rills should be about eighteen inches apart so that moisture can be supplied near the surface by frequent light irrigations. These rills should be fairly shallow to avoid burying a lot of the seed. The soil surface should be kept moist until the young seedlings are well established. After the plants are six to eight inches tall, alternate rills can be dropped from the irrigation schedule and the field irrigated with thirty-six inch corrugations throughout the life of the pasture. It is a good plan to clean out the corrugations at the beginning of each growing season and once or twice during the summer. This will give uniform distribution of water throughout the field.

Controlled Grazing for High Yield

Heavy use of pastures the season of seeding may result in reduced stands and poor yields. Unless the pasture seeding is given time to become firmly established during the first season, the length of productive life will be shortened. Mowing first year stands is recommended when weeds become a problem. The clipping should be done before the weeds produce seed. Spring seeded pastures usually may be grazed lightly during the fall; while pastures seeded in the late summer should provide grazing the following season.

Pastures that are well established will provide a lot of feed throughout their productive life. Grazing can be safely started in the spring as soon as the vegetation is six inches high. The pasture season may normally extend to October 15, and about four inches of cover should be left in the fall. Overgrazing, especially in the early spring or late fall, will reduce production and encourage invasion of weeds and bluegrass. When this stage is reached the pasture should be plowed.

Pasture crops make their most rapid growth during the spring. Thus if there is sufficient acreage to provide adequate pasture during late July, August, and September, there will be an excess of pasturage during the spring. This excess forage can be used as hay or silage to be fed during the fall and winter. The hay or silage should be removed by early June; otherwise, recovery of the plants

will be slow and pasture yields will be reduced. Small permanent pastures can be supplemented during the hot, dry period with annual pastures such as the cereals or Sudan grass. These temporary crops will lessen the grazing load on permanent pastures and decrease the danger of overgrazing.

Immature grasses contain 10 to 15 per cent digestible protein. As they begin to flower the digestible protein decreases to about three or four per cent. Thus, grazing animals obtain the most nutritive value from young rapidly-growing pasture. However, it is necessary to allow the plants to mature sufficiently once each season to maintain their full vigor. This stage is reached with most pasture plants when they begin to flower.

A rotation system of grazing is recommended for best results with pasture. The total pasture may be divided into three or more units, depending on fencing costs, labor, size of the pasture, and ease of irrigation. Each unit is then grazed in rotation by the entire herd. Some dairymen divide their herds, placing high producers in one group and low producers and dry cows in the other. The high producing group then goes onto the first rotation unit and as soon as the most palatable growth is taken, they are moved to a new unit. The second group is then placed on the partially grazed area. In this manner the high producing cows are always on the best pasture. The rotation period will depend upon the number of animals per acre and the condition of the pasture, but it should not exceed two weeks in length.

Rotation grazing fits in well with irrigation. When the stock are removed from a unit, it can be clipped, if necessary, and irrigated. The amount of water to use will depend upon the soil type. In general, enough water should be applied to wet the soil to the depth of the grass roots or approximately eight inches deep. Particularly on sandy soils, excessive irrigation is wasteful as the water may leach out available plant foods. Where irrigation is carefully done, $3\frac{1}{2}$ to $4\frac{1}{2}$ acre feet of water per season will usually keep the pasture in good condition.

To keep irrigated pastures producing at a high level, a good system of fertilization is necessary. All available manure should be returned to the pasture as a top-dressing during the winter. In addition an application of 125 pounds of treble superphosphate per acre in the early spring is recommended. Where the top-dressing

of manure is not made, production will be increased by the use of 200 pounds of ammonium sulphate per acre (or a nitrate equivalent fertilizer) broadcast in the early spring. Such a system of fertilization will increase the total production of the pasture; it will help keep out weedy low-yielding grasses; and it will increase the feeding value of the pasture. Pastures should be harrowed periodically to spread droppings. Measures also should be taken to control rodents. Trapping, poisoned grain placed in the burrow, or various poison gases, are all effective.

The carrying capacity of irrigated pastures will vary with the season, type of management, composition of the pasture, and fertility level of the soil. Under good conditions, irrigated pastures should support three mature animals per acre during the grazing season. This will not be possible unless a high level of soil fertility is maintained, together with proper irrigation and management practices. The added returns from productive pastures will more than compensate for the added cost and care involved.

Bloat is occasionally a problem on pastures, particularly if the pasture has a high percentage of legumes in the mixture. Danger of bloat can be reduced by the following management practices:

1. Give stock a good fill of hay before turning on pasture for the first time and keep hay before the stock if they are removed from the pasture overnight.
2. Eliminate chronic bloaters.
3. Use legume-grass mixtures rather than legumes alone for pasture.

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