

FIGURE 1.—An old salt ground at permanent water. On too many grassland ranges of the Southwest depleted areas like this have been allowed to develop around watering-and-salting places.

"THE 'stary man,' hot, tired, and thirsty, suddenly halted, and raising himself in his stirrups, shaded his eyes for an instant and then pointed to a distant dust cloud. 'We'll be to water before long now! There she is! That's the old Double Wells! A feller kin spot it anywheres in these parts by the dust cloud! It's been there about 20 years and I'll betcha there ain't a spear o' grass within a mile of the place!'"

So may read a paragraph from a western "thriller," unknowingly but graphically describing a lamentable condition commonly surrounding watering places on the low yearlong grass ranges of the Southwest.

Areas extending for as much as one mile or more around watering places are common on poorly watered ranges. These areas are stripped and grubbed of all worth-while vegetation; and they are washed and trampled, and the loose sand and dust are played with by the winds (see Fig. 1). A few miles out from water on a given range, one may find areas with good forage practically untouched (Fig. 2).

Too many cattle and widely distributed stock waters have been largely blamed for the deteriorated conditions around watering places. Without doubt they are contributing factors; but the fact remains that loss of valuable forage grasses has been sustained even on ranges where the watering places have been well located, as compared with the ordinary water situation on such ranges and on which stocking consistent with the conservative use of the range, as a whole, has been in effect.

On the low semidesert ranges of the Southwest, permanent water is ordinarily costly to obtain; it may be impossible to develop them, except in a few places. With relatively scant feed and low grazing capacity, it is not economically advisable to develop as many such watering places as would be considered desirable on ranges of higher grazing capacity. The average walking distance for cattle

1. Maintained at Tucson, Ariz., by the Forest Service, U. S. Department of Agriculture, in cooperation with the University of Arizona, and covering the States of Arizona, New Mexico and the western half of Texas.

*Editor's Note.*—This is the first of two articles on inexpensive means for securing better distribution of cattle on public or private ranges. The second, "How Better Utilization of Range Was Obtained Through the Use of Inexpensive Water Holes," will appear in the June issue of "The Cattleman." Each article refers to the subject of the other and they constitute two measures that should go hand in hand in any plan of range management.

on level or undulating ranges is about  $2\frac{1}{2}$  miles.<sup>2</sup> Under such conditions it would not be advisable to have permanent waters more than 5 or 6 miles apart. If there is insufficient forage within such distances to justify the cost, undesirable spacing of permanent waters must be accepted, and other means sought to attract cattle to normally little-used areas. Under such circumstances a combination of permanent and small temporary watering places have proved to be effective.

Another means of getting better distribution of cattle is the judicious use of salt. The combined use of these two means—temporary waters and salting—to attract cattle to range periodically made available by temporary waters results not only in greater use of this outlying feed, but it also relieves the range near permanent waters and makes possible the reservation of that feed for periods when permanent waters must be relied upon. The salting part of this scheme of management is highly important, for even on ranges that have adequate supplies of water and plenty of fences to control cattle drift, it has been found that range salting is needed to effect good distribution of cattle (see Fig. 3).

Range salting has long been recognized by progressive stockmen and officials administering the national forests of the West as an important phase of grazing management. This is shown by the fact that a salt map is a prominent

2. Talbot, M. W., range watering places in the southwest. U. S. Department of Agriculture Dept. Bull. 1358, 44 pp., illus. 1926.

# How the Use of SALT Obtains Better Forage Utilization on a Cattle Range

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part of the management plan for each range unit or allotment on a national forest. The desire of cattle for salt is used to attract them to the more inaccessible areas, in order to effect seasonal use and a measure of deferred and rotation grazing and to prevent premature grazing of parts of spring and summer ranges. Salting wisely also is an inexpensive means of control over cattle drift, as compared with fencing. Although salting practices cannot be expected entirely to take the place of fencing for interior control of ranges, judicious salting reduces expenditures for fences to the minimum.

Rather widespread discussion and conjecture as to the need and possible value of such national-forest salting practices on ranges that are comparatively level and typical of the great expanse of public domain suggested the desirability of conducting an intensive salting study on the Jornada Experimental Range.

The Jornada Experimental Range was created by Executive Order May 3, 1912, for the purpose of establishing a complete range unit to aid in the solution of some of the problems that confronted the cattlemen of the Southwest. It is located near Las Cruces, N. Mex., embraces nearly 200,000 acres, and is fairly representative of the low semi-desert grasslands of the Southwest.

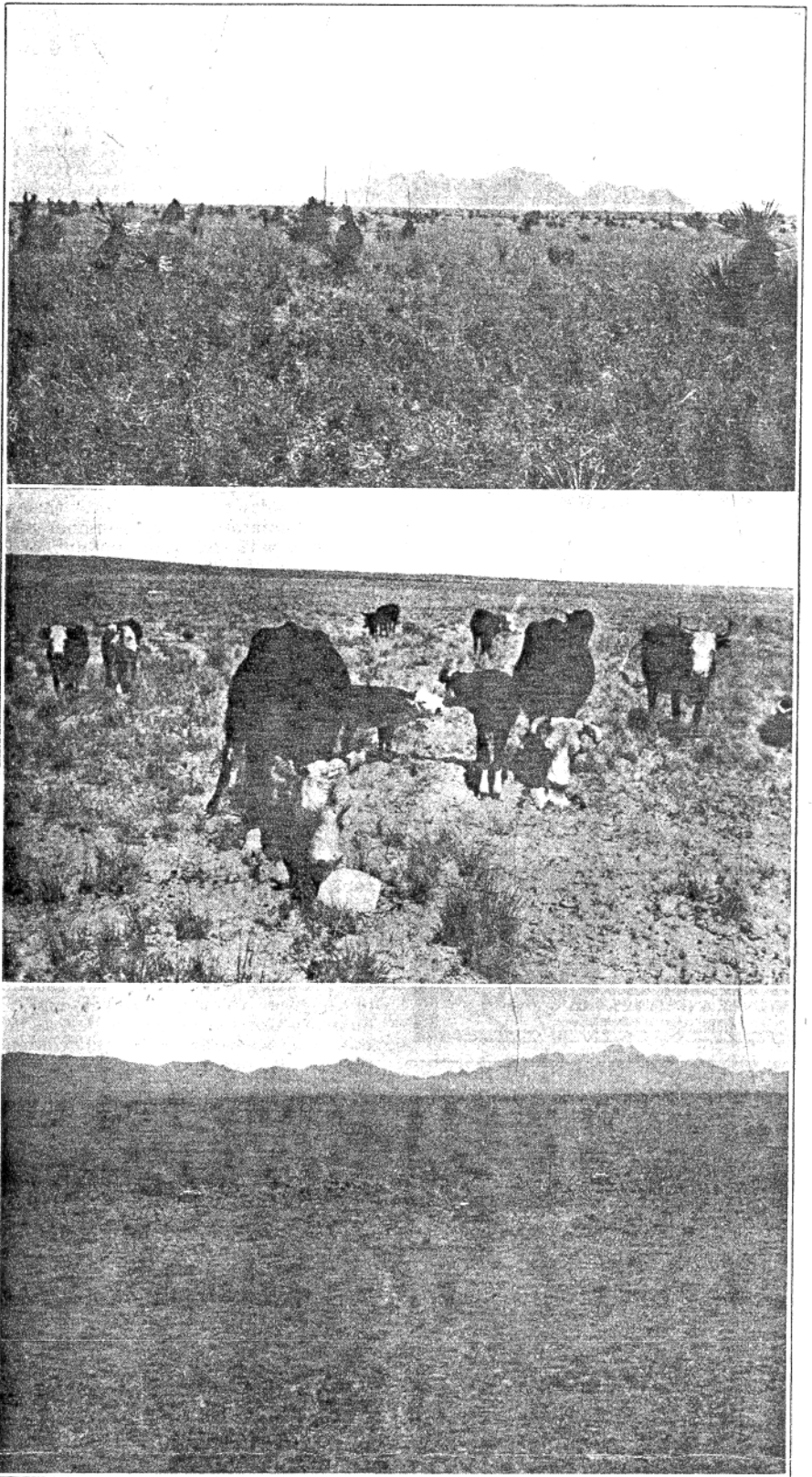
In inaugurating the study of how salting could better the utilization of forage on this range, the first step was to take up all salt at the permanent watering places, in order to reduce the congestion there. The salt was placed at points on the range carefully selected with reference to the amount and type of forage which needed to be used at that time. A total of 96 salt grounds were finally established—one salt ground to approximately 200 acres. Many of these grounds, mostly on the winter range, were located away from water at distances ranging from 1 to 4 miles. Most of those established on the summer range were located close to temporary waters. All the salt grounds were closely watched throughout the year, and regular range inspections were made for three purposes: (1) to keep the grounds supplied with salt, (2) to study the behavior and condition of the cattle, and (3) to check

the intensity of forage utilization at various points.

The first noticeable result, after the salt was taken away from permanent watering places, was an almost immediate lessening of cattle congestion at these waters. Cattle were observed to come in to water during the early part of the day, drink, and shortly afterward drift away. Few cattle could be counted at any time of day even at those watering places where their collection had previously resembled a "day herd" most of the time. Only slightly less surprising was the short time required by the cattle to find the new salt grounds. Of the first nine locations, two were selected with some misgivings at points 4 miles from water, in the hope that they would be found and that use would be made of the abundant feed near each one. Since the cattle were not salt hungry, it was supposed that several weeks would elapse before they located even the nearer grounds. But evidence of use was noted at all the closer grounds at the end of the first week; and at the two most distant grounds, within 12 days thereafter, even though none was situated near any road or trail. Close observations of grazing some distance out from water showed that the cattle came in to the salt grounds, licked for a short time, and then left, grazing in an opposite direction from water, thus disproving, so far as the Jornada range is concerned, the oft repeated statement that cattle will alternate between salt and water with resultant loss of both grazing time and weight when salt grounds are at a distance from water. When located less than a year, each salting place had trails that radiated in every direction as the spokes of a wheel, with the salt ground as the hub (see Fig. 4).

During the first year, over-utilization of some of the areas near water was substantially reduced under practically the same stocking of the entire range as had prevailed in previous years. Accompanying this reduction, there was much better use made of the forage on the outlying areas. Near one of the grounds farthest from water full or proper use of grass resulted, even under the same rate of stocking, as compared with only a little more than half use during the previous year. This gratifying increase of utilization was undoubtedly due to the better distribution by placing salt on areas of good feed away from water.

After summer rains came, which supplied the temporary watering places, and growth started on tobosa grass and other plants that provide good forage only during their growing periods, all salt was taken up from the grama-grass areas and was freely distributed over those parts of the same range unit where there was tobosa grass (tobosa flats) and other growth suitable only for summer grazing. The cattle soon drifted onto these areas and remained there during the summer and fall rainy periods. With this judicious use of salt, the tobosa grass was utilized 50 per cent; three-awns, 70 per cent; and burro grass and dropseed, 20 per cent. Ordinarily, without such salting, only about 30 per cent, 50 per cent, and 10 per cent of these respective grasses are grazed, that is, where they are reached. Cattle prefer grama at any time; and if allowed, they would remain mainly on grama range during the summer season. But when the salt was taken entirely off the grama areas during the summer, utiliza-



From top to bottom, Figures 2, 3 and 4.

FIGURE 2.—Protective vegetation and good forage commonly occur about 3 or 3½ miles from watering places. On this Jornada winter-spring black grama pasture, judicious salting has resulted in better distribution of cattle and more even utilization of forage. FIGURE 3.—A salting ground on a tobosa grass flat 2 miles from permanent water. (Jornada Experimental Range, September 1933.) Here the cattle were held for summer grazing through the aid of well distributed salting grounds and without the use of costly drift fences. FIGURE 4.—A 2-year-old salting ground on black grama or wintering range, showing radiating trails. Wider distribution of cattle through the use of salt is an important factor in the development of sustained grazing capacity.

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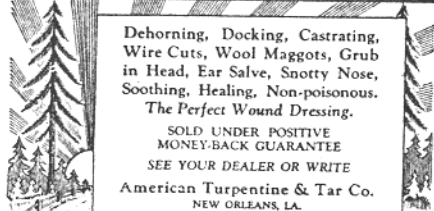
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tion of this grass at that time was materially reduced, thus making possible its deferred use during winter when tobosa grass is practically worthless.

Salting in conjunction with timely and judicious use of outlying temporary waters, when made available, is an important factor in even use of range feed. Tobosa flats or depressions, where temporary watering places (tanks) were located, are noncontinuous islandlike areas within the larger grama-grass areas. Keeping salt at or near temporary waters aids in holding cattle on such scattered areas during the period the feed produced on them is most palatable. Temporary waters also make unnecessary the use of the permanent watering places for a time, which time is ordinarily during the summer rainy season, when grama grasses make their growth. Thus it is possible to effect reservation of the forage adjacent to permanent waters for critical periods, when there are no other waters.

The results to date indicate that it is best to maintain a large number of salt grounds, with a small amount of salt at each, rather than to have fewer grounds with greater quantities. Many grounds serve to keep the cattle better scattered and effect more even utilization of feed. If salt distribution is carefully planned, the distance cattle travel is shortened rather than lengthened, and the labor cost of salting is not materially increased.

As to amount of salt required, a careful record kept of the total quantity used during the first 3 years of the study showed an annual consumption per head of 11.2 pounds on these dry, somewhat alkaline range lands. It is best to have an adequate supply of salt on a range at all times, but more especially during the growing season, when the grasses are green and succulent. Previous studies have shown that cattle require nearly twice as much salt during the growing period as for the remainder of the year when the feed is dry.<sup>3</sup> The quantity used on ranges varies, as determined by such factors as salt content of forage and drinking water and wastage because of weather.

Compressed or block salt was used for the first two years of the Jornada study. This kind was found convenient to handle, and there was less loss from the dissolving effect of rain when it was placed on the range. During the third year, loose bulk salt was used; and in order to prevent heavy loss of this mixed granulated product from the effects of rains, several salt boxes 12 inches by 10 inches by 6 inches deep were constructed as containers. These boxes were of 2-inch lumber, and cost 45 cents each for material. They are better than salt troughs, because several boxes scattered on each salt ground tend to prevent (1) control of the ground by one or two animals and (2) serious worm infections resulting from injuries.

There has been considerable discussion as to how much such salting practices might reduce the calf crop, due indirectly to the cattle being so widely scattered over the range. This question, a matter of real concern among cattlemen, presupposes the merits of approved salting practices in obtaining distribution of cattle.

The calf crop on the Jornada range for the five years preceding the salt

study averaged 74.7 per cent (three-year average, 72.3 per cent) as compared with 74 per cent, average for the three years of the study. The 74 per cent calf crop obtained is considered good for drought years. During the period of the study occurred one of the most disastrous droughts in southwestern history, and a large number of young calves died before they were branded, and therefore were not included in the yearly report. The 17-year average calf crop for the Jornada range is 70.55 per cent.

It seems probable that the number of bulls per hundred cows should be increased, especially in rough country, when the salting methods herein described are practiced, otherwise the calf-crop percentage may be lower than should be expected. But the benefits resulting from judicious salting—in increased grazing capacity, maintenance of the range, and increased cattle production—more than offset any additional bull cost.

It is believed that the beneficial results obtained on the Jornada Experimental Range may be realized on similar southwestern ranges through judicious use of salt. Preservation of vegetation around permanent waters, conservative grazing near such waters to give the grasses a chance to live and grow forage, and proper seasonal grazing of tobosa and grama areas will build up range reserves that will in due time show their benefits in better financial returns.

"Yesterday I happened to see a copy of your paper, which to me, even up North, was very interesting. As I remember it the subscription price was one dollar per year. Therefore I am enclosing that amount."—W. J. Lum, 215 S. Main St., Wallingford, Conn.

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3. Chapline, W. R., and Talbot, M. W., the use of salt in range management. U. S. Department of Agriculture Cir. 379, 32 pp., illus. 1926.