lected heifers. Cull heifers from the selection process have improved to such an extent, that, for the past two years, another cattleman has purchased them for replacement heifers in his herd.

Ten years

An outstanding record has also resulted from ten years of heifer selection at the John McNabb Reservation Ranch, Tehama County. Starting in 1954, the average conformation grade of the McNabb heifers has risen from below 83 points (2 minus) to above 87 (nearly 2 plus) in 1964. Table 1 illustrates the percentage change and the steady improvement in the conformation grade. Note that in 1954 over 50% of the heifers graded 82 points or below. In 1964 over 73% placed in the grade 2 category (an increase in this category of 71.6%).

Weaning and yearling weights also showed a gradual increase on the McNabb ranch. As in all range cattle operations weights vary with weather conditions from year to year. Graph 2 shows the increase in weaning and yearling weights of the heifers. As with the Keegan herd, heifers not kept for replacements were usually purchased by other ranchers for herd replacements.

Increased grade

Progress with heifer selection at the Lyman Willard ranch, Tehama County, has shown a similar trend (see graph 3). Seven years of heifer selection have resulted in an increase in grade 2 heifers in each year's crop from 48% to around 80%. Grade 2-minus heifers have decreased from 36% to 7% of the total heifers graded each year. Yearling weights also showed a decided increase during the heifer selection program.

All three of the cooperating cattlemen agreed that selecting and buying the best bulls possible (rate-of-gain tested and high grading) are also important. But another highly useful part of any successful improvement program is number branding for heifer selection as an aid in herd management and culling. The University of California Agricultural Extension Service Heifer Selection Program is now being used in more than 84 herds, in 24 counties, with over 6,133 cattle involved. This program has proven itself to be a practical plan for obtaining heavier weaning weights, more uniformity, improved quality and higher grading cattle.

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Propagation of California Wax Myrtle

. . . a valuable native shrub or tree for highway landscaping

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California Wax Myrtle, recently selected for testing along highways, is not propagated commercially; hence, performance trials with this species have lagged because of inadequate numbers of plants. Results of research reported here show that rooting of cuttings is greatly dependent upon the nature of the cutting material and time of year at which cuttings are taken. Up to 80% rooting has been achieved at U. C., Davis, using softwood cuttings taken in April, and applying mist-propagation techniques for two to three months. Rooting percentages are generally increased by treatment with indolebutyric acid (0.8% in a talc preparation).

FROM SANTA MONICA TO PUGET SOUND, the Wax Myrtle (*Myrica californica*) is found in meadows, along streams, and on dunes usually close to the ocean. It is small evergreen tree or large shrub highly prized for its graceful branching habit, dark green foliage, and resistance to disease. As a result, the California Highway Division has considered expanded use of this native for roadside plantings in Mendocino County near the coast and in valleys. Successful experience in these trials may lead to more extensive plantings elsewhere along the Pacific Slope.

Unfortunately, transplanting of Wax Myrtle is difficult and inadequate for large scale landscaping. Early trials indicated less than 10% rooting from cuttings, and, since little information is available concerning propagation for this species, a research program was initiated at U.C., Davis.

Branches, from which cuttings were to be taken for propagation, were collected monthly and bimonthly from native stands near Fort Bragg and shipped to Davis. Maximum time from collecting branches to sticking cuttings was four days. The branches were divided into three types of cuttings, each 6 inches long, with four to six leaves; terminal (softwood), subterminal (softwood), and one-year-old (hardwood—approximately 3/8-inch caliper). A lightweight rooting medium (coarse vermiculite) was selected to permit easy removal of cuttings with a minimum of root breakage. Regardless of treatment, the new root initials on Wax Myrtle cuttings were extremely brittle at the point of protrusion from the parent stem, and great care was taken to prevent breakage.

One root-initiating substance, indolebutyric acid (IBA), was applied in a talc dip at two levels, 0.1% and 0.8%. After sticking, the cuttings were placed in a heavily shaded greenhouse on benches supplied with bottom heat to maintain a soil temperature of about 70°F. Periodic misting, adjusted to light intensity, was necessary to maintain the cuttings for the first four to six weeks; afterwards, some of the cuttings were transferred to high-

humidity polyethylene boxes for an additional four to six weeks. Considerable leaf drop occurred during the first four weeks of propagation; and axillary buds often began growing before the root initials appeared. Root initials appeared between the eighth and twelfth weeks after the beginning of the propagation period; consequently, the data reported in the graphs are for root initiation in the 8- to 12-week interval.

The results of 10 months of testing show that terminal and subterminal cuttings were the most satisfactory propagation material. Hardwood cuttings were not useful for rooting purposes. Highest rooting percentages (up to 80%) were observed in the April collections, although acceptable rooting was observed in the March-to-September period. Rooting between September and March was negligible. During this period even the terminal cuttings were relatively "hard." In most cases, treatment with 0.8% IBA increased both the rooting percentage and the number of roots per cutting. As few as one and as many as 20 initials per cutting were observed; usually the number of root initials increased with the percentage of rooting.

Transplanting

Some cuttings were transplanted to one-gallon cans and successfully grown in Davis. Under greenhouse conditions the plants added 2 to 3 ft of stem growth on terminals and branches in three months. These plants will be placed in various locations in the Sacramento Valley where their performance will be compared with native stands in Mendocino County.

Although the program for rooting cuttings described above is satisfactory for commercial propagation, some possibilities for improvement remain. For example, root initiation should be promoted by preventing early leaf drop from the cuttings. Higher IBA concentrations applied either in talc or aqueous solutions may increase the percentage of rooting. Seed germination and seedling studies now in progress will determine whether seed-propagated material is sufficiently uniform for landscape purposes. If it is, this would represent another, perhaps more economical, means of propagating Wax Myrtle.

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