



Mexican deserts' rich native cactus are threatened by ranchers, tourists.

CONSERVATION

Mexican Cacti in Trouble

Mexico, one of the richest, if not the richest country in cactaceous plants, faces the threat of extinction of cacti species.

Illegal exportation and systematic destruction are twin perils, sparked by the great number of cactus fans in countries ranging from the United States to England, France, Japan, Switzerland and Germany. (Japan regularly publishes three magazines devoted to the study of cacti.)

With demand constant and huge, some foreign importers, dealing with Mexican representatives, are shipping cactus plants by the ton to the United States and Europe. This despite Mexican regulations officially prohibiting export of cactaceous plants and orchids.

Even American tourists are contributing to destruction by indiscriminate digging up of plants, then discarding those damaged by inexperienced removal from desert sand in Mexico's northern desert regions. This ravaging goes on by the tens of thousands of tourists annually, says Dr. Helia Bravo of the Biologic Institute of the National University of Mexico.

The valuable nopal cactus has virtually disappeared in a broad zone adjacent to Monterrey where more than a thousand tons of cactus leaf, thorns removed and chopped fine, provide fodder for livestock. Nopal is especially prized for fodder not only in San

Luis Potosi but in Coahuila, Zacatecas and other cattle regions. This is due to the fact that the nopal is virtually a water producing plant which voraciously extracts imperceptible humidity from desert soil so that 90 percent of the leaf is water content.

Cattle have been able to survive in arid areas where nopal is in abundance. But the full scope of the unregulated use is visible in the vicinity of Monterrey where nopal was abundant a few short years ago. Today, livestock ranchers have to go almost 40 miles into the desert to cut the plant for their fodder needs.

Realizing that the nopal cactus cannot long resist the heavy harvesting, the Mexican Department of Agriculture, under biologist Paulino Rojas Mendoza, has been classifying species and concentrating on inaugurating plantings of "domesticated" nopal. The National School of Agriculture at Chapingo is also conducting similar research, and here agronomist Lauro Bucio Alanis has discovered that the *Opuntia robusta* species of nopal is hardy, will grow simply from a leaf thrown on the soil. It has been noted that even pieces of leaf will eventually throw out roots and develop vigorously, but more study is needed on ways to speed up growth.

Regional organizations, such as the Institute for Investigation of Desert Areas of the University of San Luis

Potosi, and the National Institute of Forest Research are meanwhile investigating characteristics of nopal-bearing soil in all areas where it thrives to determine which regions are most apt for plantings on a large scale. So far research projects have been going on two to seven years.

In the Tehuacan valley, the beautiful organ cactus is also rapidly disappearing as shepherds of the region use it to feed their flocks. Apart from this, wild cacti growths have been cleared to make way for agricultural activities.

While the problem of plunder and destruction of cacti species is widespread throughout Latin American deserts (all cacti originated in American desert areas), it is especially grave in Mexico, due to the proximity to the United States. According to Dr. Bravo and other Mexican officials now concerned with the problem, the United States is the major consumer of cacti not only to decorate gardens but also because a thriving export business has blossomed, with plants shipped out of American ports, bound for European destinations.

A sort of cacti bootlegging operation does go on, although authorities are becoming stricter at border check points. American raiders in the past would go in, contract for peons to root out giant plants, including species weighing hundreds of pounds or col-



Nopal cactus may be domesticated as chemical source; tuna cactus makes marmalade.

lecting smaller species, such as the tuna cactus, used for making jams and marmalades. The contraband movement was made in huge trucks, with safe-conduct assured by payment of suitable bribes to customs agents and forest inspectors. This movement still exists, although it is becoming more difficult to cross the border with stolen plants.

Of the 2,000 known species of cacti fully 1,300 grow in Mexican desert areas, with many of these huge sized and of an extraordinary beauty not found in any other part of the world. The giant cardon cactus of Baja California rises to a height of 55 to 58 feet with a weight of up to 10 tons.

While cacti research in Mexico has been limited in the past, Mexican agronomists and biochemists are intrigued by the possibilities of creating new industries in arid zones by planned cultivation.

Research has already shown that the nopal, receiving the major brunt of current investigation, has important possibilities for production of vitamins, deodorants, hormones, wines and liqueurs, soaps (some from the organ cactus already on the market), industrial alcohols and other products, apart from its current large scale use as forage.

Recently biochemist Raul J. Blaisten of the Post-Graduate College of the School of National Agriculture, has extracted a substance which accelerates the fermentation process, and which is being tested for use in fabrication of wines and alcohols. Dr. Blaisten has also obtained what he terms "good quality" wines and alcohols from the tuna cactus, while residues of the fermentation process have high nutritive value and can be used for feeding of fowl. The residue product has "very

rich growth factors," Dr. Blaisten says.

While his research is still going on, Dr. Blaisten has isolated and identified sterols in nopal leaf which can serve for production of synthetic hormones, steroids, vitamins A and E, and xanthophyll. The researcher is also of the opinion that nopal leaf has a substance capable of improving milk production; cows eating the fodder have a better than average yield. If the one or more lactogenic substances can be isolated, Dr. Blaisten believes these could serve to enrich forage not only in desert areas, but all parts of the republic.

Laboratory research has also been undertaken by the Bank of Mexico's research division regarding development of new industries with nopal as a raw product. However, results of this research are not known, and officials refuse to make any public statement at this time.

Emil Zubryn