Graphic Summary of

LAND UTILIZATION IN THE UNITED STATES

COOPERATIVE REPORT

U. S. DEPARTMENT OF COMMERCE

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Letter Of Transmittal

DEPARTMENT OF COMMERCE
Bureau of the Census
Washington 25, D. C.

June 12, 1947

Sir:

I am transmitting for publication a special report on Land Utilization which is a graphic presentation of the uses being made of the agricultural land resource, both inside and outside farm boundaries. The use made of the land and the productive capacity of farm lands during World War II have been contrasted with similar characteristics for earlier periods. Attention has been given to factors contributing to record volumes of crop and livestock production with little expansion in physical areas. Most of the basic data were gathered by the Bureau of the Census in the 1945 and other censuses of agriculture or by the Bureau of Agricultural Economics of the United States Department of Agriculture.

The report was made possible through the cooperation of the Bureau of the Census of the Department of Commerce and the Bureau of Agricultural Economics of the United States Department of Agriculture. Plans for this cooperative study were made by Ray Hurley, Chief, Agriculture Division of the Bureau of the Census, and V. Webster Johnson, Head, Division of Land Economics, Bureau of Agricultural Economics. The report was prepared principally by Claude C. Haren, Bureau of Agricultural Economics, and Warder B. Jenkins, Bureau of the Census. H. H. Wooten and F. J. Marschner of the Bureau of Agricultural Economics prepared certain materials on total land use and on the use of land outside of farms and assisted in reviewing the data. Acknowledgment is made of the cartographic assistance rendered by Clarence E. Batschelet, Chief of the Geography Division, and Alford Archer of the Bureau of the Census.

Respectfully,

J. C. CAPT,
Director of the Census

Hon. W. AVERELL HARRIMAN,
Secretary of Commerce

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CHARTS AND MAPS

The period since 1940 has marked a significant milestone in the utilization of the Nation's land resources. The expansion of agricultural production, even above the previous peak levels around 1930, has been without parallel during the present century. This dynamic expansion was comparable with that attending the agricultural occupation of the prairies during the 1870's and 1880's, but the underlying conditions were vastly dissimilar. The tempo of increase during this previous period was generated by the bringing into cultivation, within a short space of only a few decades, of millions of acres of fertile land, accompanied by an upsurge of farm and total population. The unprecedented production during the present period was accomplished by fewer workers and by using substantially the same aggregate acreage for crops and pastures as had been utilized throughout the past quarter-century, and not new land or an expanded acreage. The former period represented an important stage in the expansion of agriculture through extending the physical frontier, while the latter represented an extension within the new technological frontier.

The immediate influences contributing to this recent expansion of agricultural production stemmed in part from the restoration of favorable price levels for products marketed by farmers, the recovery from the unfavorable weather conditions of the 1930's, and the patriotic response of farmers and ranchers to wartime needs. These influences were given relatively full play through a set of forces which had been gaining momentum throughout several decades. A combination of (a) rapid technological advances—particularly in the use of power machinery, the development of higher-producing crops and farm animals, and the adoption of improved feeding and cultural practices and (b) changes in the requirements for food, feed, forage, fiber, and other agricultural commodities resulted in shifts and adjustments in the use of the land between areas and within individual farms. They furnished the impetus for the expansion of agricultural production in the virtual absence of an enlargement in the physical plant.

The steady accumulation of experience by farmers has been a vital factor in the expanded productive capacity in agriculture. The use of power machinery, with the attendant enlargement and timeliness of operations, has brought about reductions in labor requirements and aided in overcoming the adversities of the weather. Substitution of tractor for animal power has released crop and pasture land for the production of feed and forage for other farm livestock and has increased the comparative natural advantage of land which is productive and which, in general, is least subject to erosion. Increased employment alternatives during the past 25 years have had the greatest impact in areas where land had proved to be poorly adapted to crops, increasing the pasture- and forest-producing potential. Improved varieties of crops, such as hybrid corn, better feeding practices, and development of livestock breeds have contributed to higher unit production. Changes in dietary and other consumer preferences have favored production of crops with high per-acre volumes and increased the value or utility of the Nation's feed- and forage-producing resources. Changes in export requirements have had an equally great influence upon national and, more especially, upon regional requirements for land. Considering the disruptions and dislocations during this period and the enormity of these changes when spread among an industry of 6 million farms, the period of time that elapsed in this major transformation of the Nation's major basic industry was relatively short.

Scope of this report.—This graphic summary of land utilization takes stock of the present uses being made of the land resources of the United States and notes the current and past changes and developments which have been instrumental in shaping these patterns of land use. It provides agricultural workers and students with a fund of graphically presented information on the use of land resources, recent accomplishments, and the major readjustments effectuated through the years. Stress has been placed on the more recent economic and technological developments with less attention to the long-standing factors in the molding of agriculture.

This present report on the utilization of crop, pasture, and other land is a continuation of a series of graphic summaries, the first appearing in the 1915 Yearbook of Agriculture which was based largely on the 1910 Census of Agriculture. A somewhat similar publication has followed each succeeding census. For example, Miscellaneous Publication No. 260 of the United States Department of Agriculture, which was issued in 1937, was a graphic presentation of Physical Features and Land Utilization in the United States using data from the 1935 Census of Agriculture and from the Department of Agriculture. In order to facilitate publication and to avoid duplication in the preparation of maps and charts, this present issue has been prepared cooperatively by the Bureau of the Census and the Bureau of Agricultural Economics. The graphic and other references supplement the data presented in the General Report and other publications of the 1945 Census of Agriculture. In order to make a more complete presentation for all agricultural land, production, and income, the Census data are supplemented by information on the use of land outside farms, material prepared from the annual crop and livestock estimates, and other statistics issued annually or periodically by the Bureau of Agricultural Economics and other agencies of the United States Department of Agriculture.

Information presented on the use of land not reported under farm or ranch ownership or lease has been assembled from the records and reports of public land-owning and land-managing agencies, State agencies, and other sources in connection with an inventory of land resources and their major uses. A number of general and detailed maps and other data on physical characteristics, use, and ownership were used in the preparation of the maps on the distribution of land in farms and of the individual categories of farm land.

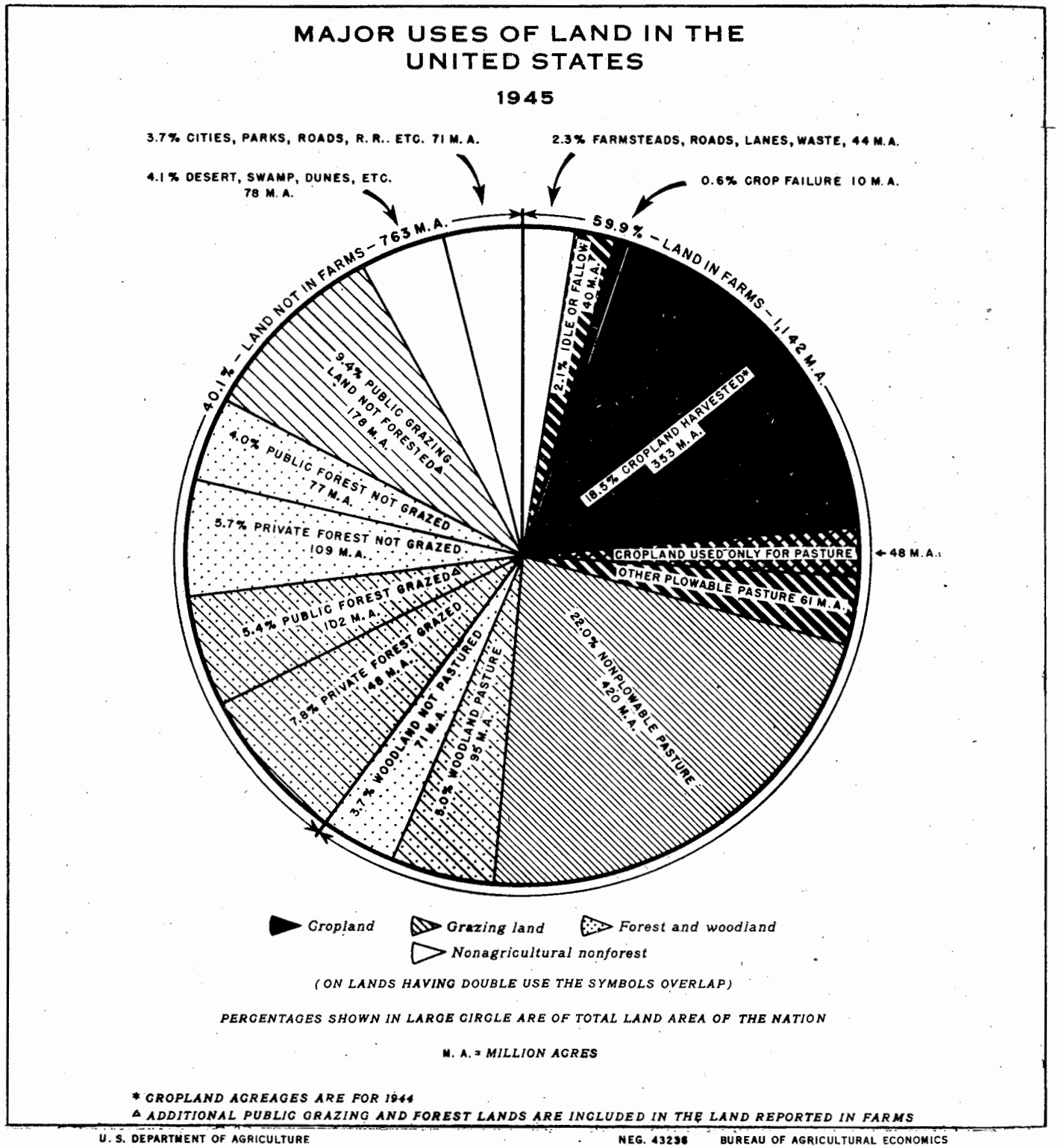
Much of what has been presented would be evident to the transcontinental traveler of today, whereas less emphasis has been placed upon what the "Forty-niner" could have visualized in his time. To the student seeking to delve more deeply into the physio-economic relationships in contrasting areas, a detailed examination of trends in major and specific uses for individual crops offers a prospective field for investigation.

Definitions and explanations.—The terminology in this report which refers to farms, land in farms, the individual classes of land in farms, and similar descriptive terms are based upon the Census definitions outlined in the 1945 reports of the Census of Agriculture. It should be noted particularly that the term "farms" includes both farms and ranches, and that the definition of land in farms generally excludes land not under ownership and lease, such as grazing land used free or under permit. Extensive areas of timber land, mineral land, or other tracts not used for crops or for pasture or grazing purposes are generally excluded from the enumeration of farm land.

In mapping changes, classes of cropland have been combined which exclude cropland reported as used only for pasture in 1944 and plowable pasture reported for previous periods. This change in classification defines cropland used only for pasture in 1944 as that plowed within the preceding 7 years as contrasted with figures for a similar item reported in 1925, 1930, 1935 and 1940 Censuses on land which could have been plowed and used for crops without additional clearing, draining or irrigating. This represented a significant distinction, excluding the land never plowed as well as that once used for crops but shifted, probably permanently, to other uses.

A number of the maps included in this report have been modified from those presented in the General Report of the 1945 Census of Agriculture. This modification was accomplished by determining and plotting the approximate location, within States, of crop failure and other classes of land in farms, adding to State as contrasted with county totals.

The description and location of various areas have involved use of physiographic terms which may be unfamiliar to some readers. In these instances, areas have been identified with a specific location within an individual State or group of States. Broader areas are designated by the familiar geographic division names. The eastern part of the United States refers to that part of the country east of the classical dividing point, the 100th meridian; or when groups of States have been involved, to the States east of the six Plains States.



Nearly 60 percent of the land area of the United States was in farms or ranches in 1945. Of this land in farms or ranches, 39.5 percent was classified as cropland, 42.1 percent as pasture (exclusive of cropland used for pasture and woodland pastured), 14.6 percent as woodland, and the remaining 3.8 percent as land occupied by farmsteads, roads, lanes, or as wasteland. Altogether, over one-half of the land area of the Nation was utilized for pasture or range for livestock. Two-fifths of the total pasture and grazing land was outside farms or ranches. About two-thirds of this latter acreage was publicly owned land, principally located in the western part of the country. The grazing land outside farms included range areas, mostly in native grasses or shrub vegetation, and the more open or accessible tracts of forest and woodland. The carrying capacity of these nonfarm grazing lands was generally low. A total of 458 million acres of forest and woodland was outside farms or ranches. Of this area, 22 million acres were in parks, preserves, and military reservations. Over one-half of the nonfarm forest or woodland was in private ownership, and about three-fifths was grazed. The land required for cities, parks, roads, railroads, and similar uses amounted to only 71 million acres, or 3.7 percent of the total land area. The 78 million acres of desert, bare rock, tidal marshlands, and coastal beaches had little agricultural value but had some value for wildlife and recreational uses.

PRESENT UTILIZATION OF LAND RESOURCES

The land resources of the United States are both abundant in quantity and varied in character relative to resources in other parts of the world. The 353 million acres from which crops were harvested in 1944 represented more than two and one-half acres per capita. The 200 or more crops of economic or commercial significance included all of the major crops except certain tropical and subtropical products, such as rubber, tea, coffee, palm and coconut oils, bananas, and spices. During 1944 and the other wartime years when agricultural production might have been expected to be disrupted by shortages of labor and materials, most crop and livestock commodities were produced at record levels.

About two-thirds of the total cropland harvested was utilized for producing feed and forage crops for consumption by livestock and, in turn, largely for supplying animal proteins, vitamins, and other essentials of quality diets. One-fifth of the acreage from which crops were harvested, or about one-half acre per capita, was utilized for growing crops, such as wheat, rice, rye, potatoes, beans, and peas, which provide staple diets for a large proportion of the population in other parts of the world. About one-tenth of an acre per capita was used for fruits and vegetables, sources of minerals and other protective constituents of today's diets. The fiber, oil-producing, and other crops accounted for the remaining one-tenth of the acreage of harvested crops.

Production of record supplies of dairy, meat, poultry, and other livestock products during the war years required about the same acreage of feed and forage crops and of pasture and grazing land as were utilized during the previous peak period of agricultural production of the predrought years around 1930. A part of this increased production was attributable to herd and farm-flock improvements; better feeding practices; improved quality of pastures, hay, and other livestock feed; and to decreased feed and forage requirements for farm work stock. An equally important or even greater contribution was provided by increased crop yields and increased pasture-carrying capacities. Production of feed grains was one-fifth and hay one-fourth greater during the 5-year period from 1942 through 1946 than during the years from 1928 through 1932. There was an improvement over the former period of one-fifth in the condition of late summer pastures and some improvement in the western range.

To the extent that weather during these two periods was generally favorable and the acreage used for production of feed and forage was virtually the same, these increases can be attributed to the influence of such factors as the widespread adoption of higher yielding varieties, greater use of fertilizers and lime on both crop and pasture fields, establishment of safeguards against soil losses and excessive run-off, and of increased selectivity in the use of land for crops. The enlargement of the capacity of crop and pasture acres to produce, which had been arrested or obscured during the period of drought and low prices of the 1930's, was expanded from 1937 onward under the impetus of these technological developments, the return of favorable growing conditions, a favorable price structure, and of the patriotic response of farmers during the war.

Crop and livestock products are replenished or restored annually or over a relatively short period of years. The large volume and variety of lumber, timber, pulpwood, naval stores, and other forest products which went to meet wartime needs represented the harvest of a resource accumulated and carried over from many preceding decades. This latest drain upon the Nation's forests has accentuated a situation where dependence, as that upon crops and pastures, henceforth must be placed upon current and prospective growth.

This wartime period was noteworthy in that all requirements for agricultural production—for a population nearly one-third greater than in 1920, the added needs of the armed forces, wartime industries, and for meeting commitments overseas—were supplied without seriously impairing the gains in conservation achieved during preceding years. Improvements in yields and carrying capacities and in soil and moisture conservation were associated with reductions over the predrought period of about 30 million acres in the two intertilled crops of corn and cotton alone. Mechanization since 1920 not only resulted in reductions of about 70 million acres in crops on mostly tillable pasture land required for feeding farm work stock, but also in additional gains through timeliness of farm operations. These and other savings applied to growing of other crops, to pasture, and to providing feed and forage for meat and dairy animals scaled down over-all demands for land and thereby precluded the rebreaking or plowing of a large acreage of grassland in areas susceptible to erosion and to high climatic risk.

Shortages in manpower, machinery, and other equipment and facilities placed a high premium upon land which was productive, easy to work, or easy to farm with mechanized equipment. Farmers made the most of their time and of scarce machinery and fertilizer by continuing or intensifying the practice of restricting crops like corn and cotton to the fields where soils, slope, erosion, drainage, and other conditions were relatively favorable for crop production. Vacant farms were generally leased or acquired by neighboring farmers for enlarging crop-farming operations where physical conditions were fairly good. Where physical conditions were less favorable many farms that were vacated by operators who left for the armed forces or for wartime industries remained idle or were used in part for pasture.

Scarcity of labor and materials also had the effect of retarding or postponing additional farm and community engineering projects, reseeding of depleted pastures and range, replanting of deforested areas, and other aids to soil and moisture stabilization. While adjustments in land use continued to be made and conservation practices were maintained, much remained to be done to protect and safeguard cropland and other resources.

Cropland.—About 500 million acres, or one-fourth of the land area of the United States, comprise what may be regarded as the present cropland area. This includes the 451 million acres classified by the Census as cropland. A part of the remainder was in permanent but tillable pasture and a small amount was in tracts temporarily unoccupied in 1944. About 40 million acres of the total cropland are ill-suited to cultivation every year owing to low fertility or to critical slope or erosion conditions. These 500 million acres do not represent the acreage that is either physically or economically feasible to devote to crops every year. They represent the over-all area where use for crops has competed and is likely to continue to compete with other demands for the land, contingent upon the needs for agricultural production, prices and markets, and production facilities available to farm operators, and upon the relative capacities to produce and responsiveness of various grades of land. Prospective additions to this over-all cropland base through land reclamation would have the effect of replacing the acreage shifted from cropland to other uses as the result of the reversion of poor farm land to pastures, grazing or forests, or the expansion of urban areas.

The present situation with respect to the utilization of cropland may be clearly visualized when it is recognized that only 353 million acres of cropland harvested in 1944 provided (either directly as foodstuffs or fibers, or indirectly through use as feed and forage for livestock) the bulk of the many

agricultural products that went to meet the tremendous consumption demands during wartime and later years. A precise measurement cannot be made, but the geographic distribution of the cropland harvested indicates that as much as 90 percent or more of the acreage was concentrated on land of comparatively high natural advantage for crops. This concentration of harvested crops on land which was productive, workable, dependable, and durable was especially significant in view of the character of the remaining cropland in farms. The 10 million acres of complete crop failure in 1944 and comparable losses during the other wartime years may be regarded as a minimum annual expectancy, considering the wide geographic range of drought, flood, unseasonable weather, and shortage of help which beset individual farmers between the time crops are planted and are ready for harvest. The 40 million acres of cropland, idle or fallow, in farms in 1944 included the minimum reserve required to sustain the practice of alternate summer fallow as a moisture-saving and moisture-storing measure in areas such as the western Great Plains, and to compensate for insufficient fertility or other obstacles to maintenance of continuous crop usage. This acreage also included cropland which, because of such recurring factors as too little or too much moisture or scarcity of labor and materials, was not used for crops or pasture, even when the intention at the outset of the season had been to produce a crop.

Cropland used only for pasture in 1944 (plowed during the previous 7 years) consisted mainly of pasture in rotation with crops, as contrasted with permanent pasture lots. This pasture generally consisted of land unadapted to sustained use for crops except in rotations of pasture with occasional use for crops. A small acreage represented pasture provided on unplanted fields or on abandoned corn, cotton, and other crop fields. Mature crops with low yields in prospect may be completely abandoned (crop failure), be harvested in the customary or an entirely different manner, or be grazed by livestock. During 1944 and other recent years, when both prices and yields were favorable, the acreage of crops abandoned or diverted to pasture and other uses was comparatively small.

Pasture and grazing.—The 1,052 million acres of pasture and grazing land which were within and outside farms or ranches at the beginning of 1945, or which had been used or were available for use during the preceding year, provided low-cost forage sufficient to meet more than one-third of the feed and forage requirements of farm and ranch livestock. This pasture and grazing land varied widely in grass and other forage provided and in carrying capacities. Only 624 million acres were under farm ownership and lease, the remainder consisting of national forest, public domain land in grazing districts, and other publicly and privately owned land outside farms. Of the total area of pasture and grazing land, 707 million acres were nonforested, but only about 100 million acres were adapted to use for crops. This acreage of essentially nontillable and unwooded land, combined with the 345 million acres of farm woodland and nonfarm forest, comprised about 950 million acres of dry, steep, rough, poor, and swampy land, valuable for pasture or grazing, for a combination of forest and grazing uses, for providing cover for wildlife, and for watershed protection.

Forage supplies are supplemented by utilizing wheat and rye fields for pasture in the fall or spring, and by turning cattle and other farm livestock to graze over hay, grain stubble, and cornfields after the crop is removed. Improved pastures include a large number of such introduced species as bluegrass, white clover, lespedeza, and Johnson, Bermuda, and carpet grasses. Native forage plants in the humid and subhumid areas include the broom sedges, wire grasses, and similar species of the originally forested areas; the grasses, reeds, and undergrowth within the forested and cut-over areas; and the bluestem pastures of central Minnesota, the Dakotas, and the Flint Hills and adjoining areas of eastern Kansas and Oklahoma. The grama, buffalo, and other short grasses of the semiarid areas of the Great Plains; the sagebrush and other desert shrubs of the intermountain region; and the scattered vegetation on the mountain slopes and other elevated or better situated areas in the West round out the broad picture of the many grasses and other plants adding up to the forage resource. In many instances this vegetation provides forage palatable to cattle, but in others it is browsed only by sheep or goats.

The pasture or grazing season is yearlong in the southern portion of the United States, but with limitations—associated with high temperatures and scant moisture supplies—from southwestern Texas to southern California. Other limitations associated with high temperatures, humidity, tropical diseases, and pests along the lower Atlantic and Gulf Coasts have been partially overcome by cross-breeding of cattle to withstand such conditions. The season averages from 3 to 6 months in the upper latitudes of the Northeast, northern Minnesota, and the high elevations of the West. Climatic limitations in the length of the pasture season (particularly in the Northern States and the mountain valleys of the West) are overcome by growing hay and other crops for winter feeding. Throughout much of the West, farm and ranch livestock are moved to seasonal pastures—during the summer to the mountains and plateaus and during the fall to the lower-lying winter ranges where moisture and water supplies are more favorable than at any other time of the year.

Carrying capacities of pasture and grazing land range from the two or more head of cattle or equivalent livestock units per acre maintained on virtually a yearlong basis on the rice fallow land in southern Louisiana, southeastern Texas, and eastern Arkansas to one head for 40 acres or more on a seasonal basis of the arid West. The highly productive land in areas such as the Corn and Dairy Belts and the Mississippi Delta is capable of producing excellent pastures, but is of even greater value for crops. Pasture and grazing land on the typically dry, rough, or otherwise low-quality land which comprises over 90 percent of the present pasture area provides relatively low carrying capacities which are mostly improvable by controlled grazing, reseeding, and the application of soil and moisture-conservation measures.

Forest and woodland.—The Forest Service, in a reappraisal of the forest situation, has estimated the total forest and woodland area in 1945 to be 624 million acres, or nearly one-third of the Nation's land area. This acreage included approximately 163 million acres in inaccessible alpine ranges, or in chaparral, mesquite, pinon-juniper, and other noncommercial wooded areas, or in withdrawn areas (parks, preserves, etc.). About 461 million acres were in commercial forest-producing land. Parks, military reservations, and similar installations included 9 million acres of the total forest area.

This area of available forest-producing land in 1945 was only 56 percent of the 820 million acres which comprised the original forested area of the United States. The area in forest, at that, was tremendous in size but the forests themselves possessed many unsatisfactory characteristics compared with forests only a half century ago. Only about one-tenth, concentrated in the Western States, was old or virgin growth. About two-thirds of the area was in stocks of saw timber and pole dimensions. The remainder represented seedlings and saplings, and poorly restocking and denuded areas in about a 50-50 ratio.

About 139 of the 166 million acres of farm woodland in 1944 were in one or other of the forest-producing categories. The principal exceptions were the woodland pastures of the oak-cedar breaks and the mesquite areas of west central Texas, the pinon-juniper of the Indian reservations in Arizona, and the chaparral of California. Farm woods on the 2.7 million farms reporting woodland were typically small tracts on poor, rough, or steep land, or consisted of farm woodlots reserved to meet farm needs. Farm timber is not generally as heavy as in the larger tracts outside farm ownership. The value to farmers of their farm forests and woodlots as a source of income was demonstrated by the nearly 222 thousand farms reporting sale of forest products amounting to 78 million dollars in 1944. This excluded the annual value of the timber and wood used for farm purposes, the pasturage for livestock, the protection afforded farm land and farmsteads, and the employment provided by forest products industries.