

A Tour of East German Agriculture

H.A. Pearson, C.H. Herbel, and D.T. Pendleton

In May and June of 1977 following the 13th International Grassland Congress in Leipzig, East Germany (German Democratic Republic), we toured several of the country's agricultural centers. We visited state and cooperative farms, research centers, and schools for grassland and animal management. English-speaking guides gave us information about East German farming, forestry, livestock, pasture and forage, and wildlife and fish. In this paper, we present a digest of that information.

Farming

Before World War II, most farmers in East Germany lived in small villages and kept single-family farms. After the war, however, most small ownerships, 10 ha (25 acres) or less, were merged into small cooperative farms with about eight workers. After small cooperatives proved inefficient, farms were consolidated into large cooperatives or state complexes. An example is the sprawling Lenin Schlettau Farm in the Erzgebirge Forest where nearly a thousand small farms were pooled together. This farm covers 5,000 ha (12,355 acres) and draws workers from 13 villages.

These large cooperatives are highly mechanized and specialize in crops or animals. Increased mechanization and fertilization, improved crop and animal genetics, and the industriousness of the workers have greatly increased East Germany's agricultural output since World War II. While the farm labor force was cut by 38% since 1950, farms now produce 20 times as much forage and fives times as many eggs as they did in that year.

Forestry

Conifers are the most common trees in southern East Germany, mainly spruces (*Picea abies*) and firs (*Abies alba*), with some pines (*Pinus sylvestris*) and larches (*Larix* spp.). Spruce makes up 90% of the southern forests in the Thuringian mountains. Near Berlin the main forest species is pine. Birch (*Betula* spp.), maple (*Acer* spp.), and beech (*Fagus sylvatica*) are plentiful in some locations. Although livestock has not grazed the forests since World War II, grasses and forbs grow abundantly in wooded areas where tree densities allow sunlight to penetrate. Shrubs are relatively sparse except on the forest edges. Annual precipitation in the forests varies from 600 to 1,200 mm (23 to 47 inches).

Pearson is chief range scientist, Southern Forest Experiment Station, USDA, Alexandria, La.; Herbel is research leader, Jornada Experimental Range, Federal Research, Science and Education Administration, USDA, Las Cruces, NM; Pendleton is chief range conservationist, Ecological Sciences and Technology Division, Soil Conservation Service, USDA, Washington, D.C.

Long-term forest planning involves both tree reestablishment and harvesting practices. The size of clearcuts, number of trees harvested, and harvesting techniques used in the mountain forests are determined by steepness of slope. But aesthetics are also taken into account. Clearcuts are given 18 months to successfully regenerate naturally; thereafter, about 5,000 trees/ha (2,024/acre) are reforested artificially if needed. The lower elevations are planted at about 8,000 trees/ha (3,239/acre) while about 3,000 trees/ha (1,215/acre) are planted in the high elevations. Forest fires pose little threat because of the East Germans' respect for and appreciation of their forests.

The first timber harvest is of trees 30 to 40 years of age or about 10 cm (4 inches) in diameter, and trees are generally managed on a 90- to 130-year rotation. Christmas trees are cut between the ages of 10 to 15. About 150,000 cubic meters of wood are utilized annually from the timber crop. Additional



Cities and forests shown on the map are the areas mentioned.

harvesting, usually by thinnings, is conducted when greater wood supplies are needed. Normally the forests are inventoried on a 5-year basis but thinned only as needed; the Thuringian mountain forests produce the greatest amount of wood.

Sawlogs are transported to mills by rivers when possible, and some processing plants are located near the forests to reduce transportation costs. Wood products include cellulose, paper, lumber, and furniture. Sawdust is put into particle board; "wood concrete" is made by mixing sawdust with cement. Projections for 1980 are to utilize 94% of the wood harvested in East Germany.

Livestock

Cattle, sheep, pigs, and chickens are the primary livestock in East Germany. Essentially all cattle are heavy-bodied, predominantly Holstein-Friesian, and are used for milk or for milk and meat. Some crossbreeding is done, primarily with Simmental.

Cows generally graze improved pastures throughout the spring, summer, and fall (April through October), and stay in protective barns during the extremely cold winters. We did not visit the large cattle operations because of the danger of introducing or spreading disease among the cattle herds. Some cattle stay in barns year-round and feed entirely on silage, hay and supplements.

Young cattle are usually raised in the mountains, apart from the main dairy herd. Farms on lowland pastures sell calves 2 weeks after birth to mountain farms, which raise them until breeding age. Bred heifers are then brought back by the dairies where, depending on their first year's performance, they are kept in the herd or slaughtered. Heifers weigh about 450 kg (992 lb) when they calve at 28 months and are expected to produce a minimum of 4,000 kg (8,818 lb) of milk during the first year. Growing heifers gain about 560 g/day (1.2 lb) on winter feed and 800 g (1.8 lb) on spring and summer pasture. Annual milk yield on dairies averages 4,000-5,000 kg/cow (8,818-11,023 lb).

Farmers rotate grazing in pastures, which are divided by electric fences. Each paddock is grazed 1 to 3 days and rested 21-28 days. Water is hauled to livestock. Dairy cattle graze in shifts, with the most productive cows having first access to the fresh pasture and less productive cows having later shifts. Bulls are fed until 12 to 15 months of age or about 450-500 kg (992-1,102 lb) and then placed into breeding status or slaughtered. About 200 to 250 cattle are necessary for a dairy farm to be

efficient, and the best herd size is 300 to 350 cows.

The principal sheep breed is Merino, used primarily for wool production. About 4,000 sheep in the north graze the dikes year round. Sheep also graze at the higher elevations and along hillsides in central and southern East Germany.

Pasture and Forages

Forage research is mainly conducted at the Paulinenaue Institute and Research Center near Berlin. Pasture or forage research includes: breeding of forage grasses, agronomy of forage crops, and production of conserved forages.

Pastures in East Germany generally include meadow fescue (*Festuca pratensis*), Italian ryegrass (*Lolium multiflorum*), bentgrass (*Agrostis alba*), orchardgrass (*Dactylis glomerata*), timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*) and red clover (*Trifolium pratense*). Every 3 to 4 years the forages are plowed under and replanted. The first year's growth increases production by 30%. Even in the mountains, native grassland is plowed, leveled, and sown with single or mixed species. Corn is the highest silage producing crop, and with adequate water and fertilizer, ryegrass produces the highest forage yields. The Markkleeburg Forage Production Exhibition on the outskirts of Leipzig informs residents, students, and visitors about forage agriculture in East Germany.

Although soils are generally loamy and fertile, with 3.5 to 8% organic matter, much of the pasture land is irrigated and fertilized. About 100 kg/ha (89 lb/acre) nitrogen are used in dry land operations while 400 kg/ha (357 lb/acre) are used with irrigation. In the mountains fertilization is done with helicopters. Urea is sprayed on foliage when the plants are about 15 cm (6 inch) high and slurry manure is used in some areas. The slurry is deodorized by adding oxygen and supposedly smells like honey or has no odor after about 14 days. Water for irrigation is generally abundant from rivers such as the Saale and Elbe. Most irrigation is with gasoline-powered side-roll sprinkler systems with some center pivot systems. Normally, crops are irrigated when usable water or soil storage capacity is 55-60%. About 165 mm (6.5 inches) of irrigation water is applied each growing season.

Pasture development usually provides a mixture of forages with varying dates of maturity. Orchardgrass and ryegrass are planted for early use; meadow fescue, timothy, and bluegrass for medium early use; meadow fescue, timothy, bentgrass, and perennial ryegrass (*L. perenne*) for medium to late use; and



Swath mower cutting forages.



Forestry on the hillsides.

perennial ryegrass and bluegrass for late use. Fertilizer regimes of 300 kg/ha (267 lb/acre) N, 50 (45) P, and 350 (312) K bring forage yields exceeding 100 tons/ha (45 tons/acre) green weight. At the Orlatal Farm near Oppurg, with 160 mm (6.3 inches) of irrigation, Italian ryegrass produced 80 to 100 tons/ha (36-45 tons/acre) of green weight from 4 to 5 cuttings. This forage dries to about 14 tons (6.3 tons/acre), which contains 2.2 tons (1.0 tons/acre) of crude protein. At higher elevations, yields are only 40-60 tons/ha (18-27 tons/acre) green weight because of colder temperatures and shorter growing seasons.

Wheat is also planted in late fall and early winter; in the spring it is overseeded with ryegrass and orchardgrass. Grain is harvested in spring and fodder is harvested and pelleted May through July. Late May to early June is the best time for fodder harvest since the weather is usually dry.

In 1977, equipment, planting, irrigating, and harvesting the forage crops cost about 1,600 Deutsche Marks (DM)/ha (\$270/acre). Returns were about 2,000 DM/ha (\$337/acre), or net profits of about 400 DM/ha (\$67/acre). Silage cost about 2,500 DM/ha (\$422/acre), and returned net profits of about 10% on the costs.

Drying and Pelleting Plants

We saw two forage drying and pelleting plants. At Oppurg 8,000 tons of dry feed are processed annually. The plants operate year round: January through March, pellets are produced from straw and minerals; equipment is repaired in April; May through July, pellets are produced from leafy forage ma-

terial; July through September, pellets are made from whole plant material; September to December, potatoes and sugar beets are processed. The quantity of pelleting and drying is based on advanced quota agreements with nearby forage-producing cooperative farms. At peak work periods, four crews of three workers each operate the drying and pelleting processes, which cost about 100 DM/ton (\$42). The drying process requires about 30 minutes at temperatures of 600-700° C. Products are bought and sold based on chemical analysis. Forages are analyzed for dry matter, crude protein, crude fiber, ash, urea, and energy.

Wildlife and Fish

Hunting in East Germany is conducted entirely by hunting clubs. Approximately 12,000 clubs exist, with members assisting in management of the forest and game.

Since no wildlife research unit exists in East Germany, hunters and foresters collect most of the wildlife information. Woods, cropland, and grassland all appear favorable for wildlife in many of the rural areas, and birds and other wildlife have more than doubled since 1945. The most important game species in the southern part of the country are red and roe deer, hares, swine, and geese. In the northern regions, red and roe deer, swine, and mouflon sheep, which were introduced from Italy in 1967, are most important.

Artificial lakes provide fishing and a source of hydroelectric power. Near Dresden and Meissen, water is pumped from the Elbe River to a nearby mountain reservoir during the night when energy requirements are low and is used to generate electricity during the day. Trout farming is conducted in many of the lakes, and facilities are provided for fishermen.

Wildlife production charts at the Paulinenaue Institute and Research Center showed that about 4 tons of wildlife were killed in 1965 from a 30,000 ha (74,130 acres) area which included hares, deer, and pigs. The 1976 harvest was about 12 tons and included 20 red deer, 221 wild pigs, 276 roe deer, 186 foxes, 60 hares, and 140 ducks.

Other Items

Farmers work a 40-hour week, have 18 holidays per year and are provided medical benefits, housing, and community improvements. Women with two or more children have reduced working hours. Men are eligible for retirement at age 65, women at age 60. Farm managers receive an intensive education and go through an internship. Managers and farm workers are under an incentive program to produce maximum yields of plants or animals.

Deadlines for *Rangelands*

To insure prompt publication, **advertising, position announcements, and news items**, must reach the Denver office, 2760 West Fifth Avenue, Denver, Colorado 80204, by the 20th of the month preceding the publication of *RANGELANDS*. Deadlines for such items for this magazine, then, are January 20, March 20, May 20, July 20, September 20, and November 20.

RANGELANDS is scheduled to be delivered to the mailers during the last week of the month of issue—February, April, June, August, October, and December. This means that most readers will not receive the publications until some time during the next month—an important fact where deadlines for position applications are critical.

Manuscripts for feature articles and lengthy news items should be sent directly to the editor, Danny Freeman, 316 Whitney, Prescott, Arizona 86301. He will inform the author of the probable date of publication of accepted manuscripts.