

that are not being used. It is suggested that they might be used with good effect in attaining better distribution of cattle on larger range units. They might also be of value in extending the range of cattle away from the watering facilities.

The shade shelters in use are approximately eight by sixteen feet and six feet in height. The original shelters were constructed as a spare time employment from corral rails and used lumber. Similar shelters can be built in less than a day and for a cost not exceeding \$20.00. Originally the shelters were covered with black plastic sheeting, which lasted for one year. Presently the roof is of cage wire and brush. The roof shown has been in use for four years, and the brush is now in need of replenishment. A shelter of the size shown is adequate for twenty yearling animals. Shelters up to six years old are still in use, none having yet required repairs other than re-roofing.

THE SAN JOAQUIN CAGE

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Certain aspects of range grazing studies, such as herbage production, vegetation composition, and plant growth and height, require that small areas be protected from grazing animals. Often large numbers of such areas or plots are needed; therefore, protection must be provided easily and economically. Various kinds and arrangements of wire and wood have been used successfully, depending on the vegetation and kind of animals involved.

The San Joaquin cage (Figure 1) was developed for use on California annual foothill ranges



FIGURE 1. The San Joaquin cage provides adequate protection to low-growing, herbaceous vegetation.

grazed by cattle. Constructed of 18 gage, 1½-inch mesh, 24-inch galvanized-after-weaving wire at the rate of three units per man-hour, the total cost per cage was \$1.21. This cost combined \$0.54 for 12 feet of wire and \$0.67 for ¼ man-hour of labor at \$2.00.

The cage is 24 inches tall and tapers from a 29-inch square base to a 22-inch square top. This size is adequate for protecting square-foot sampling plots. Fastened to the ground by short metal or wooden stakes, it is sufficiently rigid without braces. Light weight and easy nesting

facilitate transportation, installation, and storage. In past experience, with reasonable care, this type of cage has served for a 5- to 10-year period.

In 1961 more than 500 San Joaquin cages were built and used at the San Joaquin Experimental Range near O'Neals, California. A 3-step construction operation—cutting, shaping, and attaching the top—proved most efficient (Figure 2). This cage is recommended for use on low-growing herbaceous vegetation.

BASAL COVER AND PRODUCTION OF WEEPING LOVEGRASS UNDER VARYING AMOUNTS OF SHRUB LIVE OAK CROWN COVER

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Shrub live oak (*Quercus turbinella* Greene) is one of the major components of the Arizona chaparral. Where the oak is dense, herbaceous vegetation tends to be sparse. To give a better ground cover and increase

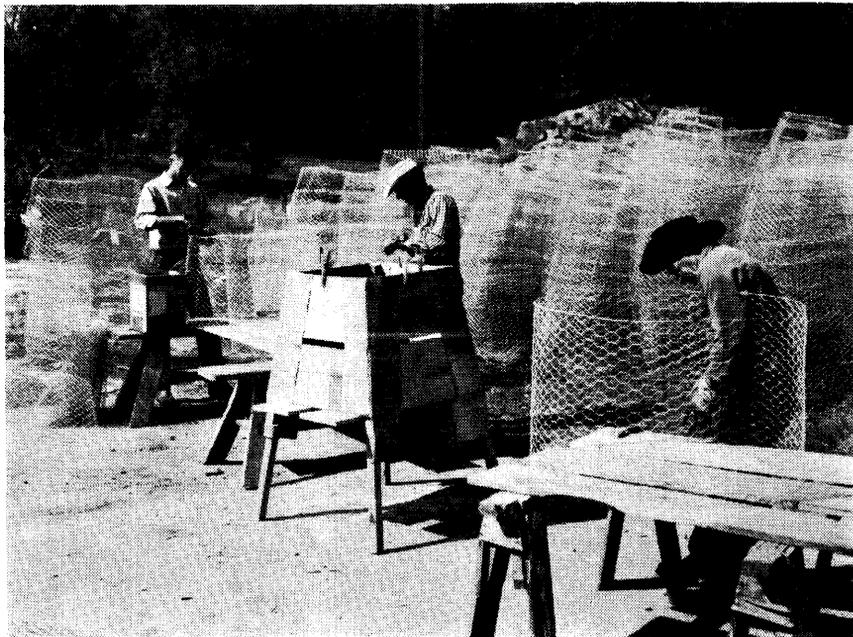


FIGURE 2. Three-step construction—cutting, shaping, and attaching top—proved most efficient.