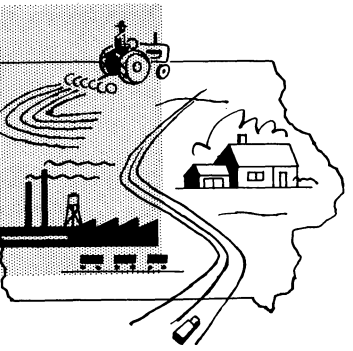

CHAPTER 6

National concerns with land use; nonagricultural requirements for land; future land use problems.

The Nation's Present and Future Land Use and Crop Production

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THE LAND available for crops and cropland pasture in the 48 contiguous states of continental United States totaled about 466 million acres in 1959, or nearly a fourth of the total land area of 1,904 million acres (Table 6.1).[1] In addition, 630 million acres of open pasture and grazing land and 270 million acres of woodland and forest pasture were used for grazing livestock. These grazing lands are about 47 percent of the total land area, but much of this land is

[1] The estimates of land uses for 1959 should be recognized as preliminary, and subject to revision when the "Conservation Needs Inventory" is completed and the tabulations from the 1959 Agricultural Census become available. Revised estimates of the land available for crops and cropland pasture may fall within a range of 460 to 470 million acres.

TABLE 6.1

MAJOR USES OF ALL LAND IN THE CONTINENTAL UNITED STATES, 1954, WITH PRELIMINARY APPROXIMATIONS FOR 1959*

Land use	Acreage, in millions		Percentage of total	
	1954	*1959*	*1954*	*1959*
Land used for crops, pasture, and forest:				
Cropland used chiefly for crops:				
Cropland harvested, failure, fallow, and soil bank	380	379	20.0	19.9
Land in soil-improvement crops and idle cropland not harvested or pastured	19	21	1.0	1.1
Total†	399	400	21.0	21.0
Cropland used only for pasture	66	66**	3.4	3.5
Total cropland available for crops	465	466	24.4	24.5
Pasture and grazing land, not cropland and not woodland	633	630††	33.2	33.1
Woodland and forest‡				
Pastured	301	270	15.8	14.2
Not pastured	314	345	16.5	18.1
Total	615	615	32.3	32.3
Special use§	110	118	5.8	6.1
Miscellaneous‖	81	75	4.3	4.0
Grand total	1,904	1,904	100.0	100.0

* Data for 1954 from *Major Uses of Land in the United States*, Agr. Info. Bul. 168, January 1957. Estimates based on data assembled from current records and reports of state and federal agencies dealing with agriculture and public land management, and from the reports of the Bureau of the Census for the 1954 Census of Agriculture. For data on each major use in Alaska and Hawaii, see Table 6.2.

† Total cropland used chiefly for crops includes cropland harvested (including crops, gardens, and orchards not otherwise reported, and wild hay harvested); crop failure; summer fallow; cropland in soil-improvement and cover crops not harvested or pastured, or used for another crop; and temporarily idle cropland.

‡ Woodland and forest, excluding 26 million acres withdrawn from primary forest use for parks and other special public-use areas, and duplications of 7 million acres with pasture (not woodland) reported by the 1954 Agricultural Census.

§ Urban and town areas, farmsteads and farm roads and lanes, highway and railroad rights-of-way, airports, parks, wildlife refuges, national defense areas, flood-control areas, and other special-use areas.

‖ Includes miscellaneous unaccounted-for areas not included among other major uses, including marshes, bare rock areas, deserts, sand dunes, and other lands which now generally have low value for agricultural purposes but which have social utility for wildlife and recreational use and potential value for minerals.

** Includes much cropland recently seeded to pasture.

†† Approximately 460 million acres in open permanent pasture in farms, and 170 million acres in nonforest rangeland not in farms.

located in semiarid and desert regions, where the forage available per acre is very low. In many of the drier areas, from 20 to 40 acres are required to provide a season's grazing for one cow.

If we include all the land used for grazing as well as the cropland, about 72 per cent of the total land area is available for use in crop and livestock production. The balance of our total land area is in woodland and forest not used for grazing, or in special uses such as urban and town sites, recreation areas, transportation facilities, and a residual of 75 million acres largely made up of wasteland such as marshes, deserts, and sand dunes.

Alaska's land resources are still undeveloped (Table 6.2). Lands located under climatic and soil conditions some-

TABLE 6.2

MAJOR USES OF LAND, ALASKA AND HAWAII, 1950, WITH PRELIMINARY APPROXIMATIONS FOR 1959

Land use	Alaska		Hawaii		Total	
	1950	*1959*	*1950*	*1959*	*1950*	*1959*
	Thousand acres		*Thousand acres*		*Thousand acres*	
Total cropland and arable land*	12	20	465	460	477	480
Grassland and other pasture, excluding cropland pasture†	363	355	796	801	1,159	1,156
Forest and woodland‡	153,008	...	1,211	...	154,219	.....
Other land§	212,099	...	1,628	...	213,727	.....
Total land area	365,482	...	4,100	...	369,582	.....

* Total cropland includes cropland harvested, crop failure, cropland idle, fallow, cropland in soil-improvement crops, cropland for future harvest, and cropland pastured. Cropland pastured includes cropland that was used for pasture but that could have been used for crops without additional clearing, draining, and irrigating.

† Grassland and other pasture includes rough areas and brushland pastured and any other land pastured that was not considered as either woodland or cropland.

‡ Includes forest and woodland, pastured and not pastured. Insufficient information for a 1959 estimate.

§ Other land includes all unaccounted-for land areas, including urban and special-use areas, grassland areas not in farms, tundra, nonvegetated lava flows, sandy beaches, and rock areas. Insufficient information for a 1959 estimate.

TABLE 6.3

LAND IN SPECIAL-USE AREAS OF THE CONTINENTAL UNITED STATES, 1954, WITH PRELIMINARY APPROXIMATIONS FOR 1959*

Item	Acreage, in millions		Percentage of total	
	1954	*1959*	*1954*	*1959*
Urban areas	18.6	21.1	16.9	17.8
Highways and roads	19.8	....	17.9	....
Railroads	3.4	....	3.1	....
Airports	1.3	....	1.2	....
Total rural transportation areas	24.5	27.0	22.2	22.8
Farmsteads, farm roads, and lanes	11.0	10.0	10.0	8.5
National parks	14.0	....	12.7	....
State parks	4.7	....	4.3	....
Total parks	18.7	20.0	17.0	16.9
Federal wildlife areas	3.9	....	3.5	....
State wildlife areas	4.9	....	4.5	....
Total wildlife areas	8.8	10.4	8.0	8.8
National defense areas	21.5	21.5	19.5	18.2
Flood-control and navigation areas	3.9	4.8	3.5	4.0
Federal industrial areas	2.0	2.0	1.8	1.7
Publicly-owned institutional sites and miscellaneous other uses	1.2	1.5	1.1	1.3
Grand total	110.2	118.3	100.0	100.0

* For basis of classification, see footnotes to Table 7 in *Major Uses of Land in the United States*, Agr. Info. Bul. No. 168, ARS-USDA, January 1957.

† Preliminary data indicate that the special-use areas expanded about 1.5 million acres annually from 1954 to 1959.

what similar to the areas best adapted for farming in Alaska support a flourishing agriculture in the Scandinavian countries. More complete information for all states, including Alaska and Hawaii, is available as a result of the 1959 Cen-

The land in special-use areas in the 48 contiguous states of continental United States is classified in Table 6.3. Preliminary data indicate that the special-use areas expanded

about 1.5 million acres annually from 1954 to 1959. Urban, transportation, and recreational uses are making more and more inroads on available land resources in some areas, especially along both the Atlantic and the Pacific coasts. But it should be noted that for the country as a whole, land in special uses accounts for only about 6 percent of our total land area. Although many difficult local problems arise in areas of rapid "rurbanization," special uses will absorb only a small percentage of our total cropland. However, once productive cropland is devoted to these special uses, it is more or less permanently subtracted from the productive cropland base. In many areas, unplanned expansion has seriously disrupted the local agricultural economy.

The farm uses of our land resources were, as we entered the 1960's, more than adequate for producing the farm products for which outlets were available. In our attempts to control crop surpluses, we established a Conservation Reserve Program which absorbed 22 million acres of cropland in 1959. About an equal acreage of cropland was either idle or devoted to soil-improvement crops. Even within the area available for crops, a much larger acreage could be planted if profitable outlets were available for the resulting production.

We have large areas of abandoned cropland in the humid eastern states that would be cultivated very intensively if they were located in some of the densely populated countries of Europe or Asia, but they cannot profitably be used for crop production under prevailing and prospective economic conditions. In 1959 continental United States contained about 110 million acres of grassland and 105 million acres of woodland fairly well adapted for use in the cropland rotation.[2] As an offset to this acreage, some 40 to 45 million acres physically ill-suited for cropland rotation

[2] See page 14 of "A 50-Year Look Ahead at U. S. Agriculture," USDA, June 1959. A more detailed discussion of potential land and water resources is found in "Water Resources Activities in the United States," Select Committee on National Water Resources, United States Senate. Committee Print No. 12, December 1959.

were nevertheless in production; but subtracting 45 million acres from the potential cropland area of 215 million acres still leaves an additional 170 million acres that could be used in the cropland rotation if demands for farm products warranted such expansion. So large an expansion would absorb woodlands that may also be needed to produce timber. If urgent need for much more cropland should arise in the future, it would be necessary to reconcile competing demands for timber versus other farm products.

We are fortunate to have tremendous flexibility in the use of our land resources. We can shift into grazing or forestry additional land which for some years to come is not likely to be needed for crop production. Land shifted to these uses can be regarded as a *contingency reserve* of cropland — against emergencies or for future needs.[3]

The greatest benefits from the potential flexibility in use of our land resources cannot be realized unless we recognize the impediments to shifting uses in response to prospective needs. The land used for crops as well as much of the grazing and timber land is owned by farmers and other private landowners. Their primary aim is to obtain a high current income from the land. Pressure for current income may prevent prudent and protective use of their land resources if protection results in less net income than exploitive production.

Farmers will continue production of surplus crops unless other more profitable alternatives become available. Attempts to ration land devoted to surplus crops — by acreage allotments or other devices — are likely to be at least partly offset by substituting labor, capital, and other resources for land to increase production on the remaining acreage. One of our unfinished tasks is development of better ways to harmonize individual, group, and public interests in the

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[3] For a statement on the desirability of maintaining a contingency reserve of cropland, see Johnson, Sherman E., "Farming Systems in Relation to Soil Conservation." Proceedings of the United Nations Scientific Conference on the Conesrvation and Utilization of Resources, Vol. VI, 1949.

ownership and use of land and water. This unsolved problem should be kept in mind as we consider more in detail the use of land for crops.

USE OF CROPLAND AND CHANGES IN PRODUCTION IN THE 1950'S

The total acreage of land used for crops remained relatively constant in recent years, but important shifts occurred in the various regions. Compared with the 1940's, the land used for crops increased in the Mountain, Pacific, Northern Plains, and Corn Belt states. Decreases occurred in the Southeastern, Appalachian, and Northeastern states.

Within wide limits, the acreage of land actually planted to crops depends upon available outlets for farm products and the relative economy of increasing yield per acre rather than cultivating additional areas of land. In the 1950's, farmers devoted much more attention to increasing yields per acre by the application of improved technology than to extending the area of land used for crops. The choice was partly influenced by land rationing farm programs. Land already in use for crops was improved by drainage, irrigation, terracing, and other land improvements. Some additional cropland was developed by irrigation and by plowing up native sod for wheat production. But these additions were more than offset by reductions in other areas, that were partly the result of soil bank operations.

Yield per acre is greatly dependent upon the application of improved technology in crop production. The rate of adoption of improved technology became a torrent in the postwar years. The rapid adoption of new techniques by farmers largely accounts for the continuously increasing total production of farm products.

Figure 6.1 emphasizes the greatly accelerated adoption of technology in the postwar years. On this chart it is interesting to compare trends in production extended from two different base periods, 1910–31 and 1937–59. The trend of farm production has stayed above the increase in U.S.

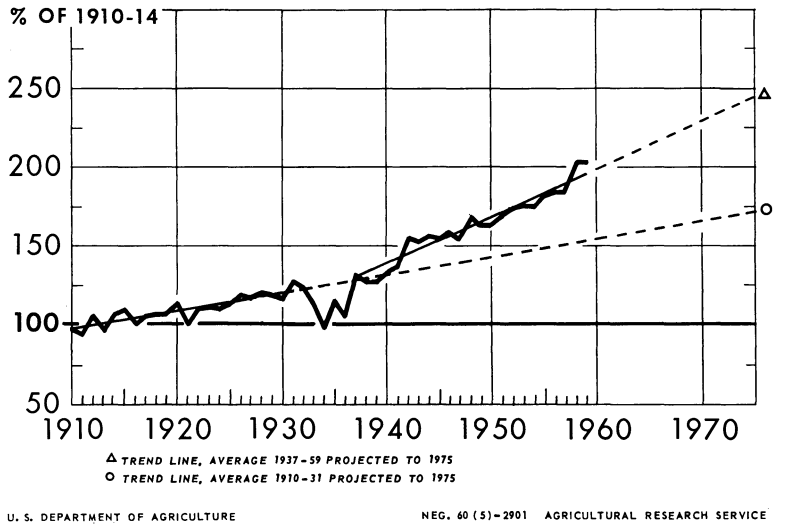

Fig. 6.1 — Farm production trends in the United States with projection to 1975.

population in the postwar period (Figure 6.2). In considering future production trends in relation to projected needs by 1975, we should bear in mind that current production is above outlets despite restriction programs.

Although more cropland can be made available in future years, if economic conditions warrant such expansion, adoption of improved technology to obtain higher yield per acre is likely to be the greatest source of increases in production in the 1960's. Therefore, we should have clearly in mind what is involved in application of improved technology.

First, the new techniques must be made available through research. But unless they are tested for practical and economical application before they are recommended for adoption, there may be a considerable time lag between discovery and adoption. A few venturesome farmers may try out new discoveries, but most farmers will adopt the

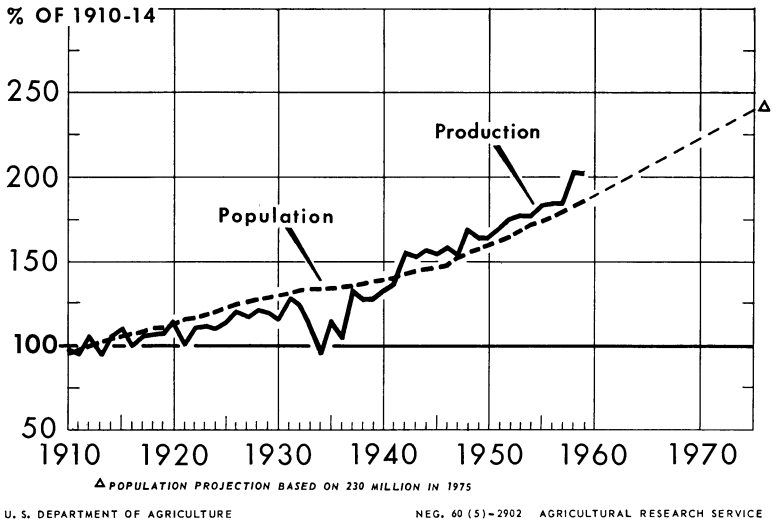

Fig. 6.2 — Population and farm production in the United States with population projection to 1975.

new techniques only if they are convinced that the new methods will increase their net incomes. Rate of adoption, therefore, also depends on economic conditions, and on the required capital investment.

Under the prosperity conditions of the immediate post-war years, farmers made large investments in new machinery and in real-estate improvements. They also greatly accelerated use of chemical fertilizer, pesticides, and other current expenditures. These investments provided a strong momentum for the production expansion that continued into the 1950's.

Farm prices declined about 20 percent from the peak of 1951 to 1959. Net incomes of farm operators dropped about 27 percent, and still farm production rose about 20 percent in those years. Production continued to rise, despite reductions in farm prices and in net incomes for the reasons indicated by Heady in Chapter 3.

After many farmers bought sufficient machinery to operate larger farms, they found that purchase or rental of additional land would add to net income. If improved technology was applied for the first time on the land which changed hands, the yield per acre was increased, resulting in higher production.

The total resources used in farm production changed very little from 1951 to 1959, while total output increased about 20 percent.[4] But the investments in machinery and equipment, and the additional operating expenses for more chemical fertilizer, pesticides, and other supplies, resulted in large substitutions of capital and management for labor and land. The hours of farmwork required in 1959 were 27 percent less than in 1951. But the value of farm capital per worker was 80 percent higher than in 1951. The capital assets per worker were 44.5 percent above 1951 even when they were valued at constant prices in both years.

Farmers substituted purchased supplies for both family and hired labor, and for land. This is evident from examination of available data. Adoption of improved technology resulted in a much larger production with consequent downward pressure on farm prices. But the larger production has been produced at lower cost *per unit of product* than would have been incurred with no change in technology. This, plus adverse changes in cost-price relationships, has reduced net incomes and weakened the cash position of farmers.

CROP PRODUCTION PER ACRE

Although concerted attempts to restrict the acreage of land used for crops from 1954 to 1959 resulted in net reduction of 16 million acres, total crop production increased because of rising yields per acre. Acreage limitations and support prices on allotment crops stimulated substitution of fertilizer and other resources for land.

[4] See Table 1, page 50, of *Agricultural Outlook Charts, 1960*, USDA, November 1959.

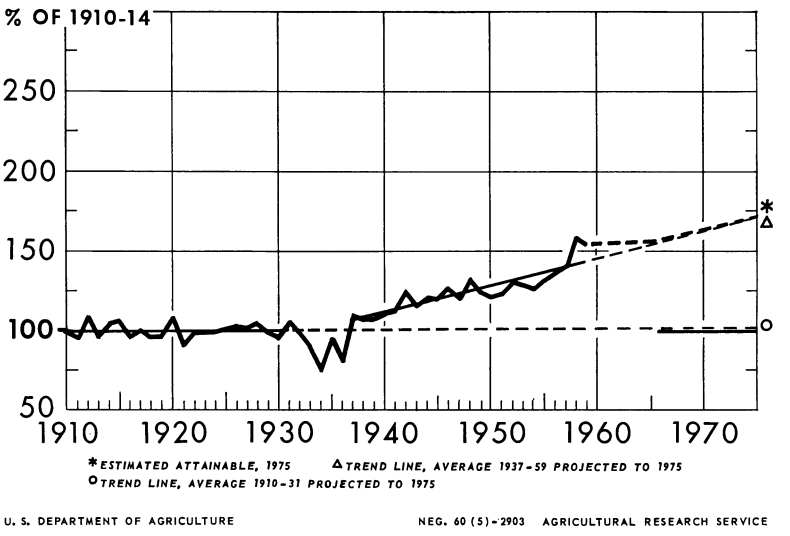

Fig. 6.3 — U.S. crop production per acre.

"Attainable crop production per acre" and projected trends to 1975 are illustrated in Figure 6.3. Crop production per acre increased each year from 1950 to 1958 with the exception of 1954. The large increase in 1958 reflects very favorable growing conditions in many areas which were not repeated in 1959, but production per acre in 1959 was far above any year previous to 1958.

The chief sources of increase in crop production per acre in the 1950's were chemical fertilizer, irrigation, improved seed, mechanization, crop protection, and conservation. Calculated in plant nutrients, the use of chemical fertilizer increased about 55 percent from 1951 to 1959. Durost and Barton have estimated that additional use of fertilizer contributed two-thirds of the increase in crop production per acre from 1951–52 to 1955.[5] They also calcu-

[5] Donald D. Durost, and Glen T. Barton, "Changing Sources of Farm Output," Production Research Report No. 36, ARS-USDA, February 1960.

lated that increases in irrigation accounted for 5 to 10 percent of the increase in crop production per acre in the same period.

Hybrid seed corn contributed very significantly to yield increases in the 1940's but to a lesser extent in the 1950's. By that time hybrid seed was in general use. Hybrid seed has also become available for grain sorghums and, combined with favorable weather, produced a sharp rise in yields per acre of this crop in 1958 and 1959. The effect of other sources of increased production per acre is much more difficult to estimate except in combination with other factors. Crop protection has been very important in maintaining yields per acre that would have been reduced by plant diseases, insect pests, and weeds.

Conservation activities usually involve a combination of practices applied on the individual farm. Consequently, separate measurement is difficult. A single technical improvement, such as terracing, may be responsible for a perceptible increase in production per acre. However, its effects will be multiplied if it is combined with adequate application of chemical fertilizer, protection against crop pests, and with other crop, soil, and water management practices that provide an overall favorable environment for crop growth. Consequently, the increase in crop production per acre in recent years can be more accurately characterized as the result of adoption by farmers of *combinations of new technology* rather than separately attributed to single improvements.

MANAGEMENT AND TECHNICAL SKILLS FOR INCREASING CROP PRODUCTION

The new technology of crop production makes vastly greater demands on both management and technical skills than the simpler practices which prevailed a generation ago. The successful farm operator today has a much more

complex job of determining the highest income potentialities. He also must have sufficient engineering ability to operate high-priced equipment and to make repairs to case of breakdown. He must be informed about the most suitable crop varieties, the most economical application of chemical fertilizer, the best tillage practices for his soil conditions, and the most effective pesticides to protect his crops against diseases, weeds, and insect damage. He must be able to operate the entire combination of new technology to achieve the highest possible net income from its use.

Mechanization has greatly increased the acreage of land that can be operated by a farm family. This has encouraged expansion of farm size, which, combined with rising land values, has resulted in a much higher capital investment for a farm unit. The average investment per farm increased 44 percent from 1951 to 1959. If we measure the change in constant prices, the investment still shows an increase of 30 percent from 1951 to 1959.

As a result of all these changes, the range in both production and net incomes has widened between the farms operated under capable management and those operated by farmers who are lagging in adoption of the new technology. The lag may be accounted for partly by the lack of capital to invest in new technology, or to unwillingness or inability to assume the risks incident to the larger investment in land improvements, equipment, and current operating expenses.

We should note, however, that a higher level of basic education, capped with vocational courses in the high schools and colleges, and continued through extension and other adult education programs, trained capable operators to cope with the complexities of a modern farm business.

Successful use of the new technology involves much more than adoption of new techniques. Capable management is required to combine the new methods into a profitable system of farming. More capital is needed for improved equipment and for higher operating expenses. Successful

adoption of the new technology involves substitution of brains for brawn, of machines for hand labor, and of capital for both land and labor. It requires a delicately balanced combination of capable management, capital investment, and technical skills.

CROP PRODUCTION – RECENT AND PROSPECTIVE

The annual production of all crops from 1910 to 1959 and the projected trendline to 1975 are indicated in Figure 6.4. Unless unforeseen foreign needs develop, it should not be difficult to satisfy demands for crop production by 1975 under average weather conditions.

Increases in crop production since 1953 occurred despite concerted efforts to restrict production. We have much additional land which could be used for crops if larger markets were available. Further adoption of known technology is likely to mean continued increases in production per acre. In fact, some recent analyses project conservative increases in crop yields to 1965 and conclude that under specified conditions, which include continuation of present programs, we could have 15 to 18 million surplus acres by 1965 in addition to the 1960 Conservation Reserve Program of 28 million acres.[6]

If market outlets increased sufficiently to make expanded production profitable, more land would be planted to crops and increases in yields per acre would be accelerated. Either widespread drought of the severity experienced in the 1930's, or worldwide emergency demands on our food production capacity, could alter the prospect of easy balance with prospective needs up to 1975. But if our farm plant is well maintained, our World War II experience indicates that with average weather, farmers can expand production rapidly in response to urgent demands for farm products.

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[6] Raymond P. Christensen, Sherman E. Johnson, and Ross V. Baumann, "Production Prospects for Wheat, Feed, and Livestock, 1960–65," ARS 43–115, December 1959.

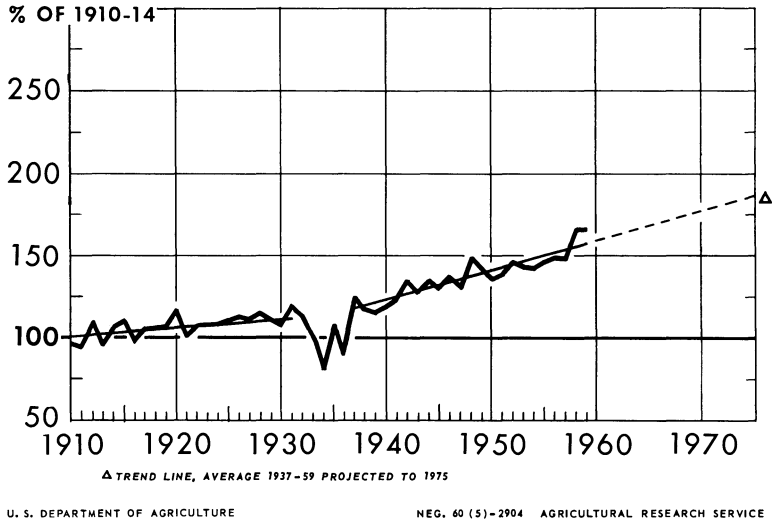

Fig. 6.4 — Crop production in the United States.

PROBLEMS AHEAD

This summary appraisal of our land resources indicates tremendous potential flexibility in their use. The land problems of the 1960's are not likely to be those of meeting demands of U.S. consumers for food. The question of "food enough" will probably not arise unless we are confronted with international emergencies. The chief questions are likely to center on wise, efficient, and profitable uses of our land resources in view of our great potential productive capacity. We will be concerned with how to maintain a *contingency reserve* for emergencies and for the future, and still provide opportunities for farmers to earn incomes comparable with those obtainable in other occupations.

Despite the current adequacy of our land resource base, we must not permit wasteful use of our national heritage. Wasteful use during our development period resulted in soil depletion and land abandonment, and in forest lands cut over and burned over with no provision for restocking.

The national interest requires prudent use and protection of our land and water resources: (1) To assure continued efficient production, (2) to insure against emergency needs, and (3) to provide a heritage for future generations.

Our rapidly growing population will need more living space, more recreation areas, more transportation facilities, and more space for factories in our mechanized economy. Careful planning is needed to provide for these uses because the land once committed to them cannot readily be shifted. Adequate provision is also needed for our timber requirements and for watershed protection, and a reserve of potential cropland maintained.

The possibility of adjusting uses of cropland in response to prospective demands is considerably limited by the need for reconciling private, group, and public interests in the use of our land and water resources. For example, continuation of low net farm incomes over several years could force many individual farmers to neglect prudent and protective use of their land, to postpone repairs on farm buildings, and to avoid purchase of new equipment. If the farm plant were permitted to deteriorate in this way, it would be much more difficult to increase production in response to urgent needs.

If the farm plant is well maintained, however, farmers are quite willing to expand production in response to more attractive prices and higher net incomes. Increase in production under those conditions harmonizes private, group, and public interests because farmers, both as individuals and as a group, gain from expanding production, and the general public obtains a larger supply of farm products at lower prices than otherwise would prevail.

In the 1950's, however, production continued to expand despite slackening prices and lower net farm incomes. Attempts to slow down the increase in production were usually ineffective because they did not reconcile the conflict between individual and group interests. Farmers as a group would have obtained higher incomes if production had ex-

panded less rapidly, or if additional outlets for the products had been developed. Production continued to exceed available outlets, and programs were not developed that assured individual farmers that they would benefit financially from holding production in check. Consequently, each operator attempted to maximize his net income by producing as much as possible within the restrictions imposed by the farm programs in operation.

Our experience indicates that achievement of flexibility by restraining production or by finding additional markets is much more difficult than increasing production in response to greater demands. Reconciliation of private, group, and public interests under those conditions is one of our unsolved problems. We have learned how to produce abundantly, but we have not learned how to combine abundant production with prosperity for the great majority of farm people. By our neglect of this problem, we have tacitly assumed that it would solve itself. Perhaps it would if enough time were given for sufficient loss and withdrawal of land, labor, and capital from farming, and if technology, prices, and costs changed less rapidly than they have in postwar years. Farmers adapt their operations fairly well to moderate changes in their economic environment, but when changes come in torrents as they have in recent years, maladjustments and distress are inevitable unless countervailing actions are taken.

It is our responsibility as citizens to find solutions to the unsolved problems in the use of our land and water resources — through support of objective research and through public education, discussion, and action. It is our responsibility as individuals, as groups, and as a nation.

Individual users of land and water have primary responsibility for protecting and improving this heritage. But all U.S. citizens have an interest in guarding against misuse of our resource base. Sustained use of publicly owned watersheds, forests, grazing land, and recreation and wildlife areas, is especially dependent on citizen interest.

Systems established for use and ownership of land are subject to orderly modification. If we consider it of sufficient importance, we can have wide distribution of land ownership with a preponderance of owner-operated family farms. We can provide an economic environment that will permit sustained and profitable operation of family farms. We can develop communities where full-time and part-time farms will prosper side by side, and where urban residents will find "roots in the earth," and will help to enrich a new "rurban" culture. We can guide urban expansion into rural areas to the benefit of both rural and urban industry. We can develop recreational facilities from the most suitable and accessible of our natural resources. We can conserve and improve our soil and water resources. We can protect our watersheds, and can channel scarce water supplies into the most beneficial uses. We can husband our timber and grazing resources for sustained production and use.

These and other desirable objectives can be achieved if we, as a nation, become convinced that they need to be done. Progress on these tasks will first require an understanding of the problems we face, and then analysis and consideration of alternative solutions. We need to agree on the objectives to be attained, and then develop programs to achieve them.

Agreement on objectives is frequently time-consuming because it depends upon public understanding and acceptance of the need for action. On reaching such understanding and acceptance, we can undertake the jobs to be done — as individuals, as groups, and as public agencies dedicated to serve the public welfare. These were the methods used by our forefathers to achieve better use of land. The Homestead Act was the product of long discussion and evolutionary development of our land policy. So was the creation of the Department of Agriculture and the land-grant colleges.

Most of the tasks that need to be undertaken can be

carried out by private individuals if the economic environment makes nationally desirable objectives the most profitable alternatives for individual farmers and other private users of land and water. Reconciliation of private, group, and public interests, however, will require public investment in research, education, and regulatory and other programs designed to improve our uses of land and water for the greatest continuous benefit of individuals, groups, and the general public.

REFERENCES

Christensen, Raymond P., Johnson, Sherman E., and Baumann, Ross V. *Production Prospects for Wheat, Feed, and Livestock, 1960–65.* USDA, ARS 43-115, 1959.

Durost, Donald D., and Barton, Glen T. *Changing Sources of Farm Output.* ARS-USDA Prod. Research Rpt. No. 36, 1960.

Johnson, Sherman E. *Farming Systems in Relation to Soil Conservation.* Proceedings of the UN Scientific Conference on the Conservation and Utilization of Resources, Vol. VI, 1949.

Panelists appearing before the Subcommittee on Agricultural Policy. *Policy for Commercial Agriculture: Its Relation to Economic Growth and Stability.* Joint Economic Committee, Eighty-fifth Congress, first session, November 22, 1957.

Rogers, Robert O., and Barton, Glen T. *Our Farm Production Potential, 1975.* Manuscript submitted for publication, ARS-USDA.

Select Committee on National Water Resources. *Water Resources Activities in the U.S.* U.S. Senate, Eighty-sixth Congress, first session. Committee Print No. 12, December 1959.

USDA. *A 50-Year Look Ahead at U.S. Agriculture.* 1959.

———. *Agricultural Outlook Charts, '60.* 1959.

———. *Changes in Farm Production and Efficiency: A Summary Report.* Stat. Bul. No. 233 (Revised), 1959.

———. *Farm Costs and Returns: Commercial Family-Operated Farms by Type and Location.* ARS, Agr. Info. Bul. No. 176, 1959.

———. *Land.* The 1958 Yearbook of Agriculture. 1958.