ISSUE: Natural vanilla production via tissue
culture technology
CROP: Vanilla Planifolia—the commercially
important species of vanilla orchids
COUNTRIES AFFECTED: Madagascar, Comoros Islands,
Reunion, Indonesia
IMPACT: Possible loss of up to $67 million in
annual export earnings
WHEN: Mid-1989
COMPANIES INVOLVED: David Michaels Co., Inc.;
International Plant Research Institute; DNA Plant
Technology, Inc. for Firmenich (Swiss)

Vanilla is likely to be one of the first
commercially-successful flavors produced via plant tissue
culture. This new technology enables the production of natural
vanilla flavor from cell culture—eliminating the need for
traditional cultivation of the vanilla bean. Several companies
based in the United States are now conducting research on the
vanilla orchid—vanilla planifolia (Andrews), the plant species
from which high-quality vanilla beans are harvested.

According to the January, 1987, issue of Bioprocessing
Technology, cell cultures are now producing vanilla in the
laboratory and a natural vanilla product could reach the market
as early as mid-1989.

Vanilla planifolia is indigenous to Central and South
America, but is no longer grown there commercially. Today, 98
percent of the world's vanilla crop is produced by four
countries: Madagascar, Reunion, the Comoros (all of these
islands are located off the east coast of Africa) and
Indonesia. Madagascar alone accounts for three-quarters of the
world's vanilla production, where up to 70,000 small farmers
are engaged in production of this labor intensive crop.

The economies of these nations depend on the export of
vanilla beans, valued at approximately $66 million annually.
inconsistent supply, cost and product quality from season-to-season. In a plant tissue culture process, all parameters...can be controlled.

Current Research on Vanilla

David Michael & Co. is a privately-held company based in Philadelphia, Pennsylvania (USA), which specializes in the manufacturing of natural and artificial flavors. They are supporting a three-year research project at the University of Delaware on tissue culture and vanilla. Their goal is "to improve the genetics of natural vanilla in order to make possible a consistent supply of vanilla beans at a reasonable market price."

Their research, under the direction of Dr. Dietrich W. Knorr, head of University of Delaware's Biotechnology Center, is two-fold: 1) They are using plant tissue culture to develop new varieties of hardy, disease-resistant vanilla plants which could be grown outside of traditional vanilla-growing areas. 2) They are experimenting with the production of natural vanilla flavor using plant cell technology.

David Michael & Co. reports that they have made significant progress in their efforts to culture plant cells for vanilla flavors, but declines to say when a product might be available for commercial sale. According to Skip Rosskam, Senior Vice-President for Sales and Marketing of David Michael & Co.:

Developing a vanilla flavor in a controlled environment could be an adjunct to the traditional growing process—or an alternative to traditional vanilla production, and to the political, cartel-like control that these [vanilla producing] countries have now.

The International Plant Research Institute (IPRI) based in San Carlos, California (USA), is a private biotechnology company founded in 1979. The company specializes in phytoproduction of natural flavors for the food processing industry. Under the direction of Dr. Om Sahai, IPRI has successfully established cultures to produce vanilla, grape and strawberry flavors. The company is focusing primarily on vanilla, and hopes to release a commercial product in mid-1989.

Firmenich, a Swiss-based flavor and fragrance company is reportedly contracting with DNA Plant Technology (Cinnaminson, New Jersey, USA), to conduct research on vanilla production via tissue culture technology. The company refuses to discuss details of their current research.

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Four Major Vanilla Producing Countries
Account for 98% of Worldwide Vanilla Exports
Valued at (US)$67 Million

Source: RAFI