

Brushland Management in California

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A SUMMARY of current information entitled "What We Know About Brushland Management in California" has been compiled recently by the California Agricultural Extension Service, University of California, Berkeley. According to the editor, Milton D. Miller, the purpose of this publication was to assemble at one point the experience and thinking, as of September 1949, of our key California range researchers and administrators on the brush range problem.

The publication is not generally available outside the state, as only 1800 copies were mimeographed and most of these were sent to the county Farm Advisors. The problem is of such widespread interest that it seemed advisable to highlight the progress report for readers of the *Journal of Range Management*.

Besides the editor's foreword the publication includes nine papers: Coordinating Brush Range Research, by Ben A. Madson; the Role of the State Division of Forestry in the Range Improvement Program, by Ralph Fenner and Dewitt Nelson; Runoff, Erosion and Soil Moisture from Vegetated and Burned Plots in Typical Brush Areas of California, by F. J. Veihmeyer; the Manipulation of Brush Covers, by H. H. Biswell; Why Seed Brush Burns, by J. R. Bentley and M. W. Talbot; Revegetating Brush Lands, by R. M. Love and M. D. Miller; Reducing Wildlife Depredations on Broadcast Seedings on Burned Brushlands, by Walter E. Howard; Chemical Control of Brush, by P. S. Pattengale and M. D. Miller; and Mechanical Brush Removal, by Reuben Albaugh and R. E. Weber.

This compilation represents the current

interest being shown by landowners and public land administrators in measures designed to increase forage production from wild lands. Unfortunately, however, little published information is available on methods of opening up dense brushlands and keeping them in a productive state. Therefore, this effort to assemble pertinent information of all phases of the brush problem is an important step toward making research findings and the experiences and observations of our range land administrators, available to those interested in improving brush ranges.

Mr. Madson in his article on coordinating brush range research traces the development of the range improvement program of the University Committee on Range Land Utilization up to the present. The current policy of this committee is to demonstrate the application of research findings on a ranch basis. These demonstrations on large units should do much to dispel the fears of those who question the application of data obtained from small plots. This plan will also enable investigators in several agencies to make recommendations about policy and procedures used and to review the results of the demonstration projects sponsored by the Range Land Utilization Committee.

In the next part Fenner and Nelson set forth the role of the State Division of Forestry in the range improvement program which includes a discussion of their policies and procedures in regard to range improvement controlled burning. In my opinion, this is an important phase of brushland management as fire will probably continue to be one of the principal tools used in management of brush

ranges. However, as has been demonstrated in the Southeastern United States, the goodwill and understanding of the landowners must be obtained in order to avoid serious losses from fires. Perhaps, a more effective program can be achieved in California by knowing the conditions of temperature, humidity, and fuel moisture under which fire can be used properly as well as to set forth circumstances too dangerous for its use. My observations on controlled burns indicate that a careful study of these conditions and the preparation of a guide for landowners to use in controlled burning would be very beneficial.

Runoff, erosion, and soil moisture from unburned and burned plots in typical brush areas of California is a summary of studies made by F. J. Veihmeyer over a period of 14 years. These studies, and others, which have been conducted principally on small plots have been the center of much controversy. The new demonstration projects should be adequate proving grounds to test his findings that burning does not adversely alter the moisture properties of the soil and where brushland is converted to grassland the result is a saving of water and, at the same time, an increase in production of forage.

The manipulation of brush covers is the subject of a section prepared by H. H. Biswell on the basis of results obtained largely from a joint research project between the California Division of Fish and Game and the University of California. He sets forth principles to observe in brush control in three cover types: (1) woodland-grass where the brush has become too abundant, (2) chaparral where chamise is the principal species, and (3) live oak and blue oak thickets. It seems useful to develop management plans according to brush cover types. This enables the land administrator to develop general recommendations that can

be fitted to the purpose or reason for control and local conditions of soil, topography, slope, and exposure. As Biswell has pointed out, secondary species, such as yerba santa in chamise brushland, may become more abundant in a brush control program. If the brush cover is to be completely removed, as in some woodland-grass areas, these secondary species may not be too important. However, where the brush is to be only partially opened up, as in manipulation for wildlife, it is my opinion that the succession of these species needs to be carefully studied under various management techniques to avoid the possibility of exchanging one brush species for another less valuable one.

Bentley and Talbot under the heading of why seed brush burns discuss the advantages of a good grass cover the first few years after a fire. They compare the necessity of reseeding after fires in open and dense brush and state that regrassing a burn during the first year is a primary step in converting brushland to open productive range. In reseeding small ash spots in burns of open brush the writers have rightly emphasized the difficulty of establishing herbaceous vegetation, especially perennials, because of concentration here of livestock as well as rodents and other wildlife. Although it was not mentioned by Bentley and Talbot, it might be important also in reseeding burns in dense brush that the areas be large enough to avoid damaging concentrations by wildlife.

Revegetating brush lands is the subject of a part prepared by Love and Miller. This section is an enlargement of portions of a circular by Love and Jones on the same topic and contains more up-to-date information on the seeding and management of species used in revegetating brush ranges. In this work the most obvious need seems to be for more data on the effectiveness of perennial grasses and legumes in controlling

brush species. It is my observation that species which are poor carriers of fire may have to be seeded at a heavier rate, or more quickly maturing annuals may have to be included in the mixture, if brush seedlings and sprouts are to be destroyed at the time of the reburn. Although the writers have prepared a good section on management of reseeded stands, it appears that they have overlooked the possible use of heavy browsing by livestock and big game as a factor in brush control. In other words, if brush control is to be achieved the regrowth of brush may have to be checked by either fire, grazing, or a combination of these.

W. E. Howard stresses the importance of wildlife depredations on broadcast seedings on burned brushlands in his article and gives directions for treating seed to reduce losses from birds and rodents. Seeds dyed brilliant yellow before they are broadcasted will be afforded considerable protection from birds. For rodents the compound 1080 and to a lesser degree strychnine have proven to be effective but are expensive and hazardous, so a search is under way for a cheaper and less toxic repellent. The precautions to decrease wildlife depredations may well be worth taking in many instances but it seems that more data are needed before one can safely justify the added expense of treating seed on large scale operations. It may be more practical to use the trampling of livestock or game to cover the seeds until more results are available indicating that the returns from dyeing and poisoning more than cover the cost of treatment.

In their discussion on chemical control of brush, Pattengale and Miller review the available literature on the effectiveness of the hormone-type sprays in killing species of California chaparral. Valuable suggestions for reporting the strength of spray solutions by Pryor, Supervisor of Weed Control in the State Department

of Agriculture, have been included. One aspect that seems to have been overlooked in using chemicals to control brush is the possibility of combining their use with other techniques used in brush control, for example, reseeding. Also, it is important to remove the brush without increasing the fire hazard in later years—a danger that may be overlooked in spraying mature brush and leaving it in a dry condition until it breaks down from weathering and decay.

The advantages and disadvantages of mechanical brush removal are pointed out by Albaugh and Weber in the last section of the compilation. These writers seem to have ignored the advantages of combining mechanical methods with other means of brush control. For example, bulldozing and windrowing of live oak brush followed by goat grazing has proven to be a successful method for controlling live oak sprouts in the Sierra foothills. Mechanical removal of brush followed by farming in Monterey County has proven effective in controlling the brush but this method leaves the soil loose and unprotected for long periods of time thereby inviting serious losses from erosion.

The compilation is a noteworthy effort to make results of experiments and demonstrations available to all those interested in the improvement of brush ranges. Bringing together data on all phases of brushland management serves to emphasize the magnitude and complexity of an adequate brush control program. It also reveals the need for additional facts to properly evaluate different methods of brush removal. These data should become available as control measures are applied on a larger scale. Further cooperative efforts like the present one should do much toward achieving better use of brush ranges through coordination of research programs and pooling of experimental results and observations.