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Crop production nears record

Production estimates for each of the important Ninth district crops except corn were increased during August. Based on the September 1 crop report by the United States Department of Agriculture, total 1960 district grain production will be only slightly below the record year of 1958. Favorable growing conditions for the late crops (corn, flax and soybeans) in late August and early September may further improve the yields and quality of these crops. A late frost date would, of course, further enhance corn prospects. The corn crop has been 10 days to 2 weeks behind throughout the growing season.

District durum wheat production for 1960 is now estimated at 36 million bushels, an increase of 72 percent from last year's relatively small crop. Spring wheat production is up 27 percent and winter wheat 19 percent. It now appears likely that soybeans and possibly corn, among the major district crops, will fail to equal or exceed last year's totals. Late August rains, which did so much to boost yields of the late crops, also improved range and pasture conditions and replenished needed stock water supplies in the range areas of the district.

With larger marketings of grain and livestock and higher prices for both hogs and milk, district farm incomes have recently exceeded those of a year earlier.

The improvement so far in 1960 in district non-

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The Range Area:
First in a series on the livestock industry of the Ninth district's western states 2

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Livestock industries I: the range area

The loudspeaker scratches, then blares, "All right boys, we're going to sell the cattle." At that call from the auctioneer, farmers, ranchers, buyers, and spectators milling around the alleys between livestock pens move into the sales ring. The sale begins.

It's sale day in late October at the Miles City Livestock Sales Barn. The run of cattle is heavy; the sale starting now, at 10:00 a.m., may continue into the evening hours.

Jack Hines, a Chalk Buttes, Montana, rancher, fidgets in the audience, awaiting the call of consignment number 39—his cattle. Today he is selling 190 head of 400-pound Hereford calves. In spite of the heavy run, he hopes they will average $25 per hundredweight.

The plaid-shirted man sitting down a few rows in front of Hines is Bill Davis, an order buyer from Sioux Falls, South Dakota. Every fall for a number of years Davis has satisfactorily filled the feed lots of farmer customers in his home territory. That is his job today. He knows the run is heavy, and now thinks he might be able to buy cattle at lower prices than he had estimated a week ago, when he was worried by his customers' talk of a soft corn crop.

Among the purchase orders Davis has to fill is one for 200 quality Hereford calves weighing about 400 pounds—they are to be "laid down" at John Steven's farm at Corson, South Dakota, for 27 cents a pound. At 1:30, Bill Davis enters the final bid of $24.50 for Jack Hines' calves. He now has almost all the cattle he needs at a price that will let him fill the order from John Stevens.

The sale and purchase terminated the 'crop' year for Jack Hines. For John Stevens, the job of fattening the 190 calves lies ahead.

* * *

The setting of the sale may be a public stock yard, a rancher's yard or another auction market; but to the ranchers of the region, such as Jack Hines, the fall sales of their calves marks the end of a crop year. It is the harvest.

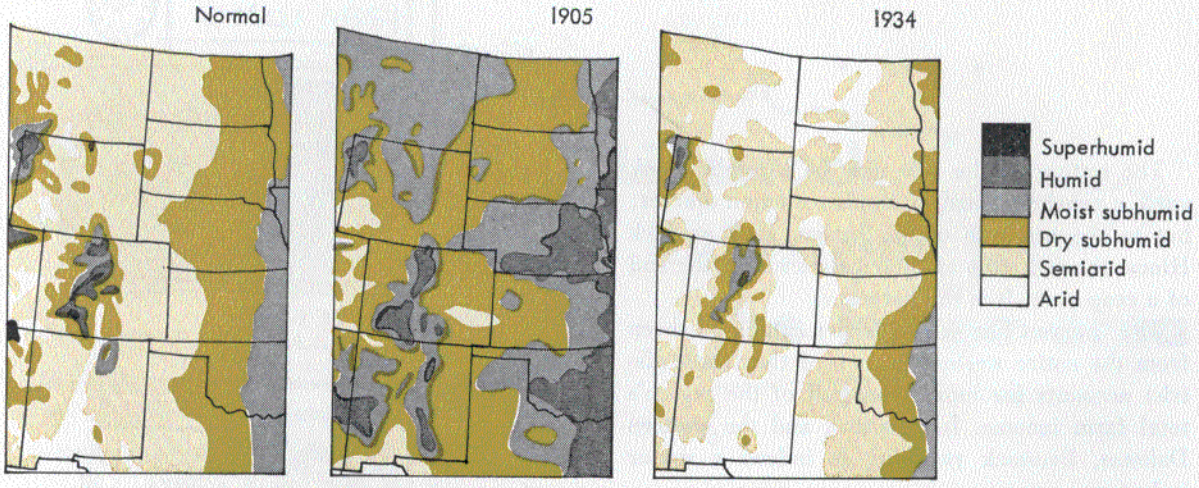
The "harvest" or sale of feeder cattle and sheep from the entire western section of the Ninth district accounts for more than half of the region's total farm income. In Montana and the western Dakotas, livestock ranching is indeed a major industry.

This and subsequent articles will deal with the location, physical and economic bases, and organization of the western district's livestock industry, a major industry in the three major types of farming areas delineated on chart 1. These areas are labeled, for convenience, 7, 8 and 9, and conform to a numbering system employed in earlier articles covering other aspects of the district's agriculture.

The Ninth district's agricultural land area is devoted to a wide range of uses—uses determined by a number of physical and economic factors. Climate, soil types and topography delineate the possible alternative uses of land. In turn, a multitude of economic factors ultimately reflected in terms of prices, costs, and profits determine the particular enterprise or combinations of enterprises best suited to a particular area.

The physical characteristics of the western portions of the district suggest why livestock raising plays such a significant role in the region's agriculture. Of these, climate is the most critical, because of the extent to which land use is governed by moisture supply. In the mountainous areas of the far western reaches of the district, topography obviously plays a major role in limiting land use.

Chart 1—Pattern of climatic distribution in the Great Plains



The 'normal' or long term average pattern of precipitation delineates a climate called "dry subhumid," extending north and south through the eastern and central Dakotas. This dry subhumid region forms a transitional zone between the more humid east and the semiarid west. The average annual precipitation approximates 20 inches in this zone, and is heavier in the east. The semiarid plains which extend from the 100th meridian west to the breaks of the Rocky Mountains record an annual average precipitation ranging from 10 to 15 inches.

The problems of the Ninth district plains have been rooted in a climate which exhibits extreme variations. Unlike a desert or a humid region, expectations of continued dryness or moistness are not always realized. At times, as in 1905—one of the wettest years on record—the climate is characteristic of a moist subhumid area. In other years the face of the plains appears more nearly like a desert; such was the case in 1934, one of the driest on record.

The great variations in rainfall result from differences in the moisture content of northward moving warm air masses, their routes, and the force of impact between them and cold air masses.[1]

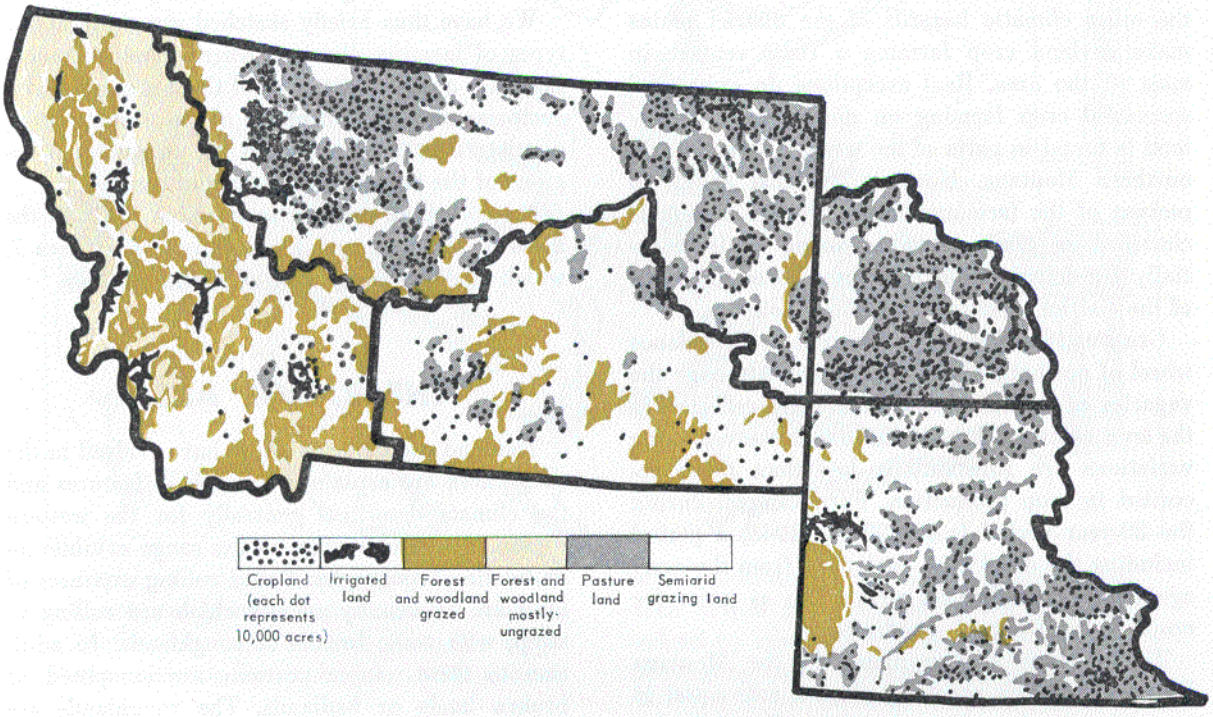
Rainfall patterns in the northern plains have tended to exhibit sequences of wet years and dry years to a much greater extent than in the central and southern plains area.[2] A series of wet years has caused many of the problems of the plains in the past, by leading to expectations of more rain in the future, with the result that rangelands are overstocked or turned to cropping. Problems of readjustment follow with a succession of dry years.

Other climatic hazards beset the agriculture of the plains. Hail, early and late frost, and hot winds, produced by alternate inundations by various types of air masses, are all particularly severe.

[1] Thornthwaite, Warren C., "Climate and Settlement in the Great Plains" **Climate and Man**, U. S. Department of Agriculture Yearbook of Agriculture, 1941, p. 179.

[2] Clawson, Marion, **Western Range Livestock Industry**, 1950, pp. 39-44.

Chart 2—Major lands uses, western Ninth district



People, plows and problems

Periods of wet years and favorable wheat prices, combined with the Homestead Act and railroad publicity campaigns, brought people, plows and problems to the region. Alternately drouth, dust and disaster idled plows and people left the plains. The favorable prices of World War I combined with good weather to cause a vast expansion in crop acreages. Improvements in tractor power and the introduction of the grain combine brought virtually all of the tillable land in the plains under the plow by 1930. Drouth struck in 1931 and recurred with severity in the mid-thirties. The drouth which cut agricultural output, in combination with the depression and its effect on agricultural prices, caused an out-migration. Favorable weather and prices which bolted upward with the advent of World War II returned land to crops in quantity in the 1940s. An indication of the impact of these forces on land use in the plains is noted in the changes that occurred in the acreage of cropland

TABLE 1—ACREAGE OF CROPLAND HARVESTED
(Montana)

Year	Acreage (thousands)
1920	3,812
1925	6,416
1930	7,841
1935	4,592
1940	5,748
1945	7,439
1950	7,576
1954	8,414

harvested in Montana in census years since 1920.

The deficiencies of rainfall in combination with the other climatic hazards of the district plains make dryland crop farming a risky venture in most of the area. Real exceptions do exist, and successful crop farming on nonirrigated or dry land is found in parts of the western Dakotas and northern Montana. However, in total about 70 percent of the farmland in the western region is classified as grazing land. Grazing lands essentially by default from crop uses form the basis of the district's livestock ranching economy.

Grassland has been characterized as the balance wheel of northern plains agriculture. Although the vagaries of weather are dramatically reflected in the level of livestock production over the years, the variations are substantially less than those recorded in crop production. For example, during the 20-year period from 1924 to 1945, a period including the dry 1930s, variations from the average level of production were twice as great for crops as for livestock production.[3]

To the west of the plains in the Montana Rockies, livestock ranching plays a role equal in importance to its role in the plains. Rainfall, altitude and its effect on the growing season, and topography emerge as factors mainly responsible for directing the land in the area to livestock ranching. In this region, rainfall varies widely but irrigation provides the basis for crop farming. However, the altitude shortens the growing season and limits the cropping pattern, with the result that hay is the major crop in the high mountain irrigated valleys of western Montana, area 9. Grazing land accounts for approximately 70 percent of the land in farms in this area. In addition, the mountainous public forest lands provide grazing lands which are utilized on a lease or fee basis. Thus, in this region the basis of agriculture is also seen to be roughage.

In the whole of the western Ninth district (areas 7, 8 and 9) grasslands are, and will continue to be, the basis for an important livestock economy.

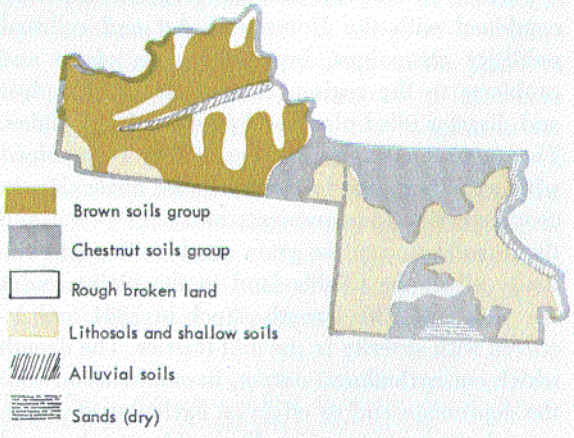
We have thus briefly sketched out three major types of farming divisions where livestock ranching plays a prominent role. Of these areas, 7 and 8 comprise the semiarid plains of the western Ninth district; area 9 encompasses the mountainous regions of the far western reaches of the district.

Now we shall proceed to examine in detail the basis of ranching and its organization in area 7, which shall be designated as the range area.

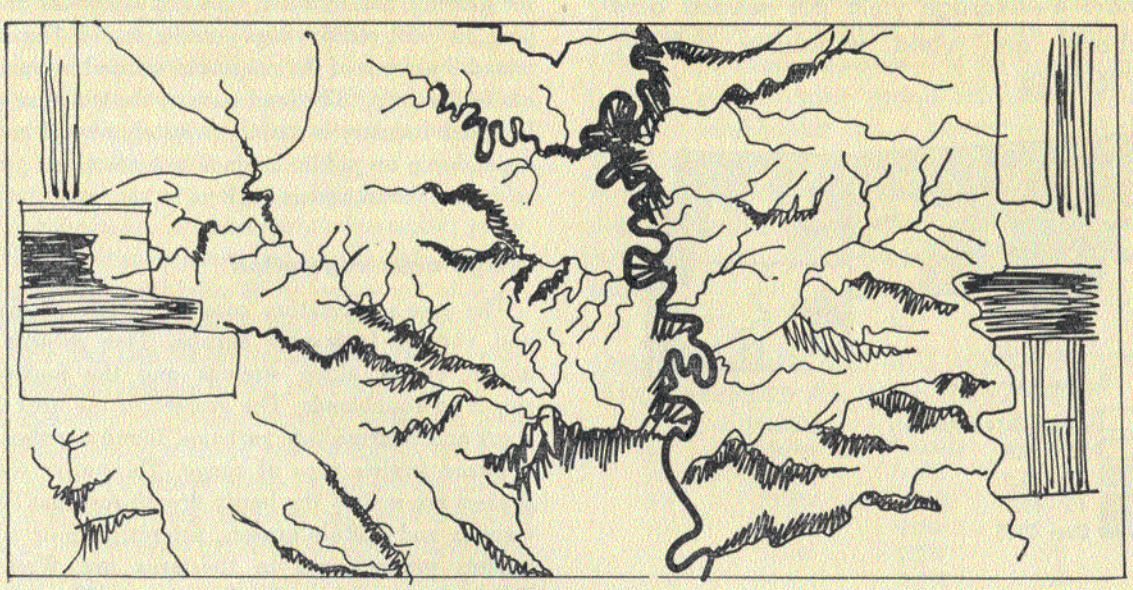
THE RANGE AREA

The land use patterns which have evolved in the range area are explained by its land features and the climate described generally for the western region. The land surface of the range exhibits an undulating topography. Broad rolling expanses of land are broken by valleys which are rolling to steep, with some breaks of roughlands. In addition to these, major portions are composed of broken lands or badlands. The roughlands are

Chart 3—Soils of the range area



[3] Kelso, M. M., "The Place of Grassland Farming," Grass, USDA Yearbook of Agriculture, 1948, p. 471.



Aerial view of a portion of the western South Dakota range area: crop production is largely confined to fields planted along the edges of rangelands; livestock raising is the primary agricultural enterprise. Rough, eroded areas such as the one adjacent to the river are valued by stockmen for the protection they provide to cattle in stormy winter months.

valued by stockmen because of the shelter they provide for livestock during the winter months.

Soils of type of farming area 7 are mainly those of the Chestnut and Brown soil groups which formed under the short grass sod of a semiarid climate. These two soil groups have high production capacities; the major limiting factor to their productivity is moisture. As a result, irrigation developments in the area have been quite successful.

Soils of the major areas of rough, broken lands interspersed throughout the region are classified as lithosols; these are defined as skeletal or thin soils of varied character lacking the clear layered structure of other soil types.[4]

The most fertile soils of the area are the alluvial or water laid soils of the creek beds and river valleys.

[4] "Soils of the United States," **Soils and Men**, USDA Yearbook of Agriculture, 1938, p. 1125.

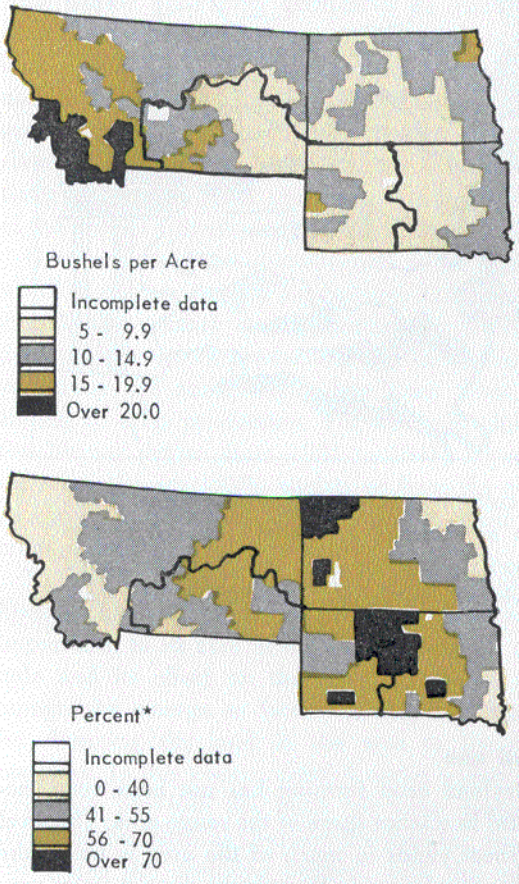
Land use

Dryland crop farming has not been very successful in a large share of the range area. The level of wheat yields in much of the area is below the levels experienced in the western district states generally, and the variability in yields is greater.

Because of the high risk attached to range area crop farming, only 9 percent of the land in farms was cropped in 1959; 81 percent was harvested through grazing. The latter forms the basis of the area's vast livestock industry. The remaining 10 percent of the farmland reported in 1959 was in forests, farmsteads and other uses.

Within area 7, cropland constitutes a larger proportion of the farmland in South Dakota, where substantial acreages suitable to dryland crop farming are found. In Montana's portion of the range

Chart 4—Average yield per seeded acre (above) and yield variability (below), 1926-1948



area the highest proportion of farmland in crops is found in the south central area, where about one-third of the cropland is irrigated.

Approximately 15 percent of the land in the range area is not included in farms, but remains in public parks, forests, other public lands, unreserved domain, Indian reservations, military reservations, cities, towns and roads. A portion of these lands—the unreserved domain, public forests, state-owned lands and Indian lands—are also used by farmers and ranchers on a lease or fee basis for grazing, and to a more limited extent for cropping. In 1952, public range permits provided an estimated 8 percent of the rangeland utilized by ranchers in the area.[5] The land base of the range area's livestock industry is mainly privately owned land; dependence on public lands is not nearly so great as in the mountainous regions to the west.

Range area vegetation

The area's vegetation consists mainly of grass and various browsable shrubs. Tree growth is absent except along streams and the northern slopes of roughlands. The grasses of the area are short and intermediate varieties, found together in a mixed prairie type of range. The native short grasses are mainly the hardy drouth-resistant Blue Gamma and Buffalo grasses. Intermediate or midgrasses predominant in the area are Western Wheatgrass and the Needle grasses. The mixed prairie forage provides, under proper management, a productive, well-balanced range. The intermediate or cool-season grasses provide forage in the spring and again in the fall; the short grasses make most rapid growth in the heat of the summer. Where the mixed prairie ranges are stocked too heavily, the midgrasses are depleted first, allowing the short grasses to take over. Carrying capacity and productivity are then reduced. The mixed prairie rangeland of the area when in good condition provides a range season of 9 or 10 months of well-balanced grazing and also provides sufficient forage for winter feed.[6]

Winter feeding in the range area requires the provision of hay to supplement range forage for 30 to 90 days during storm periods. Protein supplements are also generally used during winter months. The snow-clearing action of the winds makes forage available from open range throughout most of the

[5] Gray, James R. and Baker, Chester B., **Organization, Costs and Returns on Cattle Ranches in the Northern Plains, 1930-1952,** Montana Agricultural Experiment Station Bulletin 495, 1953, p. 41.

[6] Saunderson, Mont H. **Western Stock Ranching,** University of Minnesota Press, 1950, pp. 3-5.

winter. Except in unusually severe winters, the use of hay in this region seldom exceeds one-half ton per head.[7] The availability of year-round range forage, which reduces haying and feeding costs, places this region among the lowest cost beef-raising areas in the nation.

Carrying capacity of the rangeland depends upon differences in soil types, topography, vegetation, past management, and past as well as present moisture conditions. These factors not only account for variations in capacity among sections of this area, but also for the variability between years and between seasons in the same sections. Scientific measures of grazing capacity have not been developed, but as a rough rule of thumb, stocking rates on these northern plains mixed prairie ranges should average about 40 acres per adult beef animal or 8 to 10 acres per stock sheep, for sustained productivity.[8]

Although there are substantial numbers of sheep in area 7, it is most favored for cattle. Cattle make the most efficient use of the grass available, especially the coarser intermediate varieties. During the last five years the inventory of cattle in the range area as of January 1 averaged 1.8 million head, while sheep inventories averaged .8 million head. In terms of harvesting capacity, five sheep are equivalent to one adult beef animal; this reflects the prominence of cattle in the region.

Sheep are found in the areas where the short grasses are predominant and where there is an abundance of browsable shrubs. The sheep enterprise is also common where irrigated acreages provide alfalfa hay for winter feed.

Trends in range area agriculture

The number and size of farms and ranches in the range area have exhibited the same trends apparent throughout agriculture. During the last two decades farm numbers in the region declined more than one-third, while farm size nearly doubled. The increase in size as reported in the Census, particularly in the earlier period 1939-1944, is influenced considerably by a census redefinition. The 1944 farm size includes substantially more leased Indian and public lands as land in farms than was true in earlier periods, although the land may have been in the same use throughout the period.

TABLE 2—AVERAGE SIZE AND ACRES OF CROPLAND HARVESTED PER FARM, RANGE AREA

Year	Number of farms	Average Acreage	Cropland Harvested
1939	23,128	1,381	102
1944	20,796	1,955	203
1949	18,796	2,266	232
1954	17,043	2,537	275
1959	14,823	2,935	250

Cropland as a percent of total land in farms increased from 7.4 to 9 between 1939 and 1959; this increase, combined with the decrease in farm numbers, resulted in an increase of approximately 150 percent in cropland harvested per farm during the period. The decrease of 25 acres per farm between 1954 and 1959 may be accounted for by variations in acreage abandonment.

The number of cattle and calves per farm tripled during the last 20 years. Expansion of average farm size and a shift to marketing younger animals account for the larger number of cattle carried per farm from early spring calving to the sale date in the fall.

The sheep enterprise suffered a sharp decline from the early 1940s into the mid-1950s, similar to the decline generally experienced in sheep production in the western states. Labor problems of the sheepmen during and following World War II, coupled with developments of competitive textiles, placed sheep at a competitive disadvantage to cattle. Under the Wool Incentive Program, sheep numbers have again turned upward; the largest gains in production have been experienced in the

[7] Saunderson, Mont H., "Montana Stock Ranches and Ranching Opportunities," **The Montana Stockgrower,** Vol. 22, No. 2, Feb. 15, 1950; Vol. 22, No. 3, March 15, 1950.

[8] Saunderson, Ibid.

farm flock regions, but the enterprise is currently in an expansion phase in the ranching areas also.

Sheep operators in the range area tend, on the average, to be larger, more specialized operators. Whereas 90 percent of the farms in the area reported cattle and calves as a part of the farm business, only 20 percent of the farms in the area reported a sheep enterprise as part of the farm business. The average number of either cattle or sheep per farm cannot adequately describe the enterprise in the area because of the very wide range in sizes of herds and flocks. The beef enterprise varies from the small 20 to 50 cow herd of the combination grain and stock farm, to 1,000 to 3,000 cows or more on large stock ranches. The sheep enterprise likewise varies from 50 to 100 head flocks, found mainly in the irrigated valley stock farms, to the very large ranches in the short grass areas which may include 6,000 to 10,000 head or more.

TABLE 3—NUMBERS OF LIVESTOCK PER FARM, RANGE AREA

Year	Cattle and Calves	Milk Cows	Sheep and Lambs	Hogs and Pigs
1939	45	5	462	6
1944	76	5	452	12
1949	77	5	385	12
1954	113	5	335	20
1959	137	5	349	24

Based only on individual farms reporting each kind of livestock.

Marketing

Total agricultural product marketings from the range area equalled $232 million in 1958; 74 percent, or $172 million, was accounted for by livestock and livestock products. Crop marketings grossed $60 million. Sales of cattle, calves, sheep and lambs bulked $151 million, or 65 percent of the total marketings in the region. The value added to cattle and lambs through feeding plus the value of cull dairy cattle (products of the irrigated valleys) accounted for an estimated $20 million of the $151 million livestock marketings. The balance, an estimated $131 million, represents the output of feeder livestock from the range area.

The cattle, calves, sheep and lambs sold by range area 7 ranchers and farmers are sold as feeders to the producers of feed grains, mainly in the corn belt, for finishing. The increasing concentrations of populations in the West, however, combined with the increased production of barley on acreage diverted from wheat, have provided a stimulus to livestock feeding throughout the West. Thus the corn belt is no longer the only market for range area feeder stock.

The major changes in the pattern of cash receipts in the range area indicate an increasing relative importance of cattle and calves in the total farm marketings. The number of cattle and calves marketed in 1958 exceeded 1939 marketings nearly threefold. Crop marketings in physical terms nearly doubled during the same period. Since the price relationship between crops and beef cattle remained essentially unchanged during the period, cattle increased in importance relative to crops in terms of cash receipts.

TABLE 4—CASH RECEIPTS BY SOURCE, RANGE AREA

Source	1939	1949	1958
		(percent)	
All Crops*	31	25	26
Cattle and calves	45	57	60
Sheep and lambs	13	7	5
Dairy, poultry, hogs and other livestock	11	11	9
All Livestock	69	75	74
Total	100	100	100

*Includes a minor portion of forest products.

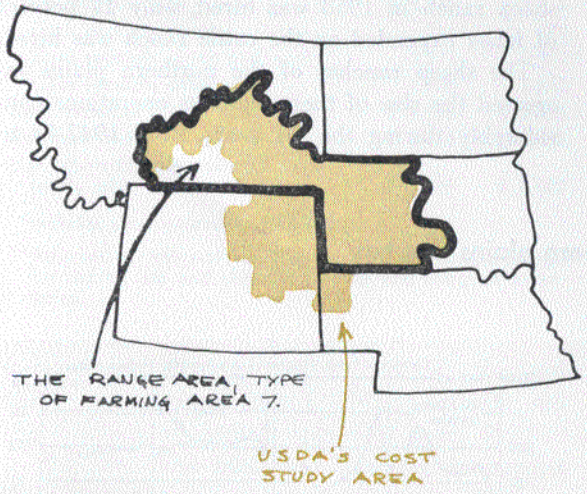
Receipts from sales of sheep and lambs reflect the trends in numbers discussed earlier; sheep numbers declined to the mid-1950s before turning upward. Dairy and poultry enterprises of the range area declined in relative importance throughout the last two decades. However, hog marketings have shown some increase; thus all other livestock

and livestock product marketings showed only a slight decrease over the period.

Organization, costs and returns

The U. S. Department of Agriculture annually reports descriptive data on the organization, costs and returns for a number of types of typical family-operated farms. Among them are northern plains cattle and sheep ranches. The area of the USDA's northern plains sample survey of cattle and sheep ranches is approximately the same as type of farming area 7, the range area. The data will thus suffice to point out the organization as well as changes in the organization of cattle and sheep ranching, the major agricultural activities in the district's range area.

Chart 5—USDA's cost study area compared with the range area



The typical northern plains cattle ranch expanded its land base by 12 percent between the 1947-49 period and 1958; most of the increase in acreage was in rangeland. Cattle numbers in total in 1958 were reduced slightly from the average of

TABLE 5—ORGANIZATION, COSTS AND RETURNS ON TYPICAL NORTHERN PLAINS CATTLE RANCHES

	1947-49 Average	1958
Land in Ranch (acres)	3,800	4,240
Cropland harvested (acres)	239	259
Rangeland (acres)	3,561	3,981
Cattle numbers January 1		
All cattle	140.2	135.1
Cows and heifers (2 years and older)	63.7	87.3
Calf crop (percent)	78.0	84.0
Labor used (total hours)	4,330	3,880
Family (total hours)	3,550	3,210
Hired (total hours)	780	670
Ranch capital January 1	$59,810	$72,650
Cash receipts total	$10,980	$10,855
Cash receipts crops	2,001	1,553
Cash receipts cattle	8,204	8,516
Cash receipts other	775	786
Cash expenses	$ 5,351	$ 6,319
Net cash income	$ 5,629	$ 4,536
Return to operator and family labor*	$ 4,047	$ 2,413

*Adjusted for value of family living from the farm, a charge for capital use and changes in crop and livestock inventories.

1947-49, likely reflecting in part the stage in the cattle cycle. Cattle buildup was in progress after a reduction in 1956 and early 1957. In addition, however, the continuing shift to marketing younger animals has been a significant factor causing a decrease in the total inventory on January 1. Evidence of the shift is noted in the change from 46 to 64 percent in the proportion of the herd accounted for by cows and heifers of producing age. Ranchers have been shifting toward carrying a higher proportion of breeding animals and marketing younger animals in an effort to increase the productive capacities of their ranches.

Productivity has also been stepped up on these ranches through improved calving rates, which have increased from an average of 74 percent of the breeding females in the 1937-41 period, to 78 percent in 1947-49 and to 84 percent in 1958.

Labor utilization on northern plains cattle ranches has exhibited the same downward trend experienced throughout agriculture. The 4,330 total hours of labor expended in the base period

1947-49 dropped to 3,880 hours in 1948, in spite of an increase in the size of the farm business. Improvements in cropping, haying, and feeding methods have allowed the reduction in labor requirements. The machinery and equipment investment on the typical northern plains ranch increased 57 percent between 1947-49 and 1958. During the same 10-year period the prices paid for machinery advanced 49 percent. The real increase in machinery investment was thus less than the 57 percent indicated. The reduced labor requirement over the 10 years likely reflects general efforts to offset rising wages by saving labor through work reorganization, in addition to some replacement of labor by machines.

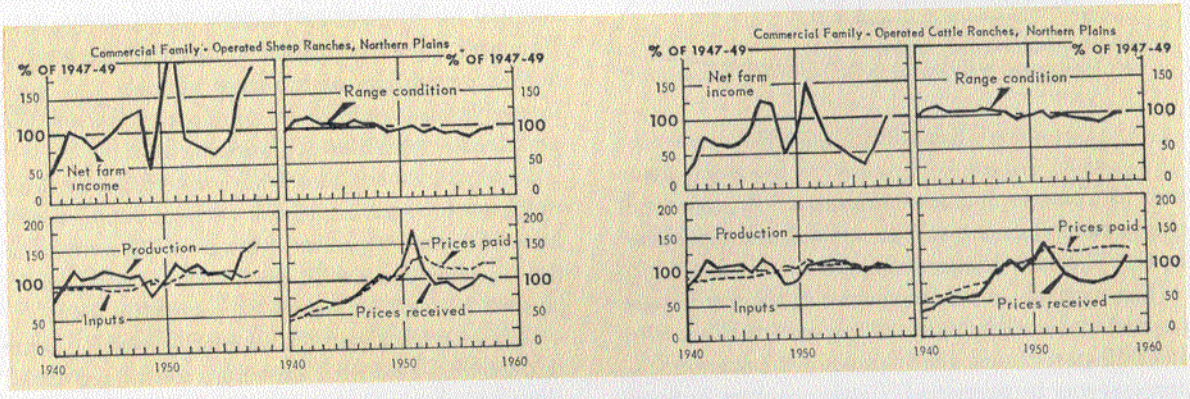
Total ranch capital at $72,650 was over one-fifth higher in 1958 than in 1947-49. Land investment which increased the most, rose from $33,320 to $46,390, due both to land price advancement and land acquisition. Machinery and equipment investments on the typical ranch, up 57 percent, were the only other capital components to increase during the 1947-49 to 1958 period. Livestock investment in 1958 was slightly below the level of 1947-49, as was the January 1 crop inventory.

The net income pattern on these cattle ranches shows great variability (see chart 6), arising mainly from variations in production and prices received for cattle. Livestock production in any one year reflects the productivity of the rangelands, which in turn depends on moisture conditions of the current year and previous years.

The typical sheep ranch of the northern plains is somewhat larger than the typical cattle ranch. The average base in the sheep ranch in 1958 was 6,298 acres, compared with 4,240 acres in the cattle ranch. The number of breeding sheep kept on the average sheep ranch in terms of animal units (5 sheep equal 1 animal unit) was 209 in 1958; the average cattle ranch had 87.3 animal units in the breeding herd (1 cow equals 1 animal unit). A noticeable contrast between the cattle and sheep ranches in addition to size is the greater reliance of the sheep operators on hired labor. Whereas over half of the total labor used on the sheep ranch in 1958 was hired, only 17 percent of labor expended on the cattle ranch was hired.

The sheep ranches of the northern plains increased the size of their business operations considerably during the 10 years from 1947-49 to

Chart 6—Production, income and costs on northern plains ranches



1958. Ranch size increased 1,169 acres, over one-fifth. Breeding flocks were increased by approximately the same proportion.

The total capital investment in the typical sheep ranch was two-fifths larger in 1958 than it was 10 years earlier. Between 1947-49 and 1958 the land investment increased from $38,520 to $59,200, and the livestock investment increased from $19,880 to $26,260. The land and livestock investment expansions reflect both increased size of business and higher prices. The machinery investment increased 51 percent, which partially reflects replacements at higher prices and partially the addition of equipment.

TABLE 6—ORGANIZATION, COSTS AND RETURNS ON TYPICAL NORTHERN PLAINS SHEEP RANCHES

	1947-49 Average	1958
Land in Ranch (acres)	5,119	6,298
Cropland harvested (acres)	219	219
Rangeland (acres)	4,900	6,079
Livestock inventory January 1		
All sheep	1,055	1,235
Breeding ewes	868	1,043
All cattle	23.7	21.0
Lamb crop (percent)	81.0	88.0
Labor used (total hours)	7,450	8,050
Family (total hours)	4,380	3,930
Hired (total hours)	3,070	4,120
Ranch capital January 1	$66,890	$94,580
Cash receipts total	$14,630	$22,115
Cash receipts crops	711	590
Cash receipts sheep and wool	12,213	9,987*
Cash receipts other	1,706	1,538
Cash expenses	$ 9,454	$13,034
Net cash income	$ 5,176	$ 9,081
Net return to operator and family labor**	$ 4,238	$ 8,087

*Includes wool payment of $3,650.

**Adjusted for value of family living from the farm, a charge for capital use and changes in crop and livestock inventories.

Labor utilization on the sheep ranches increased from 7,450 hours to 8,050 hours, or about 8 percent. Considerable improvement was achieved in labor use, however, because the 1958 labor force handled 21 percent more volume, in terms of increased size of sheep breeding flocks. The family labor component of the total labor supply decreased while the hired labor portion rose nearly one-third.

The pattern of cash receipts and in turn of net incomes on sheep ranches has exhibited wide variations, as noted for cattle ranches. The production patterns which emerge from present and past weather conditions combined with the variations in prices received, are noted to be clearly reflected in the net income pattern (see chart).

Relatively wider swings have been apparent in net farm income patterns of recent years than was true formerly. The reason is that production expenses have been rising and accounting for an increasing proportion of gross incomes.

Summary and conclusions

The range area's major agricultural activity is the production of feeder livestock, both cattle and sheep; these products accounted for $131 million, or 56 percent of the region's total agricultural product sales, in 1958.

The climate, soils and topography of most of the range area combine to preclude crop farming. Only 9 percent of the farmland of the region was devoted to cropping in 1959. Irrigation has promoted successful crop farming in the valleys where it has been employed. However, in the main, the area is a range livestock region; approximately four-fifths of the land in farms is harvested through livestock grazing.

The mixed prairie range of the region, which favors cattle, is a productive one when well managed. It provides 9 to 10 grazing months or more, with the result that little supplemental feed is needed except through storm periods. The short feeding period and reduced winter hay requirements are factors which tend to make this the lowest cost feeder producing region in the Ninth district and among the lowest in the nation. Yet the industry is disadvantaged by vagaries of weather which cause wide fluctuations in both livestock and crop

production and, in turn, net incomes. Drouth which cuts forage growth and dries up stock water supplies leaves few choices for the cattleman; he must cull his herd to fit the water available and buy additional feed. And, to the extent that herds have to be reduced sharply, incomes may be lowered for a number of years while herds are being rebuilt. The individual rancher faced with the problems of adjustments to drouth also find that he is not alone. He is selling when everyone is selling, and prices drop. And he must buy to restock when everyone else is restocking, and prices are bid upward.

The range livestock industry has not exhibited the rapid rise in productivity noted in most other types of agriculture. First, both cattle and sheep raising are long-term programs. Improvements in breeding stock are made much more slowly than in the case of poultry, hogs, or crops. Weather continues to upset long-range production planning. However, productivity has been improved by increasing the proportion of cows in the herd and by marketing younger animals. The higher proportion of calves and lambs saved now, as compared with earlier years, has also resulted in increased productivity on range area livestock ranches. However, the productivity trend of northern plains livestock producers will always be sharply influenced by the fickleness of the weather.

The last 20 years have been years of rapid transition in the range area, as they have been throughout agriculture. Farm numbers in the region have dropped 36 percent during the last 20 years, while farm size has exhibited a continual upward trend. The trend toward larger units has been hastened by labor-saving cropping and materials-handling techniques, and by a rising cost structure. Rising prices for labor and production supplies have generated the need to enlarge farm size to make better use of the available labor and capital. The transition toward larger, more efficient units, in the range area as throughout agriculture, has by no means ended; it is likely to continue with vigor for some time. —Arvid C. Knudtson

CROP PRODUCTION . . .

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agricultural employment has not fully kept pace with the expansion of the labor force. The number of persons drawing unemployment insurance has tended to increase in recent months. In July, the number was up 18 percent from a year earlier. The number filing initial claims for unemployment insurance was also up in July.

District department store sales for the four weeks ended September 10 were about the same as those of a year ago. August bank debit figures registered a plus 14 percent from year ago levels, compared with a minus figure of 4.5 percent in July. The building permit valuation figures for the month of July were particularly low—down almost 30 percent from a year earlier.

In general, the Ninth district's business economy in late September appears to be moving sidewise at a high level with the economic pluses and minuses about offsetting each other. The most significant plus indicator is, of course, the considerable improvement in the 1960 crop production.

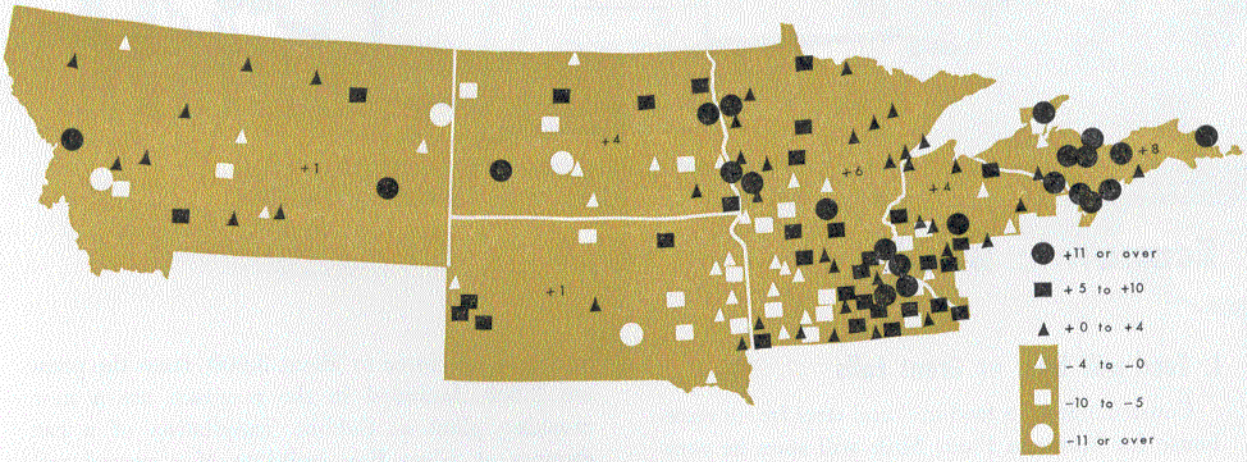
Bank deposits, both at city and country banks, have been increasing in recent weeks, reflecting the usual seasonal improvement as district crops are marketed in larger volume. Improved farm incomes are quickly reflected in country bank deposits.

In recent weeks, loans and discounts at all district member banks have changed very little. The larger city banks, however, continue to report a strong demand for new loans.

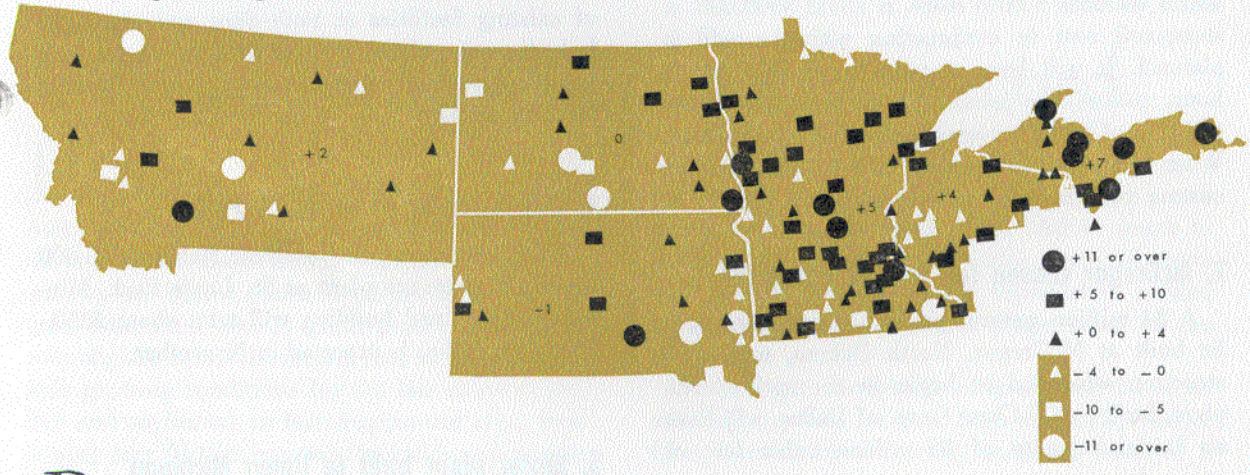
Borrowings by member banks from the Federal Reserve Bank of Minneapolis have been reduced substantially in recent weeks due largely to the seasonal improvements in deposits. District borrowings in the Federal Funds market have also declined recently, another reflection of improved deposit trends.

Bank debits at district trade centers

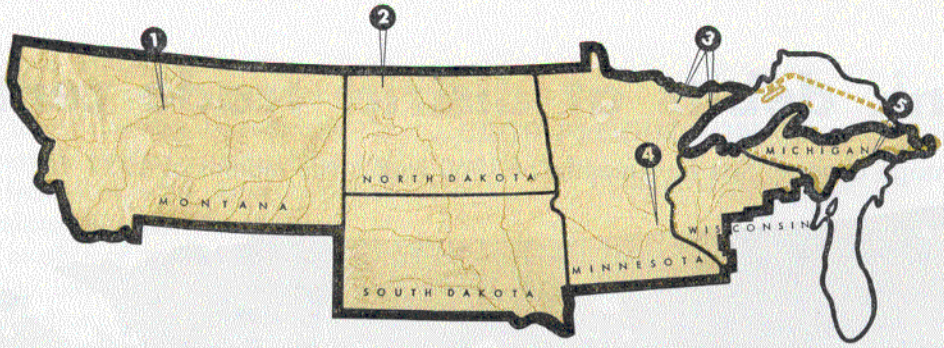
Percentage change, first four months of 1960 from same months of 1959



Percentage change, second four months of 1960 from same months of 1959



Bank debits figures, although subject to influences not strictly related to local economic conditions, give some indication of the direction of movement of local spending. Totals for the states, dominated usually by a few large centers, in most cases show moderate increases over the past year. Yet figures for individual towns show a mixed sprinkling of pluses and minuses reflective of a lack of strong upward movement in the economy in general. The two four-month patterns shown above reveal no significant difference. Geographical patterns are not very distinct, but two area groupings seem to emerge. The iron range belt of northern Minnesota, Wisconsin and Michigan forms the core of a fairly extensive area of positive change. Southwestern Minnesota and eastern South Dakota form the most prominent area dominated by negative figures, and may reflect the poorer hog income picture earlier this year.



Economic Briefs

1. Feed mill built at Great Falls

Construction of a feed mill and steel frame warehouse for Montana Flour Mills will soon be completed at Great Falls, Montana. Cost of the project, which includes a farm store, is about $500,000. A steam-roll unit in conjunction with the mill is planned. It will have a capacity of 10 tons an hour, and will be provided with facilities for the addition of liquid molasses and other supplements. When complete, the project will be outfitted for custom pelleting and mixing services.

2. McGregor chosen for natural gas plant

A $4 million natural gas processing plant will be built at McGregor, North Dakota, with construction scheduled to begin in the spring. The plant, built by Oil-Chem Corp. of Dallas, will have an initial capacity of 20 million cubic feet of gas a day.

3. $120 million taconite expansion started

Construction is underway on Reserve Mining company's $120 million expansion of taconite facities at Silver Bay and Babbitt, Minnesota. When completed in 1963, the project will have increased the company's taconite producing capacity by 50 percent, to about 9 million tons of pellets annually, and its work force to about 3,000, from the present 2,200. Included in the program are a new crushing plant at Babbitt, installation of a car dumper at Silver Bay, building of a second rail line between the two communities, and expansion of existing facilities at both sites and along the Lake Superior shore. Cost of the project does not include additional millions to be spent on housing for new workers.

4. New building at St. Louis Park

Work has begun on Goodyear Rubber's 45,000 square-foot storage plant at St. Louis Park, Minnesota. Land and building will total about $350,000; completion is expected in November.

5. Sinter plant built in Upper Michigan

Inland Lime & Stone Co. has built a sinter sand plant at Port Inland, Michigan, near Manistique. The plant, which will produce a new type of fluxing limestone for use in steel-making, includes two buildings for reduction of limestone, a screenhouse and other facilities. Sinter sand is important to a new process which increases output from furnaces, and aids in the manufacture of steel from finely-ground low grade iron ore.