For This Local Startup, It Is all About The Bugs

BIOTECH: Sustainable Ag-Tech to Use Insects to Disrupt Insecticide Market

■ By STEVE ADAMEK

It is a classic San Diego story, one that plays out often in this city, each time with new players, new dreams, new ideas and innovations in the starring roles.

This version has research coming out of UCSD, a CEO with an impressive resume of biotech and pharma work, including a deep background in oncology and immunology, not to mention he grew up on a farm.

Call it "A Startup Is Born." We even get a new villain in this version: fruit flies.

San Diego based sustainable ag-tech startup **Agragene** is hoping to disrupt the insecticide industry as it disrupts the sex lives of fruit flies and, of course, cleans up the world, a bit.

Agragene recently announced $1.2 million seed round financing from **Ospraie Ag Science (OAS)**, the venture arm of New York based **Ospraie Management LLC** a commodities and basic industries firm.

Gordon Alton

The funding will be used for field trials to further move Agragene toward commercialization with its Precision-Guided Sterile Insect Technology (pgSIT), said **Gordon Alton** CEO of Agragene. "If we play our cards right here, we can mostly displace the insecticides on the planet with this kind of approach."

The DNA Role

Agragene gives CRISPR technology a starring role. According to the company, it uses CRISPR based genome engineering to create the sterile flies. "In terms of CRISPR, nothing is more sophisticated and at the same time easy to use," Alton said.

"Female bugs can't seem to tell the difference between our sterile male and a wild male, Alton said. Females mate with the sterile males and the females' eggs do not hatch.

The company said it is a targeted approach with a solution needed for each insect species.

$19 Billion Market

Carl Casale

The startup is taking on a huge industry. "Agragene pgSIT platform has enormous potential to disrupt the $19 billion insecticide market," said Ospraie Ag Science (OAS) Senior Partner **Carl Casale**. "We see strong demand for targeted biological pest control to reduce costly chemical inputs for growers. It fits perfectly with our objective to invest in innovations that help farmers do more with less environmental impact…"

Casale is one of those valuable supporters every startup could use. The former CFO of Monsanto has extensive industry background. Casale bring lots of credibility and lots of business knowledge, Alton said.

Bug Bomb

Every day since 1996, planes have been dropping sterile fruit flies near the Port of Los Angeles to deal with its insect problem. Sterile insect technology has been used since the '50s; it is effective, but a radiation source is used in most versions greatly increasing the costs.

The costs of standard insecticides are also expensive. The chemicals are made cheaply, but the labor costs are high for chemical insecticides.

"Someone has to buy a tractor; someone has to fill the tractor with gas; someone has to drive the tractor through the fields," Alton said. "When applying insecticide two things factor into cost, material and labor to apply it."

The bio-pesticides offer an alternative, but they are expensive, three times the cost of conventional pesticides which explains the high cost of organic crops.

The bio-pesticides are safer but they are still toxic. "They are better for the ladybugs, but they can still kill them," Alton said. "Our solution is targeted to one species, one specific insect. We make the male insect sterile and when it mates with a female there are no fertile eggs,"

The Fly

Agragene is starting out targeting the spotted wing drosophila with the company's solution.

The costs for Agragene are from sexing the female flies (removing them from the process) and sterilizing the males. You don't want to mix sterile males and sterile females. You want the sterile males to mate with the wild females; it defeats the purpose.

Image courtesy of Agragene
Agragene will use sterile male flies dropped from drones as a chemical-free way to protect crops.

Agragene

CEO: Gordon Alton
HEADQUARTERS: UTC
REVENUE: $1.2 million
LOCAL EMPLOYEES: 4
CO. DESCRIPTION: Ag-tech startup
WEBSITE: www.agragene.com
NOTABLE: Uses CRISPR to create sterile flies

"Once we create a fly line, we achieve both sexing (removing the females), and the sterilization of the male," Alton said.

With the big costs gone, all that is left is the feeding of the flies which is not an expensive endeavor.

"Bottom line is we believe our product will be similar cost structure to conventional insecticides when you factor in labor costs, Alton said. "Biologicals, bio-pesticides are safer but still toxic and still have to be applied. We believe we would be a half to one

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