Genebanks

Treasure Houses of Uncommon Foods

Kiwi

Fava Bean Pods

One day your dinner plate may be filled with bright, speckled beans, licorice-flavored avocado slices, and spicy pickled cabbage.

A Halloween trick? No, a tasty treat.

These and many other exciting foods are popular in other countries—and could one day be palate pleasers here. Some fruits and vegetables, like kiwi and bok choy, are loaded with important nutrients and already have a home on American tables.

In fact, while some berries and nuts are U.S. natives, most of the foods we eat originated in foreign lands. As people migrated to the United States, they often brought seeds of their favorite crops.

"Our diet is limited only by our imagination," says Henry L. Shands, ARS associate deputy administrator for genetic resources in Beltsville, Maryland. "Up to 5,000 plant species have been used for food, although today most of the world relies on less than 200.

"Each food crop species has hundreds of wild and cultivated relatives with potentially important genetic differences," he says. "These relatives could be used to develop flavorful new U.S. crops. Or they may hold the keys to pest resistance or other improvements in existing crops."

Scientists at 21 ARS facilities and land-grant institutions carefully store seeds and other plant parts—known as germplasm—that can be grown into plants.

These germplasm repositories, or genebanks, are located across the

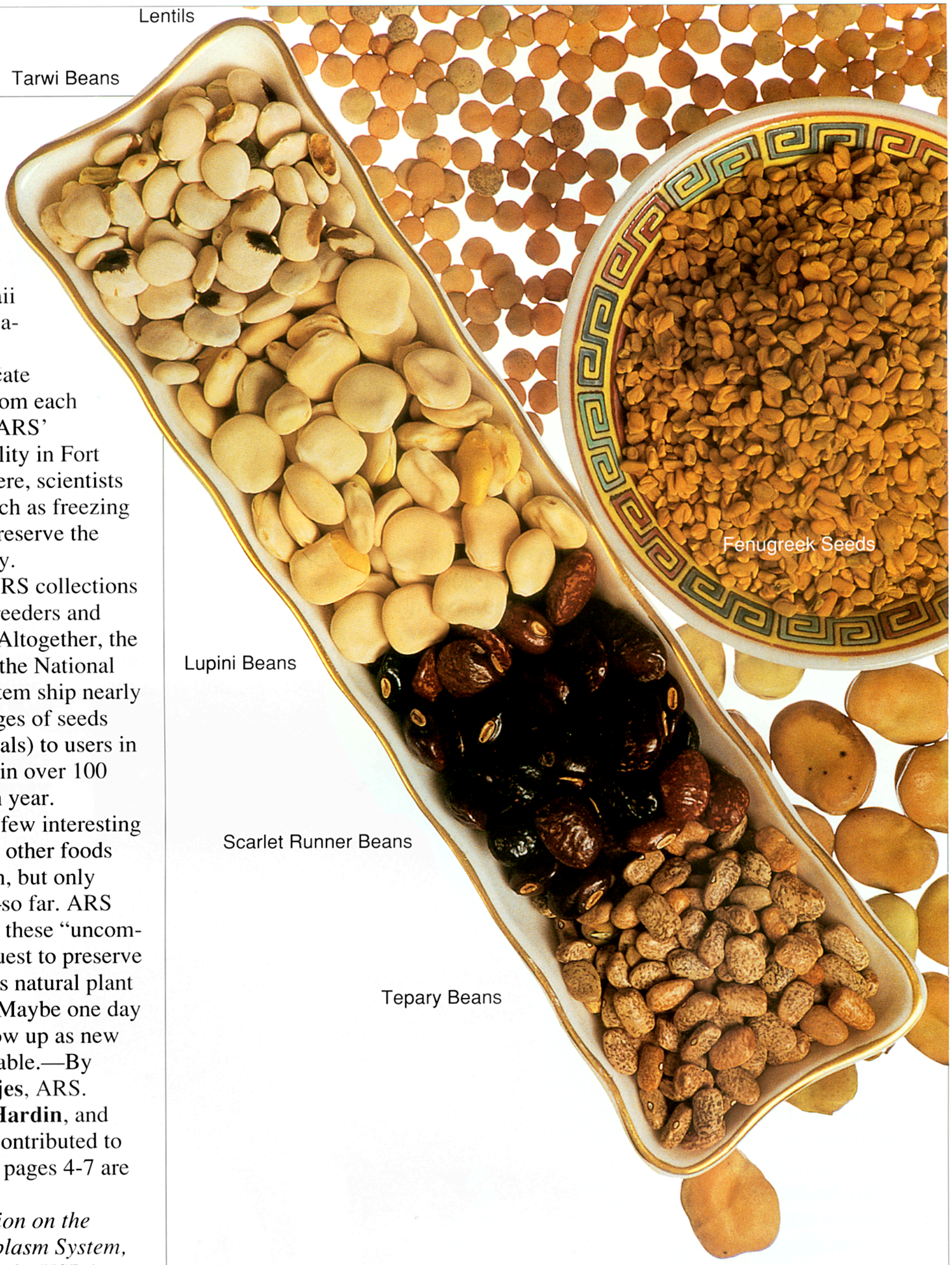
country to provide the best growing conditions for the crops they store, like berries in Oregon and tropical fruits in Hawaii and Florida [list of locations, page 8].

As a backup, duplicate germplasm samples from each repository are sent to ARS' long-term storage facility in Fort Collins, Colorado. There, scientists develop techniques such as freezing in liquid nitrogen to preserve the germplasm indefinitely.

Germplasm from ARS collections is available to plant breeders and scientists worldwide. Altogether, the various collections in the National Plant Germplasm System ship nearly 150,000 items (packages of seeds and other plant materials) to users in the United States and in over 100 foreign countries each year.

Pictured here are a few interesting fruits, vegetables, and other foods that have large foreign, but only small U.S., markets—so far. ARS scientists came across these "uncommon" foods in their quest to preserve as much of the world's natural plant diversity as possible. Maybe one day some of them will show up as new foods at your dinner table.—By **Kathryn Barry Stelljes**, ARS. **Marcia Wood**, **Ben Hardin**, and **Dennis Senft**, ARS, contributed to this article. Photos on pages 4-7 are by Keith Weller.

For more information on the National Plant Germplasm System, contact Henry L. Shands, USDA-ARS, Room 115, Bldg. 005, 10300 Baltimore Ave., Beltsville, MD 20705-2350; phone (301) 504-5059, fax (301) 504-6191.



(K6027-9)

A Sampling of Fruits and Vegetables From U.S. Plant Repositories

Beans - Lentils, peas, beans, and other legumes are staple foods worldwide. One of the earliest cultivated crops, lentils make creamy soups eaten in North Africa and Eurasia. One cup of beans—like fava beans in Africa and the Middle East, and tarwi, lupini, and tepary beans in Latin America—provides a third of an adult's daily requirement of protein. Legumes are also popular as snacks and spices. In Mexico,

Nuñas

tender shoots from scarlet runner beans are dipped in batter and fried. Nuñas from the Peruvian Andes are popped like corn. Fenugreek seeds enhance curry spices, vanilla flavorings, and maple-like syrup. Pullman, Washington (K3914-11)

Gooseberries

Gooseberries - Competitions for the largest gooseberry have been held in England for over 100 years—the largest berry on record reaching the size of a small apple. Native to North Africa and the northeastern United States, gooseberries, *Ribes grossularia*, are similar to currants. They are enjoyed raw, in preserves, and as a pie filling. Corvallis, Oregon (K6026-1)

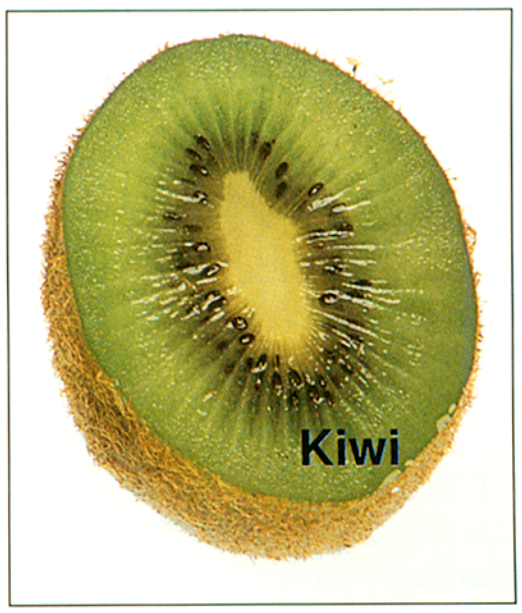
Bok-choy

Tomatillo

Tomatillo - Like the tomato, the tomatillo, *Physalis* sp., ripens into a sweet fruit. But in its native Mexico, it is preferred green and slightly underripe as the basis for a spicy salsa. Geneva, New York (K6023-1)

Chinese leafy vegetables - Most oriental leafy greens, like bok-choy, *Brassica rapa* subsp. *chinensis,* come from China, but they are eaten regularly across the Pacific Rim. They are stir-fried, fermented, or pickled. Kim chee is a favorite Korean side dish made with pickled cabbages, radishes, garlic, and hot pepper. Related to broccoli and cabbage, all oriental leafy greens are high in vitamins A and C, iron and other minerals, and fiber. They may have an important role in preventing some kinds of cancer. Geneva, New York (K6020-1)

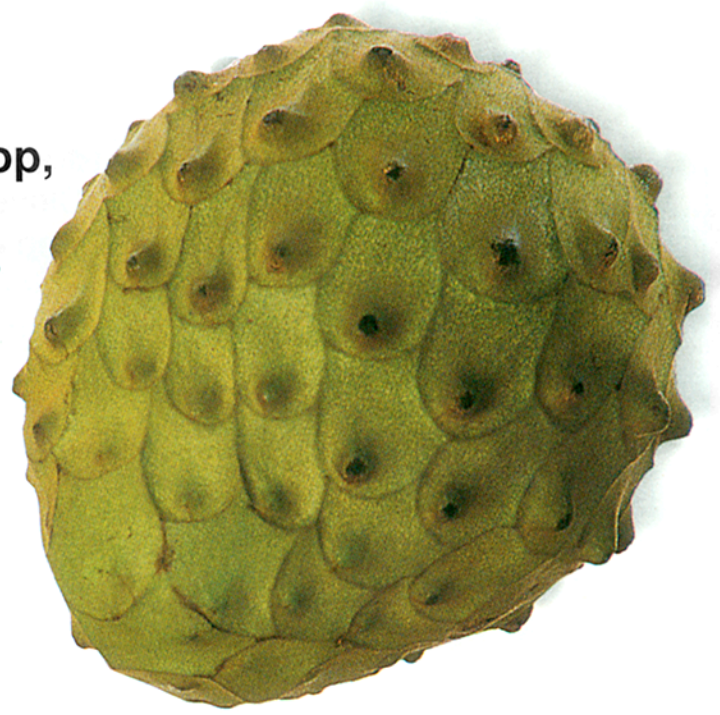
Kiwi - Originally known as yang tao or Chinese gooseberry, this tangy green fruit originated in China. In the 1960's, New Zealanders renamed the brown, fuzzy-skinned fruit after



their national symbol, a native flightless bird. The fruit is eaten alone, in salads, and as a condiment on ice cream and pastries. Kiwi, *Actinidia deliciosa,* can also be used to tenderize meat. Each fruit has more vitamin C than a large orange. Davis, California (K6024-6)

Cherimoya, soursop, and sugar apple - Sweet dessert fruits from tropical America are enjoyed fresh or made into sherbet. Andean cherimoyas combine pineapple and banana flavors. With a taste like pineapple and mango, soursops are made into a refreshing Cuban drink. The white, custardlike flesh of the sugar apple is a favorite in India. Miami, Florida (K6032-11)

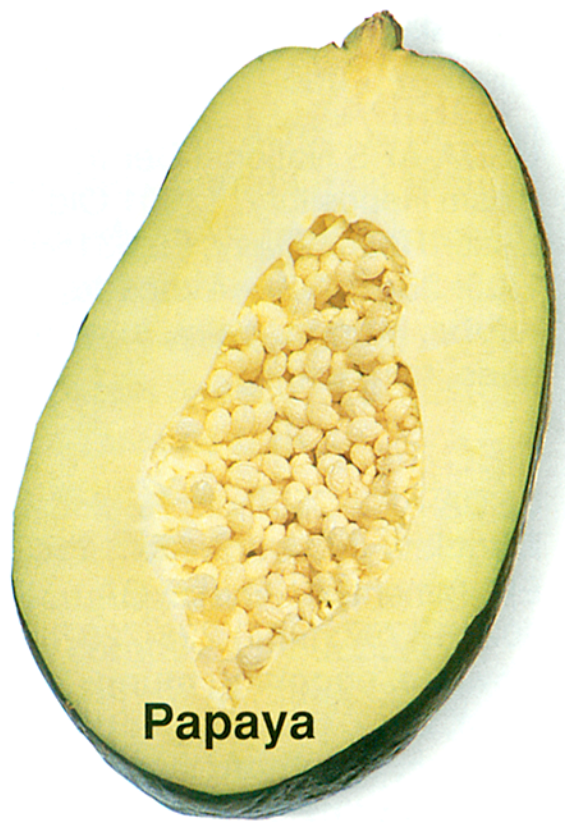
Wampee - These Chinese fruits are distantly related to kumquats and other citrus. The wampee, *Clausena lansium,* bears mostly sour fruit in clumps and is eaten fresh. Riverside, California (K6022-1)



Mountain soursop

Pummelo - Grapefruits may have been developed from these larger, sweeter relatives. Some varieties in their native Southeast Asia have green skin and flesh. Improved U.S. cultivars have fewer seeds, thinner rinds, and may be red fleshed. All pummelos, *Citrus grandis,* are eaten fresh or juiced. Riverside, California (K6025-1)

Papaya - This crunchy and green fruit is best known in green papaya salad with fish sauce, a popular Thai dish. When ripe and salmon-red, it is good just plain or in juice, and it is rich in vitamins A and C. Papaya cultivars from Thailand are about five times larger than typical supermarket varieties from Hawaii. Papayas, *Carica papaya*, contain the enzyme papain, which is used to make meat tenderizers. Hilo, Hawaii (K6029-1)



Pummelo

Repositories and Their Locations

CALIFORNIA

USDA-ARS National Germplasm Repository, University of California, Davis, CA 95616-8607; (916) 752-6504.—**Almond, apricot, cherry, fig, grape (warm season), kiwi, nectarine, olive, peach, pistachio, plum, pomegranate, walnut**

USDA-ARS National Germplasm Repository, 1060 Martin Luther King Jr. Blvd., Riverside, CA 92507; (909) 787-4399.—**Date, grapefruit, lemon, lime, orange**

DISTRICT OF COLUMBIA

U.S. National Arboretum, 3501 New York Avenue N.E., Washington, DC 20002; (202) 245-2726.—**Ornamental trees and shrubs**

FLORIDA

USDA-ARS National Germplasm Repository, 13601 Old Cutler Road, Miami, FL 33158; (305) 254-3632.—**Avocado, jujube, mango, palm, sugarcane, tropical fig**

GEORGIA

USDA-ARS Southern Regional Plant Introduction Station, 1109 Experiment St., Griffin, GA 30223-1797; (404) 228-7207.—**Cowpea, eggplant, mungbean, okra, peanut, pepper, sesame, sorghum, sweetpotato, watermelon**

HAWAII

USDA-ARS National Germplasm Repository, PO Box 4487, Hilo, HI 96720; (808) 959-5833.—**Breadfruit, carambola, guava, lychee, macadamia nut, papaya, passion fruit, pineapple, rambutan**

IDAHO

USDA-ARS National Small Grains Collection, PO Box 307, Aberdeen, ID 83210; (208) 397-4162.—**Barley, oat, rice, rye, wheat**

ILLINOIS

USDA-ARS Maize Genetic Cooperation Stocks Collection, Center S108 Turner Hall, 1102 South Goodwin Ave., University of Illinois, Urbana, IL 61801; (217) 244-0864.—**Maize**

USDA-ARS National Soybean Collection, 1101 West Peabody Ave., Urbana, IL 61801; (217) 244-4346.—**Soybean**

IOWA

USDA-ARS North Central Regional Plant Introduction Station, Iowa State University, Room G212, Agronomy Hall, Ames, IA 50011; (515) 294-3255. **Amaranth, asparagus, cantaloupe, carrot, corn, cucumber, sunflower, sweet clover**

KENTUCKY

Clover Collection, Agronomy Department N222, Agr. Science North, University of Kentucky, Lexington, KY 40546-0091; (606) 257-5785. **Clover**

NEW YORK

USDA-ARS Plant Genetic Resources Unit, Cornell University, Geneva, NY 14456-0462; (315) 787-2390.—**Apple, broccoli, brussels sprout, cabbage, cauliflower, celery, collard, grape (cool season), onion, pumpkin, radish, squash, tomato**

NORTH CAROLINA

USDA-ARS Tobacco Collection, Oxford Plant Protection Center, North Carolina State University, 901 Hillboro St., Oxford, NC 17565; (919) 693-5151. **Tobacco**

NORTH DAKOTA

USDA-ARS Northern Crops Research Laboratory, PO Box 5677, Fargo, ND 58105; (701) 239 1321.—**Flax**

OREGON

USDA-ARS National Germplasm Repository, 33447 Peoria Rd., Corvallis, OR 97333-2521; (503) 750-8712.—**Blackberry, blueberry, currant, filbert, hop, mint, pear, raspberry, strawberry**

PUERTO RICO

USDA-ARS Tropical Agricultural Research Station, National Germplasm Repository, PO Box 70, Road 65, Mayagüez, PR 00681-0070; (809) 831-3439.—**Banana, Brazil nut, cassava, cocoa, plantain, yam**

TEXAS

USDA-ARS Cotton Collection, 2765 F&B Road, College Station, TX 77845; (409) 260-9209.—**Cotton**

USDA-ARS National Germplasm Repository, Rte. 2, Box 133, Somerville, TX 77879; (409) 272-1402.—**Pecan**

WASHINGTON

USDA-ARS Western Regional Plant Introduction Station, 59 Johnson Hall, Washington State University, Pullman, WA 99164-6402; (509) 335-1502.—**Bean, chickpea, forage and range grasses, garlic, leek, lettuce, pea, sugarbeet**

WISCONSIN

USDA-ARS Potato Germplasm Introduction Project, 4312 Hwy 42, Sturgeon Bay, WI 54235; (414) 743-5406.—**Potato**

The National Plant Germplasm System

The National Plant Germplasm System, coordinated by ARS, maintains about 450,000 accessions of plant material, including food, feed, and natural fiber crops and ornamentals. Information about holdings in the germplasm system can be obtained from the World Wide Web at http://www.ars-grin.gov

International plant exchange, quarantine, and the Germplasm Resources Information Network (GRIN) are coordinated by the USDA-ARS National Germplasm Resources Laboratory, Bldg. 003, Room 225, 10300 Baltimore Ave., Beltsville, MD 20705-2350; phone (301) 504-6235, fax (301) 504-5536.

Preserving the U.S. base collection of plant germplasm and serving as the long-term backup site for all accessions is the USDA-ARS National Seed Storage Laboratory, 1111 South Mason St., Fort Collins, CO 80521-4500; phone (970) 495-3223, fax (970) 221-1427.