

# Improving Weed Control Through Stacking Tools

Eric Gallandt, University of Maine - Orono, ME

Physical weed control is the cornerstone of weed management strategies in vegetable crops. Reducing weed seedling density is critical for establishing and maintaining the crop's early size advantage, ensuring maximum yield and quality and improving harvest efficiency. Unfortunately, physical weed control efficacy is often poor and highly variable. For many tools, typical weed seedling mortality will average 50 to 60%, often ranging from 0 to 100% over the field. A promising strategy to improve efficacy and reduce variability is to cultivate with two or more tools of different design, a practice we call "tool stacking." Recent field experiments in corn showed that stacking offered a synergistic effect on efficacy, i.e., benefits beyond simply additive, which was promising. Minimizing crop injury, however, remains challenging; high levels of weed control generally resulted in greater crop mortality. Our current work aims to determine whether physical weed control tools vary in their mechanisms of action in ways that could be better optimized to remove some of the so-called "art" of cultivation.



Eric Gallandt is Professor of Weed Ecology and Management at the University of Maine. Over the past 20 years, Dr. Gallandt's research has focused on ecological and physical weed management of weeds in organic farming systems. His guiding philosophy is that multiple stresses or "Many Little Hammers," can offer improving and durable weed management outcomes. His current work aims to combine proven weed seedbank management strategies with advanced physical weed control tools to establish a virtuous cycle of improving weed control.