



Dr. Jay Thomas collects petunia seeds from plants that are part of his gene experiments.

Photo by Tracy Staton

New gene transfer method could improve cereal crops

By George Weissenberger
Reporter

Electroporation is a relatively new method of gene transfer that shows great potential in improving cereal crops, says Dr. Jay C. Thomas, a member of a gene transfer group in the biology department at Texas A&M.

Electroporation allows genes to be transferred into monocotyledons — corn, beans, barley, rice and other important crop plants, Thomas says.

Before electroporation, he says, the preferred method of gene transfer was limited mostly to a group of plants called dicotyledons, which doesn't include cereal crops.

This older method of transferring genes into dicotyledons, Thomas says, makes use of a type of bacteria called *agrobacterium tumefaciens*. This bacteria contains a plasmid called the *ti* plasmid, which, for some unknown

reason, can transfer part of its DNA into a plant cell, he says.

In nature, Thomas says, this transfer of DNA can result in strange, tumor-like growths on plants. But in the lab, geneticists have learned to take advantage of the process by cutting out sections of the *ti* plasmid and filling the gap with other genes, he says. The genes then could be transferred into a plant cell by the bacteria, he says.

Electroporation does away with this long bacterial process by allowing free genes to directly enter into a plant cell, Thomas says.

Through electroporation, free genes are mixed with plant cells chosen by the geneticist, he says.

The cells, he says, are prepared by having their cell walls dissolved by an enzyme called cellulase. Once the cell walls of the plant cells are dissolved, the genes are allowed to come into di-

rect contact with the cell membrane, he says.

Then, the solution is jolted with about 350-400 volts per centimeter, he says, burning holes in the cell membrane, allowing the genes to enter and enabling the cell to repair itself.

Afterward, the membrane is able to repair itself, he says.

"If you've been very careful in growing your cells in your cultures," Thomas says, "you can end up with a mature plant.

"Without being able to do this, the whole process of introducing new genes into a cell would be worthless. The next challenge is to isolate genes that are of agronomic interest. We're not there yet. We're just finding out what genes are important for disease resistance."

Many interesting genes already exist in nature, he says, and it's just a matter of finding them.

Comptroller: Think about state income tax

AUSTIN (AP) — State Comptroller Bob Bullock told Senate budget writers Tuesday he is as opposed as anyone to a state income tax but "you might as well talk about it, you might as well think about it."

Bullock said because Louisiana has a state income tax, it will obtain about a 28 percent increase in revenue next year by amending its law to

coincide with the new federal tax law.

"But in Texas, where are we?" he asked. "We don't have that, we don't have a growth tax."

The comptroller appeared before the Senate Finance Committee on his request for an office appropriation of nearly \$218.4 million in 1988-89. Unlike what many state agencies are facing, the original Sen-

ate bill proposes almost as much as Bullock is requesting.

Bullock said as a result of layoffs and job attrition during Texas' recent financial crisis, his office had lost 470 jobs the last two years.

Sen. Roy Blake, D-Nacogdoches, recalled, "Years ago in East Texas, if you just mentioned income tax it was enough to defeat you — even (just) the mention."

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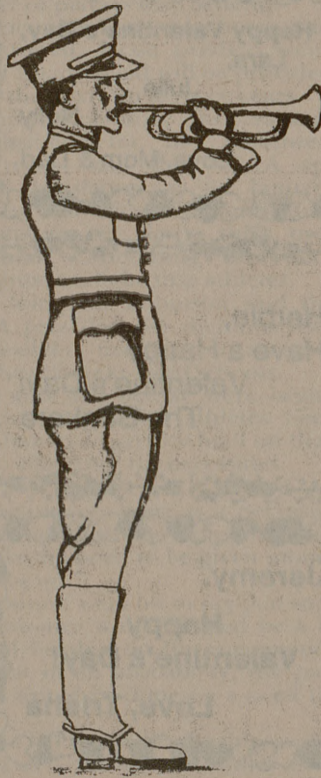
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