

Farmers' Efficiency: The Sky's No Limit

The 1950's and the 1960's saw new technologies make computers our modern-day oracles, space satellites our manmade moons.

But despite the sensation of these achievements, progress in agriculture, man's oldest

science, came close to outstripping strides in other sciences during those years—though agricultural gains received far less attention.

To understand why agricultural technology gained so much so quickly, it's necessary to

take two interrelated factors into account: the halving of the farm population and the rapid adoption of new ways of doing things which resulted in drastic changes in the mix of farm inputs.

One way of roughly measuring how much agriculture progressed: the headcount method.

Back in 1950, one U.S. farmworker produced enough food and fiber for himself and 15 other people. Two of these people lived abroad and were supplied by our exports.

In 1971, one U.S. farmworker produced enough for 47 other people—7 lived abroad.

Population shifts put a premium on laborsaving farm technology.

By 1971 farm numbers had sunk to less than 3 million, about half as many as in 1950. Farmworker numbers more than halved over the same decades, standing at just under 4½ million in 1971, compared with 1950's 10 million. Farm operators and their families generally account for about three-fourths of the farm working force.

The exodus from the farm and increased wage rates were important incentives in the rapid adoption of new laborsaving technology during the 1950's and 1960's.

Technological advances are hardly new to U.S. agriculture but the speed with which farmers embraced them was.

In the past two decades farmers accepted far more quickly than in the past the new seeds, machines, and production and management systems that would increase their output and save labor.

For example, it took far longer for hybrid corn to catch on with farmers than it took for hybrid sorghums.

Hybrid corn seed became commercially available in 1933, and yields then were about 23 bushels per acre. By 1950 about three-fourths of all corn acres were seeded with hybrids and yields averaged 38 bushels an acre. Now virtually all acres are planted to hybrids. Average yield in 1971 was 87 bushels.

Improved and larger planting equipment, along with mechanical harvesting, reduced the man-hours required to produce 100 bushels of corn from 40 hours in 1950 to 7 in 1971.

Farmers quickly accepted hybrid sorghum which appeared in the mid-1950's, shifting almost completely to the new varieties within 5 years. Yields have gone from 21 bushels in 1950 to about 54 nowadays.

The higher yielding hybrids also encouraged sorghum growers to increase irrigation with over a third of present-day acreage watered compared with 15 percent in prehybrid days.

In all, the adoption of new technologies increased crop output per acre over 55 percent between 1950 and 1971.

Livestock labor efficiency also benefited during the two decades. Total hours of labor to produce milk, meat and eggs fell from 1950's 5.5 billion to 2.3 billion in 1971.

For example, poultry and egg production doubled while labor needs in the poultry industry declined more than two-thirds. Meat animal production increased by 50 percent, but labor to produce meat animals was off about one-third.

Farm inputs remained about the same overall during the two decades but the mix changed drastically.

Purchased inputs gained nearly 50 percent in 1950 totals. In the mechanical category, it wasn't just an increase in numbers, machines that could do more work were constantly introduced.

Consider tractors. Tractor numbers increased over one-third while horsepower more than doubled. While 1950's average tractor had 27 hp., 1971's had 45 hp. Distributed over the farm labor force, each farmworker had 47 hp at his disposal in 1971, compared to 10 in 1950. Along with increased tractor

power came improvements in other types of machinery. For example, the self-propelled combine sported a cutting edge of 7 feet as the 1950's began. The 1970 models cut up to 25 feet.

In 1954 the introduction of the picker-sheller head permitted the combine to enter the cornfields. In 1970, a good harvest rate was 10 bushels per minute, picked and shelled, from an eight-row head.

Other purchased inputs that have gone up since 1950 include fertilizer and pesticides, each up five times, and mixed feeds, whose use more than doubled.

The labor input obviously declined drastically and rapidly. It took 15.1 billion hours to produce the 1950 agricultural output. In 1971, man-hours had plunged 57 percent to 6.5 billion.

Cropland harvested declined just 10 percent during the 1950's and remained rather stable through 1970. Cropland harvested rose somewhat during 1971. This year it returned to the level of the past decade. The reduction in farm numbers was nearly offset by the 83-percent expansion in average farm size from 213 to 389 acres.

Agriculture will continue to become more productive but the experts at USDA expect things to slow a bit from the lightning pace of the past two decades.

Comparisons between optimum crop yields and average yields suggest that future national crop production could improve without the introduction of any new technologies.

For example, the best corn farmers are now obtaining yields of 150 to 200 bushels per acre and cotton variety yield tests show yields 50 percent greater than the average farmer is obtaining. National averages stand at 87 bushels for corn and 438 pounds for cotton.

We have been discussing changes during the last two decades but what happened between 1970 and 1971? Farm output per hour of farm labor continued to climb during 1971, gaining 11 percent for crops and 8 percent for livestock over the previous year.

The inputs remained about the same in both 1970 and 1971 but these produced 9 percent more in 1971 than in 1970 due to better than average growing conditions, increased use of available farm resources, especially land, and greater application of improved technology.

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