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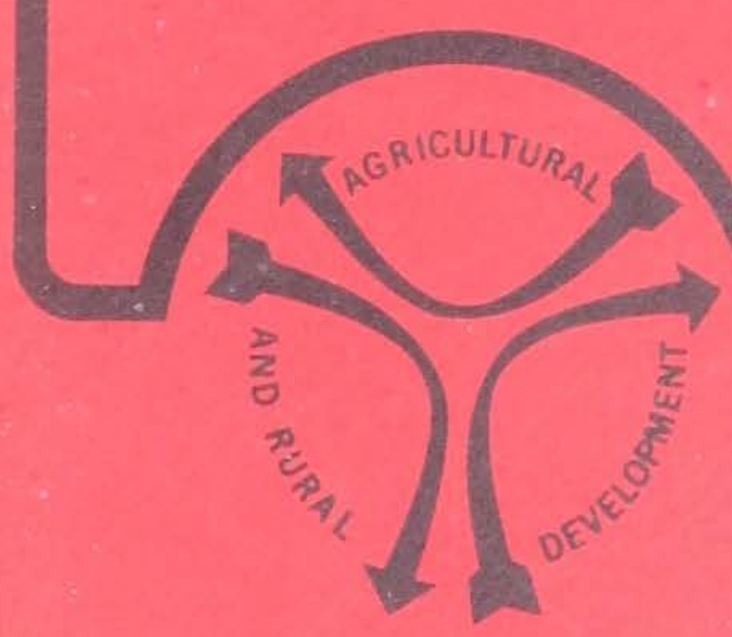

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PROJECTED QUANTITIES OF GRAIN AND FERTILIZER REQUIRING TRANSPORTATION SERVICES IN IOWA IN 1979-80 AND 1984-85, BY COUNTIES

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Introduction

The Iowa grain and fertilizer industries are in a period of major adjustment to changing demand and transportation conditions. Owners and managers of grain and fertilizer facilities have a need for information on the trends in grain acreage, production, sales, and fertilizer requirements. These types of information are needed in planning for storage, distribution, and transportation facilities in the years ahead. There are no regularly published data on commercial grain sales--the quantity of grain moving out of the county where it is produced. The Iowa Crop and Livestock Reporting Service annually prepares state estimates of the quantities of grain sold off farms where the grain is produced. However, these estimates include farm-to-farm and farm-to-elevator-to-farm sales and therefore do not accurately reflect the quantities moving through commercial channels beyond the country elevator. This information is available for counties in the U. S. Census of Agriculture, but only once every five years.

Purpose

The basic purpose of this report is to provide projections of the future quantities of grain and fertilizer requiring transportation services in Iowa counties.

These data will be useful in evaluating grain and fertilizer facility handling needs and grain and fertilizer transportation requirements. They also are needed in planning efficient handling and transportation systems to maintain Iowa's competitive position in national and international markets.

The first two sections of the report present estimates of the quantities of corn, soybeans, and oats that required transportation services in 1960 and 1972. In addition, projected quantities of these grains requiring transportation in 1980 and 1985 are presented.

The third section deals with fertilizer usage. Fertilizer usage estimates by counties in 1971, as well as projections of quantities to be applied in 1979 and 1984, are presented. Fertilizer consumption in the years ahead will depend on a number of factors, including environmental restrictions, available supplies, fertilizer and crop prices, and acreages of row crops. Possible changes in the mix of anhydrous and non-anhydrous fertilizers also will have a major bearing on fertilizer transportation needs. For example, Iowa's anhydrous ammonia supply is now transported into the state largely by pipeline. If anhydrous ammonia were gradually replaced by urea, ammonium nitrate, or other solid forms of nitrogen fertilizer, more rail, truck and (or) barge services would be needed. In addition, the required tonnage of fertilizer materials would be increased, since other types of fertilizer have a much lower nitrogen nutrient content per pound than anhydrous ammonia. Such factors need to be analyzed in order to evaluate fertilizer transportation needs accurately in future years.

Commercial Grain Sales, 1960 and 1972

Commercial grain sales for 1960 and 1972 are defined here as the residual after subtracting estimated on-farm usage of corn, oats, and soybeans from the reported county production. The difference between reported production and estimated usage on farms is assumed to be sold through commercial channels. Thus, commercial grain sales are defined as grain transported from the area where it was produced.

Grain and livestock estimates

Data for estimating commercial grain sales came from various sources. Estimates of corn, soybean, and oat production by counties were taken directly from the Iowa Annual Farm Census[6]. The basic source of data on livestock numbers by county other than hogs marketed was also the Iowa Annual Farm Census. However, county livestock data from this publication are based on tax assessor reports and historically have shown lower levels of production for many classes of livestock than have been indicated by marketing levels and other published reports of state-wide production. To allow for such biases, county livestock data from the Iowa Annual Farm Census were adjusted to reflect production and marketing levels estimated by the Statistical Reporting Service of the U. S. Department of Agriculture. The adjustment procedure for each class of livestock except hogs marketed was to divide the county estimate by a ratio of the state totals from the census and the corresponding state totals from the Statistical Reporting Service of the USDA. In other words, it was assumed that biases in the census data were uniform from one county to another.

County pig crop data were available directly from the Statistical Reporting Service. These were believed to be more accurate than census estimates and were used in estimating hogs marketed by counties. Hogs marketed were defined as the county pig crop minus the estimated death losses plus estimated shipments into the county. It was assumed that the state average death rate was uniform throughout the state and that inshipments of pigs were distributed among counties in proportion to the size of county pig crops. The procedure used to estimate the number of hogs marketed is given in Equation 1, Appendix D.

Feed requirement estimates

Estimated grain-feeding requirements per animal expressed in bushels of corn or corn equivalent are presented in Table 1. Feeding rates were developed through discussions with Iowa State University staff members in Dairy, Poultry, and Animal Science Departments and from published and unpublished reports on feeding requirements[2,8]. Corn feeding requirements for each county were estimated by multiplying the number of head of livestock by the estimated feeding rates per head.[1/]

[1/] Throughout this report, "corn" refers to corn for grain only; silage production and feeding are specified separately.

Table 1. Estimated bushels of corn consumed annually per animal by class of livestock, 1960 to 1972.

Class of Livestock	Annual Feeding Rate in Bushels per Head
Milk Cows	71.4[a/]
Beef Cows	5.0
Hogs Marketed	14.7
Grain-Fed Cattle Marketed	55.2
Sheep and Lambs Marketed	4.5
Hens and Pullets	1.0
Turkeys	0.9

[a/] Assumes each cow consumes 5 tons of silage in addition to the 71.4 bushels of corn.

Allowances for breeding stock needs were included in all classes except grain-fed cattle marketed. Beef cows are separate, because approximately half the grain-fed cattle marketed in Iowa come from cow herds outside the state.

Grain requirements for milk cows were based on a feeding program that included an annual consumption of five tons of corn silage. County silage production was allocated first to dairy cows, and any residual above five tons per cow was assumed to be allocated to grain-fed cattle. The corn-consumption rate for grain-fed cattle listed in Table 1 is based on rations containing no silage. However, in all but two counties, some silage usually has been available for grain-fed cattle. The amount varies significantly from county to county. The 1970-72 average amount of silage used for grain-fed cattle by county was taken as the average silage feeding rate per head and was assumed to remain constant through 1985. These volumes of silage were substituted for corn in cattle feeding at a rate of one ton of silage for 6.5 bushels of corn. Consumption of silage per head in dairy operations also was assumed to remain at present levels.

County grain sales

Estimated commercial corn sales for a given county were based on production from the previous crop year (t-1) and the current year's (t) livestock numbers, since it is largely the previous year's grain that will be consumed and (or) sold in the current year.

Corn sales are defined as corn production in county i, year t-1, minus the number of head of each type of livestock in year t, times the corn feeding rate for that type of livestock.[2/] The amount of corn fed is reduced by substituting the oats fed for corn at the rate of two bushels of oats for one bushel of corn. The procedure used to estimate commercial corn sales is found in Equation 2, Appendix D.

Oat sales were estimated by multiplying production times the percent of oats sold off farms as reported in the 1964 U. S. Census of Agriculture, adjusted for the increase in oat sales over the years.[3/] It was assumed that each county's oat sales increased at the same rate as sales for the entire state. The residual oats were assumed to have been fed to livestock on farms.[4/] The procedure for estimating commercial oat sales is found in Equation 3, Appendix D.

[2/] There may be a small error in this procedure from using calendar year data rather than marketing year data, but it is believed to be of limited significance in planning grain transportation facilities. Lack of livestock data by crop marketing year prevented more precise calculations.

[3/] 1964 was the last year county oat sales were reported. State oat sales are reported in Field and Seed Crops -- Production Farm Use Sales Values by State[5].

[4/] The estimate of commercial oat sales is biased upward slightly, because it includes farm-to-farm sales and farm-to-elevator-to-farm sales. However, because of the recent reduction in oat production, it is believed that this procedure introduces only a small error in the estimates.

Since only a small amount of soybeans are normally used on farms, a slightly different procedure was used to estimate soybean sales. Soybean sales were defined as county soybean production minus one bushel of soybean seed per acre. The procedure for estimating county sales of soybeans is given in Equation 4, Appendix D.

Projections of Grain Sales to 1980 and 1985

The basic procedure for projecting commercial grain sales to 1980 and 1985 involved four steps. Step one was to project corn, oat, and soybean production to 1979 and 1984 and livestock numbers to 1980 and 1985 for the state. Secondly, county percentage shares of state production were projected through a non-linear regression of past shares. County production was then derived by multiplying the projected state production total by the county percentage share of total production. Projections of county livestock numbers were then used in the third step to estimate 1980 and 1985 grain feeding requirements. The final step was to subtract grain feeding requirements and soybean seed requirements from projected production levels in order to obtain estimates of grain to be moved through commercial channels.

Projected Iowa grain and livestock production

The method used to project Iowa grain production to 1979 and 1984 and livestock production to 1980 and 1985 was to estimate Iowa's share of recent USDA projections of national grain and livestock production

in 1979, 1980, 1984, and 1985.[5/] The procedure used in making these estimates was to project Iowa's percentage of national production to 1979-80 and 1984-85 on the basis of past trends in Iowa's share of U. S. production.

National demand projections

The USDA projections were based on an analysis of national demand for farm production and projected demand in 1980 and 1985. Important assumptions behind these projections include a total U. S. population of 233.7 million people by 1985 and an average growth in real gross national product of about 4.0 percent per year by 1985. Two alternative levels of grain export were considered for 1980 and 1985. These alternatives were: (1) low commodity exports, based on past export levels excluding 1972-3 and 1973-4, and (2) a high export alternative based on a continuation of recent high export levels. Actual export levels will depend on grain and livestock production trends in other areas of the world, as well as the growth in demands of the developing nations for U. S. agricultural products. Domestic consumption was assumed to remain constant under the two alternatives. Table 2 shows the levels of corn and soybean exports under the two alternatives.

[5/] See [1,11, and 9]. Slight adjustments in the data in these works were made on the basis of more recent projections published in United States and World Fertilizer Outlook, 1974 and 1980[13].

Table 2. Projected net exports to 1980 and 1985 for corn and soybeans under the low and high export alternatives, in millions of bushels, for the United States.

	Low Export		High Export	
Commodity	1980	1985	1980	1985
Corn	1150	1200	1575	1652
Soybeans	750	950	925	1158

The 1980 and 1985 national demands for livestock were taken directly from USDA projections. Since the national projections were expressed in units of production, such as carcass weight of beef and million hundredweights of milk, additional work was needed to convert them into projections of animal numbers. Below is an outline of the procedure used to arrive at estimates of animal numbers.

Fed cattle marketed -- To translate carcass weight of beef production into numbers of fed cattle marketed, we assumed that 90 percent of the total beef supply would come from fed beef. A weighted average carcass weight of 620.1 pounds per head was computed, based on an average of steers at 650 pounds carcass weight per head and heifers at 552 pounds per head. Steers were assumed to account for 69.5 percent of fed cattle marketings, with heifers accounting for 30.5 percent.[6/] The remainder of the computational procedure was as follows:

1. Total beef production was multiplied by 90 percent to obtain fed beef production in pounds of carcass weight.

2. Fed beef production in carcass weight was divided by the average carcass weight per head to obtain projected numbers of fed cattle marketed.

6/ These estimates were based on unpublished work by Gene A. Futrell, Department of Economics, Iowa State University, Ames.

Dairy cow numbers -- Milk production per cow was projected at 10,500 pounds. This would be a moderate increase from recent levels but would represent a gradual slowing in the growth rate in output per cow. Dairy cow numbers were projected by dividing 1985 milk production by projected milk output per cow.

Beef cows -- Beef cow productivity was assumed to increase moderately during the 1974-1985 period, and 1.28 beef cows were assumed to be required for each head of fed cattle marketed. This figure allows for death losses, herd replacements, and non-fed cattle marketings. Fed cattle marketings were multiplied by 1.28 to obtain the estimated beef cow numbers.

Hogs marketed -- The average carcass weight was assumed to reach 162 pounds per hog, a continuation of the upward trend in carcass weights but at a slower rate than in the recent past. The upward trend reflects a shift to production of more meat-type hogs and genetic improvements that have raised the average dressing percentage. Projected pork production in carcass weight was divided by the average carcass weight per head to estimate the number of hogs marketed.

Laying flock numbers -- The average laying rate was projected at 237.6 eggs per bird in 1985, up from about 228 eggs per bird in 1972. This represents a modest slowing of the recent upward trend in productivity per bird. Projected egg production was divided by the average laying rate per bird to obtain the projected number of layers in 1985.

Sheep and lambs -- Average carcass weights per head were assumed to remain at present levels. Thus, the USDA projected percent decrease of sheep and lamb production by carcass weight was applied to project sheep and lamb numbers.

Turkeys -- Slaughter weights were assumed to remain at present levels, and the 1985 estimating procedure was the same as for sheep and lambs.

Iowa shares of U. S. production

Iowa's shares of national grain production were projected to 1979 and 1984 by use of a non-linear regression of 1960-73 shares. Iowa's shares of national livestock production, except grain-fed cattle, were projected by using data from 1960 through 1972. The Iowa share of grain-fed cattle was projected to 1980 and 1985 by using data for 1968 through 1972, since the reduced share of recent years was believed to be more representative of the future than the upward trend from 1960 to 1968. The procedures for estimating and projecting Iowa's shares are found in Equation 5, Appendix D.

Tables 3 and 4 show Iowa's shares of U. S. production and projections of grain and livestock output for the United States and Iowa for 1979-80 and 1984-85. The projected Iowa share of milk cows was adjusted downward slightly from regression estimates based on subjective judgments about Iowa's competitive position compared with other regions of the nation.

Iowa's shares of grain production were projected by using data from 1959 through 1972. The Iowa share of U. S. corn production is projected to continue the slow increase experienced from 1959 to 1972. The Iowa share of U. S. soybean production is projected to increase but at a slower rate than from 1959 to 1972. The share of U. S. oat production is projected to continue to decline but at a slower rate of decrease than from 1959 to 1972.

Table 3. U. S. and Iowa production of corn, soybeans, and oats in 1959 and 1971 and projections to 1979 and 1984 under the low and high export alternatives.

	Type of Grain		
	Corn	Soybeans	Oats
U. S. Production		(million bushels)	
1959	3,825	533	1,050
1971	5,641	1,176	881
Low Export Alternative			
1979	6,602	1,765	803
1984	7,141	2,052	816
High Export Alternative			
1979	7,122	1,880	803
1984	7,589	2,241	816
Iowa's Share of U.S. Production		(percentage)	
1959	20.62	11.82	17.90
1971	20.88	15.22	10.33
1979	21.22	17.36	9.73
1984	21.30	17.76	9.39
Iowa Production		(million bushels)	
1959	789	63	188
1971	1,178	179	91
1973	1,204	269	64
1974[a]	964	198	91
Low Export Alternative			
1979	1,401	306	78
1984	1,521	364	77
High Export Alternative			
1979	1,512	326	78
1984	1,616	398	77

[a]Preliminary estimates

Table 4. U. S. and Iowa production of livestock and poultry in 1960 and 1972 and projections to 1980 and 1985.

U. S. Production	Fed Cattle Marketed	Hogs Marketed	Beef Cows	Dairy Cows	Sheep & Lambs	Hens & Pullets	Turkeys Raised
			(million head)				
1960	13.0	88.4	26.3	19.3	22.6	295.3	84.5
1972	27.8	91.5	41.1	11.7	14.4	305.4	128.8
1980	41.0	93.4	52.5	11.5	6.1	307.7	158.8
1985	45.8	101.1	58.6	11.5	5.2	319.3	175.2
Iowa's Share of U. S. Production			(percentage)				
1960	19.77	20.55	3.50	4.87	6.97	8.34	9.12
1972	14.35	24.92	4.40	3.88	4.95	3.22	5.06
1980	10.62	24.50	4.64	2.95	4.99	3.28	4.56
1985	9.04	25.00	4.83	2.61	4.84	3.04	4.29
Iowa Production			(million head)				
1960	2.57	18.17	0.92	0.94	1.58	24.64	7.71
1972	3.99	22.83	1.81	0.45	0.71	9.82	6.52
1980	4.36	22.88	2.44	0.34	0.30	10.09	7.24
1985	4.14	25.28	2.83	0.30	0.25	9.71	7.52

Iowa is projected to obtain an increasing share of the nation's hogs and beef cow herd. Shares of other livestock are projected to decline from recent levels. Important factors affecting future livestock shares include the level of grain prices, grain production, availability of feeder animals, environmental regulations, and availability of off-farm employment opportunities.[7/] Iowa's share of the nation's fed cattle production, for example, has dropped considerably in the last four years. Relatively high feed-grain prices during the corn blight season of 1970-71 and again in 1972-73 and 1973-74 appear to have been a major factor behind the declining share. Iowa cattle feeding operations typically are family farm units that can drop out of livestock feeding and rely on cash grain income when profit opportunities so dictate. Thus, whether the recent slump in Iowa cattle feeding will continue depends heavily on the level of grain prices.

Projected county grain production

After state projections to 1979 and 1984 were developed using the procedure outlined above, the next step was to allocate production among counties. This was done by multiplying projected Iowa production by each county's projected share of the state total.

Projected county shares -- Projected county shares of state grain production were derived first by computing the counties' shares for 1960-72. This was done by dividing the county production by Iowa's total production for each year from 1960-72. Then the county shares were projected by a non-linear regression to 1979 and 1984. The projected

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7/ A discussion of the impact of off-farm employment on livestock production is included in [12].

county grain production was then derived by multiplying Iowa's projected production by the projected county share for each grain for 1979 and 1984. The procedures for estimating and projecting the county shares of grain are given in Equation 6, Appendix D.

Yield estimates -- Potential grain yields for each county, using present technology and management practices, were developed from published and unpublished materials developed by Iowa State University agronomists [3,10]. These data were used as a base for projecting two different levels of grain yields to 1979 and 1984. The base yields are believed attainable as a five-year average with present technology and average weather conditions. Potential county yields are based on soil types, slope and erosion factors, conservation methods, and weather factors. Yields obtained in any one year may vary considerably from projected yields at any or all locations because of the variability of these factors.

Two alternative levels of yields were projected for 1979 and 1984. Under alternative I--an average productivity growth rate--the base yields were raised by 6.9 percent and 11.5 percent for 1979 and 1984, respectively. For alternative II--a high productivity growth rate--base yields were raised by 11.5 percent and 15.0 percent, respectively. The average productivity growth assumption is based on a non-linear regression of 1960-73 yields. The high productivity growth rate assumes a high level of management, use of most known technology, and development of additional yield-increasing technology.

After corn yield projections were developed, soybean and oat yields were projected by assuming yields on these crops would vary proportionately with corn. Soybean yields (bushels per acre) were established at 38 percent

of the estimated corn yields, based on results from yield test plots and present corn-soybean yield relationships. Oat yields (bushels per acre) are more difficult to estimate, because weather and diseases influence oat yields differently than corn or soybean yields on the same soils. Taking into account weather influences, oat yields in northwest Iowa were placed at 85 percent of corn yields, compared with 75 percent in north central and northeast Iowa, 70 percent in west central, central, and east central Iowa, 50 percent in southwestern Iowa, and 55 percent in south central and southeastern Iowa[3].

Acreage requirements and conservation practices -- Two alternative levels of conservation practices were used in projecting the amount of land available in each county for row crops in 1979 and 1984. Use of minimum conservation practices was assumed to make available for row crop use 100 percent of A slope, 100 percent of B slope, 33.3 percent of C slope, and 16.7 percent of D slope land.[8/] Maximum conservation practices were assumed to make available for row crop use 100 percent of A slope, 100 percent of B slope, 90 percent of C slope, and 80 percent of D slope land.[9/] Therefore, lower row crop acreages will be available by county with minimum conservation practices than with maximum conservation practices. Projected row crop acres were considered an absolute constraint in the allocation of state corn and soybean production to individual counties.

8/ Available row crop acreages and crop land acreages were obtained from Iowa Conservative Needs Inventory[7]. Slopes for A, B, C, and D land are A = 0-2%, B = 2-5%, C = 5-9%, D = 9-14%.

9/ The minimum conservation level approximates present practices, while the maximum conservation level would require extensive use of terracing, minimum tillage, and other erosion control practices on the C and D slope land.

Row crop acreage is defined as land used for corn, corn silage, and soybeans. Therefore, projections of corn silage acreage also were needed to establish the row crop acreage. Silage production was projected first by dividing projected corn yields by 6.5 bushels of corn equivalent per ton of silage to obtain silage yields in tons per acre. Next, corn silage production was projected by multiplying the projected county numbers of milk cows times five tons per head plus the projected numbers of grain-fed cattle times the 1970-72 silage feeding rates per head of grain-fed cattle. Since it was assumed that all silage is consumed in the county where produced, this sum was the projected silage production in the county. The final step was to determine silage acres required by dividing silage production by the projected silage yield in tons per acre. The procedures for these three steps are found in Equation 7, Appendix D.

Corn, corn silage, and soybean acreage were allocated to counties by soil slopes. First, all slope A land was used for these crops, followed by slope B, slope C, and finally the available slope D land. The level of conservation practices affected this procedure by limiting the amount of land available in C and D slope land. Corn, corn silage, and soybean acres were allocated to each slope according to the projected ratios of individual crop acres needed to the total row crop acres needed. For example, if the production projections for a county called for 5000 acres of corn, 1000 acres of silage, and 4000 acres of soybeans, then 50 percent of A slope land would be allocated to corn, 10 percent to silage, and 40 percent to soybeans. These same ratios will apply to B, C, and D slopes for that county. In cases where acreage available for row crops exceeded projected plantings, the unused land was assigned to higher slope soils.

Oats were allocated to the land remaining after the row crop acres were determined. If the projected production of row crops used all the land available for row crops, oat production would be allocated to the remaining C and D slope land. Under the minimum level of conservation practices, 66.6 percent of C slope and 83.3 percent of D slope land would be available for oat production. Under the maximum level of conservation practices, 10 percent of C slope and 20 percent of D slope land would be available for oat production.

Upper bound on county production -- The possibility that the land required to meet grain production forecasts for a particular county might exceed the row crop acreage available created the need for an upper bound on grain production estimates. An upper bound was imposed on corn and soybean production whenever total row crop acres available were less than acreage requirements needed to satisfy the demand projections. Likewise, an upper bound was imposed on oat production whenever total crop land (A, B, C, and D slopes) was less than the total acreage requirement. In counties where the upper bounds were reached, additional production needs were reallocated to other counties. Because of rotation requirements and potential disease problems from continuous soybeans, county soybean acreages were restricted to a maximum of the corn plus silage acreages.

If more acreage was needed to meet grain demand projections than was available in a given county, the additional grain needs were reallocated to counties with excess row crop acres. Silage acreage was not altered, since it is considered a function of livestock numbers. The reallocation procedures are found in Equation 8, Appendix D.

To summarize the grain projection process, three sets of assumptions were made to obtain the county grain production projections. The low and high export alternatives were used to determine the projected production of the U. S. and consequently Iowa's production of grain. The average and high productivity growth rates were used to project the increases in county yields resulting from increasing productivity. The minimum and maximum levels of conservation practices were used to determine the amount of land available in a county using two levels of conservation practices. However, the minimum level of conservation practices resulted in total state production substantially below projected demand levels, so only the maximum conservation county projections are presented.

Three combinations of alternative production levels, productivity growth rates, and conservation practices were actually computed and results presented--(1) low export alternative with the low productivity growth rate and the maximum level of conservation practices, (2) low export alternative with high productivity growth rate and maximum level of conservation practices, and (3) high export alternative with the high productivity growth rate and the maximum level of conservation practices.

Projected county livestock production

After state projections of 1980 and 1985 livestock productions were developed using the derived demand procedure, the next step was to allocate production among the counties. This was done by multiplying projected Iowa production by each county's projected share of the state total. The procedures for these calculations are presented in Equation 6, Appendix D.

County shares of state production were projected based on a non-linear regression of 1960-72 shares for all classes except grain-fed cattle, which used 1968-72 to reflect a more recent shift in trends.

The resulting livestock projections were used in determining the amount of corn consumed within the county and in projecting commercial grain sales.

Feeding requirements

Livestock feeding requirements per head for 1980 and 1985 were modified from the 1972 rates (Table 1) and are shown in Table 5. A slight decrease in ruminant roughage was projected, along with an expected improvement in hog feeding efficiency.[10/] Grain-fed cattle feeding requirements were adjusted according to the average amount of silage fed in the county, using the same procedure developed for 1972 estimates.

Table 5. Estimated bushels of corn consumed annually per animal by class of livestock, 1980 and 1985.

Class of livestock	Annual feeding rate in bushels per head	
	1980	1985
Milk cows	74.0[a/]	77.0[a/]
Beef cows	4.0	4.0
Hogs Marketed	14.2	14.2
Grain-Fed Cattle Marketed	56.0	57.8
Sheep and Lambs Marketed	5.0	5.5
Hens and Pullets	1.0	1.0
Turkeys	0.9	0.9

[a/] Assumes each cow consumes 5 tons of silage in addition to the 74.0 or 77.0 bushels of corn.

[10/] Actual feeding rates could be higher than projected if environmental considerations bring a restricted use of growth stimulants, antibiotics, and other efficiency-increasing practices.

Projected county grain sales

The final step in calculating county grain sales was to use the methods previously described and the equations found in Tables 2, 3, and 4, of Appendix D, along with the modified corn feeding rates and projected livestock numbers. Results from the low export assumption and average and high productivity growth rates are presented in Appendix A. The high export and high productivity growth rate results are presented in Appendix B. Livestock numbers will be the same under both export alternatives and are presented in Appendix C.

Projected Fertilizer Usage to 1979 and 1984

Fertilizer consumption was projected to the 1979 and 1984 fertilizer seasons by multiplying projected crop acres by the projected fertilizer application rates per acre. Projected application rates were based on 1970-71 levels adjusted upward to reflect increased productivity growth in corn and soybean yields.

Application rates per acre

Since recent application rates are believed to have approached optimum levels, 1970-71 applications by counties were averaged and used as the base application rates. County fertilizer data are reported on a fiscal year basis--July to June. Thus, July 1970 to June 1971 represents the fertilizer application season for 1971 grain production.

Fertilizer application rates and tonnages of material were separated into primary nutrients--nitrogen, phosphate, and potash--for each county.[11/]

11/ See [4]. Hereafter, the basic plant nutrients are referred to as N, P_2O_5, and K_2O.

This method estimates the amount of actual plant nutrients applied but not the form of fertilizer or the total tonnage of fertilizer materials.

It was assumed that all the nitrogen is applied to corn acres but that P_2O_5 and K_2O are applied to both corn and soybean acres. Thus, nitrogen application rates were computed by dividing nitrogen usage by all corn acres, while P_2O_5 and K_2O application rates were computed using all row crop acres.

Since the application rates were based on data reported by licensed dealers located within individual counties, some inconsistency among counties occurred because of dealer sales to farmers located in other counties. The following adjustments were made to eliminate this county-to-county sales bias:[12/] If county application rates varied more than 10 percent from the Soil Conservation District average, the excess or deficit was assumed to be caused by county-to-county sales. An effort was then made to match up high and low counties. If towns existed on the border of these matched counties, the adjoining high and low counties were combined to obtain an average application rate for each of the combined counties. If no town existed along the border, it was assumed that the high application rate was correct and there were no sales by dealers to farmers outside of the county. In this case, 1970-71 application rates were left unadjusted.

Application rates for 1970-71 were then projected to 1979 and 1984 by increasing them 6.9 and 11.5 percent, respectively, for the

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[12] Based on consultation with R. D. Voss, Extension Agronomist, Department of Agronomy, Iowa State University, Ames.

average productivity growth rate and 11.5 and 15.0 percent, respectively, for the high productivity growth rate projections.

Projected fertilizer usage

Projected 1979 and 1984 plant nutrient requirements were obtained by multiplying the projected application rates per acre by the appropriate 1979 and 1984 projected crop acreages. Nitrogen application rates were multiplied by projected corn acres to estimate nitrogen consumption. Projected P_2O_5 and K_2O application rates were multiplied by projected row crop acres to project P_2O_5 and K_2O requirements.

Tables 13, 14, and 15 in Appendices A and B show the projected usage in tons for each county for 1979 and 1984 for the two productivity growth rate assumptions.

Summary and Results

Table 6 summarizes the projected changes in grain production, sales, and livestock numbers to 1979-80 and 1984-85 under both the low export and high export alternatives.

Grain production

Substantial increases in corn and soybean production have occurred in Iowa since 1959. Corn production increased 48 percent from 1959 to 1971 and another 6 percent from 1971 to 1973. It is projected to increase 26 percent from 1973 to 1984 under the low export alternative and 34 percent under the high export alternative. Soybean production increased 187 percent from 1959 to 1971 and another 54 percent from 1971 to 1973. Under the low export alternative, soybean production

is projected to increase 35 percent from 1973 to 1985 and 48 percent under the high export alternative.

Oat production decreased 53 percent from 1959 to 1971 and another 26 percent from 1971 to 1973. The sharp decline in 1973 reflected a 19 percent cut in yields due to adverse weather; preliminary estimates for 1974 show a sizeable increase in both yields and acreage, bringing production back to about the 1971 level. Using 1971 as a base because of the unusual nature of 1973, oat production is projected to decrease 10 percent from 1971 to 1984 under both the low and high export alternatives.

Grain sales

Corn sales are projected to increase 58 percent from 1972 to 1985 under the low export alternative and 74 percent under the high export alternative. Soybean sales are projected to increase 109 and 129 percent, respectively. Oat sales are projected to decrease 6 percent from 1972 and 1985 under both the low and high export alternatives. These figures suggest that the percent of the total corn production to be sold will increase through 1985. Almost all the increase in soybean production is expected to be sold through commercial channels.

Soil conservation needs -- Projected total grain production under the minimum soil conservation alternative just equaled projected 1979 demand requirements but fell short of the 1984 requirements under even the low export alternative. For this reason, projected grain production under the minimum soil conservation alternative is not presented in this report. From a practical standpoint, soil conservation practices will need to substantially exceed minimum requirements to produce the

lowest level of demand projected for 1979, and they will need to approach the maximum level of conservation to meet both the low and high export demand alternatives by 1984.

Fertilizer requirements

Table 7 shows the projected increases in fertilizer consumption needed by 1979 and 1984 under the low and high export alternatives. Under the low export alternative, nitrogen usage is projected to increase 39 percent, P_2O_5 usage by 65 percent, and K_2O usage by 82 percent by 1984 over the 1971 tonnages. Under the high export alternative, these figures would increase to 48 percent for nitrogen, 78 percent for P_2O_5, and 96 percent for K_2O. Larger increases are projected for P_2O_5 and K_2O than for N because the former two nutrients are required by soybeans as well as corn. Differences in fertilizer usage for the low export alternative under the average and high productivity growth rates are relatively small.

Two important assumptions behind the grain production projections are: the existence of approximately normal weather conditions and production inputs available at prices low enough to induce farmers to produce the projected volumes. Fertilizer consumption in years ahead will depend on environmental restrictions, available supplies, fertilizer and crop prices, and weather factors. Unless restricted by supply shortages and environmental controls, it appears that average application rates will increase further, corresponding with the yield increases, However, rates per acre are projected to increase at much slower rates than in the past. Factors tending to reduce the rate of increase include higher prices for all types of fertilizers and application rates which are closer

to optimum levels than a few years ago.

With these projected increases in grain sales and fertilizer usage, substantially increased demands on the Iowa transportation system are expected in the years ahead. These changes imply that adjustment and expansion will need to occur to accommodate the increasing demand on the grain and fertilizer transportation and distribution industries if Iowa is to maintain or improve its competitive position in marketing corn and soybeans. Shippers and receivers will need to develop extensive plans for receiving, storage, and distribution facility expansion. These plans will need to consider the optimal size, type, and location of these facilities. It means that changes will need to be made in the modes of transportation as well as in size of shipments, rate differentials, and investments and disinvestments in the transportation system. The projections in this report should provide a starting point for this planning effort.

Table 6. Estimated grain production in 1959, 1971, and 1973, livestock production and grain sales in 1960 and 1972, projected grain production to 1979 and 1984, and projected livestock production and grain sales to 1980 and 1985 for low and high export assumptions in Iowa.[a/]

	Estimated			Low Export Projected		High Export Projected	
Grain Production (millions of bushels)	1959	1971	1973	1979	1984	1979	1984
Corn Production	772	1,141	1,204	1,401	1,521	1,512	1,616
Soybean Production	61	175	269	306	364	326	398
Oat Production	184	86	64	78	77	78	77
Grain Production	1,017	1,402	1,537	1,785	1,962	1,916	2,091
Grain Sales (millions of bushels)	1960	1972		1980	1985	1980	1985
Corn Sales	339	590		845	934	955	1,029
Soybean Sales	58	170		298	355	318	389
Oat Sales	58	31		29	29	29	29
Grain Sales	455	791		1,172	1,318	1,302	1,447
Livestock Numbers (millions of head)	1960	1972		1980	1985	1980	1985
Milk Cows	.94	.45		.34	.30	.34	.30
Beef Cows	.92	1.81		2.44	2.83	2.44	2.83
Hogs Marketed	18.17	22.83		22.88	25.28	22.88	25.28
Grain-Fed Cattle Marketed	2.57	3.99		4.36	4.14	4.36	4.14
Sheep and Lambs Marketed	1.58	.71		.30	.25	.30	.25
Hens and Pullets	24.64	9.81		10.09	9.71	10.09	9.71
Turkeys	7.71	6.52		7.24	7.52	7.24	7.52

[a/] State-wide estimates are identical for both productivity alternatives.

Table 7. Fertilizer use in Iowa, in tons of primary nutrients, N, P_2O_5, and K_2O, 1959-1973, and projections to 1979 and 1984 under the low export assumption with average and high productivity growth rates and under the high export assumption with the high productivity growth rate.

Year	N	P_2O_5	K_2O
1959	93,739	117,532	66,595
1960	103,117	115,070	64,837
1961	133,816	124,559	65,842
1962	164,366	137,970	72,697
1963	229,696	169,921	94,893
1964	273,189	206,817	122,391
1965	316,444	225,471	139,397
1966	398,257	280,029	178,177
1967	543,471	348,174	268,162
1968	632,855	361,144	298,957
1969	556,856	381,760	310,237
1970	659,435	404,696	353,570
1971	701,768	422,566	352,940
1972	662,568	402,108	367,055
1973	643,696	380,301	391,041
Low Export Avg. Prod.			
1979	903,758	622,563	574,236
1984	978,104	697,846	643,642
Low Export High Prod.			
1979	903,002	621,991	573,820
1984	977,551	697,349	643,699
High Export High Prod.			
1979	973,151	667,964	616,052
1984	1,039,169	750,508	691,765

Sources:

U. S. Department of Agriculture. "Consumption of Commercial Fertilizers and Primary Plant Nutrients by States, 1945-64." USDA Stat. Bul. No. 375. June 1966.

U. S. Department of Agriculture. "Consumption of Commercial Fertilizers, Primary Plant Nutrients and Micronutrients." USDA Stat. Bul. No. 472. June 1971.

U. S. Department of Agriculture. "Consumption of Commercial Fertilizers in the United States." USDA Sp. Cr. 7. October 1972.

APPENDIX A: LOW COMMODITY EXPORT ALTERNATIVE

Appendix A. Table 1. Estimated corn production in 1959, 1971, and 1972 and projections for 1979 and 1984 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	5,856	8,693	8,724	10,377	11,261	10,374	11,223
Adams	3,710	5,916	5,824	7,369	8,080	7,367	8,052
Allamakee	3,750	6,092	6,111	7,256	8,016	7,254	7,989
Appanoose	2,214	2,809	3,287	3,832	4,149	3,831	4,135
Audubon	6,375	9,289	9,690	10,481	11,264	10,478	11,226
Benton	13,211	17,310	17,320	22,511	24,382	22,505	24,300
Black Hawk	9,885	12,427	12,640	15,882	17,239	15,877	17,182
Boone	10,056	13,929	16,335	18,783	20,622	18,778	20,552
Bremer	6,596	8,857	9,190	11,367	12,455	11,364	12,413
Buchanan	9,026	12,615	13,223	17,314	19,202	17,309	19,138
Buena Vista	10,905	15,612	16,011	17,650	19,109	17,645	19,046
Butler	10,246	13,831	13,972	17,181	18,777	17,176	18,715
Calhoun	9,974	11,961	15,412	16,374	17,659	16,369	17,601
Carroll	9,370	12,059	14,853	16,715	17,981	16,710	17,921
Cass	7,135	11,666	12,319	13,703	14,928	13,699	14,878
Cedar	10,517	16,847	14,460	20,095	21,821	20,090	21,747
Cerro Gordo	10,588	14,528	13,603	17,534	19,124	17,530	19,061
Cherokee	9,018	13,087	14,565	14,318	15,333	14,313	15,282
Chickasaw	6,191	8,154	9,218	10,561	11,563	10,558	11,524
Clarke	2,102	3,201	3,356	3,728	4,038	3,727	4,025
Clay	9,144	13,408	13,924	15,104	16,318	15,100	16,264
Clayton	6,141	11,538	12,463	15,778	17,865	15,774	17,806
Clinton	12,467	18,290	16,719	22,958	24,916	22,952	24,832
Crawford	10,044	13,625	15,661	15,617	16,718	15,612	16,662
Dallas	8,965	14,221	16,403	17,561	19,293	17,556	19,228
Davis	2,439	4,423	4,128	5,268	5,890	5,267	5,871
Decatur	1,857	3,421	3,562	4,463	4,934	4,462	4,918
Delaware	7,774	12,528	14,063	17,511	19,459	17,506	19,394
Des Moines	5,593	8,441	8,686	10,914	11,964	10,911	11,924
Dickinson	3,912	8,210	8,152	9,397	10,200	9,395	10,166
Dubuque	6,122	9,921	9,743	12,742	14,014	12,738	13,967
Emmet	5,942	10,850	9,725	12,519	13,029	12,516	13,450
Fayette	8,778	13,434	13,925	17,740	19,711	17,735	19,645
Floyd	8,650	11,202	11,409	13,764	14,952	13,760	14,902
Franklin	12,784	16,490	15,528	20,139	21,799	20,133	21,726
Fremont	7,894	11,723	11,472	12,601	13,538	12,597	13,493
Greene	9,562	12,941	16,402	18,557	20,093	18,552	20,026
Grundy	11,431	15,340	15,341	20,259	22,164	20,253	22,090
Guthrie	6,478	8,643	9,541	10,911	11,795	10,908	11,755
Hamilton	12,453	16,600	16,921	20,970	22,285	20,964	22,710
Hancock	10,081	15,481	15,176	20,086	21,362	20,081	22,041
Hardin	12,153	16,150	15,502	19,780	21,539	19,775	21,467
Harrison	10,103	14,550	16,370	17,425	18,914	17,420	18,851
Henry	5,627	9,908	9,436	12,710	14,177	12,706	14,130
Howard	5,382	5,943	7,423	8,344	9,244	8,342	9,213
Humboldt	8,561	12,184	11,212	15,067	15,951	15,063	16,352
Ida	6,931	11,148	12,023	11,702	12,581	11,699	12,539
Iowa	7,622	11,644	10,779	13,202	14,266	13,198	14,218
Jackson	5,709	9,073	8,872	11,654	12,770	11,650	12,727

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Appendix A. Table 1. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	10,169	16,929	16,213	20,586	22,485	20,581	22,409
Jefferson	4,133	6,863	6,210	8,305	9,217	8,302	9,186
Johnson	7,814	12,612	11,288	15,380	16,844	15,376	16,787
Jones	8,157	12,391	12,065	15,923	17,365	15,918	17,307
Keokuk	6,729	11,997	11,334	14,177	15,676	14,173	15,623
Kossuth	17,002	27,146	26,108	35,080	36,712	35,070	37,886
Lee	4,992	9,238	9,789	13,488	15,485	13,485	15,433
Linn	9,849	15,645	14,575	19,574	21,434	19,569	21,362
Louisa	5,535	7,759	8,818	11,678	12,890	11,674	12,847
Lucas	1,896	3,675	3,635	4,438	4,917	4,437	4,901
Lyon	7,491	12,572	14,775	14,173	15,238	14,169	15,187
Madison	5,116	7,372	7,699	8,586	9,254	8,583	9,222
Mahaska	7,556	12,355	11,461	14,646	16,007	14,641	15,954
Marion	4,985	8,646	8,340	9,678	10,496	9,676	10,461
Marshall	10,601	15,286	15,162	19,762	21,627	19,756	21,554
Mills	7,146	8,263	8,903	9,751	10,347	9,748	10,312
Mitchell	7,688	8,982	10,419	11,544	12,517	11,540	12,475
Monona	8,742	15,057	16,113	17,167	18,868	17,162	18,805
Monroe	1,666	2,870	2,860	2,995	3,251	2,994	3,241
Montgomery	5,207	8,209	8,503	9,472	10,150	9,469	10,115
Muscatine	6,363	8,564	8,676	11,082	12,036	11,079	11,995
O'Brien	9,434	14,579	16,136	16,282	17,553	16,278	17,495
Osceola	5,810	9,543	10,567	11,243	12,212	11,240	12,171
Page	6,100	9,762	9,871	10,550	11,344	10,547	11,306
Palo Alto	9,625	14,980	14,114	17,532	18,484	17,527	19,080
Plymouth	12,844	18,802	23,428	23,040	25,132	23,034	25,047
Pocahontas	10,737	15,221	14,722	17,928	19,251	17,923	19,406
Polk	7,262	10,840	11,320	14,323	15,722	14,319	15,669
Pottawattamie	15,640	21,825	23,094	25,586	27,637	25,578	27,545
Poweshiek	7,563	11,063	10,051	12,692	13,552	12,689	13,506
Ringgold	2,834	4,815	5,075	5,703	6,318	5,701	6,297
Sac	9,726	12,778	14,963	15,546	16,614	15,542	16,558
Scott	7,643	12,298	11,656	15,313	16,693	15,308	16,638
Shelby	10,556	13,794	16,278	15,685	16,717	15,680	16,661
Sioux	12,224	19,013	21,652	20,637	21,972	20,631	21,898
Story	12,319	14,643	15,438	18,617	20,184	18,612	20,116
Tama	10,958	16,815	16,464	21,312	23,236	21,306	23,158
Taylor	3,506	5,743	6,230	6,766	7,417	6,764	7,392
Union	2,982	4,153	4,551	5,222	5,664	5,221	5,645
Van Buren	2,820	4,542	4,508	6,152	6,856	6,150	6,832
Wapello	3,614	5,610	5,414	7,123	7,927	7,121	7,900
Warren	4,303	7,586	8,352	8,936	9,744	8,934	9,712
Washington	8,111	13,597	12,819	17,033	18,795	17,028	18,733
Wayne	2,743	5,315	5,345	6,181	6,825	6,179	6,803
Webster	12,217	16,971	17,455	21,630	23,593	21,624	23,514
Winnebago	7,679	10,355	9,343	12,718	13,877	12,714	13,830
Winneshiek	6,191	9,081	9,875	11,589	12,812	11,586	12,769
Woodbury	11,678	17,593	20,160	17,545	18,759	17,540	18,696
Worth	6,813	9,695	9,612	11,759	12,962	11,756	12,919
Wright	11,797	17,159	16,186	21,105	21,444	21,494	22,121
Total	771,890	1,140,795	1,178,299	1,401,007	1,520,856	1,401,007	1,520,856

Appendix A. Table 2. Estimated soybean production in 1959, 1971, and 1972 and projections for 1979 and 1984 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	231	1,436	1,642	2,690	3,346	2,687	3,326
Adams	189	874	1,009	1,653	1,984	1,652	1,973
Allamakee	7	93	119	236	330	236	328
Appanoose	515	851	1,158	1,365	1,549	1,364	1,540
Audubon	53	801	1,043	2,236	3,043	2,234	3,024
Benton	332	2,682	3,191	5,394	6,950	5,389	6,909
Black Hawk	408	1,603	2,450	3,413	4,180	3,410	4,155
Boone	1,157	2,936	3,626	4,779	5,564	4,775	5,531
Bremer	237	1,201	1,385	2,116	2,578	2,114	2,563
Buchanan	266	1,566	2,153	2,953	3,633	2,951	3,611
Buena Vista	1,141	2,797	3,265	4,712	5,468	4,708	5,436
Butler	421	1,831	2,204	3,166	3,853	3,163	3,830
Calhoun	2,073	3,368	4,761	5,671	6,397	5,666	6,360
Carroll	569	1,747	2,518	3,584	4,276	3,582	4,251
Cass	110	1,236	1,483	2,659	3,494	2,657	3,473
Cedar	167	2,140	2,281	3,937	5,277	3,934	5,247
Cerro Gordo	657	2,166	2,846	4,053	4,865	4,050	4,836
Cherokee	838	1,759	2,228	3,038	3,492	3,036	3,472
Chickasaw	344	1,090	1,707	1,972	2,321	1,970	2,308
Clarke	257	638	820	1,056	1,226	1,055	1,219
Clay	1,127	2,893	3,535	4,486	5,228	4,483	5,197
Clayton	7	85	142	231	323	231	321
Clinton	174	1,531	1,799	3,120	4,115	3,118	4,090
Crawford	84	1,038	1,398	3,524	4,894	3,521	4,865
Dallas	1,231	2,667	3,130	4,037	4,613	4,033	4,586
Davis	492	909	1,170	1,227	1,414	1,226	1,406
Decatur	241	643	836	1,036	1,182	1,035	1,175
Delaware	57	576	833	1,438	1,938	1,437	1,927
Des Moines	602	1,455	1,705	2,060	2,417	2,058	2,404
Dickinson	504	1,625	2,058	2,602	3,084	2,600	3,065
Dubuque	1	62	55	255	431	255	429
Emmet	954	2,234	2,719	3,358	3,669	3,355	3,783
Fayette	445	1,298	1,786	2,180	2,574	2,178	2,559
Floyd	443	1,919	2,396	3,538	4,296	3,535	4,271
Franklin	684	2,862	3,277	5,054	6,218	5,050	6,182
Fremont	476	1,778	2,215	3,053	3,555	3,050	3,534
Greene	1,589	2,951	4,141	5,071	5,746	5,067	5,712
Grundy	685	2,490	2,976	4,414	5,340	4,411	5,309
Guthrie	491	1,612	1,986	2,848	3,381	2,846	3,361
Hamilton	1,555	3,716	4,120	5,956	6,717	5,950	6,876
Hancock	1,142	3,149	4,037	5,405	6,187	5,400	6,380
Hardin	734	3,019	2,949	5,164	6,276	5,159	6,239
Harrison	581	1,476	1,902	3,001	3,511	2,998	3,490
Henry	500	1,867	1,988	2,635	3,169	2,633	3,150
Howard	360	728	1,380	1,721	2,035	1,720	2,023
Humboldt	1,214	2,865	2,863	4,417	4,954	4,414	5,100
Ida	254	1,061	1,368	2,324	2,855	2,322	2,839
Iowa	193	1,239	1,462	2,234	2,859	2,232	2,843
Jackson	15	198	235	461	622	460	618

(cont. on next page)

Appendix A. Table 2. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	532	2,345	2,735	4,094	5,070	4,090	5,041
Jefferson	644	1,549	1,665	2,282	2,674	2,280	2,659
Johnson	290	1,578	1,817	2,453	3,036	2,451	3,017
Jones	59	829	1,032	2,131	2,939	2,130	2,922
Keokuk	705	1,743	1,999	2,450	2,852	2,448	2,836
Kossuth	2,620	5,767	6,980	9,359	10,237	9,350	10,556
Lee	624	1,310	1,456	1,892	2,236	1,891	2,223
Linn	288	1,997	2,519	3,650	4,621	3,647	4,594
Louisa	603	1,680	1,768	2,390	2,823	2,388	2,807
Lucas	301	607	884	1,138	1,324	1,137	1,317
Lyon	538	1,357	1,959	2,343	2,723	2,341	2,707
Madison	565	1,544	1,689	2,445	2,869	2,443	2,853
Mahaska	658	2,149	2,374	3,318	3,948	3,315	3,925
Marion	442	1,635	1,710	2,257	2,664	2,255	2,649
Marshall	534	2,311	2,557	4,036	4,937	4,033	4,908
Mills	179	1,430	1,807	2,935	3,590	2,933	3,569
Mitchell	388	1,182	1,951	2,499	3,014	2,496	2,996
Monona	1,156	1,628	1,962	2,506	2,830	2,504	2,814
Monroe	277	565	616	814	932	814	927
Montgomery	167	1,340	1,725	2,658	3,345	2,655	3,325
Muscatine	460	1,341	1,453	2,007	2,377	2,006	2,364
O'Brien	1,450	3,067	3,804	4,405	5,040	4,401	5,011
Osceola	822	1,805	2,500	2,715	3,135	2,713	3,116
Page	292	1,837	2,199	3,189	3,861	3,187	3,838
Palo Alto	1,386	3,455	4,070	5,487	6,143	5,481	6,365
Plymouth	489	1,439	2,049	3,397	4,124	3,394	4,099
Pocahontas	1,871	4,120	4,555	6,366	7,226	6,359	7,317
Polk	1,159	2,318	2,822	3,792	4,364	3,789	4,339
Pottawattamie	293	2,373	2,787	5,584	7,210	5,578	7,169
Poweshiek	362	1,890	2,149	3,493	4,368	3,490	4,342
Ringgold	422	830	1,100	1,359	1,565	1,358	1,557
Sac	776	1,910	2,403	3,765	4,407	3,762	4,381
Scott	209	1,280	1,345	2,310	2,900	2,309	2,882
Shelby	44	1,134	1,466	4,082	4,195	4,219	4,537
Sioux	748	1,506	1,989	2,678	3,087	2,676	3,068
Story	1,044	3,218	3,693	5,120	6,016	5,116	5,981
Tama	496	2,588	3,048	4,774	5,984	4,770	5,949
Taylor	420	1,040	1,455	1,911	2,234	1,910	2,221
Union	217	650	829	1,152	1,345	1,151	1,337
Van Buren	689	1,107	1,196	1,250	1,416	1,249	1,408
Wapello	700	1,256	1,448	1,944	2,253	1,942	2,240
Warren	662	1,341	1,683	2,078	2,351	2,076	2,338
Washington	586	2,263	2,536	3,445	4,153	3,442	4,128
Wayne	483	981	1,338	1,540	1,765	1,539	1,755
Webster	2,492	4,616	5,374	7,383	8,387	7,376	8,339
Winnebago	710	2,037	2,562	3,688	4,441	3,685	4,415
Winneshiek	59	277	436	648	823	647	818
Woodbury	753	1,245	1,654	2,359	2,716	2,357	2,701
Worth	701	1,332	2,113	2,613	3,035	2,611	3,016
Wright	1,546	3,933	4,305	6,286	6,781	6,400	6,993
Total	60,718	175,496	213,916	306,004	363,795	306,00[illegible]	363,795

Appendix A. Table 3. Estimated oat production in 1959, 1971, and 1972 and projections for 1979 and 1984 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	1,610	1,060	824	937	964	932	949
Adams	884	607	449	507	523	504	515
Allamakee	1,529	1,113	1,017	1,265	1,327	1,258	1,307
Appanoose	151	254	301	251	263	249	260
Audubon	1,585	990	609	790	801	786	789
Benton	3,620	1,630	1,239	1,575	1,574	1,567	1,550
Black Hawk	2,293	883	678	811	801	806	789
Boone	2,497	777	612	650	629	647	620
Bremer	1,973	1,040	740	1,017	1,045	1,012	1,028
Buchanan	2,336	1,125	775	1,112	1,142	1,106	1,125
Buena Vista	2,962	891	611	689	265	686	649
Butler	2,289	1,293	1,044	1,130	1,153	1,123	1,135
Calhoun	2,591	661	529	521	494	518	487
Carroll	2,552	1,151	912	931	913	926	899
Cass	1,717	869	613	728	729	724	717
Cedar	2,861	1,220	941	1,302	1,304	1,295	1,284
Cerro Gordo	2,342	672	571	631	609	627	600
Cherokee	2,468	914	742	757	742	752	730
Chickasaw	1,942	1,037	814	1,211	1,274	1,205	1,254
Clarke	474	549	494	503	539	500	531
Clay	2,589	683	482	517	489	514	482
Clayton	2,397	1,805	1,469	2,022	2,129	2,011	2,095
Clinton	2,782	1,424	993	1,467	1,478	1,459	1,455
Crawford	2,971	1,711	1,241	1,372	1,393	1,365	1,372
Dallas	1,942	537	371	441	421	439	415
Davis	180	422	289	371	398	369	392
Decatur	236	266	248	261	271	259	267
Delaware	2,383	1,629	1,331	1,812	1,902	1,802	1,872
Des Moines	683	238	232	247	241	245	238
Dickinson	1,305	484	362	368	357	366	351
Dubuque	2,253	1,925	1,628	2,033	2,146	2,022	2,112
Emmet	1,590	291	253	249	229	248	226
Fayette	2,583	1,526	1,199	1,721	1,807	1,712	1,780
Floyd	2,072	698	518	658	646	654	636
Franklin	2,542	893	601	682	655	679	645
Fremont	346	52	30	22	19	22	19
Greene	2,333	469	330	352	330	350	325
Grundy	2,362	800	601	728	711	724	700
Guthrie	1,533	755	559	645	645	641	636
Hamilton	2,827	583	402	406	189	404	371
Hancock	2,605	905	824	743	336	739	357
Hardin	2,585	621	413	487	458	484	451
Harrison	1,214	592	339	392	387	390	381
Henry	791	366	411	363	363	361	358
Howard	1,443	864	908	1,213	1,281	1,206	1,261
Humboldt	2,043	448	288	354	97	352	282
Ida	2,047	1,043	652	763	756	758	744
Iowa	1,635	1,205	825	1,135	1,175	1,129	1,157
Jackson	1,530	1,344	999	1,370	1,436	1,363	1,414

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Appendix A. Table 3. continued

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Jasper	2,375	1,288	1,044	1,225	1,239	1,218	1,221
Jefferson	611	578	353	518	543	515	535
Johnson	1,880	1,113	740	996	1,012	991	996
Jones	1,873	1,060	787	1,111	1,131	1,105	1,113
Keokuk	1,318	720	564	748	774	744	762
Kossuth	4,456	1,165	946	959	475	954	490
Lee	189	253	179	193	190	191	187
Linn	2,423	1,176	789	1,148	1,151	1,142	1,133
Louisa	902	328	190	272	265	271	261
Lucas	313	396	347	382	405	379	399
Lyon	2,601	2,118	1,816	1,561	1,583	1,553	1,559
Madison	1,200	672	455	570	575	566	566
Mahaska	1,703	947	745	917	948	912	933
Marion	1,099	793	668	664	683	661	672
Marshall	2,340	742	684	697	674	693	665
Mills	758	137	101	86	78	85	77
Mitchell	2,397	1,053	949	1,182	1,192	1,176	1,173
Monona	924	611	393	451	459	448	452
Monroe	250	252	240	217	227	216	224
Montgomery	1,080	354	183	238	228	237	224
Muscatine	1,231	588	390	535	534	533	526
O'Brien	2,744	1,247	1,035	1,022	1,013	1,016	997
Osceola	1,479	983	754	827	837	823	824
Page	845	343	236	260	259	259	256
Palo Alto	2,808	772	517	519	420	516	481
Plymouth	4,280	2,658	2,272	2,214	2,236	2,202	2,201
Pocahontas	2,813	657	397	442	171	439	403
Polk	1,372	498	353	380	374	378	368
Pottawattamie	2,955	1,011	657	797	778	793	766
Poweshiek	1,860	1,289	933	1,127	1,152	1,121	1,134
Ringgold	334	452	395	445	474	443	467
Sac	2,789	956	860	787	758	782	746
Scott	1,640	813	597	787	786	782	773
Shelby	2,726	1,664	1,201	1,249	1,303	1,420	1,343
Sioux	4,109	2,142	1,968	1,599	1,583	1,591	1,559
Story	2,654	436	345	340	313	338	309
Tama	2,682	1,361	1,035	1,233	1,232	1,226	1,213
Taylor	631	555	453	513	532	510	524
Union	660	560	430	505	532	502	524
Van Buren	159	276	256	289	306	287	301
Wapello	489	334	297	414	446	411	439
Warren	963	610	583	516	527	513	519
Washington	1,753	769	541	731	735	727	723
Wayne	412	662	497	580	622	577	613
Webster	3,018	597	415	429	398	427	392
Winnebago	1,610	483	489	495	483	492	476
Winneshiek	2,645	1,886	1,786	2,321	2,462	2,308	2,424
Woodbury	2,202	1,577	1,020	1,132	1,145	1,126	1,127
Worth	1,754	618	531	653	649	649	639
Wright	2,802	533	455	214	223	464	230
Total	184,089	86,401	67,184	78,002	76,951	78,002	76,951

Appendix A. Table 4. Estimated quantities of corn sold through commercial channels in 1960 and 1972 and projections for 1980 and 1985 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated		Average Prod. Growth Rate		High Prod. Growth Rate	
	1960	1972	1980	1985	1980	1985
Adair	2,060	4,030	5,584	6,119	5,580	6,077
Adams	1,250	3,241	4,262	4,735	4,259	4,706
Allamakee	- 735	1,407	2,748	3,234	2,743	3,198
Appanoose	659	1,701	2,645	2,889	2,644	2,874
Audubon	2,059	3,275	4,065	4,540	4,060	4,498
Benton	6,109	9,422	14,411	15,937	14,404	15,850
Black Hawk	4,619	7,726	11,821	13,140	11,816	13,080
Boone	6,485	9,241	13,861	15,537	13,856	15,466
Bremer	2,008	4,851	7,743	8,713	7,738	8,667
Buchanan	3,887	7,052	11,888	13,476	11,883	13,408
Buena Vista	5,295	7,825	10,065	10,988	10,060	11,021
Butler	5,121	8,069	11,182	12,367	11,176	12,301
Calhoun	6,904	6,745	11,014	12,007	11,010	11,948
Carroll	3,644	1,017	5,100	5,484	5,095	5,421
Cass	2,501	5,262	7,362	8,328	7,357	8,276
Cedar	2,513	7,887	10,917	12,233	10,910	12,155
Cerro Gordo	6,611	10,220	13,080	14,379	13,075	14,314
Cherokee	2,656	4,830	6,104	6,905	6,099	6,852
Chickasaw	2,426	4,230	6,953	7,767	6,949	7,722
Clarke	630	1,690	2,006	2,152	2,005	2,137
Clay	5,456	8,457	9,900	10,972	9,896	10,917
Clayton	- 802	3,218	8,405	10,013	8,397	9,941
Clinton	3,909	7,213	11,904	13,528	11,896	13,438
Crawford	3,835	4,008	5,353	5,753	5,346	5,692
Dallas	5,493	10,169	13,175	14,731	13,171	14,667
Davis	580	2,528	3,073	3,472	3,071	3,451
Decatur	206	1,699	2,711	3,013	2,709	2,996
Delaware	115	1,875	7,383	8,458	7,375	8,383
Des Moines	2,860	5,648	8,523	9,495	8,521	9,455
Dickinson	1,814	5,468	6,591	7,225	6,589	7,190
Dubuque	-1,038	1,279	4,362	5,130	4,354	5,072
Emmet	3,726	7,608	9,302	9,692	9,299	10,113
Fayette	2,544	6,844	11,273	12,870	11,265	12,796
Floyd	5,357	7,922	10,569	11,620	10,565	11,568
Franklin	7,148	9,802	13,655	14,959	13,649	14,884
Fremont	5,930	9,164	9,878	10,721	9,876	10,676
Greene	6,839	8,923	14,078	15,388	14,073	15,321
Grundy	6,307	9,328	14,061	15,722	14,055	15,646
Guthrie	3,640	4,431	6,350	6,830	6,347	6,789
Hamilton	6,730	10,193	15,094	16,187	15,088	16,645
Hancock	5,815	10,523	15,197	16,055	15,192	16,742
Hardin	6,663	8,007	11,455	12,810	11,450	12,737
Harrison	7,222	10,966	13,584	14,873	13,579	14,810
Henry	1,852	5,433	8,514	9,731	8,511	9,683
Howard	2,350	2,936	5,512	6,268	5,508	6,230
Humboldt	5,660	9,293	12,237	13,011	12,233	13,456
Ida	2,337	4,420	4,060	4,672	4,055	4,626
Iowa	1,612	4,768	5,906	6,495	5,901	6,442
Jackson	930	1,660	4,484	5,139	4,478	5,089

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Appendix A. Table 4. continued

County	Estimated 1960	Estimated 1972	Average Prod. Growth Rate 1980	Average Prod. Growth Rate 1985	High Prod. Growth Rate 1980	High Prod. Growth Rate 1985
Jasper	3,939	9,862	13,014	14,494	13,008	14,415
Jefferson	1,586	3,609	5,273	5,911	5,271	5,879
Johnson	1,474	4,978	7,756	8,591	7,751	8,531
Jones	1,086	3,983	7,581	8,615	7,574	8,552
Keokuk	2,062	4,638	7,166	7,918	7,161	7,863
Kossuth	10,613	18,955	26,679	27,754	26,670	28,934
Lee	2,057	5,692	10,035	11,805	10,032	11,753
Linn	4,057	10,268	14,648	16,311	14,642	16,236
Louisa	2,200	4,943	9,111	10,240	9,108	10,197
Lucas	216	1,310	2,088	2,274	2,086	2,256
Lyon	1,925	3,608	4,943	5,508	4,937	5,451
Madison	2,428	4,256	5,131	5,500	5,129	5,467
Mahaska	1,891	3,813	6,412	7,147	6,407	7,090
Marion	7,718	3,236	4,404	4,822	4,400	4,784
Marshall	5,668	9,925	14,154	15,878	14,148	15,804
Mills	4,394	4,473	5,808	6,288	5,806	6,254
Mitchell	4,004	4,378	7,256	8,009	7,241	7,961
Monona	6,070	11,110	13,153	14,582	13,148	14,519
Monroe	239	1,310	1,580	1,692	1,579	1,680
Montgomery	1,762	3,753	4,449	4,858	4,446	4,824
Muscatine	2,514	4,180	6,757	7,480	6,754	7,439
O'Brien	3,788	6,036	7,850	8,750	7,844	8,688
Osceola	2,586	4,967	6,717	7,541	6,713	7,498
Page	1,678	4,300	4,959	5,470	4,956	5,431
Palo Alto	6,452	10,504	12,881	13,610	12,877	14,220
Plymouth	3,872	5,093	8,604	9,917	8,594	9,824
Pocahontas	6,713	9,585	12,153	13,203	12,148	13,404
Polk	5,127	8,903	12,298	13,641	12,294	13,588
Pottawattamie	5,986	9,095	12,183	14,107	12,174	14,012
Poweshiek	2,787	5,657	7,250	7,780	7,245	7,731
Ringgold	924	2,461	3,154	3,484	3,152	3,461
Sac	3,552	3,033	4,923	5,487	4,917	5,430
Scott	2,569	6,501	9,521	10,586	9,515	10,528
Shelby	4,865	5,630	6,902	7,478	6,944	7,434
Sioux	2,560	- 371	996	1,167	988	1,085
Story	8,640	9,962	14,087	15,495	14,082	15,428
Tama	4,805	9,994	14,073	15,715	14,065	15,633
Taylor	732	1,956	2,906	3,192	2,903	3,164
Union	1,057	1,786	2,970	3,234	2,968	3,213
Van Buren	1,202	2,623	4,185	4,671	4,182	4,646
Wapello	1,824	3,604	5,143	5,796	5,141	5,769
Warren	1,832	4,582	5,975	6,542	5,973	6,508
Washington	1,046	4,621	8,609	9,707	8,603	9,642
Wayne	916	3,116	3,809	4,219	3,807	4,194
Webster	9,790	12,537	16,576	18,303	16,571	18,225
Winnebago	4,847	7,700	9,981	10,988	9,977	10,941
Winneshiek	- 545	1,905	4,977	5,780	4,969	5,722
Woodbury	4,987	7,682	7,721	8,464	7,715	8,398
Worth	4,214	7,518	9,404	10,499	9,401	10,454
Wright	7,571	13,356	17,164	17,371	17,605	18,051
Total	339,072	590,120	844,789	933,637	844,789	933,637

Appendix A. Table 5. Estimated quantities of soybeans sold through commercial channels in 1960 and 1972 and projections for 1980 and 1985 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated		Average Prod. Growth Rate		High Prod. Growth Rate	
	1960	1972	1980	1985	1980	1985
Adair	223	1,393	2,624	3,268	2,625	3,251
Adams	182	847	1,614	1,939	1,614	1,929
Allamakee	7	89	230	322	230	320
Appanoose	491	819	1,317	1,497	1,318	1,489
Audubon	51	775	2,181	2,970	2,182	2,954
Benton	321	2,608	5,278	6,804	5,278	6,770
Black Hawk	393	1,546	3,329	4,080	3,329	4,059
Boone	1,117	2,849	4,670	5,442	4,671	5,414
Bremer	227	1,159	2,065	2,519	2,066	2,506
Buchanan	255	1,512	2,879	3,545	2,880	3,527
Buena Vista	1,103	2,711	4,588	5,328	4,590	5,302
Butler	405	1,771	3,091	3,766	3,092	3,746
Calhoun	2,000	3,255	5,539	6,253	5,538	6,222
Carroll	545	1,687	3,499	4,178	3,500	4,157
Cass	106	1,199	2,596	3,414	2,597	3,397
Cedar	161	2,087	3,851	5,166	3,851	5,140
Cerro Gordo	631	2,093	3,956	4,752	3,957	4,728
Cherokee	809	1,703	2,953	3,399	2,955	3,381
Chickasaw	327	1,043	1,921	2,264	1,922	2,252
Clarke	245	617	1,029	1,196	1,030	1,191
Clay	1,086	2,806	4,372	5,100	4,373	5,074
Clayton	7	82	226	315	226	313
Clinton	167	1,488	3,043	4,016	3,044	3,995
Crawford	81	1,001	3,434	4,770	3,435	4,746
Dallas	1,188	2,588	3,941	4,509	3,942	4,485
Davis	470	880	1,192	1,375	1,192	1,368
Decatur	227	621	1,008	1,151	1,009	1,146
Delaware	55	556	1,402	1,892	1,402	1,882
Des Moines	581	1,419	2,008	2,360	2,009	2,348
Dickinson	479	1,570	2,530	3,002	2,531	2,986
Dubuque	1	60	249	421	249	419
Emmet	914	2,168	3,268	3,575	3,270	3,689
Fayette	426	1,252	2,126	2,512	2,126	2,500
Floyd	424	1,852	3,450	4,194	3,451	4,173
Franklin	661	2,782	4,937	6,079	4,938	6,049
Fremont	460	1,719	2,970	3,462	2,971	3,445
Greene	1,525	2,850	4,952	5,617	4,953	5,588
Grundy	663	2,422	4,321	5,230	4,321	5,203
Guthrie	472	1,559	2,779	3,303	2,780	3,285
Hamilton	1,503	3,608	5,817	6,567	5,817	6,727
Hancock	1,098	3,053	5,273	6,041	5,274	6,234
Hardin	711	2,936	5,049	6,142	5,049	6,110
Harrison	551	1,426	2,919	3,419	2,921	3,401
Henry	482	1,819	2,575	3,098	2,576	3,083
Howard	343	681	1,675	1,983	1,676	1,973
Humboldt	1,174	2,783	4,310	4,838	4,311	4,984
Ida	245	1,027	2,256	2,774	2,257	2,761
Iowa	185	1,204	2,179	2,792	2,179	2,778
Jackson	15	192	447	604	447	601

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Appendix A. Table 5. continued

County	Estimated 1960	Estimated 1972	Average Prod. Growth Rate 1980	Average Prod. Growth Rate 1985	High Prod. Growth Rate 1980	High Prod. Growth Rate 1985
Jasper	511	2,276	4,000	4,958	4,000	4,934
Jefferson	620	1,504	2,225	2,611	2,226	2,597
Johnson	280	1,536	2,394	2,965	2,394	2,949
Jones	57	806	2,080	2,871	2,081	2,856
Keokuk	679	1,695	2,391	2,786	2,392	2,773
Kossuth	2,522	5,589	9,123	9,989	9,125	10,308
Lee	599	1,270	1,842	2,178	1,843	2,167
Linn	277	1,939	3,560	4,512	3,561	4,488
Louisa	580	1,632	2,332	2,757	2,333	2,744
Lucas	287	585	1,111	1,294	1,111	1,288
Lyon	514	1,312	2,278	2,651	2,279	2,638
Madison	545	1,499	2,386	2,803	2,387	2,789
Mahaska	633	2,089	3,234	3,853	3,235	3,833
Marion	423	1,587	2,200	2,600	2,201	2,587
Marshall	516	2,249	3,947	4,833	3,947	4,808
Mills	173	1,383	2,861	3,501	2,862	3,484
Mitchell	371	1,124	2,442	2,948	2,442	2,932
Monona	1,098	1,575	2,433	2,752	2,434	2,738
Monroe	265	545	792	907	792	903
Montgomery	161	1,300	2,596	3,270	2,596	3,253
Muscatine	441	1,303	1,957	2,320	1,957	2,309
O'Brien	1,399	2,979	4,288	4,912	4,289	4,887
Osceola	786	1,747	2,643	3,056	2,644	3,040
Page	281	1,781	3,113	3,771	3,114	3,752
Palo Alto	1,336	3,350	5,342	5,987	5,342	6,208
Plymouth	470	1,386	3,300	4,011	3,302	3,991
Pocahontas	1,806	3,997	6,207	7,054	6,207	7,148
Polk	1,113	2,246	3,708	4,272	3,709	4,249
Pottawattamie	281	2,300	5,441	7,030	5,442	6,996
Poweshiek	349	1,839	3,417	4,277	3,417	4,254
Ringgold	402	803	1,325	1,527	1,325	1,520
Sac	748	1,843	3,669	4,299	3,669	4,277
Scott	202	1,247	2,259	2,837	2,259	2,822
Shelby	43	1,097	3,974	4,089	4,112	4,425
Sioux	719	1,457	2,605	3,005	2,606	2,990
Story	1,008	3,126	5,006	5,887	5,007	5,857
Tama	478	2,517	4,669	5,859	4,670	5,828
Taylor	402	1,006	1,867	2,184	1,867	2,174
Union	208	629	1,124	1,314	1,125	1,307
Van Buren	661	1,069	1,213	1,376	1,214	1,369
Wapello	673	1,218	1,897	2,200	1,897	2,189
Warren	633	1,298	2,025	2,293	2,026	2,282
Washington	566	2,206	3,367	4,063	3,368	4,042
Wayne	461	947	1,501	1,720	1,502	1,713
Webster	2,405	4,478	7,209	8,197	7,210	8,156
Winnebago	683	1,966	3,599	4,338	3,600	4,315
Winneshiek	56	263	631	802	631	798
Woodbury	715	1,199	2,289	2,639	2,290	2,627
Worth	671	1,271	2,548	2,962	2,549	2,946
Wright	1,494	3,819	6,135	6,624	6,253	6,836
Total	58,394	170,049	298,473	355,188	298,798	355,457

Appendix A. Table 6. Estimated quantities of oats sold through commercial channels in 1960 and 1972 and projections for 1980 and 1985 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated		Average Prod. Growth Rate		High Prod. Growth Rate	
	1960	1972	1980	1985	1980	1985
Adair	424	348	331	351	328	343
Adams	241	206	185	196	184	192
Allamakee	135	122	149	162	148	158
Appanoose	46	96	102	109	100	107
Audubon	365	285	245	256	242	249
Benton	1,298	729	757	779	751	762
Black Hawk	755	363	358	364	355	356
Boone	1,089	423	380	378	377	371
Bremer	467	307	323	342	320	334
Buchanan	734	441	468	496	465	484
Buena Vista	1,089	409	340	135	337	327
Butler	660	465	437	459	433	449
Calhoun	1,303	414	351	343	348	336
Carroll	768	432	375	379	372	371
Cass	431	272	245	253	243	247
Cedar	815	433	497	513	493	501
Cerro Gordo	771	276	279	277	276	271
Cherokee	710	328	292	295	289	288
Chickasaw	346	230	289	314	287	306
Clarke	153	221	217	239	215	235
Clay	959	315	258	249	254	244
Clayton	220	206	249	271	246	263
Clinton	688	440	486	505	483	494
Crawford	759	545	470	491	466	480
Dallas	883	305	269	265	267	259
Davis	47	137	129	143	129	140
Decatur	83	116	122	131	122	128
Delaware	348	297	355	384	352	375
Des Moines	266	115	128	130	128	127
Dickinson	498	231	188	188	187	184
Dubuque	319	340	386	421	383	410
Emmet	675	154	141	134	141	131
Fayette	474	349	423	458	420	447
Floyd	629	264	268	271	266	265
Franklin	894	391	322	318	319	311
Fremont	87	16	7	6	7	6
Greene	1,024	257	206	199	205	195
Grundy	883	373	365	367	362	359
Guthrie	516	317	291	300	288	293
Hamilton	1,354	348	261	125	259	244
Hancock	888	385	340	158	337	167
Hardin	856	256	215	209	214	205
Harrison	443	270	191	194	190	191
Henry	270	156	165	171	165	167
Howard	322	178	269	294	267	286
Humboldt	793	217	184	52	183	150
Ida	517	329	260	265	256	258
Iowa	457	420	425	454	422	443
Jackson	265	291	319	344	316	336

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Appendix A. Table 6. continued

County	Estimated 1960	Estimated 1972	Average Prod. Growth Rate 1980	Average Prod. Growth Rate 1985	High Prod. Growth Rate 1980	High Prod. Growth Rate 1985
Jasper	879	595	608	633	603	619
Jefferson	218	258	249	268	246	263
Johnson	493	364	351	367	348	359
Jones	392	277	312	327	309	319
Keokuk	377	257	287	306	284	298
Kossuth	1,765	576	509	260	505	266
Lee	47	78	65	65	64	64
Linn	977	591	621	640	615	626
Louisa	351	159	142	142	141	139
Lucas	93	147	152	166	151	162
Lyon	771	783	621	648	615	633
Madison	436	304	277	288	275	282
Mahaska	471	327	340	362	338	354
Marion	326	293	264	280	262	273
Marshall	885	350	353	352	350	345
Mills	278	63	42	39	42	39
Mitchell	384	210	254	264	252	258
Monona	319	263	208	218	207	214
Monroe	54	68	63	67	62	66
Montgomery	224	92	66	65	66	64
Muscatine	375	223	218	224	217	219
O'Brien	803	455	401	410	398	400
Osceola	509	422	382	399	379	389
Page	150	76	62	63	62	62
Palo Alto	1,182	405	293	244	291	278
Plymouth	1,150	891	798	830	791	811
Pocahontas	1,242	362	262	104	259	244
Polk	631	286	234	237	233	232
Pottawattamie	889	379	322	324	319	316
Poweshiek	608	525	493	519	489	508
Ringgold	90	152	161	177	160	173
Sac	1,003	429	380	376	376	368
Scott	470	291	302	311	300	304
Shelby	941	717	578	621	655	636
Sioux	940	611	490	500	487	489
Story	1,124	230	193	183	192	179
Tama	883	559	544	559	540	547
Taylor	148	163	161	172	160	169
Union	192	203	193	213	195	209
Van Buren	51	109	124	134	122	131
Wapello	223	190	253	281	251	275
Warren	371	293	267	280	264	274
Washington	474	260	265	275	263	268
Wayne	130	260	245	271	243	265
Webster	1,617	399	308	295	306	288
Winnebago	527	197	217	218	216	214
Winneshiek	240	214	283	310	280	302
Woodbury	666	595	459	478	456	468
Worth	523	230	261	267	259	261
Wright	1,262	299	129	139	279	142
Total	58,171	31,298	29,374	29,308	29,374	29,308

Appendix A. Table 7. Estimated corn acres in 1959, 1971, and 1972 and projections for 1979 and 1984 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of acres, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	93.6	91.6	83.9	96.2	100.0	92.4	96.7
Adams	62.7	63.0	57.7	66.9	70.0	64.3	67.8
Allamakee	56.6	62.1	58.6	68.0	71.6	65.4	69.4
Appanoose	41.7	34.5	33.3	51.5	53.1	49.5	51.6
Audubon	96.5	100.7	93.1	97.5	102.3	92.8	98.4
Benton	171.3	164.2	153.0	184.3	192.8	176.1	185.9
Black Hawk	136.0	125.9	115.3	149.6	155.5	143.6	150.4
Boone	144.0	132.6	126.5	162.2	171.0	155.4	165.1
Bremer	96.0	92.7	86.2	102.9	108.3	98.7	104.5
Buchanan	135.4	128.7	119.7	165.3	175.4	158.7	169.6
Buena Vista	157.8	151.3	139.9	176.9	185.6	169.2	178.3
Butler	151.7	144.0	129.9	153.2	160.6	146.9	155.2
Calhoun	152.6	133.4	128.2	145.5	150.6	139.6	145.5
Carroll	145.2	144.9	133.4	151.6	157.0	144.9	151.4
Cass	110.2	122.2	117.6	123.1	129.3	117.7	124.8
Cedar	138.0	142.5	127.5	167.4	175.0	160.4	168.7
Cerro Gordo	164.1	142.8	123.7	160.1	167.6	153.5	161.9
Cherokee	143.4	131.9	129.7	151.9	156.2	145.6	150.8
Chickasaw	107.5	91.8	90.0	103.6	108.1	99.7	104.8
Clarke	43.0	36.0	33.9	35.1	36.6	33.6	35.3
Clay	150.2	132.7	128.4	146.2	151.6	140.2	146.4
Clayton	96.8	115.4	117.7	146.4	158.5	140.7	153.4
Clinton	166.0	167.7	156.0	216.1	226.3	207.3	217.9
Crawford	154.4	157.2	153.6	152.7	160.7	145.3	154.3
Dallas	134.9	135.4	130.1	157.2	165.5	150.9	160.0
Davis	47.2	46.6	40.7	58.4	62.5	56.0	60.4
Decatur	47.0	40.0	35.9	45.5	48.7	43.4	46.8
Delaware	119.9	129.8	129.0	165.7	176.6	158.8	170.6
Des Moines	73.0	70.3	69.9	102.9	108.0	98.5	104.4
Dickinson	97.0	87.1	77.3	98.4	102.5	94.3	99.0
Dubuque	89.8	102.0	97.3	118.8	125.8	113.6	121.4
Emmet	111.4	102.3	87.3	126.5	126.7	120.7	126.8
Fayette	142.2	136.7	132.8	168.5	179.2	161.8	173.3
Floyd	136.3	112.3	104.5	129.1	134.9	123.7	130.2
Franklin	174.5	149.1	133.5	177.4	185.1	170.3	178.1
Fremont	135.5	117.0	102.0	130.1	134.6	124.8	129.5
Greene	151.2	142.0	131.2	164.8	171.0	158.2	165.4
Grundy	138.4	139.4	126.7	164.0	172.4	157.5	166.4
Guthrie	102.3	95.6	89.0	100.1	103.7	96.0	100.3
Hamilton	169.9	153.2	139.5	185.2	189.3	177.6	186.8
Hancock	158.7	142.0	128.3	186.1	191.2	177.6	191.3
Hardin	156.6	145.9	132.3	167.1	174.7	160.2	168.7
Harrison	165.2	155.1	150.3	179.4	188.4	171.4	181.2
Henry	84.2	86.9	80.8	109.9	118.5	105.0	114.2
Howard	96.8	77.8	77.4	84.5	89.5	81.2	86.6
Humboldt	123.9	110.8	100.7	139.4	142.0	133.8	141.0
Ida	108.6	113.1	107.7	129.5	134.5	123.7	129.6
Iowa	115.0	106.3	101.6	123.3	127.1	118.6	123.1
Jackson	83.6	92.5	90.3	132.2	138.5	127.0	134.0

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Appendix A. Table 7. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	151.5	154.3	141.1	178.7	187.1	171.7	180.5
Jefferson	68.6	64.9	57.3	77.8	83.5	74.3	80.4
Johnson	119.0	115.3	104.7	141.3	148.5	135.6	143.4
Jones	113.6	119.4	112.0	145.6	153.0	139.3	147.6
Keokuk	106.4	106.1	100.3	128.8	136.8	123.3	132.1
Kossuth	272.2	247.2	233.7	335.3	337.2	320.9	337.4
Lee	76.2	89.4	88.2	137.1	152.8	130.7	147.1
Linn	148.1	150.2	132.6	182.9	193.5	174.8	186.5
Louisa	82.3	79.6	74.4	107.6	113.5	103.4	109.9
Lucas	40.3	42.5	36.9	39.7	42.2	38.1	40.8
Lyon	155.9	149.9	139.9	148.0	152.7	141.9	147.5
Madison	79.2	75.5	71.6	78.4	81.2	75.1	78.4
Mahaska	119.5	114.4	103.5	140.9	146.8	135.6	142.3
Marion	88.0	86.3	76.7	92.0	95.7	88.2	92.5
Marshall	140.2	143.8	127.3	165.2	173.1	158.6	167.2
Mills	115.9	90.8	82.1	94.2	97.1	89.8	93.3
Mitchell	122.0	102.5	97.7	100.0	104.0	95.9	100.5
Monona	150.7	160.2	149.5	189.2	198.5	182.0	192.3
Monroe	35.0	32.4	29.0	31.8	33.2	30.4	32.0
Montgomery	91.7	86.8	82.0	83.5	86.2	79.8	83.2
Muscatine	93.0	81.0	78.5	105.8	109.2	102.1	106.0
O'Brien	156.0	146.0	138.2	164.4	170.2	157.5	164.3
Osceola	111.6	101.2	92.6	112.8	117.4	108.2	113.5
Page	107.4	100.6	93.2	96.3	99.6	92.2	96.1
Palo Alto	160.9	138.4	126.7	176.3	178.5	169.1	178.3
Plymouth	230.5	226.9	219.5	248.3	260.3	237.8	251.3
Pocahontas	161.5	141.0	126.5	169.4	174.7	162.7	170.6
Polk	111.2	107.4	100.6	120.5	127.1	115.5	122.7
Pottawattamie	243.0	222.8	210.2	249.1	263.2	236.7	252.7
Poweshiek	120.3	105.4	95.4	105.1	107.6	100.7	104.0
Ringgold	59.0	52.0	51.3	54.9	59.0	52.7	56.6
Sac	148.3	147.0	135.6	150.9	154.6	144.7	149.4
Scott	105.1	108.6	105.8	130.7	136.6	125.3	132.0
Shelby	149.3	149.8	146.5	158.0	161.0	150.6	155.9
Sioux	222.1	218.3	205.6	215.4	220.4	206.5	212.6
Story	164.1	138.9	129.1	156.8	163.5	150.4	157.6
Tama	149.8	161.2	144.1	177.1	184.7	170.0	178.6
Taylor	69.7	63.4	62.5	59.4	62.4	57.0	60.3
Union	55.7	46.8	46.6	47.9	49.7	45.9	48.1
Van Buren	46.0	49.5	44.4	69.5	74.2	66.7	71.7
Wapello	57.4	52.7	48.7	66.1	70.8	63.3	68.3
Warren	76.4	75.2	74.0	86.7	90.5	83.2	87.5
Washington	122.8	120.8	113.3	145.3	154.3	139.1	148.9
Wayne	57.4	56.4	51.4	59.7	64.9	56.4	61.9
Webster	182.9	162.1	144.4	193.8	203.8	185.1	196.4
Winnebago	118.5	102.4	84.1	117.1	122.9	112.0	118.6
Winneshiek	99.7	101.0	101.1	115.4	122.2	110.7	118.2
Woodbury	201.7	204.7	187.6	196.9	202.0	188.7	195.1
Worth	109.9	97.9	87.6	110.7	117.2	106.1	113.2
Wright	170.2	153.4	136.5	193.2	188.3	187.9	188.3
Total	12,015.5	11,443.3	10,653.1	13,169.7	13,742.0	12,620.3	13,310.8

Appendix A. Table 8. Estimated soybean acres in 1959, 1971, and 1972 and projections for 1979 and 1984 under average and high productivity growth rates and maximum soil conservation assumptions, in thousands of acres, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	8.5	42.6	50.1	65.7	78.2	63.0	75.4
Adams	7.3	27.1	30.3	39.5	45.3	37.9	43.7
Allamakee	0.3	3.5	3.8	5.8	7.8	5.6	7.5
Appanoose	23.9	31.5	35.9	48.3	52.2	46.3	50.5
Audubon	2.1	26.0	32.0	54.8	72.7	52.1	69.7
Benton	11.3	74.6	83.6	116.2	144.6	111.0	139.1
Black Hawk	15.0	57.0	67.8	84.6	99.2	81.2	95.7
Boone	40.0	87.2	89.8	108.6	121.4	104.0	116.9
Bremer	9.5	41.8	46.7	50.4	59.0	48.3	56.8
Buchanan	10.9	53.7	64.1	74.2	87.3	71.2	84.2
Buena Vista	37.7	86.9	92.7	124.3	139.8	118.8	133.9
Butler	16.0	60.2	66.9	74.3	86.7	71.2	83.6
Calhoun	73.6	113.7	121.8	132.6	143.5	127.1	138.3
Carroll	24.0	60.1	64.9	85.5	98.2	81.7	94.5
Cass	3.9	37.1	43.4	62.9	79.6	60.1	76.6
Cedar	5.5	53.2	59.3	86.3	111.4	82.7	107.1
Cerro Gordo	26.7	72.6	81.2	97.4	112.2	93.3	108.1
Cherokee	28.9	56.6	60.9	84.9	93.6	81.2	90.2
Chickasaw	16.6	46.9	55.5	50.9	57.1	49.0	55.2
Clarke	11.4	20.7	24.1	26.2	29.2	25.0	28.1
Clay	41.1	87.1	92.3	114.3	127.8	109.5	123.1
Clayton	0.3	2.8	4.3	5.7	7.5	5.4	7.3
Clinton	6.8	43.1	49.8	77.3	98.3	74.1	94.5
Crawford	3.3	37.1	39.8	90.7	123.8	86.2	118.5
Dallas	43.0	79.6	82.6	95.1	104.1	91.2	100.4
Davis	22.9	29.8	36.1	35.8	39.5	34.3	38.1
Decatur	14.1	22.1	26.1	27.8	30.7	26.5	29.4
Delaware	2.4	20.0	24.7	35.8	46.3	34.3	44.6
Des Moines	21.1	36.4	43.4	51.1	57.4	48.9	55.4
Dickinson	25.3	54.4	55.3	71.7	81.5	68.7	78.6
Dubuque	0.1	1.8	1.9	6.3	10.2	6.0	9.8
Emmet	39.3	66.0	70.8	89.3	93.9	85.1	93.9
Fayette	18.4	46.3	57.4	54.5	61.6	52.3	59.4
Floyd	18.7	67.3	75.1	87.4	102.0	83.6	98.2
Franklin	23.5	80.1	90.0	117.2	138.9	112.4	133.4
Fremont	17.0	59.1	58.8	82.9	93.0	79.6	89.3
Greene	64.1	101.1	106.1	118.5	128.7	113.7	124.1
Grundy	21.3	68.0	76.5	94.1	109.3	90.3	105.2
Guthrie	18.9	53.4	56.5	68.7	78.2	65.9	75.4
Hamilton	51.9	108.1	111.6	138.4	150.2	132.6	148.8
Hancock	44.4	95.4	107.0	131.8	145.7	125.7	145.7
Hardin	23.6	82.4	88.4	114.8	133.9	110.0	129.1
Harrison	29.1	49.9	53.9	81.3	92.0	77.6	88.3
Henry	17.8	48.0	51.0	60.0	69.7	57.3	67.0
Howard	17.3	46.6	47.7	45.9	51.8	44.0	50.1
Humboldt	40.1	81.9	87.4	107.5	116.0	103.2	115.7
Ida	9.4	34.6	37.2	67.7	80.3	64.6	77.2
Iowa	7.7	34.8	42.7	54.9	67.0	52.8	64.8
Jackson	0.6	5.9	7.6	13.8	17.7	13.2	17.1

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Appendix A. Table 8. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	21.0	69.3	70.8	93.5	111.0	89.8	106.9
Jefferson	24.1	44.7	49.1	56.3	63.7	53.7	61.3
Johnson	10.5	41.6	50.3	59.3	70.4	56.9	67.8
Jones	2.1	23.1	29.0	51.3	68.1	49.0	65.6
Keokuk	25.5	48.3	56.2	58.6	65.5	56.0	63.1
Kossuth	97.9	177.2	194.0	235.4	247.4	225.2	247.4
Lee	25.0	40.6	42.2	50.6	58.1	48.2	55.7
Linn	11.0	58.7	70.4	89.7	109.8	85.7	105.5
Louisa	23.5	47.9	48.7	58.0	65.4	55.7	63.2
Lucas	14.1	21.7	27.3	26.8	29.9	25.7	28.8
Lyon	23.9	45.1	50.3	64.4	71.8	61.7	69.2
Madison	20.5	44.9	49.6	58.7	66.2	56.2	63.8
Mahaska	24.6	59.5	64.6	84.0	95.3	80.8	92.1
Marion	18.3	48.0	49.1	56.4	63.9	54.1	61.6
Marshall	18.1	62.4	68.5	88.8	104.0	85.2	100.2
Mills	6.1	47.6	50.1	74.7	88.6	71.1	85.0
Mitchell	16.8	58.4	60.3	57.0	65.9	54.6	63.5
Monona	57.7	52.9	58.8	72.7	78.3	69.9	75.7
Monroe	12.5	20.6	20.6	22.7	25.0	21.8	24.1
Montgomery	6.4	40.0	45.7	61.6	74.8	58.9	71.9
Muscatine	19.2	38.3	41.0	50.4	56.7	48.6	55.0
O'Brien	51.4	87.5	90.8	117.0	128.6	112.0	123.9
Osceola	36.0	57.4	63.1	71.7	79.3	68.7	76.5
Page	10.7	56.4	61.3	76.6	89.2	73.3	85.9
Palo Alto	50.5	105.0	113.5	145.2	156.1	139.2	156.5
Plymouth	19.3	52.8	53.9	96.3	112.4	92.2	108.2
Pocahontas	64.2	123.6	127.3	158.3	172.5	151.9	169.3
Polk	45.6	72.1	78.0	84.0	92.8	80.4	89.4
Pottawattamie	11.4	73.2	78.1	143.0	180.7	135.8	173.0
Poweshiek	13.2	51.5	59.2	76.1	91.3	72.9	88.0
Ringgold	20.0	26.8	33.0	34.5	38.5	33.0	36.8
Sac	28.0	66.8	69.9	96.1	107.9	92.2	104.0
Scott	7.7	32.8	35.0	51.9	62.4	49.7	60.2
Shelby	1.6	37.9	40.4	108.2	106.3	106.7	111.7
Sioux	29.0	49.6	50.5	73.6	81.5	70.5	78.4
Story	35.8	91.9	95.0	113.5	128.2	108.8	123.3
Tama	18.3	71.2	83.1	104.4	125.2	100.1	120.8
Taylor	18.0	34.0	44.3	44.2	49.5	42.3	47.7
Union	9.2	20.6	25.9	27.8	31.1	26.7	30.0
Van Buren	27.5	38.4	38.2	37.2	40.3	35.6	38.9
Wapello	26.7	37.5	41.5	47.5	53.0	45.4	51.0
Warren	28.8	43.4	50.4	53.0	57.5	50.9	55.4
Washington	19.6	57.3	64.8	77.3	89.7	74.0	86.4
Wayne	22.7	33.6	41.8	39.1	44.2	37.0	42.0
Webster	86.3	138.8	147.4	174.0	190.6	166.2	183.3
Winnebago	27.1	71.4	76.8	89.3	103.5	85.5	99.7
Winneshiek	2.8	13.9	14.5	17.0	20.7	16.3	19.9
Woodbury	38.7	45.9	49.3	69.7	77.0	66.7	74.2
Worth	29.9	61.0	66.4	64.8	72.2	62.0	69.6
Wright	52.6	114.2	117.4	151.4	156.7	147.2	156.7
Total	2,328.0	5,453.4	5,964.3	7,527.3	8,594.7	7,211.7	8,325.6

Appendix A. Table 9. Estimated oat acres in 1959, 1971, and 1972 and projections for 1979 and 1984 under average and high productivity growth rates and maximum conservation assumptions, in thousands of acres, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	44.7	20.1	16.1	15.5	15.3	14.8	14.6
Adams	27.6	12.9	9.9	8.7	9.2	8.3	8.3
Allamakee	34.7	19.8	19.2	14.6	14.7	13.9	14.0
Appanoose	8.2	5.4	6.2	5.4	5.3	5.5	5.0
Audubon	41.1	16.7	10.7	16.6	16.1	15.8	15.3
Benton	73.3	25.9	19.7	19.8	18.9	18.8	18.1
Black Hawk	47.8	15.0	12.0	9.9	9.4	9.5	9.0
Boone	53.9	10.6	8.0	8.2	7.8	7.8	7.2
Bremer	42.0	18.7	15.3	12.6	12.6	11.7	12.0
Buchanan	55.4	20.6	15.5	13.8	13.5	13.1	12.9
Buena Vista	59.8	12.5	9.7	10.7	4.0	8.9	9.4
Butler	54.0	22.3	18.8	13.5	13.2	12.8	12.6
Calhoun	51.2	9.4	7.1	6.6	6.1	6.3	5.8
Carroll	59.2	17.3	13.2	12.8	12.1	12.2	11.5
Cass	46.7	15.1	11.3	13.8	13.3	13.2	12.7
Cedar	55.8	20.2	15.9	15.8	16.5	15.0	14.4
Cerro Gordo	46.5	11.1	9.0	7.7	7.2	7.4	6.8
Cherokee	49.8	13.0	11.0	9.7	9.1	9.2	8.7
Chickasaw	47.1	21.9	16.5	14.2	14.3	13.7	13.7
Clarke	17.4	11.8	9.7	9.1	9.3	8.6	8.9
Clay	51.5	10.0	7.3	5.9	5.4	5.6	5.1
Clayton	56.7	32.8	30.4	25.6	25.8	24.4	24.6
Clinton	57.6	23.3	18.4	18.7	18.9	17.3	18.0
Crawford	77.2	29.3	22.0	22.0	21.4	20.7	20.4
Dallas	44.0	8.7	6.0	5.5	5.3	5.3	4.8
Davis	10.5	8.9	5.8	7.4	7.6	7.0	7.2
Decatur	13.3	6.0	5.3	5.5	5.5	5.2	5.2
Delaware	56.1	31.9	28.0	22.9	24.9	21.8	22.3
Des Moines	18.4	4.2	3.8	4.1	3.9	4.3	3.7
Dickinson	33.4	7.6	5.4	5.2	4.8	4.9	4.6
Dubuque	50.4	35.2	34.5	26.1	26.4	24.8	25.2
Emmet	30.9	4.4	4.2	3.5	2.2	3.3	2.9
Fayette	59.6	28.6	24.3	21.0	21.2	20.1	20.2
Floyd	46.5	12.9	9.5	8.5	8.0	8.1	7.6
Franklin	52.0	13.2	9.1	7.8	8.3	7.4	7.9
Fremont	12.0	1.1	0.6	0.4	0.4	0.4	0.4
Greene	49.4	6.9	4.6	4.4	4.0	4.2	3.8
Grundy	48.4	12.0	9.2	8.4	8.1	7.8	7.8
Guthrie	41.4	13.5	10.6	8.4	8.0	8.1	7.6
Hamilton	56.5	8.2	6.1	5.3	2.5	4.9	4.9
Hancock	49.4	13.1	12.5	10.2	4.6	9.8	4.7
Hardin	53.5	9.1	6.6	5.9	5.4	5.5	5.1
Harrison	39.0	10.0	6.2	8.5	8.0	7.9	7.6
Henry	25.7	7.4	7.2	6.2	5.9	5.9	5.7
Howard	45.2	19.6	17.8	15.7	15.9	14.9	15.2
Humboldt	38.3	6.1	4.4	4.6	1.3	4.1	4.0
Ida	48.5	15.2	10.5	12.2	11.5	11.5	10.9
Iowa	41.9	21.9	16.4	14.2	14.1	13.5	13.5
Jackson	37.3	24.5	23.0	20.4	20.5	19.4	19.6

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Appendix A. Table 9. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	60.9	22.5	18.1	14.5	15.1	13.8	13.5
Jefferson	23.8	12.0	7.7	9.6	9.7	9.2	9.3
Johnson	44.2	19.9	14.9	12.9	14.2	12.3	12.0
Jones	42.1	20.9	16.7	15.2	14.8	14.5	14.2
Keokuk	37.1	14.2	11.0	12.7	12.6	12.1	12.1
Kossuth	85.7	16.5	13.6	12.8	6.2	12.2	6.2
Lee	11.3	5.4	3.6	4.0	3.8	3.8	3.6
Linn	57.2	20.8	15.0	16.6	15.9	15.7	15.2
Louisa	23.1	6.0	3.4	4.3	4.0	4.1	3.9
Lucas	12.3	8.3	6.9	6.1	6.2	5.8	5.9
Lyon	68.5	28.9	25.6	19.4	18.8	18.5	18.0
Madison	28.6	11.8	8.6	9.7	9.3	9.3	9.0
Mahaska	44.1	17.0	12.8	14.8	14.6	14.1	14.0
Marion	30.3	15.6	12.1	11.5	11.3	11.0	10.8
Marshall	52.0	12.4	10.9	8.0	7.4	7.6	7.1
Mills	22.8	2.9	2.1	1.7	1.5	1.6	1.4
Mitchell	49.8	20.4	15.9	13.7	13.2	13.0	12.6
Monona	28.6	10.3	7.9	6.5	6.4	6.2	6.1
Monroe	10.7	5.2	4.4	4.3	4.3	4.1	4.1
Montgomery	29.6	6.8	3.9	4.4	4.1	4.2	3.9
Muscatine	28.4	10.2	7.5	6.2	6.0	6.0	5.7
O'Brien	49.9	15.6	13.2	12.4	11.8	11.8	11.3
Osceola	33.9	13.1	9.9	9.6	9.3	9.2	8.9
Page	28.4	6.6	4.6	4.9	4.7	4.7	4.5
Palo Alto	56.4	11.3	8.2	6.9	5.5	6.6	6.2
Plymouth	99.8	39.8	34.3	28.9	28.0	27.6	26.7
Pocahontas	57.9	8.5	5.4	5.6	2.2	5.1	4.8
Polk	32.2	8.5	5.9	4.7	4.4	4.4	4.2
Pottawattamie	77.0	17.1	11.4	17.5	16.3	16.6	15.5
Poweshiek	49.9	22.4	17.2	13.4	13.1	12.8	12.5
Ringgold	18.8	9.8	8.0	9.1	9.7	7.8	9.3
Sac	59.0	14.4	14.0	10.8	10.9	10.3	9.6
Scott	35.0	13.6	10.3	9.6	9.1	9.1	8.7
Shelby	68.3	25.9	18.4	29.4	29.4	32.1	29.4
Sioux	89.8	31.4	28.8	21.7	21.4	18.9	19.5
Story	52.6	6.7	5.1	4.1	3.9	3.9	3.7
Tama	61.9	24.1	18.9	14.2	13.6	13.6	13.0
Taylor	25.3	11.6	9.8	8.9	8.9	8.5	8.5
Union	22.2	11.6	8.8	8.3	8.4	7.9	8.0
Van Buren	8.9	6.9	5.6	5.8	5.9	5.6	5.6
Wapello	15.6	6.7	5.3	7.3	7.5	6.9	7.2
Warren	26.9	11.5	9.9	8.8	8.7	8.4	8.3
Washington	42.4	14.2	10.3	11.8	11.4	11.3	10.9
Wayne	20.4	13.0	9.5	14.4	14.8	13.4	14.1
Webster	59.0	8.2	6.1	6.0	5.3	5.7	5.1
Winnebago	32.5	7.5	6.8	6.3	6.1	6.0	5.7
Winneshiek	61.1	36.7	35.0	28.8	28.5	27.9	27.6
Woodbury	61.5	26.2	19.6	18.4	17.9	17.6	17.1
Worth	34.3	11.2	8.3	8.3	7.9	8.0	7.6
Wright	51.5	7.7	6.3	3.0	3.0	6.0	3.0
Total	4,284.3	1,475.7	1,182.0	1,101.3	1,054.7	1,051.4	1,016.5

Appendix A. Table 10. Comparison of estimated maximum row crop land available under maximum soil conservation assumption, estimated 1972 row crop acres harvested, and projected row crop acres for 1979 and 1984 under average and high productivity growth rate assumptions, thousands of acres, by counties, Iowa.

County	Est. Max. Row Crop Acres Available	Est. Row Crop Acres Harvested 1972	Projected Row Crop Acres Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Adair	284.2	135.7	163.9	180.0	157.3	173.8
Adams	220.9	89.2	107.6	116.4	103.4	112.6
Allamakee	242.1	69.8	79.1	84.1	76.1	81.5
Appanoose	203.2	70.8	101.2	106.6	97.2	103.4
Audubon	210.8	133.6	160.3	182.4	152.5	175.1
Benton	397.0	243.3	307.1	343.1	293.5	330.5
Black Hawk	321.2	189.4	240.3	259.9	230.6	251.2
Boone	333.1	218.6	273.6	294.9	262.0	284.5
Bremer	267.2	138.7	158.3	171.7	151.7	165.5
Buchanan	344.2	188.1	243.2	265.9	233.5	257.0
Buena Vista	332.7	239.0	308.1	331.6	294.5	318.2
Butler	348.6	200.2	230.6	250.0	221.0	241.4
Calhoun	352.2	256.2	283.3	298.9	271.6	288.4
Carroll	317.0	216.8	250.6	268.0	239.6	258.3
Cass	296.9	167.7	190.7	213.3	182.4	205.6
Cedar	318.1	191.3	257.6	289.7	246.8	279.1
Cerro Gordo	329.4	207.9	260.6	282.4	249.8	272.6
Cherokee	316.4	208.3	255.2	266.2	244.4	256.9
Chickasaw	308.3	153.2	162.3	172.2	156.1	166.9
Clarke	182.0	59.3	62.5	66.9	59.7	64.5
Clay	346.0	228.9	270.6	288.5	259.4	278.5
Clayton	299.5	130.0	159.0	172.0	152.8	166.5
Clinton	346.2	215.6	302.5	332.7	290.2	320.3
Crawford	345.9	202.9	250.9	291.3	238.6	279.4
Dallas	318.6	214.3	254.4	271.6	244.1	262.2
Davis	246.3	78.3	96.0	103.8	92.1	100.2
Decatur	213.2	69.3	76.0	81.9	72.4	78.7
Delaware	313.6	162.0	207.2	227.9	198.6	220.1
Des Moines	198.3	115.0	155.7	166.9	149.1	161.3
Dickinson	216.5	139.5	178.1	191.4	170.8	184.8
Dubuque	218.3	107.9	131.8	142.0	126.0	136.9
Emmet	224.5	162.7	220.1	224.5	209.9	224.5
Fayette	381.3	200.2	231.5	248.3	222.3	240.1
Floyd	304.8	183.2	220.8	240.6	211.4	232.0
Franklin	351.2	228.7	300.9	329.6	288.8	316.9
Fremont	277.3	163.1	214.5	228.9	205.8	220.1
Greene	334.3	242.0	288.5	304.4	276.8	294.1
Grundy	304.8	207.8	261.8	285.0	251.3	274.8
Guthrie	290.2	149.2	172.1	184.8	164.9	178.5
Hamilton	341.5	253.6	326.1	341.5	312.5	337.6
Hancock	340.1	238.9	321.5	340.1	306.7	340.1
Hardin	335.9	225.9	286.4	312.7	274.5	301.8
Harrison	298.4	210.3	265.2	284.6	253.5	273.4
Henry	234.5	132.6	170.4	188.5	162.7	181.5
Howard	288.6	131.0	135.8	146.1	130.4	141.3
Humboldt	261.3	192.2	250.6	261.3	240.5	259.9
Ida	225.2	153.4	205.2	222.2	195.9	213.8
Iowa	269.7	148.2	182.1	197.5	175.0	191.1
Jackson	212.8	103.3	149.8	159.6	144.0	154.5

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Appendix A. Table 10. continued

County	Est. Max. Row Crop Acres Available	Est. Row Crop Acres Harvested 1972	Projected Row Crop Acres Average Prod. Growth Rate 1979	Projected Row Crop Acres Average Prod. Growth Rate 1984	Projected Row Crop Acres High Prod. Growth Rate 1979	Projected Row Crop Acres High Prod. Growth Rate 1984
Jasper	377.3	216.1	276.6	302.0	265.6	291.1
Jefferson	215.5	107.4	134.9	147.9	128.8	142.4
Johnson	263.2	157.7	202.8	220.9	194.6	213.0
Jones	282.0	147.6	202.9	226.5	194.1	218.4
Keokuk	306.8	158.3	188.7	203.6	180.7	196.4
Kossuth	591.8	435.0	578.7	591.8	553.8	591.8
Lee	258.2	133.1	190.2	213.2	181.3	205.0
Linn	361.4	208.1	277.2	307.2	264.9	295.8
Louisa	196.6	124.1	166.6	179.7	160.0	173.8
Lucas	210.6	66.2	68.5	73.9	65.7	71.4
Lyon	343.1	206.8	230.0	240.8	220.4	232.5
Madison	259.4	124.1	139.4	149.5	133.5	144.2
Mahaska	310.8	172.6	230.3	247.0	221.5	239.1
Marion	256.3	128.7	150.4	161.3	144.1	155.7
Marshall	317.5	200.5	258.5	281.1	248.2	271.2
Mills	201.1	137.8	173.1	189.5	164.8	181.9
Mitchell	283.6	166.8	165.3	177.1	158.4	171.1
Monona	311.3	213.0	267.4	281.9	257.2	273.0
Monroe	183.4	52.4	57.1	60.6	54.7	58.4
Montgomery	225.9	132.8	149.3	164.9	142.8	158.8
Muscatine	241.0	122.2	158.1	167.5	152.5	162.5
O'Brien	346.0	240.5	293.3	309.7	280.9	298.8
Osceola	240.0	162.8	190.9	202.6	183.1	195.7
Page	289.9	156.6	174.8	190.5	167.3	183.6
Palo Alto	340.4	244.8	327.8	340.4	314.4	340.4
Plymouth	451.6	287.8	358.0	384.7	342.8	371.2
Pocahontas	351.8	259.1	332.8	351.8	319.6	344.3
Polk	293.2	180.2	206.2	221.3	197.5	213.5
Pottawattamie	460.3	300.2	401.7	452.6	381.6	434.1
Poweshiek	297.1	156.8	183.4	200.9	175.8	193.9
Ringgold	256.1	86.5	91.1	99.0	87.3	94.9
Sac	336.2	223.9	264.0	278.3	253.2	268.8
Scott	219.8	145.2	186.3	202.2	178.6	195.3
Shelby	277.5	198.9	277.5	277.5	268.1	277.5
Sioux	444.0	295.8	321.7	332.8	308.4	320.9
Story	321.9	228.4	274.3	295.3	263.0	284.4
Tama	368.2	232.2	286.2	314.0	274.7	303.4
Taylor	295.2	108.4	104.3	112.5	100.0	108.6
Union	209.6	74.7	77.3	82.2	74.1	79.5
Van Buren	187.9	83.9	107.8	115.5	103.4	111.6
Wapello	210.2	91.2	114.5	124.6	109.6	120.1
Warren	281.6	127.1	141.6	149.6	135.9	144.6
Washington	315.1	180.6	224.1	245.3	214.4	236.5
Wayne	257.1	96.3	101.8	112.0	96.2	106.7
Webster	417.7	293.7	369.8	396.2	353.2	381.4
Winnebago	237.5	163.0	208.5	228.2	199.5	220.0
Winneshiek	322.5	127.1	142.1	151.6	136.3	146.6
Woodbury	417.8	251.0	279.1	290.2	267.4	280.2
Worth	240.6	156.4	178.7	192.1	171.2	185.4
Wright	346.6	255.9	346.6	346.6	337.0	346.6
Total	29,304.7	17,187.4	21,213.8	22,802.5	20,326.9	22,087.8

Appendix A. Table 11. Estimated 1959, 1971, 1972 corn yields and 1979 and 1984 projected corn yields under average and high productivity growth rates and maximum soil conservation assumptions in bushels per acre, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	62.6	94.9	104.0	107.8	112.6	112.3	116.1
Adams	59.1	93.9	101.0	110.2	115.4	114.6	118.8
Allamakee	66.3	98.1	104.0	106.7	111.8	110.9	115.1
Appanoose a/	53.1	81.5	99.0	74.4	78.1	77.5	80.2
Audubon	66.1	92.2	104.0	107.4	110.1	112.9	114.1
Benton	77.1	105.4	113.0	122.2	126.5	127.8	130.7
Black Hawk	72.7	98.7	110.0	106.1	110.9	110.5	114.3
Boone	69.8	105.0	129.0	115.8	120.6	120.9	124.5
Bremer	68.7	95.5	107.0	110.5	115.0	115.2	118.7
Buchanan	66.7	98.0	110.0	104.8	109.5	109.1	112.8
Buena Vista	69.1	103.2	114.0	99.8	102.9	104.3	106.8
Butler	67.5	96.1	108.0	112.2	116.9	117.0	120.6
Calhoun	65.4	89.6	120.0	112.5	117.3	117.3	121.0
Carroll	64.5	83.2	111.0	110.3	114.5	115.3	118.4
Cass	64.7	95.4	105.0	111.3	115.4	116.4	119.3
Cedar	76.2	118.2	113.0	120.0	124.7	125.2	128.9
Cerro Gordo	64.5	101.7	110.0	109.5	114.1	114.2	117.7
Cherokee	62.9	99.2	112.0	94.2	98.2	98.3	101.3
Chickasaw	57.6	88.8	102.0	102.0	107.0	105.9	110.0
Clarke	48.9	88.8	99.0	106.1	110.3	110.9	114.0
Clay	60.9	101.0	113.0	103.3	107.7	107.7	111.1
Clayton	63.4	100.0	106.0	107.7	112.7	112.1	116.1
Clinton	75.1	109.1	107.0	106.3	110.1	110.7	114.0
Crawford	65.0	86.7	102.0	102.3	104.1	107.5	108.0
Dallas	66.5	105.0	126.0	111.7	116.5	116.4	120.2
Davis	51.6	95.0	101.0	90.3	94.2	94.1	97.1
Decatur	39.5	85.4	99.0	98.1	101.4	102.9	105.0
Delaware	64.8	96.5	109.0	105.7	110.2	110.2	113.7
Des Moines	76.6	120.1	124.0	106.1	110.8	110.8	114.2
Dickinson	40.3	94.3	105.0	95.5	99.5	99.6	102.7
Dubuque	68.2	97.3	100.0	107.3	111.4	112.1	115.1
Emmet	53.4	106.1	111.0	99.0	102.9	103.7	106.1
Fayette	61.7	98.3	105.0	105.3	110.0	109.6	113.3
Floyd	63.5	99.7	109.0	106.6	110.8	111.3	114.4
Franklin	73.3	110.6	116.0	113.5	117.8	118.2	122.0
Fremont	58.2	100.2	112.0	96.9	100.6	100.9	104.2
Greene	63.2	91.2	125.0	112.6	117.5	117.3	121.1
Grundy	82.6	110.0	121.0	123.5	128.6	128.6	132.7
Guthrie	63.3	90.4	107.0	109.0	113.7	113.7	117.2
Hamilton	73.3	108.4	121.0	113.2	117.7	118.1	121.6
Hancock	63.5	109.0	118.0	107.9	111.7	113.1	115.2
Hardin	77.6	110.7	117.0	118.4	123.3	123.4	127.2
Harrison	61.1	93.8	109.0	97.2	100.4	101.6	104.1
Henry	66.8	114.0	117.0	115.6	119.7	121.0	123.8
Howard	55.6	76.4	96.0	98.7	103.3	102.8	106.4
Humboldt	69.1	110.0	111.0	108.1	112.3	112.6	116.0
Ida	63.8	98.6	112.0	90.3	93.5	94.6	96.8
Iowa	66.3	109.6	106.0	107.1	112.2	111.3	115.5
Jackson	68.3	98.0	98.0	88.1	92.2	91.7	95.0

(cont. on next page)

Appendix A. Table 11. continued

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Jasper	67.1	109.7	115.0	115.2	120.2	119.9	124.1
Jefferson	60.3	105.7	108.0	106.7	110.4	111.7	114.2
Johnson	65.7	109.4	108.0	108.8	113.4	113.4	117.1
Jones	71.8	103.7	108.0	109.4	113.5	114.3	117.2
Keokuk	63.2	113.1	113.0	110.1	114.6	115.0	118.3
Kossuth	62.4	109.8	112.0	104.6	108.9	109.3	112.3
Lee	65.5	103.3	111.0	98.4	101.3	103.2	104.9
Linn	66.5	104.1	110.0	107.0	110.8	112.0	114.6
Louisa	67.2	97.4	118.0	108.5	113.6	112.9	116.9
Lucas	47.0	86.4	98.0	111.7	116.6	116.4	120.2
Lyon	48.0	83.8	106.0	95.8	99.8	99.9	103.0
Madison	64.6	97.7	107.0	109.5	114.0	114.3	117.7
Mahaska	63.2	108.0	111.0	103.9	109.0	108.0	112.1
Marion	56.7	100.2	109.0	105.2	109.7	109.7	113.1
Marshall	75.6	106.3	119.0	119.7	124.9	124.5	128.9
Mills	61.7	91.0	108.0	103.5	106.6	108.6	110.5
Mitchell	63.0	87.7	107.0	115.4	120.3	120.3	124.1
Monona	58.0	94.0	108.0	90.7	95.1	94.3	97.8
Monroe	47.6	88.7	99.0	94.2	98.0	98.4	101.2
Montgomery	56.8	94.5	104.0	113.5	117.7	118.6	121.6
Muscatine	68.4	105.8	110.0	104.7	110.2	108.5	113.2
O'Brien	60.5	99.8	117.0	99.0	103.1	103.4	106.5
Osceola	52.0	94.3	114.0	99.7	104.0	103.9	107.2
Page	56.8	97.0	106.0	109.6	113.9	114.4	117.6
Palo Alto	59.8	108.2	111.0	99.5	103.5	103.7	107.0
Plymouth	55.7	82.9	107.0	92.8	96.6	96.9	99.7
Pocahontas	66.5	108.0	116.0	105.8	110.2	110.2	113.8
Polk	65.3	100.9	112.0	118.8	123.7	124.0	127.7
Pottawattamie	64.4	97.9	110.0	102.7	105.0	108.1	109.0
Poweshiek	62.9	105.0	105.0	120.8	125.9	125.9	129.8
Ringgold	48.0	92.6	99.0	103.8	107.1	108.2	111.2
Sac	65.6	86.9	110.0	103.1	107.5	107.4	110.8
Scott	72.7	113.3	110.0	117.2	122.2	122.1	126.0
Shelby	70.7	92.1	111.0	99.3	103.8	104.1	106.8
Sioux	55.0	87.1	105.0	95.8	99.7	99.9	103.0
Story	75.1	105.4	120.0	118.7	123.5	123.8	127.6
Tama	73.1	104.3	114.0	120.4	125.8	125.3	129.6
Taylor	50.3	90.6	100.0	113.9	118.8	118.7	122.5
Union	53.5	88.7	98.0	109.1	113.9	113.7	117.4
Van Buren	61.2	91.8	101.0	88.5	92.4	92.2	95.2
Wapello	63.0	106.5	111.0	107.7	111.9	112.5	115.6
Warren	56.3	100.9	113.0	103.1	107.7	107.4	111.0
Washington	66.1	112.6	113.0	117.2	121.8	122.5	125.8
Wayne	47.8	94.2	104.0	103.6	105.1	109.6	109.9
Webster	66.8	104.7	121.0	111.6	115.8	116.8	119.8
Winnebago	64.8	101.1	111.0	108.6	112.9	113.5	116.6
Winneshiek	62.1	90.0	98.0	100.4	104.8	104.6	108.0
Woodbury	57.9	86.0	107.0	89.1	92.9	93.0	95.8
Worth	62.0	99.0	110.0	106.2	110.6	110.8	114.1
Wright	69.3	111.9	119.0	109.2	113.9	114.4	117.5
State Average	64.2	99.5	110.6	106.4	110.7	111.0	114.3

a/Projected yields could be somewhat conservative. Rathbun Dam and resulting flood controls could increase projected yields in Appanoose County.

Appendix A. Table 12. Estimated 1959, 1971, 1972 soybean yields and 1979 and 1984 projected soybean yields under average and high productivity growth rates and maximum soil conservation assumptions in bushels per acre, by counties, Iowa.

County	Estimated			Average Prod. Growth Rate		High Prod. Growth Rate	
	1959	1971	1972	1979	1984	1979	1984
Adair	27.3	33.7	33.0	41.0	42.8	42.7	44.1
Adams	25.9	32.2	33.0	41.9	43.8	43.5	45.1
Allamakee	22.9	26.4	31.0	40.6	42.5	42.1	43.7
Appanoose[a/]	21.5	27.0	32.0	28.3	29.7	29.4	30.5
Audubon	25.2	30.8	33.0	40.8	41.8	42.9	43.4
Benton	29.4	35.9	38.0	46.4	48.1	48.6	49.7
Black Hawk	27.3	28.1	36.0	40.3	42.1	42.0	43.4
Boone	28.9	33.7	40.0	44.0	45.8	45.9	47.3
Bremer	24.9	28.8	30.0	42.0	43.7	43.8	45.1
Buchanan	24.3	29.2	34.0	39.8	41.6	41.5	42.9
Buena Vista	30.3	32.2	35.0	37.9	39.1	39.6	40.6
Butler	26.3	30.4	33.0	42.6	44.4	44.4	45.8
Calhoun	28.2	29.6	39.0	42.8	44.6	44.6	46.0
Carroll	23.7	29.1	39.0	41.9	43.5	43.8	45.0
Cass	27.9	33.3	34.0	42.3	43.9	44.2	45.3
Cedar	30.6	40.2	38.0	45.6	47.4	47.6	49.0
Cerro Gordo	24.6	29.8	35.0	41.6	43.4	43.4	44.7
Cherokee	29.0	31.1	37.0	35.8	37.3	37.4	38.5
Chickasaw	20.7	23.2	31.0	38.7	40.7	40.3	41.8
Clarke	22.4	30.8	34.0	40.3	41.9	42.2	43.3
Clay	27.4	33.2	38.0	39.3	40.9	40.9	42.2
Clayton	25.2	30.8	33.0	40.9	42.8	42.6	44.1
Clinton	25.5	35.5	36.0	40.4	41.8	42.1	43.3
Crawford	25.7	28.0	35.0	38.9	39.5	40.8	41.0
Dallas	28.6	33.5	38.0	42.4	44.3	44.2	45.7
Davis	21.5	30.5	32.0	34.3	35.8	35.7	36.9
Decatur	17.1	29.1	32.0	37.3	38.5	39.1	39.9
Delaware	23.8	28.8	34.0	40.2	41.9	41.9	43.2
Des Moines	28.5	40.0	39.0	40.3	42.1	42.1	43.4
Dickinson	19.9	29.9	37.0	36.3	37.8	37.8	39.0
Dubuque	23.0	33.6	29.0	40.8	42.3	42.6	43.7
Emmet	24.2	33.8	38.0	37.6	39.1	39.4	40.3
Fayette	24.1	28.0	31.0	40.0	41.8	41.6	43.1
Floyd	23.7	28.5	32.0	40.5	42.1	42.3	43.5
Franklin	29.1	35.7	36.0	43.1	44.8	44.9	46.4
Fremont	28.1	30.1	38.0	36.8	38.2	38.3	39.6
Greene	24.8	29.2	39.0	42.8	44.7	44.6	46.0
Grundy	32.1	36.6	39.0	46.9	48.8	48.9	50.4
Guthrie	26.0	30.2	35.0	41.4	43.2	43.2	44.6
Hamilton	29.9	34.4	37.0	43.0	44.7	44.9	46.2
Hancock	25.7	33.0	38.0	41.0	42.4	43.0	43.8
Hardin	31.1	36.6	33.0	45.0	46.9	46.9	48.3
Harrison	20.0	29.6	35.0	36.9	38.1	38.6	39.5
Henry	28.0	38.8	39.0	43.9	45.5	46.0	47.0
Howard	20.8	15.6	29.0	37.5	39.2	39.1	40.4
Humboldt	30.3	35.0	33.0	41.1	42.7	42.8	44.1
Ida	26.9	30.7	37.0	34.3	35.5	35.9	36.8
Iowa	24.9	35.6	34.0	40.7	42.6	42.3	43.9
Jackson	27.1	33.7	31.0	33.5	35.0	34.8	36.1

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Appendix A. Table 12. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	25.4	33.9	39.0	43.8	45.7	45.5	47.2
Jefferson	26.8	34.6	34.0	40.5	42.0	42.4	43.4
Johnson	27.7	37.9	36.0	41.4	43.1	43.1	44.5
Jones	28.2	35.9	36.0	41.6	43.1	43.4	44.6
Keokuk	27.6	36.1	36.0	41.8	43.5	43.7	44.9
Kossuth	26.8	32.5	36.0	39.8	41.4	41.5	42.7
Lee	24.9	32.3	34.0	37.4	38.5	39.2	39.9
Linn	26.3	34.0	36.0	40.7	42.1	42.5	43.5
Louisa	25.7	35.0	36.0	41.2	43.2	42.9	44.4
Lucas	21.3	28.0	32.0	42.4	44.3	44.2	45.7
Lyon	22.4	30.1	39.0	36.4	37.9	38.0	39.1
Madison	27.6	34.4	34.0	41.6	43.3	43.5	44.7
Mahaska	26.8	36.1	37.0	39.5	41.4	41.0	42.6
Marion	24.2	34.1	35.0	40.0	41.7	41.7	43.0
Marshall	29.5	37.0	37.0	45.5	47.5	47.3	49.0
Mills	29.2	30.0	36.0	39.3	40.5	41.3	42.0
Mitchell	23.1	20.2	32.0	43.8	45.7	45.7	47.2
Monona	20.0	30.8	33.0	34.5	36.1	35.8	37.2
Monroe	22.2	27.5	30.0	35.8	37.3	37.4	38.5
Montgomery	26.0	33.5	38.0	43.1	44.7	45.1	46.2
Muscatine	24.0	35.0	35.0	39.8	41.9	41.2	43.0
O'Brien	28.2	35.0	42.0	37.6	39.2	39.3	40.5
Osceola	22.8	31.4	40.0	37.9	39.5	39.5	40.7
Page	27.4	32.6	36.0	41.6	43.3	43.5	44.7
Palo Alto	27.5	32.9	36.0	37.8	39.3	39.4	40.7
Plymouth	25.4	27.2	38.0	35.3	36.7	36.8	37.9
Pocahontas	29.2	33.3	36.0	40.2	41.9	41.9	43.2
Polk	25.4	32.1	36.0	45.2	47.0	47.1	48.5
Pottawattamie	25.8	32.4	36.0	39.0	39.9	41.1	41.4
Poweshiek	27.5	36.7	36.0	45.9	47.8	47.9	49.3
Ringgold	21.1	30.9	33.0	39.4	40.7	41.1	42.3
Sac	27.7	28.6	34.0	39.2	40.8	40.8	42.1
Scott	27.1	39.1	38.0	44.5	46.4	46.4	47.9
Shelby	27.9	29.9	36.0	37.7	39.4	39.6	40.6
Sioux	25.8	30.3	39.0	36.4	37.9	38.0	39.1
Story	29.1	35.0	39.0	45.1	46.9	47.0	48.5
Tama	27.1	36.4	37.0	45.7	47.8	47.6	49.3
Taylor	23.4	30.6	33.0	43.3	45.1	45.1	46.5
Union	23.6	31.6	34.0	41.5	43.3	43.2	44.6
Van Buren	25.0	28.8	31.0	33.6	35.1	35.0	36.2
Wapello	26.2	33.5	35.0	40.9	42.5	42.8	43.9
Warren	23.0	30.9	33.0	39.2	40.9	40.8	42.2
Washington	29.8	39.5	39.0	44.5	46.3	46.5	47.8
Wayne	21.3	29.2	32.0	39.4	40.0	41.6	41.8
Webster	28.9	33.3	36.0	42.4	44.0	44.4	45.5
Winnebago	26.2	28.5	33.0	41.3	42.9	43.1	44.3
Winneshiek	21.3	20.0	30.0	38.2	39.8	39.8	41.1
Woodbury	19.5	27.1	34.0	33.9	35.3	35.3	36.4
Worth	23.4	21.8	32.0	40.4	42.0	42.1	43.4
Wright	29.4	34.4	37.0	41.5	43.3	43.5	44.6
State Average	26.1	32.1	35.9	40.7	42.3	42.4	43.7

a/ Projected yields could be somewhat conservative. Rathbun Dam and resulting flood controls could increase projected yields in Appanoose County.

Appendix A. Table 13. Estimated 1971 tonnage of nitrogen fertilizer applied and projected 1979 and 1984 tons of nitrogen fertilizer under average and high productivity growth rates and maximum soil conservation assumptions, by counties, Iowa.

County	Estimated 1971	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Adair	5,399.1	7,323.9	7,907.0	7,328.0	7,886.5
Adams	4,416.1	4,818.2	5,245.4	4,828.4	5,238.2
Allamakee	2,541.5	2,781.8	3,020.5	2,790.3	3,018.8
Appanoose	2,062.3	3,103.7	3,324.7	3,109.4	3,330.5
Audubon	7,107.7	7,357.2	7,969.9	7,301.0	7,903.0
Benton	9,591.2	12,147.3	13,173.6	12,106.0	13,101.2
Black Hawk	7,326.4	9,299.7	10,008.8	9,306.9	9,985.0
Boone	9,218.2	13,039.1	14,297.5	13,024.9	14,242.4
Bremer	5,451.7	6,441.4	7,014.9	6,439.7	6,983.5
Buchanan	7,940.3	11,172.9	12,306.0	11,183.5	12,277.7
Buena Vista	10,165.1	12,412.2	13,505.4	12,375.3	13,382.3
Butler	9,414.2	11,407.6	12,425.6	11,403.2	12,384.5
Calhoun	11,297.6	12,179.8	13,095.1	12,176.6	13,048.8
Carroll	8,668.7	9,992.6	10,715.0	9,961.9	10,659.4
Cass	7,398.0	9,529.4	10,386.5	9,503.0	10,334.5
Cedar	7,079.3	10,394.7	11,284.9	10,384.5	11,222.6
Cerro Gordo	9,872.7	11,965.8	13,008.5	11,959.5	12,964.1
Cherokee	7,971.0	9,773.8	10,326.2	9,762.0	10,287.9
Chickasaw	6,744.5	7,717.5	8,316.6	7,743.1	8,319.1
Clarke	1,887.5	2,072.8	2,244.0	2,067.6	2,233.0
Clay	9,147.1	10,555.5	11,320.4	10,552.8	11,282.3
Clayton	5,332.8	7,316.0	8,181.0	7,328.5	8,167.2
Clinton	10,568.9	13,740.8	14,911.4	13,744.4	14,813.8
Crawford	8,769.6	9,695.4	10,574.6	9,616.7	10,473.1
Dallas	9,394.8	12,588.0	13,794.6	12,595.9	13,749.6
Davis	3,191.3	4,302.1	4,782.8	4,303.9	4,770.1
Decatur	2,212.2	2,751.9	3,047.8	2,735.0	3,024.6
Delaware	6,007.2	8,459.5	9,344.9	8,456.7	9,314.7
Des Moines	4,497.1	6,981.9	7,617.8	6,970.5	7,598.9
Dickinson	4,931.0	6,288.3	6,770.0	6,286.3	6,746.8
Dubuque	4,771.2	6,194.0	6,781.9	6,175.5	6,746.8
Emmet	5,589.5	7,729.1	8,048.5	7,685.3	8,301.1
Fayette	6,533.9	8,923.4	9,819.3	8,934.5	9,799.7
Floyd	8,022.8	9,325.4	10,099.4	9,309.6	10,056.4
Franklin	10,449.5	13,470.1	14,573.5	13,481.8	14,466.0
Fremont	8,289.0	10,271.2	11,063.3	10,279.8	10,981.4
Greene	11,840.6	13,740.3	14,815.3	13,748.9	14,778.5
Grundy	10,457.0	13,856.8	15,132.1	13,873.1	15,066.7
Guthrie	6,201.1	7,087.2	7,625.0	7,084.9	7,604.4
Hamilton	11,314.9	14,609.4	15,534.9	14,601.7	15,802.5
Hancock	8,998.0	13,797.6	14,735.5	13,726.0	15,198.0
Hardin	10,977.0	14,174.1	15,399.1	14,169.5	15,343.5
Harrison	9,557.3	13,828.6	15,096.3	13,781.2	14,971.0
Henry	6,928.2	9,884.5	11,096.0	9,847.2	11,030.9
Howard	4,513.1	5,840.3	6,387.6	5,849.6	6,376.8
Humboldt	8,440.0	11,386.0	12,052.8	11,395.8	12,334.3
Ida	6,696.7	9,229.6	9,924.7	9,188.1	9,861.9
Iowa	7,153.7	8,437.8	9,027.1	8,458.3	9,016.8
Jackson	5,779.6	8,301.8	9,023.0	8,318.3	9,009.6

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Appendix A. Table 13. continued

County	Estimated 1971	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	9,393.1	11,068.9	12,041.6	11,087.1	11,982.2
Jefferson	5,229.3	7,043.9	7,861.2	7,013.8	7,812.0
Johnson	5,698.7	8,709.2	9,518.1	8,712.0	9,474.1
Jones	6,763.5	10,160.1	11,060.1	10,135.9	11,007.9
Keokuk	6,981.0	8,638.1	9,552.2	8,624.3	9,511.5
Kossuth	18,739.4	27,319.1	28,566.6	27,261.1	29,463.3
Lee	6,018.3	10,019.5	11,606.3	9,960.4	11,521.1
Linn	8,376.7	11,598.7	12,734.6	11,559.5	12,660.3
Louisa	6,105.9	8,820.9	9,680.8	8,837.1	9,665.0
Lucas	3,225.9	3,223.6	3,551.3	3,225.6	3,542.6
Lyon	4,925.7	5,524.4	5,878.6	5,520.5	5,859.1
Madison	4,838.5	5,764.0	6,199.8	5,755.9	6,174.6
Mahaska	7,712.2	9,705.8	10,496.6	9,736.2	10,490.7
Marion	4,252.4	5,182.9	5,601.4	5,180.8	5,582.9
Marshall	8,799.3	10,262.7	11,165.6	10,278.9	11,120.5
Mills	5,934.2	6,450.3	6,893.1	6,404.9	6,836.0
Mitchell	7,867.0	7,566.9	8,105.6	7,565.0	8,080.7
Monona	10,228.9	14,002.8	15,262.5	14,048.8	15,256.0
Monroe	2,032.1	2,013.5	2,171.7	2,010.2	2,162.8
Montgomery	5,682.7	6,424.0	6,880.8	6,406.2	6,845.2
Muscatine	3,987.6	6,531.2	7,005.6	6,570.4	7,017.1
O'Brien	7,314.6	8,670.3	9,288.3	8,659.3	9,252.4
Osceola	6,432.7	6,706.9	7,230.4	6,709.0	7,211.2
Page	7,386.6	7,706.8	8,287.1	7,691.6	8,249.7
Palo Alto	7,952.3	11,113.8	11,695.4	11,115.4	12,035.5
Plymouth	9,998.3	12,314.4	13,360.8	12,295.6	13,306.1
Pocahontas	7,816.2	11,505.9	12,325.1	11,523.2	12,410.6
Polk	7,778.5	9,126.2	10,007.3	9,115.7	9,968.1
Pottawattamie	13,889.6	18,146.5	19,885.2	17,997.7	19,690.6
Poweshiek	4,438.0	4,619.0	4,917.2	4,617.0	4,900.8
Ringgold	2,734.8	3,232.3	3,602.0	3,232.2	3,564.4
Sac	10,714.6	12,021.5	12,721.8	12,021.4	12,684.2
Scott	6,155.2	7,895.5	8,565.5	7,894.7	8,539.2
Shelby	10,499.7	11,801.9	12,439.4	11,735.1	12,425.1
Sioux	8,800.7	10,005.3	10,566.1	9,999.6	10,513.8
Story	10,190.7	12,013.2	13,010.7	12,014.0	12,937.0
Tama	9,829.1	10,993.5	11,906.1	11,003.5	11,878.5
Taylor	4,431.5	4,252.7	4,648.4	4,253.5	4,635.0
Union	3,378.9	3,498.8	3,774.1	3,500.5	3,764.2
Van Buren	3,330.7	5,065.9	5,625.6	5,066.5	5,611.9
Wapello	3,482.1	4,448.0	4,955.3	4,438.6	4,932.3
Warren	4,790.3	6,329.8	6,866.2	6,335.4	6,850.3
Washington	7,902.7	10,500.8	11,607.5	10,477.9	11,553.2
Wayne	4,245.0	4,843.3	5,467.9	4,772.5	5,378.0
Webster	14,970.2	8,972.3	9,823.1	8,936.9	9,763.3
Winnebago	7,705.8	9,480.1	10,347.1	9,460.3	10,299.6
Winneshiek	5,065.0	6,308.0	6,885.4	6,311.0	6,868.1
Woodbury	11,664.7	13,122.3	13,933.3	13,110.4	13,883.1
Worth	6,445.7	8,030.3	8,812.9	8,022.1	8,779.6
Wright	12,473.6	17,304.4	17,558.4	17,542.4	18,109.6
Total	722,728.4	903,758.2	978,104.4	903,002.2	977,551.4

Appendix A. Table 14. Estimated 1971 tonnage of P_2O_5 fertilizer applied and projected 1979 and 1984 tons of P_2O_5 fertilizer under average and high productivity growth rates and maximum soil conservation assumptions, by counties, Iowa.

County	Estimated 1971	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Adair	2,136.3	3,102.5	3,550.6	3,103.6	3,537.7
Adams	1,992.2	2,595.0	2,926.2	2,600.0	2,919.4
Allamakee	1,816.5	1,856.5	2,057.8	1,862.2	2,056.1
Appanoose	1,544.6	2,727.8	2,994.4	2,732.1	2,996.0
Audubon	2,967.7	4,208.0	4,991.9	4,175.1	4,944.8
Benton	8,001.4	9,572.6	11,153.1	9,538.0	11,080.2
Black Hawk	5,181.8	7,042.3	7,940.3	7,046.4	7,913.9
Boone	5,965.2	7,723.1	8,680.2	7,713.0	8,638.1
Bremer	3,837.9	4,637.0	5,244.2	4,635.0	5,216.3
Buchanan	5,878.7	8,636.1	9,841.9	8,642.8	9,811.4
Buena Vista	6,369.9	8,615.7	9,667.8	8,588.2	9,569.7
Butler	6,404.7	7,878.0	8,905.6	7,873.5	8,868.7
Calhoun	6,810.0	7,710.1	8,481.7	7,706.0	8,441.7
Carroll	6,585.0	8,295.3	9,249.5	8,268.2	9,192.7
Cass	2,594.4	3,609.7	4,209.5	3,599.0	4,184.5
Cedar	4,585.0	7,451.7	8,737.6	7,443.0	8,681.2
Cerro Gordo	7,428.2	9,630.0	10,877.1	9,622.9	10,829.4
Cherokee	5,698.5	7,396.1	8,044.4	7,385.8	8,006.9
Chickasaw	5,293.9	5,926.1	6,556.4	5,944.7	6,552.8
Clarke	1,014.1	1,336.1	1,492.6	1,332.4	1,483.6
Clay	5,962.0	7,566.8	8,413.0	7,563.1	8,375.1
Clayton	3,571.7	5,000.3	5,639.7	5,008.7	5,629.6
Clinton	8,484.9	11,015.0	12,632.4	11,016.3	12,540.4
Crawford	5,970.4	8,303.5	10,053.0	8,234.5	9,945.9
Dallas	5,830.0	7,181.6	7,993.4	7,184.6	7,960.0
Davis	1,990.3	2,778.3	3,129.4	2,778.9	3,118.1
Decatur	1,150.5	1,625.1	1,825.5	1,614.7	1,809.9
Delaware	5,297.8	8,076.6	9,261.6	8,073.2	9,227.0
Des Moines	3,760.5	5,395.3	6,029.7	5,385.6	6,009.7
Dickinson	3,828.4	5,295.8	5,933.8	5,292.9	5,906.9
Dubuque	3,734.4	5,135.9	5,770.7	5,120.4	5,739.8
Emmet	4,451.8	6,543.7	6,959.0	6,505.2	7,177.4
Fayette	5,221.8	6,931.2	7,753.1	6,938.9	7,732.8
Floyd	6,915.0	7,898.0	8,973.2	7,882.9	8,925.6
Franklin	7,971.3	11,118.9	12,696.7	11,126.1	12,589.8
Fremont	2,471.9	3,910.9	4,351.5	3,913.3	4,315.1
Greene	6,653.1	7,851.7	8,638.1	7,854.8	8,607.7
Grundy	6,865.8	9,546.8	10,835.0	9,556.1	10,778.0
Guthrie	2,915.3	3,689.1	4,131.7	3,687.1	4,116.2
Hamilton	9,251.9	12,501.5	13,652.3	12,491.9	13,917.2
Hancock	6,877.7	9,334.9	10,294.9	9,284.4	10,618.0
Hardin	7,564.6	10,442.7	11,889.8	10,437.0	11,834.4
Harrison	4,926.7	7,884.9	8,821.9	7,856.6	8,741.8
Henry	3,868.9	5,829.5	6,725.2	5,806.4	6,679.8
Howard	4,559.0	5,132.5	5,760.2	5,139.7	5,745.3
Humboldt	6,686.5	8,429.6	9,163.8	8,434.8	9,398.2
Ida	4,769.1	6,891.9	7,778.1	6,859.6	7,721.7
Iowa	3,620.0	4,770.1	5,395.9	4,780.8	5,385.2
Jackson	3,958.5	5,455.6	6,059.1	5,466.2	6,048.5

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Appendix A. Table 14. continued

County	Estimated 1971	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	5,236.9	6,861.7	7,812.2	6,871.7	7,766.7
Jefferson	3,162.3	4,617.3	5,277.5	4,596.5	5,239.0
Johnson	3,663.3	5,867.2	6,661.1	5,868.2	6,625.2
Jones	4,432.8	7,432.4	8,647.9	7,413.6	8,600.6
Keokuk	3,887.6	4,944.8	5,561.3	4,936.1	5,533.3
Kossuth	14,690.5	19,464.8	20,750.7	19,419.1	21,402.1
Lee	5,318.3	6,815.0	7,963.2	6,773.8	7,899.5
Linn	5,536.6	8,745.6	10,104.2	8,714.4	10,036.4
Louisa	3,054.3	4,426.5	4,979.9	4,433.8	4,967.4
Lucas	1,838.6	2,146.1	2,415.1	2,146.9	2,406.6
Lyon	3,625.0	4,365.1	4,765.3	4,361.3	4,745.7
Madison	2,107.5	3,078.8	3,441.4	3,073.8	3,423.7
Mahaska	4,449.3	6,033.3	6,747.6	6,051.0	6,737.4
Marion	2,128.4	2,870.5	3,210.0	2,868.7	3,196.3
Marshall	4,848.8	6,412.4	7,270.8	6,421.3	7,234.9
Mills	2,432.4	3,118.5	3,559.3	3,095.8	3,525.7
Mitchell	6,497.2	5,911.6	6,606.8	5,908.9	6,580.2
Monona	5,304.3	7,362.7	8,093.3	7,385.8	8,084.3
Monroe	1,283.8	1,538.9	1,701.9	1,536.1	1,693.1
Montgomery	2,560.6	3,361.5	3,869.4	3,351.4	3,845.0
Muscatine	2,773.1	4,572.1	5,050.5	4,598.7	5,054.6
O'Brien	5,566.8	7,323.3	8,062.1	7,312.4	8,022.3
Osceola	5,271.3	5,685.5	6,290.2	5,686.1	6,267.2
Page	2,553.1	3,869.1	4,395.7	3,860.5	4,370.9
Palo Alto	6,179.4	7,852.3	8,502.9	7,851.5	8,769.8
Plymouth	6,338.5	9,227.7	10,337.4	9,212.2	10,287.6
Pocahontas	5,987.1	9,181.3	10,120.9	9,192.7	10,215.6
Polk	5,335.8	6,195.1	6,933.5	6,186.5	6,899.3
Pottawattamie	6,680.4	10,460.7	12,286.9	10,361.4	12,154.6
Poweshiek	3,069.5	3,736.7	4,266.4	3,734.2	4,247.4
Ringgold	1,413.5	1,947.8	2,207.2	1,947.3	2,182.1
Sac	7,890.0	9,417.0	10,349.6	9,414.9	10,308.2
Scott	3,771.2	5,437.7	6,155.7	5,436.3	6,132.1
Shelby	4,372.9	7,284.2	7,594.8	7,338.6	7,833.2
Sioux	5,685.3	6,778.3	7,310.8	6,773.5	7,269.6
Story	6,916.3	8,242.4	9,251.0	8,241.0	9,188.9
Tama	5,450.4	7,099.9	8,122.1	7,104.9	8,095.3
Taylor	2,146.9	2,514.9	2,828.7	2,514.8	2,817.5
Union	1,521.0	1,862.9	2,067.9	1,863.4	2,060.6
Van Buren	3,581.7	3,861.1	4,314.8	3,860.9	4,300.6
Wapello	2,274.7	3,000.6	3,403.3	2,993.5	3,384.0
Warren	2,069.2	3,127.9	3,445.4	3,130.0	3,434.2
Washington	4,315.6	5,332.4	6,086.3	5,319.9	6,052.5
Wayne	2,559.8	3,188.5	3,658.7	3,141.2	3,595.0
Webster	7,335.9	9,650.3	10,779.6	9,609.7	10,701.6
Winnebago	5,991.6	7,012.1	8,003.8	6,995.9	7,958.3
Winneshiek	3,449.5	4,254.5	4,733.8	4,256.2	4,720.2
Woodbury	8,613.6	10,250.9	11,115.5	10,240.1	11,067.9
Worth	4,944.7	6,306.4	7,069.1	6,298.7	7,035.9
Wright	8,573.3	11,027.4	11,497.7	11,179.1	11,858.6
Total	469,926.4	622,563.1	697,845.7	621,990.9	697,348.9

Appendix A. Table 15. Estimated 1971 tonnage of K_2O fertilizer applied and projected 1979 and 1984 tons of K_2O fertilizer under average and high productivity growth rates and maximum soil conservation assumptions, by counties, Iowa.

County	Estimated 1971	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Adair	1,376.3	1,971.9	2,256.8	1,972.6	2,248.5
Adams	1,220.0	1,605.3	1,810.2	1,608.4	1,806.0
Allamakee	1,510.6	1,755.0	1,945.3	1,760.4	1,943.7
Appanoose	1,043.3	1,802.3	1,978.5	1,805.2	1,979.5
Audubon	2,005.7	2,948.1	3,497.4	2,925.1	3,464.4
Benton	6,752.5	8,948.6	10,426.1	8,916.3	10,358.0
Black Hawk	6,638.0	8,610.1	9,708.0	8,615.1	9,675.8
Boone	6,187.8	7,664.6	8,614.5	7,654.6	8,572.7
Bremer	4,916.5	5,669.3	6,411.7	5,666.8	6,377.5
Buchanan	7,539.0	10,717.1	12,213.5	10,725.4	12,175.6
Buena Vista	5,416.2	7,248.4	8,133.6	7,225.2	8,051.0
Butler	7,125.6	8,186.2	9,254.0	8,181.6	9,215.6
Calhoun	7,280.1	8,467.4	9,314.9	8,463.0	9,270.9
Carroll	4,656.8	5,454.2	6,081.7	5,436.4	6,044.3
Cass	1,671.4	2,294.3	2,675.5	2,287.5	2,659.7
Cedar	4,725.1	7,699.7	9,028.3	7,690.6	8,970.0
Cerro Gordo	9,274.3	11,581.0	13,080.8	11,572.6	13,023.5
Cherokee	2,890.4	3,861.8	4,200.3	3,856.4	4,180.7
Chickasaw	6,477.7	7,106.1	7,861.9	7,128.4	7,857.5
Clarke	739.4	975.3	1,089.6	972.6	1,083.0
Clay	5,069.4	6,366.0	7,077.8	6,362.8	7,046.0
Clayton	4,079.2	5,595.6	6,311.1	5,605.0	6,299.8
Clinton	6,768.1	10,076.8	11,556.5	10,078.1	11,472.3
Crawford	4,222.2	5,459.6	6,610.0	5,414.3	6,539.5
Dallas	6,047.6	7,127.2	7,932.9	7,130.2	7,899.7
Davis	1,664.1	2,336.6	2,631.9	2,337.2	2,622.5
Decatur	838.8	1,186.3	1,332.6	1,178.8	1,321.2
Delaware	5,454.8	8,010.1	9,185.4	8,006.7	9,151.1
Des Moines	3,835.8	5,628.5	6,290.2	5,618.3	6,269.4
Dickinson	3,880.4	4,695.7	5,261.5	4,693.2	5,237.6
Dubuque	3,845.0	5,093.6	5,723.2	5,078.2	5,692.5
Emmet	4,512.3	5,802.3	6,170.4	5,768.1	6,364.1
Fayette	6,741.2	8,800.1	9,843.6	8,809.9	9,817.9
Floyd	8,047.5	9,444.5	10,730.3	9,426.5	10,673.4
Franklin	9,952.4	13,371.7	15,269.1	13,380.4	15,140.6
Fremont	1,763.1	2,660.8	2,960.6	2,662.4	2,935.8
Greene	7,112.4	8,623.0	9,486.7	8,626.4	9,453.2
Grundy	7,415.9	10,162.8	11,534.0	10,172.7	11,473.4
Guthrie	2,581.4	3,311.9	3,709.2	3,310.1	3,695.3
Hamilton	9,847.4	12,989.7	14,185.4	12,979.8	14,460.7
Hancock	8,511.2	11,862.0	13,081.9	11,797.9	13,492.5
Hardin	8,170.7	11,116.4	12,656.9	11,110.4	12,597.9
Harrison	2,879.0	4,084.3	4,569.6	4,069.6	4,528.1
Henry	3,570.7	5,301.2	6,115.8	5,280.2	6,074.5
Howard	5,208.9	5,727.8	6,428.3	5,735.9	6,411.6
Humboldt	7,422.9	9,448.1	10,271.1	9,454.0	10,533.7
Ida	2,132.9	3,127.7	3,529.9	3,113.0	3,504.3
Iowa	3,511.2	4,439.1	5,021.4	4,449.1	5,011.5
Jackson	3,157.6	4,991.0	5,543.1	5,000.7	5,533.4

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Appendix A. Table 15. continued

County	Estimated 1971	Average Prod. Growth Rate 1979	Average Prod. Growth Rate 1984	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	5,065.8	6,211.1	7,071.4	6,220.1	7,030.2
Jefferson	2,918.6	4,198.8	4,799.3	4,179.9	4,764.2
Johnson	3,775.2	6,062.4	6,882.8	6,063.4	6,845.6
Jones	4,387.4	7,356.4	8,559.5	7,337.9	8,512.7
Keokuk	3,770.8	4,601.7	5,175.4	4,593.6	5,149.4
Kossuth	16,308.4	21,816.7	23,258.0	21,765.5	23,988.1
Lee	3,990.4	5,818.2	6,798.4	5,783.0	6,744.1
Linn	6,037.3	8,908.6	10,292.5	8,876.9	10,223.5
Louisa	3,715.8	5,726.9	6,442.8	5,736.3	6,426.6
Lucas	1,353.0	1,596.8	1,796.9	1,597.4	1,790.6
Lyon	1,889.3	2,287.1	2,496.7	2,285.1	2,486.5
Madison	1,540.5	2,385.5	2,666.5	2,381.6	2,652.7
Mahaska	4,315.6	5,614.7	6,279.4	5,631.1	6,269.9
Marion	1,691.8	2,130.7	2,382.8	2,129.4	2,372.6
Marshall	4,690.3	5,804.3	6,581.4	5,812.4	6,548.8
Mills	1,478.1	1,934.0	2,207.4	1,919.9	2,186.5
Mitchell	7,561.3	7,069.1	7,900.5	7,065.9	7,868.7
Monona	2,332.7	3,216.7	3,535.9	3,226.8	3,532.0
Monroe	867.1	1,016.8	1,124.5	1,014.9	1,118.6
Montgomery	1,613.5	2,179.8	2,509.1	2,173.3	2,493.3
Muscatine	2,857.9	4,724.3	5,218.5	4,751.7	5,222.7
O'Brien	2,938.7	4.202.7	4,626.6	4,196.4	4,603.8
Osceola	3,093.7	3,552.2	3,930.0	3,552.6	3,915.6
Page	1,783.0	2,560.7	2,909.2	2,555.0	2,892.8
Palo Alto	6,115.0	8,448.2	9,148.2	8,447.4	9,435.4
Plymouth	2,036.5	3,292.9	3,688.9	3,287.4	3,671.1
Pocahontas	6,203.9	8,736.5	9,630.6	8,747.3	9,720.6
Polk	5,889.4	6,757.3	7,562.7	6,747.9	7,525.4
Pottawattamie	4,454.4	7,066.9	8,300.6	6,999.8	8,211.2
Poweshiek	2,641.5	3,040.3	3,471.4	3,038.3	3,455.9
Ringgold	1,030.6	1,421.9	1,611.2	1,421.6	1,592.9
Sac	5,894.8	7,369.8	8,099.7	7,368.2	8,067.3
Scott	3,512.2	5,178.7	5,862.6	5,177.4	5,840.1
Shelby	2,955.5	5,103.4	5,321.0	5,141.5	5,488.0
Sioux	2,335.1	3,406.4	3,673.9	3,404.0	3,653.3
Story	7,633.8	8,990.4	10,090.5	8,988.9	10,022.7
Tama	5,257.3	6,426.6	7,351.9	6,431.1	7,327.7
Taylor	1,314.7	1,555.8	1,749.9	1,555.7	1,743.0
Union	931.4	1,152.4	1,279.3	1,152.8	1,274.7
Van Buren	2,687.4	3,296.4	3,683.6	3,296.1	3,671.6
Wapello	2,206.3	2,792.4	3,167.2	2,785.8	3,149.2
Warren	1,512.5	2,423.5	2,669.6	2,425.2	2,660.9
Washington	3,895.9	4,757.3	5,429.8	4,746.0	5,399.7
Wayne	1,883.7	2,372.3	2,722.2	2,337.2	2,674.7
Webster	8,221.1	10,718.1	11,972.5	10,673.1	11,885.8
Winnebago	6,651.4	7,859.4	8,970.9	7,841.2	8,919.8
Winneshiek	4,453.3	5,401.7	6,010.2	5,403.8	5,993.0
Woodbury	3,090.9	3,804.9	4,125.9	3,800.9	4,108.2
Worth	6,826.6	8,265.3	9,264.8	8,255.2	9,221.3
Wright	9,651.3	12,213.6	12,734.4	12,381.6	13,134.1
Total	436,953.5	574,235.7	643,642.0	573,819.6	643,698.5

APPENDIX B: HIGH COMMODITY EXPORT ALTERNATIVE

Appendix B. Table 1. Estimated corn production in 1959, 1971, and 1972 and projections for 1979 and 1984 under high productivity growth rate and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	5,856	8,693	8,724	11,205	12,061
Adams	3,710	5,916	5,824	7,957	8,653
Allamakee	3,750	6,092	6,111	7,835	8,585
Appanoose	2,214	2,809	3,287	4,137	4,444
Audubon	6,375	9,289	9,690	11,317	12,065
Benton	13,211	17,310	17,320	24,307	26,114
Black Hawk	9,885	12,427	12,640	17,149	18,465
Boone	10,056	13,929	16,335	20,282	22,087
Bremer	6,596	8,857	9,190	12,274	13,340
Buchanan	9,026	12,615	13,223	18,695	20,567
Buena Vista	10,905	15,612	16,011	19,058	19,541
Butler	10,246	13,831	13,972	18,551	20,113
Calhoun	9,974	11,961	15,412	17,680	18,915
Carroll	9,370	12,059	14,853	18,049	19,259
Cass	7,135	11,666	12,319	14,796	15,989
Cedar	10,517	16,847	14,460	21,698	23,371
Cerro Gordo	10,588	14,528	13,603	18,933	20,484
Cherokee	9,018	13,087	14,565	15,460	16,423
Chickasaw	6,191	8,154	9,218	11,403	12,385
Clarke	2,102	3,201	3,356	4,026	4,326
Clay	9,144	13,408	13,924	16,309	17,479
Clayton	6,141	11,538	12,463	17,037	19,136
Clinton	12,467	18,290	16,719	24,790	26,411
Crawford	10,044	13,625	15,661	16,862	17,906
Dallas	8,965	14,221	16,403	18,962	20,664
Davis	2,439	4,423	4,128	5,689	6,309
Decatur	1,857	3,421	3,562	4,819	5,285
Delaware	7,774	12,528	14,063	18,908	20,843
Des Moines	5,593	8,441	8,686	11,785	12,815
Dickinson	3,912	8,210	8,152	10,147	10,925
Dubuque	6,122	9,921	9,743	13,758	15,011
Emmet	5,942	10,850	9,725	13,356	13,244
Fayette	8,778	13,434	13,925	19,155	21,112
Floyd	8,650	11,202	11,409	14,862	16,015
Franklin	12,784	16,490	15,528	21,746	23,348
Fremont	7,894	11,723	11,472	13,606	14,500
Greene	9,562	12,941	16,402	20,037	21,521
Grundy	11,431	15,340	15,341	21,875	23,739
Guthrie	6,478	8,643	9,541	11,782	12,633
Hamilton	12,453	16,600	16,921	22,643	22,639
Hancock	10,081	15,481	15,176	21,688	21,708
Hardin	12,153	16,150	15,502	21,358	23,070
Harrison	10,103	14,550	16,370	18,815	20,131
Henry	5,627	9,908	9,436	13,724	15,185
Howard	5,382	5,943	7,423	9,010	9,901
Humboldt	8,561	12,184	11,212	16,269	16,200
Ida	6,931	11,198	12,023	12,636	13,023
Iowa	7,622	11,644	10,779	14,255	15,280
Jackson	5,709	9,073	8,872	12,583	13,678

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Appendix B. Table 1. continued

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Jasper	10,169	16,929	16,213	22,229	24,082
Jefferson	4,133	6,863	6,210	8,967	9,872
Johnson	7,814	12,612	11,288	16,607	18,041
Jones	8,157	12,391	12,065	17,193	18,600
Keokuk	6,729	11,997	11,334	15,308	16,790
Kossuth	17,002	27,146	26,108	37,552	37,320
Lee	4,992	9,238	9,789	14,564	16,586
Linn	9,849	15,645	14,575	21,136	22,957
Louisa	5,535	7,759	8,818	12,609	13,806
Lucas	1,896	3,675	3,635	4,792	5,267
Lyon	7,491	12,572	14,775	15,304	16,321
Madison	5,116	7,372	7,699	9,270	9,911
Mahaska	7,556	12,355	11,461	15,814	17,145
Marion	4,985	8,646	8,340	10,450	11,242
Marshall	10,601	15,286	15,162	21,338	23,164
Mills	7,146	8,263	8,903	10,528	11,082
Mitchell	7,688	8,982	10,419	12,465	13,407
Monona	8,742	15,057	16,113	18,536	20,209
Monroe	1,666	2,870	2,860	3,234	3,483
Montgomery	5,207	8,209	8,503	10,227	10,871
Muscatine	6,363	8,564	8,676	11,966	12,891
O'Brien	9,434	14,579	16,136	17,581	18,801
Osceola	5,810	9,543	10,567	12,140	13,080
Page	6,100	9,762	9,871	11,392	12,150
Palo Alto	8,625	14,980	14,114	18,930	18,761
Plymouth	12,844	18,802	23,428	24,878	26,918
Pocahontas	10,737	15,221	14,722	19,358	19,518
Polk	7,262	10,840	11,320	15,465	16,840
Pottawattamie	15,640	21,825	23,094	27,627	28,621
Poweshiek	7,563	11,063	10,051	13,705	14,515
Ringgold	2,834	4,815	5,075	6,157	6,767
Sac	9,726	12,778	14,963	16,786	17,795
Scott	7,643	12,298	11,656	16,534	17,880
Shelby	10,556	13,794	16,278	16,936	17,905
Sioux	12,224	19,013	21,652	22,283	23,533
Story	12,319	14,643	15,438	20,102	21,618
Tama	10,958	16,815	16,464	23,012	24,888
Taylor	3,506	5,743	6,230	7,305	7,944
Union	2,982	4,153	4,551	5,639	6,067
Van Buren	2,820	4,542	4,508	6,642	7,343
Wapello	3,614	5,610	5,414	7,691	8,490
Warren	4,303	7,586	8,352	9,649	10,437
Washington	8,111	13,597	12,819	18,391	20,131
Wayne	2,743	5,315	5,345	6,674	7,311
Webster	12,217	16,971	17,455	23,355	25,116
Winnebago	7,679	10,355	9,343	13,732	14,629
Winneshiek	6,191	9,081	9,875	12,513	13,722
Woodbury	11,678	17,593	20,160	18,945	20,092
Worth	6,813	9,695	9,612	12,697	13,883
Wright	11,797	17,159	16,186	22,126	21,776
Total	771,890	1,140,795	1,178,299	1,511,612	1,616,476

Appendix B. Table 2. Estimated soybean production in 1959, 1971, and 1972 and projections for 1979 and 1984 under high productivity growth rate and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	231	1,436	1,642	2,871	3,704
Adams	189	874	1,009	1,765	2,197
Allamakee	7	93	119	252	366
Appanoose	515	851	1,158	1,457	1,715
Audubon	53	801	1,043	2,386	3,369
Benton	332	2,682	3,191	5,756	7,695
Black Hawk	408	1,603	2,450	3,643	4,627
Boone	1,157	2,936	3,626	5,100	6,160
Bremer	237	1,201	1,385	2,258	2,855
Buchanan	266	1,566	2,153	3,152	4,022
Buena Vista	1,141	2,797	3,265	5,029	5,747
Butler	421	1,831	2,204	3,379	4,266
Calhoun	2,073	3,368	4,761	6,052	7,083
Carroll	569	1,747	2,518	3,826	4,735
Cass	110	1,236	1,483	2,838	3,869
Cedar	167	2,140	2,281	4,202	5,844
Cerro Gordo	657	2,166	2,846	4,326	5,386
Cherokee	838	1,759	2,228	3,243	3,867
Chickasaw	344	1,090	1,707	2,105	2,570
Clarke	257	638	820	1,127	1,357
Clay	1,127	2,893	3,535	4,788	5,789
Clayton	7	85	142	247	357
Clinton	174	1,531	1,799	3,330	4,510
Crawford	84	1,038	1,398	3,761	5,419
Dallas	1,231	2,667	3,130	4,308	5,108
Davis	492	909	1,170	1,310	1,566
Decatur	241	643	836	1,106	1,309
Delaware	57	576	833	1,535	2,146
Des Moines	602	1,455	1,705	2,198	2,677
Dickinson	504	1,625	2,058	2,777	3,414
Dubuque	1	62	55	272	478
Emmet	954	2,234	2,719	3,538	3,862
Fayette	445	1,298	1,786	2,327	2,850
Floyd	443	1,919	2,396	3,776	4,757
Franklin	684	2,862	3,277	5,394	6,885
Fremont	476	1,778	2,215	3,258	3,936
Greene	1,589	2,951	4,141	5,412	6,362
Grundy	685	2,490	2,976	4,712	5,913
Guthrie	491	1,612	1,986	3,040	3,743
Hamilton	1,555	3,716	4,120	6,355	7,060
Hancock	1,142	3,149	4,037	5,768	6,506
Hardin	734	3,019	2,949	5,511	6,949
Harrison	581	1,476	1,902	3,203	3,863
Henry	500	1,867	1,988	2,813	3,509
Howard	360	728	1,380	1,837	2,253
Humboldt	1,214	2,865	2,863	4,715	5,208
Ida	254	1,061	1,368	2,480	3,038
Iowa	193	1,239	1,462	2,384	3,166
Jackson	15	198	235	492	689

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Appendix B. Table 2. continued

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Jasper	532	2,345	2,735	4,369	5,614
Jefferson	644	1,549	1,665	2,435	2,961
Johnson	290	1,578	1,817	2,618	3,361
Jones	59	829	1,032	2,275	3,254
Keokuk	705	1,743	1,999	2,615	3,158
Kossuth	2,620	5,767	6,980	9,891	10,771
Lee	624	1,310	1,456	2,020	2,476
Linn	288	1,997	2,519	3,896	5,117
Louisa	603	1,680	1,768	2,551	3,126
Lucas	301	607	884	1,214	1,466
Lyon	538	1,357	1,959	2,500	3,015
Madison	565	1,544	1,689	2,609	3,178
Mahaska	658	2,149	2,374	3,541	4,371
Marion	442	1,635	1,710	2,409	2,951
Marshall	534	2,311	2,557	4,307	5,467
Mills	179	1,430	1,807	3,133	3,975
Mitchell	388	1,182	1,951	2,667	3,337
Monona	1,156	1,628	1,962	2,674	3,134
Monroe	277	565	616	869	1,033
Montgomery	167	1,340	1,725	2,836	3,703
Muscatine	460	1,341	1,453	2,143	2,632
O'Brien	1,450	3,067	3,804	4,701	5,581
Osceola	822	1,805	2,500	2,897	3,471
Page	292	1,837	2,199	3,404	4,275
Palo Alto	1,386	3,455	4,070	5,855	6,457
Plymouth	489	1,439	2,049	3,625	4,566
Pocahontas	1,871	4,120	4,555	6,793	7,586
Polk	1,159	2,318	2,822	4,047	4,832
Pottawattamie	293	2,373	2,787	5,958	7,672
Poweshiek	362	1,890	2,149	3,728	4,836
Ringgold	422	830	1,100	1,451	1,734
Sac	776	1,910	2,403	4,018	4,880
Scott	209	1,280	1,345	2,466	3,210
Shelby	44	1,134	1,466	4,051	4,057
Sioux	748	1,506	1,989	2,859	3,417
Story	1,044	3,218	3,693	5,464	6,661
Tama	496	2,588	3,048	5,095	6,626
Taylor	420	1,040	1,455	2,040	2,474
Union	217	650	829	1,230	1,489
Van Buren	689	1,107	1,196	1,334	1,568
Wapello	700	1,256	1,448	2,075	2,495
Warren	662	1,341	1,683	2,218	2,603
Washington	586	2,263	2,536	3,677	4,598
Wayne	483	981	1,338	1,644	1,954
Webster	2,492	4,616	5,374	7,879	9,232
Winnebago	710	2,037	2,562	3,937	4,807
Winneshiek	59	277	436	692	911
Woodbury	753	1,245	1,654	2,518	3,008
Worth	701	1,332	2,113	2,789	3,360
Wright	1,546	3,933	4,305	6,511	7,124
Total	60,718	175,496	213,916	325,942	398,340

Appendix B. Table 3. Estimated oat production in 1959, 1971, and 1972 and projections for 1979 and 1984 under high productivity growth rate and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	1,610	1,060	824	943	966
Adams	884	607	449	510	525
Allamakee	1,529	1,113	1,017	1,272	1,331
Appanoose	151	254	301	252	264
Audubon	1,585	990	609	795	803
Benton	3,620	1,630	1,239	1,585	1,579
Black Hawk	2,293	883	678	816	803
Boone	2,497	777	612	654	632
Bremer	1,973	1,040	740	1,023	1,047
Buchanan	2,336	1,125	775	1,119	1,146
Buena Vista	2,962	891	611	693	261
Butler	2,289	1,293	1,044	1,136	1,156
Calhoun	2,591	661	529	524	496
Carroll	2,552	1,151	912	936	915
Cass	1,717	869	613	732	730
Cedar	2,861	1,220	941	1,310	1,308
Cerro Gordo	2,342	672	571	634	611
Cherokee	2,468	914	742	761	743
Chickasaw	1,942	1,037	814	1,219	1,277
Clarke	474	549	494	506	541
Clay	2,589	683	482	520	490
Clayton	2,397	1,805	1,469	2,034	2,134
Clinton	2,782	1,424	993	1,476	1,249
Crawford	2,971	1,711	1,241	1,381	1,397
Dallas	1,942	537	371	444	423
Davis	180	422	289	374	399
Decatur	236	266	248	262	272
Delaware	2,383	1,629	1,331	1,823	1,907
Des Moines	683	238	232	248	242
Dickinson	1,305	484	362	371	358
Dubuque	2,253	1,925	1,628	2,045	2,152
Emmet	1,590	291	253	250	230
Fayette	2,583	1,526	1,199	1,731	1,813
Floyd	2,072	698	518	662	648
Franklin	2,542	893	601	686	463
Fremont	346	52	30	22	19
Greene	2,333	469	330	354	331
Grundy	2,362	800	601	733	713
Guthrie	1,533	755	559	649	648
Hamilton	2,827	583	402	409	195
Hancock	2,605	905	824	747	347
Hardin	2,585	621	413	490	459
Harrison	1,214	592	339	394	388
Henry	791	366	411	365	364
Howard	1,943	864	908	1,220	1,285
Humboldt	2,043	448	288	303	101
Ida	2,047	1,043	652	767	758
Iowa	1,635	1,205	825	1,142	1,179
Jackson	1,530	1,344	999	1,378	1,441

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Appendix B. Table 3. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	2,375	1,288	1,044	1,232	1,243
Jefferson	611	578	353	521	545
Johnson	1,880	1,113	740	1,002	1,015
Jones	1,873	1,060	787	1,118	1,134
Keokuk	1,318	720	564	753	776
Kossuth	4,456	1,165	946	475	490
Lee	189	253	179	194	191
Linn	2,423	1,176	789	1,155	1,154
Louisa	902	328	190	274	266
Lucas	313	396	347	384	406
Lyon	2,601	2,118	1,816	1,571	1,588
Madison	1,200	672	455	573	577
Mahaska	1,703	947	745	922	951
Marion	1,099	793	668	668	685
Marshall	2,340	742	684	701	677
Mills	758	137	101	86	78
Mitchell	2,397	1,053	949	1,189	1,195
Monona	924	611	393	453	461
Monroe	250	252	240	218	228
Montgomery	1,080	354	183	239	228
Muscatine	1,231	588	390	539	536
O'Brien	2,744	1,247	1,035	1,028	1,015
Osceola	1,479	983	754	832	839
Page	845	343	236	262	260
Palo Alto	2,808	772	517	522	433
Plymouth	4,280	2,658	2,272	2,227	2,242
Pocahontas	2,813	657	397	444	177
Polk	1,372	498	353	383	375
Pottawattamie	2,955	1,011	657	802	780
Poweshiek	1,860	1,289	933	1,133	1,155
Ringgold	334	452	395	448	476
Sac	2,789	956	860	791	760
Scott	1,640	813	597	791	787
Shelby	2,726	1,664	1,201	1,302	1,343
Sioux	4,109	2,142	1,968	1,609	1,588
Story	2,654	436	345	342	314
Tama	2,682	1,361	1,035	1,241	1,235
Taylor	631	555	453	516	534
Union	660	560	430	508	534
Van Buren	159	276	256	290	307
Wapello	489	334	297	416	447
Warren	963	610	583	519	529
Washington	1,753	769	541	735	736
Wayne	412	662	497	583	624
Webster	3,018	597	415	432	400
Winnebago	1,610	483	489	498	485
Winneshiek	2,645	1,886	1,786	2,335	2,469
Woodbury	2,202	1,577	1,020	1,139	1,148
Worth	1,754	618	531	657	651
Wright	2,802	533	455	223	230
Total	184,089	86,401	67,184	77,975	76,836

Appendix B. Table 4. Estimated quantities of corn sold through commercial channels in 1960 and 1972 and projections for 1980 and 1985 under high productivity growth rate and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated		High Prod. Growth Rate	
	1960	1972	1980	1985
Adair	2,060	4,030	6,414	6,920
Adams	1,250	3,241	4,850	5,310
Allamakee	- 735	1,407	3,330	3,806
Appanoose	659	1,701	2,951	3,184
Audubon	2,059	3,275	4,902	5,341
Benton	6,109	9,422	16,210	17,671
Black Hawk	4,619	7,726	13,089	14,366
Boone	6,485	9,241	15,360	17,002
Bremer	2,008	4,851	8,651	9,600
Buchanan	3,887	7,052	13,271	14,842
Buena Vista	5,295	7,825	11,474	11,419
Butler	5,121	8,069	12,554	13,704
Calhoun	6,904	6,745	12,321	13,263
Carroll	3,644	1,017	6,435	6,763
Cass	2,501	5,262	8,455	9,390
Cedar	2,513	7,887	12,523	13,785
Cerro Gordo	6,611	10,220	14,480	15,740
Cherokee	2,656	4,830	7,247	7,996
Chickasaw	2,426	4,230	7,798	8,590
Clarke	630	1,690	2,305	2,440
Clay	5,456	8,457	11,106	12,133
Clayton	- 802	3,218	9,669	11,286
Clinton	3,909	7,213	13,739	14,948
Crawford	3,835	4,008	6,601	6,943
Dallas	5,493	10,169	14,576	16,103
Davis	580	2,528	3,494	3,892
Decatur	206	1,699	3,067	3,364
Delaware	115	1,875	8,785	9,845
Des Moines	2,860	5,648	9,394	10,345
Dickinson	1,814	5,468	7,341	7,950
Dubuque	-1,038	1,279	5,384	6,130
Emmet	3,726	7,608	10,139	9,907
Fayette	2,544	6,844	12,692	14,274
Floyd	5,357	7,922	11,668	12,683
Franklin	7,148	9,802	15,262	16,458
Fremont	5,930	9,164	10,883	11,683
Greene	6,839	8,923	15,559	16,816
Grundy	6,307	9,328	15,678	17,298
Guthrie	3,640	4,431	7,221	7,669
Hamilton	6,730	10,193	16,767	16,542
Hancock	5,815	10,523	16,801	16,404
Hardin	6,663	8,007	13,034	14,341
Harrison	7,222	10,966	14,974	16,091
Henry	1,852	5,433	9,528	10,739
Howard	2,350	2,936	6,180	6,926
Humboldt	5,660	9,293	13,426	13,260
Ida	2,337	4,420	4,995	5,115
Iowa	1,612	4,768	6,961	7,510
Jackson	930	1,660	5,417	6,049

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Appendix B. Table 4. continued

County	Estimated 1960	Estimated 1972	High Prod. Growth Rate 1980	High Prod. Growth Rate 1985
Jasper	3,939	9,862	14,658	16,093
Jefferson	1,586	3,609	5,937	6,566
Johnson	1,474	4,978	8,984	9,790
Jones	1,086	3,983	8,852	9,851
Keokuk	2,062	4,638	8,298	9,033
Kossuth	10,613	18,955	29,037	28,366
Lee	2,057	5,692	11,111	12,906
Linn	4,057	10,268	16,211	17,835
Louisa	2,200	4,943	10,043	11,156
Lucas	216	1,310	2,443	2,624
Lyon	1,925	3,608	6,077	6,593
Madison	2,428	4,256	5,817	6,158
Mahaska	1,891	3,813	7,582	8,286
Marion	718	3,236	5,177	5,569
Marshall	5,668	9,925	15,731	17,416
Mills	4,394	4,473	6,586	7,023
Mitchell	4,004	4,378	8,169	8,900
Monona	6,070	11,110	14,523	15,924
Monroe	239	1,310	1,820	1,924
Montgomery	1,762	3,753	5,205	5,580
Muscatine	2,514	4,180	7,642	8,336
O'Brien	3,788	6,036	9,150	9,999
Osceola	2,586	4,967	7,615	8,409
Page	1,678	4,300	5,801	6,276
Palo Alto	6,452	10,504	14,280	13,890
Plymouth	3,872	5,093	10,446	11,706
Pocahontas	6,713	9,585	13,583	13,472
Polk	5,127	8,903	13,441	14,759
Pottawattamie	5,986	9,095	14,224	15,091
Poweshiek	2,787	5,657	8,264	8,745
Ringgold	924	2,461	3,610	3,934
Sac	3,552	3,033	6,164	6,669
Scott	2,569	6,501	10,743	11,774
Shelby	4,865	5,630	8,167	8,678
Sioux	2,560	- 371	2,646	2,730
Story	8,640	9,962	15,573	16,931
Tama	4,805	9,994	15,774	17,368
Taylor	732	1,956	3,447	3,720
Union	1,057	1,786	3,388	3,637
Van Buren	1,202	2,623	4,676	5,158
Wapello	1,824	3,604	5,711	6,360
Warren	1,832	4,582	6,689	7,235
Washington	1,046	4,621	9,968	11,044
Wayne	916	3,116	4,304	4,706
Webster	9,790	12,537	18,302	19,827
Winnebago	4,847	7,700	10,996	11,741
Winneshiek	- 545	1,905	5,908	6,695
Woodbury	4,987	7,682	9,123	9,799
Worth	4,214	7,518	10,343	11,421
Wright	7,571	13,356	18,187	17,704
Total	339,072	590,120	955,387	1,029,243

Appendix B. Table 5. Estimated quantities of soybeans sold through commercial channels in 1960 and 1972 and projections for 1980 and 1985 under high productivity growth rate and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated		High Prod. Growth Rate	
	1960	1972	1980	1985
Adair	223	1,393	2,803	3,621
Adams	182	847	1,724	2,149
Allamakee	7	89	246	357
Appanoose	491	819	1,408	1,660
Audubon	51	775	2,330	3,290
Benton	321	2,608	5,637	7,539
Black Hawk	393	1,546	3,557	4,521
Boone	1,117	2,849	4,989	6,030
Bremer	227	1,159	2,207	2,791
Buchanan	255	1,512	3,076	3,928
Buena Vista	1,103	2,711	4,901	5,605
Butler	405	1,771	3,302	4,173
Calhoun	2,000	3,255	5,916	6,929
Carroll	545	1,687	3,738	4,629
Cass	106	1,199	2,774	3,782
Cedar	161	2,087	4,113	5,723
Cerro Gordo	631	2,093	4,226	5,266
Cherokee	809	1,703	3,156	3,766
Chickasaw	327	1,043	2,053	2,509
Clarke	245	617	1,100	1,326
Clay	1,086	2,806	4,671	5,651
Clayton	7	82	241	349
Clinton	167	1,488	3,251	4,405
Crawford	81	1,001	3,668	5,285
Dallas	1,188	2,588	4,211	4,996
Davis	470	880	1,273	1,524
Decatur	227	621	1,077	1,276
Delaware	55	556	1,498	2,097
Des Moines	581	1,419	2,146	2,615
Dickinson	479	1,570	2,704	3,326
Dubuque	1	60	266	467
Emmet	914	2,168	3,447	3,766
Fayette	426	1,252	2,271	2,784
Floyd	424	1,852	3,686	4,647
Franklin	661	2,782	5,274	6,735
Fremont	460	1,719	3,173	3,836
Greene	1,525	2,850	5,291	6,224
Grundy	663	2,422	4,615	5,795
Guthrie	472	1,559	2,969	3,659
Hamilton	1,503	3,608	6,213	6,907
Hancock	1,098	3,053	5,632	6,358
Hardin	711	2,936	5,393	6,805
Harrison	551	1,426	3,119	3,764
Henry	482	1,819	2,751	3,433
Howard	343	681	1,790	2,198
Humboldt	1,174	2,783	4,604	5,090
Ida	245	1,027	2,411	2,955
Iowa	185	1,204	2,328	3,094
Jackson	15	192	478	670

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Appendix B. Table 5. continued

County	Estimated 1960	Estimated 1972	High Prod. Growth Rate 1980	High Prod. Growth Rate 1985
Jasper	511	2,276	4,273	5,494
Jefferson	620	1,504	2,377	2,892
Johnson	280	1,536	2,557	3,284
Jones	57	806	2,222	3,181
Keokuk	679	1,695	2,555	3,088
Kossuth	2,522	5,589	9,652	10,518
Lee	599	1,270	1,968	2,413
Linn	277	1,939	3,803	4,999
Louisa	580	1,632	2,492	3,056
Lucas	287	585	1,187	1,434
Lyon	514	1,312	2,435	2,938
Madison	545	1,499	2,549	3,107
Mahaska	633	2,089	3,456	4,269
Marion	423	1,587	2,351	2,882
Marshall	516	2,249	4,216	5,354
Mills	173	1,383	3,056	3,879
Mitchell	371	1,124	2,608	3,266
Monona	1,098	1,575	2,600	3,050
Monroe	265	545	846	1,006
Montgomery	161	1,300	2,773	3,622
Muscatine	441	1,303	2,091	2,572
O'Brien	1,399	2,979	4,581	5,443
Osceola	786	1,747	2,824	3,386
Page	281	1,781	3,326	4,179
Palo Alto	1,336	3,350	5,706	6,298
Plymouth	470	1,386	3,526	4,445
Pocahontas	1,806	3,997	6,631	7,410
Polk	1,113	2,246	3,961	4,733
Pottawattamie	281	2,300	5,811	7,485
Poweshiek	349	1,839	3,650	4,738
Ringgold	402	803	1,415	1,692
Sac	748	1,843	3,920	4,763
Scott	202	1,247	2,413	3,143
Shelby	43	1,097	3,948	3,957
Sioux	719	1,457	2,783	3,329
Story	1,008	3,126	5,348	6,523
Tama	478	2,517	4,988	6,492
Taylor	402	1,006	1,995	2,421
Union	208	629	1,201	1,456
Van Buren	661	1,069	1,296	1,525
Wapello	673	1,218	2,026	2,438
Warren	633	1,298	2,164	2,542
Washington	566	2,206	3,597	4,502
Wayne	461	947	1,603	1,906
Webster	2,405	4,478	7,700	9,028
Winnebago	683	1,966	3,845	4,698
Winneshiek	56	263	674	889
Woodbury	715	1,199	2,446	2,925
Worth	671	1,271	2,723	3,282
Wright	1,494	3,819	6,360	6,964
Total	58,394	170,049	318,235	389,201

Appendix B. Table 6. Estimated quantities of oats sold through commercial channels in 1960 and 1972 and projections for 1980 and 1985 under high productivity growth rate and maximum soil conservation assumptions, in thousands of bushels, by counties, Iowa.

County	Estimated		High Prod. Growth Rate	
	1960	1972	1980	1985
Adair	424	348	332	349
Adams	241	206	186	196
Allamakee	135	122	150	161
Appanoose	46	96	102	109
Audubon	365	285	245	254
Benton	1,298	729	760	776
Black Hawk	755	363	359	363
Boone	1,089	423	381	378
Bremer	467	307	324	340
Buchanan	734	441	470	493
Buena Vista	1,089	409	341	131
Butler	660	465	438	457
Calhoun	1,303	414	352	342
Carroll	768	432	377	377
Cass	431	272	246	251
Cedar	815	433	499	511
Cerro Gordo	771	276	279	276
Cherokee	710	328	293	293
Chickasaw	346	230	290	312
Clarke	153	221	218	239
Clay	959	315	257	249
Clayton	220	206	249	268
Clinton	688	440	488	423
Crawford	759	545	472	489
Dallas	883	305	270	264
Davis	47	137	130	143
Decatur	83	116	123	131
Delaware	348	297	356	382
Des Moines	266	115	129	129
Dickinson	498	231	189	187
Dubuque	319	340	387	417
Emmet	675	154	142	134
Fayette	474	349	424	456
Floyd	629	264	269	270
Franklin	894	391	323	223
Fremont	87	16	7	7
Greene	1,024	257	208	199
Grundy	883	373	366	365
Guthrie	516	317	292	299
Hamilton	1,354	348	262	128
Hancock	888	385	341	162
Hardin	856	256	217	209
Harrison	443	270	192	194
Henry	270	156	166	170
Howard	322	178	270	292
Humboldt	793	217	157	53
Ida	517	329	259	262
Iowa	457	420	427	452
Jackson	265	291	320	343

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Appendix B. Table 6. continued

County	Estimated 1960	Estimated 1972	High Prod. Growth Rate 1980	High Prod. Growth Rate 1985
Jasper	879	595	610	631
Jefferson	218	258	249	267
Johnson	493	364	352	365
Jones	392	277	313	325
Keokuk	377	257	287	304
Kossuth	1,765	576	252	266
Lee	47	78	64	65
Linn	977	591	622	638
Louisa	351	159	142	142
Lucas	93	147	153	165
Lyon	771	783	622	645
Madison	436	304	278	287
Mahaska	471	327	341	361
Marion	326	293	265	278
Marshall	885	350	354	351
Mills	278	63	42	39
Mitchell	384	210	255	262
Monona	319	263	209	218
Monroe	54	68	63	68
Montgomery	224	92	66	65
Muscatine	375	223	219	224
O'Brien	803	455	402	408
Osceola	509	422	383	396
Page	150	76	62	64
Palo Alto	1,182	405	294	250
Plymouth	1,150	891	800	826
Pocahontas	1,242	362	262	107
Polk	631	286	235	236
Pottawattamie	889	379	323	322
Poweshiek	608	525	495	517
Ringgold	90	152	162	177
Sac	1,003	429	380	375
Scott	470	291	303	309
Shelby	941	717	601	636
Sioux	940	611	492	498
Story	1,124	230	194	182
Tama	883	559	546	558
Taylor	148	163	162	172
Union	192	203	198	213
Van Buren	51	109	123	134
Wapello	223	190	254	280
Warren	371	293	267	279
Washington	474	260	266	273
Wayne	130	260	246	270
Webster	1,617	399	309	294
Winnebago	527	197	218	218
Winneshiek	240	214	283	307
Woodbury	666	595	461	476
Worth	523	230	262	266
Wright	1,262	299	134	142
Total	58,171	31,298	29,209	29,059

Appendix B. Table 7. Estimated corn acres in 1959, 1971, 1972 and projections for 1979 and 1984 under high productivity growth rate and maximum soil conservation assumptions, in thousands of acres, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	93.6	91.6	83.9	99.6	103.8
Adams	62.7	63.0	57.7	69.2	72.7
Allamakee	56.6	62.1	58.6	70.2	74.2
Appanoose	41.7	34.5	33.3	53.2	54.7
Audubon	96.5	100.7	93.1	101.5	107.1
Benton	171.3	164.2	153.0	191.2	200.9
Black Hawk	136.0	125.9	115.3	154.9	161.3
Boone	144.0	132.6	126.5	168.0	178.2
Bremer	96.0	92.7	86.2	106.6	112.7
Buchanan	135.4	128.7	119.7	171.0	181.9
Buena Vista	157.8	151.3	139.9	184.1	184.2
Butler	151.7	144.0	129.9	158.6	166.8
Calhoun	152.6	133.4	128.2	150.7	156.5
Carroll	145.2	144.9	133.4	157.2	164.3
Cass	110.2	122.2	117.6	127.7	135.2
Cedar	138.0	142.5	127.5	173.5	183.7
Cerro Gordo	164.1	142.8	123.7	165.9	174.1
Cherokee	143.4	131.9	129.7	157.4	162.4
Chickasaw	107.5	91.8	90.0	107.0	111.7
Clarke	43.0	36.0	33.9	36.4	38.1
Clay	150.2	132.7	128.4	151.4	157.5
Clayton	96.8	115.4	117.7	151.4	164.3
Clinton	166.0	167.7	156.0	223.8	233.4
Crawford	154.4	157.2	153.6	159.1	168.4
Dallas	134.9	135.4	130.1	162.7	172.2
Davis	47.2	46.6	40.7	60.4	64.9
Decatur	47.0	40.0	35.9	47.3	50.8
Delaware	119.9	129.8	129.0	171.6	183.4
Des Moines	73.0	70.3	69.9	106.5	112.0
Dickinson	97.0	87.1	77.3	101.9	106.5
Dubuque	89.8	102.0	97.3	123.3	131.1
Emmet	111.4	102.3	87.3	129.9	124.8
Fayette	142.2	136.7	132.8	174.4	185.8
Floyd	136.3	112.3	104.5	133.9	140.3
Franklin	174.5	149.1	133.6	183.6	194.1
Fremont	135.5	117.0	102.0	134.8	140.6
Greene	151.2	142.0	131.2	170.6	177.9
Grundy	138.4	139.4	126.7	169.9	179.3
Guthrie	102.3	95.6	89.0	103.7	107.6
Hamilton	169.9	153.2	139.5	192.0	186.5
Hancock	158.7	142.0	128.3	193.4	188.4
Hardin	156.6	145.9	132.3	173.1	181.7
Harrison	165.2	155.1	150.3	186.6	195.6
Henry	84.2	86.9	80.8	114.1	123.5
Howard	96.8	77.8	77.4	87.4	92.8
Humboldt	123.9	110.8	100.7	144.6	139.8
Ida	108.6	113.1	107.7	134.5	135.1
Iowa	115.0	106.3	101.6	127.5	131.7
Jackson	83.6	92.5	90.3	136.7	143.5

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Appendix B. Table 7. continued

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Jasper	151.5	154.3	141.1	184.9	196.1
Jefferson	68.6	64.9	57.3	80.8	87.1
Johnson	119.0	115.3	104.7	146.3	156.0
Jones	113.6	119.4	112.0	151.0	159.2
Keokuk	106.4	106.1	100.3	133.5	142.3
Kossuth	272.2	247.2	233.7	344.9	332.4
Lee	76.2	89.4	88.2	142.5	159.5
Linn	148.1	150.2	132.6	189.8	201.6
Louisa	82.3	79.6	74.4	111.3	118.1
Lucas	40.3	42.5	36.9	41.1	43.7
Lyon	155.9	149.9	139.9	153.3	158.6
Madison	79.2	75.5	71.6	81.2	84.4
Mahaska	119.5	114.4	103.5	145.6	152.6
Marion	88.0	86.3	76.7	95.3	99.4
Marshall	140.2	143.8	127.3	170.8	181.2
Mills	115.9	90.8	82.1	98.0	101.5
Mitchell	122.0	102.5	97.7	103.6	108.0
Monona	150.7	160.2	149.5	195.4	206.7
Monroe	35.0	32.4	29.0	32.9	34.5
Montgomery	91.7	86.8	82.0	86.6	90.7
Muscatine	93.0	81.0	78.5	109.1	112.6
O'Brien	156.0	146.0	138.2	170.3	176.9
Osceola	111.6	101.2	92.6	116.8	121.8
Page	107.4	100.6	93.2	99.8	103.6
Palo Alto	160.9	138.4	126.7	182.7	175.7
Plymouth	230.5	226.9	219.5	257.4	270.9
Pocahontas	161.5	141.0	126.5	175.5	171.7
Polk	111.2	107.4	100.6	124.9	132.1
Pottawattamie	243.0	222.8	210.2	259.5	265.0
Poweshiek	120.3	105.4	95.4	108.8	111.8
Ringgold	59.0	52.0	51.3	57.0	61.9
Sac	148.3	147.0	135.6	156.2	161.2
Scott	105.1	108.6	105.8	135.3	142.3
Shelby	149.3	149.8	146.5	163.6	167.7
Sioux	222.1	218.3	205.6	223.3	230.2
Story	164.1	138.9	129.1	162.4	170.4
Tama	149.8	161.2	144.1	183.2	191.6
Taylor	69.7	63.4	62.5	61.5	64.8
Union	55.7	46.8	46.6	49.5	51.6
Van Buren	46.0	49.5	44.4	71.9	76.9
Wapello	57.4	52.7	48.7	68.6	73.7
Warren	76.4	75.2	74.0	89.7	93.9
Washington	122.8	120.8	113.3	150.7	160.6
Wayne	57.4	56.4	51.4	62.5	68.6
Webster	182.9	162.1	144.4	201.2	211.4
Winnebago	118.5	102.4	84.1	121.4	126.4
Winneshiek	99.7	101.0	101.1	119.5	126.6
Woodbury	201.7	204.7	187.6	204.0	210.3
Worth	109.9	97.9	87.6	114.7	121.8
Wright	170.2	153.4	136.5	194.3	185.4
Total	12,015.5	11,443.3	10,653.1	13,638.1	14,191.0

Appendix B. Table 8. Estimated soybean acres in 1959, 1971, 1972 and projections for 1979 and 1984 under high productivity growth rate and maximum soil conservation assumptions, in thousands of acres, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	8.5	42.6	50.1	67.2	83.9
Adams	7.3	27.1	30.3	40.4	48.6
Allamakee	0.3	3.5	3.8	5.9	8.3
Appanoose	23.9	31.5	35.9	49.3	55.6
Audubon	2.1	26.0	32.0	56.3	78.7
Benton	11.3	74.6	83.6	119.2	155.7
Black Hawk	15.0	57.0	67.8	86.6	106.4
Boone	40.0	87.2	89.8	111.2	130.8
Bremer	9.5	41.8	46.7	51.6	63.5
Buchanan	10.9	53.7	64.1	75.9	93.6
Buena Vista	37.7	86.9	92.7	127.8	142.5
Butler	16.0	60.2	66.9	76.0	93.1
Calhoun	73.6	113.7	121.8	135.8	154.3
Carroll	24.0	60.1	64.9	87.7	106.3
Cass	3.9	37.1	43.4	64.4	86.1
Cedar	5.5	53.2	59.3	88.4	120.8
Cerro Gordo	26.7	72.6	81.2	99.7	120.5
Cherokee	28.9	56.6	60.9	86.9	100.6
Chickasaw	16.6	46.9	55.5	52.0	61.0
Clarke	11.4	20.7	24.1	26.8	31.5
Clay	41.1	87.1	92.3	117.0	137.2
Clayton	0.3	2.8	4.3	5.8	8.1
Clinton	6.8	43.1	49.8	79.1	104.9
Crawford	3.3	37.1	39.8	93.4	134.1
Dallas	43.0	79.6	82.6	97.3	112.0
Davis	22.9	29.8	36.1	36.6	42.4
Decatur	14.1	22.1	26.1	28.6	33.1
Delaware	2.4	20.0	24.7	36.6	50.0
Des Moines	21.1	36.4	43.4	52.3	61.6
Dickinson	25.3	54.4	55.3	73.4	87.6
Dubuque	0.1	1.8	1.9	6.4	11.0
Emmet	39.3	66.0	70.8	90.5	95.8
Fayette	18.4	46.3	57.4	55.7	66.0
Floyd	18.7	67.3	75.1	89.5	109.7
Franklin	23.5	80.1	90.0	119.9	150.6
Fremont	17.0	59.1	58.8	84.9	100.4
Greene	64.1	101.1	106.1	121.3	138.4
Grundy	21.3	68.0	76.5	96.3	117.5
Guthrie	18.9	53.4	56.5	70.4	83.9
Hamilton	51.9	108.1	111.6	141.8	153.1
Hancock	44.4	95.4	107.0	135.3	148.6
Hardin	23.6	82.4	88.4	117.5	144.0
Harrison	29.1	49.9	53.9	83.6	98.8
Henry	17.8	48.0	51.0	61.6	75.1
Howard	17.3	46.6	47.7	46.9	55.6
Humboldt	40.1	81.9	87.4	110.3	118.3
Ida	9.4	34.6	37.2	69.5	83.0
Iowa	7.7	34.8	42.7	56.1	71.8
Jackson	0.6	5.9	7.6	14.1	19.0

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Appendix B. Table 8. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	21.0	69.3	70.8	95.6	120.3
Jefferson	24.1	44.7	49.1	57.8	68.7
Johnson	10.5	41.6	50.3	60.7	76.5
Jones	2.1	23.1	29.0	52.6	73.3
Keokuk	25.5	48.3	56.2	60.0	70.4
Kossuth	97.9	177.2	194.0	239.1	252.4
Lee	25.0	40.6	42.2	52.0	62.7
Linn	11.0	58.7	70.4	92.1	118.3
Louisa	23.5	47.9	48.7	59.2	70.3
Lucas	14.1	21.7	27.3	27.4	32.0
Lyon	23.9	45.1	50.3	65.9	77.1
Madison	20.5	44.9	49.6	60.2	71.2
Mahaska	24.6	59.5	64.6	85.8	102.4
Marion	18.3	48.0	49.1	57.8	68.7
Marshall	18.1	62.4	68.5	90.7	112.5
Mills	6.1	47.6	50.1	76.8	95.8
Mitchell	16.8	58.4	60.3	58.3	70.8
Monona	57.7	52.9	58.8	74.2	84.3
Monroe	12.5	20.6	20.6	23.3	26.9
Montgomery	6.4	40.0	45.7	63.2	81.3
Muscatine	19.2	38.3	41.0	51.4	60.5
O'Brien	51.4	87.5	90.8	119.9	138.2
Osceola	36.0	57.4	63.1	73.3	85.1
Page	10.7	56.4	61.3	78.5	96.0
Palo Alto	50.5	105.0	113.5	148.7	159.1
Plymouth	19.3	52.8	53.9	98.7	120.9
Pocahontas	64.2	123.6	127.3	162.0	175.6
Polk	45.6	72.1	78.0	86.0	99.7
Pottawattamie	11.4	73.2	78.1	147.3	186.9
Poweshiek	13.2	51.5	59.2	77.9	98.0
Ringgold	20.0	26.8	33.0	35.3	41.7
Sac	28.0	66.8	69.9	98.4	116.3
Scott	7.7	32.8	35.0	53.1	67.3
Shelby	1.6	37.9	40.4	103.0	100.0
Sioux	29.0	49.6	50.5	75.4	88.0
Story	35.8	91.9	95.0	116.1	138.1
Tama	18.3	71.2	83.1	106.8	134.2
Taylor	18.0	34.0	44.3	45.2	53.1
Union	9.2	20.6	25.9	28.4	33.3
Van Buren	27.5	38.4	38.2	38.0	43.3
Wapello	26.7	37.5	41.5	48.7	57.0
Warren	28.8	43.4	50.4	54.2	61.6
Washington	19.6	57.3	64.8	79.3	96.5
Wayne	22.7	33.6	41.8	40.5	48.3
Webster	86.3	138.8	147.4	178.6	204.5
Winnebago	27.1	71.4	76.8	91.6	109.3
Winneshiek	2.8	13.9	14.5	17.4	22.1
Woodbury	38.7	45.9	49.3	71.3	82.9
Worth	29.9	61.0	66.4	66.3	77.6
Wright	52.6	114.2	117.4	150.4	159.6
Total	2,328.0	5,453.4	5,964.3	7,695.2	9,064.8

Appendix B. Table 9. Estimated oat acres in 1959, 1971, 1972 and projections for 1979 and 1984 under high productivity growth rate and maximum soil conservation assumptions, in thousands of acres, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	44.7	20.1	16.1	15.0	14.9
Adams	27.6	12.9	9.9	8.4	9.4
Allamakee	34.7	19.8	19.2	14.1	14.3
Appanoose	8.2	5.4	6.2	5.1	5.1
Audubon	41.1	16.7	10.7	16.0	15.6
Benton	73.3	25.9	19.7	19.1	18.4
Black Hawk	47.8	15.0	12.0	9.6	9.3
Boone	53.9	10.6	8.0	7.9	7.9
Bremer	42.0	18.7	15.3	12.3	12.2
Buchanan	55.4	20.6	15.5	13.3	13.2
Buena Vista	59.8	12.5	9.7	10.4	3.8
Butler	54.0	22.3	18.8	13.0	12.8
Calhoun	51.2	9.4	7.1	6.5	5.9
Carroll	59.2	17.3	13.2	12.4	12.3
Cass	46.7	15.1	11.3	13.3	14.3
Cedar	55.8	20.2	15.9	15.2	16.0
Cerro Gordo	46.5	11.1	9.0	7.5	7.3
Cherokee	49.8	13.0	11.0	9.3	8.8
Chickasaw	47.1	21.9	16.5	13.7	14.0
Clarke	17.4	11.8	9.7	8.7	9.1
Clay	51.5	10.0	7.3	5.7	5.2
Clayton	56.7	32.8	30.4	24.7	25.1
Clinton	57.6	23.3	18.4	18.9	15.3
Crawford	77.2	29.3	22.0	21.2	20.8
Dallas	44.0	8.7	6.0	5.3	5.2
Davis	10.5	8.9	5.8	7.1	7.4
Decatur	13.3	6.0	5.3	5.3	5.3
Delaware	56.1	31.9	28.0	22.1	25.9
Des Moines	18.4	4.2	3.8	4.0	3.8
Dickinson	33.4	7.6	5.4	5.0	4.7
Dubuque	50.4	35.2	34.5	25.1	25.6
Emmet	30.9	4.4	4.2	3.3	2.0
Fayette	59.6	28.6	24.3	20.3	20.6
Floyd	46.5	12.9	9.5	8.2	7.8
Franklin	52.0	13.2	9.1	8.2	6.4
Fremont	12.0	1.1	0.6	0.4	0.4
Greene	49.4	6.9	4.6	4.2	4.1
Grundy	48.4	12.0	9.2	8.4	8.0
Guthrie	41.4	13.5	10.6	8.0	7.8
Hamilton	56.5	8.2	6.1	5.4	2.5
Hancock	49.4	13.1	12.5	10.4	4.6
Hardin	53.5	9.1	6.6	5.7	5.2
Harrison	39.0	10.0	6.2	8.2	7.7
Henry	25.7	7.4	7.2	6.0	5.8
Howard	45.2	19.6	17.8	15.1	15.4
Humboldt	38.3	6.1	4.4	4.2	1.3
Ida	48.5	15.2	10.5	11.7	11.2
Iowa	41.9	21.9	16.4	13.7	14.6
Jackson	37.3	24.5	23.0	19.7	20.0

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Appendix B. Table 9. continued

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Jasper	60.9	22.5	18.1	14.0	14.7
Jefferson	23.8	12.0	7.7	9.3	9.4
Johnson	44.2	19.9	14.9	12.4	13.8
Jones	42.1	20.9	16.7	14.7	14.9
Keokuk	37.1	14.2	11.0	12.3	12.3
Kossuth	85.7	16.5	13.6	6.2	6.2
Lee	11.3	5.4	3.6	3.9	3.7
Linn	57.2	20.8	15.0	16.0	15.5
Louisa	23.1	6.0	3.4	4.2	4.1
Lucas	12.3	8.3	6.9	5.9	6.0
Lyon	68.5	28.9	25.6	18.7	18.3
Madison	28.6	11.8	8.6	9.4	8.9
Mahaska	44.1	17.0	12.8	14.3	15.7
Marion	30.3	15.6	12.1	11.1	11.0
Marshall	52.0	12.4	10.9	7.7	7.2
Mills	22.8	2.9	2.1	1.7	1.6
Mitchell	49.8	20.4	15.9	13.2	13.1
Monona	28.6	10.3	7.9	6.3	6.7
Monroe	10.7	5.2	4.4	4.2	4.2
Montgomery	29.6	6.8	3.9	4.3	4.0
Muscatine	28.4	10.2	7.5	6.0	5.8
O'Brien	49.9	15.6	13.2	12.0	12.5
Osceola	33.9	13.1	9.9	9.3	9.4
Page	28.4	6.6	4.6	4.8	4.6
Palo Alto	56.4	11.3	8.2	7.0	5.5
Plymouth	99.8	39.8	34.3	27.9	28.7
Pocahontas	57.9	8.5	5.4	5.5	2.2
Polk	32.2	8.5	5.9	4.5	4.3
Pottawattamie	77.0	17.1	11.4	16.9	15.8
Poweshiek	49.9	22.4	17.2	12.9	12.8
Ringgold	18.8	9.8	8.0	9.1	9.4
Sac	59.0	14.4	14.0	10.8	10.6
Scott	35.0	13.6	10.3	9.2	9.5
Shelby	68.3	25.9	18.4	29.4	29.4
Sioux	89.8	31.4	28.8	21.7	20.8
Story	52.6	6.7	5.1	4.2	3.8
Tama	61.9	24.1	18.9	13.7	13.3
Taylor	25.3	11.6	9.8	8.6	8.6
Union	22.2	11.6	8.8	8.0	8.1
Van Buren	8.9	6.9	5.6	5.6	5.7
Wapello	15.6	6.7	5.3	7.0	7.3
Warren	26.9	11.5	9.9	8.5	8.4
Washington	42.4	14.2	10.3	11.4	11.1
Wayne	20.4	13.0	9.5	13.9	14.4
Webster	59.0	8.2	6.1	5.7	6.1
Winnebago	32.5	7.5	6.8	6.1	6.0
Winneshiek	61.1	36.7	25.0	27.5	27.7
Woodbury	61.5	26.2	19.6	17.8	19.1
Worth	34.3	11.2	8.3	8.0	7.7
Wright	51.5	7.7	6.3	3.0	3.0
Total	4,284.3	1,475.7	1,182.0	1,062.1	1,037.2

Appendix B. Table 10. Comparison of estimated maximum row crop land available under maximum soil conservation assumption, estimated 1972 row crop acres harvested, and projected row crop acres for 1979 and 1984 under high productivity growth rate assumptions, in thousands of acres, by counties, Iowa.

County	Est. Max. Row Crop Acres Available	Est. Row Crop Acres Harvested 1972	Proj. Row Crop Acres High Prod. Growth Rate 1979	1984
Adair	284.2	135.7	168.7	189.3
Adams	220.9	89.2	110.7	122.3
Allamakee	242.1	69.8	81.3	87.0
Appanoose	203.2	70.8	103.9	111.6
Audubon	210.8	133.6	165.5	192.8
Benton	397.0	243.3	316.8	362.2
Black Hawk	321.2	189.4	247.3	272.8
Boone	333.1	218.6	281.9	311.4
Bremer	267.2	138.7	162.9	180.4
Buchanan	344.2	188.1	250.5	278.6
Buena Vista	332.7	239.0	318.5	332.7
Butler	348.6	200.2	237.7	262.5
Calhoun	352.2	256.2	291.4	315.4
Carroll	317.0	216.8	257.9	283.1
Cass	296.9	167.7	196.7	225.4
Cedar	318.1	191.3	265.6	307.8
Cerro Gordo	329.4	207.9	268.6	297.1
Cherokee	316.4	208.3	262.0	278.9
Chickasaw	308.3	153.2	166.4	179.6
Clarke	182.0	59.3	64.4	70.6
Clay	346.0	228.9	278.1	303.6
Clayton	299.5	130.0	163.9	178.2
Clinton	346.2	215.6	311.7	346.2
Crawford	345.9	202.9	259.7	309.2
Dallas	318.6	214.3	262.0	286.0
Davis	246.3	78.3	98.8	108.9
Decatur	213.2	69.3	78.4	86.4
Delaware	313.6	162.0	213.7	238.0
Des Moines	198.3	115.0	160.4	175.1
Dickinson	216.5	139.5	183.1	201.3
Dubuque	218.5	107.9	136.1	147.7
Emmet	224.5	162.7	224.5	224.5
Fayette	381.3	200.2	238.2	259.2
Floyd	304.8	183.2	227.5	253.6
Franklin	351.2	228.7	309.5	350.2
Fremont	277.3	163.1	221.1	242.3
Greene	334.3	242.0	296.8	320.9
Grundy	304.8	207.8	269.7	300.0
Guthrie	290.2	149.2	177.1	194.4
Hamilton	341.5	253.6	336.2	341.5
Hancock	340.1	238.9	332.2	340.1
Hardin	335.9	225.9	295.0	329.7
Harrison	298.4	210.3	274.6	298.4
Henry	234.5	132.6	176.1	198.9
Howard	288.6	131.0	139.5	153.0
Humboldt	261.3	192.2	258.4	261.3
Ida	225.2	153.4	211.7	225.2
Iowa	269.7	148.2	187.2	206.7
Jackson	212.8	103.3	154.4	165.8

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Appendix B. Table 10. continued

County	Est. Max. Row Crop Acres Available	Est. Row Crop Acres Harvested 1972	Proj. Row Crop Acres High Prod. Growth Rate 1979	1984
Jasper	377.3	216.1	284.6	320.2
Jefferson	215.5	107.4	139.4	156.5
Johnson	263.2	157.7	209.1	234.4
Jones	282.0	147.6	209.4	237.7
Keokuk	306.8	158.3	194.8	213.9
Kossuth	591.8	435.0	591.8	591.8
Lee	258.2	133.1	197.0	224.5
Linn	361.4	208.1	286.4	323.8
Louisa	196.6	124.1	171.5	189.2
Lucas	210.6	66.2	70.4	77.6
Lyon	343.1	206.8	236.1	251.6
Madison	259.4	124.1	143.6	157.6
Mahaska	310.8	172.6	236.5	259.7
Marion	256.3	128.7	154.9	169.7
Marshall	317.5	200.5	265.9	297.6
Mills	201.1	137.8	178.8	201.1
Mitchell	283.6	166.8	169.8	185.8
Monona	311.3	213.0	274.9	296.0
Monroe	183.4	52.4	58.7	63.7
Montgomery	225.9	132.8	153.8	175.8
Muscatine	241.0	122.2	162.2	174.7
O'Brien	346.0	240.5	301.6	325.7
Osceola	240.0	162.8	196.3	212.6
Page	289.9	156.6	180.1	201.2
Palo Alto	340.4	244.8	337.5	340.4
Plymouth	451.6	287.8	368.9	403.5
Pocahontas	351.8	259.1	342.4	351.8
Polk	293.2	180.2	212.5	233.2
Pottawattamie	460.3	300.2	416.1	460.3
Poweshiek	297.1	156.8	188.9	211.7
Ringgold	256.1	86.5	93.9	105.1
Sac	336.2	223.9	271.0	292.9
Scott	219.8	145.2	192.0	212.7
Shelby	277.5	198.9	277.5	277.5
Sioux	444.0	295.8	330.2	348.4
Story	321.9	228.4	282.4	312.0
Tama	368.2	232.2	294.5	329.8
Taylor	295.2	108.4	107.4	118.5
Union	209.6	74.7	79.5	86.3
Van Buren	187.9	83.9	111.0	121.2
Wapello	210.2	91.2	118.1	131.5
Warren	281.6	127.1	145.8	157.1
Washington	315.1	180.6	231.4	258.4
Wayne	257.1	96.3	105.9	119.8
Webster	417.7	293.7	381.7	417.7
Winnebago	237.5	163.0	214.9	237.5
Winneshiek	322.5	127.1	146.1	157.1
Woodbury	417.8	251.0	287.3	304.1
Worth	240.6	156.4	184.1	202.0
Wright	346.6	255.9	346.6	346.6
Total	29,304.7	17,187.4	21,829.5	23,787.3

Appendix B. Table 11. Estimated 1959, 1971, 1972 corn yields and 1979 and 1984 projected corn yields under high productivity growth rate and maximum soil conservation assumptions, in bushels per acre, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	62.6	94.9	104.0	112.5	116.2
Adams	59.1	93.9	101.0	115.0	119.1
Allamakee	66.3	98.1	104.0	111.5	115.7
Appanoose[a/]	53.1	81.5	99.0	77.8	81.2
Audubon	66.1	92.2	104.0	111.5	112.7
Benton	77.1	105.4	113.0	127.1	130.0
Black Hawk	72.7	98.7	110.0	110.7	114.5
Boone	69.8	105.0	129.0	120.7	124.0
Bremer	68.7	95.5	107.0	115.2	118.4
Buchanan	66.7	98.0	110.0	109.3	113.1
Buena Vista	69.1	103.2	114.0	103.5	106.1
Butler	67.5	96.1	108.0	116.9	120.6
Calhoun	65.4	89.6	120.0	117.3	120.8
Carroll	64.5	83.2	111.0	114.8	117.2
Cass	64.7	95.4	105.0	115.9	118.3
Cedar	76.2	118.2	113.0	125.1	127.3
Cerro Gordo	64.5	101.7	110.0	114.1	117.7
Cherokee	62.9	99.2	112.0	98.2	101.1
Chickasaw	57.6	88.8	102.0	106.6	110.8
Clarke	48.9	88.8	99.0	110.5	113.5
Clay	60.9	101.0	113.0	107.7	111.0
Clayton	63.4	100.0	106.0	112.5	116.5
Clinton	75.1	109.1	107.0	110.8	113.2
Crawford	65.0	86.7	102.0	106.0	106.4
Dallas	66.5	105.0	126.0	116.5	120.0
Davis	51.6	95.0	101.0	94.2	97.3
Decatur	39.5	85.4	99.0	101.9	103.9
Delaware	64.8	96.5	109.0	110.2	113.7
Des Moines	76.6	120.1	124.0	110.7	114.4
Dickinson	40.3	94.3	105.0	99.5	102.6
Dubuque	68.2	97.3	100.0	111.6	114.6
Emmet	53.4	106.1	111.0	102.9	106.1
Fayette	61.7	98.3	105.0	109.9	113.6
Floyd	63.5	99.7	109.0	111.0	114.1
Franklin	73.3	110.6	116.0	118.4	120.3
Fremont	58.2	100.2	112.0	101.0	103.2
Greene	63.2	91.2	125.0	117.4	121.0
Grundy	82.6	110.0	121.0	128.8	132.4
Guthrie	63.3	90.4	107.0	113.7	117.4
Hamilton	73.3	108.4	121.0	117.9	121.4
Hancock	63.5	109.0	118.0	112.1	115.2
Hardin	77.6	110.7	117.0	123.4	126.9
Harrison	61.1	93.8	109.0	100.8	102.9
Henry	66.8	114.0	117.0	120.3	123.0
Howard	55.6	76.4	96.0	103.1	106.7
Humboldt	69.1	110.0	111.0	112.5	115.9
Ida	63.8	98.6	112.0	93.9	96.4
Iowa	66.3	109.6	106.0	111.8	116.0
Jackson	68.3	98.0	98.0	92.1	95.3

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Appendix B. Table 11. continued

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Jasper	67.1	109.7	115.0	120.2	122.8
Jefferson	60.3	105.7	108.0	110.9	113.4
Johnson	65.7	109.4	108.0	113.5	115.6
Jones	71.8	103.7	108.0	113.9	116.8
Keokuk	63.2	113.1	113.0	114.7	118.0
Kossuth	62.4	109.8	112.0	108.9	112.3
Lee	65.5	103.3	111.0	102.2	104.0
Linn	66.5	104.1	110.0	111.3	113.9
Louisa	67.2	97.4	118.0	113.3	116.9
Lucas	47.0	86.4	98.0	116.5	120.4
Lyon	48.0	83.8	106.0	99.8	102.9
Madison	64.6	97.7	107.0	114.1	117.5
Mahaska	63.2	108.0	111.0	108.6	112.3
Marion	56.7	100.2	109.0	109.7	113.1
Marshall	75.6	106.3	119.0	124.9	127.8
Mills	61.7	91.0	108.0	107.4	109.2
Mitchell	63.0	87.7	107.0	120.3	124.1
Monona	58.0	94.0	108.0	94.9	97.8
Monroe	47.6	88.7	99.0	98.1	101.0
Montgomery	56.8	94.5	104.0	118.1	119.9
Muscatine	68.4	105.8	110.0	109.7	114.5
O'Brien	60.5	99.8	117.0	103.2	106.3
Osceola	52.0	94.3	114.0	104.0	107.3
Page	56.8	97.0	106.0	114.1	117.3
Palo Alto	59.8	108.2	111.0	103.6	106.8
Plymouth	55.7	82.9	107.0	96.7	99.4
Pocahontas	66.5	108.0	116.0	110.3	113.7
Polk	65.3	100.9	112.0	123.8	127.5
Pottawattamie	64.4	97.9	110.0	106.4	108.0
Poweshiek	62.9	105.0	105.0	125.9	129.8
Ringgold	48.0	92.6	99.0	108.0	109.3
Sac	65.6	86.9	110.0	107.5	110.4
Scott	72.7	113.3	110.0	122.2	125.6
Shelby	70.7	92.1	111.0	103.5	106.8
Sioux	55.0	87.1	105.0	99.8	102.2
Story	75.1	105.4	120.0	123.8	126.9
Tama	73.1	104.3	114.0	125.6	129.9
Taylor	50.3	90.6	100.0	118.8	122.6
Union	53.5	88.7	98.0	113.8	117.5
Van Buren	61.2	91.8	101.0	92.3	95.4
Wapello	63.0	106.5	111.0	112.2	115.2
Warren	56.3	100.9	113.0	107.6	111.2
Washington	66.1	112.6	113.0	122.1	125.4
Wayne	47.8	94.2	104.0	106.8	106.5
Webster	66.8	104.7	121.0	116.1	118.8
Winnebago	64.8	101.1	111.0	113.1	115.7
Winneshiek	62.1	90.0	98.0	104.7	108.4
Woodbury	57.9	86.0	107.0	92.9	95.5
Worth	62.0	99.0	110.0	110.7	114.0
Wright	69.3	111.9	119.0	113.9	117.5
State Average	64.2	99.5	110.6	110.8	113.9

a/Projected yields could be somewhat conservative. Rathbun Dam and resulting flood controls could increase projected yields in Appanoose County.

Appendix B. Table 12. Estimated 1959, 1971, 1972 soybean yields and 1979 and 1984 projected soybean yields under high productivity growth rate and maximum soil conservation assumptions, in bushels per acre, by counties, Iowa.

County	Estimated			High Prod. Growth Rate	
	1959	1971	1972	1979	1984
Adair	27.3	33.7	33.0	42.7	44.2
Adams	25.9	32.2	33.0	43.7	45.3
Allamakee	22.9	26.4	31.0	42.4	44.0
Appanoose[a/]	21.5	27.0	32.0	29.6	30.9
Audubon	25.2	30.8	33.0	42.4	42.8
Benton	29.4	35.9	38.0	48.3	49.4
Black Hawk	27.3	28.1	36.0	42.1	43.5
Boone	28.9	33.7	40.0	45.9	47.1
Bremer	24.9	28.8	30.0	43.8	45.0
Buchanan	24.3	29.2	34.0	41.5	43.0
Buena Vista	30.3	32.2	35.0	39.3	40.3
Butler	26.3	30.4	33.0	44.4	45.8
Calhoun	28.2	29.6	39.0	44.6	45.9
Carroll	23.7	29.1	39.0	43.6	44.5
Cass	27.9	33.3	34.0	44.0	44.9
Cedar	30.6	40.2	38.0	47.5	48.4
Cerro Gordo	24.6	29.8	35.0	43.4	44.7
Cherokee	29.0	31.1	37.0	37.3	38.4
Chickasaw	20.7	23.2	31.0	40.5	42.1
Clarke	22.4	30.8	34.0	42.0	43.1
Clay	27.4	33.2	38.0	40.9	42.2
Clayton	25.2	30.8	33.0	42.7	44.3
Clinton	25.5	35.5	36.0	42.1	43.0
Crawford	25.7	28.0	35.0	40.3	40.4
Dallas	28.6	33.5	38.0	44.3	45.6
Davis	21.5	30.5	32.0	35.8	37.0
Decatur	17.1	29.1	32.0	38.7	39.5
Delaware	23.8	28.8	34.0	41.9	43.2
Des Moines	28.5	40.0	39.0	42.1	43.5
Dickinson	19.9	29.9	37.0	37.8	39.0
Dubuque	23.0	33.6	29.0	42.4	43.5
Emmet	24.2	33.8	38.0	39.1	40.3
Fayette	24.1	28.0	31.0	41.7	43.2
Floyd	23.7	28.5	32.0	42.2	43.4
Franklin	29.1	35.7	36.0	45.0	45.7
Fremont	28.1	30.1	38.0	38.4	39.2
Greene	24.8	29.2	39.0	44.6	46.0
Grundy	32.1	36.6	39.0	48.9	50.3
Guthrie	26.0	30.2	35.0	43.2	44.6
Hamilton	29.9	34.4	37.0	44.8	46.1
Hancock	25.7	33.0	38.0	42.6	43.8
Hardin	31.1	36.6	33.0	46.9	48.2
Harrison	20.0	29.6	35.0	38.3	39.1
Henry	28.0	38.8	39.0	45.7	46.7
Howard	20.8	15.6	29.0	39.2	40.6
Humboldt	30.3	35.0	33.0	42.8	44.0
Ida	26.9	30.7	37.0	35.7	36.6
Iowa	24.9	35.6	34.0	42.5	44.1
Jackson	27.1	33.7	31.0	35.0	36.2

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Appendix B. Table 12. continued

County	Estimated 1959	Estimated 1971	Estimated 1972	High Prod. Growth Rate 1979	High Prod. Growth Rate 1984
Jasper	25.4	33.9	39.0	45.7	46.7
Jefferson	26.8	34.6	34.0	42.2	43.1
Johnson	27.7	37.9	36.0	43.1	43.9
Jones	28.2	35.9	36.0	43.3	44.4
Keokuk	27.6	36.1	36.0	43.6	44.8
Kossuth	26.8	32.5	36.0	41.4	42.7
Lee	24.9	32.3	34.0	38.8	39.5
Linn	26.3	34.0	36.0	42.3	43.3
Louisa	25.7	35.0	36.0	43.1	44.4
Lucas	21.3	28.0	32.0	44.3	45.8
Lyon	22.4	30.1	39.0	37.9	39.1
Madison	27.6	34.4	34.0	43.4	44.6
Mahaska	26.8	36.1	37.0	41.3	42.7
Marion	24.2	34.1	35.0	41.7	43.0
Marshall	29.5	37.0	37.0	47.5	48.6
Mills	29.2	30.0	36.0	40.8	41.5
Mitchell	23.1	20.2	32.0	45.7	47.2
Monona	20.0	30.8	33.0	36.0	37.2
Monroe	22.2	27.5	30.0	37.3	38.4
Montgomery	26.0	33.5	38.0	44.9	45.6
Muscatine	24.0	35.0	35.0	41.7	43.5
O'Brien	28.2	35.0	42.0	39.2	40.4
Osceola	22.8	31.4	40.0	39.5	40.8
Page	27.4	32.6	36.0	43.4	44.6
Palo Alto	27.5	32.9	36.0	39.4	40.6
Plymouth	25.4	27.2	38.0	36.7	37.8
Pocahontas	29.2	33.3	36.0	41.9	43.2
Polk	25.4	32.1	36.0	47.1	48.4
Pottawattamie	25.8	32.4	36.0	40.4	41.0
Poweshiek	27.5	36.7	36.0	47.8	49.3
Ringgold	21.1	30.9	33.0	41.0	41.5
Sac	27.7	28.6	34.0	40.8	42.0
Scott	27.1	39.1	38.0	46.4	47.7
Shelby	27.9	29.9	36.0	39.3	40.6
Sioux	25.8	30.3	39.0	37.9	38.8
Story	29.1	35.0	39.0	47.1	48.2
Tama	27.1	36.4	37.0	47.7	49.4
Taylor	23.4	30.6	33.0	45.1	46.6
Union	23.6	31.6	34.0	43.2	44.7
Van Buren	25.0	28.8	31.0	35.1	36.3
Wapello	26.2	33.5	35.0	42.6	43.8
Warren	23.0	30.9	33.0	40.9	42.3
Washington	29.8	39.5	39.0	46.4	47.6
Wayne	21.3	29.2	32.0	40.6	40.5
Webster	28.9	33.3	36.0	44.1	45.1
Winnebago	26.2	28.5	33.0	43.0	44.0
Winneshiek	21.3	20.0	30.0	39.8	41.2
Woodbury	19.5	27.1	34.0	35.3	36.3
Worth	23.4	21.8	32.0	42.1	43.3
Wright	29.4	34.4	37.0	43.3	44.[illegible]
State Average	26.1	32.1	35.9	42.4	43.9

a/ Projected yields could be somewhat conservative. Rathbun Dam and resul[illegible]ng flood controls could increase projected yields in Appanoose County.

Appendix B. Table 13. Estimated 1971 tonnage of nitrogen fertilizer applied and projected 1979 and 1984 tons of nitrogen fertilizer under high productivity growth rate and maximum soil conservation assumptions, by counties, Iowa.

County	Estimated 1971	High Prod. Growth Rate 1979	1984
Adair	5,399.1	7,891.8	8,452.4
Adams	4,416.1	5,187.1	5,607.9
Allamakee	2,541.5	2,981.0	3,213.7
Appanoose	2,062.3	3,335.3	3,530.0
Audubon	7,107.7	7,936.1	8,560.0
Benton	9,591.2	13,109.8	14,129.1
Black Hawk	7,326.4	10,005.8	10,686.3
Boone	9,218.2	14,069.2	15,352.7
Bremer	5,451.7	6,931.7	7,508.0
Buchanan	7,940.3	12,034.2	13,149.9
Buena Vista	10,165.1	13,427.4	13,810.0
Butler	9,414.2	12,300.5	13,296.8
Calhoun	11,297.6	13,118.5	14,009.2
Carroll	8,668.7	10,743.1	11,506.4
Cass	7,398.0	10,278.4	11,171.9
Cedar	7,079.3	11,210.8	12,201.2
Cerro Gordo	9,872.7	12,904.4	13,923.6
Cherokee	7,971.0	10,475.2	11,001.6
Chickasaw	6,744.5	8,267.1	8,833.8
Clarke	1,887.5	2,236.2	2,405.1
Clay	9,147.1	11,345.4	12,084.5
Clayton	5,332.8	7,862.0	8,728.2
Clinton	10,568.9	14,796.3	15,830.3
Crawford	8,769.6	10,494.7	11,397.0
Dallas	9,394.8	13,570.7	14,789.7
Davis	3,191.3	4,632.2	5,110.1
Decatur	2,212.2	2,970.4	3,273.5
Delaware	6,007.2	9,112.1	9,992.0
Des Moines	4,497.1	7,524.5	8,144.2
Dickinson	4,931.0	6,754.1	7,223.0
Dubuque	4,771.2	6,674.5	7,258.4
Emmet	5,589.5	8,254.3	8,177.8
Fayette	6,533.9	9,591.6	10,474.6
Floyd	8,022.8	10,054.7	10,815.0
Franklin	10,449.5	14,496.9	15,731.2
Fremont	8,289.0	11,086.3	11,911.5
Greene	11,840.6	14,794.7	15,866.5
Grundy	10,457.0	14,938.1	16,213.4
Guthrie	6,201.1	7,635.3	8,147.4
Hamilton	11,314.9	15,774.9	15,780.1
Hancock	8,998.0	14,926.4	14,971.9
Hardin	10,977.0	15,281.0	16,496.9
Harrison	9,557.3	14,972.6	16,141.8
Henry	6,928.2	10,696.1	11,925.8
Howard	4,513.1	6,270.7	6,806.3
Humboldt	8,440.0	12,290.9	12,237.4
Ida	6,696.7	9,950.4	10,267.7
Iowa	7,153.7	9,073.8	9,626.8
Jackson	5,779.6	8,930.4	9,631.0

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Appendix B. Table 13. continued

County	Estimated 1971	High Prod. Growth Rate 1979	1984
Jasper	9,393.1	11,915.7	13,000.3
Jefferson	5,229.3	7,620.7	8,451.9
Johnson	5,698.7	9,389.4	10,303.8
Jones	6,763.5	10,953.8	11,844.2
Keokuk	6,981.0	9,328.4	10,239.5
Kossuth	18,739.4	29,255.4	29,032.3
Lee	6,018.3	10,847.0	12,485.2
Linn	8,376.7	12,531.6	13,670.9
Louisa	6,105.9	9,504.2	10,380.7
Lucas	3,225.9	3,466.7	3,789.7
Lyon	4,925.7	5,920.0	6,259.2
Madison	4,838.5	6,215.4	6,636.0
Mahaska	7,712.2	10,428.2	11,227.2
Marion	4,252.4	5,588.3	5,994.0
Marshall	8,799.3	11,045.6	12,036.3
Mills	5,934.2	6,973.6	7,418.6
Mitchell	7,867.0	8,124.7	8,644.9
Monona	10,228.9	15,050.9	16,365.2
Monroe	2,032.1	2,163.9	2,319.2
Montgomery	5,682.7	6,922.8	7,441.5
Muscatine	3,987.6	7,012.8	7,448.3
O'Brien	7,314.6	9,321.3	9,920.0
Osceola	6,432.7	7,210.3	7,715.6
Page	7,386.6	8,319.0	8,883.5
Palo Alto	7,952.3	11,977.0	11,865.7
Plymouth	9,998.3	13,257.6	14,300.5
Pocahontas	7,816.2	12,400.4	12,492.3
Polk	7,778.5	9,850.4	10,721.6
Pottawattamie	13,889.6	19,658.1	20,626.4
Poweshiek	4,438.0	4,980.4	5,261.9
Ringgold	2,734.8	3,488.4	3,890.1
Sac	10,714.6	12,881.3	13,596.2
Scott	6,155.2	8,507.1	9,191.1
Shelby	10,499.7	12,682.4	13,306.5
Sioux	8,800.7	10,709.4	11,289.0
Story	10,190.7	12,946.2	13,964.8
Tama	9,829.1	11,838.4	12,719.2
Taylor	4,431.5	4,586.7	4,973.6
Union	3,378.9	3,767.1	4,032.0
Van Buren	3,330.7	5,459.9	6,013.9
Wapello	3,482.1	4,804.0	5,314.4
Warren	4,790.3	6,818.3	7,336.6
Washington	7,902.7	11,345.0	12,450.9
Wayne	4,245.0	5,271.3	5,94 .8
Webster	14,970.2	9,704.3	10,50 .0
Winnebago	7,705.8	10,235.4	10,968.8
Winneshiek	5,065.0	6,76 .1	7,320.1
Woodbury	11,664.7	14,112.6	14,908.4
Worth	6,445.7	8,657.2	9,433.1
Wright	12,473.6	18,133.3	17,829.2
Total	722,728.4	973,150.6	1,039,168.7

Appendix B. Table 14. Estimated 1971 tonnage of P_2O_5 fertilizer applied and projected 1979 and 1984 tons of P_2O_5 fertilizer under high productivity growth rate and maximum soil conservation assumptions, by counties, Iowa.

County	Estimated 1971	High Prod. Growth Rate 1979	1984
Adair	2,136.3	3,329.6	3,853.4
Adams	1,992.2	2,783.2	3,170.9
Allamakee	1,816.5	1,988.6	2,197.1
Appanoose	1,544.6	2,918.1	3,234.7
Audubon	2,967.7	4,529.8	5,443.8
Benton	8,001.4	10,295.8	12,143.0
Black Hawk	5,181.8	7,553.7	8,594.7
Boone	5,965.2	8,299.1	9,454.8
Bremer	3,837.9	4,976.9	5,683.3
Buchanan	5,878.7	9,273.6	10,638.2
Buena Vista	6,369.9	9,287.2	10,005.3
Butler	6,404.7	8,466.9	9,645.8
Calhoun	6,810.0	8,268.9	9,230.7
Carroll	6,585.0	8,901.4	10,075.0
Cass	2,594.4	3,882.1	4,588.9
Cedar	4,585.0	8,010.0	9,574.9
Cerro Gordo	7,428.2	10,345.9	11,803.9
Cherokee	5,698.5	7,917.3	8,692.5
Chickasaw	5,293.9	6,335.3	7,052.1
Clarke	1,014.1	1,435.8	1,624.7
Clay	5,962.0	8,109.6	9,131.4
Clayton	3,571.7	5,371.9	6,026.5
Clinton	8,484.9	11,835.1	13,554.4
Crawford	5,970.4	8,961.5	11,003.9
Dallas	5,830.0	7,711.5	8,684.0
Davis	1,990.3	2,981.2	3,389.1
Decatur	1,150.5	1,749.3	1,988.1
Delaware	5,297.8	8,686.0	9,974.9
Des Moines	3,760.5	5,794.9	6,523.7
Dickinson	3,828.4	5,674.3	6,434.8
Dubuque	3,734.4	5,532.3	6,192.6
Emmet	4,451.8	6,959.0	7,177.4
Fayette	5,221.8	7,436.0	8,345.8
Floyd	6,915.0	8,484.6	9,754.6
Franklin	7,971.3	11,924.2	13,912.7
Fremont	2,471.9	4,203.7	4,751.0
Greene	6,653.1	8,421.6	9,390.9
Grundy	6,865.8	10,255.0	11,765.9
Guthrie	2,915.3	3,959.6	4,481.5
Hamilton	9,251.9	13,437.8	14,080.9
Hancock	6,877.7	10,056.5	10,618.0
Hardin	7,564.6	11,214.6	12,931.0
Harrison	4,926.7	8,511.7	9,541.0
Henry	3,868.9	6,283.1	7,319.3
Howard	4,559.0	5,497.4	6,219.2
Humboldt	6,686.5	9,061.8	9,451.5
Ida	4,769.1	7,412.1	8,133.4
Iowa	3,620.0	5,115.1	5,824.0
Jackson	3,958.5	5,863.6	6,493.0

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Appendix B. Table 14. continued

County	Estimated 1971	High Prod. Growth Rate 1979	1984
Jasper	5,236.9	7,362.0	8,543.6
Jefferson	3,162.3	4,972.8	5,758.4
Johnson	3,663.3	6,306.1	7,290.9
Jones	4,432.8	7,995.5	9,361.9
Keokuk	3,887.6	5,322.1	6,027.7
Kossuth	14,690.5	20,750.7	21,402.1
Lee	5,318.3	7,357.8	8,647.7
Linn	5,536.6	9,419.0	10,983.8
Louisa	3,054.3	4,751.3	5,406.8
Lucas	1,838.6	2,300.6	2,615.6
Lyon	3,625.0	4,672.7	5,135.2
Madison	2,107.5	3,306.6	3,741.7
Mahaska	4,449.3	6,461.3	7,317.9
Marion	2,128.4	3,083.3	3,482.7
Marshall	4,848.8	6,878.8	7,940.6
Mills	2,432.4	3,359.1	3,896.1
Mitchell	6,497.2	6,334.2	7,147.0
Monona	5,304.3	7,893.4	8,764.0
Monroe	1,283.8	1,649.9	1,846.4
Montgomery	2,560.6	3,610.5	4,254.6
Muscatine	2,773.1	4,893.0	5,433.0
O'Brien	5,566.8	7,852.3	8,746.4
Osceola	5,271.3	6,094.8	6,810.0
Page	2,553.1	4,157.8	4,789.4
Palo Alto	6,179.4	8,428.4	8,769.8
Plymouth	6,338.5	9,913.5	11,184.0
Pocahontas	5,987.1	9,850.8	10,438.6
Polk	5,335.8	6,657.8	7,536.4
Pottawattamie	6,680.4	11,296.3	12,890.6
Poweshiek	3,069.5	4,012.2	4,638.4
Ringgold	1,413.5	2,094.6	2,416.7
Sac	7,890.0	10,075.4	11,233.8
Scott	3,771.2	5,843.3	6,677.6
Shelby	4,372.9	7,594.6	7,833.2
Sioux	5,685.3	7,252.2	7,892.1
Story	6,916.3	8,846.8	10,082.0
Tama	5,450.4	7,618.5	8,799.2
Taylor	2,146.9	2,700.0	3,072.6
Union	1,521.0	1,999.1	2,239.1
Van Buren	3,581.7	4,146.4	4,668.7
Wapello	2,274.7	3,226.5	3,703.8
Warren	2,069.2	3,356.7	3,731.2
Washington	4,315.6	5,739.6	6,610.8
Wayne	2,559.8	3,459.5	4,036.3
Webster	7,335.9	10,384.4	11,719.7
Winnebago	5,991.6	7,537.5	8,591.3
Winneshiek	3,449.5	4,562.2	5,059.0
Woodbury	8,613.6	11,004.7	12,011.8
Worth	4,944.7	6,775.4	7,667.4
Wright	8,573.3	11,497.7	11,858.6
Total	469,926.4	667,963.9	750,508.4

Appendix B. Table 15. Estimated 1971 tonnage of K_2O fertilizer applied and projected 1979 and 1984 tons of K_2O fertilizer under high productivity growth rate and maximum soil conservation assumptions, by counties, Iowa.

County	Estimated 1971	High Prod. Growth Rate 1979	1984
Adair	1,376.3	2,116.3	2,449.2
Adams	1,220.0	1,721.7	1,961.6
Allamakee	1,510.6	1,879.9	2,077.0
Appanoose	1,043.3	1,928.0	2,137.2
Audubon	2,005.7	3,173.6	3,814.0
Benton	6,752.5	9,624.7	11,351.5
Black Hawk	6,638.0	9,235.4	10,508.1
Boone	6,187.8	8,236.3	9,383.1
Bremer	4,916.5	6,084.9	6,948.6
Buchanan	7,539.0	11,508.2	13,201.6
Buena Vista	5,416.2	7,813.3	8,417.5
Butler	7,125.6	8,798.1	10,023.2
Calhoun	7,280.1	9,081.2	10,137.5
Carroll	4,656.8	5,852.8	6,624.5
Cass	1,671.4	2,467.4	2,916.7
Cedar	4,725.1	8,276.5	9,893.5
Cerro Gordo	9,274.3	12,442.0	14,195.4
Cherokee	2,890.4	4,133.9	4,538.7
Chickasaw	6,477.7	7,596.8	8,456.3
Clarke	739.4	1,048.1	1,186.1
Clay	5,069.4	6,822.6	7,682.2
Clayton	4,079.2	6,011.4	6,743.9
Clinton	6,768.1	10,827.1	12,400.0
Crawford	4,222.2	5,892.3	7,235.2
Dallas	6,047.6	7,653.0	8,618.2
Davis	1,664.1	2,507.3	2,850.3
Decatur	838.8	1,277.0	1,451.3
Delaware	5,454.8	8,614.5	9,892.8
Des Moines	3,835.8	6,045.3	6,805.5
Dickinson	3,880.4	5,031.4	5,705.7
Dubuque	3,845.0	5,486.7	6,141.6
Emmet	4,512.3	6,170.4	6,364.1
Fayette	6,741.2	9,441.0	10,596.2
Floyd	8,047.5	10,146.1	11,664.7
Franklin	9,952.4	14,340.2	16,731.5
Fremont	1,763.1	2,860.0	3,232.4
Greene	7,112.4	9,248.9	10,313.4
Grundy	7,415.9	10,916.6	12,525.0
Guthrie	2,581.4	3,554.8	4,023.3
Hamilton	9,847.4	13,962.6	14,630.7
Hancock	8,511.2	12,778.9	13,492.5
Hardin	8,170.7	11,938.1	13,765.2
Harrison	2,879.0	4,408.9	4,942.1
Henry	3,570.7	5,713.7	6,656.0
Howard	5,208.9	6,135.0	6,940.5
Humboldt	7,422.9	10,156.7	10,593.5
Ida	2,132.9	3,363.8	3,691.1
Iowa	3,511.2	4,760.2	5,419.8
Jackson	3,157.6	5,364.2	5,940.0

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Appendix B. Table 15. continued

County	Estimated 1971	High Prod. Growth Rate 1979	1984
Jasper	5,065.8	6,663.9	7,733.4
Jefferson	2,918.6	4,522.1	5,236.6
Johnson	3,775.2	6,516.0	7,533.5
Jones	4,387.4	7,913.8	9,266.2
Keokuk	3,770.8	4,952.8	5,609.4
Kossuth	16,308.4	23,258.0	23,988.1
Lee	3,990.4	6,281.6	7,382.8
Linn	6,037.3	9,594.6	11,188.6
Louisa	3,715.8	6,147.0	6,995.1
Lucas	1,353.0	1,711.7	1,946.1
Lyon	1,889.3	2,448.2	2,690.6
Madison	1,540.5	2,562.1	2,899.2
Mahaska	4,315.6	6,013.0	6,810.1
Marion	1,691.8	2,288.7	2,585.2
Marshall	4,690.3	6,226.5	7,187.6
Mills	1,478.1	2,083.3	2,416.2
Mitchell	7,561.3	7,574.5	8,546.5
Monona	2,332.7	3,448.6	3,828.9
Monroe	867.1	1,090.1	1,219.9
Montgomery	1,613.5	2,341.3	2,758.9
Muscatine	2,857.9	5,055.8	5,613.8
O'Brien	2,938.7	4,506.3	5,019.4
Osceola	3,093.7	3,807.9	4,254.7
Page	1,783.0	2,751.8	3,169.8
Palo Alto	6,115.0	9,068.0	9,435.4
Plymouth	2,036.5	3,537.6	3,991.0
Pocahontas	6,203.9	9,373.5	9,932.9
Polk	5,889.4	7,261.9	8,220.3
Pottawattamie	4,454.4	7,631.4	8,708.5
Poweshiek	2,641.5	3,264.5	3,774.0
Ringgold	1,030.6	1,529.1	1,764.2
Sac	5,894.8	7,885.1	8,791.7
Scott	3,512.2	5,565.0	6,359.6
Shelby	2,955.5	5,320.9	5,488.0
Sioux	2,335.1	3,644.5	3,966.1
Story	7,633.8	9,649.6	10,996.9
Tama	5,257.3	6,896.1	7,964.8
Taylor	1,314.7	1,670.3	1,900.8
Union	931.4	1,236.7	1,385.2
Van Buren	2,687.4	3,539.9	3,985.8
Wapello	2,206.3	3,002.6	3,446.8
Warren	1,512.5	2,600.8	2,891.0
Washington	3,895.9	5,120.5	5,897.8
Wayne	1,883.7	2,574.0	3,003.1
Webster	8,221.1	11,533.5	13,016.6
Winnebago	6,651.4	8,448.2	9,629.3
Winneshiek	4,453.3	5,792.4	6,423.2
Woodbury	3,090.9	4,084.7	4,458.5
Worth	6,826.6	8,879.8	10,049.0
Wright	9,651.3	12,734.4	13,134.1
Total	436,953.5	616,052.4	691,765.2

APPENDIX C: LIVESTOCK NUMBERS

Appendix C. Table 1. Estimated number of hogs marketed in 1960 and 1972 and projections for 1980 and 1985 in thousands of head, by counties, Iowa.

County	Estimated		Projected	
	1960	1972	1980	1985
Adair	180.3	235.8	246.1	273.3
Adams	121.9	142.4	156.8	173.1
Allamakee	189.9	211.2	217.4	239.0
Appanoose	65.0	53.4	59.3	63.3
Audubon	152.9	221.0	225.5	252.1
Benton	295.4	340.7	362.8	398.4
Black Hawk	209.7	275.7	156.7	165.9
Boone	139.1	160.6	150.5	164.5
Bremer	188.4	178.9	167.2	180.5
Buchanan	209.8	266.3	271.8	300.5
Buena Vista	257.6	327.4	286.6	313.8
Butler	215.3	292.7	302.5	337.5
Calhoun	128.3	185.0	170.7	188.2
Carroll	252.9	405.7	400.6	451.3
Cass	180.0	215.5	221.0	243.6
Cedar	368.0	407.4	423.8	462.8
Cerro Gordo	201.4	243.4	251.9	276.7
Cherokee	221.4	257.8	247.1	270.4
Chickasaw	176.8	184.4	177.2	192.4
Clarke	72.5	91.5	102.9	113.6
Clay	157.7	147.1	146.5	157.3
Clayton	308.9	389.9	379.3	419.0
Clinton	291.2	364.8	374.5	413.4
Crawford	259.6	378.3	405.4	457.2
Dallas	154.2	148.9	158.8	171.4
Davis	69.0	89.5	108.2	121.4
Decatur	65.3	89.3	89.5	99.2
Delaware	345.4	549.2	563.6	635.2
Des Moines	118.8	127.6	114.3	122.6
Dickinson	91.5	98.9	95.7	103.8
Dubuque	281.4	376.1	394.9	441.5
Emmet	92.9	94.5	88.0	94.6
Fayette	266.0	292.9	284.1	310.8
Floyd	141.7	159.6	152.1	165.8
Franklin	223.7	297.0	284.7	314.8
Fremont	65.7	82.0	79.7	88.2
Greene	125.7	134.8	144.1	156.8
Grundy	204.0	229.5	238.8	262.4
Guthrie	121.2	199.2	214.6	242.5
Hamilton	193.8	254.6	225.0	248.8
Hancock	186.9	260.9	255.5	283.9
Hardin	233.6	291.1	287.9	317.0
Harrison	117.1	137.2	147.4	162.1
Henry	169.1	222.9	208.5	229.2
Howard	146.0	138.1	146.8	160.1
Humboldt	132.6	115.6	112.7	120.1
Ida	172.1	200.6	214.8	235.9
Iowa	267.0	335.5	358.8	398.2
Jackson	184.4	287.7	290.4	326.5

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Appendix C. Table 1. continued

County	Estimated 1960	Estimated 1972	Projected 1980	Projected 1985
Jasper	283.2	312.0	323.8	354.6
Jefferson	127.1	169.7	155.2	171.1
Johnson	324.4	424.6	440.1	489.3
Jones	270.4	356.7	365.0	404.1
Keokuk	248.7	420.9	400.2	451.8
Kossuth	278.7	364.2	368.8	407.4
Lee	118.1	162.5	157.0	174.1
Linn	252.7	264.8	249.2	269.6
Louisa	172.2	149.9	136.2	144.6
Lucas	74.8	125.0	127.9	145.2
Lyon	187.6	274.5	260.3	291.0
Madison	142.4	160.6	183.3	202.9
Mahaska	274.3	403.4	382.7	427.1
Marion	182.2	290.1	274.6	307.3
Marshall	183.6	200.2	202.4	220.7
Mills	93.4	107.4	109.6	120.2
Mitchell	143.6	190.1	187.3	207.6
Monona	108.3	147.7	158.2	176.3
Monroe	74.3	96.0	88.6	97.3
Montgomery	149.6	166.0	191.3	211.1
Muscatine	183.6	211.7	213.2	233.2
O'Brien	211.1	262.4	250.6	276.2
Osceola	110.1	127.0	125.8	137.1
Page	175.4	136.0	234.7	260.7
Palo Alto	148.3	167.5	163.8	178.6
Plymouth	360.8	552.8	548.1	613.8
Pocahontas	169.4	213.6	198.4	217.9
Polk	88.3	81.2	82.3	88.4
Pottawattamie	252.8	263.9	301.1	330.8
Poweshiek	225.6	276.9	273.9	302.0
Ringgold	78.7	128.0	141.8	161.2
Sac	237.0	305.1	293.8	323.9
Scott	232.3	271.8	278.3	305.3
Shelby	203.2	303.9	323.3	362.5
Sioux	330.8	486.0	480.1	536.6
Story	155.3	167.9	172.8	188.3
Tama	264.2	295.8	300.7	328.3
Taylor	124.2	201.2	201.6	227.4
Union	91.7	127.5	118.1	130.1
Van Buren	76.0	110.4	113.2	126.6
Wapello	84.0	101.3	101.1	111.4
Warren	118.2	164.5	161.5	178.9
Washington	363.2	520.9	484.5	536.8
Wayne	68.7	104.2	118.4	121.3
Webster	111.2	165.0	157.2	175.2
Winnebago	139.2	147.6	154.3	167.6
Winneshiek	305.4	339.2	341.2	376.2
Woodbury	236.7	311.5	305.2	337.6
Worth	126.1	123.3	132.6	143.1
Wright	194.2	182.0	193.8	209.1
Total	18,171.2	22,826.2	22,880.0	25,280.0

Appendix C. Table 2. Estimated number of grain-fed cattle marketed in 1960 and 1972 and projections for 1980 and 1985 in thousands of head, by counties, Iowa.

County	Estimated		Projected	
	1960	1972	1980	1985
Adair	17.2	23.6	23.7	22.0
Adams	8.6	12.8	17.1	16.5
Allamakee	2.5	7.9	9.9	10.2
Appanoose	1.7	3.3	4.2	4.1
Audubon	39.8	59.6	68.0	64.0
Benton	62.1	61.8	63.3	57.5
Black Hawk	30.3	33.4	31.0	28.3
Boone	29.4	41.7	50.3	47.6
Bremer	6.6	9.5	9.0	8.5
Buchanan	23.4	23.8	25.5	23.4
Buena Vista	40.0	52.9	57.7	53.6
Butler	17.1	21.2	25.9	24.4
Calhoun	23.8	49.8	58.1	56.7
Carroll	41.9	111.8	129.3	127.9
Cass	39.2	66.5	64.5	60.8
Cedar	51.1	56.9	61.8	57.0
Cerro Gordo	19.2	15.3	17.4	15.5
Cherokee	74.7	104.7	110.2	102.7
Chickasaw	9.4	18.7	20.6	20.1
Clarke	2.3	4.3	5.5	5.4
Clay	32.6	59.9	69.5	66.4
Clayton	6.2	17.9	16.5	16.4
Clinton	86.3	115.1	116.3	108.2
Crawford	43.9	80.4	86.5	82.6
Dallas	22.0	32.5	38.4	36.8
Davis	1.6	5.7	8.4	8.7
Decatur	3.2	6.2	8.5	8.4
Delaware	15.0	22.3	20.7	19.3
Des Moines	17.8	17.5	15.5	14.0
Dickinson	14.2	31.2	34.7	33.5
Dubuque	22.2	29.6	31.0	29.0
Emmet	15.3	36.6	39.7	38.7
Fayette	8.5	23.4	33.2	33.9
Floyd	20.0	17.1	20.4	18.5
Franklin	33.7	42.2	48.8	44.6
Fremont	17.2	25.0	28.8	27.1
Greene	20.0	43.7	52.1	50.9
Grundy	33.4	48.2	51.5	48.4
Guthrie	14.0	23.2	27.1	25.8
Hamilton	36.9	33.4	33.6	30.1
Hancock	22.4	22.9	24.8	22.4
Hardin	37.0	73.6	80.4	77.6
Harrison	20.4	33.7	36.1	34.3
Henry	13.2	14.4	15.6	14.5
Howard	5.3	10.6	9.7	9.3
Humboldt	20.1	25.6	27.2	25.2
Ida	42.5	79.5	94.0	90.1
Iowa	31.9	37.8	42.4	39.3
Jackson	22.5	44.6	45.7	43.9

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Appendix C. Table 2. continued

County	Estimated 1960	Estimated 1972	Projected 1980	Projected 1985
Jasper	29.4	46.6	55.8	53.6
Jefferson	6.9	10.6	11.1	10.5
Johnson	22.9	22.6	22.3	20.3
Jones	48.8	57.2	59.4	54.9
Keokuk	11.5	14.2	16.7	15.6
Kossuth	36.8	57.2	62.4	58.7
Lee	11.2	18.8	20.8	19.9
Linn	27.5	21.9	23.1	20.7
Louisa	16.0	11.8	11.3	10.0
Lucas	2.5	7.9	10.1	10.4
Lyon	44.6	105.5	118.6	115.9
Madison	8.7	15.8	16.2	15.4
Mahaska	25.1	51.4	55.3	53.5
Marion	17.0	17.9	23.0	21.2
Marshall	46.0	47.8	55.8	51.2
Mills	26.4	45.6	48.7	46.1
Mitchell	32.4	34.1	37.8	34.6
Monona	19.3	40.1	39.0	37.7
Monroe	1.7	2.7	3.3	3.3
Montgomery	24.5	42.2	46.8	44.6
Muscatine	18.4	20.3	23.7	21.9
O'Brien	43.5	99.0	102.9	99.6
Osceola	24.5	53.4	55.0	53.1
Page	31.3	37.1	41.1	37.9
Palo Alto	21.8	43.4	49.8	47.9
Plymouth	81.3	121.9	142.1	134.1
Pocahontas	30.1	48.6	56.5	53.4
Polk	12.5	15.6	16.0	14.7
Pottawattamie	120.0	175.1	177.6	165.7
Poweshiek	23.3	26.5	29.6	27.3
Ringgold	5.5	7.6	8.8	8.4
Sac	57.5	115.6	141.0	137.1
Scott	28.2	34.2	35.4	32.7
Shelby	54.6	82.5	89.9	84.3
Sioux	83.5	251.4	266.1	264.5
Story	29.2	39.0	39.9	37.0
Tama	43.3	49.9	57.6	53.3
Taylor	9.0	13.8	16.3	15.5
Union	6.6	11.0	12.0	11.4
Van Buren	1.2	4.2	5.3	5.5
Wapello	4.4	8.7	9.3	9.0
Warren	6.5	8.5	10.4	9.8
Washington	21.9	20.1	23.5	21.5
Wayne	3.5	10.2	12.7	12.9
Webster	15.0	21.7	26.7	25.4
Winnebago	7.7	9.0	10.5	9.7
Winneshiek	5.1	16.9	18.5	18.8
Woodbury	62.3	106.6	100.5	94.6
Worth	11.7	8.7	12.5	11.2
Wright	23.2	21.6	22.2	20.0
Total	2,565.1	3,987.1	4,360.0	4,140.4

Appendix C, Table 3. Estimated number of beef cows in 1960 and 1972 and projections for 1980 and 1985 in thousands of head, by counties, Iowa.

County	Estimated		Projected	
	1960	1972	1980	1985
Adair	23.1	38.7	54.4	62.8
Adams	15.6	23.6	34.7	39.8
Allamakee	13.8	28.7	39.1	45.8
Appanoose	15.7	30.8	41.2	48.0
Audubon	8.0	17.6	23.0	26.9
Benton	16.9	25.9	34.2	38.8
Black Hawk	4.8	7.8	11.0	12.6
Boone	7.2	11.3	14.1	16.0
Bremer	1.9	5.1	6.3	7.5
Buchanan	7.1	12.2	15.1	17.4
Buena Vista	5.1	9.3	11.9	13.6
Butler	6.1	12.0	16.8	19.5
Calhoun	8.1	10.5	13.7	15.3
Carroll	12.6	19.3	25.0	28.5
Cass	16.8	27.8	35.3	40.4
Cedar	12.2	20.0	26.9	30.8
Cerro Gordo	6.8	8.3	11.5	12.8
Cherokee	6.4	19.3	24.2	29.1
Chickasaw	7.8	14.2	18.7	21.7
Clarke	15.2	25.9	36.7	42.2
Clay	6.5	12.3	15.7	18.2
Clayton	9.6	24.4	32.5	38.7
Clinton	10.4	18.7	23.3	26.8
Crawford	14.6	32.8	45.8	54.0
Dallas	9.1	15.8	20.8	23.8
Davis	11.6	30.2	44.6	53.6
Decatur	16.6	38.3	49.0	57.6
Delaware	3.9	10.1	12.5	14.7
Des Moines	7.8	12.9	15.4	17.4
Dickinson	5.0	8.8	11.1	12.8
Dubuque	9.3	18.3	25.0	29.1
Emmet	4.3	9.1	10.6	12.2
Fayette	6.7	17.4	25.2	30.2
Floyd	5.7	9.2	13.0	14.9
Franklin	6.9	10.6	13.3	15.1
Fremont	6.5	16.1	22.3	26.4
Greene	8.3	15.9	19.1	22.0
Grundy	8.8	9.6	12.9	14.3
Guthrie	17.0	29.5	45.2	52.6
Hamilton	4.9	5.3	6.6	7.3
Hancock	6.3	7.2	8.5	9.3
Hardin	7.8	12.3	15.9	18.1
Harrison	8.0	20.1	28.6	34.0
Henry	9.3	15.3	17.5	19.8
Howard	8.0	14.1	19.4	22.4
Humboldt	3.9	2.9	3.3	3.6
Ida	7.1	13.1	15.9	18.3
Iowa	20.1	34.5	48.5	56.0
Jackson	18.2	35.1	44.2	51.0

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Appendix C. Table 3. continued

County	Estimated		Projected	
	1960	1972	1980	1985
Jasper	20.4	30.3	38.8	44.2
Jefferson	9.8	15.4	21.9	25.2
Johnson	16.1	24.6	34.5	39.4
Jones	10.6	21.3	28.6	33.5
Keokuk	14.5	25.3	33.6	38.8
Kossuth	10.1	10.6	12.5	13.6
Lee	9.0	12.6	18.5	21.0
Linn	11.7	18.2	25.2	28.8
Louisa	6.8	9.9	15.4	17.6
Lucas	13.7	32.7	45.7	54.5
Lyon	5.5	17.5	20.8	25.0
Madison	20.4	34.1	52.5	60.8
Mahaska	10.6	19.0	26.1	30.2
Marion	11.5	18.0	27.8	32.0
Marshall	13.4	20.3	27.1	30.8
Mills	5.4	10.7	14.1	16.4
Mitchell	4.4	8.5	9.8	11.4
Monona	6.0	14.8	21.0	25.0
Monroe	13.0	29.0	39.3	46.5
Montgomery	8.1	16.8	24.9	29.2
Muscatine	8.5	15.1	18.8	21.7
O'Brien	4.4	8.5	10.7	12.5
Osceola	3.4	5.2	6.2	7.1
Page	12.5	24.6	33.3	38.8
Palo Alto	4.2	6.9	8.1	9.1
Plymouth	10.9	24.5	33.4	39.2
Pocahontas	5.9	5.7	6.8	7.4
Polk	6.2	8.8	14.4	16.5
Pottawattamie	10.8	24.3	31.2	36.7
Poweshiek	19.1	29.2	40.5	46.3
Ringgold	17.2	37.7	49.5	58.0
Sac	9.8	19.5	24.9	28.9
Scott	6.1	9.5	13.3	15.2
Shelby	10.8	24.2	30.9	36.4
Sioux	2.8	9.1	10.3	12.3
Story	5.3	5.9	8.4	9.4
Tama	19.2	27.9	37.8	42.8
Taylor	19.0	33.4	48.8	56.7
Union	15.9	29.9	40.3	46.8
Van Buren	12.8	25.7	35.1	41.1
Wapello	9.2	17.7	24.1	28.1
Warren	15.5	27.3	37.4	43.3
Washington	9.8	15.7	23.2	26.7
Wayne	17.2	41.4	52.1	61.5
Webster	8.2	8.5	10.8	11.9
Winnebago	3.0	2.8	4.1	4.5
Winneshiek	12.3	26.3	36.5	42.9
Woodbury	8.4	27.5	37.3	45.3
Worth	4.1	4.6	7.0	7.7
Wright	5.5	5.0	7.0	7.7
Total	992.6	1,810.2	2,440.0	2,830.0

Appendix C. Table 4. Estimated number of milk cows in 1960 and 1972 and projections for 1980 and 1985 in thousands of head, by counties, Iowa.

County	Estimated		Projected	
	1960	1972	1980	1985
Adair	6.9	2.3	1.8	1.5
Adams	4.8	0.6	0.5	0.4
Allamakee	27.7	20.7	16.2	14.8
Appanoose	5.7	1.5	1.0	0.8
Audubon	7.3	3.0	2.6	2.2
Benton	9.4	4.7	3.3	2.9
Black Hawk	15.5	7.5	5.4	4.7
Boone	4.6	0.6	0.5	0.4
Bremer	24.7	14.9	11.9	10.7
Buchanan	17.8	8.7	6.3	5.5
Buena Vista	4.6	1.4	1.2	1.0
Butler	17.9	7.8	6.4	5.5
Calhoun	4.9	0.7	0.5	0.4
Carroll	7.8	2.2	1.9	1.6
Cass	5.1	2.0	1.3	1.2
Cedar	10.4	3.8	3.0	2.6
Cerro Gordo	7.4	1.6	1.3	1.1
Cherokee	6.0	2.6	1.9	1.6
Chickasaw	16.5	10.7	7.9	7.0
Clarke	3.3	0.7	0.6	0.5
Clay	5.3	1.9	1.5	1.3
Clayton	38.2	30.9	23.0	21.0
Clinton	11.5	5.9	4.6	4.0
Crawford	12.5	4.3	3.3	2.8
Dallas	4.7	0.9	0.6	0.5
Davis	7.7	3.4	2.1	1.8
Decatur	5.6	1.6	1.1	0.9
Delaware	31.3	24.7	18.7	17.1
Des Moines	3.5	0.7	0.5	0.4
Dickinson	4.7	1.8	1.3	1.1
Dubuque	34.5	29.5	22.2	20.4
Emmet	4.4	1.0	0.8	0.7
Fayette	34.5	21.4	16.5	14.7
Floyd	8.6	3.4	2.5	2.2
Franklin	11.5	3.1	2.1	1.8
Fremont	1.9	0.4	0.3	0.2
Greene	4.0	0.3	0.3	0.2
Grundy	9.8	4.2	3.2	2.8
Guthrie	7.0	2.1	1.5	1.3
Hamilton	4.3	0.5	0.4	0.3
Hancock	9.2	3.2	2.2	1.8
Hardin	7.4	1.7	1.3	1.1
Harrison	6.3	1.6	1.3	1.0
Henry	4.7	1.1	0.6	0.5
Howard	16.2	10.8	8.5	7.7
Humboldt	4.7	1.4	0.9	0.8
Ida	4.5	2.0	1.3	1.1
Iowa	9.1	3.2	2.4	2.0
Jackson	17.5	14.3	10.5	9.6

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Appendix C. Table 4. continued

County	Estimated 1960	Estimated 1972	Projected 1980	Projected 1985
Jasper	11.5	4.7	3.5	3.0
Jefferson	4.3	1.1	0.7	0.6
Johnson	7.0	3.4	2.3	2.0
Jones	16.7	8.9	6.5	5.7
Keokuk	7.0	1.7	1.3	1.1
Kossuth	13.6	4.1	3.5	3.0
Lee	6.7	3.3	2.3	2.0
Linn	16.0	8.5	5.8	5.0
Louisa	2.5	0.3	0.2	0.2
Lucas	4.1	0.7	0.5	0.4
Lyon	13.4	9.4	7.2	6.5
Madison	5.0	0.9	0.7	0.5
Mahaska	7.9	3.1	2.5	2.2
Marion	8.4	3.5	2.5	2.1
Marshall	7.2	1.5	1.2	1.0
Mills	2.8	0.5	0.4	0.3
Mitchell	11.2	7.5	5.7	5.1
Monona	4.6	1.3	0.9	0.7
Monroe	3.9	1.3	0.9	0.8
Montgomery	4.9	1.2	0.9	0.7
Muscatine	7.1	2.6	1.9	1.6
O'Brien	8.9	5.1	3.7	3.3
Osceola	7.1	4.5	3.4	3.1
Page	5.0	1.4	0.9	0.7
Palo Alto	5.6	1.8	1.3	1.1
Plymouth	9.6	4.6	3.5	3.1
Pocahontas	5.6	0.9	0.6	0.5
Polk	5.9	1.0	0.7	0.5
Pottawattamie	7.9	2.0	1.5	1.2
Poweshiek	8.2	3.0	2.2	1.9
Ringgold	5.5	1.8	1.3	1.1
Sac	8.1	2.8	2.4	2.0
Scott	10.6	4.1	2.9	2.5
Shelby	9.9	3.5	2.8	2.4
Sioux	20.8	15.7	11.2	10.1
Story	6.3	1.6	0.9	0.8
Tama	7.9	3.1	2.6	2.3
Taylor	6.5	1.1	0.8	0.6
Union	4.9	0.8	0.5	0.4
Van Buren	4.6	0.9	0.7	0.6
Wapello	4.3	0.7	0.6	0.5
Warren	7.4	2.8	1.9	1.6
Washington	5.5	1.6	1.0	0.9
Wayne	6.6	2.0	1.3	1.1
Webster	5.1	0.8	0.6	0.4
Winnebago	8.0	2.5	2.1	1.8
Winneshiek	36.8	28.0	21.7	19.8
Woodbury	6.8	2.4	1.7	1.5
Worth	6.8	2.3	1.8	1.6
Wright	6.4	0.9	0.8	0.7
Total	941.8	452.5	340.0	300.0

APPENDIX D: EQUATIONS

Equation 1. Hogs marketed.

Hogs marketed in each county were estimated by the following equation:

$$L_{3it} = PC_{it} \left[1 - \left(\frac{DS_t}{PCS_t} - \frac{IS_t}{PCS_t} \right) \right]$$

Where:

L_{3it} denotes hogs marketed for county i in year t; PC_{it} denotes county pig crop in year t; PCS_t denotes pig crop in the state in year t; DS_t denotes pig deaths in the state, year t; and IS_t denotes shipments of pigs into the state, year t.

Equation 2. Corn sales.

The equation for estimating commercial corn sales in each county was as follows:

$$CS_{it} = CP_{i(t-1)} - \left[\sum_{k=1}^{7} (L_{kit}) (FR_{kit}) - .5 (OP_{it} - OS_{it}) \right]$$

Where:

CS_{it} denotes corn sales for county i, year t; $CP_{i(t-1)}$ denotes corn production for county i, year t-1; L_{kit} denotes number of the kth class of livestock in county i, year t (index k varies from 1 to 7 and denotes milk cows, beef cows, hogs marketed, grain-fed cattle marketed, sheep and lambs marketed, hens and pullets, and turkeys raised); FR_{kit} denotes corn feeding rates to each class of livestock in county i, year t; OP_{it} denotes oat production for county i, year t; and OS_{it} denotes oat sales for county i, year t.

Equation 3. Oat sales.

Commercial oat sales in each county were estimated by the following equation:

$$OS_{it} = OP_{i(t-1)} \left[\frac{OS_{i\ 1964}}{OP_{i\ 1964}} \quad (A) \right]$$

Where:

$$A = \frac{\frac{OS_{st}}{OP_{st}}}{\frac{OS_{s\ 1964}}{OP_{s\ 1964}}}$$

Where:

OS_{it} denotes oat sales for county i, year t; $OP_{i(t-1)}$ denotes oat production for county i, year t-1; $OS_{i\ 1964}$ denotes oat sales for county i in 1964; $OP_{i\ 1964}$ denotes oat production for county i in 1964; OS_{st} denotes oat sales for the state in year t; OP_{st} denotes oat production for the state in year t; $OS_{s\ 1964}$ denotes oat sales for the state in 1964; and $OP_{s\ 1964}$ denotes oat production for the state in 1964. This equation was based on 1964 data, because 1964 was the last year in which oat sales were published by county.

Equation 4. Soybean sales.

Soybean sales were estimated by the following equation:

$$SS_{it} = SP_{i(t-1)} \left[1 - \frac{1}{SY_{i(t-1)}} \right]$$

Where:

SS_{it} denotes soybean sales for county i, year t; $SP_{i(t-1)}$ denotes soybean production for county i, year t-1; and $SY_{i(t-1)}$ denotes soybean yield for county i, year t-1.

Equation 5. Iowa's share of U. S. grain and livestock production.

Iowa's historical shares of U. S. grain and livestock production were computed by the equation:

$$A. \quad IaSh_{kt} = \frac{IaP_{kt}}{U.S.\ P_{kt}}$$

Iowa's share was projected by a nonlinear trend to 1979-80 and 1984-85 by the following equation:

$$B. \quad IaSh_{kt} = \alpha t^{\beta}$$

Where:

$IaSh_{kt}$ denotes Iowa's share of class k of grain or livestock, year t (k varies from 1 to 10 and denotes corn, soybeans, oats, milk cows, beef cows, hogs marketed, grain-fed cattle, sheep and lambs, hens and pullets, and turkeys); IaP_{kt} denotes Iowa's production of class k in year t; U.S. P_{kt} denotes U. S. production of class k in year t. α and β are regression coefficients and t denotes time in years.

Equation 6. County shares of Iowa grain and livestock production.

County historical shares of Iowa grain and livestock production were computed by the equation:

$$A. \quad CoSh_{kit} = \frac{CoP_{kit}}{\sum_{i=1}^{99} CoP_{kit}}$$

The county shares were projected by a nonlinear trend to 1979 and 1984 by the following equation:

$$B. \quad CoSh_{kit} = \alpha t^{\beta}$$

Where:

$CoSh_{kit}$ denotes the county's share of the kth class of grain or livestock for county i, year t (index k varies from 1 to 10 and denotes corn, soybeans, oats, milk cows, beef cows, hogs marketed, grain-fed cattle, sheep and lambs, hens and pullets, and turkeys); and CoP_{kit} denotes the production of the kth class of grain for county i, year t. α and β are regression coefficients and t denotes time in years.

Equation 7. Silage acres.

The three equations used to estimate silage acres were:

$$A. \quad SilY_{it} = \frac{CY_{it}}{6.5 \text{ bu./ton}}$$

$$B. \quad SilR_{it} = 5\,(MC_{it}) + Y_i(GFC_{it})$$

$$C. \quad SilA_{it} = \frac{SilR_{it}}{SilY_{it}}$$

Where:

$SilY_{it}$ denotes silage yield in county i, year t; CY_{it} denotes corn yield in county i, year t; $SilR_{it}$ denotes the total tons of silage required in county i, year t; MC_{it} denotes the number of milk cows in county i, year t; Y_i denotes the 1970-72 average silage feeding rate per head of grain-fed cattle in county i; GFC_{it} denotes the number of grain-fed cattle in county i, year t; $SilA_{it}$ denotes silage acreage required in county i, year t.

Equation 8. Reallocation procedure.

The acreage and grain production reallocation procedure was an iterative process consisting of the systematic use of equations A, B and C for the reallocation of row crops. Equations D and E were used in an iterative process for the reallocation of oat acres and oat production.

Equations for the acreage and grain production reallocation procedure were as follows:

A. If: $CA(1)_{it} + SilA(1)_{it} + SA(1)_{it} > TARCA_i$

Then:

1. $$CA(2)_{it} = CA(1)_{it} - \left[\frac{CA(1)_{it} + SilA(1)_{it}}{TNRCA(1)_{it}} \quad (TNRCA(1)_{it} - TARCA_i)\right]$$

2. $$SA(2)_{it} = SA(1)_{it} - \left[\frac{SA(1)_{it}}{TNRCA(1)_{it}} \quad (TNRCA(1)_{it} - TARCA_i)\right]$$

3. $SilA(3)_{it} = SilA(1)_{it}$

Otherwise:

4. $CA(2)_{it} = CA(1)_{it}$

5. $SA(2)_{it} = SA(1)_{it}$

6. $SilA(3)_{it} = SilA(1)_{it}$

Where:

$CA(1)_{it}$ denotes the initial estimate of corn acres in county i, year t; $SilA(1)_{it}$ denotes the initial estimate of silage acres in county i, year t; $SA(1)_{it}$ denotes the initial estimate of soybean acres in county i, year t; $TARCA_i$ denotes the total available row crop acres in county i; $CA(2)_{it}$ denotes the adjusted corn acreage for county i, year t; $TNRCA(1)_{it}$ denotes the initial estimate of the total needed row crop acres in county i, year t, which equals $CA(1)_{it} + SA(1)_{it} + SilA(1)_{it}$; $SA(2)_{it}$ denotes the adjusted soybean acreage

in county i, year t: and $SilA(3)_{it}$ denotes the unadjusted and final estimate of silage acres in county i, year t.

$$B.\quad CP(2)_{it} = CP(1)_{it} + \frac{CP(1)_{it}}{\sum_{i=1}^{99} CP(1)_{it}} \left[CP(1)_{it} - CA(2)_{it}\, CY_{it} \right]$$

$$C.\quad SP(2)_{it} = SP(1)_{it} + \frac{SP(1)_{it}}{\sum_{i=1}^{99} SP(1)_{it}} \left[SP(1)_{it} - SA(2)_{it}\, SY_{it} \right]$$

Where:

$CP(2)_{it}$ denotes adjusted corn production in county i, year t; $CP(1)_{it}$ denotes the initial estimate of corn production in county i, year t; $CA(2)_{it}$ denotes the adjusted corn acreage for county i, year t; and CY_{it} denotes the corn yield for county i, year t.

Equation C has the same notation as B except S which denotes soybeans replaces C which denotes corn in Equation B.

$$D.\quad \text{If: } OA(1)_{it} > TCA_i - TNRCA(3)_{it}$$

$$\text{Then: } OA(2)_{it} = TCA_i - TNRCA(3)_{it}$$

$$\text{Otherwise: } OA(2)_{it} = OA(1)_{it}$$

Where:

$OA(1)_{it}$ denotes the initial estimate of oat acres in county i, year t; TCA_i denotes total crop land available in county i; $TNRCA(3)_{it}$ denotes the final estimate of the total needed row crop acres in county i, year t; and $OA(2)_{it}$ denotes the adjusted oat acreage for county i, year t.

$$E.\quad OP(2)_{it} = OP(1)_{it} + \frac{OP(1)_{it}}{\sum_{i=1}^{99} OP(1)_{it}} \left[OP(1)_{it} - OA(2)_{it}\, OY_{it} \right]$$

Where:

$OP(2)_{it}$ denotes adjusted oat production in county i, year t; $OP(1)_{it}$ denotes the initial estimate of oat production in county i, year t; $OA(2)_{it}$ denotes the adjusted oat acreage for county i, year t; and OY_{it} denotes the oat yield in county i, year t.