Science Societies

Turfgrass Is Not the Biggest Crop

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Ross Braun, assistant professor of turfgrass and landscape management at Kansas State University, measures nitrous oxide emissions and soil organic carbon levels in turfgrass. Braun studies how to reduce the environmental impact of turfgrass. Photo courtesy of Ross Braun.

As a University of Connecticut grad student 20-odd years ago, Kelly Kopp was contentedly studying hydrology, focusing on how the herbicide atrazine moves in the soils of corn fields. She took pride in working on an important source of livestock feed, fuel, and human food, grown across tens of millions of acres in the U.S. Then a member of her master's committee proposed a career shift, inviting her to join his recently funded project on—of all things—turfgrass.

"I looked at him like he was out of his mind," recalls Kopp, now a professor and extension specialist in the Plants, Soils & Climate Department at Utah State University. "I thought: Why on earth would I switch from production agriculture to this—this plant material that, as far as I could see, is not really doing a whole heck of a lot for anybody?"

In the end, the professor persuaded Kopp that, given how much land turfgrass covers in the country—three times as much as corn, according to estimates—their work would have high impact. Today Kopp, a member of all three Societies, spends much of her time not only educating people on the proper care of turfgrass, but taking on skeptics who, like her younger self, see scant value in the stuff. With climate change on everyone's mind, she fields more frequent and pointed questions on turfgrass's utility, its carbon footprint, how it stacks up against alternative plantings. "There's been a real target put on turfgrass," Kopp says.

Indeed, with global warming, some experts say the less turfgrass the better; an active anti-lawn movement advocates for native, pollinator-friendly, low-maintenance alternatives. But while turf has environmental downsides, it also, as outlined in a recent *Crop, Forage & Turfgrass Management* (CFTM) paper (https://doi.org/10.1002/cft2.20218), provides significant benefits. In addition, improved management practices and varieties are leading to a better balance of ecosystem services and disservices. The bottom line, according to lead author Ross Braun: We should continue to golf, picnic, and take pride in our front lawns. We just need to be smarter about it.

"There are a lot of things a practitioner can do," says Braun, a CSSA and ASA member and assistant professor of turfgrass and landscape management at Kansas State University. His paper, as much a how-to on climate-smart turf management as a review of recent literature, lists dozens of strategies related to mowing, fertilization, irrigation, and other practices. In this story, we'll walk through some of them, starting with a dip into irrigation.

Opposite page: A lawnmower making its way through healthy turfgrass. Raising blade height encourages root growth, reduces irrigation requirements, and lowers greenhouse gas emissions. Photo by Ross Braun.

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Dear Editor: I very much enjoyed and appreciated reading the article by Kristen Coyne, "Maintaining Turf in a Changing Climate" (September 2023, p. 4–11; https://doi.org/10.1002/csan.21113), but did note one issue: The very first line of the

article reads “Turfgrass, **the biggest crop in the United States**, is also among the most hotly debated.” This sentiment was again repeated in the figure on p. 10. These statements unfortunately seem to perpetuate a misconception that has been common in media since Milesi et al.’s landmark 2005 study estimating turf area in the U.S. was published (https://doi.org/10.1007/s00267-004-0316-2).

The article by Milesi et al. seems to make an incorrect assumption that all turf in the U.S. is irrigated… this is captured by the following quote from the abstract “*… it was calculated that potentially 163,800 km^2 (+/–35,850 km^2) of land are cultivated with turf grasses in the continental United States,* ***an area three times larger than that of any irrigated crop****.”*

Milesi et al. estimated total turf area at approximately 40 million acres.

The irrigated corn acreage in the U.S. is actually about 12 million acres (https://bit.ly/irrigation-water-use), which indeed is much smaller than the 40 million acres for turf found in the study. But most corn is not irrigated, and the total acreage in corn in the U.S. approaches 100 million acres (https://bit.ly/3Lzk5e0). The assumption in the study that all 40 million acres of turf is irrigated is also a significant over-simplification because a substantial percentage of turf, like corn, does not receive supplemental irrigation.

I’m not aware of any currently available research-based estimates on irrigated turf area in the U.S., but we can attempt to back into it in some creative ways:

- **Total irrigated cropland in the U.S. is estimated at 58 million acres (https://bit.ly/irrigation-water-use).**
- **Total water used daily in the U.S. is estimated at 322 billion gallons. Of this, 118 billion gallons per day is estimated to be used for irrigation**

(https://on.doi.gov/3Puu2ut)

- **Water used for outdoor "landscape irrigation" is estimated at 9 billion gallons per day (https://bit.ly/48vTybm)**

This means that landscape irrigation accounts for less than 8% of total daily irrigation water use in the U.S., which solidifies the assumption that far less than that 40 million acres of turf are irrigated and verifies that turf is far from the largest irrigated "crop" in the U.S.

Thanks for your consideration, and thanks again for what was an otherwise excellent and well□thought□out piece.

Best regards,

—**Jason D. Lanier, Extension Specialist, Umass Amherst**

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