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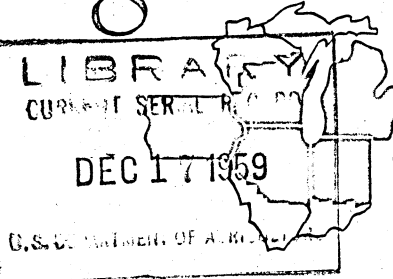
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# Agricultural Letter



Number 537

**TECHNOLOGICAL CHANGE** has had a great impact on agriculture in the past two decades. One example of the advances in crop technology is the progressive and rapid rise in yield per acre of feed grains. Corn yields have gone from an average of 36 bushels per acre in 1947-49 to about 52 bushels the past two years. Yields of sorghum grains have increased from 19 bushels per acre to about 36 bushels. Smaller increases have taken place in yields of barley, oats, soybeans and wheat. For the four major feed grains (corn, oats, barley and sorghum grains), combined yields per harvested acre in 1958-59 were 37 per cent higher than in 1947-49 and about 52 per cent above the 1940-42 level.

Increased fertilizer use is, of course, one of the major factors. Figures presented by the USDA at the Annual Outlook Conference in November show that: "From 1947 to 1954, the amount of nitrogen used on corn, oats and barley increased by 208 per cent. The increase for P<sub>2</sub>O<sub>5</sub> was 55 per cent; for potash, it was 148 per cent. In 1954, fertilizers were used on 60 per cent of the acreage of corn, 31 per cent of the oats, 27 per cent of the barley and grain sorghums and only 18 per cent of the soybeans. At 1954 fertilizer rates and with the crop yields of that year, it is estimated that use of fertilizer (as compared with no fertilizer at all) was responsible for increases in yield as follows: 23 bushels per acre of corn fertilized, 19 bushels per acre for oats, 13 bushels per acre for barley, almost 8 bushels per acre for soybeans and grain sorghums and 16.5 bushels for wheat."

If the trend of yields from 1940 to date were continued to 1965, yields per acre would increase an additional 15 per cent. However, a committee of USDA scientists projected an over-all increase of about half the historical rate, assuming normal weather and further adoption of presently known technology.

Historical and Projected Yields per Acre Harvested

Year	All corn		Barley	Sorghum grains		Wheat	Soybeans for beans
	Oats	(bushels)		Wheat	(bushels)		
1947-49	36.3	33.5	25.5	19.2	16.8	19.9	
1954-58	44.5	37.8	29.2	26.2	21.4	22.0	
1958.	51.7	44.7	31.6	36.7	27.3	24.2	
1959.	52.2	37.3	27.1	36.9	21.0	24.0	
1965 <sup>1/</sup>	51.0	39.0	32.0	32.0	23.0	24.0	

<sup>1/</sup> Preliminary projection for 1965 made by a committee of Agricultural Research Service scientists, USDA. They assumed acreages for harvest as in 1959 and continued adoption of known practices.

Some scientists feel these projections are too low. In the case of corn, one team of researchers projects a

possible yield of 59 bushels by 1965 if 75 per cent of the acreage were fertilized at an average rate of 60 pounds of nitrogen per acre. This is well above the 52 bushels this year and the 51 bushel projection.

Total livestock production, however, depends not only on production of feed grains but also on the efficiency of feed conversion into meat and other animal products. Some improvement has been made in average feed conversion efficiency; but except for broilers and turkeys, it has been modest. Some experimental results show the potential effects of technological change in this field. "In beef-feeding experiments, it has been found possible to produce 1 pound liveweight gain with 5.6 pounds of feed. But at the national average level, about 8 pounds are used. In experiments, using pelleted feeds, stilbestrol and antibiotics, lambs have been fed to produce 1 pound of gain with 4 pounds of feed. This compares with a national average ratio of 1 pound of gain to 10 of feed. Under experimental conditions, hogs can be fed to produce a pound of gain with less than 3-1/2 pounds of feed including feed consumed by the breeding herd. But under farm conditions, the average is almost 5-1/3 pounds."

For the future, the USDA people expect "beef output per pound of feed to increase by about one-half of 1 per cent a year. Milk and pork output per unit of feed probably will increase by about 1 per cent a year. For eggs, feed efficiency might increase by about 1-1/2 per cent a year. By 1965, improvements in feed efficiency might result in an over-all reduction in feed-grain requirements per animal unit of between 3 and 4 per cent. This would add about 4-1/2 million tons to feed supplies or reduce acreages of feed grains needed by about 5 million acres."

Just using the possible improvements in yields and ignoring possible gains in efficiency in livestock production, total meat production could expand greatly. The speaker at the USDA Conference expressed the possibility this way: "...if acreages of wheat and feed-grain were held at present levels and stocks were not allowed to increase further, enough livestock could be fed so that per capita consumption of red meats would go up from 157.5 pounds in 1959 to about 180 pounds in 1965, and at this level, livestock prices would surely be in trouble."

Research Department

FARM BUSINESS CONDITIONS

October 1959, with comparisons

I T E M S	1959		1958
	October	September	October
<b>PRICES:</b>			
Received by farmers (1947 - 49 = 100) . . . . .	87	88	92
Paid by farmers (1947 - 49 = 100) . . . . .	118	119	118
Parity price ratio (1910 - 14 = 100) . . . . .	79	80	85
Wholesale, all commodities (1947 - 49 = 100) . . . . .	119	120	119
Paid by consumers (1947 - 49 = 100) . . . . .	126	125	124
Wheat, No. 2 red winter, Chicago (dol. per bu.) . . . . .	1.96	1.94	1.92
Corn, No. 2 yellow, Chicago (dol. per bu.) . . . . .	1.15	1.22	1.21
Oats, No. 2 white, Chicago (dol. per bu.) . . . . .	.74	.70	.63
Soybeans, No. 1 yellow, Chicago (dol. per bu.) . . . . .	2.14	2.09	2.11
Hogs, barrows and gilts, Chicago (dol. per cwt.) . . . . .	13.07	13.87	19.08
Beef steers, choice grade, Chicago (dol. per cwt.) . . . . .	27.19	27.62	26.67
Milk, wholesale, U.S. (dol. per cwt.) . . . . .	4.54	4.36	4.46
Butterfat, local markets, U.S. (dol. per lb.) . . . . .	.60	.60	.59
Chickens, local markets, U.S. (dol. per lb.) . . . . .	.14	.14	.15
Eggs, local markets, U.S. (dol. per doz.) . . . . .	.32	.33	.38
Milk cows, U.S. (dol. per head) . . . . .	228	233	220
Farm labor, U.S. (dol. per week without board) . . . . .	42.00	--	42.25
Factory labor, U.S. (dol. earned per week) . . . . .	89.06	89.47	85.17
<b>PRODUCTION:</b>			
Industrial, physical volume (1947 - 49 = 100) . . . . .	148	149	138
Farm marketings, physical volume (1947 - 49 = 100) . . . . .	174	147	177
<b>INCOME PAYMENTS:</b>			
Total personal income, U.S. (annual rate, bil. of dol.) . . . . .	382	381	364
Cash farm income, U.S. <sup>1</sup> (annual rate, bil. of dol.) . . . . .	--	32	33
<b>EMPLOYMENT:</b>			
Farm (millions) . . . . .	6.1	6.2	6.4
Nonagricultural (millions) . . . . .	60.7	60.1	58.9
<b>FINANCIAL (District member banks):</b>			
Demand deposits:			
Agricultural banks (1955 monthly average = 100) . . . . .	105.2	104.5	110.6
Nonagricultural banks (1955 monthly average = 100) . . . . .	103.9	105.0	102.4
Time deposits:			
Agricultural banks (1955 monthly average = 100) . . . . .	129.9	129.7	123.0
Nonagricultural banks (1955 monthly average = 100) . . . . .	125.6	125.4	123.1
<sup>1</sup> Based on estimated monthly income.			

Compiled from official sources by the Research Department, Federal Reserve Bank of Chicago