

Ohio-Israel Agricultural & CleanTech Initiative of the Negev Foundation

Annual Report (07/01/21-6/30/22)

FY2021/2022 Funding Cycle

The Ohio-Israel Agricultural & CleanTech Initiative (OIACI) of The Negev Foundation focuses on promoting and enhancing trade opportunities, business attraction, technology transfer, and cooperation between Ohio and Israel in the agriculture, food and CleanTech industries. The Initiative's goal is to enable Ohio to Israel export and Israel to Ohio business and technology attraction in these sectors to enhance business opportunities in Ohio through collaboration with Israel. The Initiative pursues these objectives by working directly with Israeli and Ohio companies, participating in tradeshows, presenting seminars, facilitating demonstration of company products, assisting in technology transfer, planning for and having missions and delegations between the two regions, and promoting and coordinating collaborative R&D between Ohio and Israel. Presented below are activities that took place in the FY 2021/2022 funding cycle.

Collaborative

Collaborative projects include research partnerships, information sharing, and business relationships between Israeli and Ohio agricultural, food, and CleanTech institutions through collaboration with other organizations. In this strategy the OIACI takes advantage of the speed, simplicity, and low cost of global communication by serving as a crucial conduit.

Cleveland Water Alliance

OIACI Program Director had three introductory meetings with Cleveland Water Alliance to learn about their organization, programs, and collaboration opportunities. These meetings got the Program Director caught up on their test beds, communications efforts, and co-hosting a water conference. They also shared information about their test beds for distribution to our Israeli network, providing lead time for identifying ideal participants.

Ohio Department of Agriculture

Ohio Department of Agriculture (ODA) is a longtime partner of OIACI. The OIACI team met with ODA's new Assistant Director, Tracy Intihar to provide her with background on the program and learn about her priorities. This relationship will help identify Ohio businesses interested in export to Israel and guidance for Israeli companies coming to Ohio.

Ohio Senator Gavarone

The OIACI team met with Senator Gavarone to discuss water issues and technologies in her district. The Senator's office is working with OIACI to identify and connect her community with wastewater solutions.

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Ohio Jewish Communities

A longtime partner, Ohio Jewish Communities is assisting OIACI in connecting with people in Ohio's capital. Howie Beigelman joined OIACI at meetings with State Senators.

Toledo Metropolitan Area Council of Governments (TMACOG)

OIACI's program director communicated with TMACOG's President to learn about the unique water needs of northwestern Ohio communities. TMACOG shared that the area needs more attention on livestock waste than failing water systems. The Program Director continued investigating communities that are critical sewage areas in northwestern Ohio. TMACOG's Water Quality Planner stated they are updating their water quality plan and that information will be available in early 2022.

Central State University (CSU)

A new relationship is getting established with Central State University, a land-grant university and HBCU. CSU shared areas where innovative technology could enhance the ability for urban and small rural farmers to increase yields. OIACI shared a vision for a workforce development practicum for students. Each agreed an additional viable experience exists for small farmers to learn techniques in Israel. OIACI is investigating opportunities.

Heidelberg University

The Negev Foundation president met with the university to discuss potential partnership opportunities, focusing on a student practicum in Israel. The university is interested in learning more and working with OIACI on this initiative. Heidelberg University is the home of the National Center for Water Quality Research, commissioned by the US Congress. This program is ideal for students studying biochemistry, environmental sciences, international studies, and watershed science.

Tiffin University

The Negev Foundation president met with the university to discuss potential partnership opportunities, focusing on a student practicum in Israel. The university is interested in learning more and working with OIACI on this initiative. Tiffin University students studying manufacturing management, business management, marketing, and international business might be interested in participating.

Israeli Economic Mission

The Israeli Foreign Trade Administration at the Ministry of Economy is responsible for managing and directing the international trade policy for the State of Israel. The main fields of activity include the promotion of trade and export, initiating and maintaining trade agreements for the improvement of Israel's trade conditions, attracting and encouraging foreign investments, and creating strategic cooperation with foreign companies. OIACI and the Economic Mission

regularly discuss synergistic partnership opportunities and recommends companies for OIACI to connect with the State of Ohio.

Federation of Israel Chamber of Commerce (FICC)

The FICC was founded in 1919 as an independent and non-profit entity. It is the leading economic organization representing the trade and service sector, the largest sector in Israel. The FICC serves as the roof organization to over 5000 businesses and organizations operating in more than 120 divisions which represent various economic branches including export, import, trade, real estate, financial, and business services.

OIACI connecting FICC with Matrix FT to establish Israeli partnerships.

Projects

Demonstrations

Cuyahoga Soil & Water Conservation District Pilot

The program's original goal was to show that improving existing soil on pilot sites through the utilization of cover crops with assistance from Rootella™ will be more cost-effective than the current method of trucking in new soil. In this regard the program has been successful thus far. Final results show that the Rootella™ function of inoculating the soil with healthy mycorrhizae was successful. The levels of mycorrhizal fungi were measured by the soil professionals at Rust Belt Riders in Cleveland.

Additionally, the soil saw an increase in micro-organism generally, such as protozoa and nematodes. This is likely due to the increase in organic matter that came from the addition of organic matter from the dead cover crops. The available soil nutrients at both sites were already at the optimum levels or higher, but there was an increase in nutrients at the Gorman site observed. Soil nutrient levels were tested by the soil labs at UMass.

Considering that urban lots need a large amount of soil trucked in (as much as 10,000 yd³ per ¼ acre lot), the price of an yd³ of soil costs (as much as \$60 per yd³), and the environmental impact of delivering so much soil (up to 25 truck trips per lot) it is safe to assume that the cover cropping method, although more time consuming, is the more economically and environmentally friendly option.

Kingwood Center Gardens

Kingwood Center Gardens in Mansfield is rebuilding their duckpond. They are looking for innovative solutions for water recycling and reached out to OIACI to assist with connecting them to a provider. OIACI made introductions between the garden and three Israeli companies.

Odis Filtering was selected as the partner. The system is built and getting tested in Israel prior to installation.

Woosh Water Systems

The company produces smart water stations that provide ultra-purified, ice-cold water on the go and in public spaces. The stations fill any type of bottle with filtered water, using their patented ozone technology that removes impurities and keeps "the good stuff" in the water via an eco-friendly process.

They offer a new model that is specifically designed with schools in mind, dealing with lead contamination that may be present in schools and daycares. According to the EPA & WHO, lead is a significant concern for the growing bodies of children and infants, as they absorb more lead than the average adult. Woosh developed a multi-tap system that is designed to remove lead from drinking water in these types of facilities but still allows for up to 4 individuals to use the one station at a time, as it has a very high refill rate, at 20 fills per minute.

OIACI secured funding from The Cleveland Foundation, the Ohio 2022-2024 Capital Bill, and individual donors for installation throughout the state. Four units will go into Hillel's, with another three planned for Jewish Day schools in Cuyahoga County.

Wastewater Treatment

OIACI is undergoing detergence in ensuring any Israeli company vetted and promoted within Ohio is ready and able to operate in the state on a regulatory level. Septic system replacements for individual homes are regulated through the Department of Health. Larger systems are under Ohio Environmental Protection Agency. OIACI is obtaining regulation documentation to share with Israeli companies.

OIACI had multiple conversations with several Israeli wastewater treatment companies to learn about their technologies while contacting local communities with wastewater issues. OIACI Program Director, utilizing TMACOG's critical sewage area reports and the Ohio EPA's consent decree list located an initial list of communities that can benefit from these technologies.

OIACI called health departments in northwestern Ohio identifying the following opportunities:

Marion County

Tyler Pigman, Director of Environmental Health
Sandy Bridenstine, Sanitation
Philip Wright, Marion County Sanitation Engineer

Pleasant Acres Mobile Home Park – is under Ohio EPA orders. The unit is a sand filter, with water infiltration after a flood.

Crawford County

Steve Jozwiak, Environmental Health Director

Stephanie Drive in Liberty Township near Bucyrus has 20 homes with leaking sewage. Sewage is contaminating a nearby common tile creek that leads into the nearby Sandusky River to the north.

Village of Oceola is a small burb seven miles outside Bucyrus city center with many failing septic systems. There are many failing septic systems. The village is not yet under Ohio EPA orders. Oceola consists of homes, churches, and a service station. The population in 2010 was 190 people.

Morrow County

Stephanie Zmuda, Director of Environmental Health

Stephanie Bragg, Health Commissioner

Andy Ware, Development Director

The village of Iberia in northwestern Morrow County is an area where we have a cluster of failing household septic systems. Efforts to address the issue thus far have been hampered by the high ongoing cost per household of maintaining a treatment system. If technology exists that would be a cost-effective solution for wastewater treatment in Iberia. Iberia has a sewer study from 2016 that was shared with multiple Israeli companies to determine compatibility.

Village of Crestline

Linda Horning Pitt, Mayor

Corey Spackey, Village Administrator

Crestline has a sanitation engineering plan in place and is moving forward with that plan. Residents are upset with the village's hard water. Water treatment currently uses only 2 chemicals. The goal is to create water that does not damage appliances quickly from hard water without using increasing the amount of chemicals in water treatment.

Ronan from Fluence said water softening involves adding additional chemicals.

Wastewater Companies

E.P.C. Ltd.

E.P.C. Ltd. (www.epc-tec.com) offers onsite wastewater treatment solutions, which are innovative, patented, scalable and energy efficient. The systems are small and can operate in remote areas. E.P.C. Ltd.'s main products are: Bio-Robi – for single homes, and Bio-Disk with an innovative RBC (rotating biological contractor with multiple parallel disks) – for small communities.

Bio-Robi is a novel, patented, environment-friendly, wastewater solution that converts domestic sewage into clean, odorless effluent for reuse in irrigation or other applications. Bio-Robi ensures minimal sludge accumulation, requiring removal only once every few years. While normal septic systems can achieve up to 60% reduction in BOD and TSS, the effluent produced by Bio-Robi is 95%-98% clean. The system offers ease of operation and low maintenance. Bio-Robi's unique purification process effectively handles sewage on small sites. The versatile system is especially suited to family dwellings, small communities, government facilities, gas stations and truck stops, camping grounds and trailer parks. Bio-Robi is an ideal wastewater solution for rural areas or areas without central sewage systems. The system does not use unsafe chemicals, and there are no unpleasant odors. The system is particularly effective in regions with poor soil absorption or in water reuse areas.

E.P.C. Ltd. has 60 Bio-Robi systems in Israel, Cyprus and Germany, the majority of which are in Israel. E.P.C.'s systems can work at 4C, and thus should work at cold temperature regions, as the water coming from the home is relatively warm. If needed, a heating system can be added for the winter.

E.P.C. has an installation near Morgantown W.V., and is currently in conversations with the state and local engineering companies about their technology. They are very willing to speak

with persons of interest in Ohio, either in Columbus or to view their technology in person. OIACI connecting EPC with Ohio Department of Natural Resources, Ohio Environmental Protection Agency, Ohio Department of Agriculture, and multiple elected officials to create awareness of their technology.

Fluence Corp.

Fluence Corp. (www.fluencecorp.com) (formerly Emefcy Ltd.), with its R&D and Product and Innovation (P&I) center based in Caesarea, Israel, is a manufacturer of Membrane Aerated Biofilm Reactors (MABR)-based decentralized wastewater treatment systems. The company's biological wastewater treatment systems are energy efficient, modular, quiet and odorless, with a potential of water reuse applications, and can be used in rural villages and small towns. The systems can be applied to domestic type of sewage such as municipal and commercial applications. These energy efficient systems are cost competitive relative to conventional alternatives with respect to both capital and operating costs. OIACI has been working with Fluence Corp., introducing its technology to the Ohio market.

ODIS

Since 1978 ODIS has been a global leader in water treatment solutions. ODIS develops, designs, manufactures and operates water and wastewater treatment plants for various industries, municipalities, and agricultural sectors. Their expertise includes treating wastewater, drinking water, industrial process water, as well as remote and emergency relief aid. Utilizing state-of-the-art water treatment technologies, ODIS provides innovative and custom-made solutions for its customers.

They take pride in the fact that their products are cost-friendly, modular and adaptable to their client's needs, while also delivering the best water treatment solution available, for a clearer sustainable future. Some of the areas of focus multi-media filtration, automatic screen filtration, disinfection, reverse osmosis (RO), ultra-filtration (UF), activated carbon absorption, UV, clarification, ion exchange, coagulation - flocculation, EDI, MBBR, activated sludge, sludge treatment, sludge de-watering, oxidation, fertigation, advanced oxidation, ozone, and chlorination.

Drinking Water

See Woosh Water System demonstration project.

Agriculture

Agrinoze

In partnership with The Ohio State University, OIACI applied for USDA's Specialty Crop Block Grant to study the efficacy of the Agrinoze fertigation system while providing an Ohio farmer with the system. The proposal was not selected, but OSU researchers plan to apply again in 2023.

Greeneye Technology

Greeneye technology provides high-tech fertilizer sprayer that can be retrofitted on existing systems with their CPUs, lights, and cameras for industrial farms. The Farm Science Review would like them to attend the event. They are looking for a soy/corn farmer w. 2,000+ acres to purchase equipment. Production needs are either a facility or ag dealership to sell products wholesale.

Biofuel

While speaking with community leaders, OIACI discovered a need for livestock waste management. Biogas is something brought up by multiple stakeholders. OIACI is taking into consideration the opinions of Steve Slack, Professor Emeritus of Plant Pathology, The Ohio State University who was involved in the quasar biogas development on their Wooster Campus, and Karl Gebhart, retired from Ohio EPA for Ohio insight, and Israel's Economic Mission and Zvi Herman, Executive Director of Business Development, Agriculture Division in Israel. The Ohio professionals are providing guidance in regulations, company reputation, and technology compatibility, while Israel is providing a connection to innovative biogas technologies from Israel.

Co-Energy

Co-Energy Ltd. is an Israeli private company, established in 2014 after several years of research, with the aim of applying existing theories to effective treatment of organic waste, and turning a nuisance into a resource.

The world currently produces about 2.3 B tons of organic municipal solid waste (MSW) and plastic waste per year (with the expectation that the amount will increase by 70% by 2050). Naturally, the world must get rid of this waste, preferably in a correct and efficient manner, i.e., in a way that does not turn MSW into other waste (such as CO₂ or Methane) like in the case of burning for example.

The total energy value of all annual waste constitutes about 2% of the total electricity consumed in the world, therefore, the absorption of these 2% will neither disturb the existing electricity system nor require them infrastructure adjustments.

Based on well-known Pyrolysis process, the company's engineers have developed a new system for converting organic waste into a variety of other materials for the energy sector. The system incorporates several innovative IP technologies.

Co-Energy is in preparations to establish a HUB in the USA, which will deal with marketing, plants and projects building, maintenance and support. Until such hub is established, the design and preparations will be done by Co-Energy in Israel, with the potential of manufacturing at least some of the system locally in Ohio.

Toledo's Director of Public Services is communicating with Co-Energy around how this system can benefit their city, focusing on wastewater treatment sludge.

Food

Matrix FT

Matrix FT is a manufacturer of fibrous, edible, ACF, plant-based and customizable nanofiber scaffolds and microcarriers for cultivated meat. OIACI made an introduction to the Israeli Chamber of Commerce and will connect them with Israeli food incubators, venture capitalists, and a consultant.

Workshops, Seminars, and Podcasts

The Ohio-Israel Ag & CleanTech Initiative (OIACI) is working in two areas, connecting Israeli companies to Ohio communities to provide clean water and connecting Ohio companies to Israel. OIACI is identifying funding opportunities for each project, once a solid plan is in place.

Israeli companies in the clean water sector are trying to establish themselves in Ohio through demonstration projects located throughout the state, with the intention of them creating a permanent business presence in the state. OIACI is creating relationships with communities primarily in Ohio's western basin, identifying their unique water needs, i.e., failing septic systems, livestock waste, drinking water. Those communities are introduced to the Israeli companies to determine if there is a business opportunity.

OIACI is connecting Ohio businesses to Israeli technologies through pod casts, seminars, and conferences. The Advisory Committee is planning a new OIACI podcast, discussing best practices, outreach methods, and outlining topics and speakers. Working with Ohio Developmental Services Agency's Office of Export Assistance, OIACI is creating an educational seminar on doing business with Israel, featuring a workshop on achieving Kosher certification. The Cleveland Water Alliance is partnering with OIACI to have a water conference, showcasing innovative Israeli technologies.

OIACI Water Conference

OIACI and the Negev Foundation are planning to host a North Coast of Ohio Water Conference that will take place in early 2021. They are currently in the planning stages which include putting together a planning document and finding partners and sponsors. They have been in touch with the Israeli Consulate in New York City and the Israeli Economic Mission to learn more about similar types of programs that have happened elsewhere in the United States. The Economic Mission has co-sponsored a roadshow which included several Israeli companies traveling across several states to showcase their technologies and systems. The states that have participated in a similar showcase include Arizona, Texas, California, and Maryland.

This conference involves collaboration with CWA, with hosting a water conference as a near-term organizational deliverable. It would namely focus on Lake Erie, the issues that have been presented there, and Israeli technologies that can be used to address issues directly related to Lake Erie. In addition, the Maumee River Watershed is an area of the state with a host of issues that several Israeli technologies could be used to address.

Israeli Trade Conference

OIAIC is working with Ohio Developmental Services Agency to plan a seminar focused on doing trade with Israel, as a conduit for trade in the Middle East. The seminar is a two-day virtual

event, over two hours, with regional in-person networking events on the first evening. Initial outreach is conducted to finalize September dates.

OIACI Podcast

OIACI is developing a podcast to increase awareness of how the initiative brings value to Ohio and Israeli businesses around agriculture, cleantech, manufactured food, and trade. The podcasts share information about the benefits of Israeli/Ohio business relationships and the exchange of technological advances.

Currently, OIACI hired two production professionals, developed a topic list, and created a network outreach list with assistance from a small advisory group. The first three podcast “scripts” are created and interviews are underway.

Farm Science Review

OIACI Program Director attended the Farm Science Review on September 21, 2021. While there, she met Groundworks sales representatives John Buck and Amanda Hill who are on OIACI’s advisory committee. She also met a variety of partners from OSU, Ohio Soybean Council, and the Ohio Farm Bureau to name a few.

Ohio Food Industry Summit

OIACI Program Director attended the CIFT Ohi Food Industry Summit in April, 2022, learning about Ohio’s food manufacturing landscape. Future opportunities exist with CIFT partnership and connecting Israeli companies with Plastilene Group’s Sustainable Food Packaging Innovation Center.