

Speeding Up Mother Nature

They're speeding up Mother Nature to provide desert-adapted plants for your front yard.

Gary A. Thompson, a University of Arizona plant scientist, and Jimmy Tipton, the UA Cooperative Extension arid ornamental plant specialist, are developing a system to propagate desert-hardy woody plants using tissue culture techniques.

They're converting a well-known laboratory process into one that a commercial nursery can use. They pick out the best and most beautiful desert-adapted plant, perhaps growing wild in the middle of nowhere, and reproduce it — exactly, down to the last gene.

A labor-intensive process, tissue culture starts with the tip of a plant shoot taken when the plant is actively growing. The tip is sterilized in bleach, rinsed, put into a small container with a growing medium and then carefully exposed to just the correct amount of light at the right temperature.

Once the micro-cutting grows into a miniature plant, the researchers can make additional cuttings.

They can get as many as 60 new plantlets from each miniature plant and literally millions from the original plant tip, Thompson said. All exactly the same.

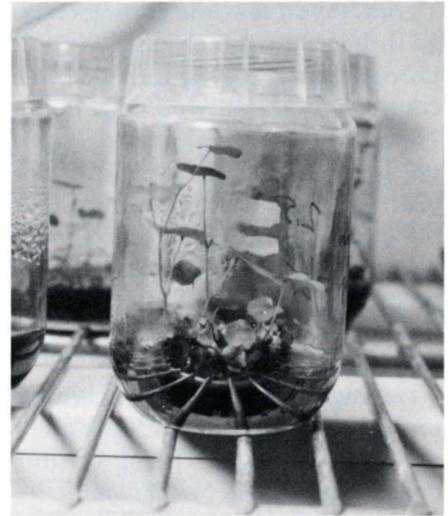
It's painstaking work. Thompson and Tipton give credit to their high school intern Edelissa Nava, who has graduated from Catalina High School in Tucson and is now a UA student.

"She brought our project along to its present stage," Tipton said.

The next step is learning how to successfully root the plantlets. Then the process is ready to move to commercial nurseries. They're interested — despite the expense and complications of using tissue culture.

It's a common propagation technique large nurseries have used for other kinds of plants. Tipton and Thompson are expanding the technique to desert woody plants for low-water use landscaping.

Why bother? Why not simply get seeds from a plant with all the right characteristics to make it a popular desert landscape plant — growing well in the hot, dry climate, blooming beautifully with good-looking foliage, disease and insect resistant?



Tissue cultures

Michael Stoklos

It's a good idea, but it doesn't work very well, Tipton said.

Mexican redbud, for example, is a pink-blooming small tree that resembles a redbud used for landscaping in the Eastern United States. The desert variety grows naturally in West Texas and parts of Mexico. Tipton and Thompson used the Mexican redbud in their first experiments with tissue culture for woody desert plants.

The redbud and many other woody plants with desirable characteristics are highly variable, with dormancy periods that make life difficult for commercial nurseries, Thompson said.

"You see a gorgeous plant that looks just perfect for a suburban front yard, so you collect the seed," he explains. "You won't know for six or seven years whether the young tree is going to look the same — and it may not."

In the case of the Mexican redbud, plant scientists can only get viable stem cuttings for four weeks after the tree buds in the spring. Wait six weeks and the cuttings probably won't produce roots.



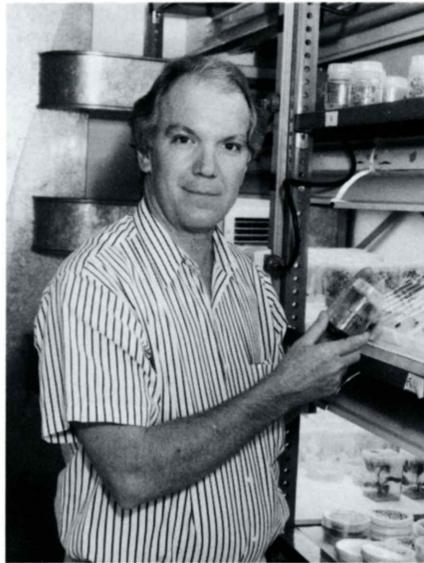
Gary Thompson

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"But, if you take the cuttings and go through the tissue culture process, you can keep the micro-cuttings for years if you need to," Thompson said. Also growers can produce new plants any time of the year, each identical. Transporting the micro-cuttings is easy and inexpensive. Tiny peat plugs will hold 400 cuttings per square foot, fitting neatly in a styrofoam case that can be shipped by air.

Having designed a tissue culture process that works with Mexican redbud, Tipton and Thompson are beginning to work on similar systems for mesquite, landscape jojoba, red yucca and the bird of paradise plants.

"We're not working to produce plants for commercial growers,"



Jimmy Tipton

Michael Stoklos

Tipton emphasized. "We're developing a practical method that they can use, plus we want to train students for an interesting career field."

"The beauty of tissue culture is that growers can select a plant that's perfect for their business and propagate it quickly," Thompson added. "If they find a plant they like better, they can shift to it — again quickly." ♦

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Getting the Most from Lehmann Lovegrass

Lehmann lovegrass flourishes in the summer on more than 200,000 acres in Cochise, Pima, Pinal and Santa Cruz counties. It resists drought and comes back quickly after a fire. It greens up early in the spring.

But, it's not the perfect range grass by any means. The South African native has aggressively pushed out native grasses because it comes back quickly after a fire or prolonged drought and simply outcompetes other grasses.

Since the lovegrass covers such a large acreage, species and structural diversity is limited. That's less favorable for wildlife, said George Ruyle, a University of Arizona Cooperative Extension range management specialist.

For example, Lehmann lovegrass seeds are extremely small, more than six million to a pound. So the

grass is not as good a forage for seed-eating animals, such as some rodents, birds and lizards.

Although Lehmann lovegrass is fairly nutritious, cattle prefer the native species. However, if the choice is between brown, dry native grass and green lovegrass, cattle eat the green.

Ranchers can't get rid of Lehmann lovegrass in southern Arizona, so their challenge is using it effectively for cattle grazing, Ruyle said. He and Jerry Cox, U.S. Department of Agriculture range scientist, have worked for several years at the UA Santa Rita Experimental Range, south of Green Valley, to develop guidelines.

Also, native grass species play an important part in the future of Southern Arizona rangelands. Ruyle recommends seeding native grasses in some higher elevations that receive greater rainfall.

"Native grass species are more likely to grow here," Ruyle explains.

The fact that Lehmann lovegrass is more drought-resistant than native grasses means ranchers can depend on it for emergency forage during dry periods. Ruyle, Cox and Bruce Roundy, an assistant professor in the UA School of Renewable Natural Resources, found that Lehmann lovegrass produces almost four times more forage than native grasses in dry summers.

Since Lehmann lovegrass stems remain green during late winter and early spring, they often become a major part of livestock diet then. In the summer, ranchers can put cattle on the Lehmann lovegrass and let the native grass pastures rest.

In pastures where both native grasses and Lehmann lovegrass grow, cattle tend to graze the highly