FORAGE PRODUCTION PROBLEMS IN NORTHEAST BRAZIL

By Robert R. Humphrey

Ceará, one of eight states lying partly or entirely within Brazil's so-called "Arid Northeast" has an area almost exactly half that of Arizona. The state typically has a six-month dry season and is plagued periodically by severe and extensive droughts.

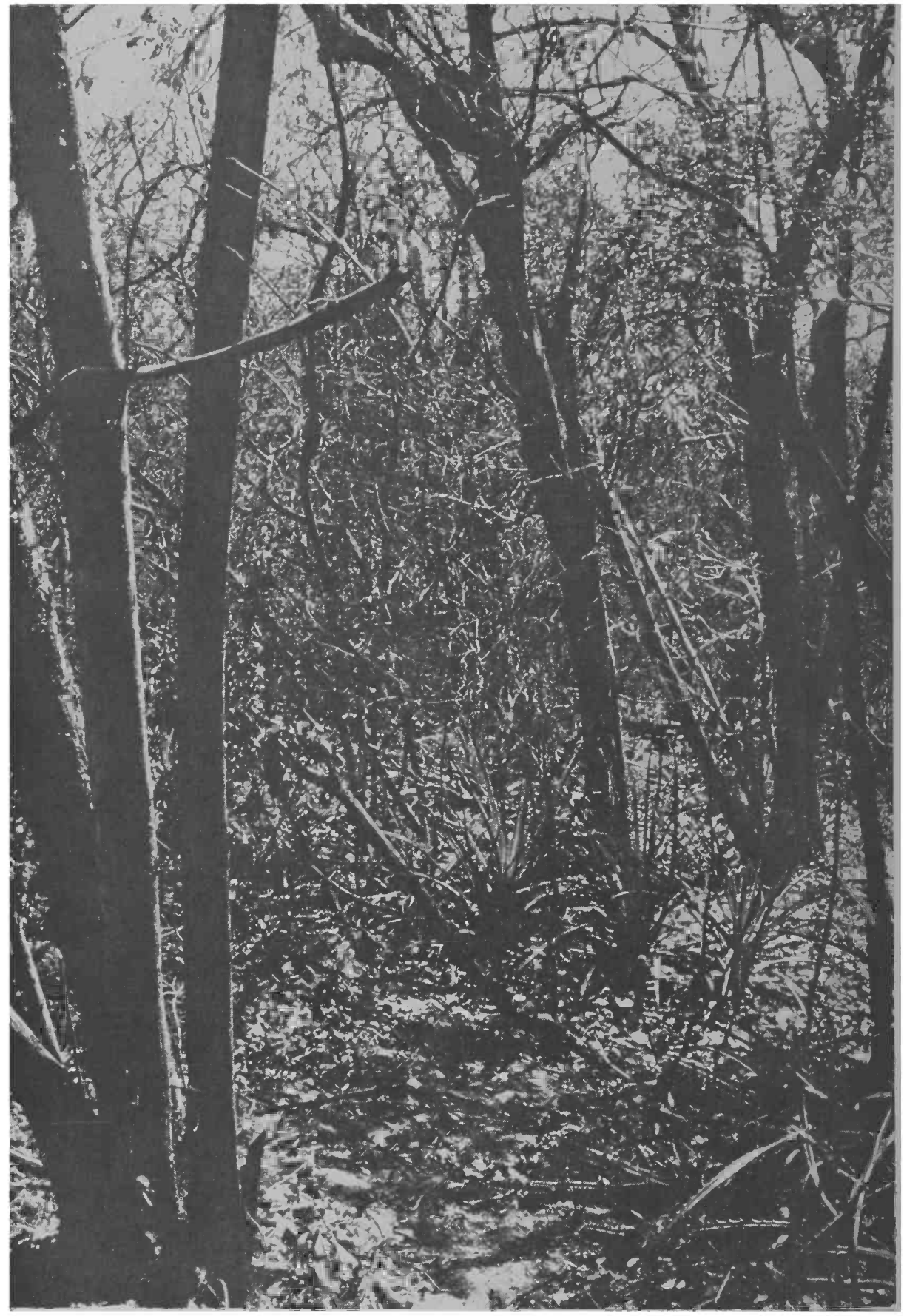
Despite these droughty features and despite its reputation as a desert area, the drier portion of Ceará has an average annual rainfall of about 32 inches. To an Arizona cattleman this doesn't sound like the precipitation of a desert-like area. Yet, it is.

Largely because of the monthly distribution pattern, the precipitation does not produce adequate forage yearlong. Most of the rain falls from January to June, leaving the balance of the year with little or no effective moisture. Add to this high temperatures, and generally shallow sandy soils that retain water poorly, and we do not have a situation conducive to production of adequate yearlong livestock feed. Then, as a final clincher, at unpredictable but too-frequent intervals there may be whole years of periods of two or three years with little rain even during the normally wet season.

It Presents a Problem

To one accustomed to thinking largely in terms of perennial grass as a forage base the climatic and soil conditions present, if not insuperable, at least difficult, problems. As the various facets of the whole picture come into focus however, the problem no longer seems to be so nearly incapable of solution.

Although fairly extensive portions of the upland sites have a soil too shallow to support perennial grasses, they do grow annuals that provide good feed for about six months of the year. These same areas are also generally covered with brush, some of which is palatable when green or the leaves of which are palatable and eaten during the dry season after they have fallen to the ground. Except during the occasional protracted droughts, on the other hand, the rainy season is not a period of feed shortage but of surplus. However, this still leaves us with the critical six-month dry season.



ABOVE, TYPICAL native vegetation in the state of Ceará before clearing and seeding.

In any forage improvement program it seems to make good sense to concentrate first on those areas with the best soil and the least aridity. A cursory analysis indicates that from 8 to 10 percent of the state of Ceará has deep, alluvial soils in the valleys of rivers or small drainages. In some of these, subsurface water is close enough to the surface to be reached by deep-rooted perennial grasses, a practice that has already been proved practical. In other areas ground water is relatively shallow, and may be pumped to irrigate forage crops. Although the extent of these alluvial valley soils is known in a general way, they need to be carefully mapped and the availability and quality of their water determined.

These lands today are growing in part a mixture of brush and weeds

(Continued on Next Page)

Dr. Robert R. Humphrey, veteran professor of range management, has depicted the range resources of all Arizona counties in a valuable series of bulletins widely distributed throughout this state. Now, as part of the UA team at the University of Ceará, Bob is applying those same talents to northeast Brazil.

(Continued from Previous Page)

with, in places, an overstory of the wax-producing carnauba palm or the oil-yielding oiticica tree. Portions are also planted to generally low-yielding stands of bananas, manioc, beans or corn. Presumably, much of the fraction planted to these various food crops would not be available for forage production. The Carnauba-oiticica areas, on the other hand, are well suited to producing forage beneath and between the trees.

Considerable Productive Land

At this point we have to make certain assumptions because of the lack of essential data. Using eight percent of the total area of the state as the alluvial fraction gives a total of 4,640 square miles. Assuming that 50 percent of this is available for pasturage (a conservative estimate) we come up with 2,320 or, in round figures, 2,300 square miles of potentially highly productive alluvial land.

Because of the uniformly high temperatures — day and night, summer and winter — in this region, plant growth and consequent forage production is high yearlong. Volume production of the commonly used giant panic (known locally as sempre verde) or elephant grass is extremely high. Even such lower-growing species as Pangola grass or coastal Bermuda have a high production.

Although actual carrying capacity figures have not been obtained, it does not seem unreasonable to expect that their present carrying capacity is probably less than 1/10 of the potential.

Quadruple Carrying Capacity

On the basis of these figures, these bottomlands could be developed to support an absolute minimum of more than four times the number of cattle being produced in the entire state at present. And, perhaps most important, these cattle would be well fed and fat the year round, eliminating the usual starvation losses of today and increasing growth rate, animal weights and health, and percentage calf crop.

The developed alluvial areas should be used in conjunction with the non-improved or improved uplands. These uplands provide considerable forage during the 6-month rainy season, generally more than can be used by the available animals while the forage is green. They do constitute an important fraction of the total feed produced during a 12-month period. As this forage consists largely of annuals and the leaves of deciduous brush, it is largely wasted by leaching, oxidation and consumption by termites when it is not grazed.

In conjunction with development of the alluvial areas, a consistent program of research is needed to determine the adaptability of specific grasses and legumes to particular dryland sites. For the most part the grasses studied should be perennials, the legumes either annuals or perennials, and either herbs or shrubs. The sites should be those without free water during much of the dry season, or where the water table is too deep to be reached by grass roots, or where for various reasons pumping may not be deemed feasible.

Because of the yearly hazard of almost complete desiccation of the soil to root penetration depth or to bedrock, the theoretical grass best suited to most sites should have the following characteristics:

1. **It should be a perennial but should have the rapid and prolific establishment characteristics of annuals.**
2. **It should be highly drought resistant.**
3. **It should be a prolific seed producer.**
4. **The seed should be readily disseminated by natural means.**
5. **It should be at least moderately palatable and nutritious.**

Research may indicate several grasses with these characteristics. On the basis of today's rather limited information, however, two grasses seem most nearly to meet these particular requirements. They are Lehmann lovegrass *(Eragrostis lehmanniana)* and Boer lovegrass *(E. chloromelas)*. Initial tests of these species look promising, and they will be included and more widely planted in the continuing research program.

"Man will conquer poverty, famine and disease only as he masters the problems of water supply.

"Water is our most vital resource. Man can exist without food for as much as 60 days. Without water, he will perish in five. Three billion people on this planet are competing for the available fresh water — but there is essentially no more water today than there was when civilization began.

"Furthermore, it is essentially the same water. The dribble from a leaky faucet in our homes may be the liquid which slaked the thirst of a dinosaur, watered the Hanging Gardens of Babylon, or refreshed Hannibal at some Alpine stream." — Secretary of the Interior Stewart Udall.

ELEPHANT GRASS just six months after planting of vegetative shoots. Man in the picture indicates tremendous growth of this forage species.