

Penn State 'clones' cotton plants

UNIVERSITY PARK — Plant scientists at Penn State have become the first to produce cotton directly from cell tissue instead of from seed. The technique is gaining worldwide recognition as a "breakthrough" in producing plants with superior genes.

The cotton plants were regenerated from cellular structure known as callus tissue.

Gayle Davidonis, research assistant at the Pesticide Research Laboratory of Penn State, reported the experiments at the 10th annual meeting of the Plant Growth Regulatory Society of America June 21 in East Lansing, Mich.

Callus tissue, she explained, is a mass of cells not in any recognizable form. Such tissue can be obtained from any part of a

mature or seedling plant and can be maintained almost indefinitely. Some cells can be induced to form embryos by an appropriate change in nutrients.

Davidonis works with Robert H. Hamilton and Ralph O. Mumma at Penn State. The three claim that regeneration of whole cotton plants from callus tissue is the first step in using genetic engineering

techniques to produce desirable new traits in cotton.

"Fortunately, plant tissue cultures maintain the basic metabolic or biochemical characteristics of the original plants," declares Dr. Mumma. "Scientists now have an opportunity to select cotton plants for desirable traits such as resistance to salt damage, weed

killers, and pests," he adds.

Development of embryos from ordinary (somatic) plant cells was first demonstrated with carrots in the 1950's.

"Using this and other methods, it is now possible to propagate over 250 species of cultivated plants," Dr. Davidonis said. "Nearly 100 commercial facilities are using tissue culture to reproduce a variety of ornamental plants as well as food and forest crops," she added.

Geneticists can now develop new breeding lines of cotton with superior qualities from an exceptional plant. Then new plants can be generated directly from ordinary (somatic) cells. The challenge, it was pointed out, is first to produce outstanding plants by asexual cloning methods.

The somatic cell cloning process was described as "regenerating new crop strains much faster than the old-style cross-fertilization." Plant tissue cultures are free of microorganisms and require only shelf space with little or no light. Plant tissue cultures are easy and economical to produce and can be grown year around.

Culture conditions needed to regenerate tissue into cotton plants were discovered at Penn State during experiments into the way a new insecticide was metabolized or broken down by callus tissue. Careful control of growth regulators and other nutrients in the growth medium was vital in the research, it was noted.

Davidonis believes the Penn State achievement in cloning cotton plants has been anticipated for a long time. Other major food and forage plants such as potatoes, corn, and alfalfa have been regenerated from tissue culture. She urged scientists to continue their efforts to regenerate soybeans—an increasingly vital farm crop. And she noted that biotechnical companies are "heavily into tissue culture."

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Horse disease comments requested

WASHINGTON, D.C. — Are current U.S. Department of Agriculture regulations to prevent the introduction and spread of contagious equine metritis too strict or not strict enough? "That's the question we're asking the horse industry," said John K. Atwell, deputy administrator of USDA's Animal and Plant Health Inspection Service. "There are some horse importers and breeders who would like to see USDA turn the control of this venereal disease over to the horse industry," he said. "Others would like to see an industry-state cooperative program. Still others are asking that USDA make horse import regulations even tighter than they now are."

Contagious equine metritis is a bacterial disease first diagnosed in 1977. Since then, USDA has restricted the

movement of breeding-age stallions and mares into the United States from countries known to be affected by the disease. These restrictions have prevented introduction and spread of the disease in the United States.

However, the disease has been found in animals not known to have been bred. Also, it is supposed that many horses move from one country to another so that horses from affected countries may be exported by unaffected countries.

Notice of this request for public comment is scheduled to be published in the June 14 Federal Register. A complete copy of the notice is available from the Regulatory Coordination Staff, APHIS, USDA, Room 728, Federal Building, Hyattsville, Md. 20782. Written comments should be sent to the same office before Aug. 15.