

Irrigated Pastures

further studies planned on pasture varieties and management practices

Maurice L. Peterson

Irrigated pastures in California have increased to about 400,000 acres in approximately 15 years.

Most of the acreage is on soils not well suited for other crops. Examples are the extensive irrigated pastures of the Oakdale District in Stanislaus County and the reclamation of alkali land in Madera County.

These pastures produce most during summer months when dry ranges are just what the name indicates. It has been stated that no innovation has done more to balance California's seasonal feed supply for livestock.

Many Legumes to Use

There are many legumes which have a place in irrigated pastures. Queen among them is ladino clover. This vigorous perennial combines high production with quality and is unchallenged on our fertile soils with ample supplies of water. When proper attention is given to surface drainage, ladino makes excellent growth on soils with impervious clay layers.

It is generally believed that ladino clover yields better and recovers more rapidly after grazing than does birdsfoot trefoil. The latter, however, has a greater tolerance to alkali soils and appears to completely avoid the principle complaint stockmen have of ladino—the bloat hazard.

It may be possible through experimental work to determine the production of these legumes under different soil conditions and to define their limits of adaptation. Alfalfa may also have a place in

irrigated pastures on deep fertile soils. More definite information is needed on how long alfalfa stands can be maintained productive under grazing conditions.

Grasses in Irrigated Pastures

Exceptionally good grasses are needed to hold their place in mixed stands with ladino clover.

Four grasses provide most of our pasture at the present time. These are Annual or Domestic ryegrass, Perennial or English ryegrass, Orchard grass and Tall fescue. Each of these grasses has shortcomings and this is by no means a complete list of grasses which may have a place in irrigated pastures. The characteristics or descriptive sketch of a grass variety should include information on the following points:

1. Forage yield and season of growth;
2. ability to grow in combination with other plants;
3. tolerance to wet, alkaline or drouthy soils;
4. palatability and nutritional value at different stages of growth;
5. length of life and ability to stand grazing.

Observations and trials of different grasses on the ranches of California have provided a wealth of background information. Quantitative data are needed to bring all factors into focus on the problem of selecting the proper grasses for irrigated pastures.

Annual ryegrass is included in practically all irrigated pasture mixtures. It comes on quickly after seeding but reaches maturity and dies as the heat of the summer approaches. Perennial rye-

grass is a more conservative starter, but continues production throughout the summer. A cross between these two was made in New Zealand and subsequently improved and released by the University of California this year. It combines some of the desirable qualities of both species and is designated as Ryegrass 12. One of the outstanding characteristics is its rapid recovery after grazing. Its place in irrigated pastures needs to be studied more thoroughly. Some time will be required, also, to develop adequate seed supplies for general use.

Orchard grass is a heavy producer, recovers quickly after grazing, but is lacking in palatability, particularly for sheep. When it is used in mixtures with other grasses, it is sometimes avoided by all classes of stock and the pasture becomes bunchy. Grazing trials should tell whether or not palatability is a problem when orchard grass is the only grass in the mixture.

There are two varieties of tall fescue which are very similar in appearance and growth characteristics. These are Alta fescue, released by the Oregon Experiment Station and Kentucky 31, a product of Kentucky. Because the seed is more generally available, Alta fescue is most commonly used in California. This grass is grazed by sheep and cattle even though it appears coarse textured. Mowing is the best method of preventing grasses from becoming coarse and unpalatable.

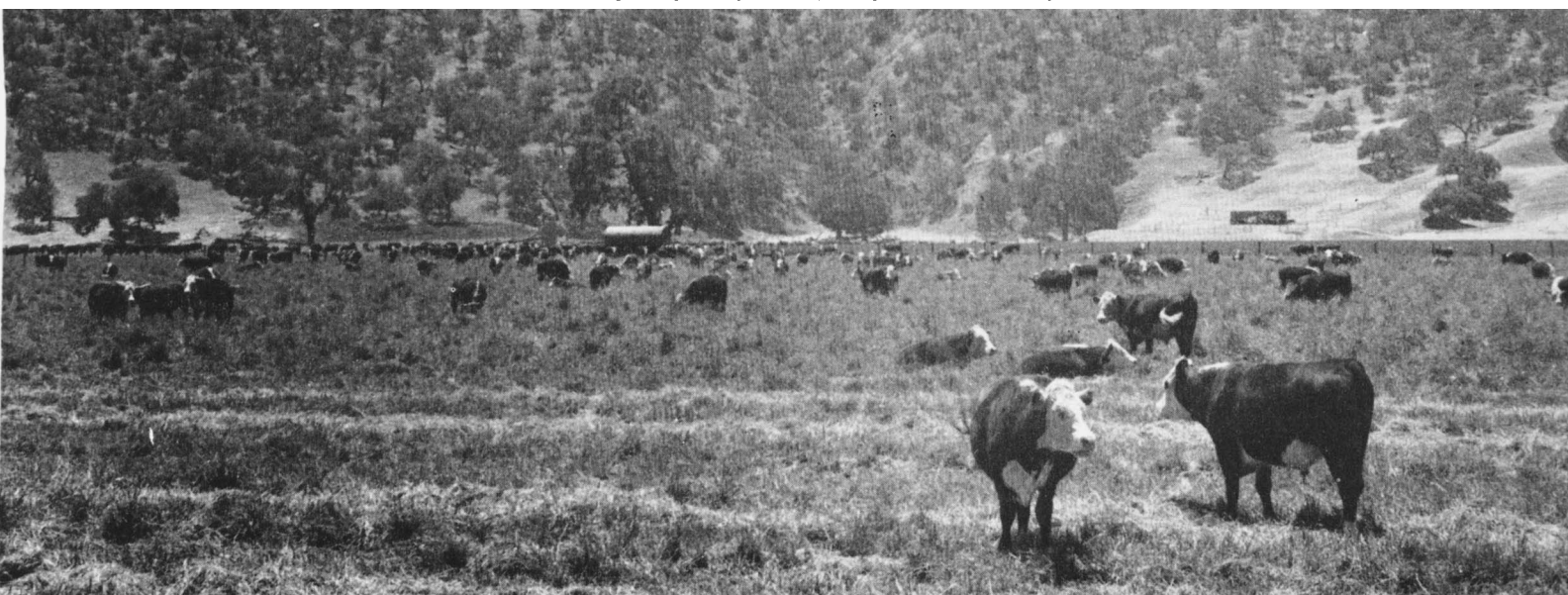
Other grasses which are being used in irrigated pastures are Dallis, Rhodes, Harding, Bermuda and Brome, but their places have been less well established and there is need for further trials for determining adaptation and management.

Improved Varieties

Most of the irrigated pasture varieties are mixtures of different types of plants and do not breed true. These mixed types are not recognized in close growing pasture stands or mixtures, but are easily observed when each plant is individually

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Range cattle grazing on a good irrigated pasture in Monterey County.



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spaced. Broadleaf birdsfoot trefoil is an example of one of these variable species. Within this variety can be found plants which are erect like alfalfa—others which grow flat along the ground. Some plants are stemmy—others leafy and so on through numerous contrasting characteristics.

To develop an improved variety, the type of plant wanted must first be determined. These are selected and isolated so they can cross among themselves but not with the undesirable plants. A rigid selection and testing program must precede the distribution of any new crop variety. Breeding programs with forage crops move rather slowly and new varieties should not be expected too soon.

Mixtures to Fit Conditions

Most irrigated pastures are mixtures of grasses and legumes. Some of the reasons given for seeding mixtures are that legumes maintain fertility—grasses help prevent bloat and control erosion where that is a problem. Mixtures are said to insure better stands on variable soils and may lengthen the grazing season and provide a better balanced diet.

A standard or general-purpose mixture would include the following species and seeding rates in pounds per acre:

Ladino clover	3
Domestic ryegrass	2
Perennial ryegrass	2
Orchard grass	3
Alfa fescue	4
Total	14

Soil and climatic differences as well as class of livestock will require modifications of this mixture. For example, on alkaline soils and where bloat is a problem, birdsfoot trefoil should replace a part or all of the ladino in the mixture. Birdsfoot trefoil was the only legume among several tested which gave an appreciable yield under high salt conditions in studies conducted in southern California. The growth of ladino clover was negligible under similar conditions.

Local experiences are good guides for suitable mixtures in a particular area. Such information can be obtained from the local farm advisor. At Davis emphasis will be placed upon studies of the management practices best suited for different types of mixtures.

Pasture Management

The kind of management to be given irrigated pastures; the frequency of irrigation; whether rotation or continuous

grazing should be practiced and the frequency and how close a pasture should be grazed are some of the questions which confront the owner of an irrigated pasture.

The need for supplying adequate and continuous pasture for a herd of livestock imposes certain restrictions on grazing management. However, some ranchers have combined good grass management and good livestock management programs into very efficient production.

Data Needed

Many of the grass management problems need to be answered by studies of the physiology of pasture plants.

Knowledge of the optimum requirements for growth of the most important pasture species will require studies of temperature, moisture, plant nutrients, light requirements, area of leaf surface and other factors.

The response of pasture plants to fertilization is particularly important because many irrigated pastures are on problem soils. The effect of fertilization on the quality of grass is important. Factors which influence nutritional value of forages are numerous and complex.

Some indications of quality are provided through chemical tests but the burden of proof lies with the grazing animal. The final testing of many pasture improvement practices will need to be conducted under actual grazing conditions. This calls for close cooperation between the research workers in pastures and live-

stock management. A successful irrigated pasture is one which is effectively used with sound management going hand in hand with good pastures.

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NEW PUBLICATIONS

A copy of the publications listed here may be obtained without charge from the local office of the Farm Advisor or by addressing a request to Publications Office, College of Agriculture, University of California, Berkeley 4, California.

AGRICULTURAL PUBLICATIONS, September 1948. New catalog of 270 agricultural pamphlets now available for distribution. A short descriptive paragraph defines the scope of each publication.

THE WALNUT SITUATION AND OUTLOOK—1948, by George B. Alcorn. Extension Circular 386, September, 1948.

An up-to-date report on the current situation of the nation's walnut industry which is located entirely on the Pacific Coast. Acreage and tonnage of commercial walnuts have increased since the 1920's. The bulk of the crop is handled by local buyers or coöperative packing plants. Farm prices this year, as in any year, depend upon consumer purchasing power and sensitive wholesale prices.

DONATIONS FOR AGRICULTURAL RESEARCH

Gifts to the University of California for research by the College of Agriculture accepted in August, 1948

BERKELEY

Dr. William H. Boynton	\$209.91
Veterinary science research	
Canners League of California	\$3,000.00
Investigations on insects attacking tomatoes	
Colloidal Products Corporation	Four sacks of insecticide: 3% DDT dust with sticker—approximately 204 pounds
For experimental purposes on insect pests	
Dow Chemical Company	Two sacks, 50 pounds each of 1% Gamma Isomer dust
For experimental use on insect pests	
Naugatuck Chemical (Div. of U. S. Rubber Co.)	10 Pounds Phygon-XL-MS, Control N-3378
To determine new uses for this product	
Rohm and Haas Company	Two cartons 12/4 rothane WP 50
For experimental use on insect pests	
Sugar Research Foundation, Inc.	\$1,000.00
Study of sugars in the freezing of fruit	
Sugar Research Foundation, Inc.	\$702.00
Studies on sucrose phosphorylase	
U. S. Public Health Service	\$4,050.00
Utilization of carbon dioxide and synthesis of fatty acids by bacteria	

DAVIS

California Fertilizer Association	\$750.00
Investigations of methods of fertilizer applications	
Canners League of California	\$1,500.00
Investigations on tomato breeding	
Julius Hyman & Company	\$1,250.00
Investigations of a new insecticide	
U. S. Public Health Service	\$306.00
Rodent control	

LOS ANGELES

Golden West Gladiolus Growers	30 quarts gladiolus cormlets
For ornamental horticulture investigational work	