



the Seedhead News

Desert Adapted Criollo Cattle

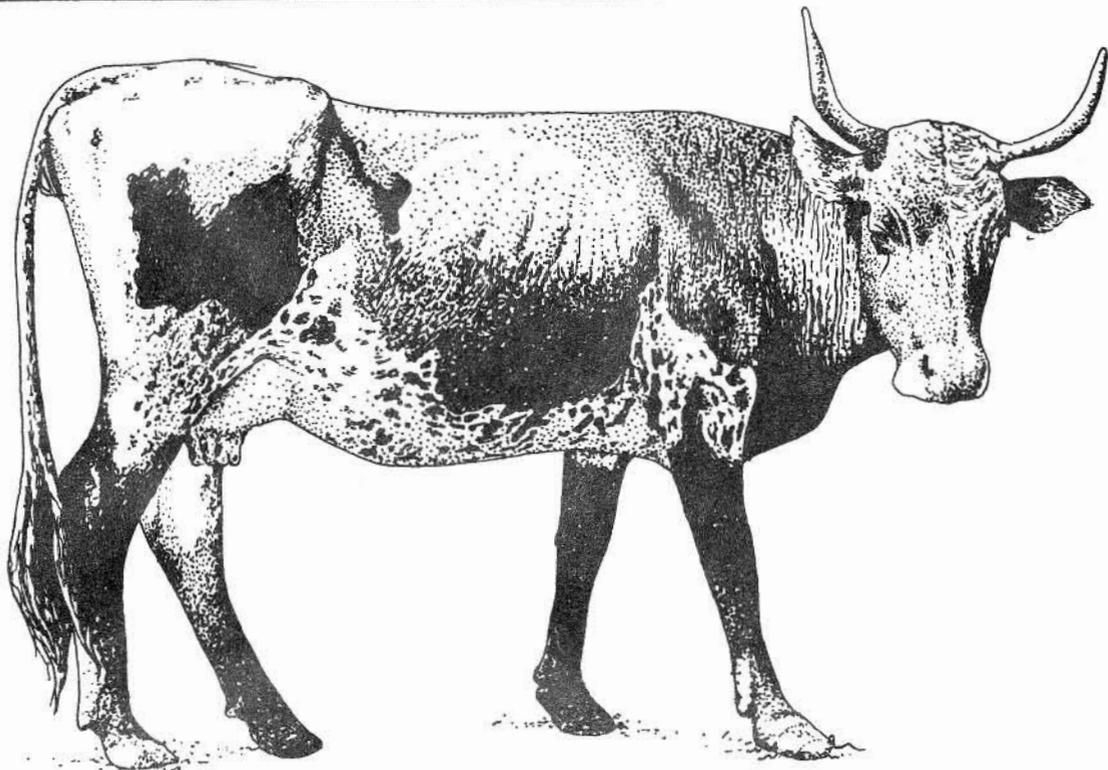
The Spanish criollo cattle radiated into many locally adapted forms as they spread through the Americas, with their most famous progeny being the Texas Longhorn breed. In the deserts of northwest Mexico, criollo herds established in the 1690s gradually evolved into "one of the hardest bovine types which natural selection has ever produced" according to cattle historian John Rouse. Yet by the time Rouse briefly travelled to this arid region in the late 1960's, he lamented that "this type will probably not survive another decade, and with its disappearance will go...an irreplaceable ruminant which could someday have made a significant contribution in an overcrowded world."

Fortunately, recent interviews with livestock experts suggest that criollos have not only persisted in isolated areas, but their remarkable adaptations are being reconsidered. A 1981 survey of cattle breeds in the state of Sonora indicated that 63,000 head of "criollo corriente" or "native/Spanish cattle" remained there, primarily in the rugged sierras of eastern Sonora. Centered around the Sahuaripa, Sonora vicinity, the criollo corriente population runs on open

ranges in mixed herds, among nearly a million "criollos cruzadas" or crosses with more recent introduction. Even in mixed herds, the criollos are known to forage differently, feeding upon a wider range of thornscrub vegetation than Zebu or European cattle breeds. They are considered hardy, but inferior in their ability for weight gain in wet years. They nevertheless command excellent prices from buyers who purchase them on contract for U.S. rodeos.

In Baja California, criollos have evolved into an even harder form, sometimes referred to as chinampos. Perhaps 20% of the range cattle remaining in Baja California are criollos, with the purest examples persisting near Mulege. They have been the long-term interest of a gifted veterinarian and ecologist, Dr. Aurelio Martinez Balboa of La Paz. He has documented how their 280 years of adaptation to desert conditions has resulted in a breed that is much like a wild desert herbivore in behavior and physiology. The criollos of Baja California have diverged from a parental form that weighed perhaps 500 kg to one that now weighs 300-350 kg. It is most active at night, and is primarily a browser on mesquite and palo verde, shrubs, cacti and succulents, the latter providing it with much of its water. Under the same desert conditions, Baja criollos have a lower metabolic rate, and their body temperatures may be 1 to 1.5°C lower than those of Angus and Herefords, and their body temperatures remain under (or in) normal levels, when the Angus and Herefords have 1 to 1.5°C higher temperatures.

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An example of Criollo cattle. Drawing by Kay Mirocha.

In 1979, Dr. Martinez proposed an experimental ranch to be founded under a National Program for the Rehabilitation of Criollo Livestock, at that time ruled by the Mexican government. Economic difficulties and political changes have kept this ranch from being established, however to date there is some representation of criollos in Mexican livestock semen repositories. Dr. Martinez continues to have the implementation of such a program as his life goal. He may be contacted at Apartado Postal 43, La Paz, 23000, Baja California Sur, MEXICO.

References:

Martinez Balboa, Aurelio. 1980. La Ganaderia en Baja California Sur. Volumen 1. Editorial J.B., La Paz, BCS, Mexico. 229 p.

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Rouse, J.E. 1977. The Criollo-Spanish Cattle In The Americas. University of Oklahoma Press, Norman, Oklahoma. 303p.

Gary Nabhan

Book Reviews

THE HEIRLOOM GARDENER

Written by Carolyn Jabbs. 1984. Published by Sierra Club Books, San Francisco, California. 310p. \$9.95

The heirloom gardener is a good basic information book for people new to domestic seed conservation. Who, what, why and how are all covered in this manual on saving old and rare varieties of vegetables and fruits. The section on the U.S. government seed conservation program is especially enlightening. Unfortunately the style of the book is not particularly gripping, and probably will not make many converts to the cause of seed saving. However, for the layman who wants a non-technical introduction to the world of heirloom crops, there is a lot here.

One interesting contribution is that it does contain a listing of seed exchanges, seed companies, living historical farms and museums, sources for old horticultural books and seed catalogs, federal repositories for fruits and vegetables and other bibliographical listings. SEARCH is mentioned among these.

Mahina Drees

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WE'VE COME FULL CIRCLE

Native Seeds/SEARCH Annual Report 1983-1984

A child grows more in its first year of life than during any other time. Likewise, Native Seeds/SEARCH has experienced incredible growth during its first year of existence. Our goal of maintaining native crop diversity in the region has resulted in a wide number of activities that involve public education and seed conservation itself. As we become more firmly established financially, our energies are turning toward the heart of seed saving. At the present our principal means of support is by associate memberships, grants, seed sales and special contributions.

A year ago SEARCH celebrated its "coming out" to the Tucson community with a San Juan's Day fiesta held at Tucson Botanical Gardens. Prior to this event, our principal means of outreach was through letters of invitation to prospective associates, seed sales, or writeups in several national gardening publications. Since the 1983 San Juan's Day fiesta, we have also introduced ourselves regionally by participating in plant sales and fairs at the Boyce Thompson Arboretum in Superior, Arizona, the Arizona-Sonora Desert Museum Harvest Bazaar in Tucson and the Tucson 4th Avenue Street Fair. In February, 1984, we sent a mailing of our seed listing and brochure to over 2,500 potential associates.

Currently our associates number 214, though this increases weekly. Nine of these are lifetime associates.

Workshops and Educational Programs

SEARCH maintains a Demonstration and Conservancy Garden at Tucson Botanical Gardens for the purpose of displaying rare Native American crops, wild relatives of crops, and cultivation techniques. Esther Moore is expertly caretaking the garden on a regular basis. Two major planting seasons are observed which coincide with local Native American cultivation practices. In general, more limited seedstocks are planted here.

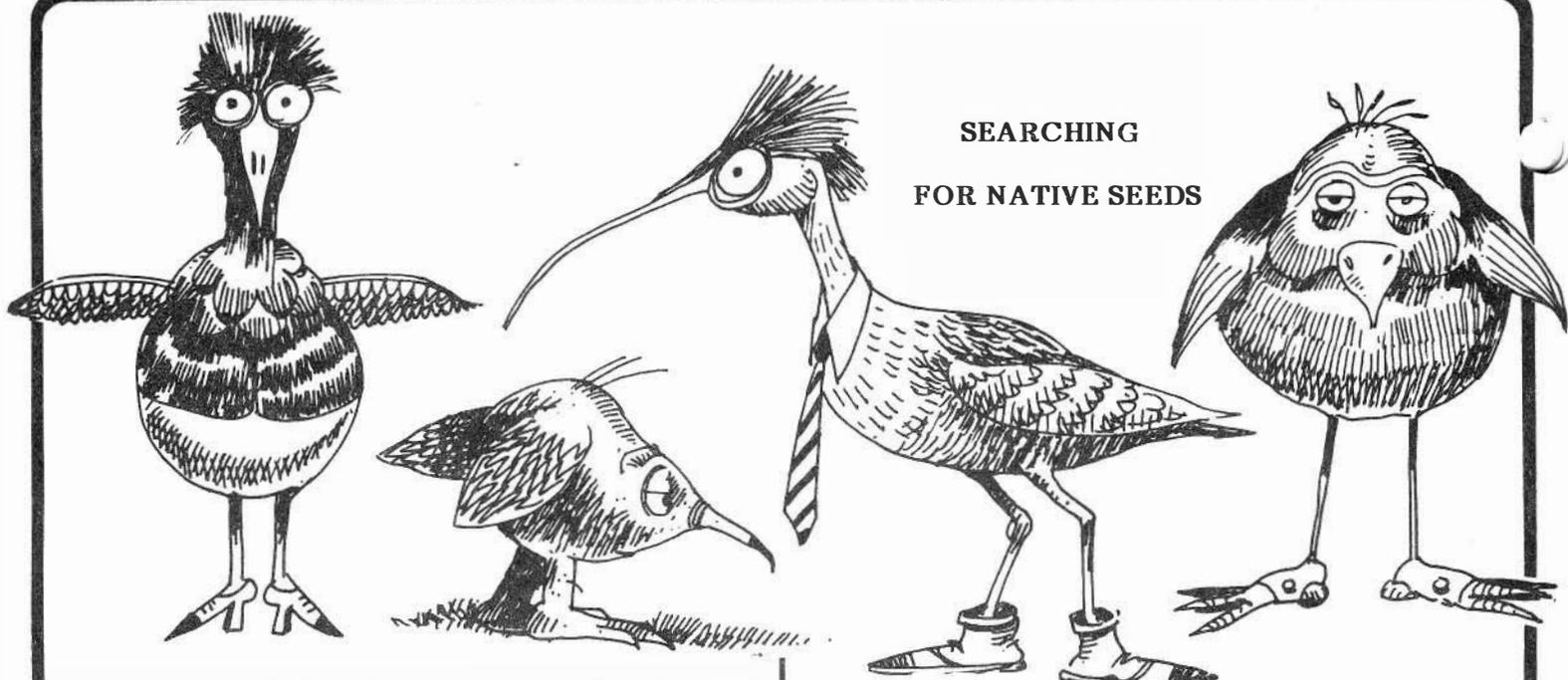
The first of a series of workshops was held on the topic of corn on January 21 and 22 of 1984 at Tucson Botanical Gardens. The purpose of SEARCH's workshops is to educate the public on the uses of native foods which are either not currently in common use or well known. At our January, 1984 corn workshop, participants learned about the many varieties of corn and the numerous ways to prepare them. Techniques covered included roasting, grinding, lime washing, and stewing.

Research Involvement

Within the past year members of the SEARCH team have become involved in a variety of research topics. Several of these topics are still in development stages, to be studied in depth when funds are available. Seed has also been provided to other research institutions. Following is a list of research topics, goals and status of projects.

1. Monitoring of wild chile populations in Arizona and Sonora. Goal: To determine whether populations are becoming endangered by human harvesting pressure in both states and to learn the economic status of cultivated and wild populations in Sonora. Status: University of Arizona Plant Sciences graduate student Cindy Baker is receiving funds from SEARCH for travel and field expenses to begin survey of these chile populations. Proposals for additional funds have been sent to Horticultural Research Institute and other foundations.
2. Preliminary investigations about the prevalence of seed-borne bean common mosaic virus in domesticated tepary beans. Goal: to screen public as well as private, or institutional accessions to isolate a virus free seed source. Status: SEARCH grew out teparies from a wide variety of sources in cooperation with University of Arizona Plant Pathologists,

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SEARCHING
FOR NATIVE SEEDS

who confirmed the virus presence with electron microscopy. Meanwhile, a Mexican pathologist determined that many currently available lines of teparies carry the virus even though they don't always show symptoms. We have recently obtained two lines of virus resistant (though not immune!) teparies discovered in 1977 trials in Puerto Rico. These will be evaluated under desert conditions this coming summer. Domesticated teparies were removed from the SEARCH seed listing until a satisfactory seed source is located.

3. Cooperation with Ms. Radziah Arriffin and Dr. Charles Weber at the U of A Nutrition Department in the evaluation of the chemical composition of native foods eaten by Papago and Pima Indians. Goal: To justify the consumption of these foods based on nutritional analysis. Over 40 food plants have been analysed. Results will be published in a subsequent issue of the Seedhead News.

Seed Collection Trips

Seed collection is the activity which most clearly corresponds to the acronym SEARCH in our name. We have collected native seeds during several expeditions into Indian country, even though those trips were for other purposes. Whether the main purpose of travel is for scientific research or for arts and crafts buying, a few minutes are set aside each day for learning what the local people are growing and eating. Thus, six trips were made into Mayo and Yaqui country in 1984, where several varieties of corn, beans, squash and gourds were collected. Wild beans of Mexico were collected in conjunction with a wild bean research trip from Jalisco to Sonora. Some new seed varieties were also collected from the Tarahumara Indians in Mexico.

Seed Distribution

Our primary objective of in situ conservation was aided by replenishing the seedstocks of the following tribes, providing seed formerly grown by these tribes to individual farmers or to programs: Papago, Gila River Pima, Salt River Pima, Baja California Cocopa, Chihuahua Mountain Pima, Sonora Pima Bajo, Zuni and Hopi.

In addition, about 1500 seed packages were sold to the public. The Smithsonian Institution received packages of the entire collection of seeds for sale. Meals For Millions/Freedom From Hunger was supplied Mexican corn to be planted in Ecuador, and Papago Indian seeds to be distributed on the Papago Indian Reservation. During SEARCH's first year of existence we have provided seed varieties to the following researchers:

1. Dr. F. Bliss of the University of Wisconsin, received common beans from various tribes to study the origin and dispersal of protein types in beans.
2. Richard Pratt of Purdue University received tepary beans from various tribes for comparison of electrophoresis "fingerprints" with bruchid beetle resistance.
3. Laura Merrick of Cornell University received wild and cultivated cucurbit seeds for study of evolution and introgression on the Cucurbita mixta - C. sororia complex.
4. Numerous archaeologists studying Southwestern crop origins were provided comparative plant material.
5. Dr. Giles Waines of University of California, Riverside received Papago 60-day corn for field growing trials.

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Public Presentations

The following interested organizations have invited presentations about SEARCH at their regular meetings:

- Arizona Native Plants Society,
Yuma Chapter
- Arizona Native Plants Society,
Tucson Chapter
- Ocotillo Garden Club, Tucson
- Rolling Hills Garden Club, Tucson
- Tucson Organic Gardening Club

Talks by Gary Nabhan to organizations on SEARCH related topics:

- Salt River Indian Reservation Elderly Education Program coordinated by Scottsdale Community College.
- Heard Museum, Phoenix, Arizona
- Society for Economic Botany, 1984 annual meeting
- USDA Water Conservation Laboratory, Tempe, Arizona

Publications and Professional Papers

Nabhan has authored or co-authored several papers related to SEARCH during 1983-84. Titles of publications in which these articles appeared are: Cucurbit Genetics Cooperative Newsletter (2 papers), Economic Botany, Southwestern Naturalist, Desert Plants (3 papers), Agro-Ecosystems, American Minor Breeds Conservancy (in press), Journal of Arid Environments (in press). Nabhan wrote the introduction to the book By The Prophet of The Earth, reviewed in this issue.

Grants Received

SEARCH has received two grants in the past year. The CS Fund contributed \$5,000 for general support. The Tides Foundation has given \$15,000 for general support and for marketing and seed distribution proposals. This financial assistance allows us to pay three people part-time to work on memberships and seed sales, collection accessioning, the newsletter, and our demonstration garden. In addition, SEARCH's seed collection is continually being updated with additional field collections and growout.

Financial Statement

Income for the year ended December 31, 1983 was \$9,262.09. Other sources of income were from associates, publications, article sales, donations for special research projects and seed sales. Expenses for this same period were \$3,903.88, leaving \$5,358.21. The CS Fund grant was received in December. The Tides Foundation grant of \$15,000 was awarded during 1984.

Karen Reichhardt

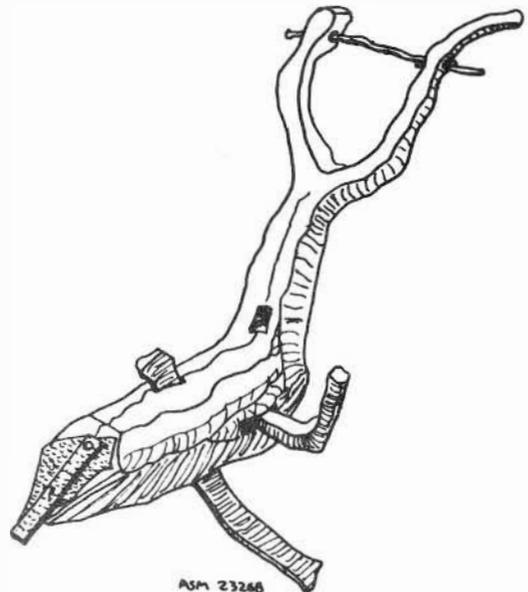
BOOK REVIEW CONTINUED

BY THE PROPHET OF THE EARTH,
Ethnobotany of the Pima

Written by L.S.M. Curtin. 1984. Published by The University of Arizona Press, Tucson, Arizona. 156p. \$6.95

Newcomers to the desert often brought their food and agriculture from other climates, changing the desert to make it "bloom". On rare occasions, a white person would come to the Southwest to observe and take note of the botanical richness already used by the native people. L.S.M. Curtin was one such observer. She interviewed local Pima informants in the late 1940's to produce an ethnobotany covering more than 100 species of desert plants. This does include some non-native trees that were adopted by the Pima for superior qualities of shade. Also covered are Old World vegetables and grains which were grown during winter, offering a whole new growing season.

Anyone interested in desert plants will learn from this book. The section on informants charmingly introduces us to several Pimas, making good reading itself. The University of Arizona Press reproduced this ethnobotany that was first printed in 1949. The text is a direct photographic reproduction of the first edition. A new introduction is by Gary Nabhan. Cover design by Linnea Gentry Sheehan and cover design by Kay Mirocha.



Historic Papago plow fashioned from mesquite wood. Drawing by Gary Nabhan.

Seedkeepers In Their Own Right

According to popular belief, home gardening is an expensive hobby which yields expensive produce, such as \$5.00 tomatoes. Especially in the arid Southwest U.S., gardening is perceived to be prohibitive because it requires a large quantity of water during the summer growing season.

Four Tucson residents, Tom Orum, Nancy Ferguson, Daniela Soleri and David Cleveland have set out to dispel this myth. This team maintains three different plots: two gardens are for fruits and vegetables; the third, larger plot is devoted to field crops such as arid-adapted beans and wheat. They have made a significant dent in food bills by planting crops suited to seasonal weather conditions and by using water efficient gardening techniques. Careful records are taken on each garden including: work time spent by each gardener, quantity of water used, quantity of organic soil amendments; costs of any purchased seed, and weight and market value of harvested produce.

In the gardens, emphasis is given to growing crops year around in consistent quantities sufficient to contribute vitamins and minerals to the diet by means of fresh produce without surplus of any one crop. Frost tolerant crops are grown in winter (i.e. greens, root crops, broccoli), heat tolerant crops in summer (i.e. cowpeas, okra, amaranth and peppers), and heat and frost sensitive crops in the spring and fall (i.e. tomatoes, cucumbers, summer squash, sweet corn).

In the field plot, 3600 square feet of grains and beans are planted in basins over an area of 12000 square feet. The design of sunken beds allows for flood irrigation, with raised walkways between each bed. The goal here is to produce 100 lb. per year - enough for two people for one year. Wheat is planted in winter and tepary beans in the summer. Watering is kept at a minimum. To minimize the need for irrigation, plant densities are lower than would be found in commercial fields. One year winter wheat was grown to maturity with only one irrigation.

Is the effort worthwhile? Results of four years data show that it is. Using energy and resource efficient methods such as theirs gives a net economic return in all seasons, or about \$115 a year. Their harvest varies per month, but averages 11 ounces of vegetables per day. This quantity meets daily requirements for at least 10 nutrients.

Energy costs are low compared to those of shipping in fruits and vegetables grown in California and Mexico. Water accounts for 25% of total yearly garden costs of about \$50. However, labor returns are low - between 50 cents and \$1.50 per hour per week, for an equivalent of five days per year. However, the exercise, relaxation and high health value of fresh organic produce more than compensates for time spent gardening.

The most impressive aspect of Daniela, Tom, Nancy and Dave's gardening is their dedication to sound scientific research at the home gardening level. And they have demonstrated that gardening can be incorporated into the busy lives of modern day people.

Karen Reichhardt

SEARCH Is Looking for a few good Understudies

If you have an interest in seedsaving, gardening, horticulture or Native American agriculture or marketing, your talents are needed! Internships are available with SEARCH for 3-4 week sessions. Arrangements for college credit can be made. Activities include assistance with field trips in Southern Arizona and northern Mexico (tentative), working in the Demonstration Conservancy Garden, contributing to the Seedhead News, and helping out with correspondence and seed sales. Room and board is available for a nominal fee. For more information write: Karen Reichhardt, Native Seeds/SEARCH, 3950 W. New York Drive, Tucson, Az. 85745, (602)628,1425.

Safekeeping Mexican

Genetic Resources

In June 1984, Gary Nabhan had the opportunity to spend a week with the staff of Mexico's Genetic Resources Unit at the Mexico Valley Agricultural Experiment Station in Chapingo, Mexico. Founded in 1974, with Dr. Francisco Cardenas Ramos as its coordinator, the national genetic resources program is already active at 11 stations throughout Mexico. Dr. Cardenas, a Michigan State University trained plant breeder, is the author of the key reference on traditional land races of common beans in Mexico, but he is knowledgeable about many other native crops as well. Under his capable leadership, the program continues to make considerable progress in the area of germplasm ex situ conservation and evaluation, despite setbacks due to Mexico's financial crisis.

The Chapingo experiment station is the base of Mexico's bean genetic resources effort. Ing. Jose Muruaga Martinez, an experienced field collector of wild beans, directs germplasm increases, evaluates the forage potential of perennial beans, and experiments with vegetative propagation of scarlet runner bean varieties there. Mexico already has significant accessions of many wild bean species, particularly from Durango, where Muruaga made 153 collections of wild Phaseolus and Macroptilium populations between 1978 and 1981.

He will be hosting Nabhan, SEARCH's B.T. Burns and the University of Arizona's Russ Buhrow on an FAO funded exploration trip during this coming September. He will be hosted by Nabhan in late August for collection in Arizona, New Mexico and west Texas. Muruaga and Cardenas recognize the food and forage potential of wild bean resources. Their goal is to complete collections of the remaining species before land clearing or grazing further threatens these plants which are a valuable part of Mexico's cultural and natural heritage.

Gary Nabhan

THE SEEDHEAD NEWS
Published Quarterly By
Native Seeds/SEARCH
3950 W. New York Drive
Tucson, Arizona 85745

Editor, Karen Reichardt. Contributing Editors, Barney T. Burns, Mahina Drees, Gary Nabhan. Write the editor if you wish to order back issues or contribute an article.



YES! I'd like to help in the conservation of native crops and their wild relatives in the American Southwest. Enclosed is a contribution to Native Seeds/SEARCH for: (check off)

ASSOCIATE MEMBERSHIP (1 YR., \$10.00)
(Includes newsletters, and 10% discount on seed purchases, workshops & publications)

LIFETIME ASSOCIATE MEMBERSHIP (\$100.00)
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-Native seed collection/conservation:
-Virus-free tepary grow-out:
-Conservation of wild chile stands:
-Nutritional analysis of native foods:

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PRESERVING OUR GENETIC HERITAGE

"There are numerous similarities between the destruction of the cultural heritage and that of the genetic heritage. And though neither one is justified, there are differences in the way the general public reacts. For many years, man has condemned any attack on his cultural heritage. The destruction of works of art, of language or his customs...is not tolerated. On the other hand, man looks indifferently at the destruction of nature and at the disappearance of species. [And yet] a country that destroys its ecological balance and its genetic heritage, just like a country that destroys its historical heritage, is closing options for the future..."

Institute of Ecology, Mexico

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