

TOPIC NUMBER:
AF121-207

TOPIC TITLE:
Floral Disruptor –
Directed Energy
Weed Abatement and
Prevention Tool

**CONTRACT
NUMBER:**
FA9304-14-C-0008

**SBIR
COMPANY
NAME:**
Global Neighbor Inc.
Centerville, OH

**TECHNICAL
PROJECT
OFFICE:**
Air Force Test Center,
Edwards AFB, CA

PUBLISHED:
September 2016



Global Neighbor recently demonstrated its distributed array machine, which is pulled behind a tractor and includes dozens of individual lights in a grid pattern to treat the area passing underneath. (U.S. Air Force photo)

DIRECTED ENERGY FOR WIDESPREAD VEGETATION CONTROL A STEP CLOSER TO REALITY

The need to spend millions of dollars yearly on toxic chemicals for weed control across U.S. military installations may be cut drastically in the not-too-distant future.

Ohio-based Global Neighbor Inc. recently demonstrated several prototypes of directed energy-based machines to tackle unwanted vegetation that were developed with support from the Air Force Small Business Innovation Research/ Small Business Technology Transfer (SBIR/STTR) Program.

One machine – called a distributed array – is pulled behind a tractor and includes dozens of individual lights in a grid pattern to treat the area passing under the unit. The other – called a long standoff unit – is designed to treat bush-size weeds from a distance with its higher-intensity ultraviolet (UV) spectrum.

After years of research and development, the latest results show Global Neighbor is a step closer to rolling out machines that can be widely used at military bases and for commercial applications.

BETTER FOR THE ENVIRONMENT

Letting vegetation go uncontrolled isn't an option because weeds can cause the extinction of native species, according to Dr. Danny Reinke of the 412th Civil Engineering Group, principal scientist for conservation issues at Edwards Air Force Base in California.

Mowing or tilling disturbs the soil and encourages weeds to grow while traditional herbicides are inherently toxic to wildlife. Herbicides also create a potential hazard as runoff into water supply systems and impact the health of the people who apply them.

That led officials at Edwards Air Force Base to develop a novel approach and release the SBIR topic that was ultimately won by Global Neighbor.

By replacing chemicals, this new technology could provide military installations a tool to save money; comply with laws regarding wildlife, fish, and game conservation; and help meet Department of Defense goals to reduce toxic chemical use.

"It could become a major player," Reinke says of the SBIR-backed technology's potential to shape the landscape and weed control industries.

BEHIND THE TECHNOLOGY

For the company, the thought of using light and energy in this manner came about seven years ago while it was searching for an easier way to disrupt and kill the root system of weeds, said Jon Jackson, Global Neighbor president and principal investigator.

Global Neighbor got its start in business incubator at Central State University near Dayton, Ohio and worked with Dr. Candace Lowell of at the school to fashion tests that would ultimately help in the design stage.

The company made some strides with the technology, so the SBIR topic was a natural fit when it was released.

ADVANCEMENTS FUELED BY SBIR FUNDING

While working on the SBIR project, Global Neighbor developed a consumer unit which already is being sold on Amazon and through other retail outlets. This hand-held unit – called NatureZap - can be pointed at a weed, which begins to turn brown and die in just a few second. The 412th Civil Engineering Group owns three NatureZap units that are basically a "touch-up" tool for small plants about the size of a softball.

Global Neighbor's Jackson credits the Air Force SBIR/ STTR Program with accelerating the design of the distributed array and long standoff units.

"We can finally demonstrate them to potential commercial partners," Jackson said. "Since this technology was so far out there and our directed energy was very much different than what was being researched, the risk was too high for many to invest in."

On its own, the company also has developed software for detecting broadleaf weeds on its machines – which would allow them to be a high-precision tool - using simple web cameras.

In addition to their use at Edwards and other military bases, Jackson intends to position the distributed array machines for sale in the precision organic farming market. He plans to market the long standoff units for algae bloom treatment in waterways and there also is the potential to assist those who treat some tree bark diseases.



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