The role of land in western ranching.

Land is the main resource in livestock ranching in the West. The forage it provides can be converted into economic uses only by grazing animals. The rancher must care for his animals so they can do the most economical job of harvesting. He must care for his land so that it will support the highest number of animals consistent with efficiency and conservation. By *M. L. Upchurch,* head, Western Field Research Section, Farm Economics Research Division.

LAND IS RELATIVELY more significant in ranching than in any other major type of farming. The very words "livestock ranching" bring to mind the expanses of prairie, desert, and mountain range that we link with grazing.

More than half of all land in the United States is used for grazing. Some of it is in farm pastures, but most of the acreage is in the rangelands of the West. Much more than half of the total investment on most livestock ranches is in land.

The western livestock region covers roughly the western half of the United States. About three-fourths of all land in this region is used for grazing. The rest is in cropland, mountains, and forests that are not grazed, military and other reserved areas, and urban and industrial areas. The soils and climates, of which there are many different ones in this region, determine the amount and kind of forage and the season of grazing use.

The land used for grazing generally is unfit for any other agricultural use. The soil may be too poor or rocky for cultivation. The climate may be too dry and the summers too short for crops. Some areas may be too remote from market to make crop production profitable.

Therefore ranchers have little choice but to continue livestock grazing, regardless of the price levels for their product, the costs of operation, or the productivity of the land itself.

Most of the western rangeland will continue to be used for grazing, despite competition from other livestock-producing regions, price levels, and the other hazards of ranching.

To be sure, any one rancher may go broke and quit the business, but the rangeland itself will continue to be used for grazing, if it is used at all. Grazing is the residual economic use.

Even though most rangeland cannot be used successfully for other types of agriculture, surprisingly little land in the West is so poor that it cannot be used for grazing. There are a few nearly barren areas, like the salt flats in Utah and parts of the desert in southern California, western Arizona, and southern Nevada. A few areas of the rockier, more barren mountains, and some of the densely forested areas of northwestern California and western Oregon and Washington have no grazing.

No one knows for certain just how scant vegetation has to be to preclude some kind of grazing use. Some of the near-desert land may be grazed only in years when rainfall is favorable, or it may be grazed for only a few weeks following rains. Other dry areas may be grazed only by sheep in winter, when snow provides enough water for

them. Still other areas may be grazed briefly in spring or summer when water and vegetative conditions are favorable.

A rule of thumb is that land that will not support at least five or six animal units on a section of land for the grazing season probably cannot be used economically for grazing.

On the other hand, the better rangelands of the West will not provide feed for more than about 60 animal units a section during the grazing season. The more productive land usually has soils and rainfall suitable for crops. Among the few exceptions are some of the higher mountain meadows that can be stocked properly at heavier rates, although the growing season is too short for crops.

In general, however, an acre of rangeland has a relatively low productivity. Many acres are needed for a reasonably efficient ranch. Even a small, family-operated ranch may have 12 thousand acres. This simple fact gives ranching and the management of rangeland its unique character.

A RANCHING ECONOMY supports a sparse population. Distance becomes an important factor in the social and economic organization of ranching communities. The usual community services of schools, churches, and libraries do not exist or are costly.

The relatively low productivity and the relatively large acreage in an operating unit make it difficult for the rancher to have close control over rangeland.

Rangeland is seldom used only for grazing range livestock. Western range areas, particularly those in the national forests, are primary sources of water. They are the vital watersheds. They are habitats for game. Many areas are important for recreation. Forestry and grazing often are companion uses.

These multiple uses of rangeland make many different persons interested in the management of a range area: The rancher, whose livestock graze it; the hunter, because deer and elk may use the area; the irrigation farmer, the industrialist, and the urban householder, because range areas are the source of water; the State, because it controls the game and the appropriations of water; the vacationer, because he camps and fishes there; the lumberman, because the area may supply logs or other forest products.

Each tries to influence the management so as to further his particular interest. The extent to which each is successful depends on the ownership of the land and on other institutions through which management decisions are made and exercised.

A little more than half of the land used for pasture and grazing in the western range area—355 million acres—is in private ownership. Public land comprises 286 million acres, and 42 million acres are Indian land.

Indian land is not public land. It is held in special trust. Indian ranchers use most of it, either in common with other ranchers or in individual allotments. Non-Indian ranchers lease some of it for grazing.

PUBLIC LAND is used by ranchers either under lease or permit, as prescribed by law and the rules of the administering agencies. State-owned land is leased for grazing. Most leases are like those that might be made between individuals. The leases in some States provide for renewals on expiration. They are also transferable, so that a leasehold has many of the attributes of ownership in fee simple.

Federal land, most of which is administered by the Forest Service of the Department of Agriculture or the Bureau of Land Management of the Department of the Interior, is allotted to ranchers under a system of permits. Permits are given to eligible ranchers under the rules prescribed by each.

Ranchers use private land alone or private land in combination with various forms of public land. The rancher's ability to control such land in achieving his own interests is limited by the large acreages he must police

and manage and by the control he has over the land he uses through ownership, lease, or permit.

Private ownership in fee simple normally gives the owner a high degree of control. A rancher who operates large acreages, however, may be unable to exercise precise control in a real physical sense. In areas where big game abounds—as an example—the rancher may not be able to prevent grazing by the animals. He may not be able to exclude hunters or others from access to the land. Sometimes this lack of precise control may affect greatly the product he reaps from the land.

His control over the public land he uses is subject also to the limitations imposed by the permit from the administrative agency. The reality of multiple uses then makes itself felt. Grazing on a public range allotment may be conditioned by one or more additional uses at the same time. The allotment may be open to hunters or fishermen during the grazing season, or the grazing season may be cut short to make way for a hunting season.

A further unique characteristic of the use and management of rangeland, as compared with cropland, lies in the fact that the rancher's harvesting machines are the animals themselves. Management of livestock under range conditions is somewhat more complex than operation of a mowing machine or a combine harvester. The grazing animals may not harvest the range forage uniformly, in the proper amounts, or at the proper stage of growth to get maximum production from the land.

The science of range management has lagged behind technological developments elsewhere in agriculture. The State agricultural experiment stations, the Department of Agriculture, and other research agencies only recently have devoted very much attention to the use of rangeland. Now the young science of range management is making rapid strides.

Ranchers also have intensified their efforts toward better management of grazing land. More and more of them are "farming" their ranges by controlling undesirable plants, seeding desirable ones, using fertilizer, and following other practices in order to achieve more efficient production.

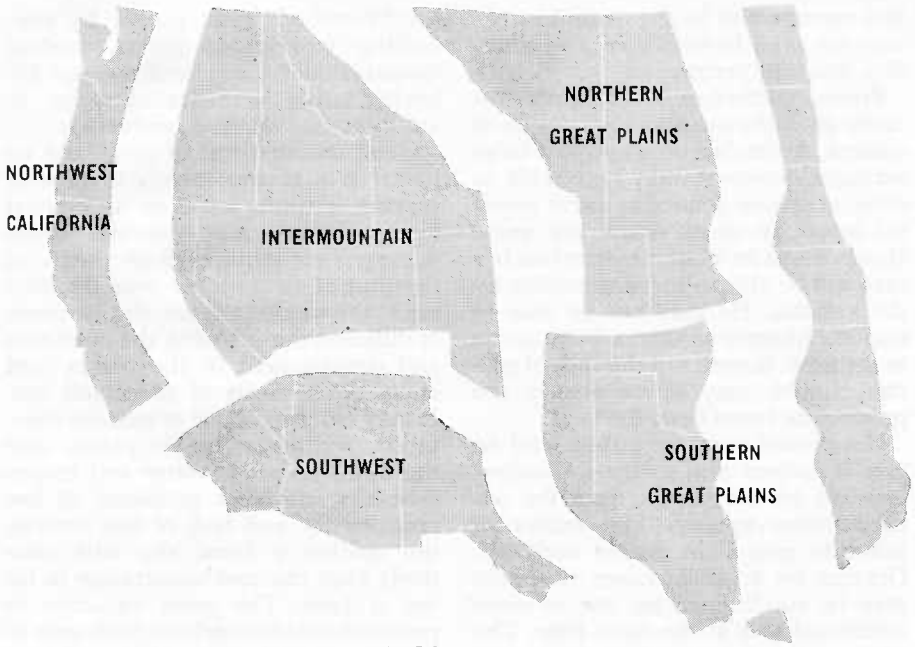
Good management of rangeland no longer is a matter merely of turning grazing animals loose to seek what forage Nature may provide. Good management requires close watch on the part of the rancher over the livestock, the way they graze, the use made of different range plants, the condition and development of the plants, and many other facets of rangeland use. It may require control of noxious vegetation, seeding of usable plants, and the development of water and fences.

Besides the basic problems of low productivity and lack of full control, the rancher is faced also with relatively high risk and uncertainty in his use of land. The great variation in productivity of rangeland from year to year requires flexibility in number of animals and seasons of grazing and causes a variable output. The rancher at times may not be able to graze his land at all, or he might have to dispose of his livestock or obtain feed from other sources. Either may be costly.

I have said that many different range conditions exist in different parts of the West. Range conditions actually may differ from ranch to ranch or even within the same ranch. Certain broad areas or types of rangeland nevertheless can be defined.

The Northern Great Plains mostly is rolling or flat. Medium and short grasses are the dominant vegetation. Many sheep graze here, but this country usually is better suited to cattle. Generally 7 to 10 months of grazing are provided. Native hay or alfalfa and other forages from cropland are the main winter feeds.

The Southern Great Plains is mostly shortgrass country. Mixtures of semidesert species and winter and early spring-growing annuals and shrubs exist. Yearlong grazing is common. Supplemental feeding of crop feeds and cottonseed cake or pellets may be



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practiced during short periods in winter and occasionally at other seasons when drought limits range feeds.

The intermountain region has many range types. The lower country supports a complex of desert and semidesert grasses and shrubs, which are used mainly as winter or spring and fall grazing. Higher elevations slope into the pinyon-juniper, oak brush, and timber types. Much of the rangeland is used seasonally. Livestock often must be moved long distances among spring, summer, fall, and winter ranges. A higher proportion of the rangeland in this area is in Federal ownership than in other major range areas.

The southwestern range region has desert-shrub types at lower elevations, grama grasslands in southeastern Arizona and southwestern New Mexico, and a wide mixture of feed types in the pinyon-juniper and forested zones. The desert lands are used rather precariously by sheep and cattle. Speculative inshipments of livestock for grazing are common when seasons are favorable. Cattle ranching is usually on the grama grasslands, where grazing is yearlong, or nearly so. Cottonseed cake or other feeds may be needed during the winter. These cattle ranches are rather productive and stable. Only occasionally are they plagued by severe and prolonged droughts. Lands of higher elevation are used mainly as summer range for cattle and sheep that are wintered in the irrigated valleys or on range at lower elevations.

The California range region is unique in that the main range feed is annual grasses and legumes that grow in winter and early spring. The winter rains and dry summers provide abundant feed in late winter and spring but very poor feed in summer and fall. Ranches therefore have developed a system based on inshipments of stocker cattle in the fall for grazing until the spring, when they are marketed. Another common practice is to graze cows on the range during winter and spring and move them to irrigated

pastures and croplands in the Central Valley in summer and fall.

Most of the land in the northwestern range region once was forested. Range livestock grazing there is largely on cutover land or on the small areas of natural grasslands.

I HAVE DESCRIBED the range regions in broad terms. Climate mainly determines the characteristics of rangeland and largely dictates how the land can be used best. Therein lies one of the rancher's major problems as he tries to carry on a profitable business within the natural environment.

Livestock must have feed at all seasons and more at some seasons than others. Yet range forage plants do not grow in all seasons. The task of balancing feed supplies with feed requirements season by season and year by year always is a primary problem. The rancher's success in meeting this problem largely determines his success in the business.

Ranchers who needed winter feeds have acquired cropland or some other means of producing at least part of the winter feed they need. Ranchers in seasonal range areas strive to acquire a balance in their spring, summer, fall, and winter range or other supplies of winter feed.

Each rancher in each region and in each locality must solve the problem of seasonal feed balance in his own way. The efforts and the results have far-reaching effects on the profitability of ranching and on the value placed on certain types of rangeland in a locality. For example, the rancher who is short on spring range can afford to pay high prices for that type of land. Thus he may use his other land and resources more efficiently.

The rancher also faces the problem of feed supplies from year to year. What can he do when drought reduces his feed supply? He may overuse his range for short periods and even sacrifice some weight on his animals, but he soon finds himself in a grave situation if feed is not forthcoming.

He may sell some or all of his cattle to bring his feed requirements in line with his supply. But cattle forced onto the market by drought often are not in shape to sell for a good price. Often they compete with many other cattle in the same condition.

He may buy feed to carry him through until his ranges are again productive. The many ranchers who use this solution get help from the Department of Agriculture, the railroad companies, and the States in various ways. Widespread drought is a drain on feed supplies, and purchase of feed to maintain range herds is often costly, even with the outside aids.

He may try to provide his own reserves of feed and carry them over from good years to meet drought or other hazards. But can—or should—the rancher afford to maintain an inventory of feed large enough to meet the prolonged and unpredictable drought? The long droughts of the 1930's in much of the range country and of later years in the Southwest would have exhausted the feed reserves any prudent rancher might have tried to provide.

Also: Can the rancher who might be able to carry over reserves of feed afford to feed it to his own stock? Feed is in high demand during droughts. A rancher who has feed might be able to sell it for more than it would be worth to him as feed for his own stock. The question must be answered in terms of each situation when it arises.

THE PLACE OF LAND in ranching can be described by presenting a few situations of different types.

A ranch differs from a farm in that a major part of the income is from livestock and a chief source of feed is range forage. Many farms specialize in livestock but depend mainly on crop feeds and cropland pasture.

The size, organization, and operation of individual ranches depend on several factors: The type, topography, and location of the different tracts of land available; ownership and management limitations prescribed by the owner-

ship; the kinds and relative amounts of feeds produced on the rangeland and on cropland on the ranch or in the locality; the abilities and preferences of the rancher; and the amount, costs, and skills of the available labor.

Some ranches do best as a cow-calf business. Others are best as steer ranches. Still others are most profitable as sheep ranches.

I cite a steer ranch in Montana as an example. It has about 6,400 acres of upland prairie land that makes excellent summer range. About 4,400 additional acres of rough land, much of it with southern slopes, is suitable for winter and early spring grazing. Used for native hay are 260 acres of meadowland. The supply of irrigation water is somewhat limited in late summer, so yields of hay are not high.

The grazing land is made up of private and public lands intermingled. The rancher owns about two-thirds of the acreage. The rest is public land, which he uses under permit from the Bureau of Land Management. The hayland and ranch headquarters land is privately owned.

Because of the supply of winter feed and the topography of the spring range, this ranch is not adapted to cow-calf operations. Each fall, by the first of November, the rancher customarily has bought about 350 head of long-yearling steers. He puts them on the winter range and feeds them hay as necessary. Considerable feeding usually is required in January and February. The cattle are kept on the range nearest the headquarters during these months to make feeding easier.

The steers are moved to summer range about the middle of May. This area is adequately cross-fenced and watered to permit the stock to use the range feed efficiently with a minimum of movement. The primary aim is to put as much weight as possible on the animals. They are moved gradually and slowly from pasture to pasture and end the grazing season on especially good range just before they are shipped in late September.

This ranch is well adapted to steers. Young animals can be bought in the fall when normally the price is at a seasonal low. Winter range and supplies of hay are adequate to rough the animals through until spring except during an occasional severe winter when some feed must be bought. The spring and summer range is of a type that puts rapid and solid gains on the animals. Normally this ranch produces about 115 thousand pounds live weight of beef a year, the difference between the weight of the animals bought and the weight of the animals sold. The ranch operates with little hired labor.

This kind of operation is subject to considerable risk from falling prices. The investment in livestock is high and is in the nature of a cash expense each year. A drop of a couple of cents in the cattle market from one fall to the next could easily wipe out the entire profit for the year. The rancher usually buys and sells on the same market, however. Losses sustained one year may be more than regained in another.

The land, including buildings and improvements, represents an investment of 134 thousand dollars, although probably it would cost considerably more if bought today. Machinery and equipment, feed and supplies, and livestock represent a total investment of about 8 thousand dollars. Steers purchased each fall cost perhaps 35 thousand dollars, but this amount is considered an expense rather than an investment.

Land and the forage it produces is the dominant factor on this ranch. The steers are merely a means for harvesting and selling the grass. The haying operations and other aspects of ranch activity are ways to facilitate the harvest of range feed by the steers themselves.

A COW-CALF RANCH in the Southwest is another example. It normally carries about 150 animal units of cattle. About 100 are cows. The rest are replacement heifers, bulls, and a few calves and steers carried over. It cov-

ers 7,200 acres, only 810 acres of which are owned. From the State the rancher leases 2,050 acres, which have been leased in connection with this ranch for many years. The rest is Federal land and is used under yearlong permit from the Bureau of Land Management.

This ranch is in a truly yearlong grazing area. The main source of feed at all seasons is from the range itself. Cottonseed cake or pellets are fed during periods of drought or occasional winter storms. The range feed is usually most limited in spring, before summer rains bring on the current year's growth of weeds and grasses.

Calf crops are not very high, partly because of the low level of nutrition during the spring, which should be the most active breeding period, and partly because of the rough topography and brush, which make it difficult to get all cows served in season.

One might think that with a low calf crop, the rancher could do better by growing out older animals rather than depending on sales of calves as a major source of income. With the type of forage on this ranch, however, it is almost impossible to get satisfactory gains in weight and finish on older animals. Even though the ranch is not highly productive as a cow-calf unit, it is relatively more profitable when used in this way than in any other.

All of the grazing land on the ranch can be used at any season, although not all the land is grazed all the time. Lack of stock water at times on parts of the ranch precludes much use even when forage is available. No doubt more adequate water development and fencing would permit this rancher to manage his range more effectively.

About 30 acres, mainly in alfalfa, at the ranch headquarters are irrigated. More land could be farmed if water for irrigation were available. Only enough irrigation water is available for horse feed and for a little hay for the "hospital bunch." Purchased high-protein concentrates are depended on for the main supplemental feed.

Calves, cull and dry cows, and surplus bulls normally are marketed in early fall. Replacement heifers and some of the late smaller calves and perhaps a few yearling steers are overwintered if the supply of range feed is fairly good. A few cows or calves may be marketed at any time, depending on their age and condition, the supply of range feed, and the prices and prospects of the market.

Drought and shortage of range feed are the rancher's greatest hazards. The years 1953 to 1956 were particularly difficult in the area. All animals except the herd of cows and the current year's calf crop were sold in the summer of 1953. All calves were sold early in the fall, and the cow herd was culled closely. New bulls were bought in the spring of 1954, but supplies of feed continued to be short, and further culling was done throughout the year. Loans were obtained in the winter of 1954–1955, and grain feed was purchased under emergency programs. With the continuing drought, further sales of stock were made and additional emergency supplies of feed were purchased.

When rains and the spring grass failed to come in 1956, the remaining cattle were sold. Every means available to the rancher to keep the ranch a going concern had been exhausted. Drought had wiped out many years of work to build a good cow herd and a good range-management program. With the return of rains, he must rebuild his herd and rejuvenate the range, possibly by incurring heavy indebtedness. Both are slow and costly undertakings.

ANOTHER EXAMPLE, that of a sheep ranch in the Northwest, presents a different type of land use and operation. The rancher owns about 2 thousand acres of mountain foothill rangeland suitable for spring and fall range. This land is used with about 21 thousand acres of similar Federal land under permit from the Bureau of Land Management as a spring and fall range.

Summer range is obtained on a national forest. The summer range allotment covers an area approximately 3 by 6 miles in extent, but with only about 8,700 acres open and usable for grazing. All land in the summer allotment is Federal, except about 60 acres in scattered mining claims.

Winter feed is obtained from irrigated land in the Snake River Valley. The rancher owns 142 acres of irrigated farmland, but rents additional hayland or buys hay at other farms. The purchased hay usually is bought "in the sheep"—that is, sheep are moved to the farm where hay is grown and are fed there.

This ranch operates about 3,500 ewes of a Rambouillet crossbreed and uses mutton-type bucks of several breeds. Lambs are dropped in February while the sheep are still on the winter hayfields. This is earlier lambing than is common among most range sheep operations. It is made possible by feeding the ewes hay in winter and by providing lambing sheds or tents as protection from storms in late winter.

The ewes and their lambs are formed into three bands early in March and moved to spring range about 60 miles distant from the winter quarters. Sheep once were trailed long distances between seasonal ranges. Now movements are made by motortrucks on most ranches.

The sheep graze on the spring range until the middle of June. They start at the lower elevations and gradually work up until they reach higher foothill parts of the range at the end of the season. Shearing is done on the spring range in permanent shearing sheds and corrals.

Sheep are moved by truck to the mountain summer allotment the middle of June, about 40 miles. Both spring and early summer feed is excellent. Under these conditions, the ewes give maximum milk and lambs grow rapidly. Most of the lambs are ready for market by mid-July. Lambs ready for sale are shipped at that time. Ewes without lambs are then formed into a single band for the rest of the summer.

Ewes still with their lambs are put in another band and are herded on the choice feed to get maximum growth on the lambs. The remaining lambs usually are shipped between mid-August and the first of September.

Ewes are then brought to farm stubblefields and irrigated pastures for the breeding season. Breeding in this way shortens the breeding season and requires fewer bucks than breeding on the range. After the breeding season, at least part of the ewes may be returned to the spring range for 2 to 3 months of fall grazing.

The rancher owns about one-tenth of his spring-fall range. The rest is Federal land under Bureau of Land Management administration.

He owns none of his summer range, except for a few acres originally alienated as mining claims, on which he has constructed the pens and loading chutes needed to handle the sheep. The summer range is administered by the Forest Service.

The rancher owns an irrigated farm of 142 acres of cropland that produces about half of his winter feed needs. He buys hay and feeds on other farms in the community.

This type of ranching operation requires a high order of managerial ability. Close coordination between sheep numbers and the method and time of movement of the sheep, on the one hand, and the management plans of the Forest Service, the Bureau of Land Management, the private landlord, and the rancher, on the other, is essential for successful operations.

THE THREE RANCHES in the illustrations are typical of a type of ranching in each of the areas, but they are not average. The average ranch is somewhat smaller than those I described. Many ranches are too small to provide satisfactory incomes to the ranch families, except under abnormally favorable price conditions and are too small to provide full employment to the rancher and his family.