



Flexibility with Irrigated Pasture

F. B. Gomm

Research Agronomist

USDA - ARS

and

H. A. Turner

Animal Nutritionist

Oregon State University

Squaw Butte Exp. Station

Today's rancher is in a squeeze. Forage and feed prices threaten to put him out of business unless he can increase livestock sales while holding production costs to a minimum.

Improved pastures and flexibility:

In the western states, rangeland traditionally provides most of the summer feed for the brood cow herd and for calves that are held and sold as long yearlings. And improved pasture, when used to advantage, contributes flexibility in the livestock operation.

In dry years, and particularly in a series of dry years, the rancher may be forced to remove his herd from the range early. He may also be forced to heavy culling and premature selling. But if sufficient irrigated pasture or supplementary hay is available during these short-feed or dry periods of short range, he might survive and maintain his herd at normal numbers.

Fall calving has been proposed as an alternative management practice to increase calving and weaning percentages, and increase weaning weights. Fall-born calves could be put on range or improved pasture when they are old enough to use forage efficiently.

Irrigated pasture is an excellent "buffer" in dry years when range forage is limited. Yearlings make good gains on irrigated

pasture. Cows and spring-born calves can be held on pasture later than usual to allow the range plants to produce to their maximum; or animals may be brought from the range when that source of forage is exhausted. In years when moisture is adequate and irrigated pasture is not needed for grazing, it can be cut and stored as hay.

Early weaning offers additional advantages to fall-calving herds. Weaned in April, fall-born calves can take advantage of high quality summer pasture and dry cows can go onto range without the demand of the calf for milk. Spring-born calves also can be weaned in mid summer and put on pasture, allowing cows on range to go into the winter in good condition, reducing winter feed requirements. Cows without calves are better distributed over the range and utilize less forage than cows with calves.

With the world market demand for cereal grains and the accompanying high prices for feed grains, improved pasture may provide a suitable source of forage for growing and finishing cattle on roughage.

Pasture research:

The primary objective of irrigated pasture research at Squaw Butte Experiment Station, Burns, Ore., is to investigate alternative uses of improved pastures and how they affect management and income.

Experiment Station pastures are mixtures of alfalfa and tall fescue or ladino clover and tall fescue. Grazing begins about May 1 and continues to the end of August, when animals are

removed and studies are discontinued. Alfalfa requires a rest period in the fall to harden and thus reduce winter-kill. After plant growth ceases, animals again graze to clean up the fields from about October 1 to November 15.

The carrying capacity per acre of pasture for the season has been 3-3.5 yearlings, 2 mature cows with their spring-born calves, or 6 early-weaned fall-born calves. This stocking rate is equivalent to 10 or more animal unit months (AUM's) per acre when forage quality is excellent.

The amount of beef produced depends on the class of animal and the grazing management imposed. Yearling heifers weighing 450 pounds in May have gained about 2.0 pounds/day over a 112-day test period. In addition to the average 700 pounds/acre gained, the pastures provided an additional 2 AUM's/acre of late fall grazing during which animals gained 1.1 pounds/day for 45 days.

During the same 112-day test period, early-weaned calves born the previous fall (October and November), gained 1.3 pounds/day on pasture forage alone. Calves supplemented with $\frac{3}{4}$ and $1\frac{1}{2}$ pounds of barley per day gained 1.4 and 1.5 pounds/day, respectively. Without supplement, calves produced 875 pounds/acre; with supplement over 1,000 pounds/acre.

Mature cows with spring-born calves gained 1.9 pounds/day while calves gained 1.8 pounds, gains equal to 426 pounds/acre for cows and 404 for calves or a total gain of 830 pounds/acre.

Yearling steers grazing clover-tall fescue pasture gained 1.7 pounds/day while those receiving 3 pounds of barley gained 2.0 pounds/day. When liquid supplements were fed free choice on pasture, steers gained 1.8 pounds and 2.2 pounds/day respectively, consuming 2.5 pounds of molasses fortified with vegetable oil and 4.9 pounds of molasses fortified with propylene glycol.

Management of animals and pastures significantly affected gains and total beef production. Heifers gained only slightly more per day on fertilized pastures than on unfertilized but produced 150 pounds/acre more beef because of the lower carrying capacity of the unfertilized pastures. Fertilization with nitrogen is essential for maximum grass production of grass. We applied 120 pounds/acre of nitrogen as urea, ammonium-sulfate, or ammonium-nitrate; the form of nitrogen is apparently of no concern, but urea was most economical on a nitrogen basis. Split applications, 60 pounds/acre June 1 and 60 pounds/acre July 15, probably give most efficient use of the fertilizer. A single application of 120 pounds/acre of N caused rank growth of fescue that, when grazed with only three head per acre, reduced daily gain and total beef produced per acre. Pastures should be irrigated immediately after fertilization to get the nitrogen into the soil and reduce gaseous loss of ammonia.

Grazing systems significantly affected gains and production. When grazing 14 days in a 28-day two-pasture rotational grazing system, yearling heifers gained up to 0.4 pounds/day more than they did when grazing 7 days in a 28-day four-pasture system. Tall fescue, when allowed to regrow for 21 days before being grazed again, became coarse and more mature, which probably reduced forage quality and intake.

Fly control by use of a pour-on insecticide increased animal

gains 0.1 pound/day over gains by nontreated animals.

Because of the chemical nature of the soil, an ancient lake bottom, the resulting forage is borderline deficient in copper and borderline excessive in molybdenum. Consequently, animals grazing these pasture forages may become symptomatically copper deficient. The addition of 0.5 pound of finely ground copper sulfate to 100 pounds of salt increased gains of yearling heifers up to 0.4 pound/day above those receiving no copper.

When yearling heifers were pastured under a combination of the productive treatments, i.e., alfalfa-grass, 14 days' grazing in 28 days and copper supplement only, they gained 2.4 pounds/day and 850 pounds/acre.

Pastures that were cut for hay yielded 4 to 6 ton/acre of high quality alfalfa-grass hay. This compares to average yields of $\frac{3}{4}$ to $1\frac{1}{2}$ ton/acre from adjoining native meadows.

Implications:

Results at Squaw Butte indicate that the rancher can use irrigated pasture to improve the management of his range livestock operation. Because of the nature of the land to which irrigation can be applied, the value returned must be equal to or greater than that which could be obtained from other land uses or crops. When climate dictates that only hardy forage crops can be grown, the decision is not difficult. The rancher, however, must decide the class of animal to use, what species to plant, and how the pasture will best meet his needs.

Tall fescue was the only grass used in our studies. Since fescues may be high in alkaloids, which have been implicated in reducing gains, other grasses might improve production, especially of younger animals.

When range forage is less expensive in relation to the economic worth of irrigated land, the rancher probably cannot afford to use irrigated pasture exclusively for a cow-calf operation. The value of the forage is through the sale of beef. Therefore, the most productive gains from an acre of pasture will be from young, fast-growing animals. The early-weaned, fall-born calf probably will give the best return. Growing yearlings to feedlot size also yields good returns and competes fairly well with other crops in an overall economic analysis.

The gain in body weight made by a brood cow on pasture is of questionable importance. Her increased weight cannot be marketed, but has value in maintaining good animal health and may determine how well she breeds, winters, and calves again. Although calves with their mothers on pasture out-gain weaned calves, they are not physically capable of growing fast enough to compensate for the additional forage taken by the cow and her unsaleable weight gains.

For a given set of economic conditions, a rancher might use irrigated pastures profitably for any class of animal. His level of profit would depend on the nature of the "environmental" pressures brought against his business. The rancher's foresight in having pasture available when needed and his judgment of how to use it best should increase the flexibility of his operation. That flexibility might determine whether he stays in business or gets squeezed out. ●