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FARM MECHANIZATION: A KEY TO MEETING FOOD NEEDS

Land and labor — once the answer to increasing man's food supply — are diminishing in importance as the pressures of meeting world food needs become greater, points out the Foreign Agricultural Service. At one time the production of more food meant opening new lands to cultivation; but the amount of new land in today's densely populated world is limited, and much of it would be costly to develop. In many countries, farm labor forces have also declined. The solution to the food production problem now lies primarily in the application of science and technology to existing croplands in order to make them more productive.

One of the chief contributions of science to agriculture has been in farm mechanization. The use of tractors and other machinery has resulted in higher yields through more intensive cultivation. With their greater speed and capacity, machines have enabled farmers to time the tilling, planting, and harvesting of crops in order to take advantage of favorable weather. In addition, machines have replaced draft animals to some extent, thus permitting the land once used to support these animals to be diverted to the production of food and feed.

Agricultural mechanization has been rapid in the developed countries — those with abundant capital, declining farm labor forces, sufficient fuel at relatively low prices, and large farm units. In these countries, tractors have not only helped increase yields but have also been substituted, to a great degree, for labor as a farm input, resulting in greater output per worker. In the less developed countries — where labor is still more abundant than capital and fuel and where individual farms frequently are small — mechanized farming generally has been restricted to plantation crops.

The number of tractors used in agriculture in any region can serve as a general indication of its level of farm mechanization. On a worldwide basis, tractor use rose over 60 percent between 1954 and 1964; however, less than 10 percent of the increase was in the less developed regions, those most in need of greater food output. The developed regions — North America, Europe, the Soviet Union, Oceania, and Japan — have 15 times more tractors per unit of arable land than have the less developed areas — Latin America, most of Asia, and Africa.

Rapid mechanization of North American farms actually began in the late thirties and was virtually completed by the midfifties. Thus, in the 1955-64 decade, when other parts of the developed world were experiencing large gains in tractor use, the number of machines in North America rose only 8 percent. At over 5.2 million machines, or more than one per farm, mechanization has now reached the saturation point, according to the FAS.

Since the midfifties, Western Europe has experienced the most rapid increase in farm mechanization. This region had 1½ times more tractors in 1965 than in 1955. In West Germany the number of tractors per unit of

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arable land rose from 16 in 1950 to 120 in 1962, and in Austria the number advanced from 10 to 98.

The overall increase in the number of farm machines in Eastern Europe and the Soviet Union was only slightly less rapid than in Western Europe, but this region still has far fewer tractors per unit of arable land. Czechoslovakia showed the most rapid rise in the 1954-63 period — from 31,000 to 162,000 tractors. In the Soviet Union, tractor numbers almost doubled between 1956 and 1965. Many of these units went to new croplands opened up in the midfifties in Siberia, Kazakhstan, the Urals, and in the region around the Volga River.

In Japan, tractor numbers rose from 35,000 in 1954 to 2.4 million in 1964. Although the conservation of farm labor was probably the chief factor in farm mechanization in other developed countries, in Japan — where labor was abundant and land was not — mechanization was intended specifically to increase yields. Most of the rise in tractor use between 1954 and 1964 was in small garden tractors, the principal type used by Japanese farmers.

The use of modern technology on farms is also progressing in the less developed regions, but it remains limited. In these regions as a whole, the increase in the use of farm machinery has not been accompanied by a decline in numbers of draft animals.

The FAS says that the developing regions face many obstacles to farm mechanization beyond the production of plantation crops, such as sugar and cotton. Individual landholdings are small and frequently are noncontiguous. Machinery and fuel are expensive; consequently, mechanization probably would require a system of cooperative ownership. Even if machinery were available, farm personnel would have to be trained to operate it efficiently and effectively. Labor in the developing regions is abundant; therefore, the major problem in producing sufficient food is not in saving man-hours but in raising yields.

While the walking-type garden tractors used so successfully in Japan would work well in many of the developing countries, they are too small for heavy soils. Many economists recommend that developing countries first introduce improved farm equipment operated by manual and animal labor. Combined with other scientific contributions (such as fertilizers and pesticides), the use of this equipment would help to raise yields while the problems of mechanizing agriculture are worked out.

Demand for tractors and other farm machinery in many of the less developed countries is too limited to make domestic production economical since it requires such resources as iron, steel, and power. Some countries, however, have set up plants for assembling tractors from initially imported components and are now producing many of the parts domestically.

Sure Way To Find Out About Hay

The one sure way to settle the argument "My hay is better than yours" is to have the hay tested, points out Al Novosad, Extension Pasture Specialist at Texas A&M University. Mr. Novosad says that farmers often have a great tendency to overestimate the quality of their hay.

Data from the A&M Forage Testing Service show that there are imposing differences in quality and feed value of forages. For instance, the samples of coastal Bermuda grass tested in 1966 contained from 3.7 to 19.0 percent crude protein, and the average was 8.7 percent. The crude protein content of forage sorghum cut for hay ranged from a high of over 12.0 percent to a low of 1.9 percent and averaged 5.2 percent. Crude fiber, digestible protein, and TDN (total digestible nutrients) showed the same wide variation.

A relatively new factor — net energy — is being included in the A&M forage analyses. According to Mr. Novosad, net energy is a more accurate indication of the worth of a forage to an animal than is crude protein or TDN. Net energy is calculated by subtracting the various energies lost in the digestion process from the gross energy in a feedstuff.

The specialist says that there are several items which influence hay quality. Among the more important of these are the amount of fertilizer the hay received and the stage of maturity at the time of cutting. Lower fertilizer rates usually mean lower-quality hay. As a general rule, the longer the forage is allowed to grow, the lower in quality it becomes.

Wool Incentive and Mohair Support Prices for 1968 Marketings

The U.S. Department of Agriculture has announced a shorn wool incentive price of 67 cents per pound for 1968 marketings, representing an increase of 1 cent per pound over the 1967 level. The price of pulled wool will continue to be supported at a level comparable with the incentive price for shorn wool. Shorn wool payments will be equal to a percentage of each producer's returns from sales. The percentage will be that required to raise the national average price received by all producers for shorn wool up to the announced 67-cents-per-pound incentive price.

The USDA has also announced that the support price for the 1968 marketings of mohair will be 77.4 cents per pound, also an increase of 1 cent per pound over the 1967 price. Mohair payments will be determined in a manner similar to that for wool. Payments to producers of wool and mohair for the 1968 calendar year marketings will begin in April 1969. Applications for such payments must be filed not later than January 31, 1969.

Wasp Offers New Hope for Cattle Industry

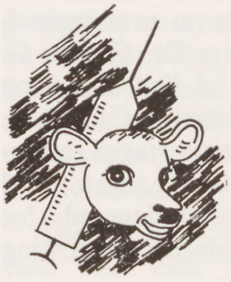
A small wasp found in India by a U.S. Department of Agriculture entomologist promises to control scale insects that make pastures unfit for grazing in large areas of the Gulf Coast States, as well as in other nations. The wasp lays its eggs in the scale, which dies when the eggs hatch. The USDA says that control of scale in this manner could increase forage yields as much as 50 percent and could prevent losses in those pastures where the scale is most harmful — in overgrazed or drought-stricken rangeland.

George W. Angalet, Entomologist with the USDA's Agricultural Research Service, discovered the wasp and had it brought to the United States. Extensive tests to determine its effectiveness as a scale parasite were conducted by Michael F. Schuster, Entomologist with Texas A&M University.

Texas A&M University scientists are now testing the wasp's effectiveness under range and laboratory conditions. In experimental releases over 900,000 acres in Texas, scale populations were reduced 50 percent, and pasture density was increased 80 percent. Scale can deplete pastures in 3 years or less; scale-free Rhodes grass pastures usually last 8 years or longer.

Scientists are now rearing and releasing thousands of the wasps, distributing them with an airplane releasing system developed by the ARS a few years ago during a screwworm eradication program. This technique costs only 34 cents per square mile. Current tests are attempting to achieve 90 percent parasitization in 1 year under range conditions. Since the scale is found in all tropical and subtropical climates, its successful control by the wasp would permit greater cattle production in countries where scale has reduced meat supplies. According to the USDA, this accomplishment could enrich the protein-deficient diets of millions of people.

Vaccination Age Lowered



The minimum age for vaccinating heifer calves against brucellosis has been lowered from 4 months to 3 months, according to the U.S. Department of Agriculture. Brucellosis is a costly disease of cattle and swine and is known as undulant fever in human beings.

The amended regulation defines an official vaccinate as a female bovine animal vaccinated against brucellosis at the age of 3 through 8 months. If the heifer calf is a beef breed in either a range or a semirange area, it may be

vaccinated at 3 through 11 months of age. The vaccine must be approved by the Animal Health Division and administered under the supervision of a Federal or state veterinary official.

Recent research shows that the resistance induced in heifer calves vaccinated with Strain 19 at 3 months of age is equivalent to that in heifers vaccinated at an older age. Moreover, calves treated at 3 months of age are less likely to carry over a suspicious or positive vaccination reaction that can confuse the brucellosis test.

From the standpoint of the livestock producer, the opportunity to vaccinate calves at an earlier age fits in with his routine management practices. The amendment is in accordance with recommendations by the Brucellosis Committee of the U.S. Livestock Sanitary Association.

Turf Is Big Business!

A Texas A&M University research and education program is assisting the already "big business" of turf grass. Maintenance costs alone in the industry exceed $211 million annually. An indication of the industry's growth may be obtained from the observance of home lawns, school grounds, athletic fields, parks, golf courses, and other recreational areas. The highway right-of-way also offers an area of expansion as new programs of beautification are undertaken.

Recreational facilities are an ever-expanding area of development, says Dr. George G. McBee, Assistant Professor of Soil and Crop Sciences at Texas A&M University. Each year, Americans are discovering new vistas of recreational facilities at local, county, state, and national parks. With increased demands for recreation, the turf grass industry is growing rapidly in this area.

Texas A&M University has initiated a three-point program of research, student instruction, and adult education in turf grass. Modern laboratories and field research plots have been acquired in order to conduct both basic and applied research.

A strain of Bermuda grass that is suitable for use under certain conditions has been found to be more tolerant of low light conditions. Research in herbicides, new varieties of grass, fertilizers, and turf management is conducted to aid the turf grower in solving problems he may encounter.

Wheat Acreage Allotments Announced

Secretary of Agriculture Freeman recently announced a national acreage allotment of 59.3 million acres for the 1968 wheat crop. With average weather conditions, this acreage probably would provide an output of approximately 1.5 billion bushels of wheat, or slightly less than the record 1967 production.

The 59.3-million-acre national allotment for 1968-crop wheat reflects a 55-million-acre allotment, plus 4.3 million acres in small farm increases provided by legislation. The 1967 total wheat acreage allotment was 68.2 million acres, and the 1966 figure was 51.6 million acres.

The following table shows wheat acreage allotments for the states of the Eleventh Federal Reserve District for 1966-68.

State	1966 (acres)	1967 (acres)	1968 (acres)
Arizona	39,326	51,821	45,068
Louisiana	38,105	50,376	43,851
New Mexico	423,698	560,302	488,865
Oklahoma	4,449,337	5,881,345	5,117,838
Texas	3,704,785	4,896,216	4,258,167

Research on Health Aspects of Tobacco

The U.S. Department of Agriculture has awarded three contracts to the University of Kentucky Foundation, at Lexington, for research on health-related aspects of tobacco. The contracts, totaling $277,903, will run concurrently for 2½ years. They are part of an intensified research effort by the USDA's Agricultural Research Service to determine what substances in tobacco and tobacco smoke may be injurious to health and then to remove or prevent formation of such substances.