THE IMPORTANCE OF GRASSLANDS

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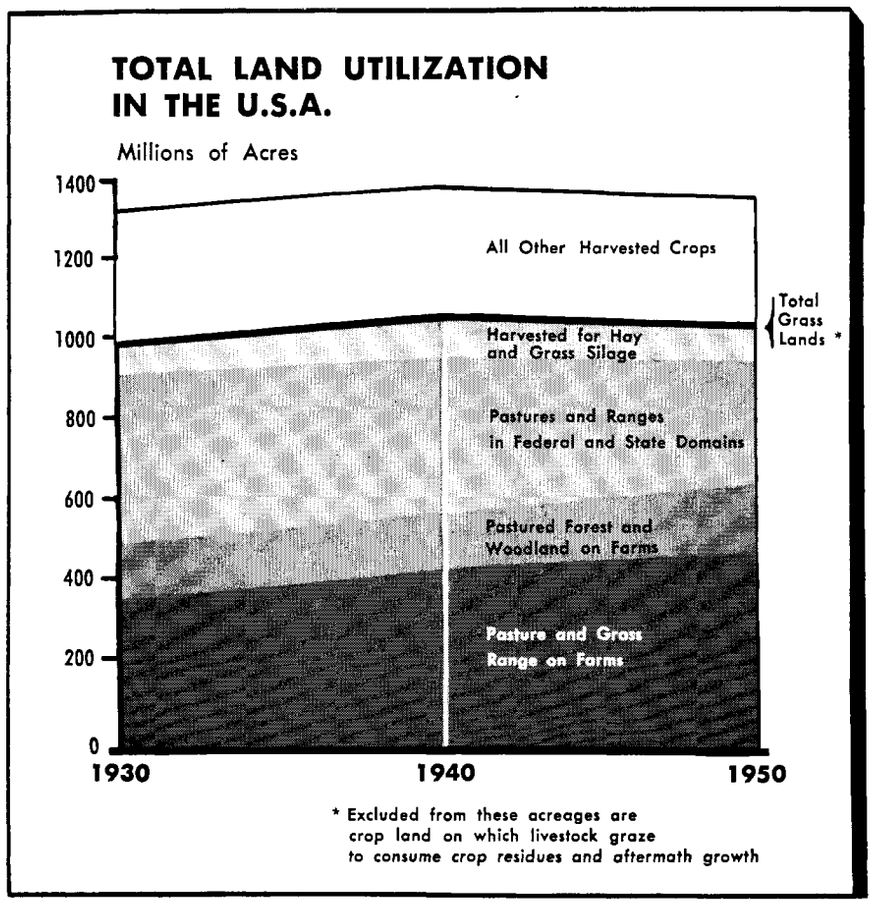
Grasslands take up twice as much acreage in the U. S. as croplands, but the attention they receive is minor compared with their significance in the national economy. A potentially important market for fertilizer and agricultural chemicals

THE GRASSLANDS of this country include those harvested for hay or grass silage and those utilized directly by grazing animals. As used in the general sense, grassland includes both grasses and legumes which occupy land continuously for more than one year. Some grassland is essentially permanent, but grasslands in crop rotation stand for one, two, or three years. Those grasslands used for grazing which occur in humid regions are usually termed "pastures," and those which occur in subhumid or semiarid regions are usually designated as "ranges." The grasslands of this country are not now receiving the attention they warrant on the basis of their relative significance in the agricultural economy. This situation is of long standing and results from the comparative poverty of data on grasslands production and utilization. The U. S. Bureau of the Census which makes a comprehensive enumeration of agriculture every 10 years, with a supplement at the intervening five-year period, does not include any information on the production from lands utilized directly by grazing animals. The agricultural censuses each provide a single table on land use, however, from which the information in the chart is derived.



The agricultural census data relate solely to that land on which crops are harvested by man. Grasslands harvested by livestock, even though under man's direct control and management, are not included in the census records. The ratio of all harvested crop land to all grazing lands (pastures plus range) is about 1 to 2.2. Since the censuses provide basic information on which legislation, policies, and programs rest, it is inevitable that the economic importance of grazing lands is imperfectly evaluated.

Such census attention as grasslands receive is derived from the hay and grass silage produced as harvested crops. From the standpoint of land use, hay and grass

Wisconsin dairy cows head for the milking barn from their pasture. Milk is only one of the many economically and nutritionally important products of grasslands

silage occupied 74 million acres of land in the U. S. in 1950. Such harvested forage land is approximately one twelfth as extensive as all grazing lands on which forage is utilized directly by livestock.

It is generally known that much grazing land occurs in subhumid and semiarid regions of the country. Wherever limited rainfall occurs, plant growth is reduced. However, it is fallacious to assume that grazing lands in the less-well-watered regions have no great economic significance. The true value of such lands is difficult to estimate, but the total value of all grazing lands in the nation may be calculated by determining the total feed requirements of all livestock and subtracting the portion of those requirements supplied by harvested feeds. Such figures cannot be regionalized because of interregional movement of grains and concentrate feeds, and of livestock. For the country as a whole, such calculations are valid. An estimate of this type (Sprague, H. B., *Jour. Range Mgt.*, **5,** 266–70 [1952]) indicates that in 1950, harvested feeds provided 45% of the total feed requirements of all livestock, and that standing forage consumed "on the stem" by grazing animals, constituted 55% of the total requirements for all classes of livestock within the United States. On the basis of dollar values of 1949, standing forage consumed on pasture and range had a farm value of about $10.6 billion.

Since the reported farm value of harvested forage in 1949 was approximately $2.5 billion, and the estimated value of standing grass and legumes consumed directly by livestock was $10.6 billion, it is obvious that the census data deal with only about 20% of the total forage utilized by livestock. Whether evaluated on the basis of acreage, or of feed supplied to livestock, the grasslands of the country constitute a vital portion of the nation's agricultural economy. The grand total value of 72 harvested crops in the U. S. in 1950 was about $21.2 billion, of which roughly 10% was hay and other harvested roughage. Standing forage consumed directly by livestock has been valued at $10.6 billion. For a balanced estimate on the significance of all grasslands, it is necessary to consider all harvested forage ($2.5 million) and all grass consumed directly ($10.6 million), providing a total of about $13 million in value in 1950.

The importance of grasslands is not measured solely in extent of acreage occupied or in dollar value because: grasslands are indispensable to the nation's supply of beef, milk and milk products, and lamb and wool; great acreages of our land either poorly suited or totally impracticable for cultivated crops are capable of producing forage in support of livestock production; and grasslands for hay, silage, and improved pasture are the most effective means yet devised for restoring and maintaining soil humus and soil structure so that the productivity of the land may be increased and the losses of soil and water kept under control.

The people of this country are unlikely to substitute willingly any crops grown for direct consumption by man, or for beef, veal, lamb, milk, and milk products. The dependence of cattle and sheep on grasslands is very great. Although no accurate data are available, the following approximations may not be greatly out of line. For all beef production, perhaps 65% of the total feed requirement is satisfied by pasture and range and by hay or grass silage. For the dairy industry, rough forages of these same types supply at least 55% of the total feed. For sheep (mutton, lamb, and wool), the rough forages must account for nearly 90% of the total feed consumed. These livestock industries are dependent on grasslands for continued volume production.

Lands now utilized as pasture and range that are not suited for cultivation and production of harvested crops, have been reported to total approximately 800 million acres. The acreage includes the grasslands occurring in subhumid to semiarid regions, and the lands in humid regions that are too stony, steep, shallow, wet, or otherwise unsuited for tilled crops. Some lands now tilled might better be restored to permanent grass, particularly in subhumid and semiarid regions where harvested crops are too uncertain in performance. The production of grass and its utilization by livestock, provides a practical and effective means of utilizing nonarable land for satisfying the needs of people.

The conservation value of grasslands is becoming well known, particularly in the humid portions of the U. S. (roughly the area east of the line from Fargo, N. D. to Austin, Tex., and the areas west of the Cascade Mountains). Although the mere presence of grass does not constitute conservation, the grasslands used for hay, silage, and pasture, when properly managed, are exceedingly effective in controlling soil and water losses and in restoring the soil's capacity to take in and store moisture for use by other crop roots. Perennial grass and legume roots are effective in increasing the porosity and ventilation of the soil for all vital activities of the crop roots, and for the activities of beneficial micro- and macroorganisms of the soil. Well balanced farming systems include grass sod for 25 to 75% of the crop rotation cycle, depending on local conditions. In general, no satisfactory field methods have yet

been devised for maintaining soil structure and productive capacity, combined with control of soil erosion losses and conservation of rainfall, that do not include appropriate use of grass sod for one, two, or three years in each cycle of rotation on arable land. The test of time has either disproved or cast grave doubt on soil management systems that fail to include grass sod in the rotation. Some of our inherently and fabulously fertile soils which continued to produce tilled crops for many years in succession eventually lost productivity capacity until the use of grass became necessary for profitable farming on a sustained basis. Lime, chemical fertilizers, and soil amendments are not substitutes for grass sod, nor for the physical and biological improvements in the soil which perennial roots and associated micro-organisms produce. The reclamation of "dust-bowl" and "worn-out" soils of subhumid areas and the restoration of badly eroded and depleted soils of humid areas requires above all else, the use of perennial grass-legume sod. Such grassland may be utilized either for pasture and range, or for hay or grass silage.

The improvement of grasslands was limited to the attention given to hay crops until about 25 years ago. During the last quarter-century, recognition has been growing as to the value of all pastures and ranges and the possibilities of improving the total supply of feed, its seasonal distribution, and its nutritive value. Also, the opportunities for more effective utilization of the feed produced, by intelligent management of both grass and livestock, are now much more clearly realized by agricultural leaders than was formerly true. In spite of the accumulating knowledge derived from actual field experiments and the practical trials of farmers and ranchers, the application of such knowledge to all grasslands is still meagre and spotty. Some of this exceedingly tardy adoption of improved practices may be attributed to the traditional inertia of farmers. However, part of it stems from the fact that harvested forage is rarely sold for cash, but is fed to livestock which is in turn sold. The farmer and rancher is usually preoccupied with the livestock as a direct source of income and fails to recognize that some 55 to 70% of the cost of producing livestock and their products lies in the feed consumed. Also, considerably more effort is required, and new techniques must be used to measure the increased amount of feed produced and utilized on pastures and ranges.

Until suitable techniques and procedures are adopted and standardized for general use, such as would be needed for the census enumeration, it will remain difficult to evaluate the returns received by farmers' and ranchers' treatments and management of grasslands. For example, in measuring the benefits from adequate fertilization of dairy pastures, it is not sufficient merely to record the number of days the dairy herd grazes on the improved pasture. It is necessary also to know how much milk was produced by the cows in that period, and what part of the milk flow was produced from harvested feed given the cows (grain, hay and silage). While it is not difficult to calculate the total nutritive values produced on pastures, and thereby measure the returns from any treatments given the grasslands, the fact remains that very few farmers or ranchers are now using reliable methods of measuring the net returns from their grazing lands.

Grasslands can provide an important outlet for weed control chemicals. Of the several methods of application, a boom sprayer such as that below, permits a minimum number of traverses of the field and its height reduces injury to standing pasture

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The improvements that are possible by application of experimental and practical findings to grassland management are as spectacular and significant as for any type of crop production. The nature of the improved treatments and management practices covers a very wide range. Grasslands occur in all parts of the country, and involve practically the entire range of soil conditions and climate found in the 48 states. Also, the plant species are exceedingly varied to meet the conditions of soil, climate, and the use made by man and livestock. For these reasons, it is not feasible to attempt generalizations that are nationwide. Improvements in grassland treatments and utilization may involve the correction of soil deficiencies by fertilizers and chemical amendments, the elimination or suppression of undesirable plant species (weeds and brush), the introduction and establishment of desired forage species suited to the soil, and use of the feed, the management of the forage growth (stage of growth when utilized, duration and intensity of grazing, clipping to control weeds and unpalatable growth, and the like), and management of the livestock on all grazing lands. Even the class of livestock may be the determining factor in accomplishing significant improvement.

It is evident from the foregoing that efficient utilization of grasslands, and the discovery and application of new facts relating to their improvement is vastly more complicated than say the production of corn, or of cotton, or of any other single crop. The importance of these grasslands to the nation is very great, and permanently productive agriculture must include the proper use and management of nearly 1000 million acres of grasslands as well as the 335 million acres of all other harvested crops, if our agricultural economy is to be soundly based and keep pace with developments in industry, business, and commerce.