

Hopland Field Station

in Mendocino County is a 4,700-acre experimental range area dedicated to improving production of forage, livestock, water and wildlife on foothill and coastal rangeland areas of the State. Sheep, black-tail deer, ground squirrels, jack rabbits and even grasshoppers figure in some of the many investigations underway.

The Station lies along the east slope of the Russian River Valley at elevations varying from 500 to 3,000 feet. Rainfall averages about 37 inches annually. Among the many significant observations from the Station's research projects in the short 10 years of its existence is the indication that carrying capacity on good sites, in this type of range area, may be increased from the Station average of one sheep for every five acres to two sheep per acre on an annual basis—with proper fertilization, deer fencing, brush control and reseeding to improved forage species.

Sheep research

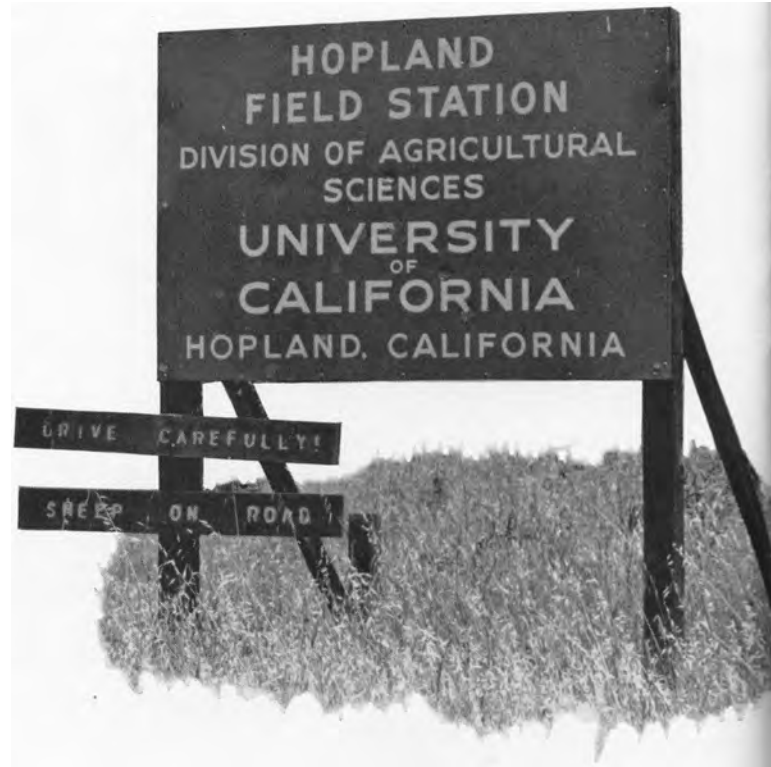
A recent summary of results from animal husbandry investigations at the Station included the following items of interest to sheepmen: (1) Sheep selectively graze the forage available to them, and material selected is higher in protein and lower in crude fiber; (2) Salt mixtures may be successfully used to control the intake of supplemental feeds; (3) Weekly feeding of alfalfa pellets or wafers as a range supplement appears promising; (4) Cobalt bullets did not benefit treated lambs; (5) Suffolk rams were compared to Southdown rams as the sires of market lambs and although a higher percentage of the Southdown sired lambs were fat at weaning, the Suffolk sired lambs returned the larger income because of their larger size and increased rate of gain; and (6) Equipment for sheep rais-

ing in this area, developed at the Station has included plastic shelters, self feeders for supplemental feed and portable cutting chutes.

Fertilizer studies

Fertilizer studies at the Station indicate that: (1) Nitrogen fertilizers should be applied in the form of ammonia in the early autumn to be effective on annual range land; (2) An 80-pound-per-acre rate of nitrogen produced as much forage as 160 pounds in two out of three years; (3) Forage yields increased 50 per cent

with application of 160 pounds of P_2O_5 per acre (where nitrogen was not limiting), and rose clover matured earlier; (4) 20 pounds of sulfur per acre was enough to offer maximum yield possibilities of forage if there was a good stand of sub clover where deficiencies existed. However, the percentage of sub clover continued to increase up to the maximum rate of sulfur applied which was 80 pounds per acre; (5) Sulfur applied as gypsum at 20 pounds per acre must be applied annually in order to maintain production, but applications of elemental



Watershed after burning and seeding to determine the effect of this treatment on water-soil-plant relationships. Headquarters area, upper right hand corner.

Hydrologic installation for the study of erosion and water yield in a watershed unit.



sulfur will maintain forage production for several years; (6) Nitrogen fertilization generally increased the percentage of grasses while phosphorus and sulfur applications increased the clover.

Vegetation manipulation

Brush and tree studies indicate that cutting chamise when twig moisture is high and stored starch reserves are lowest, allows production of least vigorous sprouts. For killing madrone or sprouting manzanita, spraying with 4 pounds of acid equivalent of 2,4-D ester and 1 gallon of diesel oil to 100 gallons of water gave best results. Best cut-surface treatment for oaks and madrones was obtained with 2,4-D amine solutions applied in winter or spring. Where brush was controlled with fire or herbicides, an excellent grass stand was obtained but otherwise, there was little or no grass. Use of EPTC herbicide to inhibit germination of annual grass seeds aided establishment of annual clovers in pastures. Best range plants, according to adaptation trials include: harding, Palestine orchard, smilo, and Mt. Barker sub clover.

Current research

Current research projects at the Hopland Field Station and personnel include:

- *Animal husbandry studies* in Hopland watershed IIA: D. T. Torell, Animal Husbandry Department, Hopland Field Station; and W. C. Weir, Animal Husbandry Department, Davis. Cooperators, R. H. Burgy, Irrigation Department, Davis; H. F. Heady, Forestry Department, Berkeley; and W. M. Longhurst, Zoology Department, Hopland Field Station.
- *Hydrologic studies* on Hopland Field Station: Burgy. Cooperators, Weir; J. E. Street, Agricultural Extension Service, Davis; and Heady.

- *Anatomical and physiological responses* of woody species to herbicides: O. A. Leonard, Botany Department, Davis; A. H. Murphy, Superintendent, Hopland Field Station.

- *Biology and ecology* of rangeland grasshoppers: W. W. Middlekauff and F. Proshold, Entomology and Parasitology Department, Berkeley.

- *Management practices* to improve California rangeland: Heady. Cooperators, Longhurst, Torell, and Weir.

- *Relations of wildlife* to agriculture: Longhurst.

- *Relation of soil fertility* to the population dynamics of field rodents: E. M. Brock and W. E. Howard, Field Station Administration, Davis.

- *Parasitic diseases of animals*: J. R. Douglas and N. F. Baker, Microbiology Department, Davis.

- *Control of range weeds*, brush, and plant competition by fire, chemical, mechanical, grazing and other means: Burgess L. Kay, Agronomy Department, Davis; C. M. McKell, Agronomy Department, Riverside; and Leonard.

- *Response of range plants* and animals to various types of grazing and management systems: A. H. Murphy and R. M. Love, Agronomy Department, Davis. Cooperators, Street; M. B. Jones, Agronomy Department, Hopland Field Station; Kay; C. O. McCorkle, Agricultural Economics Department, Davis; and Torell.

- *Range plant nutrition*, range soils and range fertilization: Jones; W. A. Williams, Agronomy Department, Davis; McKell; and Kay. Cooperators, W. C. Lusk, Farm Advisor, Lake County; W. E. Martin, Agricultural Extension Service, Davis; J. Vlamis, Soils and Plant Nutrition Department, Davis; and Torell.

FALL FIELD DAY

October 10

The Fall Field Day at the Hopland Field Station on October 10 will include discussions of watershed management, sheep studies and vegetation manipulation.

Ewes and lambs on the Field Station winter range. Animal research is aimed at improving animal production, both in quality and quantity, on this type of rangeland.



Conversion of brush to productive grassland by seeding, chemicals, and fire. Grass area to left looked the same as heavy brush to the right of the road and in the background before conversion.

- *Management, manipulation and measurement* of vegetation on watersheds: Love.

- *Barns and equipment* for livestock in California (plastic shelters for sheep): Torell; C. F. Kelly and L. W. Neubauer, Agricultural Engineering Department, Davis.

- *Fiber and fibrous feeds* in nutrition (supplementation of ewe lambs on a dry summer range): Weir; Torell; and J. H. Meyer, Animal Husbandry Department, Davis.

- *Nutritive value of specific range forage* species as influenced by seasons, fertilization and management: G. P. Lofgreen and F. D. Carroll, Animal Husbandry Department, Davis; Weir; Love; Torell; and K. A. Wagon, Animal Husbandry Department, Davis.

- *Effect of environment* on response to selection in sheep: Bradford, Spurlock, Torell, and Weir.

- *Grading up vs. crisscrossing* with the Corriedale and Targhee breeds: Bradford, Spurlock, Torell, and Weir.

- *Comparison of crossbred* and purebred rams as sires of market lambs: Bradford; Spurlock; R. Albaugh and H. Strong, Agricultural Extension Service, Davis; and Torell.

- *Sheep and deer management*: Torell, Heady, Longhurst, and Weir.

Some projects recently completed are:

- *Relationships between* the physiological condition of the brush plant and its sprouting response: H. M. Laude, Agronomy Department, Davis; and Jones.

- *Survey of response* of sheep under California conditions to a cobalt supplement: Weir; Torell; Monte Bell, Farm Advisor, Glenn County; Lin Maxwell, Farm Advisor, Tehama County; and Roderick Shippey, Farm Advisor, Mendocino County.

This is the second article of a series featuring the agricultural field stations operated by the University of California. The stations are located from the Oregon to the Mexican borders. A brochure locating and describing all of the field stations is available free. Write to AGRICULTURAL PUBLICATIONS, University Hall, University of California, Berkeley 4, California.

