

Produce, reuse, recycle

From extensive recycling to 100% rainwater irrigation, Krueger Maddux Greenhouses focuses on environmentally conservative production.

Jolene Hansen | Photography by Justine Krieg



From left: Maintenance Manager Mike Lawler, Owner Bob Maddux and President & Co-owner Rob Maddux

About 40 miles west of Cincinnati, Ohio, Krueger Maddux Greenhouses sits on 82 acres of Indiana farmland. The family-owned company is known for its quality, customer service, diverse selection and something even more exceptional: 100% of the site's production irrigation comes from rainwater. For Owner Bob Maddux, treating the environment well is part of being in the green industry, just like caring for customers and employees. Now, with 30 years at this site and 47 years in business, the company produces more than 10 million flowering and specialty plants.

Mike Lawler, Krueger Maddux maintenance manager, remembers a day in 2004 when county officials said the operation had to cut back on municipal water. At the time, the fields were brimming with a thirsty mum crop. Owner Bob Maddux's decision to cut dependence on municipal irrigation water didn't surprise Lawler, who started as a grower just 10 days after graduating from Ohio State in 1981.

After a year of building, grading and excavating existing and new ponds, the new rainwater system was up and running. The cost exceeded \$1 million, but the company went from a \$50,000+ annual water bill (with alkalinity running higher than 300 ppm) to a sustainable, rainwater-fed system that provides two to three times the water volume, plus superior quality. "The payback is already there," Maddux says.

A history of growth and conservation

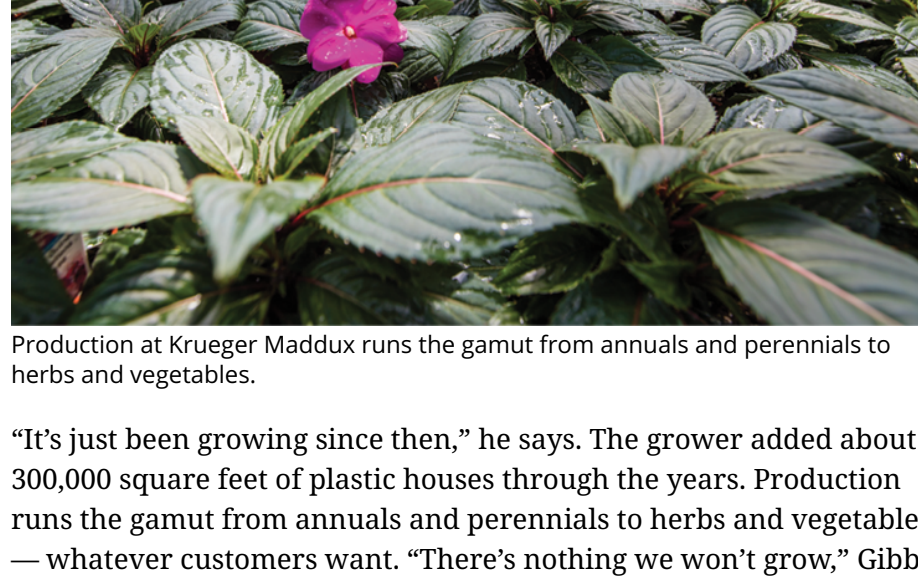
Before it became the eco-friendly powerhouse it is today, Krueger Maddux Greenhouses got its start back in 1972. In 1960, 20-year-old Bob Maddux and his uncle, Bill Krueger, opened Delhi Hills Flower and Garden Center in a former carnation-growing facility outside Cincinnati. After 12 successful years, the partners decided to launch a wholesale branch and Krueger Maddux Greenhouse was born.

When Krueger retired in 1979, Maddux bought out his uncle's half, keeping the Krueger Maddux name. The wholesale grower blossomed, adding Cincinnati-based grocery store Kroger to its customer base in the mid-1980s. To meet demand from wholesale customers and the thriving garden center, Maddux operated five separate growing locations in the Cincinnati area.

As wholesale was steadily picking up, Gibbs remembers a meeting between Maddux and his production managers. They wanted to know his plans and Maddux wanted to hear their opinions.

"He came out to Indiana that day and started looking for property," Gibbs says.

Maddux bought the current site in Sunman, Indiana, in 1988 and opened with a 100,000-square-foot glass greenhouse the next year.



Production at Krueger Maddux runs the gamut from annuals and perennials to herbs and vegetables.

"It's just been growing since then," he says. The grower added about 300,000 square feet of plastic houses through the years. Production runs the gamut from annuals and perennials to herbs and vegetables — whatever customers want. "There's nothing we won't grow," Gibbs says.

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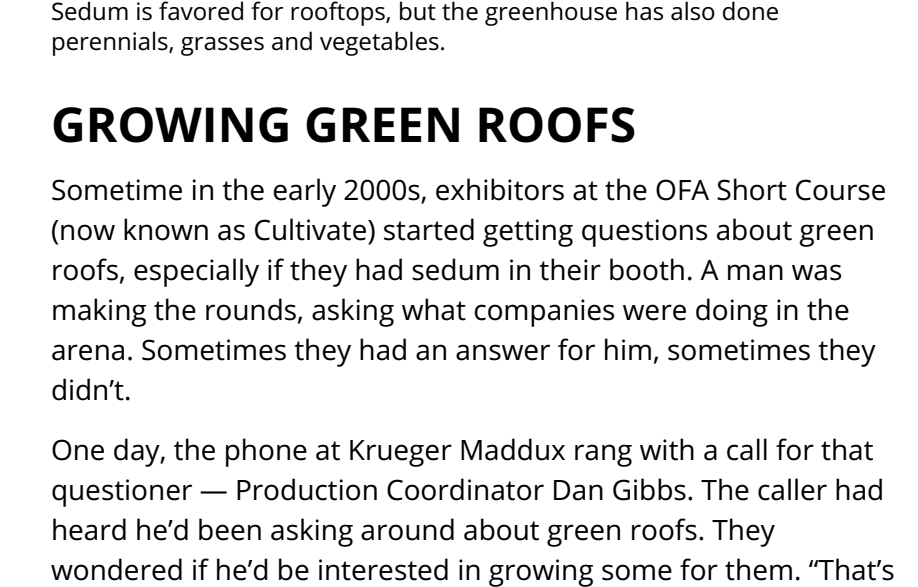
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Kroger grocery stores receive about 60% of Krueger Maddux's product. The balance goes to independent garden centers, including Delhi Flower and Garden Center, the last of several IGC locations owned by the Maddux family over the years.

Visit the Indiana site in late summer or fall and you'll find 8.2 acres under cover and 10 acres of outdoor production in full swing. The company grows 167,500 fall mums in six pot sizes (mostly 8- and 10-inch) and up to 50 varieties. At the same time, they're growing nearly a quarter-million poinsettias in more than 100 varieties and eight pot sizes, with about 145,000 finished and the balance pre-finished for other greenhouses.

As the company has grown, so has Maddux's concern about the resources it uses. "In the earlier years, we just used a lot," he says. But about 20 years ago, the grower started recycling extensively. The long list of recycled items includes all cardboard and polystyrene plastic, plug trays, plastic water bottles, junk metal, old racks, used truck oil and more. Plus, delivery drivers pick up plastic pots that customers return to Kroger stores.

"We just try to recycle everything we can, even if it costs us the nation's money to get it hauled away," Maddux says, noting how the nation's trash is found from city gutters to country farm fields. "I'm a firm believer. It's amazing what America throws away. That's what we don't want to see."



Sedum is favored for rooftops, but the greenhouse has also done perennials, grasses and vegetables.

GROWING GREEN ROOFS

Sometime in the early 2000s, exhibitors at the OFA Short Course (now known as Cultivate) started getting questions about green roofs, especially if they had sedum in their booth. A man was making the rounds, asking what companies were doing in the arena. Sometimes they had an answer for him, sometimes they didn't.

One day, the phone at Krueger Maddux rang with a call for that questioner — Production Coordinator Dan Gibbs. The caller had heard he'd been asking around about green roofs. They wondered if he'd be interested in growing some for them. "That's how I got started, and we've been doing this at least 12 years," Gibbs says.

When Krueger Maddux first started with green roofs, Gibbs propagated six sedum varieties and limited shipment to five nearby states. Today, he likes to keep about 350,000 sedum plants on hand for the projects. Planted in segments known as modules, Krueger Maddux green roofs have shipped as far as Texas, Florida and Nebraska.

While sedum is favored, Krueger Maddux has created green roofs with perennials, grasses and even vegetables. A typical module measures 2 feet square, with 4-inch depths for sedum or 6 to 8 inches for perennials and grasses. That's much more manageable than the standard 4-foot-by-8-foot modules they grew on skids when they started.

Green roof clients typically request specific varieties, but Gibbs takes it from there. Plants are grown in 1801s before planting in the final modules and the planting crew follows blueprints Gibbs draws up. "You get a lot prettier patterns that way than just scattered," he says. "If they want them 90% grown out, it takes us three months."

Gibbs warns there is a trick to planting. "Green roof media is almost like sand and gravel," he says. Finished modules are stacked seven high, four in a layer, and shipped out on flatbeds. The biggest project so far was two 20,000-square-foot jobs, done back to back. And demand doesn't seem to be slowing down.

Most of the projects have been for hospitals, colleges and military bases, but Gibbs' favorite so far was a Mississippi hotel with a rooftop bar and rooms that opened to the plantings. "Every module was different, not one was the same, and all were flowering perennials," he says. "That was gorgeous."

So far, Krueger Maddux has only done roofs, not walls, but Gibbs is ready for the call if and when it comes.

Company culture

Around 40 employees keep Krueger Maddux running year-round, and during spring the number rises to 80. Numerous long-term employees at the operation attest to a strong company culture that extends beyond sustainability and generous benefits.

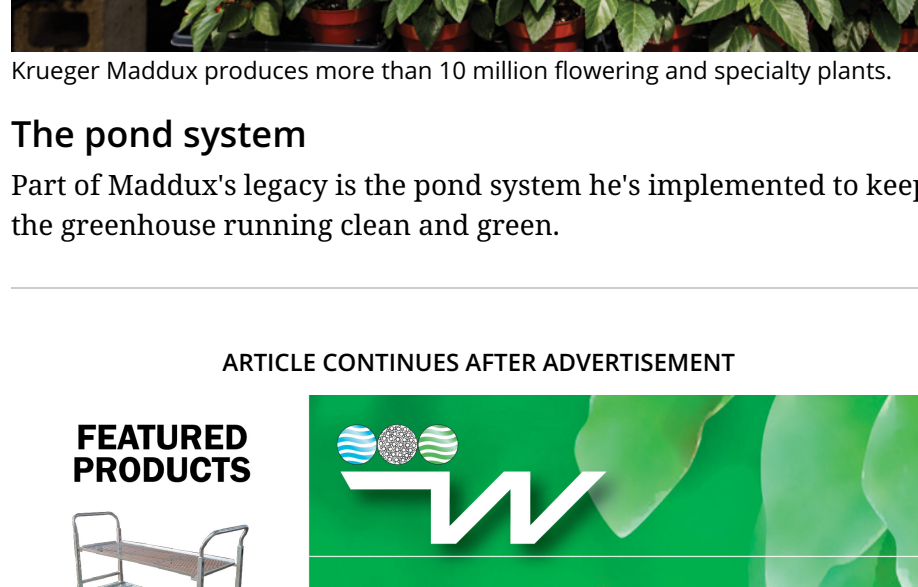
"I'm very proud of the team of people that's been with me for many, many years," Maddux says, mentioning several employees by name, including his son, company President and Co-owner Rob Maddux, who's "been here since he was born."

The company focuses on simple things like birthdays and events that involve families. "We're small enough that you know everybody's name. You know about their family, their parents, their spouse and kids," Maddux says. "That's what it's about. It's all about the people and how you take care of the people that are part of your team and the people that are your customers."

Though Maddux is turning 80 this year, he's not in a hurry to retire. When friends ask about his plans, his answer is ready. "I say I'm semi-retired now. I'm only working six days a week," he says, laughing. "I just love the business and the people so much. It's been a great ride."



From left: Bob Maddux, Rob Maddux, Dan Gibbs, Steve Luckey, Mike Lawler and Pat Ernst



Krueger Maddux produces more than 10 million flowering and specialty plants.

The pond system

Part of Maddux's legacy is the pond system he's implemented to keep the greenhouse running clean and green.

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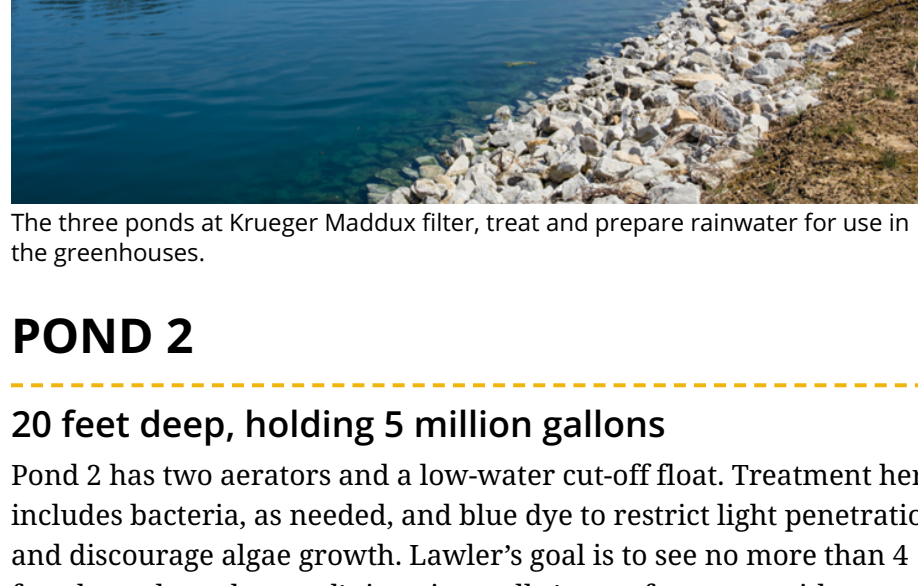
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The reclaimed water system works through a series of ponds and collection systems. Water in developed areas is collected, including runoff from roofs and French drains on all of the outdoor growing areas. All collected water feeds by gravity into the first of three ponds.

POND 1

15 feet deep, holding 2 million gallons

Pond 1 is where soil, perlite, plant labels and other large particles settle out. Lawler treats with beneficial bacteria every two weeks but allows algae to develop and reduce excess nutrients from runoff. Gravity then feeds water into the next pond.



The three ponds at Krueger Maddux filter, treat and prepare rainwater for use in the greenhouses.

POND 2

20 feet deep, holding 5 million gallons

Pond 2 has two aerators and a low-water cut-off float. Treatment here includes bacteria, as needed, and blue dye to restrict light penetration and discourage algae growth. Lawler's goal is to see no more than 4 feet deep along the pond's interior wall. A transfer pump with a strainer moves water to Pond 3, which sits on higher ground.

POND 3

30 feet deep, holding 12 million gallons

Pond 3 has two aerators and gets supplemental bacteria, as needed. From here, water travels about 300 feet, via a 12-inch pipe laid 25 feet underground, into a live well in the "water room" building. A set of high-water cut-off floats in the well regulate the pond's height.

Two sets of pumps and automatic filters, a combined capacity of 400 to 500 gallons per minute, pull from the well to a 300,000-gallon cistern that forms the building's basement. When needed, a heat exchanger warms water to 55 degrees F along the way. Lawler uses 93% technical sulfuric acid to adjust for alkalinity and a 12.5% sodium hypochlorite sanitizer follows. Controls and pH and oxidation-reduction potential (ORP) probes help ensure the system maintains treatment levels within the range Lawler sets.

The company plans to add an additional pump and filter to speed up water processing and recovery. "We want to increase our ability to produce or treat water by a third over the capacity we're at now," Lawler says.

Two variable-frequency drive pumps pull water out of the cistern. "That provides the volume and the pressure for our watering system, and we're also looking to increase that by one more pump," he says.

As Lawler points out, running on 100% rainwater involves more than people imagine, but it's worth it. "The water quality is better and the quantity of water we have at any time is much better," he says. "The water's free, but you have to work it."

The author is a freelance writer based in Wisconsin and frequent contributor to GIE Media publications.



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