

TyraTech: Bringing "Green Pesticides" To The World Marketplace

University of California, Davis (UC Davis)

Vanderbilt University



One day in the early 1990s, it was business as usual for Essam Enan, Ph.D.

Enan was performing cancer related research on essential plant oils in his laboratory at the University of California, Davis, where he was working as a research professor. Suddenly, the lights went out. After waiting a bit, he realized the power was not going to come back on right away, so Enan opened the door to his lab to try to keep cool in the summer heat.

Other scientists in the building did the same thing, and soon flies and other insects started coming in from outside. But as he walked by the labs next to his, Enan noticed a strange thing: they had many more flying pests than his lab did.

This got him to thinking. Could it be possible that these essential plant oils had something to do with the absence of insects in his lab space?

Essential oils — the volatile aroma compounds of the oils that can be extracted from any plant — have been around for ages. They have been used in the perfume industry, and have been on the Environmental Protection Agency's list of

exempt chemicals, considered safe for people and animals.

But it was also known that these oils had the power repel, and even to kill, insects. However, scientists did not know why essential plant oils had these insect-killing and repelling qualities. So in his spare time, when he wasn't doing his cancer research, Enan began to investigate this question, out of pure scientific curiosity.

A few years later, in 1996, he unlocked the mystery: essential plant oils disrupt certain external olfactory and protein receptors that only invertebrates have. This causes rapid and abnormal calcium production which either kills or repels the bugs.

Filling a Potential Marketplace Need

For several years, Enan went on investigating the properties of these oils. He developed oil combinations that could repel mosquitoes, kill ants, and he even found a way to screen for oil combinations that would target specific insects. Yet it wasn't until 2003 that his mind turned from curiosity about the process, to how it might be applied to the needs of people in the marketplace. Enan took stock of his discoveries, and decided this was something that could benefit society while filling a key market niche: green pesticides.

"I looked at everything I had," says Enan, who was then a research professor in biochemistry at Vanderbilt University, where he is still based, "and I decided, this is not just about the science, or about the publication. There is something behind it, and I need to see if I can make something out of it. That's when I decided that this should be a product, not just a publication."

Enan gathered up his things, and went down to Vanderbilt's Office of Technology Transfer and Enterprise Development, where he made his pitch to Brian Laden, who remembers it well.

"It's very unusual that someone would walk in the door here with a technology related to agriculture," says Brian Laden, the university's senior technology commercialization associate, "At Vanderbilt, we don't do much with that. But then, in walks Essam, and he starts telling me this story of how he's come up with some essential oil combinations that are very effective at repelling or killing insects."

““ Laden was impressed, but skeptical. Together, he and a colleague walked over to Enan's lab, where Enan gave them a little demonstration, by dripping a few drops on a tissue covered with ants, and watching the ants scatter.

Laden was even more impressed, and could see the obvious market possibilities for a benign pesticide that didn't even need to be approved by the Environmental Protection Agency. So they took some of his samples and sent them to an independent lab for testing. "Lo and behold," says Laden, "they were very, very effective, compared to typical products."

Partnering with XL TechGroup

Vanderbilt had already been in touch with XL TechGroup, a Melbourne, Fla.- based company that is publicly traded on London's Alternative Investment Market (the U.K.'s equivalent of the NASDAQ), and that has pioneered what it calls a new "value creation" model, different than the traditional venture capital model. Instead of putting money into a host of promising new technologies and pushing them out into the market, XL TechGroup works with the business community to identify needs that exist in the current marketplace. XL TechGroup then scours university systems and other technology sources looking for technology platforms that can meet those needs. When they find such

technologies, they build companies based on them. It's a model that has proven remarkably successful.

When XL TechGroup was alerted to Enan's oils by Vanderbilt's Technology Transfer office, according to senior vice president Harold Gubnitsky, they liked what they saw: a technology platform, an innovation, with massive development potential to do everything from revolutionizing agriculture to stamping out intestinal parasites, to making our barbeques that much more pleasant.

As it happens, just when Enan was getting his oils tested and verified, the demand for "green pesticides" began to grow in Europe. Under strict new environmental laws, traditional pesticides were being banned by the hundreds. Clearly, there was market demand in Europe and elsewhere for environmentally friendly pesticides, and XL TechGroup could help bring Enan's laboratory discovery to consumers around the world.

Laden and his colleagues, Tom Noland and Christopher Rand, sat down with Gubnitsky and others at XL TechGroup to negotiate the formation of a company called TyraTech in June 2004. In exchange for an equity stake in the company for Vanderbilt, the technology was given to Tyratech, which would take responsibility for developing the technology into marketable products. Then the XL Techgroup, which founded TyraTech, began cultivating partnerships with large companies like Scotts Miracle-Gro, Kraft Foods, Syngenta, Arysta LifeScience and others to fund the development of the various essential oil products. These companies are currently in the process of developing (or have developed) products that can kill bedbugs, lice, mosquito larvae, cockroaches and other pests. They are also working on agricultural pesticides, and a variety of other applications. One of the more surprising developments is the possibility that Enan's oils could help to eradicate intestinal parasites. Since essential plant oils have no effect on humans, the company has developed a range of combinations that target the so called *Helminths* that plague many areas in developing countries where water quality and sanitation are a persistent problem.

After three years of building partnerships and growing the technology from its initial platform, TyraTech went public in June 2007, on London's AIM. The company had a first-day market capitalization of \$219 million, before its products have even gone on sale. XL TechGroup expects this to increase significantly over the next several years.

Needless to say, all of this is immensely gratifying for Enan, who has made a power failure into a powerful idea that will have a real impact on the world. That is all he ever wanted.

"The ultimate goal for any scientist," Enan says, "is to translate your science into something people can benefit from. Besides the publicity, besides all of that, what will really give you satisfaction is to see the community benefit from it."

This story was originally published in 2008.

To see available technologies from research institutions, [click here to visit the AUTM Innovation Marketplace.](#)

Share your story at autm.net/betterworldproject

#betterworldproject