

How Better Utilization of Range Was Obtained Through the Use of Inexpensive Water Holes

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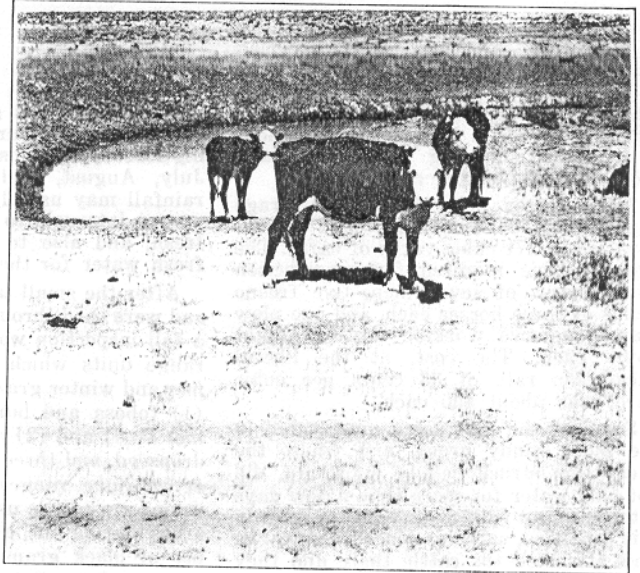


FIGURE 1.—Cattle at a temporary tank on a summer-range, or tobosa area on the Jornada Experimental Range, August 8, 1934. Such waters aid greatly in realizing more even utilization of forage on these flats.

ALTHOUGH improvement in quality of commodity produced is one of the principal objectives in all lines of business, control of cost of production usually goes hand in hand with such an aim in any successful business enterprise. Leading cattlemen of the Southwest have discovered, during the lean years since the World War, that a speaking acquaintance must at all times be maintained with Cost of Production if profit is to be realized. During this period, sharp competition for range entered the field and this, with low cattle prices prevailing most of the time, has forced the industry to adopt more intensive methods, with closer study of investments and returns by operators.

Range improvements are expensive. Large areas of public domain are watered by wells which vary in depth from 100 to 1,500 feet. The cost of drilling these wells alone is a major item, even before considering the purchase of casings, pipes, mills, and the installation of storage tanks and drinking tubs. On areas where drilling is too expensive, the supply of stock water is obtained by the construction of earth tanks. These are usually built with large capacity, in order that a yearlong supply may be had if possible. These, too, may be costly.

To the high costs of drilling and equipping deep wells, of building large surface tanks, or both, as is often the case, one should add the expense of the necessary fencing to control cattle drift, cost of ranch improvements, corrals, dipping vats, and the like. Thus a formidable figure of capital investment is built up before any cattle were grazed and before any returns are realized from the investment. The interest on this investment, together with cost of maintenance, make an annual operating cost that is worthy of careful study.

The average walking distance of cattle on the more level and rolling ranges is about 2½ miles.² Accordingly, watering

Editor's Note.—This is the second of two articles on inexpensive means for securing better distribution of cattle on public or private ranges. The first, "How the Use of Salt Obtains Better Forage Utilization on a Cattle Range," was carried in the May issue. 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.

places should not be spaced more than 5 miles apart even under ideal conditions. But where poor ranges are involved, low grazing capacity, waste, areas and the like, it is not economically feasible to construct the needed permanent watering places to make ideal conditions; and hence one must resort to the construction of cheaper water developments for the provision of temporary water.

The Jornada Experimental Range, a branch station of the Southwestern Forest and Range Experiment Station, embraces an area of nearly 200,000 acres which is also fairly typical of that great southwestern range area known as public domain. This experimental range is considered a complete range unit. This range probably has the average grazing capacity of the range lands represented, but with more than average water developments and other range improvements.

With a total yearlong grazing capacity of about 1,800 cattle, after provision is made for reserve forage, the Jornada range has 10 deep wells, 1 developed spring, and 9 large earth tanks. The average cost of the wells, completely equipped with windmills, was \$2,833, including steel tanks and drinking tubs. The cost of the earth tanks is estimated at \$400 each, and the cost of the spring was \$100.

The above system of range water development, together with 61 miles of outside boundary and 75 miles of interior division fences, are available on the Jornada range to aid distribution of cattle over the range. The improvements are supplemented by a plan of range salting which has proved to be invaluable in obtaining better use of the more re-

mate and outlying areas that lie at considerable distance from water.

However, in spite of this outlay of expense for water developments (averaged \$17.80 per head) and the effectiveness of the salt plan, some distant parts of the summer-feed areas continued to be under-utilized, because it was impossible to get proper utilization thereon at the proper time, owing to distance from water. Since a certain degree of use of summer feed, as tobosa grass, is expected when making up the range budget each year, under-utilization of the distant areas resulted in lowering the entire capacity of the range, because the forage from tobosa and some other grasses that are palatable only during the grazing season, is wasted if not used at the proper time.

Cattle were observed near barrow pits along the roads through the range after showers, and groups lingered in the vicinity of shallow water holes in natural depressions, reluctant to return to the old range so long as a drop of water remained. This suggested the construction of small water holes on and near the larger areas of summer range (tobosa areas or "flats").

By making use of C.C.C. labor during the winter of 1933-34, 35 small earth tanks were constructed on the summer-range, or tobosa, areas. On some of the larger flats, water holes were made at intervals of not over half a mile. It was thought best, for purpose of cattle distribution, to have a greater number of small watering places rather than a lesser number of larger, more expensive ones. Another point in favor of a greater number of well-distributed watering places is that water is not so readily fouled and muddied as when a number of cattle concentrate at any one reservoir when they are few in number.

These water holes are small and of simple design. They were located wherever possible on some small gully or other defined surface drainage-run, and were built crescent-shaped, with the excavated material forming a small embankment on the lower side, which embankment serves to increase the water capacity of the excavation (see fig. 1).

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.

2. Talbot, M. W., range watering places in the southwest. U. S. D. A. Dept. Bull. No. 1358, 44 pp., illus. 1926.

On some locations it was necessary to run short furrows in opposite directions to serve in collecting water, especially from the light summer showers.

These water holes have an average capacity of 58,000 gallons, with an excavation of 271 cubic yards of earth. The average time required for construction with a crew of seven men, five fresno teams of three horses each, and one plow team, was two working days of eight hours each. The cost, at the liberal excavation rate of 33 cents per cubic yard, was about \$90 each.

Some of the reservoirs constructed in the more sandy areas, and where the excavation struck caliche substrata, did not hold water for more than a few days after the first filling. In order to remedy this condition, salt was placed near them. This attracted the cattle there and they trampled the earth bottoms of the holes into a hard, compact state. After that these tanks held water like jugs. Some of the reservoirs that were built with perpendicular sides had to be modified later and given a gradual slope, to allow the cattle to approach on all sides and pack the loose earth. Further, this correction was also necessary to prevent the tendency of the steep walls to cave in and fill the excavations.

After the first rains that filled the small tanks, cattle began to drift of their own accord to the tobosa areas where forage becomes available soon after these flats are flooded. Salt was placed conveniently near as an added attraction; and as the result, the cattle continued to

graze these areas so long as the grass remained fresh. During the normal growing season, which usually extends through July, August, and September, enough rainfall may usually be expected and at proper intervals to keep the flats fairly fresh, and also to furnish a supply of fresh water for the tanks.

After the small tanks became effective and were used throughout one full season, a fall inspection was made of one of the range units which contained both summer and winter grazing grounds—that is, (1) tobosa and burrograss areas (summer feed) and (2) areas of black grama, dropseed, and three awn grasses (winter, or yearlong range). The inspection revealed very little use of the black-grama areas during the growing period. What use of black grama there was occurred on areas immediately adjoining the summer-feed areas. The same examination showed heavier-than-ordinary utilization on the tobosa flats, of which use a large percentage can be directly attributed to the combination of the use of small tanks and timely salting. It is worthy of note, too, that during the growing season the cattle had access to the old permanent waters on other parts of the range, but they seemed to prefer to remain near fresh surface water and good forage. Although perhaps a minor point, the cattle seemed also to prefer surface watering places in summer time where they were able to wade around in mud and water.

Since these small water holes have

been in use, it has not been necessary to rebuild one deep-well plant, the windmill and tower of which had been almost demolished by wind. This well, located on a summer-feed area, is no longer needed, because four water holes provide sufficient water for the season during which this area is used.

These observations led to a study of the remaining deep wells on the Jornada range and also of the areas they watered. It was concluded from this study that two additional wells could be eliminated. These other two are located, as the one mentioned above, in summer-forage areas. It is believed that the same or even better use could be had of the area concerned through the construction of about 14 small earth tanks at a total cost of about \$1,260. The average of \$90 per tank is very liberal. Now that the way has been found to construct such tanks, probably most stockmen or contractors could build them for much less. Even at an average cost of \$90, how much cheaper is such watering equipment, as compared with three fully equipped deep wells at a total cost of \$7,998. One can readily see that the cheaper plan opens up possibilities that should be to the advantage of every stockman interested in getting maximum capacity and results from his range at minimum cost.

Of course, on ranges that already have adequate permanent waters, such a watering plan as herein outlined, would be effective only as replacement improvements.