

## Special Issue

# Cross- and Multiple-Herbicide Resistance: Implications for Grain Production Systems

### Message from the Guest Editor

Cross- and multiple-herbicide resistance are major challenges in modern grain production. In soybean-maize rotations and in crops such as wheat, rice, barley, and sorghum, repeated reliance on a few herbicide modes of action has increased selection pressure and accelerated the evolution of complex resistance. Many weed populations now possess overlapping resistance mechanisms, reducing field efficacy and threatening the sustainability of simplified cropping systems. Despite advances in understanding herbicide toxicology and resistance, the rising number and complexity of resistance cases demand deeper biochemical and molecular insight. Improved knowledge of herbicide modes of action and resistance pathways is essential to develop effective, science-based resistance management strategies.

- This Special Issue highlights the biochemical and molecular foundations of herbicide action and weed resistance, with emphasis on cross- and multiple-herbicide resistance.
- Topics include molecular modes of action of novel herbicides, new target-site resistance mechanisms, non-target-site resistance in major grain-system weeds, and the fitness costs and ecological impacts of resistant populations.

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### Guest Editor

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