

## PROJECT SUMMARY

**Title:** Resilient Systems For Sustainable Management Of Cucurbit Crops

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Our goal is to validate two innovative strategies to enable organic cucurbit-crop growers to suppress insect pests, diseases, and weeds while achieving consistently high marketable yields. Cucumber beetles, bacterial wilt, squash bug, cucurbit yellow vine disease, squash vine borer, powdery and downy mildew cost growers >\$100 million annually, limiting organic marketing opportunities. Three years of field experiments and on-farm trials with muskmelon and acorn squash in Kentucky, Iowa, and New York will optimize mesotunnels – season-long tunnels that sharply increase marketable yield and suppress pests and diseases. This new growing system will effectively control weeds, build soil quality, and achieve efficient pollination (Objective 1). Concurrently, we will develop biological controls to suppress bacterial and fungal diseases, both as a companion strategy to mesotunnels and as a stand-alone practice (Objective 2). Growers will provide continuous feedback via an Advisory Panel, surveys, listening sessions, and on-farm trials. We will use our field trial results to calculate profitability in the South, Midwest, and Northeast, and grower viewpoints will inform adoption rates of these new tools (Objective 3). A coordinated outreach program will reach 7,000 growers throughout these regions (Objective 4). The project directly addresses five OREI priorities: trialing innovative practices that can mitigate pest and disease damage (Priority 1), developing tools for Extension professionals in advising organic growers (Priority 2), evaluating technologies to improve IPM while safeguarding resources (Priority 5), developing case studies to educate undergraduates about organic cucurbit production (Priority 8), and pinpointing socioeconomic constraints to adoption of the new systems (Priority 9).