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CROP PRODUCTION EFFICIENCY INCREASES

The amount of labor needed for the production of the major crops in the United States has decreased markedly in the last decade, according to Robert C. McElroy, Agricultural Economist with the Ecomonic Research Service. Greater crop production efficiency has resulted from higher per acre yields obtained with less labor.

In 1953 the Nation's farmers used 5.2 billion man-hours to produce field crops. A decade later, 40 percent fewer man-hours were needed. The average number of man-hours used per acre declined for all major crops except tobacco, which still requires much hand labor.

The earliest statistics available on labor used for field crops indicate that the 1960-63 decline in the number of man-hours per acre marks the continuation of a long-time trend. Estimates of man-hours used per acre for cotton, corn, and wheat at various periods of the 19th century show that labor requirements decreased throughout the century. Annual data beginning in 1910 show that the decline has continued during the 20th century for these three crops, as well as for most other field crops.

The greatest part of the saving in labor is a reflection of increased use of machinery in the last decade. Despite the reduction in the number of farms, there has been an increase in the number of tractors, corn pickers, pick-up balers, field forage harvesters, elevators, and trucks.

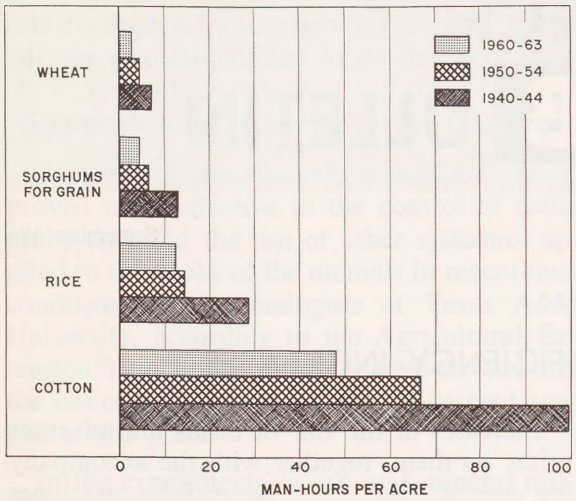
Increases in the size of farms and of enterprises on them, together with the accompanying use of more and larger farm machines, have reduced the time required for many operations. Wider use of improved seeding and tillage equipment, herbicides, and flame cultivation; increased use of airplanes for spreading pesticides; and improvements in irrigation equipment and other technological innovations have also contributed substantially to labor savings.

The effect of advances in mechanization on man-hours per acre has varied among the field crops. For example, during the last decade, the average time for producing rice declined 2 man-hours per acre, from 14.5 to 12.5 man-hours, and time for producing peanuts decreased 14.1 man-hours per acre, from 36.4 to 22.3. The difference in rate of decline during this period results primarily from the differences in the timing and rate of mechanizing the harvest. Eighty percent of the rice crop was combined in 1950; thus, the major impact of the combine on labor for rice harvesting had already taken place. In contrast, only 20 percent of the peanut crop was combined in 1950, and the proportion had risen to 76 percent by 1959.

Along with the advances in mechanization, which reduced the amount of labor required per acre, there were improvements in, and greater use of, such yield-increasing factors as fertilizers, pesticides, and high-yielding and disease-resistant crop varieties. The combined

FEDERAL RESERVE BANK OF DALLAS
DALLAS, TEXAS

LABOR USED TO PRODUCE FIELD CROPS



SOURCE: U.S. Department of Agriculture.

impact of declining labor requirements and higher yields greatly increased the productivity of labor used.

In addition to averages for the United States, numbers of man-hours of labor used per acre of field crops in each state are presented in a recent ERS report. The estimates for 1959 show wide variations among states and regions in man-hours used per acre of the same crop. These differences may be attributed to several factors, such as the size of fields, extent of irrigation, and harvesting methods. The man-hours of labor included in the report are direct labor inputs. Time for repairing machinery or buildings, mending fences, making business trips, keeping records, or any other type of overhead work is not included.

The accompanying chart shows labor used to produce four important southwestern field crops for selected periods.

New Multipurpose Van

Researchers in the Agricultural Marketing Service have developed a design concept for a multipurpose van container that could reduce shipping costs for many agricultural products, according to the U. S. Department of Agriculture. The van container can be used to haul both frozen and nonfrozen perishable commodities, as well as nonrefrigerated cargo. In moving farm products to consumers, the new multipurpose van can also be used to carry freight by rail (piggyback), highway, water (fishy-back), and perhaps air.

The USDA says that savings in shipping costs for perishable products would be possible with the new vans because, for the first time, it would be economically feasible to ship nonrefrigerated freight in a van designed for refrigerated products. More complete utilization of the refrigerated van will help to lower the transport cost of both types of freight.

The initial cost of the new vans is expected to be higher than that for conventional refrigerated vans. However, in as little as a year's time, the higher initial cost would be more than offset by the greater versatility of the van, according to the USDA.

Silage Storage

Research conducted at Beaumont and College Station, Texas, during 1957-63 resulted in the development of practical methods for ensiling clovers and grasses during weather that is unfavorable for haying, according to the Texas Agricultural Experiment Station. In the Gulf Coast area of Texas, the peak output of pasture forage occurs in the spring, when high humidity and frequent rains hinder field processing of hay. Since this production usually exceeds grazing requirements at the time, ensiling is a practical way to preserve the excess for use during periods of low forage output.

The addition of zinc bacatracin to forage at the time of ensiling reduced dry matter losses in direct-cut clover silage. However, preservatives used in these tests were not effective in reducing dry matter losses in high-moisture (80 percent) sorghum silage.

The silos used were aboveground types, designed for low-cost preservation of silage. Covered bunker and stack silos proved to be economical and practical storage facilities that offered flexibility in locating the silos for efficient management practices.

A 4- to 6-inch layer of sawdust spread uniformly over the surface of a plastic film cover eliminated top spoilage in both types of silos. Tight sidewalls were effective in preventing

spoilage on the sides in bunker silos. Side spoilage was never completely eliminated in stack silos but was greatly reduced when the edges of the plastic cover were sealed airtight.

In the studies, self-feeding from bunker and stack silos was a practical and laborsaving method of feeding silage when a concrete floor was used and the maximum depth of the silage was 6 feet. For self-feeding on a 24-hour-a-day basis, 4 to 6 inches of feeding space per animal were adequate.

Annual costs for harvesting, filling the silo, and storing each ton of feedable silage amounted to $4.80 for a 20- by 90-foot bunker silo with a concrete floor and preservative-treated lumber walls, compared with $6.54 for the same size stack silo with a concrete floor and no walls and $5.40 for stack silos with a concrete floor and temporary walls. Bunker and horizontal stack silos are relatively inexpensive and are considered practical for the Gulf Coast area of Texas, according to the experiment station.

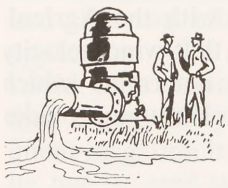
Costs of feeding silage per animal unit per day averaged 1.5 cents for self-feeding from one end of the silo, 12.4 cents for two different methods of hand feeding, and 9.0 cents for mechanical feeding. Silage was hauled 5 miles in the mechanical feeding tests, compared with 0.5 mile for the hand-feeding methods. Based on a hauling distance of 0.5 mile, the daily cost for mechanical feeding would be approximately 5.8 cents per animal unit.

Dry Poultry Houses

In many commercial egg operations, three or four birds are now being housed in the same amount of space in which one bird was kept a decade ago, points out the Texas Agricultural Extension Service. With the increased poultry population in laying houses, moisture control — especially in droppings — becomes a major problem. Because of the expense involved, very few attempts have been made to control humidity in poultry houses.

Texas A&M University researchers are conducting studies to determine which strains of birds, if any, will produce drier droppings and yet maintain present egg production levels. The specialists have found that water consumption and moisture in droppings are genetically related to different strains of birds and that poultry can be bred for different water consumption and excretion rates. However, additional research will be necessary in order to determine the relationship between water excretion levels in birds and their economic performance traits, says Dr. J. H. Quisenberry, Head of the Poultry Science Department at Texas A&M University.

Less Irrigation Water for Grain Sorghums



If irrigations are timed carefully, farmers in the Southern Great Plains can obtain favorable grain sorghum yields during most years with a limited supply of irrigation water, reports the U. S. Department of Agriculture. Experiments conducted at Bushland, Texas, showed that irrigation water could be restricted to one-half the amount required for maximum yield and yet produce a grain yield within 16 percent of the maximum.

In the experiments, plots receiving only two irrigations — 3 inches of water at plant emergence and 4 inches at the milk stage of grain development — produced 6,420 pounds of sorghum grain per acre. With four irrigations, using a total of 15 inches of water, the grain yield was 7,640 pounds per acre.

These yields were obtained on plots planted with RS-610 hybrid sorghum in two 12-inch rows on 40-inch-wide shallow beds. The soil in the plots was Pullman silty clay loam.

Irrigated grain sorghum is grown on 40 percent of the irrigated acreage of the Southern Great Plains, an area where the water table in wells has declined an average of 2.07 feet annually during the past 5 years. If farmers are to maintain their present irrigated acreage, declining groundwater supplies will have to be used more efficiently, according to the USDA.

In deciding when to apply a limited amount of irrigation water, farmers should consider

the stage of plant development, soil moisture, and probable seasonal rainfall. Water application should be timed to meet the critical moisture needs of the plants during the heading stage through grain development.

Soil Ridges Restrict Wind Erosion

Damage to farmland from wind erosion can be minimized by combining recommended conservation practices with the use of soil ridges that are 2 to 4 inches in height, reports the U. S. Department of Agriculture. Ridges of this height, placed at right angles to prevailing winds, have proved more effective in cultivated fields than either higher or lower ridges. Dean V. Armbrust, Soil Scientist with the Agricultural Research Service, says that wind velocity and cloddiness of the soil determine which height within the 2- to 4-inch range provides maximum protection.

Farmers can minimize wind erosion damage to crops by seeding in furrows protected by ridges of the proper height, placed at right angles to prevailing winds, in combination with tillage practices that leave clods on the soil surface or incorporate stubble, stalks, or straw in the topsoil. In order to prevent soil blowing, similar ridging should also be used in emergency tillage. Mr. Armbrust says that ridges ordinarily are less erodible than smooth surfaces because they trap soil particles and decrease average wind velocity.

Flying Vealers

The recent successful trial of calf cartons — a new technique for airlifting U. S. calves — points to sizeable exports of U. S. veal to Europe, provided air transport rates can be lowered to make U. S. livestock competitively priced. According to the Foreign Agricultural Service, the experiment also offers possibilities for worldwide exports of U. S. breeding calves.

In the trial, three 20-day-old Holsteins in two specially constructed cartons were placed aboard a passenger jetliner and flown nonstop from New York's Kennedy International Airport to Milan, Italy —a distance of 4,000 miles. Although fatigued from the 6½-hour trip, the calves arrived in excellent condition.

According to the FAS, cartons provide a convenient and economical way to airlift livestock. Inexpensive construction permits one-time use of the cartons, which are made of a patented heavy-duty cardboard. When shipped in a passenger plane, calves in cartons require no special care or handling and can be easily moved on pallets like any other cargo.

Europe's meat shortage, which began early this year, has set off a global search for all types of meat. However, the consumer preference traditionally is for veal — the meat of milk-fed calves, which, in Europe, are slaughtered at 1 to 3 months of age.

Your Product — And the Market

How is the market for your product? In order to answer this question correctly, two other important ones need to be answered: (1) What is the market? and (2) what is the product? According to W. Y. Fowler, Extension Economist with New Mexico State University, a large commercial rancher who sells directly to distant high-volume feeders needs to produce large amounts of quality feeder cattle. On the other hand, a small family-farm producer who sells directly to local consumers needs to supply a quality product, concentrating on such items as extra size, extra maturity, extra flavor, and extra personal service.

The agricultural producer faces the following four basic problems in marketing his products: quantity, quality, timeliness, and the type of market. Mr. Fowler says that these factors affect the producer's costs and returns. The producer's relationship to the marketing agency is also important, since the producer, in cooperation with the marketing agency, attempts to satisfy the demands and requirements of the consuming public.

Farm tractors long ago proved their worth as power suppliers, but they must be chosen wisely and used efficiently if they are to return top dividends. W. L. Ulich, Extension Agricultural Engineer with the Texas Agricultural Extension Service, points out that a tractor represents a sizable investment and should be selected to fill the needs on the farm.