



Mission: Find the Right Plants

The U.S. Plant Materials Center in Tucson is an Ellis Island for leafy immigrants where they are tested for their ability to do useful work.

The center is part of the U.S. Soil Conservation Service. It does not deport or embargo those poor huddled grasses that don't pass muster. It just saves its special seal of approval – official “release” – for the few varieties that thrive well and fit certain help-wanted job descriptions. Those jobs include erosion control along highway margins or range grass for arid-land ranching.

The center also runs some native Southwestern plants through its evaluations, but just one of the 11 plant varieties that have been officially released by the center is a native – a variety of black grama grass called Sonora. The tests are tough. Only those 11 releases have been selected out of about 28,000 different plant accessions, foreign and native, that have been tested since the center opened in 1935.

The two most recent releases are the Corto variety Australian saltbush for erosion control on disturbed sites and the Cochise variety of atherstone lovegrass, from South Africa, for rangeland improvement.

The Plant Materials Center in Tucson is one of 23 nationwide run by the U.S. Department of Agriculture. Each tests plants for a certain geographic region.

Bruce Munda, acting manager of the Tucson center, said, “The designated region for this center is Arizona plus parts of southern Utah and



Photographs: The Tucson Plant Materials Center (top) is landscaped with many arid-land plants, native and foreign. A yellow-tipped, red starburst blossom (above) adorns one of the eucalyptus trees that the center is testing. (Photos by Julia Anderson.)



Ralph Wilson has seeded part of his Falcon Valley Ranch Near Oracle with a combination of Lehmann Lovegrass and Cochise lovegrass. Both are varieties tested and released by the Tucson Plant Materials Center. Wilson holds heads of the Cochise variety, the taller and newer of the two.

southern Nevada, but most of the plant materials we develop here actually have their potential application in southern California, southern Nevada, southern Arizona, southern New Mexico and southwest Texas." On the other hand, an Indian rice grass variety developed at a Plant Materials Center in Idaho has become popular for range reseeding in northern Arizona, and is grown for seed production in Colorado City, Arizona.

Each Plant Materials Center concentrates on plant uses that are related to the soil and water conservation problems of its own region, said Munda. For example, the center in New Jersey evaluates plants for shoreline stabilization and the center in North Dakota focuses on potential windbreak trees to fight wind erosion.

Priority on Erosion Control

The Tucson center's priorities are, in order, grasses for rangeland improvement; plants to control erosion in areas that have been disturbed by mining or by construction of roads, homes or industry; plants to cover abandoned cropland; salt-absorbing plants to improve water quality and reduce runoff in areas with salty soil; and fast-growing trees and shrubs for windbreaks, shade, wildlife habitat, landscaping and Christmas tree production. Drought-tolerance is a required trait in all these categories, said Munda. In initial testing, plants get no irrigation after they start growing.

Headquarters for filling this big order is the Plant Materials Center's tree-shaded adobe building on Romero Road in northwestern Tucson. Plant samples — usually seeds — are collected here from arid lands around the world. The center also sends out samples of Southwestern plants for testing in other states and countries.

Besides the office, the center has laboratories, storage space, farm buildings and about 40 acres of fields. Half the fields are used for initial test plantings of the collected plant samples. On the rest, seed is produced for varieties that have been selected for larger-scale testing and varieties that have already been released for public use.

Munda said that about 1,500 different grasses, shrubs and trees are now being tested. For some species, that number includes many samples collected at different locations.

The initial screening takes three to 10 years, depending on weather patterns and the type of plant. The selections that thrive through summer, winter and drought, and appear to have other desired traits, advance to the next stage. They are grown for more seeds, which are used to plant larger test plots either at the Plant Materials Center or at sites away from Tucson that represent the plants' potential uses. These plots allow side-by-side comparisons of several promising selections from one or more species.

Large-Scale Field Trials

Plants that perform well in these test plots get a shot at large-scale field trials. Their success depends on the potential for practical methods of propagation, as well as on their characteristics after they start growing. That means that farm superintendent Henry Pallanes and others on the center's staff must devise ways to harvest and plant many types of seeds that give problems such as clogging machinery or blowing away.

The field trials often test seedbed treatment methods along with plant varieties. For example, recent multi-acre plots on abandoned

cropland near Red Rock tested techniques such as the scraping of surface soil and deep ripping of soil, as well as comparing six plant varieties. The results showed the possibility of revegetating idled cropland in a low-rainfall area without using irrigation, said Jim Briggs, manager of the center from 1980 to 1983.

When large-scale field trials show that a new variety has some advantage over plants that are already available, the Plant Materials Center and the University of Arizona Agricultural Experiment Station jointly publish a notice of the variety's release for commercial production and use. The notice details the appropriate growing conditions and potential uses for the variety.

The center maintains a seed-producing stock of released varieties. The seed is available through the Arizona Crop Improvement Association. Samples and records of the varieties that are not released are kept at the Plant Materials Center or elsewhere in order to preserve genetic potential that might prove valuable in the future.

Ten of the 11 releases from the Tucson Plant Materials Center have been grasses, including eight varieties of lovegrasses, which are native to South Africa. The other three released varieties are the Corto saltbush and Sonora black grama grass mentioned above, and the A-130 variety of blue panicgrass from Australia.

Lehmann lovegrass, variety A-68, has been used more than any of the center's other releases. Since its release in 1950, range seedings of this variety have developed into naturalized stands on many expanses of rangeland in Southern Arizona. Briggs reported that last year alone, about 16 tons of seed were sold for this variety, enough to seed about 32,000 acres. Establishing stands of grass on degraded rangeland helps control erosion and provides forage for wildlife and livestock.

A-68 Lehmann lovegrass needs at least 12 inches of annual rainfall. Four other released grasses — A-130 blue panicgrass, Cochise lovegrass, and Kuivato and Puhulima varieties of Lehmann lovegrass — can get by with slightly less water.

Help With Seed Production

The Plant Materials Center released the Cochise variety in 1979. "When we release a plant, we tell people where it can be grown, how to plant it and what success to expect," said Briggs. "For people who want to produce seed, we tell them how to grow the plant for seed, how to fertilize it, how to harvest the seed and how to clean the seed."

For example, Roger Major, a farmer in the Elfrida area, grew 60 acres of Cochise lovegrass this year to produce seed for sale. "I have had plenty of contact with the people there (at the Plant Materials Center) to get information," said Major. "They also refer ranchers to me who are looking for seed."

Major has sold seed for range reseeding in Sonora, Mexico, and as far north as the Kingman area. He said people value the seed because, "Cochise will out-produce Lehmann's, and it's probably more palatable and more cold-tolerant." The Plant Materials Center reported that Cochise lovegrass has survived temperatures as low as 25 degrees below zero.

"We have hundreds of thousands of acres of rangeland that need improvement," said Major. "There's a philosophy floating around in the government that we should only be growing native plants, but on these tougher sites, lovegrass can't be touched by any of the native



Top: Jim Briggs, former manager of the Plant Materials Center, cleans newly harvested seed in an air screen separator.

Bottom: Acting Manager Bruce Munda measures leaf width as part of an evaluation of eucalyptus varieties.

grasses in terms of establishing a stand.”

Corto saltbush, the Tucson Plant Materials Center’s only non-grass release, is a low-growing shrub used as a ground-cover plant for erosion control and beautification along highways and on other disturbed ground. About 60,000 potted seedlings and 40,000 pounds of seed have been produced since the variety was released in 1977. The heaviest use is in southern California, Briggs said.

Coming attractions in advanced stages of evaluation at the Plant Materials Center include more shrubs as well as grasses and trees.

Briggs predicted release of Ruby saltbush, which has been tested in reclamation of mined areas and stabilization of highway rights of way. He said, “It provides excellent erosion control. You can see how much soil has stayed in place around it compared to neighboring areas.” It can survive in areas with as little as two inches of annual rainfall. Red, edible berries and year-round green leaves make it attractive as a landscaping plant, too.

Several varieties of galleta grasses and sacaton grasses, native to the Southwest, are being tested for potential revegetation of abandoned farmland. Other grasses, from Mexico, Spain and tropical Africa, show promise for range use.

In 1979, the Plant Materials Center planted about 150 eucalyptus trees and shrubs, representing about 80 different species. This evaluation is a cooperative project with Phoenix nurseryman Ron Gass, who grew the plants to one-gallon size from seed, said Briggs. The eucalyptus varieties are being evaluated primarily for windbreaks, landscaping and soil stabilization. Several have showy blossoms.

“We have selected 10 varieties as superior so far,” said Briggs. Some of the trees have grown to 40 feet tall in four years without any irrigation since 1979. Briggs noted, though, that Tucson has not had a cold winter since 1978-79, and that a hard freeze might kill several of the eucalyptus varieties. Still, he said, “I anticipate that we will be releasing two or three varieties of them within three or four years.”



Munda (left) and Mark Albright hand-harvest a plot of Catalina lovegrass.