

without error. Equipment and procedures for rapid and precise relocation of reference points are of great value to the field worker.

The equipment described in this note is not entirely new, but has been used in different forms by other workers. We have found that the 4½-foot "browse rod" pictured in Figure 1 serves very well in establishing a vertical reference at a permanent station or along a horizontal line, and greatly facilitates sampling in the browsing zone. The removable ring bubble, of the type used to level a plane table alidade (Figure 2), at the top of

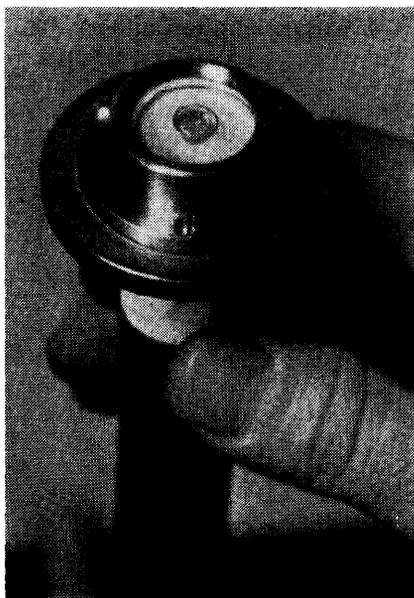


FIGURE 2. A ring bubble of the type used to level the plane table alidade provides rapid plumbing of the rod.

the rod insures rapid plumbing. A retractable spike at the lower end of the browse rod may be used for support and frees the observer to view the sample unit from any angle for counting or tallying. The rod may be used as a vertically projected point or line, or when used with another rod, as a segment of a vertical belt transect or plane. In this way the observer can count intercept crowns, interstices, or twigs; these data may be used for regression estimates of

browse volumes, or simply for time series changes in vegetation.

We have found that this equipment provides an accurate and rapid means of establishing and relocating sampling units in the browsing zone along permanently staked transects. Other uses in understory sampling are apparent; some workers may find, for example, that the equipment is useful in establishing clipping plots or sighting planes for crown intercepts.

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COMMON-RANGE TECHNIQUE IN SUPPLEMENTAL FEEDING EXPERIMENTS

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To simplify design and reduce costs of supplemental-feeding studies, range researchers at the Alexandria Research Center have adopted a technique whereby cattle grazing a common range unit can be fed different rations. All cattle graze together as a herd but are divided for brief feeding periods.

This procedure is superior to the conventional method of restricting each treatment group to a specific range unit because forage variables are avoided and bull service is randomly distributed. Separate fencing and water developments for each treatment group are eliminated.

The common-range method was used in a study designed to

compare performance levels of cows fed different amounts of range supplements. There were two 30-cow herds, each occupying a range unit. Three 10-cow groups within each herd were to be fed varying amounts of cottonseed cake for periods of 12, 8, and 5 months.

Before feeding trials began it was necessary to train the rather wild range cows to go into appropriate pens. The first step was to accustom them to eating cottonseed cake in the presence of herdsmen. For 10 days they were fed in bunks outside the pens. On the eleventh and twelfth days, the bunks were moved inside the pens and cows were allowed to eat in pens of their choice.

On the thirteenth day, cottonseed cake was placed in the bunks according to the feeding schedule and cows, marked with dye for easy identification, were driven into their assigned pens by two men on foot and confined for about 4 hours. After 3 days of such handling, most of the animals freely entered the proper pens, but it was necessary to direct a few cows throughout the first month of feeding.

After the training period, the time required to pen, feed, and release three 10-cow groups was usually about 15 minutes. The cattle, upon summons by a truck horn, entered the assigned pens. The gates were closed as feed was placed in the bunks and opened when the cows finished eating.

In a 2-year trial, the technique worked efficiently when all groups received feed daily. When an individual feeding treatment was discontinued in the spring, 3 to 5 days of close supervision were required to prevent the cows from transferring to pens of groups still receiving feed. A similar period was required to reorient a group each time a feeding treatment was resumed in the fall.