

# Greenhouse Solar, German Supermarket Greenhouse & University Innovation



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# inside GROWER

Controlled Environment Agriculture

### COMING UP THIS WEEK:

- Voltiris Solar Power
- Regenerative Ag Statement
- UCD Ag Innovation
- Ohio State & WUR
- German Greenhouse
- NFT Microtoms

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## Voltiris Solar Power

I'll admit it, a new technology being deployed in large-scale greenhouses looks a bit like an eyesore, and at first glance, an odd approach to greenhouse energy management. Voltiris, a European company, has been making waves lately by installing its systems in multi-acre greenhouse operations.



Voltiris uses a series individual reflectors that resemble satellite dishes actively tracking the sun. Photo from Voltiris

So what exactly is the product? It's a fascinating hybrid of solar filtering and photovoltaics. Installed

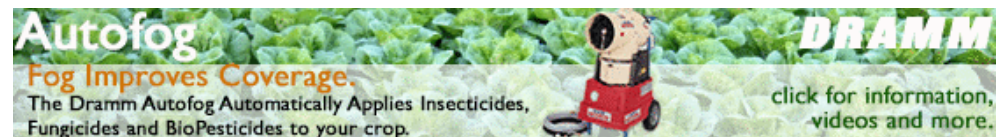
beneath the greenhouse roof, technicolor reflectors selectively transmit certain wavelengths of sunlight to the crop while reflecting others into compact photovoltaic panels.

It's an intriguing concept. While I'm naturally skeptical of filtering sunlight in a production greenhouse, the idea of concentrating light onto a much smaller solar panel is compelling for several reasons. Even as solar cell efficiency improves and panel costs continue to fall, one major expense in solar installations has remained stubbornly high: infrastructure, especially steel. These lightweight reflector and panel systems appear to dramatically reduce that structural burden, while also protecting the panels inside the greenhouse itself.

There's also an interesting physics angle here. Because only a fraction of the incoming light is redirected to the photovoltaic cells, concentrating that light could push the panels closer to the operating intensities seen in conventional outdoor solar installations. It really is one of those concepts that's so crazy, it just might work.

So far, I haven't seen anything quite like it in the United States. If you happen to come across one of these installations in Switzerland or elsewhere in Europe, I'd love to hear your thoughts, especially whether the interior is truly as kaleidoscopic as it appears in the photos.

Check out for yourself [here](#).



## CropKing on Greenhouse Regenerative Ag

Paul Brentlinger, owner of CropKing, recently published a [LinkedIn article](#) calling for greenhouse hydroponics and regenerative agriculture to stop fighting and start working together. In the piece, Paul argues that while regenerative agriculture has made meaningful progress improving the sustainability and soil health of commodity crops such as wheat and corn, outdoor vegetable production has not seen the same level of improvement.

At the same time, greenhouse production can dramatically reduce the use of scarce inputs such as water, minimize nutrient runoff and produce significantly higher yields per acre. Paul's argument is that if the broader goal is agricultural sustainability, including preserving soil health, then greenhouse production should be viewed as part of the solution rather than in opposition to it. He especially emphasizes that greenhouses do not need to occupy high-value arable land and can instead reduce pressure on degraded or overworked soils.

Paul also makes the case that fertilizer sources should be evaluated based on their actual environmental impact, rather than simply whether they are classified as synthetic or organic. Put simply, many of the environmental harms associated with synthetic fertilizers stem from uncontrolled application in open-field systems and subsequent runoff into surrounding ecosystems. A well-managed greenhouse operation, even when using synthetic fertilizers, can largely avoid these issues through containment and recirculation practices.

While the article touches on broader topics including nutrition and supply chains, Paul ultimately returns to a straightforward idea: producing more food locally, on less land, with fewer inputs. That is a goal most people in agriculture can agree on.

Without getting too philosophical, the debate surrounding hydroponics, organics and regenerative agriculture feels like the agricultural version of deontology versus consequentialism. One side tends to emphasize adherence to a specific agricultural philosophy or production ideology, while the other focuses more heavily on measurable outcomes and resource efficiency. In reality, agriculture probably needs both perspectives pushing each other forward. But I tend to agree with Paul's broader point: if a

system can safely produce more food with fewer resources and less environmental impact, it deserves a seat at the table.



## UC Davis Ag Innovation

The University of California, Davis has **officially opened the Resnick Center** for Agricultural Innovation. The brand-new facility will serve as a testbed for bringing emerging technologies, especially robotics, sensors, data science and artificial intelligence, into agriculture. While the center's work will span teaching, research and industry partnerships, one current focus is exploring how agricultural waste streams can be repurposed into higher-value products.

If you're unfamiliar with the concept of innovation centers, these specialized university facilities are designed to bridge the gap between research and real-world deployment. They often house advanced manufacturing and prototyping equipment, along with the engineering infrastructure needed to design, test and refine technologies before field deployment. Many also serve multiple roles, allowing outside companies to partner with researchers, lease workspace or collaborate directly with faculty and students.

While UC Davis has not publicly detailed exactly what equipment is housed inside the Resnick Center, the university has described the facility as supporting robotics and sensor fabrication work. Given the center's mission, it is reasonable to expect the facility includes advanced prototyping capabilities aimed at accelerating the development of next-generation agricultural technologies.



The Resnick Center for Agricultural Innovation sits nearby the Core greenhouses. Image from UC Davis



## Ohio State and Wageningen Partnership

A memorandum of understanding has officially been signed, launching a new partnership between The Ohio State University and Wageningen University & Research. Both institutions are considered global leaders in controlled environment agriculture (CEA), and the collaboration has the potential to accelerate the transfer of advanced greenhouse technologies and expertise into North America.

Under the agreement, Ohio State and WUR will collaborate on research initiatives, faculty and scholar exchanges, workshops, and student training opportunities. The partnership is expected to strengthen both academic research and workforce development within the rapidly growing CEA industry.

I expect this collaboration to have a significant impact not only on business and technology development, but also on expanding the pipeline of skilled labor entering the U.S. greenhouse industry.

Ohio State has steadily positioned itself at the forefront of CEA research over the past decade. Following the arrival of Distinguished Professor Dr. Chieri Kubota in 2017 and the opening of the university's Controlled Environment Agriculture Research Complex in 2022, the program has continued to expand its global influence. This latest partnership with WUR represents another major step forward, further cementing Ohio State's role as a leading force in controlled environment agriculture research.

Read more about it [here](#).



## German Supermarket Opens with Rooftop Greenhouse

While the concept of a rooftop greenhouse is nothing new, the scale in Germany's Lankwitz district is among the largest and most advanced examples. This month, REWE opened a new supermarket location topped with a Venlo-style greenhouse spanning just over half an acre across the roof.

This development places REWE in close competition with the [cat-loving Netto Marken-Discount](#) for my favorite German supermarket, but more importantly, it represents a serious test of a concept that has long generated interest within controlled environment agriculture: integrating food production directly into grocery infrastructure.

The idea of "0-mile food" has been something of a holy grail for supermarkets and agriculture alike. Historically, CEA efforts have largely centered around vertical farming cabinets and in-store growing systems, such as those developed by INFARM, with limited success at large commercial scale.

What makes the REWE project fundamentally different is that it relies on greenhouse technology that is already well proven at scale. The rooftop greenhouse is reportedly expected not only to supply produce for the store below, but also support distribution to roughly 500 additional locations. At the same time, the co-location strategy itself was designed with efficiency in mind, utilizing waste heat from the supermarket and harvesting rainwater for greenhouse operations.

Here's to German supermarkets, and the surprisingly important role they continue to play in pushing innovation, both in CEA and advertising campaigns. Read more [here](#).



The completed grocery store and greenhouse in Lankwitz. Photo from Trade Magazin

## Microtoms in CEA

A study recently [published in the journal HortTechnology](#), and also highlighted by *Inside Grower* magazine, explores a novel cropping system in controlled environment agriculture (CEA): the production of NFT-grown micro-dwarf tomatoes, or “microtomatoes.”

Researchers screened 17 different dwarf and microdwarf tomato varieties to evaluate their suitability for nutrient film technique (NFT) systems. The results revealed substantial variation in growth habit and structural characteristics, with only five varieties meeting the selection criteria for successful NFT production. A key requirement was the ability to reach maturity and produce fruit without structural support.



An early representation of the NFT trials. Photo from Brandan Shur

Unlike most greenhouse tomato cultivars, microdwarf types are typically determinate, meaning they complete their lifecycle in a more synchronized window. This opens the door to a fundamentally different production model in which tomatoes can be grown more like leafy greens in NFT systems, harvested in a single pass, with plant material and roots removed afterward.

While this approach is uncommon in conventional greenhouse tomato production, similar concepts have been explored in vertical farming systems, including trials by companies such as Plenty. Still, this research provides an important starting point for understanding how alternative tomato types might expand the crop palette and production strategies available within CEA systems.



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