WASHINGTON TURGRASS SEED COMMISSION
PROGRESS REPORT

**Project No.:** 3390

**Title:** Integrating New Tools for Grass Weed Control in Kentucky Bluegrass and Perennial Ryegrass.

**Personnel:** Raul Arryo, Graduate Research Assistant

**Accomplishments:**

- Both indaziflam and pyroxasulfone are effective herbicides for managing the most common problematic grass weeds in turfgrass seed production.
- Revised trials were initiated to determine the feasibility of using pyroxasulfone and indaziflam for weed management in turgrass for seed.
- Revised trials were also initiated to study the effect of GA on turfgrass stand establishment and seedbank management.
- A laboratory assay was developed to study turfgrass cultivar sensitivity to indaziflam.

**Results:**

In August and September of 2017, multiple field trials were established to examine the effects of field applications of GA on grass weed seed germination and seedbank depletion during establishment and to identify herbicide systems combining pyroxasulfone (Zidua) or indaziflam (Alion) with mesotrione (Callisto) to provide an integrated management plan leveraging our understanding of seed dormancy and seedbank management with herbicide physiology and targeted herbicide use, rather than relying on herbicides alone. Our first year results suggest: 1) that PRE applications of pyroxasulfone or indaziflam in combination with mesotrione provide complete control of downy brome, rattail fescue, alkali grass, and annual bluegrass eight weeks after treatment. However, both Kentucky bluegrass and perennial ryegrass germination and stand establishment are also inhibited, 2) while turfgrass emergence was impacted by PREs, both varieties of perennial ryegrass appeared to have some natural tolerance to both pyroxasulfone and indaziflam, and 3) all grass species tested responded to GA applications.

A revised set of trial were initiated in September 2018 to correct the doses used in September 2017, and to revise our approach understanding how to use GA in turfgrass for seed. Those trials were not sufficiently established to determine if our new strategies were appropriate – seedling establishment was slower than anticipated. Early ratings indicate that carbon seeding appears to be an effective strategy to achieve selectivity with pyroxasulfone and indaziflam. GA treatments also appear to have stimulated germination of the turfgrass species. When stands have matured, we'll have a better sense of how would modify our approach. We plan on initiating trials in the spring to speed the learning cycle.

**Publications:**

Arryo, R., K. Sanguinet, T. Lehman, and I. C. Burke. 2019. A root growth assay to determine dose-response of weeds and crops to indaziflam. In *Proceedings of the Western Society of Weed Science*.

# CURRENT & PENDING SUPPORT

**Name: Ian C. Burke**

| NAME (List/PD #1 first) | SUPPORTING AGENCY AND AGENCY ACTIVE AWARD/PENDING PROPOSAL NUMBER | TOTAL $ AMOUNT | EFFECTIVE AND EXPIRATION DATES | % OF TIME COMMITTED | TITLE OF PROJECT |
|---|---|---|---|---|---|
| | Active: | $ | | | |
| Burke and Lyon | Washington Grain Commission | 64,775 | 7/18 – 7/19 | 8 | Weed Control in Wheat |
| Creech, et al. | USDA-OREI | 1,555,000 | 10/14 – 10/19 | 8 | Compost carryover and cover crop effects on soil quality, profitability, and cultivar selection |
| Burke | Washington Grain Commission | 39,832 | 7/18 - 7/19 | 6 | Herbicide Resistance and Susceptibility in Wheat and Weeds |
| Burke, Lyon, Campbell | USADPL | 28,000 | 7/18 - 7/19 | 5 | Weed Management in Pulses |
| Johnson-Maynard et al. | USDA-AFRI | 3.99M | 8/17 - 7/20 | 8 | Inland Pacific Northwest Wheat-Based Systems: Landscapes In Transition |
| Burke | Washington Turfgrass Seed Commission | 28,883 | 8/18-7/19 | 6 | Integrating New Tools for Grass Weed Management in Kentucky Bluegrass and Perennial Ryegrass |
| Carr, et al. | USDA-OREI | 2,000,000 | 10/18 – 7/22 | 4 | CREEP STOP: Integrating Biological, Cultural, and Mechanical/Physical Tools for Long-Term Suppression of Creeping Perennial Weeds in northern Great Plains and Pacific Northwest Cropping Systems |
| | Submitted: | $ | | | |
| Burke and Madsen | WA Oilseed Commission | 12,262 | 7/19 – 7/20 | 2 | Winter and Spring Canola Variety Testing |
| Burke | WA Turfgrass Seed Commission | 28.883 | 7/19 – 7/20 | 6 | Integrating New Tools for Grass Weed Management in Kentucky Bluegrass and Perennial Ryegrass |