

Israeli natural pesticide protects crops with turmeric

By David Brinn October 08, 2007

Few plants provide so many medicinal qualities as turmeric. For centuries, many different cultures have used the versatile herb originally from Asia to treat a myriad of diseases and ailments. But it's taken a Druze researcher from northern Israel to discover a new purpose for turmeric - a natural pesticide, which could replace harmful chemicals which permeate our fruits and vegetables.

Prof. Fadel Mansour, a researcher with the Israel Agriculture Ministry's Volcani Research Center in the lower Galilee, has developed a unique method to protect crops from pest damage by spreading plastic sheets, which are specially treated with a turmeric-based substance, on the ground before sowing or planting.

"This time of year is good because generally there's a problem with growing crops like watermelons, cantaloupe, dates and zucchini because of the white fly," Mansour told ISRAEL21c. "They transmit viruses to these crops, especially during the late summer and fall."

According to preliminary experiments conducted on melon and date crops, the repellent sheets produced by the company Mansour founded to commercialize his discovery - Biopack - prevented the entry of even one single pest to the crops.

Biopack CEO Shmuel Shatzky said that based on Mansour's findings and on the response of growers who have already used the BioPack technology, the company plans to increase its marketing efforts on both local and international markets.

The results have been the culmination of a journey for Mansour, who has specialized in etymology and biocontrol research at the Volcani center for over 35 years.

"Coming from a country setting in a Druze village, I know the value of natural medicine and products, because we produce many of our own. When I discovered many years ago that there are natural repellents for insects in the turmeric plant, I began thinking about how it could be introduced to industry," Mansour said.

"One idea was to incorporate it into plastic that would protect all dry food products on the shelf like rice and cereal from insects - especially when sitting on the supermarket shelf."

He consulted with his colleague, Prof. Shlomo Navarro, a specialist in insects, focusing on post-harvest protection of durable commodities with an emphasis on insect control and storage engineering technology.

"It took me about two years to convince him to get involved, but after we did some experiments, he realized that there was a big potential," said Mansour.

The two researchers then took their idea to someone who could make it happen - Shatsky, the CEO of Global-Roto Sheka, a leading Israeli manufacturer of flexible packaging.

"We provide packaging for different kinds of products ranging from food to cosmetics," Shatsky told ISRAEL21c. "We have quite an operation, with over 100 employees and a big plant in the Caesarea industrial park."

"When I met Mansour, he proceeded to tell me the story that someplace in the world is a certain type of plant. When insects come to attack the plant, it emits an odor that repels them. Then he said, 'the news is, I've known for 20 years where this tree is and which part of it provides the active material. Maybe if we can figure out a way to harness the turmeric oil, we can help solve the problems of agriculture and pesticides.'

"I told him 'you're a genius'," recalled Shatsky with a laugh.

The trio developed the idea of laminating the turmeric oil inside layers of food packaging, which would defend inside against insects. They went to see the Israel Ministry of Industry and Trade's chief scientist, and their fledgling company Biopack was accepted into their incubator program in 2000, through the Misgav incubator. Over the next two years, Biopack built a small lab, and forged an agreement with Israeli food extract company Frutarom to provide the turmeric oil.

The natural, non-toxic turmeric oil is integrated into a laminate during the packaging manufacture. Laminates are composed of several kinds of film layers, sandwiched together by adhesives under pressure, with heat. The laminates permit a level of diffusion undetected by human but detected by the insects.

"We conducted many successful experiments, graduated from the incubator program and we were on the verge - we had the idea, the material and the results," recalls Shatsky. "The problem we had was the smell."

Turns out that the turmeric laced packaging produced by Biopack also produced an odor that proved off-putting to potential consumers.

"It's a psychological factor - the odor makes consumers confused, even though the smell doesn't permeate the food at all," said Mansour, the company's chief technological officer. "We even conducted experiments that proved that food protected by Biopack packaging didn't pick up the odor of the packaging at all."

Frustrated, but undaunted, Mansour and his colleagues simply shifted their focus. If they couldn't protect the finished food product due to the odor, why not help farmers protect their crops from insects?

"Farmers don't care about the smell. What if we used Biopack to protect agriculture from insects in the earth?" said Shatsky.

With Shatsky's packaging company producing the sheets, it was a relatively simple process, and the initial results have proven that the concept works just as well with crops in the earth as it did with food in the supermarket.

The company has already initiated contacts with potential customers including a large pineapple farm in Mexico, a cats and dogs food company and many others. And Shatsky is now looking for investors to enable Biopack to initiate the marketing of the insect repellent sheets.

As for Mansour, he's continuing his experiments on insect control in his labs. "I'm a researcher, not a businessman," he said.