

The image is a banner for the Turfgrass Stakeholder Summit II. It features a close-up photograph of green grass with numerous water droplets on the blades, creating a fresh and vibrant appearance. The text is overlaid in white, bold, sans-serif font. The main title 'Turfgrass Stakeholder Summit II' is at the top, followed by 'Virtual Workshop' and the dates 'October 20-22, 2020' at the bottom.

Turfgrass Stakeholder Summit II

Virtual Workshop

October 20-22, 2020

The following is a summary of research priorities brainstormed during breakout groups during Day 2 of the Turfgrass Stakeholder Summit II, on October 21st. Participants responded to the question, "What are the national research ideas to solve the issues facing Turfgrass?" The summit's planning team then categorized the ideas generated into the categories seen below.

- **National Turfgrass Industry Survey** = includes demographics, economic value, size (including jobs) and scope
- **Social Science Research (SSR)** (not just social scientists but physicians as well)
 - **Consumer Education**
 - **Penetration of research** (how well are we extending the research solutions?)
 - **Quantifying quality of life, mental health, recreation**
- **Environmental Stresses (ES)** (Climate extremes/changes)
 - **Extreme temperatures**
 - **Drought/flooding**
 - **Salinity**
 - **Shade**
 - **Need for plant resilience and management of interacting stresses**
- **Sustainability/Environmental Resilience (S/ER)**
 - **Soil health**
 - **Microbiome**
 - Census (quantifying what's there)
 - Management/Benefits
 - Products
 - **Low inputs** (especially with traffic and use)
 - **Alternative Pest Controls (APC)**
 - **Biocontrol** (natural predators)
 - **Natural plant defenses**
 - **Biological chemicals** (chemical applications of biological products)
 - **Landscape Optimization (LO)** (mixed landscape)
 - **Landscape installation - systems approach**
 - **Identifying alternative ground cover mixtures**

Priority	Advocation
<p>National Turfgrass Industry Survey = includes demographics, economic value, size (including jobs) and scope</p>	<ul style="list-style-type: none"> • This is an important priority that has been on the list before, but have yet to find funding or partners to achieve the goal.
<p>Social Science Research (SSR)</p> <ul style="list-style-type: none"> • Consumer Education • Penetration of research (how well are we extending the research solutions?) • Quantifying quality of life, mental health, recreation 	<ul style="list-style-type: none"> • Opportunity to capitalize on public interest in green space • Need to understand community/customer needs and how to meet them (rather than just communications and marketing) <ul style="list-style-type: none"> ◦ Balanced landscapes • Understanding behavior change and messaging
<p>Environmental Stresses (ES) (Climate extremes/changes)</p> <ul style="list-style-type: none"> • Extreme temperatures • Drought/flooding • Salinity • Shade • Need for plant resilience and management of interacting stresses 	<ul style="list-style-type: none"> • Air quality and weather extremes (communications about Turfgrass role) • Water cost and availability is a frequent public concern (drought and flooding) • Drought in the west, impacts water availability • Environmental stresses impact pests • How management impacts stressors (Greenhouse gases)
<p>Sustainability/Environmental Resilience (S/ER)</p> <ul style="list-style-type: none"> • Soil health • Microbiome <ul style="list-style-type: none"> ◦ Census (quantifying what's there) ◦ Management/Benefits ◦ Products • Low inputs (especially with traffic and use) • Alternative Pest Controls (APC) <ul style="list-style-type: none"> ◦ Biocontrol (natural predators) ◦ Natural plant defenses ◦ Biological chemicals (chemical applications of biological products) 	<ul style="list-style-type: none"> • *Biggest criticisms and problems with turfgrass relate to impact of inputs - new strategies for leveraging natural regulators (biocontrols or plant defenses) <ul style="list-style-type: none"> ◦ Systems approach to integrate - promote plant and beneficial organisms • Emerging novel "bio" control evolving from plant genetics technical advances • Soil health and microbiome <ul style="list-style-type: none"> ◦ Growing interest in soil health and microbiome ◦ Microbiome relatively unknown - could have potential for pest controls or plant health ◦ Microbiome development early studies show biocontrol (still need to compare against

<ul style="list-style-type: none"> ● Landscape Optimization (LO) (mixed landscape) <ul style="list-style-type: none"> ○ Landscape installation - systems approach ○ Identifying alternative ground cover mixtures ○ Management practices for wildflower lawn mixes 	<ul style="list-style-type: none"> ○ cultivars and species) <ul style="list-style-type: none"> ○ Lack of understanding what is going on in the soil - cultivar interaction beneath the soil ● Env. Stresses interacts with other areas in the list
<p>Ecosystem Services/Impacts (ES/I) (Data to support the benefits of Turfgrass)</p> <ul style="list-style-type: none"> ● Water impacts (nutrient capture, storm water retention, improving water filtration, etc.) ● Pollinators/wildlife habitat ● Carbon Sequestration (Greenhouse gases) ● Cooling ● Oxygen Generation ● Model Validation ● Dust Control/Soil Binding Ability 	<ul style="list-style-type: none"> ● Suggestion: Offsite impacts described as services and disservices (could describe more generally) ● Urban Ecology - strong interest, management resolutions, making quantification of ecosystem services ● Carbon Cycling (not just sequestration) ● Criticisms of pollinator/wildlife habitat (seen as “sterile”) - valuable to quantify and understand ● Opportunity to describe the role of turf spaces as serving as islands for species, connectivity (especially in urbanizing areas)
<p>Germplasm Improvement (GI)</p> <ul style="list-style-type: none"> ● Biotic Traits (disease, insects, etc.) ● Abiotic Traits (environmental) ● Consumer Traits (quality, wintergreen, reduced mowing, etc.) ● Producer Traits (yield, sod strength, sod regrowth, etc.) ● Genomics ● Phenomics ● Early stage coordinated national germplasm trials 	<ul style="list-style-type: none"> ● Suggestion: genomics and phenomics together (making better plants) ● GI has an excellent track record and still more needed here ● Germplasm improvements - links to sustainability ● Current and new turfgrass varieties are critical pillar to turf industry
<p>Research and adoption of novel technologies (AI, sensors, automated lawn mowers, IoT to lower cost sensors with IoT connectivity, etc.) - homeowner focus, exploiting technology from sister industries to bring them into Turfgrass industry</p>	<ul style="list-style-type: none"> ● Industry needs more information about why people don't adopt ● Plenty of great tech that is not being used
<p>BMPs</p>	<ul style="list-style-type: none"> ● Will help with advocacy, funding for research (will keep turfgrass on

<ul style="list-style-type: none"> ● Advancing Agronomic and Environmental Best Management Practices (BMPs) - Optimizing management practices for turf performance and environmental sustainability ● Development of additional BMPs ● BMP specific contributions to environmental factors (i.e. watershed modeling) ● Environmental Fate (EF) - Pesticides and nutrients (runoff) 	<p>forefront)</p>
<p>Production Research (PR) - seed and sod</p> <ul style="list-style-type: none"> ● Management Practices ● Quality Control ● Wildflower/grass Sod mixes 	<ul style="list-style-type: none"> ● Seed industry needs to support all information (chemical) - clean seed and clean sod is important ● Invasive species - concerns about unknowns

Additional Concerns:

- Labor concerns
- Educated managers and superintendents
- Losing programs
- Funding