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An Evaluation of OBERS Projections of Texas Agricultural Production in 1980, 2000 and 2020

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By

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THE 1972 OBERS PROJECTIONS

In September of 1972, the U. S. Water Resources Council published OBERS Projections of Regional Activity in the United States. The projections were developed in response to a need for basic economic information by public agencies engaged in comprehensive planning for development and use of the nation's water and related land resources. The Council's report is the result of a program of economic measurement, analyses and projection conducted by the Office of Business Economics (OBE) of the Department of Commerce and the Economic Research Service (ERS) of the Department of Agriculture. OBERS is an acronym signifying a united effort by OBE and ERS to develop an integrated set of projections under a common set of assumptions and procedures. Included were projections of population, personal income, employment earnings of persons, and output by industry.

Of particular interest to Texans engaged in or affected by production and marketing of agricultural commodities are the projections of food and fiber requirements for the nation and the projections of Texas' shares of national requirements. These will affect employment, earnings and incomes of many people of the state and the development and use of land and water resources which are so important to economic activities and personal welfare.

The agricultural projections are based primarily on extensions of historical trends in consumption patterns, exports, yields, state shifts in production, and land availability.[1] The projections reflect (1) United States food and fiber needs based on estimated domestic population, consumption, and international trade patterns; (2) trends in geographical distribution of production; (3) continuation of trends in agricultural inputs; and (4) continued but dampened increases in public and private investment in research and resource development as related to agricultural production capacity. These projections of agricultural trends represent a "baseline" from which simulated or "what if" questions concerning the needs and opportunities for public investment in resource management and technical RC&D in U. S. agriculture can be evaluated. The projections by themselves do not imply policy recommendations.

The principal projection components include (1) aggregate food and fiber needs, (2) crop yields, (3) distribution of production among States, (4) land resource availability, and (5) agricultural income and employment.

Aggregate food and fiber need projections are based on estimated population, per capita consumption, income, price and income elasticities of demand for farm products, and the net flow of agricultural production in international trade. Per capita disposable income is expected to increase and thus income and prices will not limit consumption. Increased per capita consumption of meat and other livestock products

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[1]The discussion in the balance of this section is extracted with slight modification from the following report: OBERS, Preliminary Agricultural Projections, April 14, 1972, U. S. Department of Agriculture, Economic Research Service, Natural Resource Economics Division.

is expected, and agricultural exports are expected to continue increasing but will represent a declining share of aggregate U. S. food and fiber output as importing countries become more self-sufficient.

Crop yields are projected to continue to increase but at a decreasing rate compared with the base period. The rate of increase in projected yields will decrease due to an assumed dampening of research and resource development in agriculture, and as national needs for food and fiber press against a limited land resource which, at the margin, is less productive than cropland now in production.

Historical 1947-1970 trends in state production relative to U. S. production of 31 of the major agricultural commodities are projected using regression analysis techniques. This technique permits historical trends in production shifts to continue at a decreasing rate of change through 2020. These projections are believed to reasonably project future production at the state, regional, and subarea levels.

Subsequently, in order to estimate future production at the water resource region and subarea levels, historical county data are used. County data are aggregated, by commodity, to the subarea portions of states and using state trends as a guide, projected to 1980, 2000, and 2020. The subarea pieces of states are then aggregated to water resource regions.

A land availability check was made to determine whether projected resources and productive capacities will support the production levels estimated for each state. Agricultural land availability is a function of the existing land base, expected increases through public and private resource development, and expected decreases due to growth in nonagricultural uses.

Earnings per worker, employment and relative wages in agriculture by economic areas for 10-year intervals from 1970 to 2020, were projected in conformity with the above assumptions relating to geographic distribution of production.

Data limitations, the quantity of calculations, and consistency requirements for the baseline projections dictate a general procedure for studying important variables such as distribution patterns of production by state, yields, and land base only in their relationship with time. Thus, there are no estimates of production functions, yield response curves, or interregional comparative advantage in production per se. Causal relationships between production and resource development and use were studied only indirectly as they have related in the past. These causal relationships are reduced to general assumptions as to the direction and rate of change in the projected variables over time under the baseline concept. Accordingly, the projections are not refined econometric estimates. However, these baseline projections are an internally consistent set of projections, both across geographic areas and with respect to the assumptions for the nation, and as such serve as a starting point for evaluating the need and opportunities for both public and private technical research and resource development in American agriculture.

Methodology of the Agricultural Projections[2]

The technique used to project State distribution of U.S. agricultural production was selected after consideration of alternatives in terms of relevance to the task. Historical 1947-1970 trends of the states' percentage distribution of national production for 31 major agricultural commodities were extended to 1980, 2000 using multiple regression analysis in the following manner: (1) when the linear trend in the states' share is increasing, the linear potential value calculated for 1990 is used as a constraint in a "Spillman type" function; the states' projected production will continue to increase through 2020 relative to the national total, but at a decreasing rate, and can approach but never exceed the linear potential for 1990. Conversely, [2] when the linear trend in the states' production as a percent of the U.S. total is decreasing, the value zero serves as a minimal constraint in a "Cobb-Douglas type" function; the states' percent of U.S. production will continue to decrease through 2020, but at a decreasing rate as it approaches but never reaches zero. This technique permits historical trends in regional production shifts to continue from 1970 through 2020 at a decreasing rate of adjustment as interregional comparative advantages tend to equate due to crop yields and resource levels approaching constraints imposed by assumption of natural phenomena. All production distributions for 1980, 2000, and

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[2] The discussion of this section is extracted with slight modification from the following report: OBERS, Preliminary Agricultural Projections, April 14, 1972, U. S. Department of Agriculture, Economic Research Service, Natural Resource Economics Division.

and 2020 are then summed and mechanically adjusted so that the total equals 100 percent. The projected values for each commodity were reviewed for reasonableness and consistency with states having similar characteristics. As a result of this evaluation, the mechanical projections of production for several commodities in several states were manually adjusted. These changes were made to further constrain or slow down state production changes which are not expected to occur as indicated by the computerized projections. Geographic distributions thus derived for each commodity in 1980, 2000, and 2020, are then applied to projected national requirements to derive the physical quantity of each commodity in each state for the three projection years.

Due to limitations of regression models in projecting complex agricultural production relationships far into the future, it is unrealistic to assume an ability to distribute projected agricultural output to the last unit. Thus, a level of one percent was arbitrarily chosen; and only those state commodity projections amounting to at least one percent of U. S. projected output were individually reported. This procedure results in 90 to 100 percent of each commodity's total output being reported by specific states in each projection year.

Implications for Texas

Because of the likely impact of the OBERS projections on federal policy with respect to agriculture and resource use, Texans are concerned about them. If Texas' shares of national food and fiber requirements are inaccurately or unreasonably computed, farmers and ranchers, farm suppliers, processors and others in the agricultural industry could be affected. Similarly, those with plans for land and/or water development for agricultural purposes could be affected by the projections.

It seems quite possible that the OBERS projections of national requirements and states' shares of requirements will significantly affect federal policy with respect to agriculture and resource use. The determination of adequacy of resources, for example, could result in reduction of federal support for conservation practices and reclamation projects. Subsidization of land-water developments for irrigation has long been a part of federal policy. It may be reduced or eliminated by the suggestion that additional irrigation of crops is not essential to our needs. Drainage projects might suffer a similar fate, though these may not be so important to farmers and ranchers in Texas.

Future farm programs may be significantly affected by the OBERS projections. Acreage controls and/or marketing quotas could be assigned on the basis of historic production of crops and projected locations of production and output in the states. These programs would thus <u>cause</u> the projections to be fulfilled. It is in the interest of every state to question the projections -- to check them for accuracy and reasonableness.

Soil conservation programs could be affected by the OBERS projections in much the same way that reclamation projects may be influenced. Many conservation measures are directed to the maintenance of productivity and the protection of land and water resources for future uses. Determination of adequacy of resources could cause complacency and lead us to relax our guard against erosion and pollution.

For these and other good reasons, the OBERS projections are important to Texas. The agricultural industry should view the projections with a critical eye, raising objections where they are found to be inappropriate to our situation with respect to the rest of the nation.

EVALUATION OF THE OBERS METHODOLOGY

The methodology employed by personnel of the Economic Research Service in computing the states' shares of U. S. food and fiber requirements, 1980-2000-2020, was noted in the introduction. Because it is so critical to the projection of future levels of output of crops in Texas, this methodology was evaluated for its relevance to the task of allocation of requirements.

An alternative to the trend projection approach of OBERS is projection of agricultural production via linear programming models that specify the most efficient use of resources in productive activities. An excellent illustration of this approach (and one that has been influential in studies of land and water use) is the study of land and water needs in agriculture done by Earl Heady, et.al. [4]. They developed a linear programming model which functioned to identify, within specified constraints, the locations of agricultural production and the quantities of land and water resources necessary to the satisfaction of our national needs for food and fiber at least cost. The United States was divided into 223 producing areas, 27 consuming regions and 51 water supply regions. The model was supplied with information on types and amounts of crop and livestock production in each of the producing areas, the interregional movement of intermediate and final products of agriculture, and land and water supply-demand balances for each of several sets of specified conditions. Outcomes were determined within a framework of selected sets of alternative assumptions relative to national agricultural policy, population, water price, exports and technology.

The model performed very well, suited as it was to the objective of the researchers, i.e. satisfaction of national food and fiber requirements at least cost. Locations of productive activities were appropriately specified and use of land and water resources consistent with cost minimization was identified. Land resources were found to be adequate for required agricultural activities and with relocation of some crops to eastern areas, water resources were sufficient.

It is interesting to note, however, that the distribution of agricultural production specified in the Heady model is significantly different from that which prevails, and projected land and water use indicates considerable changes in use of these resources. Output of the model suggests changes in location of production of some crops, changes in the use of irrigated land, more intensive use of some lands in areas with sufficient rainfall for crop production, etc.

One is led to wonder why crop production is located where it is, if the distribution of agricultural production is not economic, i.e. if resources are not efficiently used?

An important assumption of the Heady model (or others with similar purpose) is full comparative advantage. This means that economic considerations govern decisions about location of agricultural production. There are no restrictions on shifts of crops among regions; there are no constraints on output of crops; there is no control of resource use; there are no other extra-economic factors affecting decisions about location of productive activities. But full comparative advantage does not correspond to the situation within which producers make decisions about where and how much of the various crops to produce. Decisions are affected by production controls, conservation measures, subsidized resource developments and other institutional factors which are the result of federal programs. There are in addition other extra-economic considerations which include preferences for certain productive activities, limited information about alternative uses of resources, fixity of commitment of resources to existing productive activities, etc. These are all very real considerations in decisions about location of crop production and extent of resource use in various agricultural areas.

How relevant then are the more sophisticated modeling techniques to the projection of productive activity in agriculture and the determination of resource use?

The record of resource use in agricultural production in the various regions of the United States reflects the collective judgments of entrepreneurs about where our foods and fibers should be produced, in what quantities and at what times. All things considered -- the economic, and the extra-economic factors -- production of crops and livestock has developed so that our needs have been satisfied. Our foods and fibers have been modestly priced and our producers rewarded at least well enough that agricultural enterprise has survived. So why is not that record of agricultural production a good basis for projecting future uses of resources, prospective locations of productive activity and then movement of intermediate and final products of agriculture? Why is the baseline or trend projection approach not superior to the mathematical modeling approach?

Recent developments in agriculture strongly suggest that many of the extra-economic factors affecting decisions about locations of production, land and water uses, output, and movement of agricultural products will be less important in the future. Increasing populations, greater affluence and changed preferences have in the past decade or so made livestock production and feeding more important. Demands for feed grains have increased to the extent that surpluses have tended to disappear. Foreign demand for feed and food grains, e.g. the wheat sales to Russia, have further reduced stocks and even caused a movement toward increased acreage of these grains and high protein feeds. Prices of livestock, feed and food grains and many other agricultural commodities have risen. Price supports (commodity loans, subsidy payments, etc.) are increasingly irrelevant to production decisions.

Correspondingly there has been a movement away from federal programs that remove land from production. The Soil Bank, Conservation Reserve and other similar land retirement programs are not presently operative, and prospects are that they will not be necessary in the future as restraints on output of agriculture.

At the same time that demands for agricultural products have improved and prices have risen, there is increased interest in and pressure for a general reduction in federal activity related to agriculture (or perhaps the cries for assistance have weakened so that the "free enterprisers" are more easily heard). It now seems likely that many price support and acreage control programs will be phased out, with expectation that they will not again be needed. In addition, some conservation and resource development programs are being questioned. Reclamation projects are at a standstill; flood control projects are stalled; and soil erosion programs are decreasingly well supported. To the extent that these land-use development programs are reduced or eliminated, decision-making will have a greater number of alternatives to choose among and their freedom of choice of land use will be increased. And as extra-economic considerations are less and less important, economic factors will weigh more heavily in decisions.

So how useful is the trend projection approach, reflecting as it does a period of time which is unlike our prospective future? Are production patterns, acreages, and yields of 1947-71, affected as they were by production controls, price supports and land use regulations, pertinent to projections of future locations of production, resource uses, etc.?

The judgment of the federal personnel responsible for the OBERS projections was that the recent history of agriculture, as it is revealed by data on output, yields, and resource use within states and regions, is relevant to projections of future land use, crops production and locations of agricultural production. One might wish for a projection method in between the mathematical modeling and the trend projection approaches. The former takes too little account of extra-economic and non-economic considerations in production decisions. The latter ties the future too closely to the past, fixing production patterns to a past that may be irrelevant. But the projections of location of productive activities, of output, of yields and of land and water use have been made on the basis of the recent history of agriculture. Any changes in the projections which might involve a different methodology seem unlikely. So what is left for us to question?

PURPOSE OF THIS STUDY

It seems possible, perhaps even likely, that some errors of fact and/or judgment may have been made in the process of allocation of national requirements among states. There may be instances where data are inadequate for the correct expression of a region's or state's productive capacity with respect to a commodity. Perhaps the history of production is too short; maybe droughts, freezes or excess moisture situations have biased the data; perhaps there are peculiar growth characteristics of a crop that make yields erratic. There might also be very recent or prospective technological developments that would significantly affect yields of a crop in a state or region. Such developments would change the region's competitive position, but this would not show up in the history of crop production. Land and water developments affecting the productivity of an area, the crops that can be grown and the yields that can be realized, are not revealed in historic data. With changing demands for some foods and fibers such developments may be feasible, may be planned for the near future or even underway at the present time.

In this project we have searched for errors of fact and judgment as they have affected projections of Texas' shares of national food and fiber requirements. We have examined the data used in the determination of trends and the projections of yield and output. We have inquired about technology in agriculture that could make Texas producers more competitive. We have considered the prospects for land and water developments that would make these resources more productive. We have tried to discover and evaluate those factors and circumstances that are pertinent to the competitive positions of Texas producers of foods and fibers and which have not been revealed in the projection of trends.

PROCEDURE

In evaluating the OBERS projections, agricultural experts in economics, agronomy, horticulture, animal science, and other fields were interviewed at their locations in all areas of the state. Major production areas for each commodity were defined through a review of pertinent literature [5, 6, 7, 8, 9, 10, 11, 12] and in each area the interviews concentrated on major local crop and livestock industries. In this manner every listed commodity was investigated. Whenever projections for a given commodity were viewed by local experts as being questionable, further inquiries regarding that commodity were emphasized in other production areas.

Interviewees were given a review of the assumptions, data sources, and methodology utilized in the projections, and were shown statistical and graphic interpretations of projection data. They were encouraged to comment on the relevance of the projections in regard to their own area and to the state as a whole, and to volunteer whatever pertinent information they had at their disposal concerning state and local trends and recent and expected developments.

These state-wide interviews form the basis for the brief discussions of individual commodities that follow. Presented with the discussion, in Tables 1 through 27, are the OBERS projections of acreage, yield, production, and Texas' share for 1980, 2000 and 2020. These projections, as well as historical data for the 1947-70 period, are plotted in Figures 1 through 26 in the Appendix. In cases of questionable projections, more detail has been sought, and further reference has been made to recent production data and relevant publications. It should be noted that only those commodities which Texas has supplied or is expected to supply in quantities greater than one percent of the U.S. total are included.

COMMODITY ANALYSES

Cotton

Cotton is currently the most important Texas crop. The state consistently produces around 30 percent of national output. Most cotton is grown in the high plains, although significant acreages are also found in the rolling plains, southern Texas, and the blacklands [5].

A glance at Table 1, which shows the OBERS projections for Texas cotton, will show that this percentage is expected to be maintained, although significant changes will take place in acreage ratios and production. A sharp decrease in dryland acreage and a slight reduction in total acreage are projected for 1980, with increases in irrigated acreage, average yield, and production. The trend to more irrigation is expected to be reversed after 1980, with accompanying increases in dryland and total acreages.

This trend beyond 1980 toward more dryland cotton farming is justified by the expected decline in available water supplies in the high plains area. Research station staff with TAES, both at Lubbock and College Station, agree that as the local water supplies dwindle, more and more acreage will be planted to dryland cotton. In the High

Plains a great part of this may require skip-row planting. This will undoubtedly reduce average yields, as projected by OBERS for 2000 and 2020, but will not constitute a drawback for planting cotton in place of other crops, since nothing can compete with it economically on dryland acreage in the high plains area. So, indications are that as the high plains water supply declines, cotton will become an even more important crop to the area in terms of acreage devoted to it.

In the Rolling Plains, cotton acreage is now almost entirely dryland, and on this dryland acreage is found the lowest cost of production in the country. State cotton experts believe that the outlook for this and other secondary cotton producing areas is outstanding, and that Texas will easily maintain the production levels that are projected for future years.

The rather large increases in Texas production over the projection period with almost no change in the percent share of United States production reflect an increasingly favorable situation for the U. S. cotton industry. Remarks by TAES economists bear this out. The expected energy crisis may cut back production of competing synthetics after 1980, increasing the demand for cotton. Also, new developments in harvesting, ginning, and handling of cotton are beginning to have an impact on the cost of production. These and other factors could lead to a phase-out of government subsidies and the growth of a self-sustaining cotton industry. Generally, the long run outlook for cotton production in Texas is favorable, and this expectation is reflected in the OBERS projections for this commodity.

Table 1. Present and Projected Acreage, Yields and Production of Cotton, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 lbs.)	1,503,753.0	1,773,110.0	1,931,915.0	2,090,664.0
Percent of U. S. Production	28.9	30.8	30.9	30.9
Total Acreage	4,964,687	4,440,141	5,880,956	6,935,052
Irrigated	1,732,031	2,161,752	1,447,545	1,030,969
Dryland	3,232,656	2,278,389	4,433,411	5,094,083
Average Yield (lbs.)	303	399	328	301
Value (1000 dollars)		350,689.5	382,110.0	413,511.0

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 2. Present and Projected Acreage, Yields and Production of Grain Sorghum, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	286,941.3	526,170.8	659,044.4	815,539.6
Percent of U.S. Production	42.4	45.4	44.4	44.4
Total Acreage	6,079,264	8,363,826	9,303,980	10,809,617
Irrigated	2,018,775	2,513,132	1,682,835	1,198,547
Dryland	4,060,489	5,850,694	7,621,145	9,611,070
Average Yield (bu.)	47.2	62.9	70.8	75.4
Value (1000 dollars)		531,411.5	665,608.3	823,662.0

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Grain Sorghum

In recent years, grain sorghum has held a position second only to cotton among Texas crops. As can be seen in Table 2, grain sorghum will take over as the most valuable single crop in Texas by 1980. OBERS projections indicate that it will maintain this position throughout the survey period. The state will continue to provide well over 40 percent of the United States total production of this grain.

OBERS projections (Table 2) indicate that acreage trends will be much the same as for cotton, although total acreage increases are projected to be even higher. The same trend away from irrigated acreage after 1980 is evident, primarily due to the fact that a major production area is the Southern High Plains, where water supplies are expected to decline drastically.

As the water situation worsens in the High Plains, irrigated sorghum acreage will disappear from much of its current range. Very significant locational shifts will have to take place in Texas grain sorghum production in order to achieve the kind of growth projected by OBERS after 1980. Production and marketing experts indicate that this shift can occur, and that new and increased acreages of grain sorghum are likely to appear farther north in the High Plains where water levels are not so critical, in the Rolling Plains, North Central Texas, East Texas, and in southern and coastal areas.

Although an increasingly large share of the new grain acreage will be dryland, projections are that average yields will continue to improve, as indicated by the OBERS data. Texas will have an estimated

10.8 million acres in grain sorghum by 2020, with an average yield of 75.4 bushels and state production of 815,539,600 bushels. This represents a 44.4 percent share of projected total U.S. output.

Again, as for cotton, the outlook for the grain sorghum industry is very good. Factors affecting demand include the growth of the feedlot industry and the increasing trend to produce more meat on less acreage.

Vegetables

Historically, Texas has provided between 4.5 and 7.8 percent of total U.S. output of all vegetables (Figure 3, Appendix), making the state a leader in the industry. In production of vegetables for the fresh market, Texas currently ranks third [15]. The major vegetable-producing areas of Texas are found south and southwest of San Antonio; although other areas including East Texas, the High Plains and the north-central part of the state also produce significant quantities of these crops.

The OBERS projections (Table 3) express yields in terms of an aggregate of all important Texas vegetables, with no breakdown as to variety, making yield projection evaluation somewhat speculative. Although Texas vegetable specialists were disappointed in the yield projection methodology, they were able to evaluate the projections in view of conditions in their areas and the state as a whole. In every instance it was felt that OBERS had projected yields below local expectations.

Several reasons were given for this disagreement. The most important of these was the universal feeling that Texas, as a vegetable producer, is chronologically "lagged" in development behind other vegetable producing states. The implication here is that Texas has more room for improvement, and that this improvement can come faster than in other areas, which are approaching their potential in yields. A favorite example was California, a state with an intensive and highly developed vegetable industry. In 1971, for example, California had 28.9 percent of U.S. fresh vegetable acreage and a hefty 39.6 percent of production. Texas, in the same year, held 12.8 percent of the total acreage but produced only 9.9 percent of total U.S. fresh vegetables [13]. These statistics demonstrate a substantial difference in yields, and Texas specialists look upon this as an indication of the progress they expect Texas to make in coming years in improving vegetable yields. In short, it is felt that Texas vegetable growers are currently obtaining yields that are about halfway to potential yields, and since other major areas in the nation are approaching their yield potentials, Texas will make considerable progress in the next few years.

Regarding acreage projections (Table 3), disagreement was also encountered. While disagreement over acreage projections was not as intense nor as universal as disagreement over yield and production projections, it was still widely expressed. Generally, expectations are that vegetable acreage in Texas will increase with consumer demand for more processed commodities. TAES research and extension staff do not foresee a declining acreage situation as projected by OBERS.

Obviously, projections for Texas production and percent of national production were found to be wanting in view of the disagreement on yield and acreage projections. Specialists in production and marketing of vegetables agree that projected production levels are quite low and that Texas' share of U.S. production is bound to increase. It certainly will not decline as projected in Table 3.

Interviewees at every research center visited noted increasing interest and activity in the vegetable business. Horticulturists viewed yield improvement as progressing well. In fact, Texas experts predict that state production could easily be doubled on existing acreage, in view of the rapid progress in yield improvement that is currently taking place. Due to poor planting conditions in many areas vegetable acreage fell slightly in Texas in 1971 to 214,000 acres. Yet production for the state was 24,155,000 cwt. [13]. These figures represent an average yield of about 112 cwt. per acre, for a 10 percent increase over 1969 yields.

In addition, it is felt that other major vegetable producing areas are not only reaching their potential in yields, but are also facing other problems, such as land loss to urbanization and severe water problems, that are not yet limiting factors in the overall picture of Texas vegetable production. OBERS projections for Texas

Table 3. Present and Projected Acreage, Yields and Production of Vegetables and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 cwt.)	23,230.0	26,785.6	28,944.1	31,396.5
Percent of U. S. Production	5.68	4.95	4.12	3.44
Total Acreage	228,848	219,856	186,753	178,546
Irrigated	156,151	160,000	160,000	160,000
Dryland	72,697	59,856	26,753	18,546
Average Yield (cwt.)	102.0	121.8	155.0	176.0
Value (1000 dollars)		114,630.4	123,865.9	134,221.0

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 4. Present and Projected Acreage, Yields and Production of Wheat, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	63,739.0	68,686.2	74,308.5	81,001.3
Percent of U. S. Production	3.4	4.5	4.1	3.9
Total Acreage	2,725,580	2,509,111	2,570,873	2,836,764
Irrigated	688,243	855,534	572,880	408,016
Dryland	2,037,337			
Average Yield (bu.)	23.4	27.3	28.9	28.5
Value (1000 dolars)		100,278.7	108,490.3	118,262.1

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

acreage, yields, production, and percent of national vegetable output do not appear justified, therefore, in view of reports from the field and recent production data.

Wheat

Historically, wheat has been one of the most important of Texas crops. It is expected to maintain a position in the top five crops, by value, throughout the projection period.

OBERS projections (Table 4) show that Texas production is expected to increase through 2020. Total acreage is projected to decline very slightly by 1980, with an increase thereafter. Irrigated acreage will increase to 1980 and decline thereafter. Again, the reasons for the acreage shift away from irrigation is the expected water crisis in the Southern High Plains. This reduction in irrigated acreage will be more than made up by additions to the dryland acreage in the High Plains, the Rolling Plains, and the Blacklands. These are the three major wheat producing areas in Texas, and experts at all three were confident that their areas could increase output to projection levels.

In fact, Texas economists were quite optimistic in regard to the future of the wheat industry here. Strict government controls and generally poor prices have caused lower production of wheat in recent years (Figure 4, Appendix). This trend is reversing for several reasons. Wheat prices are improving, and Russia, Japan and China are viewed as excellent potential markets for export. The government may relinquish some control, and the open market price could increase significantly. Wheat is an easy crop to grow, and being a winter crop, does not compete with cotton or grain sorghum. The same cropland can be used.

Generally, the outlook for wheat is good. State and local experts reported that the projections are reasonable and can be met, given a favorable price situation. In fact, the consensus was that the projections of production in Texas are too low. It is a situation that bears close observation, since very favorable price trends could change the production picture overnight.

Rice

Texas has long been a leading producer of rice. The state has consistently provided between 20 and 30 percent of national output (Figure 5, Appendix). Rice is produced in the southeastern section of the state. The OBERS projections call for significant decreases in Texas rice acreage and a decline in the state share of U.S. production (Table 5). In Texas, however, this projection finds no support.

Since land availability is not expected to be a severely limiting factor affecting rice acreage in Texas, projections for a decline are felt to be in error. Currently rice acreage is set through an allotment system, and Texas has received a 20 percent increase this year. In 1971, 468,000 acres were planted and harvested [13], and estimates are that over 550,000 acres are being planted this year. (Lower allotments resulted in slightly smaller acreages in 1970, 71 and 72). It is not likely that acreages will decrease, and they certainly should not drop below 400,000 acres at any time in the 1980-2020 period.

Water for irrigation of rice is not seen as a limiting factor, either, although in the western half of the Texas production area the availability of water for drastic acreage increases would be questionable. In the eastern section of the production area water is plentiful in the basins of the Neches, Sabine and Trinity Rivers. Also, water is not as limiting as it once was. It is estimated that an acre of Texas rice requires 25 percent less water than it did ten years ago. This is due to the increasing use of land leveling machines. Previously, slopes were used for rice, and in order to cover the upper sections of a field with an inch of water, the lower contours had to be covered with several inches. With new technology, fields are almost perfectly level, and water waste is at a minimum.

At Texas A&M, it is felt that even with continued intensive urbanization and no development of new water sources, Texas rice acreage will remain fairly stable around a half-million acres, and will not drop to projected levels shown in Table 5. If needed, land for rice production is available throughout the producing area of southeastern Texas.

Yield projections are viewed as being reasonable, since Texas yields have increased from 3000 pounds in 1960 to around 4800 to 5100 pounds in recent seasons. The projected 5520 pounds for 1980 appears to be easily within reach of Texas producers.

Expectations are that the production of rice in Texas is certain to top the OBERS projections. Production levels in 1971 and 1972

Table 5. Present and Projected Acreage, Yields and Production of Rice, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 cwt.)	22,540.5	23,490.0	25,898.1	28,954.1
Percent of U. S. Production	23.6	23.9	22.3	21.0
Total Acreage (Irrigated)	576,707	425,545	371,885	361,881
Average Yield (cwt.)	39.1	55.2	69.6	80.0
Value (1000 dollars)		116,043.0	127,939.4	143,033.7

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 6. Present and Projected Acreage, Yields and Production of Peanuts, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 lbs.)	382,428.7	569,932	779,906.7	864,513.0
Percent of U. S. Production	15.3	13.8	14.6	15.4
Total Acreage	282,066	409,227	538,391	682,936
Irrigated	96,991	122,219	81,840	58,288
Dryland	185,075	287,008	456,551	624,648
Average Yield (lbs.)	1,356	1,392	1,448	1,384
Value (1000 dollars)		63,833.1	87,350.5	115,358.3

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

almost reached the projected 1980 level, and current acreage increases will undoubtedly result in even higher levels. It seems likely that production in coming years will easily surpass future projections, and no cutbacks are foreseen locally.

In regard to Texas' share of U.S. rice production, here again the projections were viewed as too low. Historically, Texas' percentage has been quite consistent, and the decline to 21 percent by 2020 (Table 5) does not seem likely, especially in view of the fact that in 1971 Texas provided 27 percent of total U.S. rice output [13]. Since acreage will probably be considerably higher than projections indicate, the high projected yields should result in substantial increases in production and percentage of U.S. production over the projected levels for 1980, 2000 and 2020.

Peanuts

Texas consistently provides between 10 and 15 percent of the U.S. peanut crop (Figure 6, Appendix). Historically the state has been a leader in this industry. Major production areas are located in the Cross Timbers in the north central part of the state.

The OBERS projections (Table 6) show good increases in acreage and production for Texas, but nearly stable yields and percentage share of national output. A factor in the projections for poor yield improvement is the expectation that irrigated acreage will decline in realtive importance in the acreage mix, especially after

1980. These projections are viewed as questionable by TAES specialists in the major production areas.

Texas specialists point out that most irrigated peanut acreage receives water from annually recharged wells. In view of the availability of this and alternative sources of water in the Central Texas region, no reason can be found for the projected drop in irrigated peanut acreage nor for the resultant poor projections for yields. In fact, local trends indicate more widespread use of irrigation in Texas peanut production. In many areas peanut acreages are becoming more concentrated with the larger growers taking over more of the production. Results are often more specialized operations and better yields. The larger growers tend to operate more efficiently and to utilize the most suitable croplands. Since water availability is not expected to be limiting on the increasing use of irrigation for peanuts in the Blacklands and Cross Timbers, it appears likely that TAES staff are correct in questioning the OBERS projections for a decline in irrigated acreage.

While interviewees in major production areas were very concerned with the projections regarding acreage, major disagreement was also encountered in response to projections for Texas peanut yields. Average yields are projected to be 1392 pounds, 1448 pounds, and 1384 pounds in 1980, 2000, and 2020, respectively. Given the actual average yields of 1450 pounds in 1968 and in 1970 (Figure 6, Appendix), these projections allow Texas no room for improvement. Since an average yield of 800 pounds was not reached in Texas until 1962 (Figure 6, Appendix), the outstanding progress obtained in the last decade further indicates that the OBERS projections are not reasonable.

Currently, the best Texas acreages achieve yields of about 5,000 pounds per acre. The state average is around 1,500 pounds. As acreages shift to more productive land and practices, these yields will surely continue to rise; but the most rapid progress in Texas peanut yields is expected to come from the introduction of new varieties that are even better suited to local conditions. One of these new varieties will make its Texas appearance soon, and is expected to result in increases in local yields from 10 to 15 percent, practically overnight. This particular variety was apparently developed in Georgia, where average yields of 2,500 pounds were obtained last year.

Since peanut acreage is strictly controlled under a government allotment system, Texas specialists do not expect any significant changes in the percent share of U.S. production, and they believe that the projections of lower shares in 1980 and 2000 are incorrect. They consider stability the more likely course for the share of national output, and do not expect Texas' share to drop below the 15 percent level.

Production, they believe, could easily surpass the projected levels, assuming that irrigated acreage and yields come up to their expectations. Basically, it is estimated that yields will be substantially higher than projected in 1980, 2000 and 2020; and that production will reach levels necessary to at least maintain Texas' current share of U.S. production.

Oats

Oats are produced primarily in the Rolling Plains and in the Cross Timbers and Blacklands of North Central Texas. The state generally accounts for around two or three percent of national output (Figure 7, Appendix).

The OBERS projections show a fairly stable situation for Texas oats over the coming 50 years, with little real change in anything except yields. Acreage is expected to be entirely dryland by 1980 (Table 7).

The projections show a slight drop in production from 1969 to 1980, and small increases in 2000 and 2020. In view of recent historical data (Figure 7, Appendix) and comments by some TAES specialists, these projections appear reasonable, since Texas oat production shows considerable fluctuation.

Interviewees in the Blacklands expect oat production for grain to decline, as predicted by OBERS, in that area in the short run. Reasons given for this outlook included the fact that oat yields and prices make it a less profitable crop than others that compete for local land use, and secondly, that most of the oat acreage planted is used for grazing and then baled for hay.

In the Rolling Plains, a decline in production by 1980 is not expected. Oat acreage has increased in this region in recent years,

Table 7. Present and Projected Acreage, Yields and Production of Oats, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	23,193.8	22,445.7	25,588.1	28,536.3
Percent of U. S. Production	2.6	2.6	2.9	3.1
Total Acreage	620,664	621,765	593,691	595,747
Irrigated	15,248			
Dryland	605,416	621,765	593,691	595,747
Average Yield (bu.)	19.5	36.1	43.1	47.9
Value (1000 dollars)		18,405.6	20,980.9	23,388.9

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

and excellent average dryland yields of 36 bushels have been obtained. This increase is expected to continue. The long term projections, however, appear reasonable to area specialists; and in view of declines in other state areas, the slight production drop projected for the 1969-1980 period could easily occur.

TAES research and extension staff are generally in agreement with projections made by OBERS regarding state production trends. The outlook for Texas oats is therefore one of very little significant change.

Potatoes

Texas is a fairly important producer of both Irish potatoes and sweet potatoes. The production areas for these two crops are separate and quite concentrated.

The most significant Irish potato production is on the High Plains. This acreage is almost entirely irrigated, and the projected trend is a continued increase in acreage (Table 8). OBERS projections show consistent improvement in yields and increasing production and share of national output. This kind of increase can probably be obtained although some experts warn that the high plains water situation will have an impact on potato production and acreage. Since potatoes have a high water requirement, it is likely that some location shift, possibly northward into the northern plains area, will have to take place as water supplies decline in existing production areas.

Table 8. Present and Projected Acreage, Yields and Production of Irish Potatoes, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 cwt.)	3,423.4	5,060.8	7,534.4	10,261.2
Percent of U. S. Production	1.4	1.5	1.7	1.8
Total Acreage (Irrigated)	21,621	23,539	26,813	21,284
Average Yield (cwt.)	158	215	281	328
Value (1000 dollars) All Potatoes		21,082.1	29,284.2	39,067.6

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 9. Present and Projected Acreage, Yields and Production of Sweet Potatoes, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 cwt.)	375.0	708.2	645.4	718.5
Percent of U. S. Production	5.4	5.3	4.6	4.1
Total Acreage (Dryland)	5,954	7,782	5,763	5,613
Average Yield (cwt.)	63	91	112	128
Value (1000 dollars)		See Irish Potatoes, Table 8		

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Sweet potatoes are grown in East Texas, primarily on dryland acreages, since rainfall is sufficient in this area for good production. OBERS projections are for a slight acreage increase to 1980 and a gradual decline thereafter (Table 9). Production figures show basically the same trend, although yields should increase throughout the period. The percent share of total U.S. production will decline slightly after 1980, but will remain above four percent through 2020. Local experts state that yields and production could be doubled on existing acreage with the use of irrigation. However, they do not expect any large scale use of irrigation by local growers, since they are reluctant to go to the expense of bringing in water when normal rainfall is usually sufficient to produce good returns. Acreage reductions in this crop will probably be replaced by other vegetable crops. If future price situations make irrigation practical, the water is readily available, and significant changes in the production picture could take place.

Sugarbeets

Texas sugarbeet production is concentrated in a few counties in the High Plains. Really significant acreages are found only in Castro, Deaf Smith and Parmer counties in Extension District 1.

The OBERS projections indicate substantial increases in Texas sugarbeet production levels. Acreage projections show a decline in acreage from 1969 to 1980, and an increase in acreage beyond 1980. All acreage is expected to be irrigated by 1980 (Table 10). Experts on the high

Table 10. Present and Projected Acreage, Yields and Production of Sugarbeets, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 tons)	752.2	639.9	1,017.9	1,493.1
Percent of U. S. Production	2.6	2.7	2.7	2.7
Total Acreage (Irrigated)	39,398	25,802	34,623	45,521
Average Yield (tons)	19.1	24.8	29.4	32.8
Value (1000 dollars)		7,805.5	12,419.6	18,214.6

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 11. Present and Projected Acreage, Yields and Production of Barley, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	3,593.0	7,211.3	10,538.3	14.056.3
Percent of U. S. Production	.9	1.4	1.6	1.9
Total Acreage	105,466	226,770	270,907	320,189
Irrigated	18,784			
Dryland	86,682	226,770	270,907	320,189
Average Yield (bu.)	34.1	31.3	38.9	43.9
Value (1000 dollars)		7,210.0	10,540.9	14,055.7

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

plains feel that in order to attain such acreage increases, some shifts in the location of sugarbeet production will have to take place. This will probably involve a gradual move to the North, where the water situation is not so critical, by the turn of the century.

Yields are projected to continue improving with substantial increases throughout the period. This factor, along with the shift to total irrigation and increasing acreages, means that Texas sugarbeet production will grow significantly, and that the state's share of U.S. output will be maintained at around 2.7 percent.

Barley

Texas barley production in recent years has rarely surpassed one percent of the U.S. total (Figure 11, Appendix). In 1971, due to poor weather conditions, state production was at its lowest level since 1952. Texas production is scattered, although major areas are the Northern High Plains and the Rolling Plains.

According to OBERS projections cited in Table 11, acreage, yields, and production of this minor crop are to increase. Acreage is expected to be all dryland from 1980 on, and substantial increases are projected. Texas experts view this as a reasonable projection, since as water utilization becomes more and more crucial in the High Plains, good dryland crops will gain in importance.

In the Rolling Plains, barley is used as a catch crop and production fluctuates from year to year. In this area, dryland yields consistently top 30 bushels, and experts feel that the Rolling Plains can easily maintain or surpass its share of projected production increases.

So, the outlook for barley in Texas is good throughout the projection period. The state production and share of national output are expected to increase substantially. Remarks by Texas experts bear out these projections and indicate that the state can easily achieve them.

Citrus Fruits

Due to several damaging freezes in the last quarter century, the Texas citrus industry has had a rather inconsistent history (Figure 12, Appendix). The state continues to maintain a position of importance in the U.S. citrus industry, however, by being one of only four states where citrus is grown. In spite of the several unusual freezes, Texas growers and researchers continue to make progress in the goal of attaining once again the high production levels of the early 1940's. The citrus industry in Texas is concentrated in the Lower Rio Grande Valley in the southern-most section of the state.

The OBERS projections for Texas citrus (Table 12) show a gradual increase in production and acreage (until 2000), and a declining share of national output. Yields are projected to rise gradually after a low level of 4.5 tons per acre in 1980.

Among all TAES specialists interviewed in all areas, probably the most intense disagreement encountered regarding the OBERS projections was met in regard to the projections concerning citrus fruits.

The disagreement took place in regard to projections for every phase of citrus production with the exception of acreage, where projections were felt to be within reason or possibly even optimistic. In all other phases of the Texas citrus industry, projections were viewed as grossly underestimated, assuming, as the OBERS staff did, that no freeze damage of severe proportions would occur.

The projections for average citrus yields (all oranges and grapefruit) show 4.5 tons per acre for 1980, 5.2 for 2000, and 6.3 tons for 2020 (Table 12). These are viewed as exceedingly low estimates. Table 12 shows that the average yield in the 1968-69 season was 6.18 tons, a figure that approaches the projection for 2020. According to more recent data [8, 14], the average citrus yield in 1970 was over 6.5 tons per acre. In 1971 total production was 683,000 tons and the yield was over eight tons per acre. In the 1971-72 season yields averaged about eight tons again, in spite of poor weather conditions in the growing season. The preliminary reports for the 1972-73 season indicate an average yield of over nine tons per acre.

TAES specialists insist that this is the kind of progress that can be expected in yield improvement in the Texas citrus industry. The expect average yields of over 12 tons by 1980, 14 or 15 tons by 2000, and at least 16 or 17 tons per acre by 2020.

State horticulturists give the following breakdown of yields by variety for the 1970-71 season. Actual Texas yields were 10.25 tons for

Table 12. Present and Projected Acreage, Yields and Production of Citrus Fruits, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 tons)	470	534.3	728.2	849.9
Percent of U. S. Production	4.19	3.7	3.7	3.3
Total Acreage	76,067	118,783	140,039	134,907
Average Yield (tons)	6.18	4.5	5.2	6.3
Value (1000 dollars)	See Non-Citrus Fruits and Nuts, Table 14			

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 13. Texas Citrus Fruit Production by Variety, for 1970-71, 1971-72, 1972-73, in Tons

	1970-71	1971-72	1972-73[1/]
Early oranges	180,000	171,000	202,500
Valencia oranges	99,000	90,000	103,500
Grapefruit	404,000	368,000	416,000
All Citrus	683,000	629,000	722,000

1/ Preliminary Estimates

Source: U. S. Department of Agriculture, "Fruit Situation," Economic Research Service, Washington, D.C., February, 1973.

grapefruit, 8.30 tons for early oranges, and 7.00 tons for Valencia oranges. The best yields were 18 tons for grapefruit, 16 tons for early oranges, and 13 tons for Valencia oranges. According to area citrus experts, these figures represent no more than half the yield potential.

Obviously, with current average yield at twice the level projected for 1980, the OBERS projections are entirely too low. One reason for this underestimation could be that OBERS, using the baseline techniques with heavy emphasis on recent historical data, failed to properly consider the fact that a great deal of the Texas citrus acreage has been in a rebuilding stage, or in new plantings that are still in pre-peak production stages. Periodic freezes and severe hurricane damage in 1968 have significantly affected citrus production in the last two decades, and any projection technique utilizing historical bases for citrus production in Texas could easily give undue emphasis to poor results arising from these unusual circumstances.

TAES specialists view the yield situation as one of continued progress. A great deal of research, both public and private, is being carried on. Significant acreages of young groves that are not yet at peak production will continue to contribute to better yields. Also, much of the lower-yield orange acreage is being phased out and replaced with higher yielding grapefruit trees. The outlook for yield improvement is therefore very bright, and the OBERS projections do not appear to be justified in view of these arguments.

In regard to production projections, there was also intense disagreement. Since actual 1970 production was 513,000 tons (Figure 12, Appendix), the projection of 534,000 tons for 1980 allows for only a 21,000 ton increase in annual production over a ten-year period. Since 1963 the average annual increase in production has been much higher than this figure. Also, more recent results (Table 13) that already surpassed future projections add weight to the argument that OBERS has incorrectly estimated future production levels.

The results from the seasons 1970-71 through 1972-73 show that actual Texas production has consistently been higher than the OBERS projection for 1980, and that production is approaching the level projected for the year 2000. These recent results are represented graphically by the dotted lines on the projection curve in Figure 12 of the Appendix. It is clear that Texas production has been grossly underestimated, assuming that freeze damage will be at a minimum.

Severe freezes are always a risk for Texas citrus. Although the probability of freeze is no greater than in other citrus areas, damage to the Texas industry is generally great, due to the geographically concentrated nature of state citrus production [2]. Texas A&M University spends a considerable amount of money annually on freeze protection research. A breakthrough in this area could make projections based on historical data obsolete. Although some Texas growers now have freeze protection, it is by no means widespread at this time.

TAES citrus specialists agree that state production will continue to increase. Acreage is still rising, and the excellent progress in yield improvement signals substantial production increases. One indication of expected growth is that all rootstock, or all of the nursery production, of young grapefruit trees for the next five years is already contracted for by Texas growers.

Several TAES researchers [1] predict that by the 1974-75 season, there will be 80,461 acres in various stages of citrus production with yields averaging over 12 tons per acre, for a production of 1,019,750 tons. This kind of growth indicates that the Texas citrus industry is definitely in a period of dynamic activity, and not in a nearly stable situation as indicated by the OBERS projections.

Projected shares of national production for Texas (Table 12) show a decline in the state's importance as a citrus supplier. Here again Texas specialists disagree with OBERS. Texas' share of U.S. output has increased yearly since the last bad freeze (1962), with the exception of 1968, when a hurricane damaged groves in the Lower Rio Grande Valley (Figure 12, Appendix). Current activity and recent results indicate that this trend will continue, and that the Texas citrus industry is on its way to regaining the position it held before the last series of severe freezes began in 1949.

Non-Citrus Fruits and Nuts

In spite of some regional importance, production of non-citrus fruits and nuts in Texas is of minor consequence. In Table 14 it can be noted that the state's share of national output does not approach the one percent level. However, projections appear in the OBERS data because these commodities were considered along with citrus fruits to make up the category of all fruits and nuts.

East Texas is the major production area for non-citrus fruits such as peaches and berries. Pecans are grown to some extent throughout the state, although the heaviest production occurs in the central area of Texas.

OBERS projections (Table 14) indicate a gradual decline in acreage, production and percent share of U.S. production. Regarding fruits, horticulturists and economists in East Texas view the projections as being reasonable. Fruit production has declined in that area in recent years (Figure 13, Appendix), and prospects for improvement are not outstanding for the short run. Increasing labor costs, lack of mechanical harvesting, disease problems, and competition for land use were listed as major factors in the local decline of the fruit industry. Some research is being undertaken in East Texas to develop and promote new varieties of berries, but it is too early to speculate on the effects of this work on future production.

In other areas of the state, more optimistic reports were heard. In the Cross Timbers and Blacklands, for example, non-citrus fruits and pecans were cited as entering a growth stage, with increasing interest and activity. Many small fruit and pecan orchards are being planted, and considerable local promotion is evident. Also, some large-scale pecan planting has been reported.

Table 14. Present and Projected Acreage, Yields and Production of Non-Citrus Fruits and Nuts, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 tons)	28.0	27.3	24.1	23.2
Percent of U. S. Production	.24	.25	.19	.15
Total Acreage		187,857	141,765	122,105
Average Yield (tons)		.14	.17	.19
Value (1000 dollars) All Fruits and Nuts		34,178.3	45,873.8	53,203.4

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 15. Percent and Projected Acreage, Yields and Production of Soybeans, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	6,561.2	12,395.7	20,419.0	27,519.3
Percent of U. S. Production	.65		1.09	1.25
Total Acreage	245,643	353,878	583,813	803,623
Irrigated	165,591	206,245	138,105	98,361
Dryland	80,052	147,633	445,708	705,262
Average Yield (bu.)	26.7	35.0	34.9	34.2
Value (1000 dollars)			48,198.0	64,958.5

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

The long range effects of this activity on the projected production levels cannot yet be evaluated, especially in view of the questionable situation in the East Texas fruit industry and the time lag that is necessary in achieving production on new fruit and pecan plantings. So it is reasonable to assume for the time being that the OBERS projections have a sound basis in actuality, although this industry is one that could undergo significant change by around the turn of the century if current interest continues.

Soybeans

Throughout the rather short history of soybean production (Figure 14, Appendix), Texas has not been a major supplier. However the acreage planted and output has increased significantly in recent years, and the projections of production show continued increases to 2020. Texas' share of U.S. output will top the 1 percent mark, making this crop a significant one, both in terms of production and value.

Projections show that soybean acreage in Texas will increase from the 1969 level of a quarter million acres to over one half million by 2000 and over three quarters of a million by the year 2020 (Table 15). An increasingly smaller share of this will be irrigated, and average yield figures suffer slightly because of this shift after 1980. Production is expected to top 20 million bushels by the turn of the century, for a share of U.S. production of 1.09 percent.

Major production areas now are the Southern High Plains, northeast Texas, and the upper coast area of southeastern Texas. In the High

Plains, soybeans are usually considered a catch crop. For existing varieties at current prices, irrigation is necessary in the High Plains, and this could have an effect on area production after 1980.

Production in East Texas is expected to increase, in line with OBERS projections. Most acreage here is in the Red River area.

For the state as a whole, production is currently increasing at a rate faster than that anticipated by OBERS projections. This is partly due to the abnormally high demand for protein products, and current estimates of acreage do reflect this demand. Texas soybean acreage was at a rather low 103,000 acres harvested in 1971. In 1972 225,000 acres were planted and an estimated 350,000 acres will be planted in 1973 [3]. This is very close to the projected 353,878 acres for 1980.

In spite of the fact that current high demand for soybeans could be pushing Texas production to artificial highs, the situation does bear watching. Recent increases should be considered a preliminary indication that the OBERS projections may have underestimated Texas soybean production for future years. In any event, the outlook for this commodity in Texas is very good indeed, and state agricultural experts foresee no difficulty in maintaining production level increases at least as favorable as projected.

Flaxseed

Texas has maintained a fairly important share of U.S. flaxseed production. Unusually poor moisture for the 1971 crop producing

Table 16. Present and Projected Acreage, Yields and Production of Flaxseed, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	1,092.5	1,022.0	1,039.3	1,077.9
Percent of U. S. Production	3.7	3.8	4.5	5.1
Total Acreage (Dryland)	88,869	78,015	64,553	59,225
Average Yield (bu.)	12.3	13.1	16.1	18.2
Value (1000 dollars)		2,748.9	2,796.1	2,899.5

Source: _1972 OBERS Projections_, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 17. Present and Projected Acreage, Yields and Production of Rye, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	474.4	570.4	670.0	738.7
Percent of U. S. Production	2.4	1.9	2.1	2.2
Total Acreage	24,324	28,099	25,969	24,872
Irrigated	6,403			
Dryland	17,921	28,099	25,969	24,872
Average Yield (bu.)	19.5	20.3	25.8	29.7
Value (1000 dollars)		627.4	737.0	812.6

Source: _1972 OBERS Projections_, Volume 5, U. S. Water Resources Council, Washington, D.C.

season resulted in the smallest crop since 1939, when records were begun [11]. Texas production areas are fairly concentrated in South Texas.

Only 10,000 acres with an average yield of seven bushels were harvested in 1971. Production was 70,000 bushels, as compared to over 1,000,000 in 1969 and in 1970 [11]. However, this was an unusually poor year for many crops in Texas, weather-wise; and should not be considered in regard to overall production trends for flaxseed.

The OBERS projections (Table 16) do indicate a gradual downward trend in acreage devoted to flaxseed production. All acreage is expected to be dryland by 1980, although recent irrigated acreages have been so small as to be of almost no importance in affecting average yields. Yields are projected to improve throughout the projection period, and even with some reduction in acreage there will be no appreciable change in production. Due to a decreasing national production of flaxseed the share of total output produced by Texas will show an increase, from 3.7 percent in 1969 to 3.78, 4.51 and 5.13 percent in 1980, 2000 and 2020, respectively.

Rye

Production of rye in Texas fluctuates considerably since the greatest part of the acreage is dryland and subject to weather conditions. Significant acreage is grazed also. Major production areas are confined to the northwestern third of the state.

According to OBERS projections (Table 17), rye will decline as a commercially important crop in Texas. All acreage will be dryland by 1980, and the state as a whole will probably not regain the 2.4 percent share of U.S. output that it held in 1969. Total acreage is expected to increase slightly until 1980, with a gradual decline thereafter. Production will continue to rise slightly throughout the projection period, although the increases will not be enough to significantly affect the state share of total production. The outlook for Texas rye is for very little real change.

Hay

In Texas, hay is produced practically everywhere, although by far the heaviest production is found in the Eastern half of the state. The state consistently produces between two and three percent of all U.S. hay.

In 1971, a dry year, Texas harvested 2,220,000 acres of hay. The yield average of 1.85 tons resulted in production of 4,114,000 tons [7]. The hay supply was seriously depleted during the early season drought, and all available acreages of all types of hay were cut in the fall of the year. These 1971 figures show an increase over those for 1969 and tend to justify the OBERS projections of a rising trend in Texas hay production (Table 18).

The projections indicate very significant increases in hay acreages and production, although an increase in irrigated acreage is expected to be reversed after 1980. This reflects the outlook for the

Table 18. Present and Projected Acreage, Yields and Production of Hay, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 tons)	3,173.3	4,567.1	8,060.8	11,861.6
Percent of U. S. Production	2.8	3.5	5.0	6.0
Total Acreage	1,817,135	2,710,904	3,542,534	4,442,402
Irrigated	189,469	562,201	266,493	90,692
Dryland	1,627,666	2,148,703	3,276,041	4,351,710
Average Yield (tons)	1.75	1.68	2.28	2.67

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 19. Present and Projected Acreage, Yields and Production of Silage (and including Forage), and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 tons)	3,617.7	3,023.8	1,403.5	718.9
Percent of U. S. Production	5.0[1/]	2.2	.8	.4
Total Acreage	436,507	519,182	145,100	62,750
Irrigated	123,532	152,774	102,300	48,200
Dryland	312,975	366,408	42,800	14,550
Average Yield (tons)	8.3	5.8	9.6	11.9

[1/] Percent of U. S. Production in 1969 is an average for 1968-69-70.
Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

High Plains irrigated hay acreage which will have to go to dryland hay as the water supply declines. The view of high plains experts is that there will be more acreage for hay, but no more production, since several acres of dryland hay are required to produce the yields obtained on one irrigated acre.

The greatest part of the hay produced in the state is east of the High Plains where hay is primarily a dryland crop, and where water supplies will not affect production. According to OBERS data the total 1969 hay acreage of 1.8 million acres will be almost doubled, to 3.5 million acres, by the turn of the century (Table 18). Acreage is expected to reach 4.4 million acres by 2020. These increases in acreage and in hay production are expected to result in a real improvement in the relative position of Texas as a hay producing state. From a 2.8 percent share in 1969 Texas is projected to achieve shares of five and six percent in 2000 and 2020, respectively.

So, the outlook for Texas hay production is excellent in all major production areas, and for the state as a whole. The OBERS projections indicate that real growth will occur throughout the projection period.

Silage

Silage, although not a major crop in Texas, is of considerable regional importance, especially in the High Plains, where increased livestock feeding make it a necessity for many stockmen. Silage is produced in many areas of the state, but the heaviest production takes place in the High Plains and in East Texas.

The OBERS projections for this crop represent not only corn and sorghum silage, but include various types of forage as well. The broken lines in Figure 18 of the Appendix show the actual production, yields and shares of U.S. output of corn and sorghum silage in Texas, 1947-1971. All other lines in Figure 18 of the Appendix and the data in Table 19 are based on the aggregates for silage and forage, as provided by OBERS. This method of combining several crops makes an evaluation of the projections even more difficult, and in order to identify more clearly the recent trends in silage production, the "extra" production and yield lines have been provided in Figure 18.

OBERS projections (Table 19) call for a continued decline in silage (and forage) production and in Texas' share of national production. A curious drop in yields is projected for 1980, with gradual improvement thereafter. Total acreage is projected to increase significantly from 1969 to 1980, with good increases in both irrigated and dryland acreages. Still, since a yield decline is projected, a drop in production results over the same period.

These projections are unusual, and are viewed as questionable by TAES specialists, who see the future for Texas silage production as good. Initially, a review of the situation of true silage in Texas is in order. After examining the status of corn and sorghum silage the projections for all silage and forage products can be better evaluated.

Acreage for true silage in Texas has varied between about 150 and 250 thousand acres in recent years. Yields have increased tremendously, from 4.4 tons in 1950 to nearly 14 tons per acre in 1970 (Figure 18, Appendix). An average yield of over 17 tons was achieved in 1968. Production has been maintained at levels that have resulted in percent shares of national output of from one to two and a half percent.

Historical trends indicate increasing production and yields for silage in Texas (Figure 18, Appendix), although the OBERS projections call for consistent declines. TAES specialists agree that continued increase in silage is most likely, especially in view of the modern trend to produce more meat and dairy products on less acreage. Silage is an integral part of the farm organization in many areas in Texas, and many Texans believe it must continue to grow in importance.

Clearly, the silage production increases of the past two decades indicate a favorable trend. The yield improvement has been excellent, and TAES specialists expect these trends to continue, and foresee a fairly stable situation in regard to Texas' share of U.S. silage production.

Concerning the OBERS projections for silage, it is likely that they are considerably biased, especially regarding yields, by the inclusion of extensive acreages of forage crops. For 1969, over 436,000 acres in silage are shown in Table 19. Only about 180,000 of these acres were actually devoted to true silage crops, the rest being lower yielding forage [7].

It is obvious from the information in Figure 18 of the Appendix that harvested forage has declined drastically in recent years, since the line for combined silage and forage has declined while actual silage production has increased. It is possible that OBERS, basing the silage projections on acreage and output for the combined crops, has disregarded the improving situation in silage production. It is easy to see how this could take place, if all computations and projections were based on a combination of these two crops, since their combined performance in recent years clearly indicates a decline.

The situation for silage alone, however, is quite distinct. As previously mentioned, TAES specialists see continued increases as the likely course, and a glance at Figure 18 would suggest that if this assumption is sound, the production curve for silage should intersect the OBERS projection line at least before the turn of the century, and probably sooner. A result would be that a turn-around in this line for silage and forage would have to take place. In other words, as forage crops continue to make up less and less of the combined production, the line for combined production will become more responsive to silage production levels. Assuming an increasing output situation for silage, the production curve for the combined crops will cease to decline and an increase will take place.

The object of this speculation is to identify the possibility that OBERS, by giving undue emphasis to a decline in forage crops and failing to consider silage independently, has utilized biased data for determining future silage production levels for Texas. If these assumptions are basically sound and the OBERS methodology can in this case be questioned, then the expectations of TAES research and extension specialists should be viewed as indicative of future performance in Texas silage production, and the outlook for this industry should be very good.

Corn

Texas production of corn for grain has been in a general decline in recent years. This is a trend that, according to the OBERS projections (Figure 19, Appendix), will certainly continue. Major production areas are the High Plains and Central Texas, although corn is of no great importance in any region.

The OBERS projections show significant drops in corn acreage and production for the 1969-2020 period (Table 20). There will be a shift to irrigation and a disappearance of dryland corn. TAES field staff on the High Plains and elsewhere concur in this projection. Production is expected to drop from 23.8 million bushels in 1969 to 2.9 million bushels by 2020. This drop is reflected in the projected shares of national production, which decline from .6 to .1 over this same period.

The most recent production data for corn tend to indicate an opposite trend for the state (Figure 19, Appendix). But, research and extension specialists agree with the rather pessimistic views of the OBERS staff. In the longer run Texas' share of U.S. corn output will diminish.

In the high plains area, local experts view corn production as being definitely on the way out as water supplies are diminished. All

Table 20. Present and Projected Acreage, Yields and Production of Corn for Grain, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 bu.)	23,824.0	17,713.6	7,163.6	2,944.3
Percent of U. S. Production	.6	.6	.2	.1
Total Acreage	487,199	204,782	76,698	28,951
Irrigated	187,830	204,782	76,698	28,951
Dryland	299,369			
Average Yield	48.9	86.5	93.4	101.7

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 21. Present and Projected Production of Beef, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1000 lbs.)	3,775,000	5,040,228.9	7,112,848.6	9,969,120.0
Percent of U. S. Production	10.2	10.0	10.5	11.0
Value (1000 dollars)		1,088,689.5	1,536,375.3	2,153,330.0

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

high plains corn is irrigated, and although local demand is good for feedlot use, the projections are seen as reasonable in view of the changing water situation and the advantages of grain sorghum.

In Central and North Central Texas corn is seen as declining as projected. Hybrid grain sorghum is cheaper, easier and more profitable to grow and harvest.

The general outlook, then, is not good for Texas production of corn for grain. Current production is up, but the OBERS projections, backed up by TAES specialists, indicate that this is a short-lived trend and that corn for grain will continue to decline.

Beef

OBERS projections for Texas beef production are made in terms of pounds of beef and veal, and show favorable increases throughout the projection period (Table 21). The beef industry is widespread in Texas, and one reason for the leadership Texas has shown in beef production is that there is some beef produced in every county of the state. Heavy production areas include the High Plains, the Cross Timbers and Blacklands of North Central Texas, East Texas, and South Central Texas. The Upper Coast and the Edwards Plateau of southwestern Texas are also big producing areas.

Texas production has consistently represented around ten percent of total national output of beef (Figure 20, Appendix). This is seen as a lasting trend, with a gradual increase in the percentage share over the projection period.

Livestock experts in major production areas consider the OBERS projections for continued growth in Texas beef production as reasonable, and all feel that the state can easily maintain these projected levels in production. In 1969, the state produced 3.77 billion pounds of beef and veal, representing 10.2 percent of U.S. output.

Texas production is projected to increase significantly, to five billion pounds in 1980, over seven billion in 2000, and to nearly ten billion pounds a year for 2020. These levels represent 10, 10.5, and 11 percent of national output, respectively (Table 21).

The general outlook for the industry, in Texas and nationally, is excellent. Demand is good and will increase. Both feedlots and cow and calf operations will provide increasing quantities of beef to help meet state and national demands.

Dairy

Texas produces between two and three percent of the total U.S. supply (Figure 21, Appendix). This share of national output has remained very stable over the last 25 years, although the late 1960's brought a slight increase -- a gradual trend that has continued into the early 1970's.

The major production areas in Texas include the Blacklands, the Cross Timbers and the Rolling Plains. These regions comprise the north-central section of the state.

The OBERS projections express dairy production in terms of pounds of milk. Projections indicate a substantial decline in production and percent of U.S. production between 1969 and 1980 (Table 22), with a gradual increase in production and decrease in percent share thereafter. TAES specialists interviewed in the major dairy regions disagreed with these projections.

In the Blacklands, where urbanization is booming in the Denton-Dallas-Fort Worth triangle, the dairy industry is in a period of change. Some local dairy farms are leaving the area as the land boom overtakes some formerly rural areas. These businesses are being replaced in other parts of the state as well as in more undeveloped sectors of the Blacklands. It is expected, however, that greatly increasing demand for food products in the area will serve to attract more dairy businesses, especially as the urbanization trend slows and the land use situation becomes more stabilized. In view of the dynamic situation in the industry in this region, disagreement with OBERS projections was less intense than elsewhere.

In the Rolling Plains, there has been no gain in the number of dairy operators in recent years, although production continues to increase every year. There are a number of young dairymen in this area and local extension staff report that these operators are all interested in expansion. Projected decreases are not expected in this region.

Extension specialists in the Cross Timbers area report that a slight decline in the number of operators has taken place over the last few years, although total milk production has increased slightly or remained stable in the region. The movement is toward fewer but larger dairies and more efficient operation. Here again no reason can be seen for the projected decline in Texas dairy production for the 1969-1980 period, nor for the slow recovery of production to below 1969 levels

Table 22. Present and Projected Production of Milk, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1,000 pounds)	2,987,000	2,481,800.0	2,730,300.0	2,984,300.0
Percent of U.S. Production	2.6	2.2	1.9	1.7
Value (1,000 dollars)		151,389.8	166,548.3	182,042.3

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 23. Present and Projected Production of Broilers, and Shares of National Output, Texas, 1969, 1980, 2000 and 2020.

	1969	1980	2000	2020
Production (1,000 pounds)	597,009	938,319	1,382,781	1,939,083
Percent of U.S. Production	5.9	6.4	6.7	7.0
Value (1,000 dollars) All Poultry Meat		169,485.9	250,942.3	353,830.2

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

by 2020. The accompanying decline in the percent share of U.S. production is also highly questionable, and such behavior is not expected in this region.

Generally, the outlook for the Texas dairy industry is viewed as good, in spite of OBERS projections to the contrary. State economists and extension specialists agree that the projections for the dairy industry are not justified by recent and current activity. Production results from 1970 and 1971 bear this out, since production increases were experienced in both years [6]. Texas dairymen produced 3,065 million pounds of milk in 1970 and 3,239 million pounds in 1971. Compared to the 2,987 million pounds produced in 1969, these figures represent significant increases and tend to support the beliefs of Texas specialists that the OBERS projections are in error.

Broilers

Texas is an important supplier of poultry meat products. Broilers are produced in several areas in the eastern one half of the state. The heavy production areas are far eastern Texas and Gonzales county in South-Central Texas.

The OBERS projections indicate that substantial increases in Texas production and in percent share of U.S. total production will be forthcoming throughout the 50-year projection period. Current production is expected to be doubled by the turn of the century and tripled by the year 2020. Percentage of U.S. production is estimated to increase from the current average of 6.05 to 6.44, 6.76 and 7.0 in 1980, 2000 and 2020 (Table 23).

This increasing trend in broiler production seems justified in view of recent historical data. Production has been on the increase for several years; 1970 was an excellent year, with a production level of 667 million pounds, and 1971, at 618.2 million pounds, surpassed the average of 608 million pounds for the preceding three years [10]. The outlook for the industry is excellent, and the projections appear reasonable in view of the increasing activity in the major broiler producing sectors of the state.

Turkeys

Texas has long been a major supplier of turkey in the U.S. market. The state is ranked number five among all states in turkey production, and this ranking could be improved, in view of the favorable projections for the Texas industry.

On a national scale, the turkey industry is expected to encounter an improving situation, as evidenced by the small changes in Texas' share brought about by substantial increases in Texas production levels. According to the OBERS projections (Table 24), the current Texas production is expected to be doubled by the year 2000 and almost tripled by 2020. These dramatic increases in state production are expected to bring about only minor changes in the state share of U.S. production.

Major production areas in Texas are found in the central portion of the state. The dynamic growth projected in turkey production will probably come in this area. The outlook for the industry in Texas is very good, and real growth should occur throughout the coming decades.

Table 24. Present and Projected Production of Turkeys, and Shares of National Output, Texas, 1969, 1980, 2000, and 2020.

	1969	1980	2000	2020
Production (1,000 pounds)	141,623	204,945	310,178	447,643
Percent of U.S. Production	7.0	6.5	7.0	7.5
Value	See Broilers, Table 23			

Source: <u>1972 OBERS Projections</u>, Volume 5, U.S. Water Resources Council, Washington, D. C.

Table 25. Present and Projected Production of Eggs, and Shares of National Output, Texas, 1969, 1980, 2000, and 2020.

	1969	1980	2000	2020
Production (1,000 dozen)	265,100	224,133.4	249,716.8	276,991.6
Percent of U.S. Production	3.9	3.5	3.0	2.7
Value (1,000 dollars)		73,067.2	81,407.4	90,299.4

Source: <u>1972 OBERS Projections</u>, Volume 5, U.S. Water Resources Institute, Washington, D. C.

The demand for poultry meat products is on the rise, and Texas will certainly maintain its position as a major U.S. supplier of these products.

Eggs

Texas historically has been among the top ten states in all phases of poultry production. However, in this state, egg production is the least emphasized of the several sectors of the poultry industry. In Texas much more activity is found in poultry meat production than in egg production.

The OBERS projections bear out this trend, and the implication is clear that more and more emphasis will be placed on meat birds, with a definite decline in laying hens and pullets. The OBERS data for Texas egg production (Table 25) indicates that although there will probably be no truly significant change in egg production levels, the state share of U.S. output will decline consistently throughout the projection period. The share is expected to drop from 3.9 percent in 1969 to 3.5, 3.0 and 2.7 in 1980, 2000 and 2020. Actual production is expected to vary between 225 and 275 million dozen eggs (Table 25).

These predictions appear to be justified by the more recent production data. For example, production reached 217 million dozen eggs in 1971, down from 265 million in 1969. Texas also holds the number ten position in U.S. egg production, with a share of the national output of 3.6 percent down from 3.9 in 1969 [10].

So, the long run outlook for egg production in Texas is one of little real change, with not much activity as far as new operations are concerned. Current production levels will probably become fairly stabilized, and the state share of U.S. production will continue to slip.

Hogs

Hog production is fairly scattered over the state, with heavier production areas found in the High Plains and in South Central Texas. Historically, Texas has contributed between one and two percent of national pork production.

Texas' share of U.S. hog production has declined recently, and is expected to drop below the one percent level after 1980, as indicated in Figure 25 of the Appendix. In spite of production increases in the late 1960's, state agricultural experts expect this projection to be justified. The projections for decreasing hog production in the state appear reasonable in view of the decline of the industry in 1970 and 1971.

Comments by swine experts over the state indicated that the industry is currently a difficult one to predict. Probably due to unfavorable markets and high feed prices in recent years, there is little activity in the industry, with some growers leaving the business in spite of current good prices. There seems to be no economic advantage for integrated hog operations in most parts of the state. It was noted that an important possibility for maintaining good hog production would be the feedlot finishing of feeder pigs from East Texas in the High Plains. In the High Plains, it is expected that as the water supply declines,

Table 26. Present and Projected Production of Hogs, and Shares of National Output, Texas, 1969, 1980, 2000, and 2020.

	1969	1980	2000 1/	2020 1/
Production (1000 pounds)	326,000.0	254,390.0		
Percent of U.S. Production	1.6	1.0		
Value (1000 dollars)		47,571.1		

1/ Production is projected to drop below one percent of U.S. output, and figures are not given.

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

Table 27. Present and Projected Production of Lambs and Mutton and Shares of National Output, Texas, 1969, 1980, 2000, and 2020.

	1969	1980	2000	2020
Production (1000 pounds)	145,000	143,193.4	181,983.2	225,949.3
Percent of U.S. Production	14.0	14.5	15.0	15.5
Value (1000 dollars)		24,543.6	31,192.0	38,727.6

Source: 1972 OBERS Projections, Volume 5, U. S. Water Resources Council, Washington, D.C.

farmers will look for other activities with less dependence on crops. More livestock enterprises are expected to appear.

At any rate, the OBERS projection of a drop in hog production, from 326 million pounds in 1969 to 254 million pounds in 1980 (Table 26), appears to be reasonable at this time, considering the current instability of the industry in Texas. Beyond this point, however, the hog industry bears watching as a possible alternative to the all-crop economy of many High Plains farming operations.

Lambs and Mutton

Historically, Texas has been a very important producer of sheep and lambs. The state share of U.S. production has not fallen below ten percent since 1958, and the industry has experienced a gradual increase since that time. The OBERS projections indicate that this trend will continue throughout the projection period.

According to OBERS projections (Table 27), the share of national lamb and mutton output produced by Texas will increase from 14 percent in 1969 to 14.5, 15.0 and 15.5 in 1980, 2000 and 2020, respectively. Actual production is expected to remain fairly stable through 1980, with substantial increases projected for the subsequent 20-year periods.

In view of expected increasing national demand for meat products, these projections can be viewed as reasonable. Also, there is little competition for land use in most major sheep areas among other agricultural industries or from urbanization, so Texas sheep growers will probably not find land availability a severely limiting factor in achieving these production levels. For the sheep industry, then, the outlook is good for the entire survey period, and Texas should continue to grow in national importance in regard to this commodity.

SUMMARY

In general, the OBERS projections for agricultural production in Texas call for continued development of the industry and an overall increase in production. The availability of land for agricultural uses is greater than in most states, and water is expected to be a severely limiting factor on increased production only in the High Plains. Growth will occur in many of the crop and livestock commodities considered in the projections.

One indication of the kind of growth expected for Texas is the increasing dollar value of agricultural production projected for the state. The dollar figures provided by OBERS are rapidly becoming obsolete, due to a high rate of inflation and Texas' recent production advances, but the change in percentage of total national production can be viewed as indicative of projected performance. The value of crop and livestock production in Texas was $2,123,061,600 in 1964, and this is projected to increase to $2,976,332,900 in 1980 and to $4,821,830,400 by 2020 [17]. These values are 5.51, 5.88 and 5.95 percent of national production in the years cited.

According to OBERS, Texas will gain about one half of one percent in the dollar share of national output of all agricultural products in the 1964-2020 period. Although these projections concerning the value of production are optimistic in regard to Texas, the evaluation of the individual projections indicates that even greater growth could occur.

TAES specialists in many sectors of the agricultural industry throughout the state found several of the projections questionable. Their objections regarding these projections have been discussed in the preceding section. The more questionable commodities include vegetables, rice, peanuts, oats, citrus fruits, silage and dairy. Expectations are that Texas' production of these commodities will surpass OBERS projection levels.

However, the projections for the majority of agricultural commodities were viewed as reasonable. There was general agreement with the OBERS projections. In view of the extremely complex nature of its undertaking, this agreement speaks well of the OBERS staff.

The discussions of individual commodities that are found in this report represent not only considerable research effort on the part of the OBERS staff, but also a thorough evaluation by TAES research and extension specialists. Some of the OBERS projections were found to need modification now and they will undoubtedly require future adjustments as conditions change. It is hoped that they will be useful as a basis for public and private planning in resource development and agricultural decision-making in Texas.

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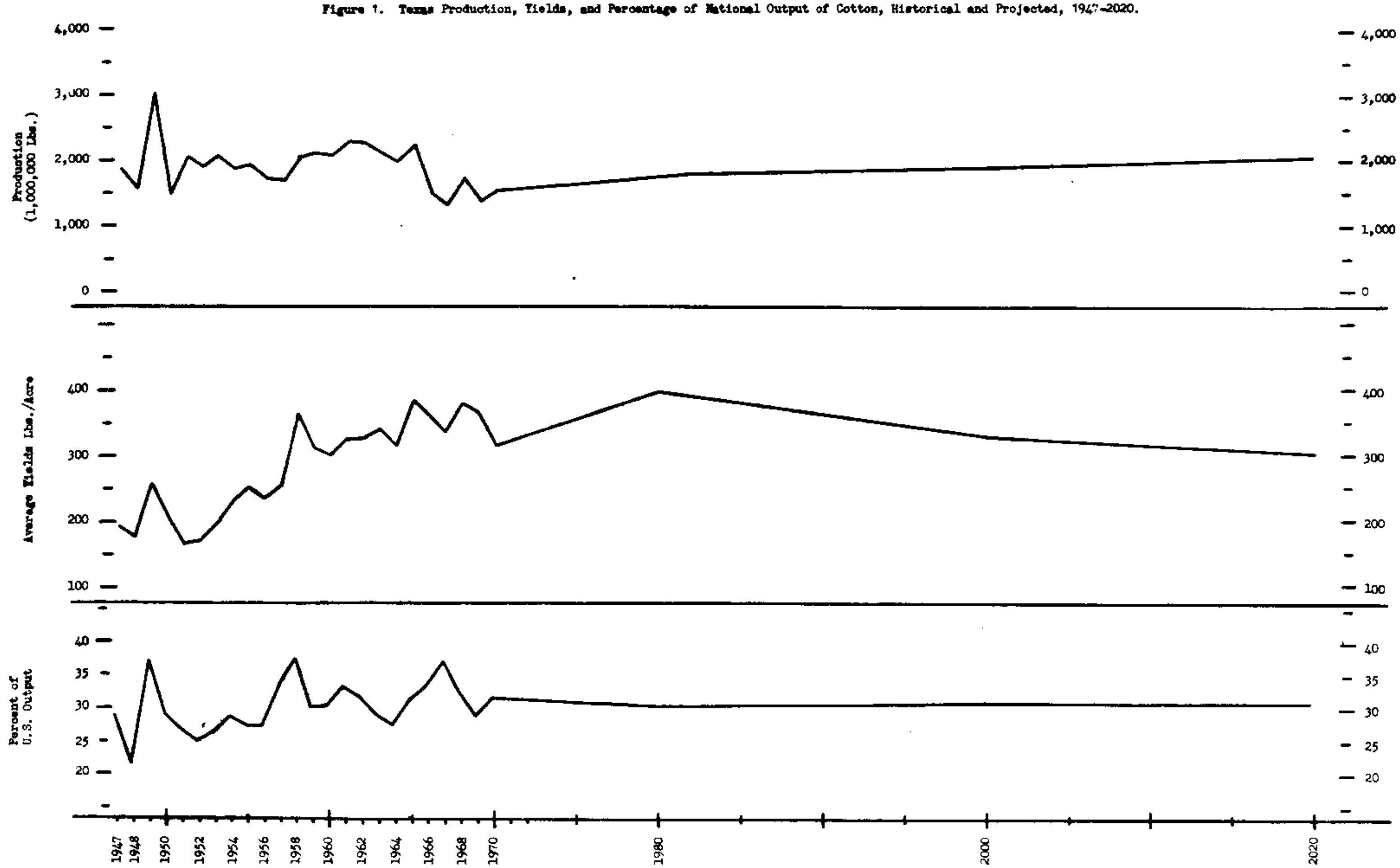
APPENDIX

Figure 1. Texas Production, Yields, and Percentage of National Output of Cotton, Historical and Projected, 1947-2020.



Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 2. Texas Production, Yields, and Percentage of National Output of Grain Sorghum, Historical and Projected, 1947-2020.

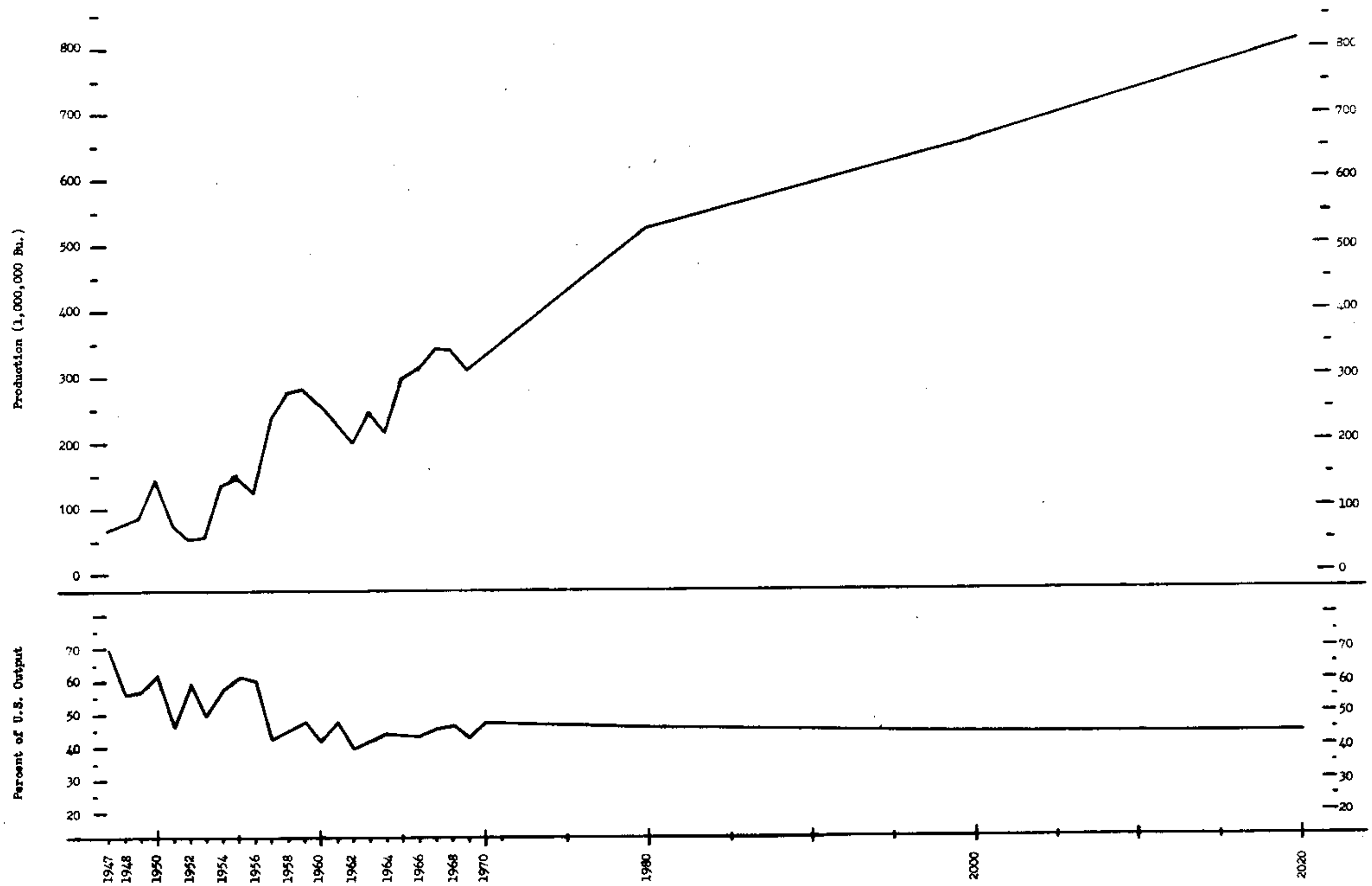
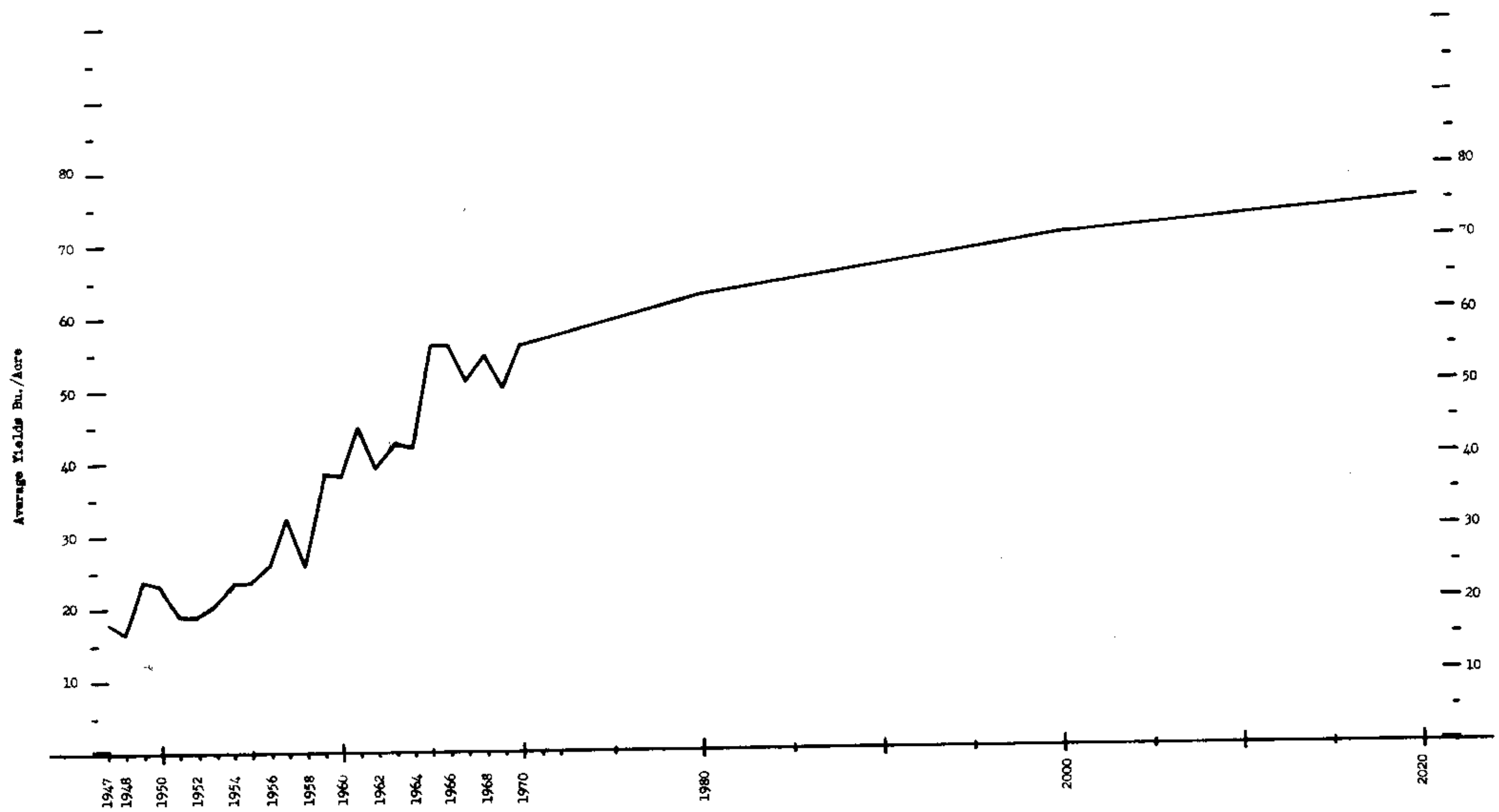
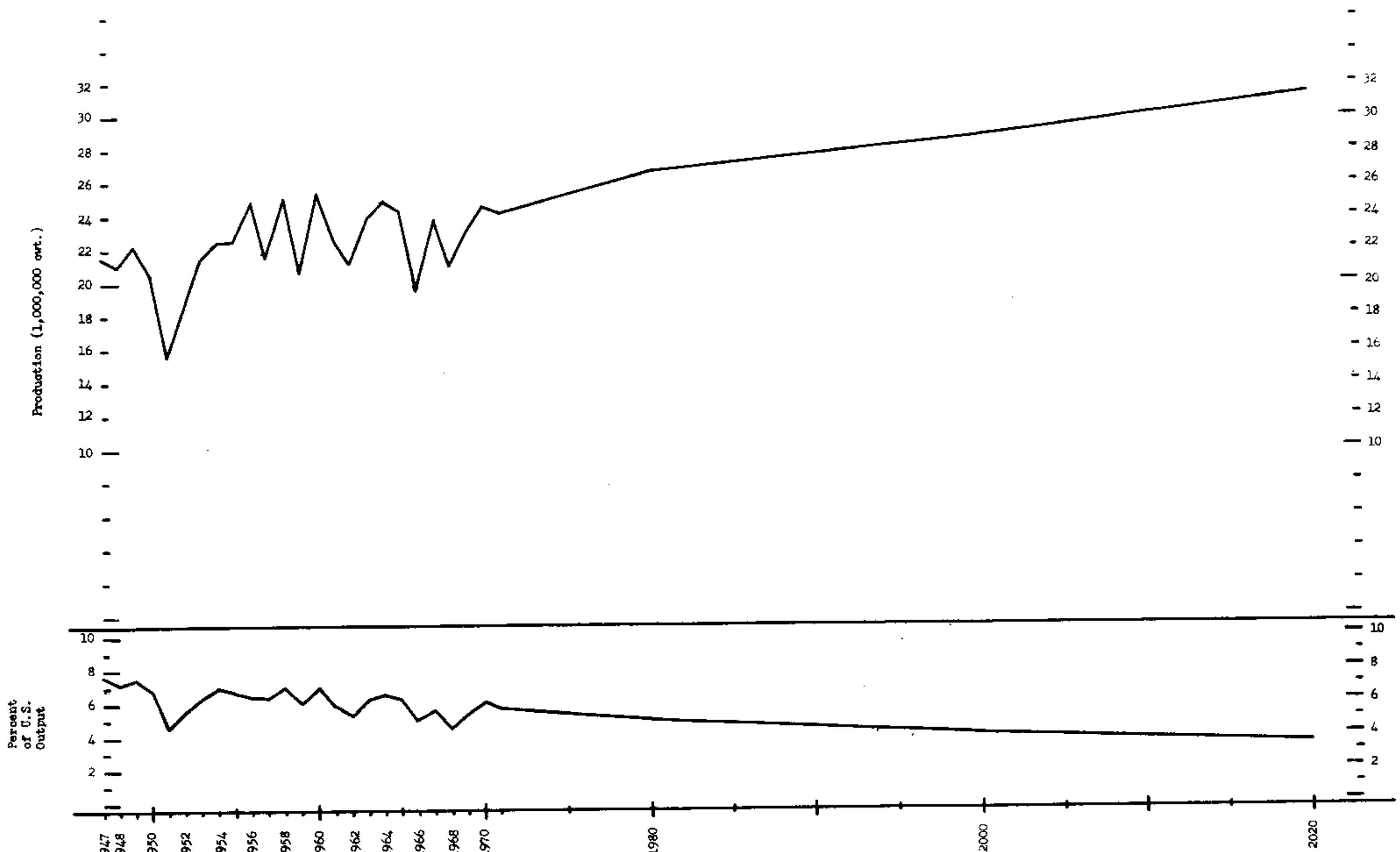


Figure 2. Continued



Sources: Plotted from data provided in (1) <u>1972 OBERS Projections</u>, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 3. Texas Production and Percentage of National Output of Vegetables, Historical and Projected, 1947–2020.



Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 4. Texas Production, Yields, and Percentage of National Output of Wheat, Historical and Projected, 1947–2020.

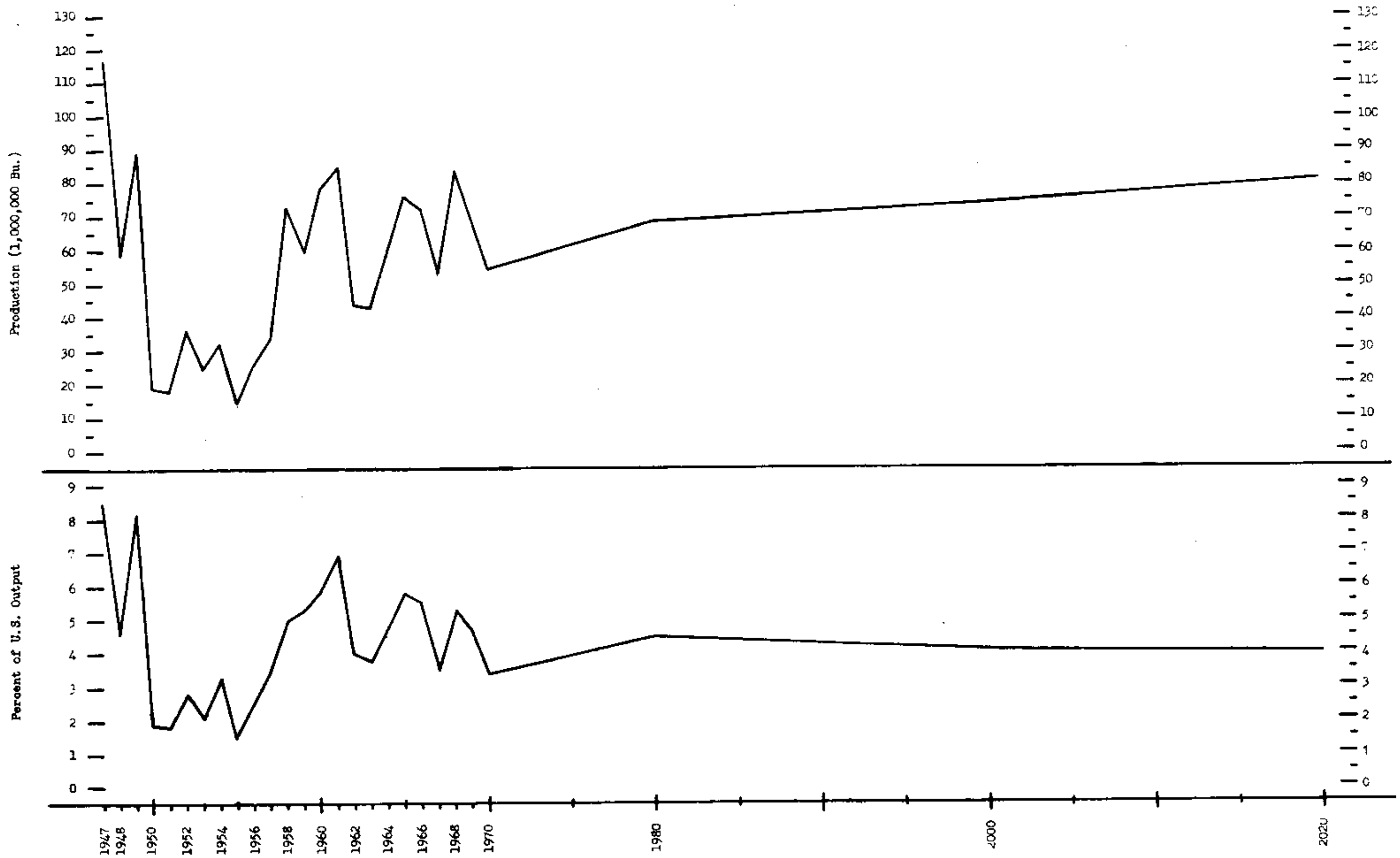
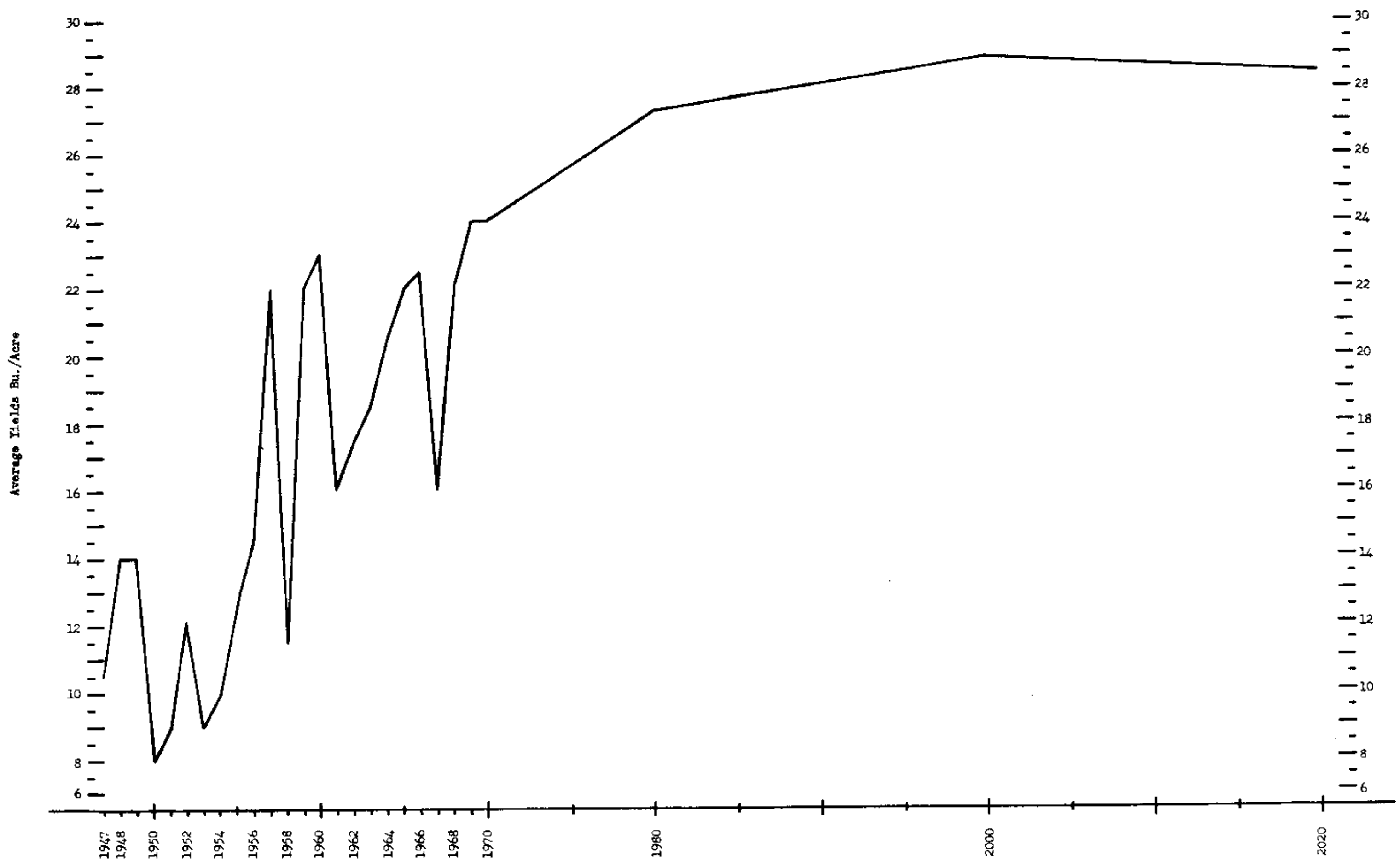
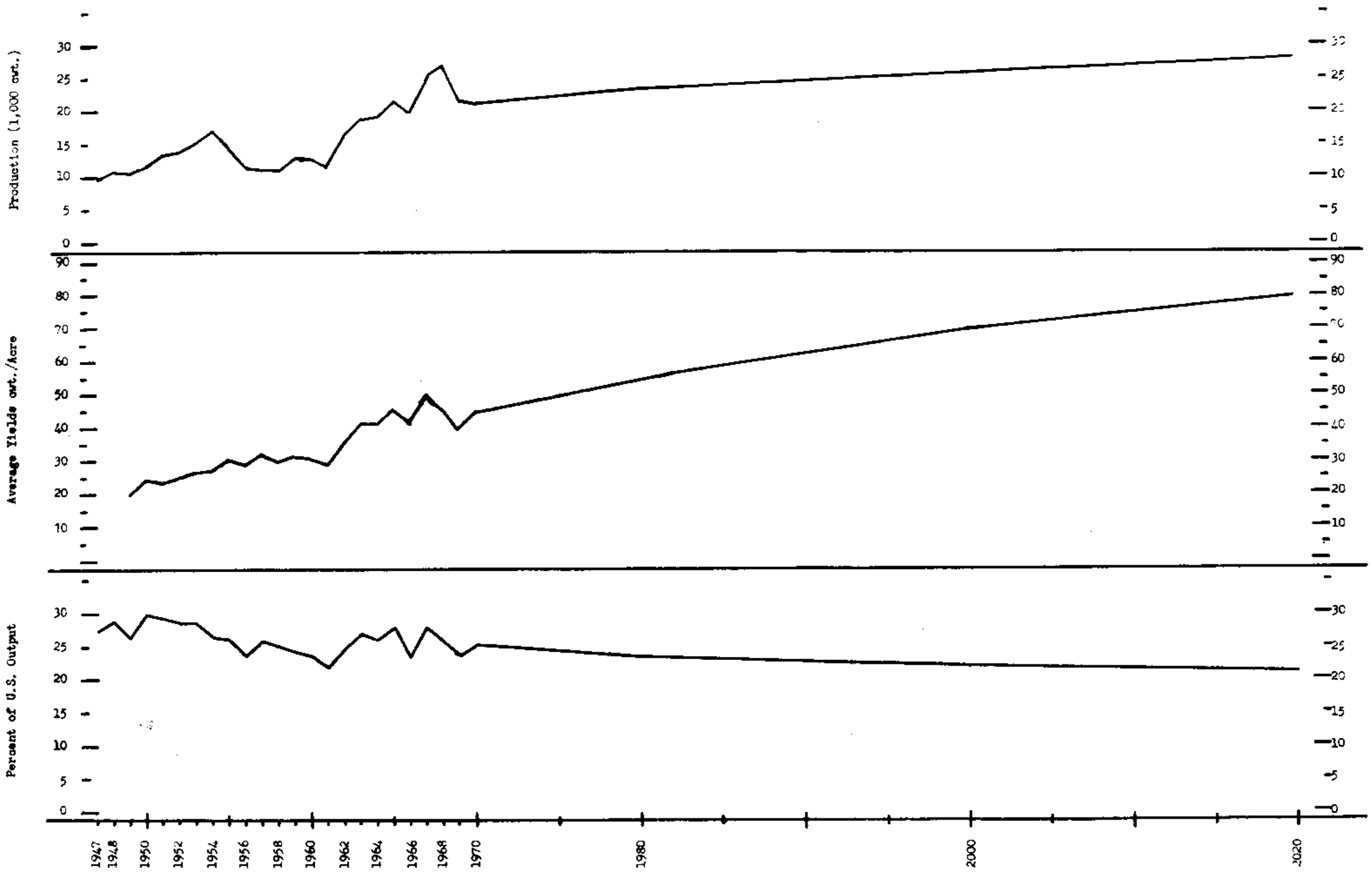


Figure 4. Continued



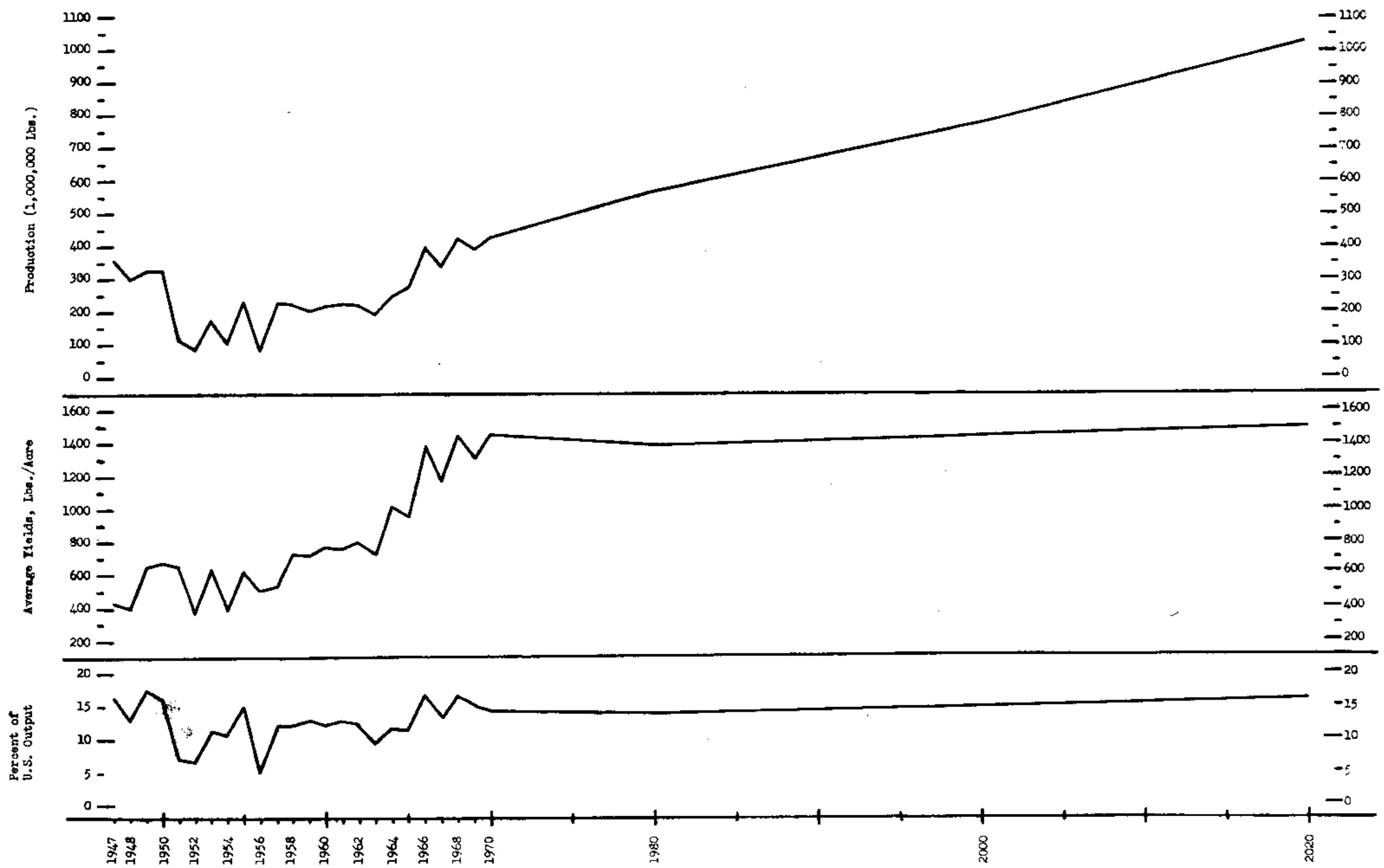
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 5. Texas Production, Yields, and Percentage of National Output of Rice, Historical and Projected, 1947-2020.



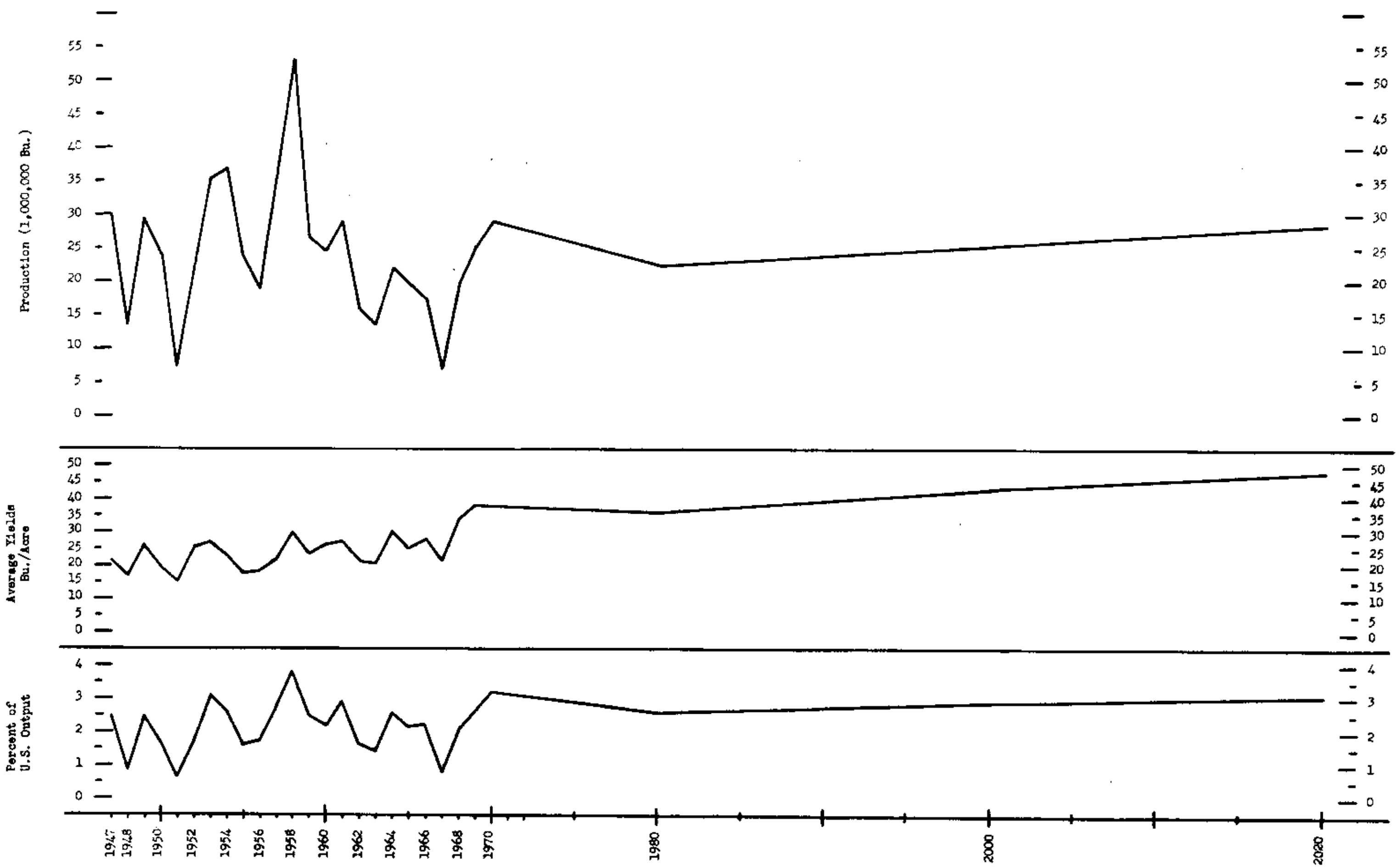
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 6. Texas Production, Yields, and Percentage of National Output of Peanuts, Historical and Projected, 1947-2020.



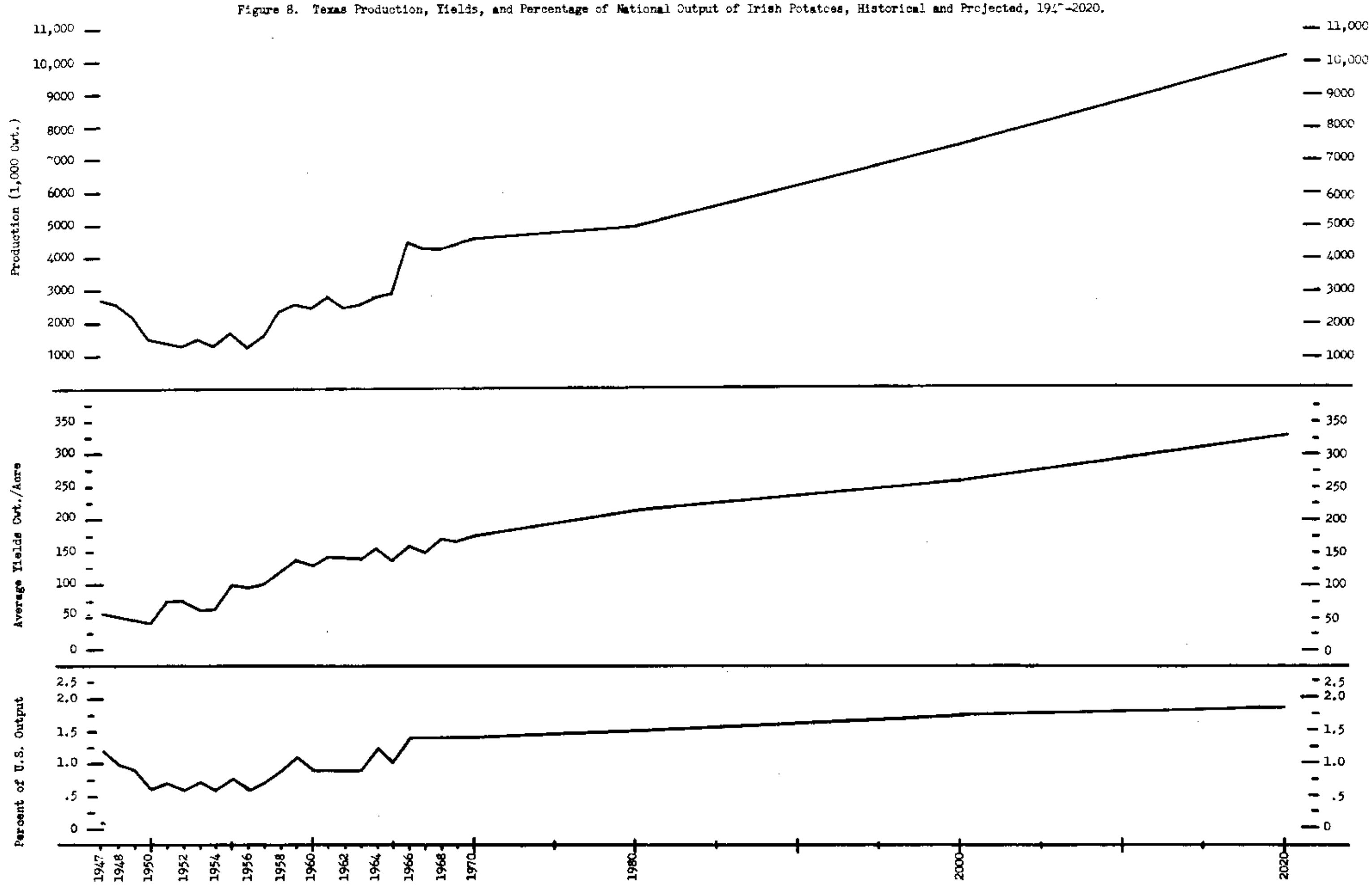
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 7. Texas Production, Yields, and Percentage of National Output of Oats, Historical and Projected, 1947–2020.



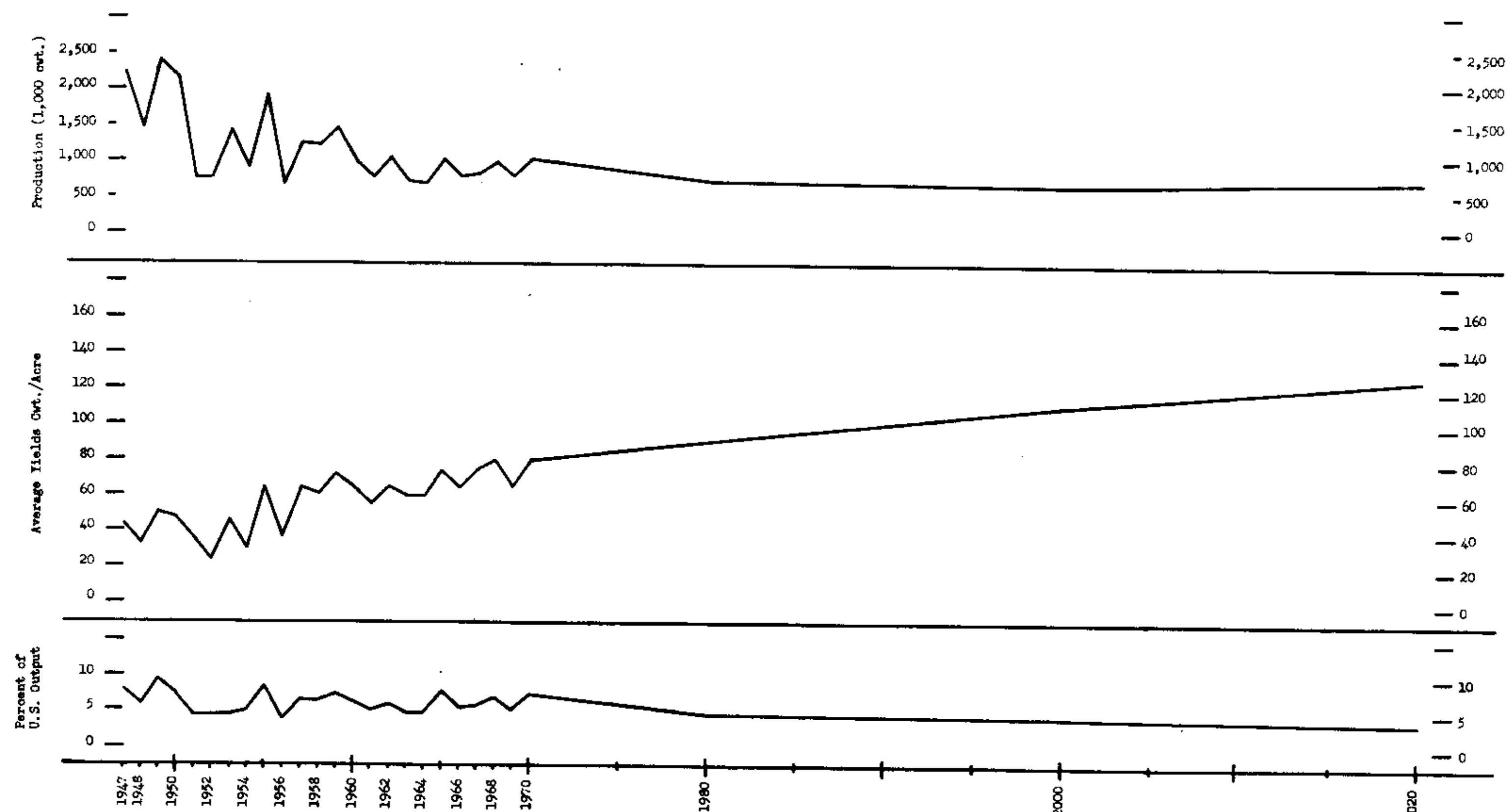
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 8. Texas Production, Yields, and Percentage of National Output of Irish Potatoes, Historical and Projected, 1947-2020.



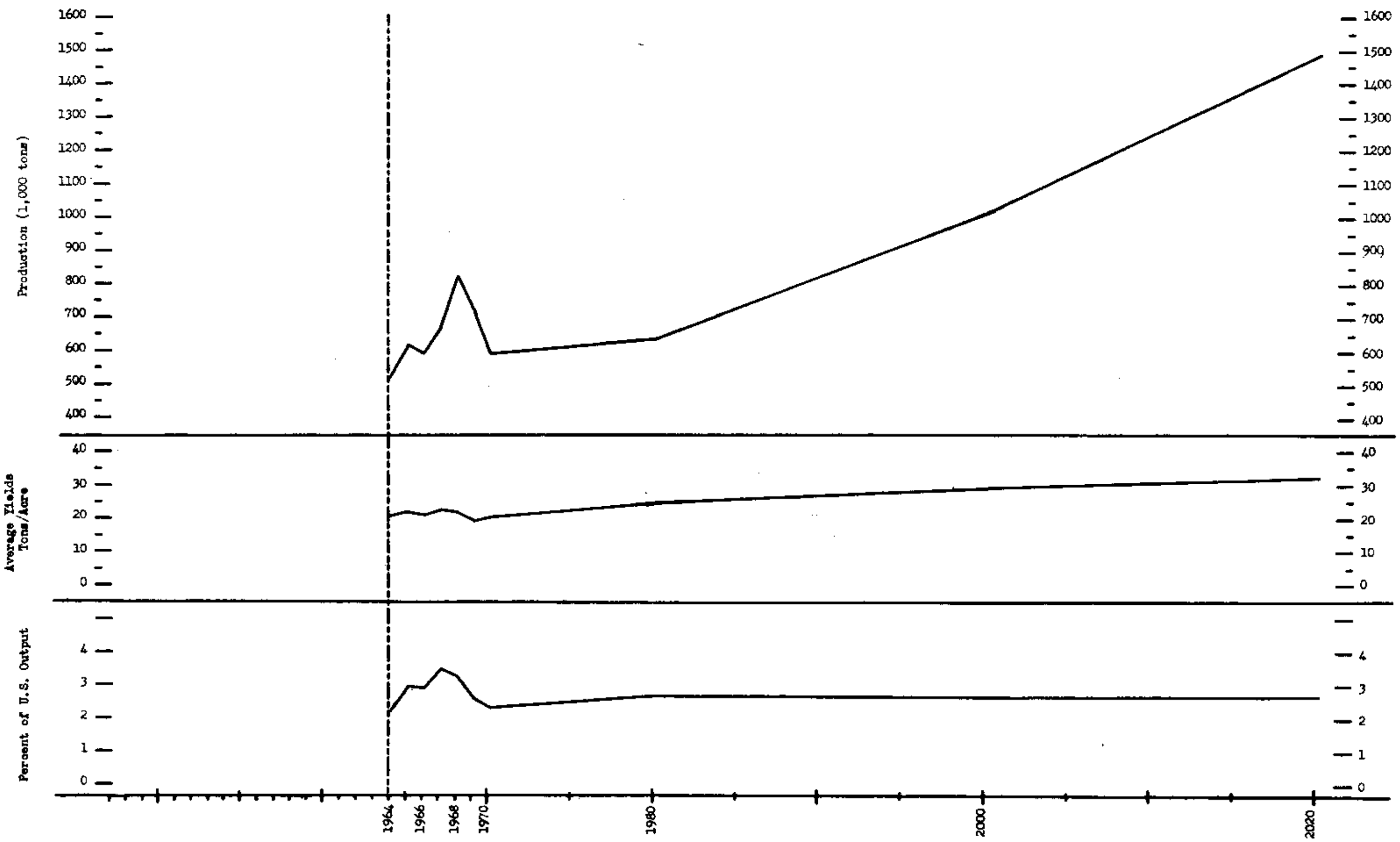
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 9. Texas Production, Yields, and Percentage of National Output of Sweet Potatoes, Historical and Projected, 1947–2020.



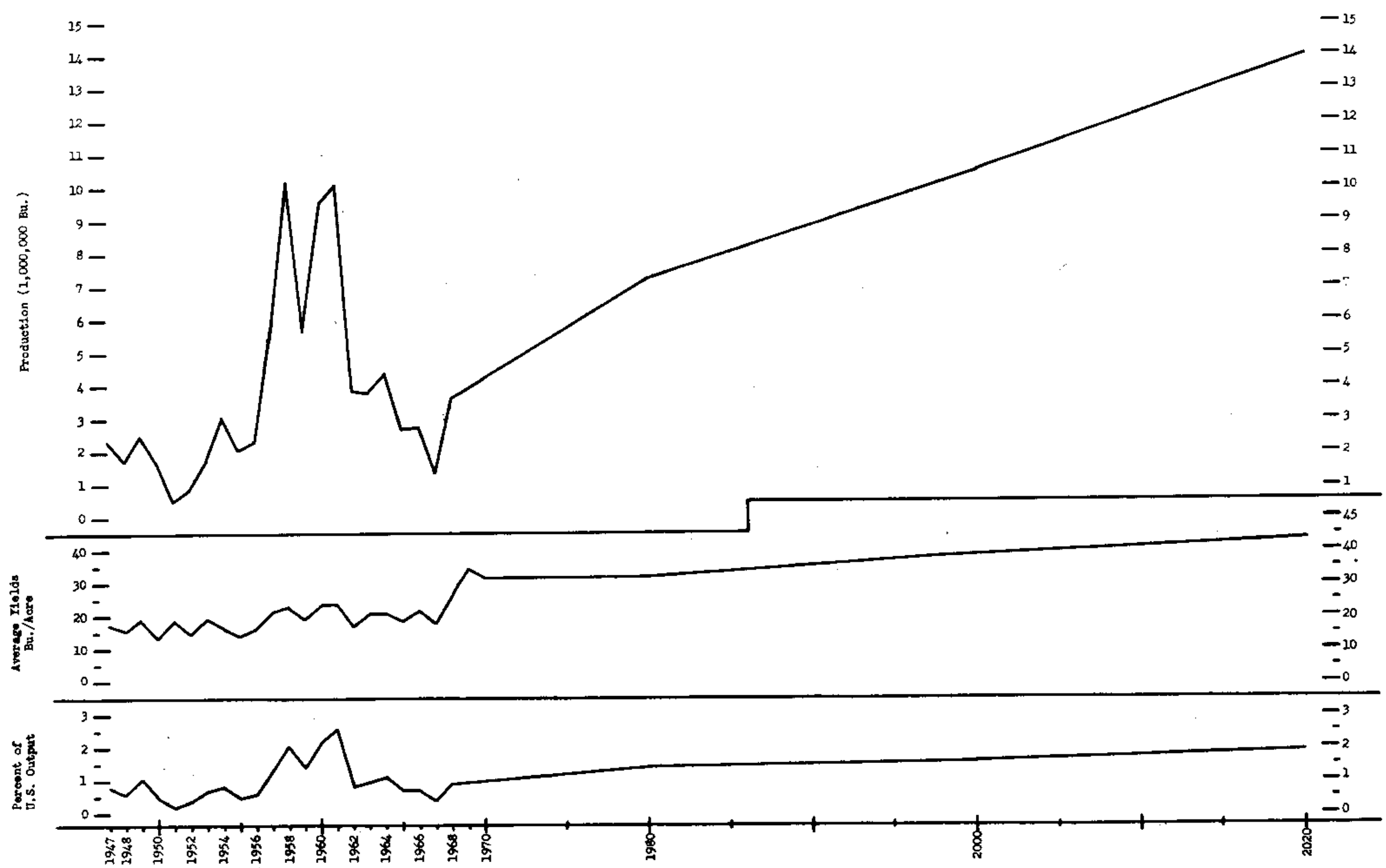
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 10. Texas Production, Yields, and Percentage of National Output of Sugarbeets, Historical and Projected, 1964–2020.



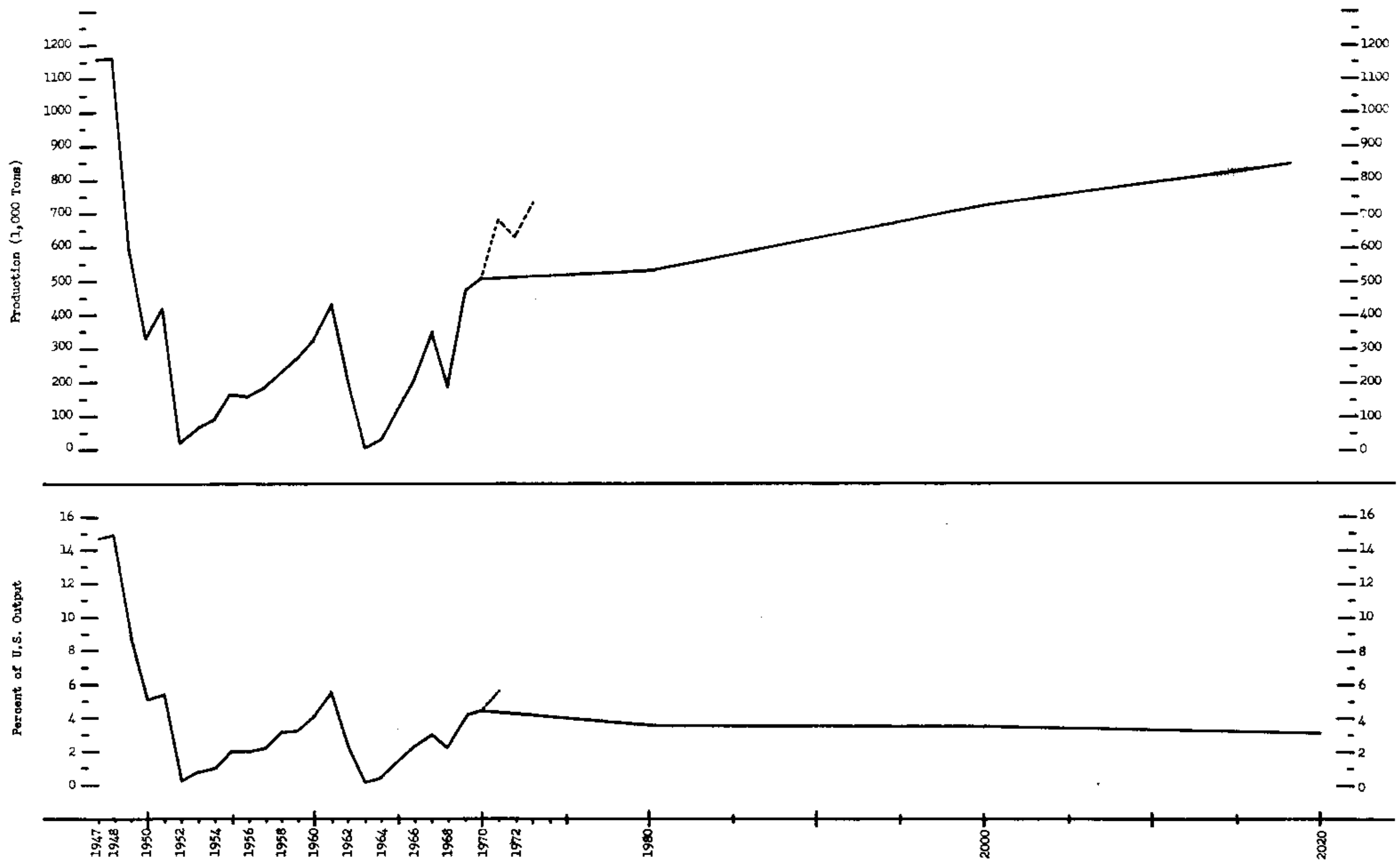
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 11. Texas Production, Yields, and Percentage of National Output of Barley, Historical and Projected, 1947-2020.



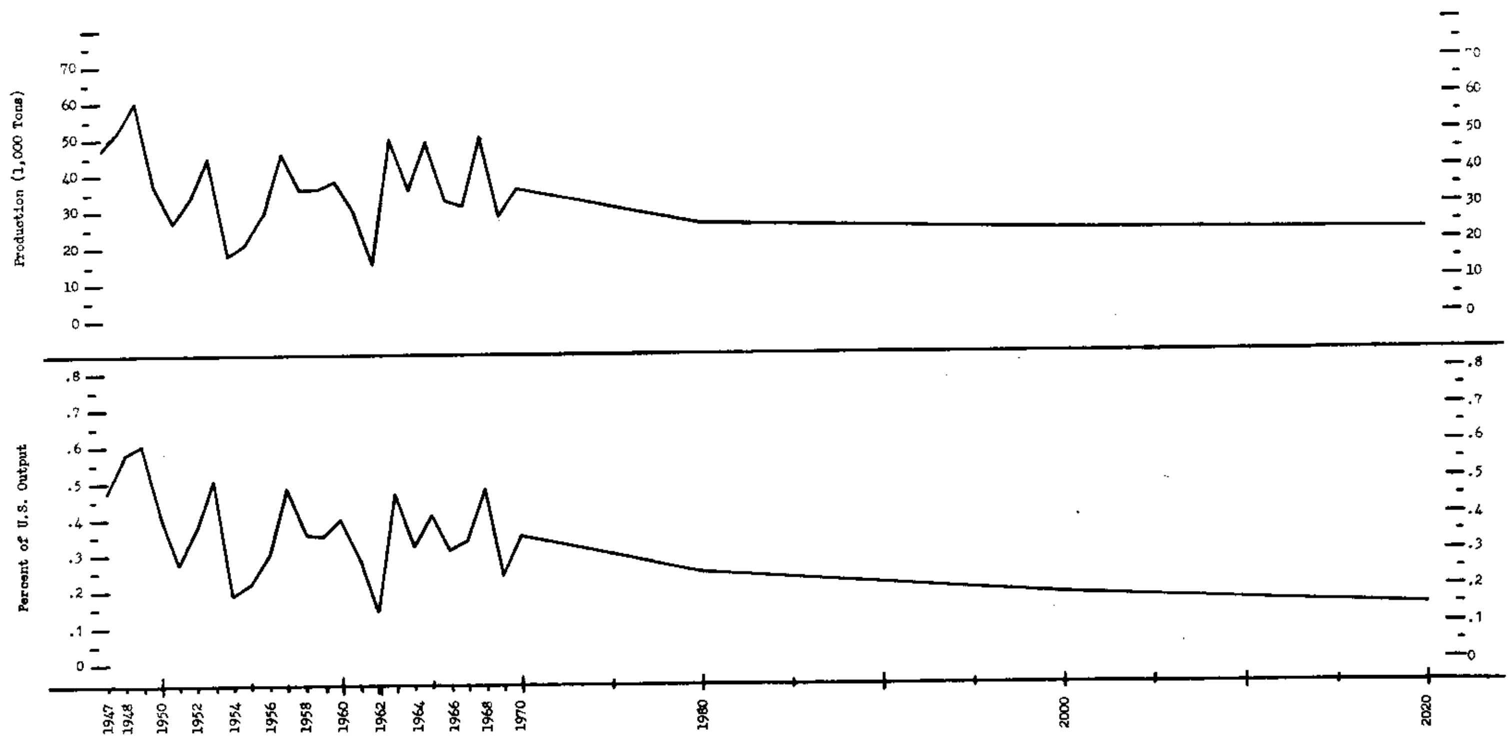
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 12. Texas Production and Percentage of National Output of Citrus Fruits, Historical and Projected, 1947–2020.



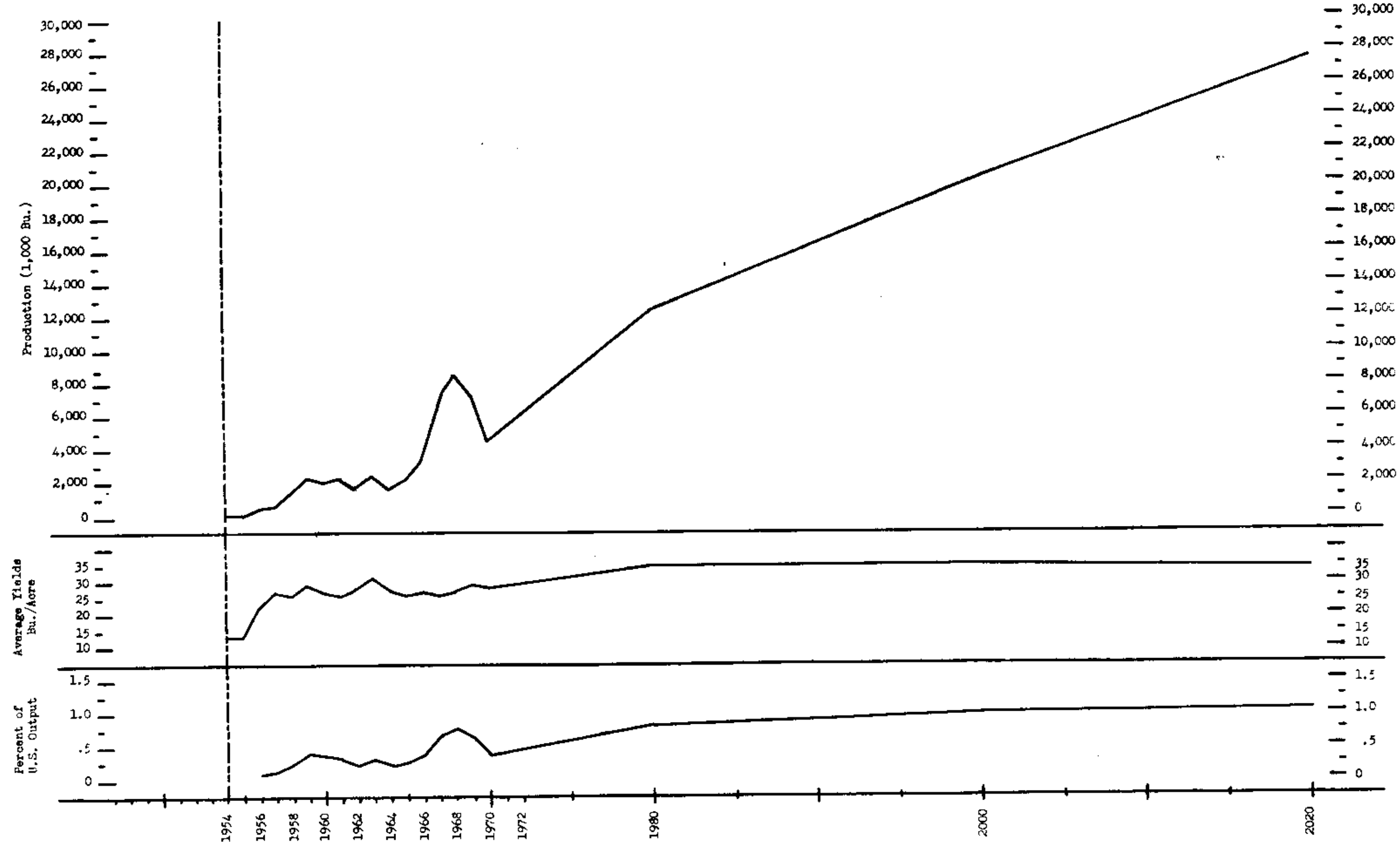
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 13. Texas Production and Percentage of National Output of Non-Citrus Fruits and Nuts, Historical and Projected, 1947–2020.



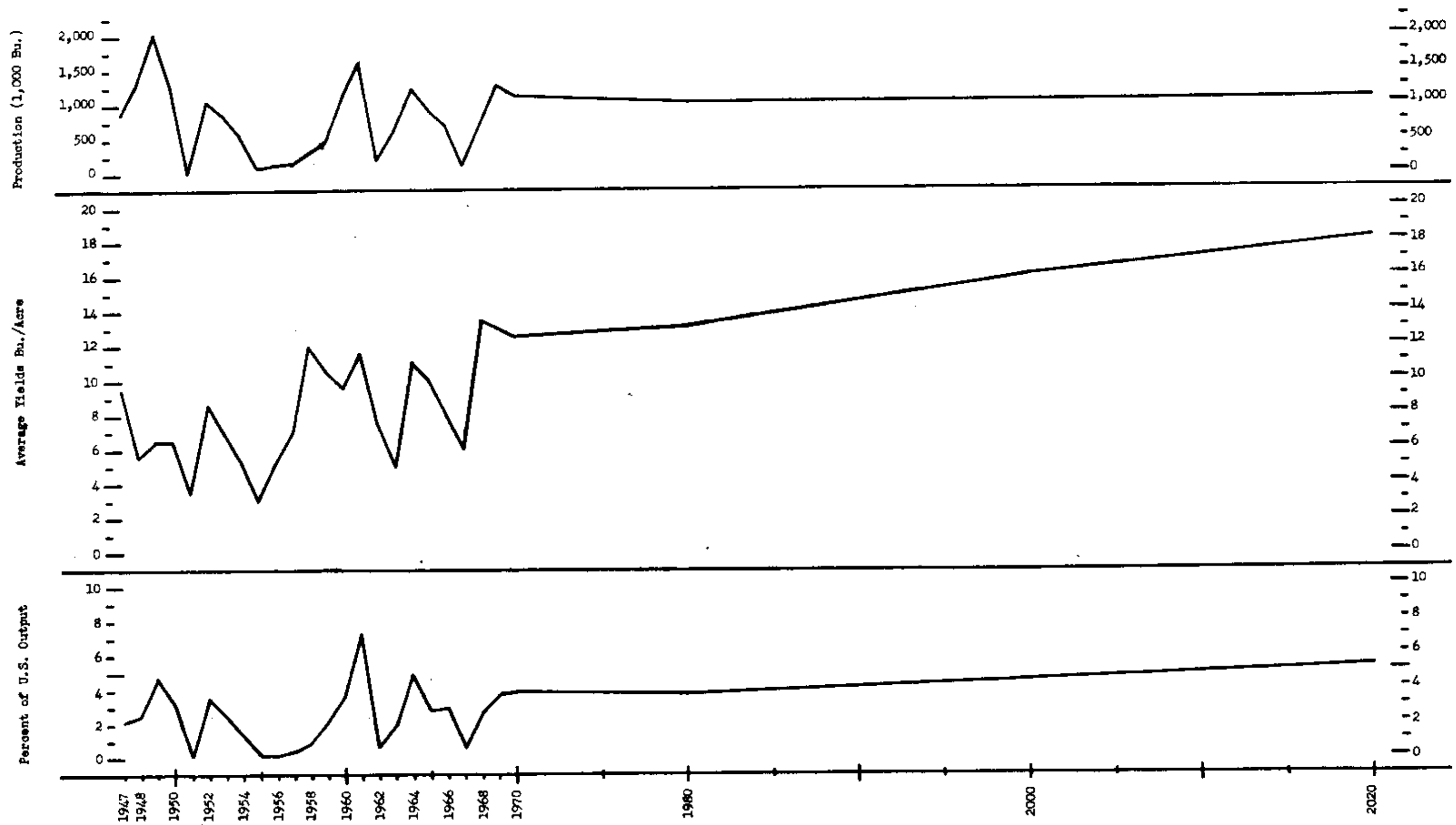
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 14. Texas Production, Yields, and Percentage of National Output of Soybeans, Historical and Projected, 1954–2020.



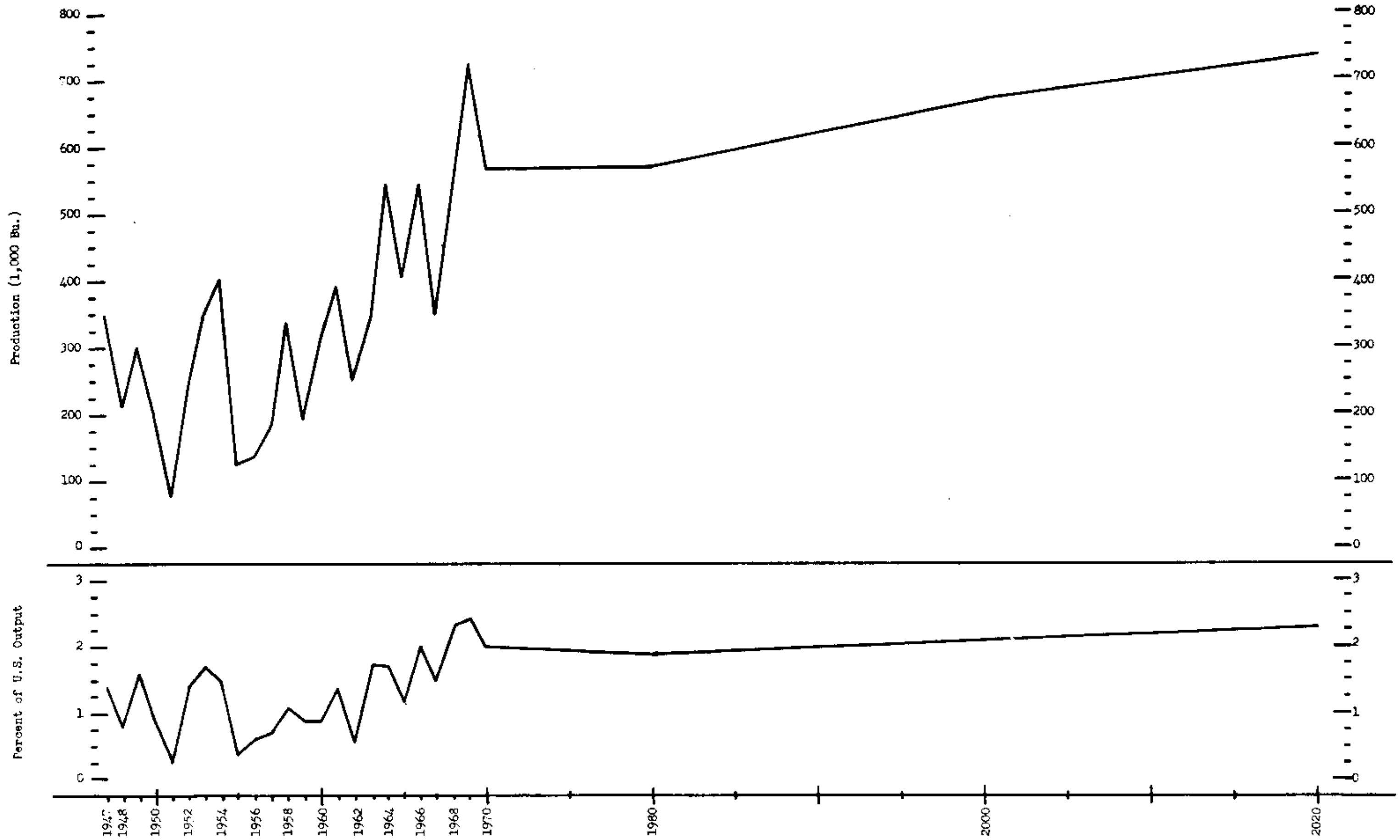
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 15. Texas Production, Yields, and Percentage of National Output of Flaxseed, Historical and Projected, 1947-2020.



Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 16. Texas Production, Yields, and Percentage of National Output of Rye, Historical and Projected, 1947–2020.



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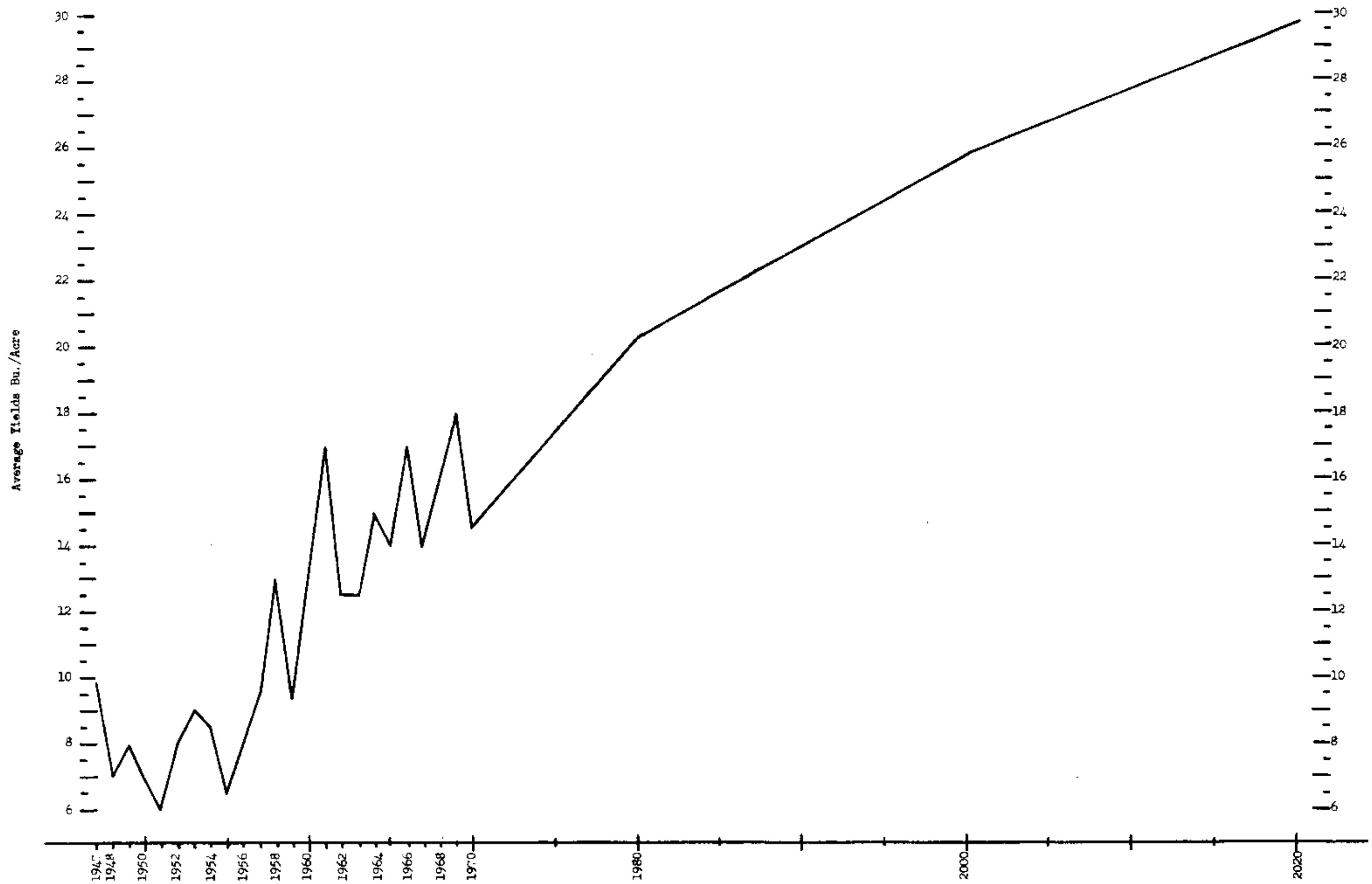
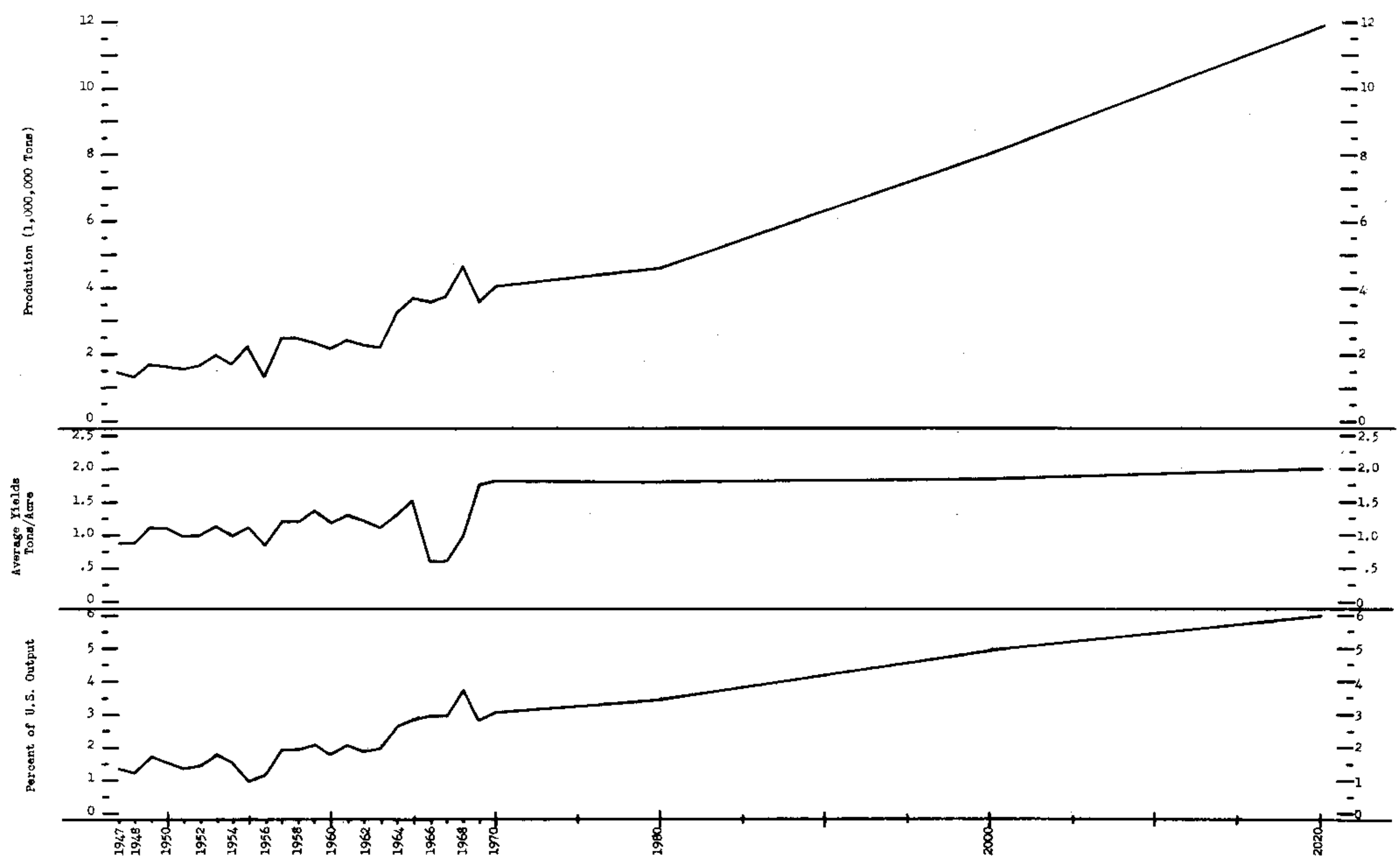


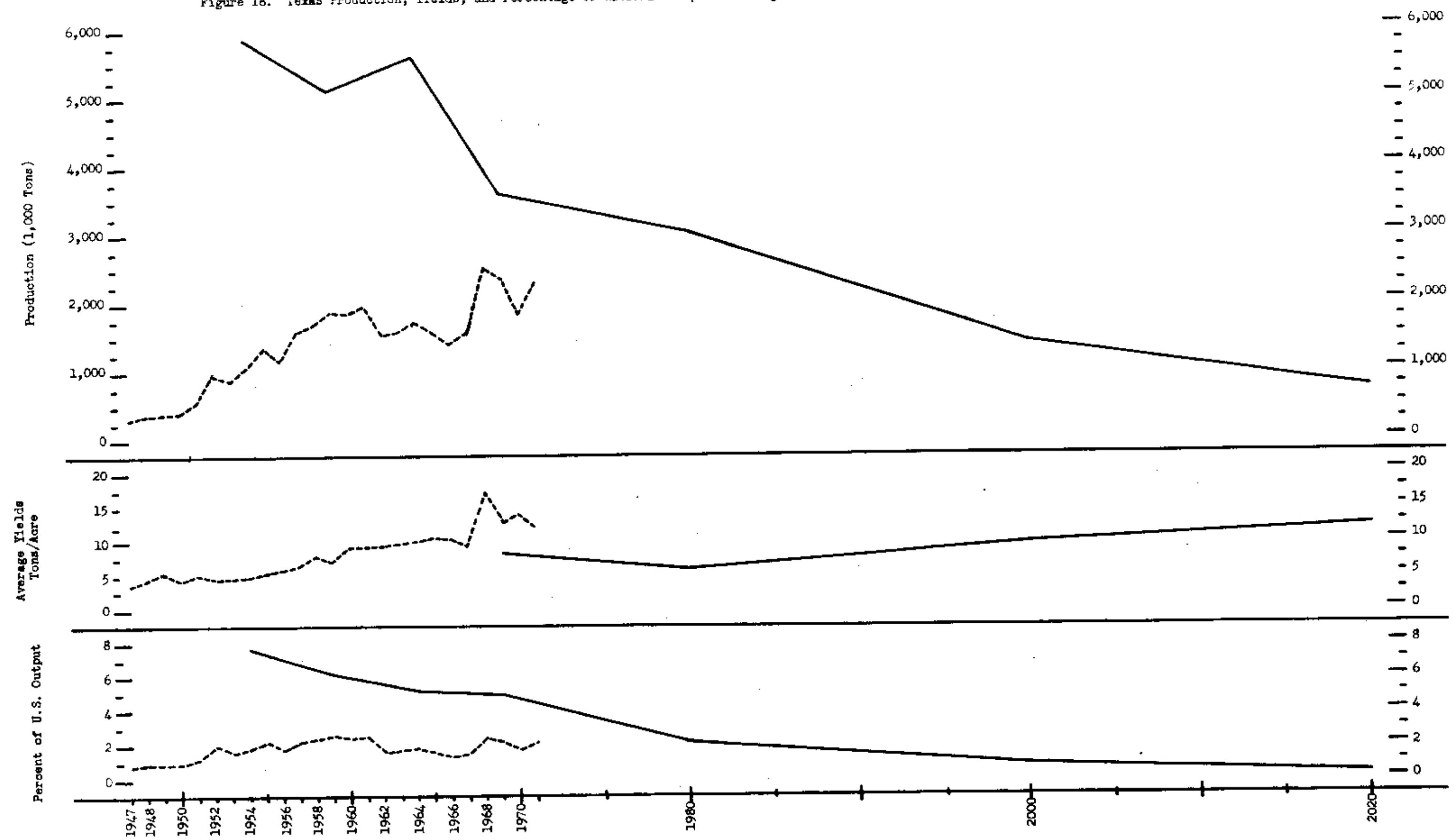
Sources: Flotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 17. Texas Production, Yields, and Percentage of National Output of Hay, Historical and Projected, 1947-2020.



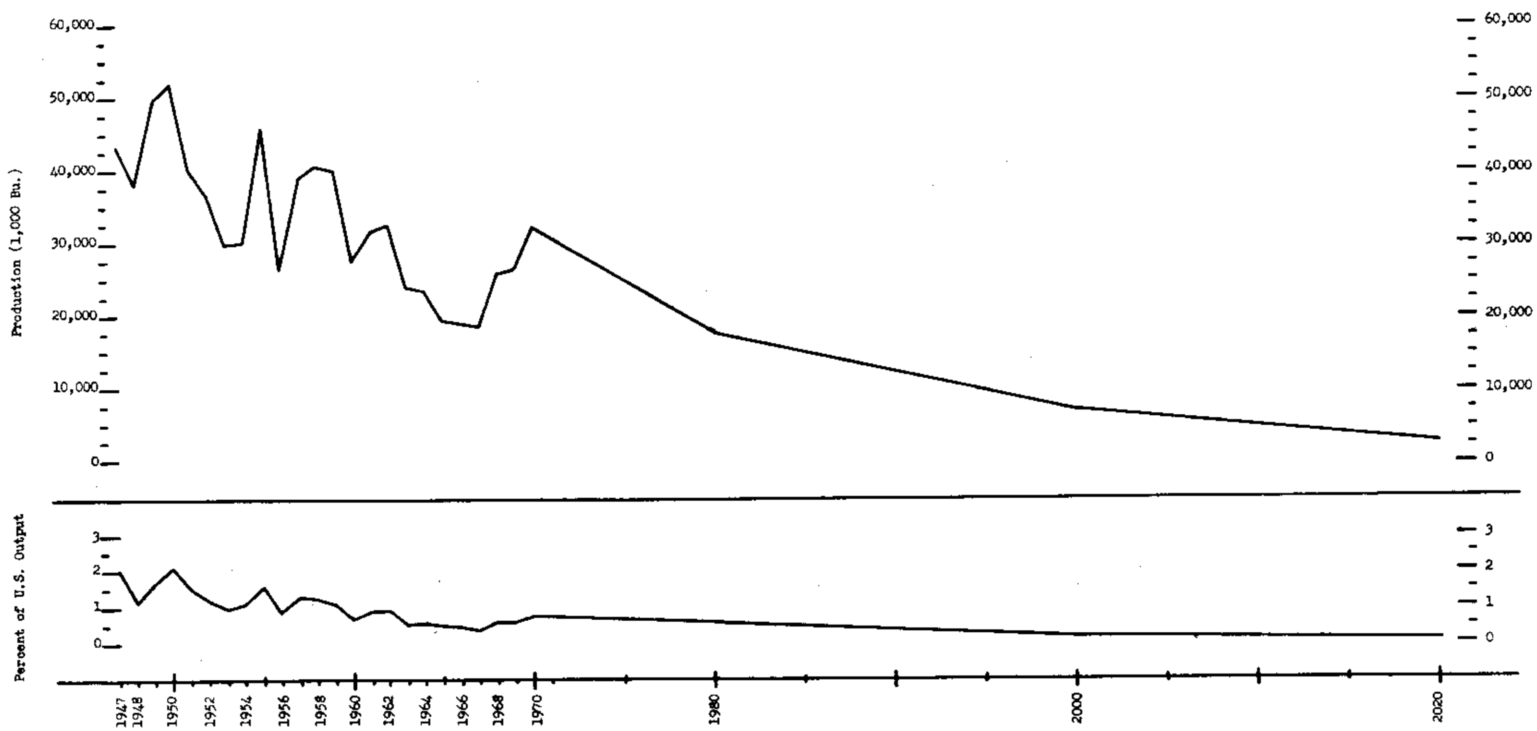
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 18. Texas Production, Yields, and Percentage of National Output of Silage (and Including Forage), Historical and Projected, 1947–2020.



Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 19. Texas Production, Yields, and Percentage of National Output of Corn, Historical and Projected, 1947–2020.



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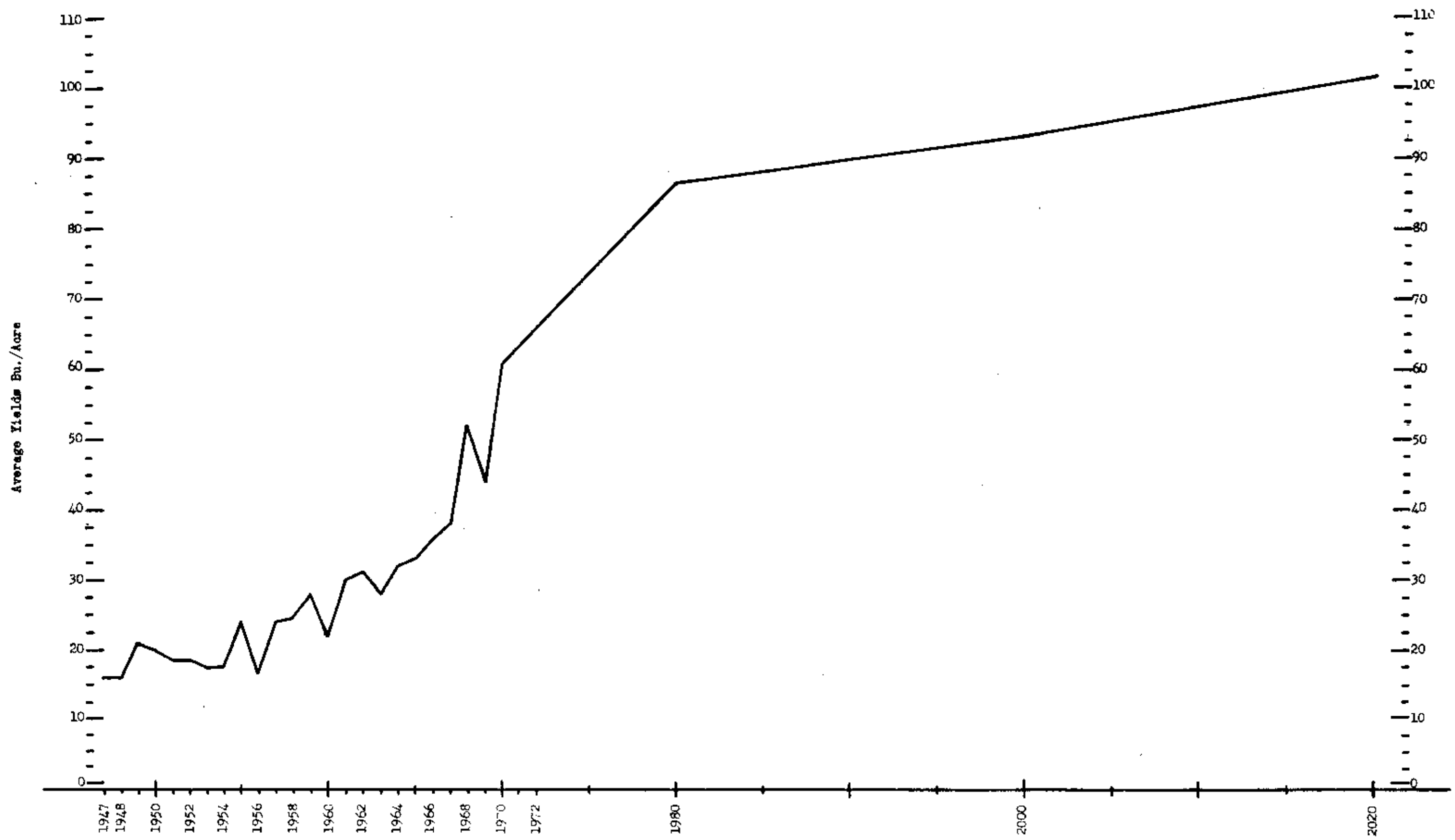
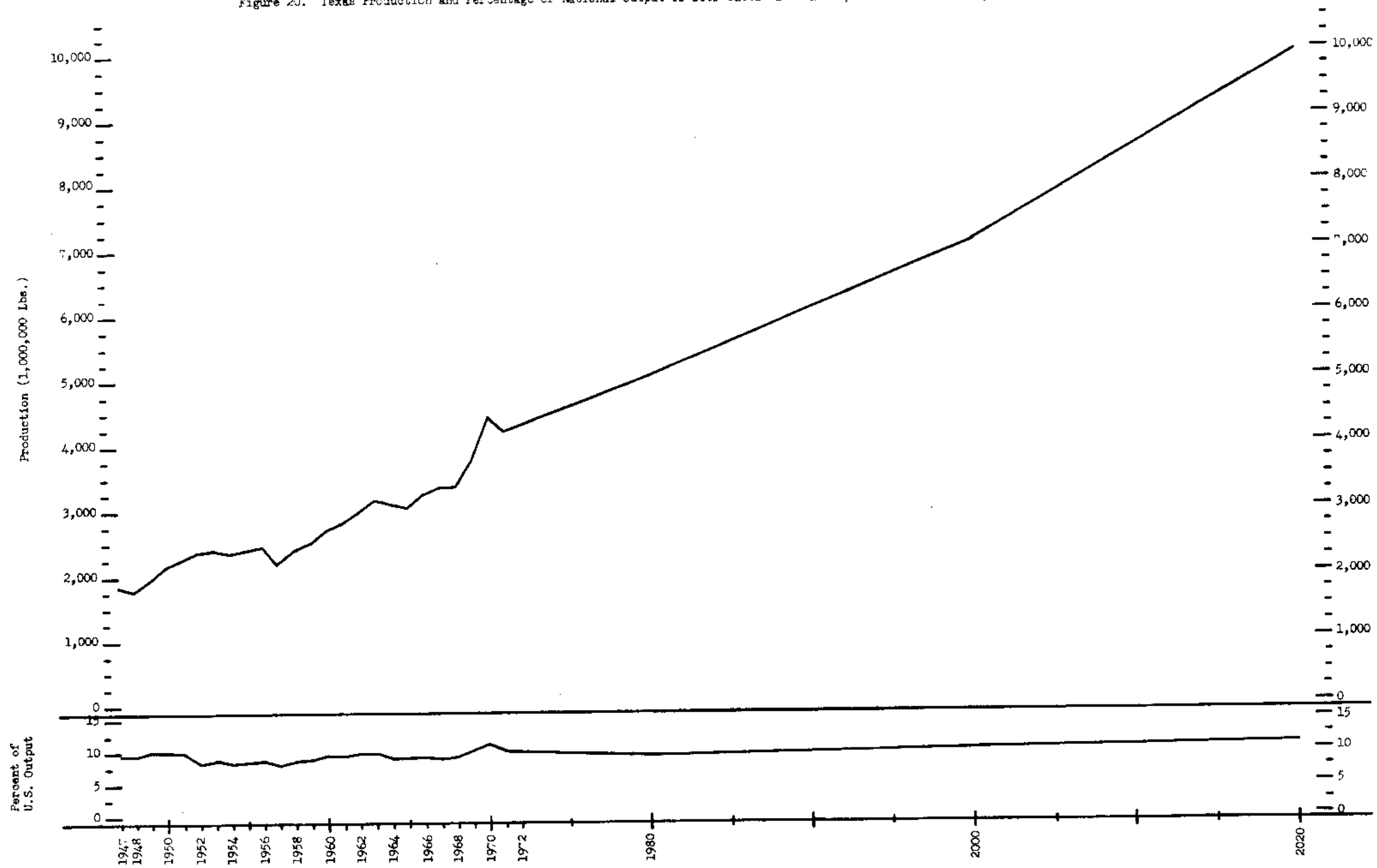


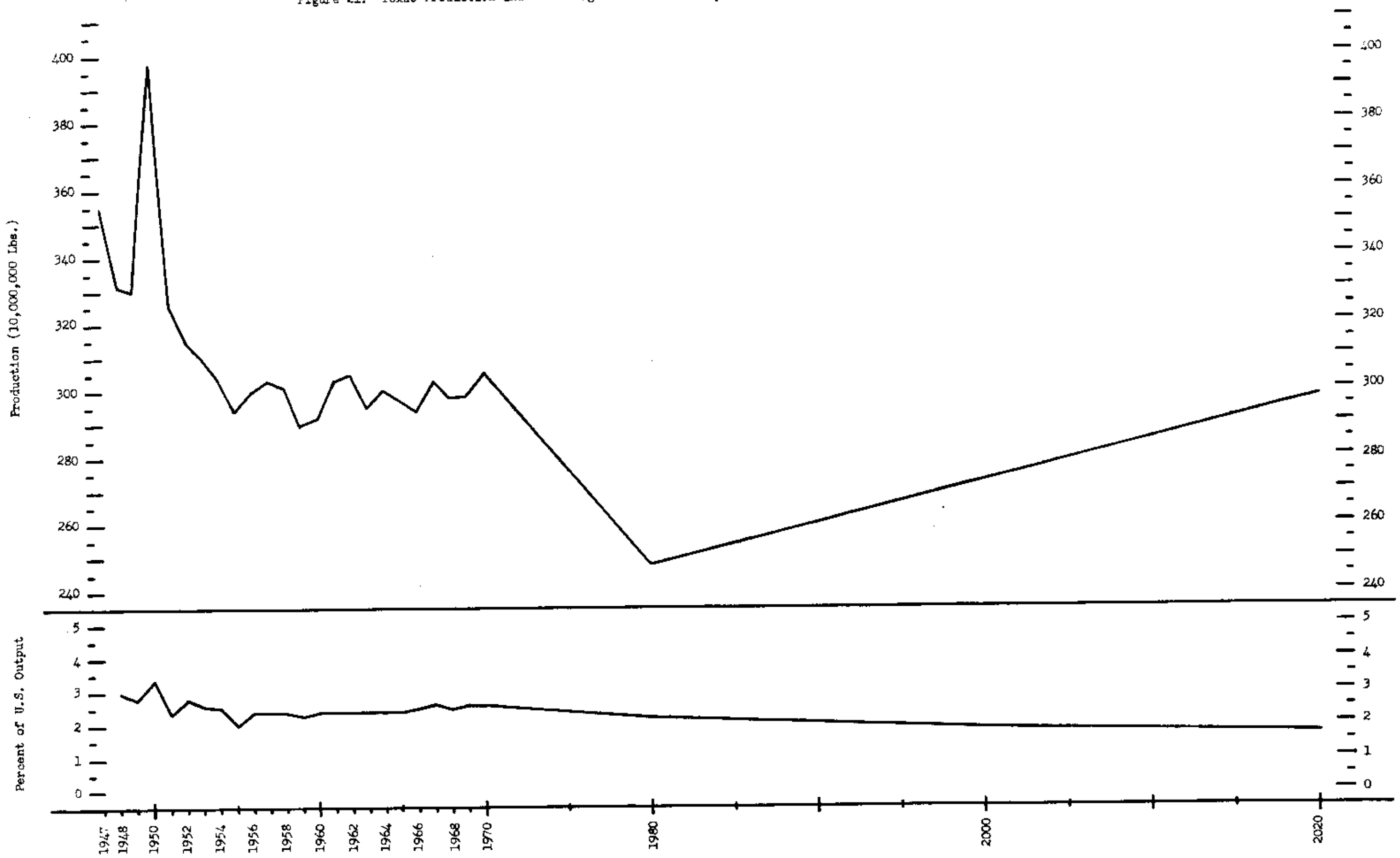
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 20. Texas Production and Percentage of National Output of Beef Cattle and Calves, Historical and Projected, 1947-2020.



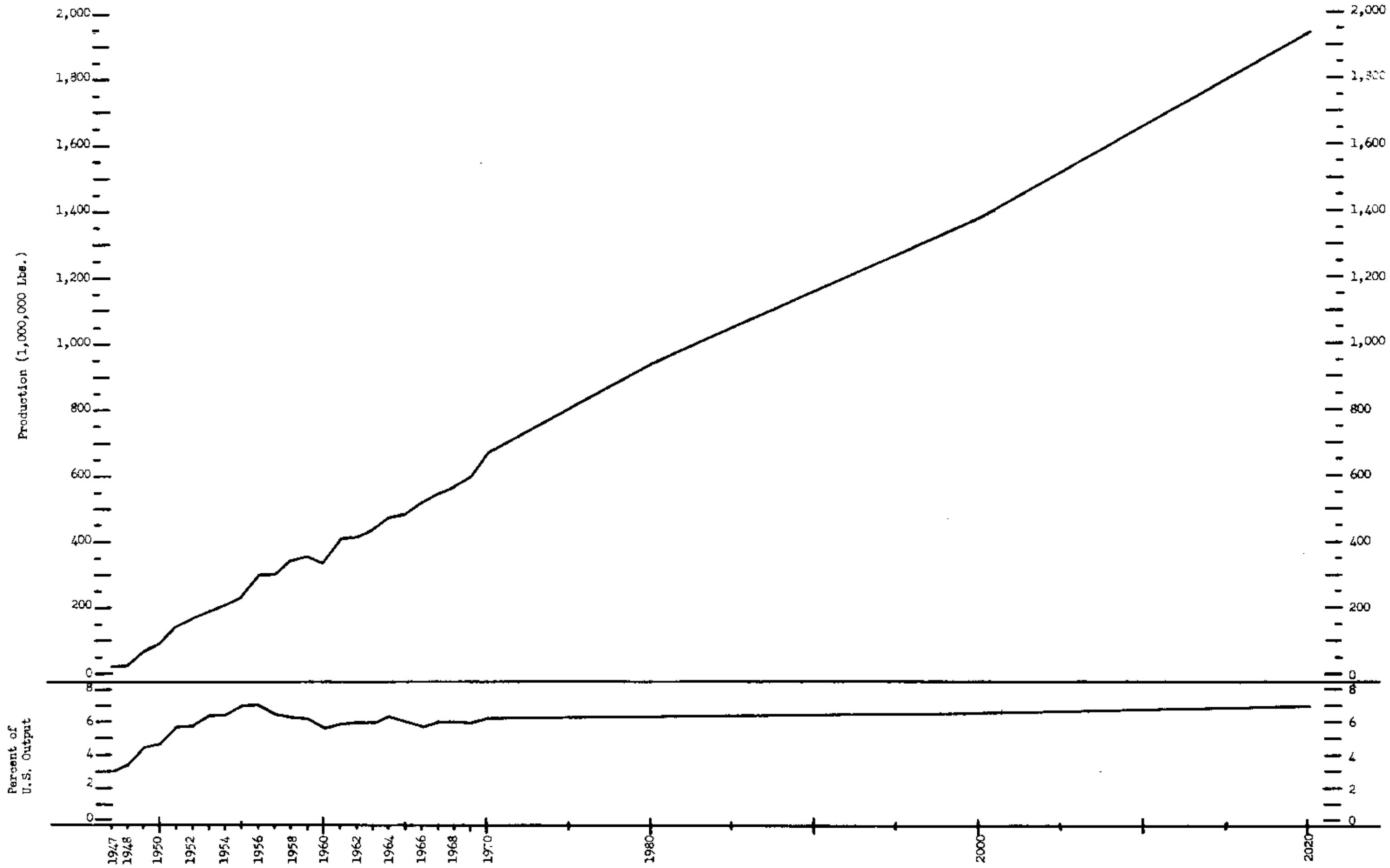
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 21. Texas Production and Percentage of National Output of Milk, Historical and Projected, 1947–2020.



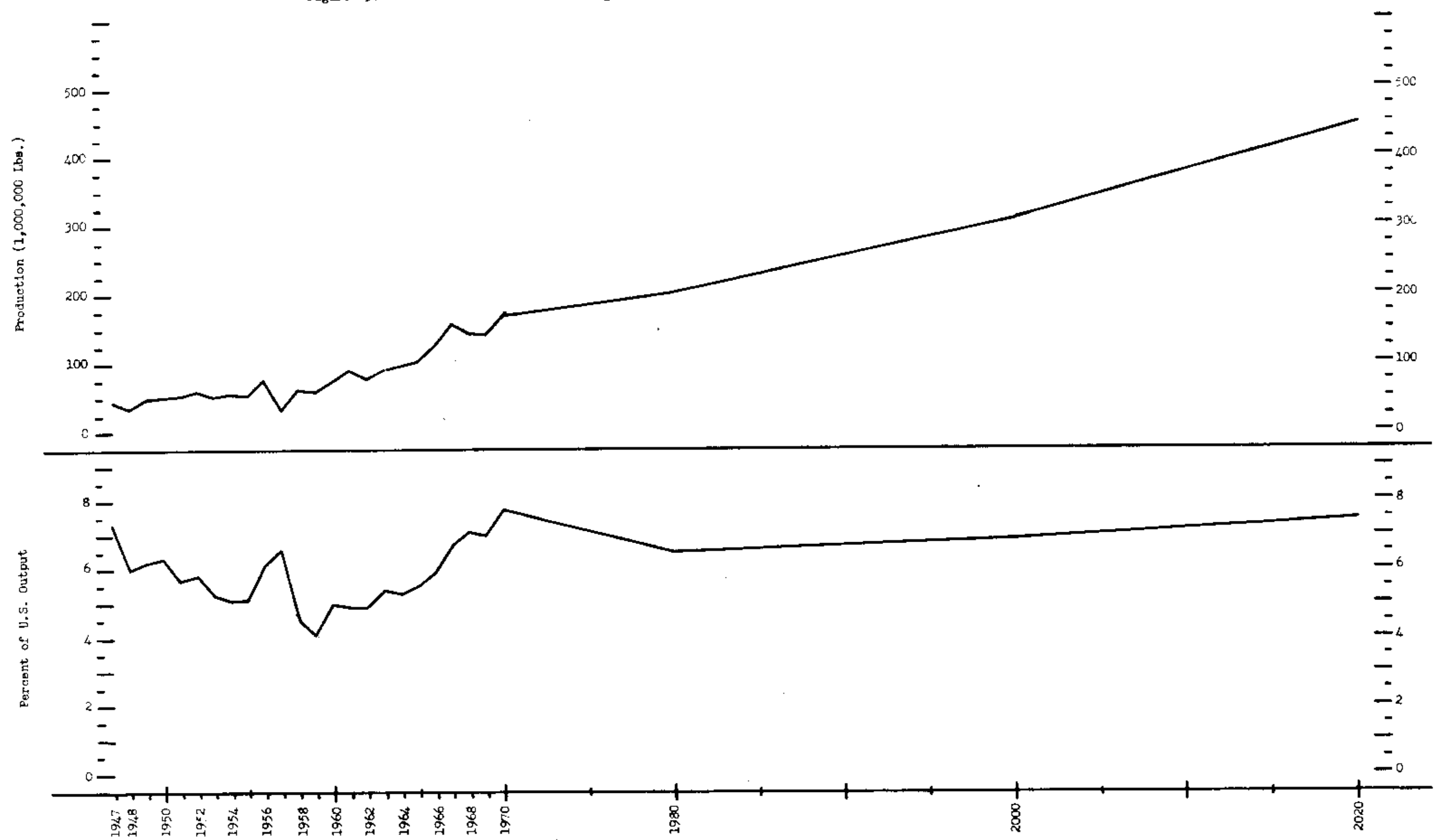
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 22. Texas Production and Percentage of National Output of Broilers, Historical and Projected, 1947–2020.



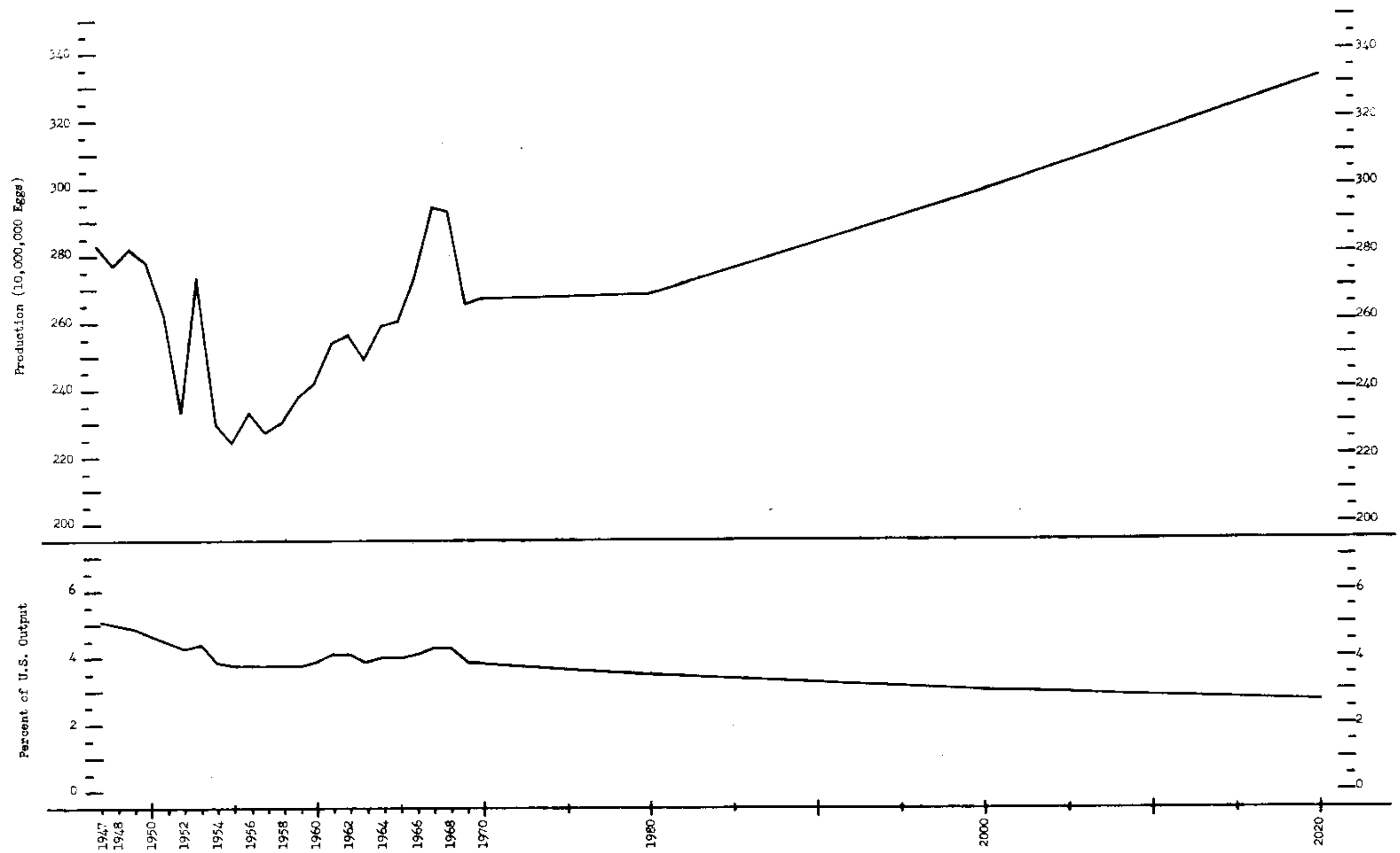
Sources: Plotted from data provided in (1) <u>1972 OBERS Projections</u>, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 23. Texas Production and Percentage of National Output of Turkeys, Historical and Projected, 1947-2020.



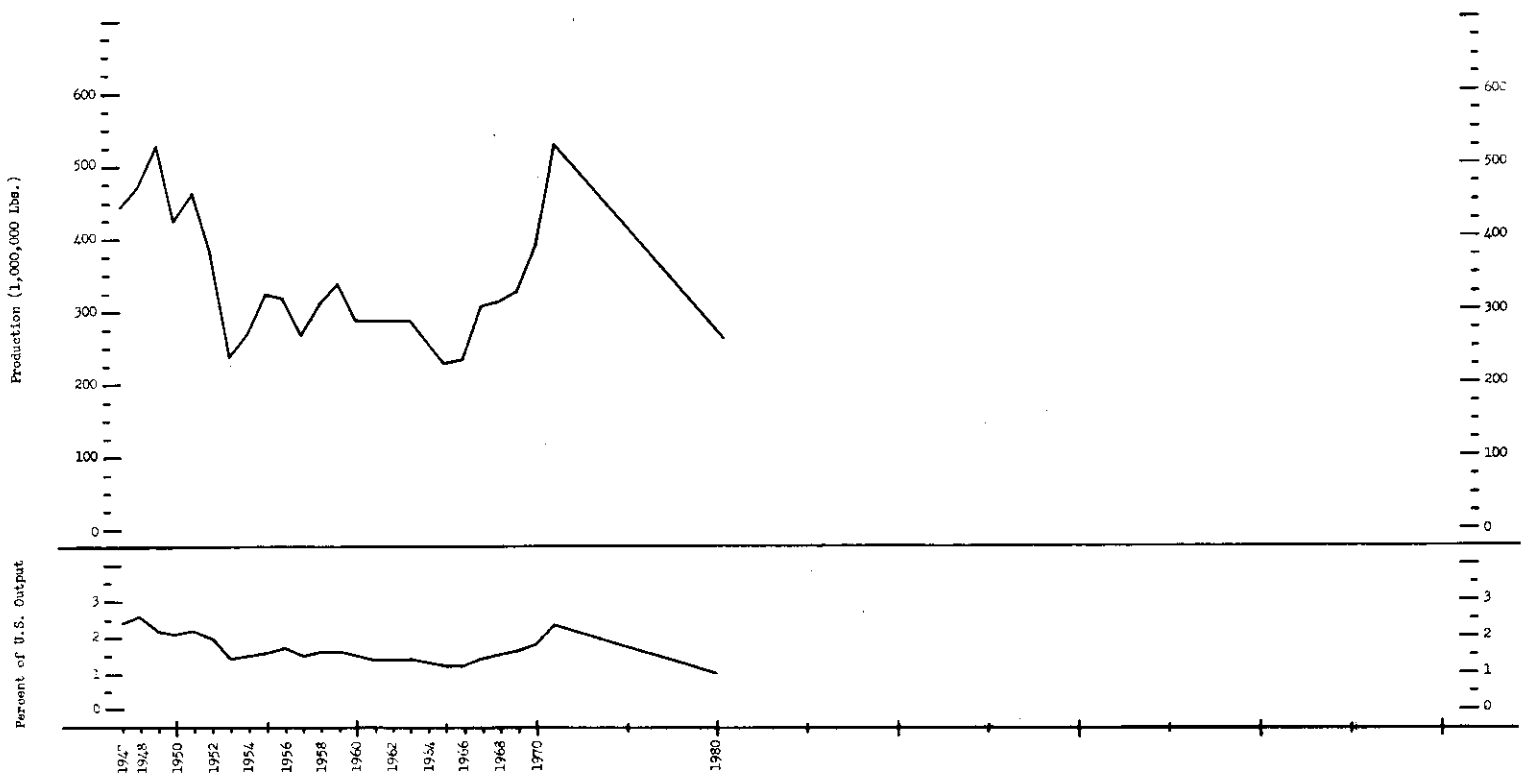
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 24. Texas Production and Percentage of National Output of Eggs, Historical and Projected, 1947-2020.



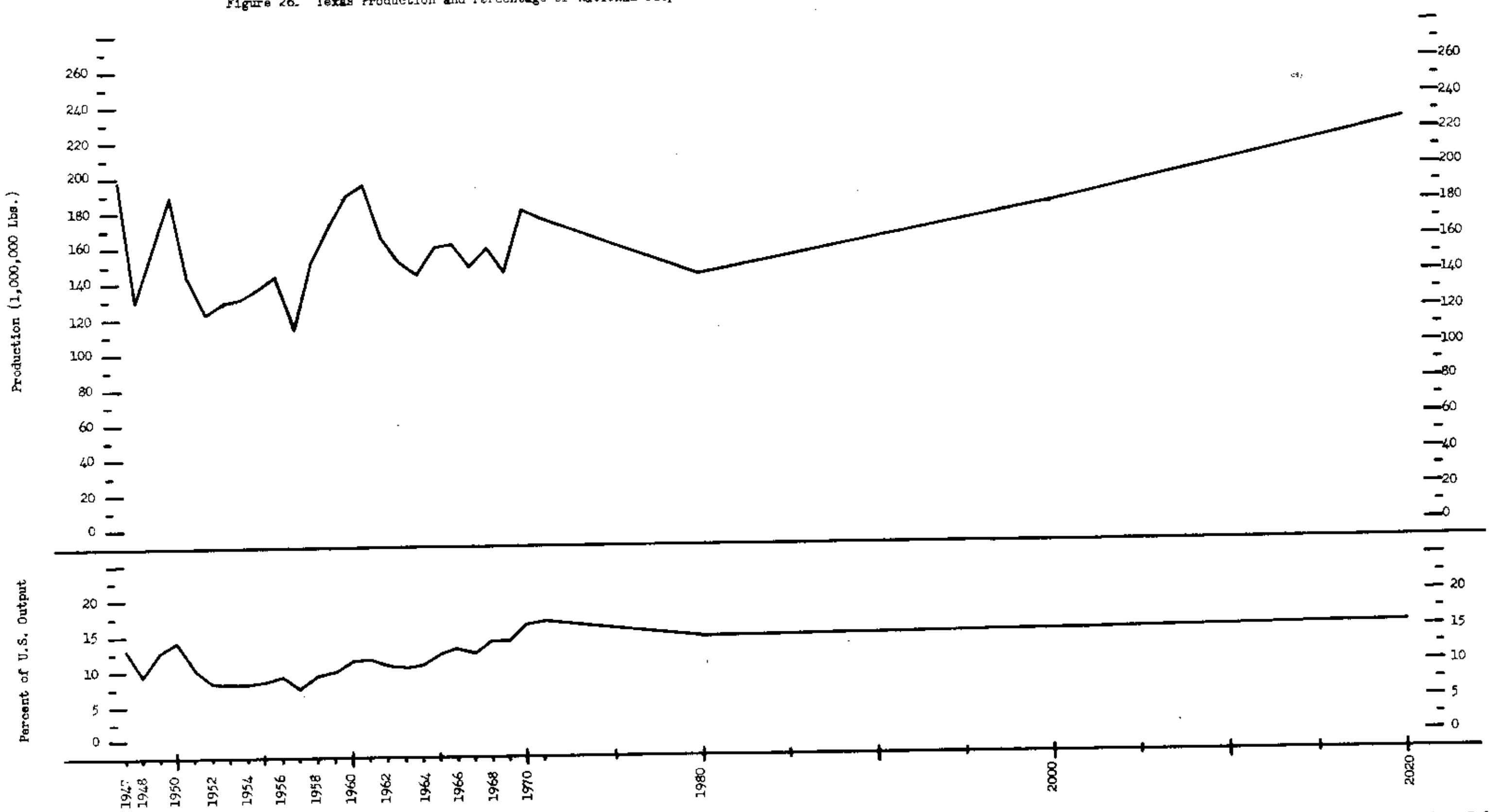
Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 25. Texas Production and Percentage of National Output of Hogs, Historical and Projected, 1947–1980.



Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.

Figure 26. Texas Production and Percentage of National Output of Lamb and Mutton, Historical and Projected, 1947-2020.



Sources: Plotted from data provided in (1) 1972 OBERS Projections, U.S. Water Resources Council; and (2) Revised Estimates of the Crop Reporting Board, U.S. Department of Agriculture, Washington, D.C.