International Turfgrass Research Initiative

A Cooperative Effort by STERF, The R&A, and USGA

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Background

STERF hosted the 14th International Turfgrass Research Conference (ITRC 2022) in Copenhagen, Denmark in July 2022. STERF created a financial buffer for the event and determined that reinvesting the funds in turfgrass research would be a most appropriate legacy from ITRC 2022. STERF's preference was to develop research projects with global significance and inquired about interest in a collaborative effort with The R&A and USGA early in 2023. Representatives from each organization initially met in May 2023. The R&A and USGA representatives supported an approach to further develop the initiative, and the planning group began meeting approximately monthly to define the best path forward.

Goals of the Initiative

1. Agree on the most important global research topics for turfgrass management.
2. Solicit and select research proposals to advance these topics through a competitive request for proposals (RFP).
3. Begin two to three globally cooperative and applicable projects with international research teams.
4. Model global research cooperation and learn from the initiative for even better future efforts.

Research Priorities

Collaborative discussions have revealed common research interests. It was agreed that longer-term and more fundamental research, such as genetics, breeding, or investigations of plant or soil microbiomes, should be avoided for this initiative. Existing research priorities from each organization and the U.S. National Turfgrass Research Initiative were shared and discussed.

Sustainable agronomy is the most prevalent area of interest, and, because of increasing pesticide regulations and droughts, all agreed that integrated pest management and water conservation will likely be important foci of the initiative. The following specific topics have been suggested so far (more detailed descriptions are available separately):

1. Integrated Pest Management

Integrated pest management is critical in turfgrass management around the globe as it ensures sustainable practices by minimizing pesticide use, preserving ecosystem balance, and reducing environmental impact. Research in this category may evaluate or integrate various control methods, including cultural, biological, and chemical approaches with a goal to enhance resilience against pests while optimizing cost-effective management strategies. Research topics should be adaptable to diverse climates and regulatory environments for fostering environmentally responsible turfgrass maintenance worldwide.

Example research topics include (in no specific order):

- Biology and management of dollar spot and other pervasive pests, including the effects of alternative

management strategies on disease development
- Global survey and benchmarking of integrated turfgrass management practices
- Global data collection and curation to advance pest forecasting with machine-learning models
- Exploiting new technologies and sensors to better predict injury from abiotic stresses
- Determination of economically important levels of turfgrass quality and damage from pests and abiotic stresses
- Assessment of less intensive management to determine the point of diminishing returns for common practices, which might not be directly related to pest management (e.g., aggressive cultivation and sand topdressing of putting greens)

2. Water Conservation

Water conservation research in turfgrass management globally is crucial to mitigate challenges from water scarcity by optimizing irrigation practices, reducing water use, and promoting drought-tolerant turfgrass species. Such research enhances environmental sustainability by minimizing water wastage, preserving freshwater resources, and adapting turfgrass systems to changing climatic conditions, ensuring resilient and sustainable landscapes worldwide.

Example research topics include (in no specific order):
- Decision support with sensors and modeling
- Turfgrass durability under longer-term drought and traffic
- Subsurface and alternative irrigation
- Global assessment of irrigation water quality and use
- Use and management of non-potable and alternative water sources on (including treated wastewater and brackish water)

3. Biodiversity and Landscape Perspective

Biodiversity research in turfgrass management globally is essential to foster ecological balance by understanding and preserving diverse ecosystems within turfgrass landscapes. It promotes resilient turfgrass systems by supporting beneficial organisms that contribute to natural pest control, soil health, and overall ecosystem stability. Such research enables the development of practices that prioritize biodiversity, ensuring sustainable and environmentally friendly turfgrass management practices worldwide.

Example research topics include (in no specific order):
- Best practices for defining, monitoring, and comparing biodiversity on golf courses and other turfgrass land uses
- Turfgrass management to improve biodiversity from a landscape perspective
- Turfgrass management to improve biodiversity in the turfgrass system
- Production and management of turfgrass materials that incorporate pollinator plants

4. Climate (Carbon Balances)

A better understanding of the carbon balance in turfgrass management globally is crucial for understanding the impact of turfgrass on greenhouse gas emissions and carbon sequestration. It aids in developing practices that reduce the carbon footprint of turfgrass systems, contributing to mitigating climate change effects. By optimizing turfgrass management techniques to enhance soil carbon sequestration and minimize emissions, this research supports sustainable and environmentally responsible land management practices worldwide.

Example research topics include (in no specific order):
- Global assessment of carbon sequestration potential and overall carbon balances associated with turfgrass management
- In-depth assessment or case study of the carbon balances of green spaces and the relative contributions of various plant materials, turfgrass management strategies and expectations, other landscape features or facility operations (potentially including comparisons among management practices or land uses)

May 2024	Aug. 2024	Oct. 2024	Nov. 2024
Circulate Phase I RFP	Phase I Proposal Due	Phase I Proposal Review Meeting	Phase I Decisions and Phase 2 RFP Circulation
Feb. 2025	**April 2025**	**July 2025**	**2026-2028**
Phase 2 Proposals Due	Phase 2 Proposal Review Meeting	Announce Decisions at ITRC 2025	Projects Conducted

Framework and Timeline

A two-phase RFP will be launched in May 2024. Brief pre-proposals will be received between May and August and evaluated in October based on alignment with RFP goals, scientific validity, and likelihood for success. Approximately 10 full proposals will be invited in November and due in February 2025 for evaluation in April.

It is anticipated that two to three projects will be selected for funding in the years 2026-2028, and decisions will be announced at ITRC 2025 in Japan.

Steering and Proposal Review Committees

The initiative will have two important committees. First, the **steering committee**, which is comprised of the authors of this paper, will continue to plan and execute the initiative, appropriately representing the interests of the organizations funding the initiative. The steering committee shall nominate, select, and oversee the work of a **proposal review committee** comprised scientists and industry practitioners. Committee members will not be eligible to apply for funding from the initiative. Importantly, the steering committee are committed to creating a proposal review committee that is inclusive and diverse considering, but not limited to, gender identity, race, and nationality.

Expectations of Funded Projects

In addition to research priorities, the RFP will define expectations for outcomes from funded projects. It is expected that projects will advance scientific knowledge with results being presented at symposia, in project reports, and disseminated as practical recommendations in modern handbooks, demonstration videos and other resources. It will be critical to define what industry changes will result from a project, and investigators will be expected to build implementation and case-study documentation of positive results from funded projects.

Importantly, each organization has shared documentation and processes for directing research (i.e., RFPs and proposal review criteria). Methods among STERF, The R&A, and USGA are similar and will facilitate cooperation towards definition of the processes for this initiative.

Funding

This will be a cooperatively funded initiative. STERF plans to add to their €100,000 financial buffer not used from ITRC 2022 and contribute a total of €250,000 to the initiative from 2026 through 2028 (i.e., €83,333.33 annually). The R&A and USGA will match STERF's annual contribution for a total investment of €750,000 over all three organizations from 2026 through 2028. Each organization will manage and appropriately disperse their funds to research institutions of investigators with selected projects. Research agreements will be executed among the funding cooperators and funded institutions.

In addition to available funding, applicants will be encouraged to explore opportunities for match funding from other organizations. While match funding is not explicitly required, it will be a prioritization criterion for proposal selection.

Decision Making

To protect the investment of each organization, the steering committee will review and renew funded projects annually. STERF, The R&A, and USGA will enter an agreement that details expected contributions and a decision-making paradigm. It will be important to follow the guidance of the proposal review committee to facilitate inclusive decision-making.

Communication

The steering committee have established a mutually agreeable communications plan with the aim of promoting the initiative globally to turfgrass researchers, practitioners and wider golfing audiences. The plan complements the organizational priorities of STERF, The R&A, and USGA, and is comprised of three stages to announce the launch of the initiative, request proposals, and announce awards. The plan will utilize the widest possible range of available channels, including those of steering committee organizations and other key stakeholders.

All successful applicants will produce a detailed dissemination plan for delivery of their research results. As the initiative moves into project commencement, it is anticipated that communication and dissemination plans for the successful projects will be incorporated into the overall communication plan for the initiative.