The Management of Livestock in the Xerophytic Forest Region of Central Argentina

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Much has been written about the region in Argentina around the city of Buenos Aires, the area better known as the "Pampas." Another region, the high wind-swept plains of Patagonia have also excited the imagination solely by their extent of empty space. But between the humid but treeless grassland of the Pampas of Argentina, and the desert in the rainshadow of the Andes mountains, lies a little known belt of xerophytic forest, commonly known as "monte," which in the south blends into the highland plateau of Patagonia (Fig. 1).

Vegetation of the Area

In the province of La Pampa this forest is dominated by the caldén tree (Prosopis calden), which in the mature forest occurs in open stands with the individual trees from 30 to 50 feet apart (Fig. 2). Besides the caldén two other tree species occur in the association, the algarroba (Prosopis juliflora), known in the United States as mesquite, and the chañar (Gourliea decorticans). To the north in the province of San Luis and Córdoba the chañar replaces the caldén as the dominant species. Under the trees in the open forest an abundant cover of grasses occurs the most important of which are Trichloris mendocina, Melica macra and several Stipas.

To the west of the caldén-dominated forest, and stretching north into Perú, lies another vegetation type, commonly named "fachinal". Here brush species dominate to the almost complete exclusion of a grassy understory. Algarroba and jarilla (Larrea divaricata) are the dominant species with the widely distributed piquillin (Condalia microphylla). All these brush species are also found thinly scattered throughout the xerophytic forest.

Where caldénes have been killed by fire or removed by man for firewood or clearing of the land for agriculture, jarilla will multiply rapidly and form impenetrable stands, making the area almost useless for the grazing by livestock.

Within the forest region lie large areas of rolling hills dominated by grass vegetation. Occasional thickets of caldén, chañar, or isolated piquillin, or sombra de toro (Yodina rhombifolia) are the only taller plants found on the coarser sandy soil of this vegetation type dominated by cebadilla (Bromus catharticus), known in the English-speaking world as rescue grass.

FIGURE 1. Map of Central Argentina showing the extension of the xerophytic forest and the fachinal.
Also in abundance is the unpalatable olives (Plazia argentea) which with its long root system is an excellent soil binder. Together with tupe (Panicum urvilleanum) it is the first to invade and fix the uncovered sand dunes of the area. Some of the other grasses in the association are Setaria geniculata, Poa longiligula, Chenchus pauciflorus, Hordeum brachyantherum, Melica macra and several more Stipas. In Argentina only the more distinctive grasses have a common name; the rest we grouped together into “pasta bueno” and “paja brava”, respectively, good grass and bad grass.

In low depressions where salts have collected only Distichlis striata and other halophytic species will grow. On other areas the proximity of the water table is indicated by the well-known Pampas grass (Cortaderia) (Fig. 3). Several of these areas have been plowed and seeded to rye or alfalfa as winter pastures (Fig. 4). Heavy grazing has allowed the invasion of Russian thistle (Salsola kali) and these pastures are useful to livestock only in early spring when the thistle is still succulent and green. Heavy grazing of the Russian thistle at that time has been found to reduce the stand considerably and allow the reestablishment of the original grass cover.

Utilization of the Range
Public range is almost unknown in Argentina. The best land has long ago been granted to Spanish soldiers or else has been bought or occupied by other private interests. Federal land has either reverted to the government through non-payment of taxes or is in sparsely populated and undeveloped areas like Patagonia. Almost all grazing land is fenced off in the basic land unit of one “legua”, a square of 3 by 3 miles enclosing an area of 2,500 hectares or approximately 6,400 acres. Sometimes these leguas are subdivided into smaller pastures depending on the intensity of the livestock operation and the development of watering facilities for livestock. Most of the livestock operators have now recognized the beneficial aspects of the shade and shelter provided by trees and many fences have been diverted from their previous straight compass lines to include at least some shaded area in each pasture.

Both cattle and sheep graze in the forest and grassland area of the province of La Pampa. The sheep are raised as wool producers and the Merino breed predominates. Cattle are bred for sale as feeders to be fattened on the alfalfa pastures in the province of Buenos Aires to the east. The Shorthorn is the dominant breed in Argentina, but both Herefords and Aberdeen Angus are found in increasing numbers on the range in addition to crosses of these breeds with the Shorthorn.

Rainfall in the area averages from 16 to 10 inches per year, decreasing across the territory from east to west. The bulk of the rainfall is in the spring and fall season when “temporales” will come in from the Atlantic Ocean and bring several inches of rain in a few days. In summer, thunderstorms provide some moisture but they are more feared for the fire danger they bring than wanted for the rainfall. The wet seasons provide moisture for an abundant new growth of grasses and the cattle and sheep will graze on the
open grasslands. During the heat of the summer they seek the shelter of the forest and graze there for the most part. In some winters the seedpods of the calden tree can be depended on to provide an abundant feed in addition to the grasses that have cured on the stem. The bulls and part of the breeding herd are mostly overwintered on pastures that have been seeded to rye or sorghums in the previous fall, but sheep are left to browse on the shrubs and to overwinter as well as they can.

Animal Husbandry

The breeding season for the cattle starts in the spring (September) when the bulls are taken out of their winter pastures and divided over the herds in the different leguas of the ranch. They remain until the winter round-up, which takes place after the first frosts have killed off the flies. At this round-up the year's calf crop is branded, dehorned and castrated, while those calves ready for weaning are separated. The cows and bulls are vaccinated against foot-and-mouth disease and the calves get a vaccination against blackleg. The older animals are run through the chute and selection takes place according to age. Old cows are sold locally while the old bulls are shipped by railway directly to the packing houses in Buenos Aires. Heifers and steers are sold at the local markets to buyers from the province of Buenos Aires at ages varying from 10 months to 2 years. Spring and fall are the best time for sales when the rains have greened up the pastures of the intermediate buyers and have allowed them to overstock temporarily. Sales take place in groups of 20 to 50 head. Prices are per head, all animals in one group being sold at the same price, which varies between 400 to 700 pesos, or $14 to $24 at the free exchange rate of 26 pesos to the U. S. dollar.

Prospects for Improvements

Lack of appreciation for the problems of the range has caused this resource to be neglected. Management of the livestock is the base of the ranch operations in this part of Argentina, while the range is considered as a fixed item influenced only by the annual rainfall. Range condition is determined largely by the condition of the livestock grazing on it. Bad distribution of the livestock over the range due to scarce water developments and faulty or complete absence of salting practices has caused overgrazing in many parts of the area. This is especially noticeable in the pastures near the ranch headquarters and corrals where horses are kept throughout the year and which get heavy use at the time the livestock are worked.

Recent research in Argentina has concentrated on crop agriculture, sometimes practiced on definitely sub-marginal land. Even there extension service and other methods of disseminating the knowledge of modern agricultural practices are inadequate. Commercial quantities of grass seeds are available for only a few species. Crested wheatgrass became available only in 1953. Experiments with this species began after its fame had spread from the United States. Little research has been conducted with native species on their adaptability to range reseeding or other improvement practices.

Argentina exports most of the products of her livestock industry. Recent manipulation of exchange rates combined with control of credit exerted a depressing influence on the prices in this industry.
Plant Counts and Seed Production on California Annual-Type Ranges

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California has about 22,000,000 acres on which annual plants predominate in the herbaceous cover. This is known as the California annual-type vegetation (Talbot, Biswell and Hormay, 1939). The flora is made up of many different species, as many as 200 or 300 per square mile. As many as 35 and commonly 15 to 20 species have been recorded for a square foot of ground. Seed production is generally high, even under adverse weather conditions and fairly close grazing. Burcham (1955) reported yields of 400 to 1,600 pounds per acre in open grassland ranges. The vegetative cover varies greatly from place to place and from season to season depending upon such factors as variable weather, kind of soil, degree and season of grazing, and occurrence of fire (Talbot and Biswell, 1942; Hervey, 1949; Kadish, 1955; Biswell, 1955).

To learn more about the ecology of the annual-type vegetation, counts were made of individual plants on 152 sample plots over a period of three years at the San Joaquin Experimental Range,2 in the Central Sierra Nevada foothills of California. This area is fairly representative of a vast portion of the 22,000,000 acres of the annual-type vegetation. Another reason for making the counts was to test the practicability of this method of sampling yearly and seasonal changes in the resident annual-type vegetation.

Plant Numbers and Survival In Dense Stands

Soon after the first rains in the fall, ground that has been virtually too dry during late summer for plants to grow becomes literally covered with thousands of annual plants. Approximately 50 percent of those in dense stands die before reaching maturity, and one-half to three-fourths of those remaining are stunted plants. This sequence of development was followed for three years by counting the individual plants on the 152 sample plots.

During the first year the young seedlings were counted on 0.2 x 0.2-foot square sods taken from the very densest stands obtainable of certain abundant range plants. Converted to a square-foot basis, four samples of soft chess (Bromus mollis) averaged 17,433 plants per square foot; four of foxtail fescue (Festuca megalurta) 20,875; and nine of broadleaf filaree (Erodium botrys) 1,048. Scattered in with the broadleaf filaree were about an equal number of other plants, mainly grasses. These averaged 1,600 per square foot for the nine plots.

On the densest plots the seedlings were about as thick as they could possibly grow. Foxtail fescue seedlings, being the smallest, occurred in the greatest numbers. Broadleaf filaree seedlings are relatively large and not nearly as many can grow on a given unit of area.

1The California Forest and Range Experiment Station is maintained at Berkeley, California by the Forest Service, U. S. Department of Agriculture in cooperation with the University of California.

2A branch of the California Forest and Range Experiment Station.

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