

# RURAL ADVANCEMENT FUND INTERNATIONAL

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## VANILLA AND BIOTECHNOLOGY

**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 paramaters...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."<sup>2</sup>

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.

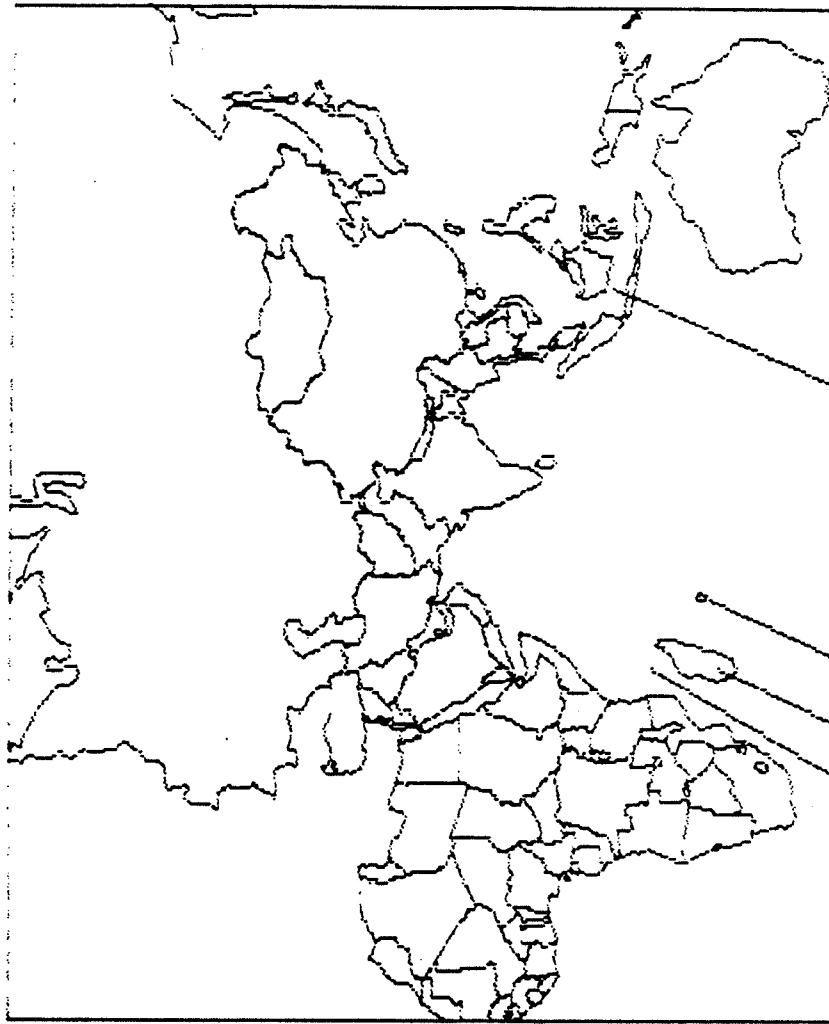
David Michael & Co. reports that they have made significant progress in their efforts to culture plant cells for vanilla flavors, but declines to say when a product might be available for commercial sale. According to Skip Roskam, Senior Vice-President for Sales and Marketing of David Michael & Co.:

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.<sup>3</sup>

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,<sup>14</sup> 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<sup>15</sup> research on vanilla production via tissue culture technology. The company refuses to discuss details of their current research.

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



- Indonesia (8 ml)
- Reunion (1 ml)
- Madagascar (52 ml)
- Comoros Islands (6 ml)

