

**Allelochemical Pest Control in Strawberry Production.** Eli M. Weissman\*<sup>1</sup>, Dr. Scott Steinmaus, Dr. Kelly Ivors, Dr. Steven Fennimore, Dr. Matt Ritter  
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Strawberry (*Fragaria x ananassa*) production relies predominantly on synthetic pesticide applications to control pests. Due to mandated reductions in methyl bromide use, and the subsequent emergence of pests previously controlled by this fumigant, strawberry growers must find novel pest control options. Allelochemicals, compounds produced by one organism that suppress the growth and/or development of another, are an appealing solution because research suggests they have fewer environmental impacts than traditional pesticides. In water agar, we produced 1000, 500, 100, and 10 parts per million (ppm) concentrations of gallic acid, ferulic acid, p-Coumaric acid, and juglone. We tested the *in vitro* dose-response of little mallow (*Malva parviflora*), common groundsel (*Senecio vulgaris*), annual blue grass (*Poa annua*), and romaine lettuce (*Lactuca sativa* ‘Inferno’) to these four putative allelochemicals. We subjected seedling length and percent germination data to analysis of variance, Tukey’s HSD tests, and nonlinear regressions. Juglone inhibited *M. parviflora* germination (EC<sub>50</sub>: 87 ppm) whereas the other compounds did not. Seedling length was a more sensitive response variable (*M. parviflora* seedling length EC<sub>50s</sub> for juglone, p-Coumaric acid, ferulic acid, and gallic acid were 71 ppm, 115 ppm, 267 ppm, and 165 ppm, respectively). Enhanced juglone phytotoxicity was likely due to the greater lipophilicity of quinones, such as juglone, relative to the three phenolic acids. Generally, the phytotoxicity of the compounds fell into the following order: juglone>p-Coumaric acid>ferulic acid>gallic acid (e.g. *S. vulgaris* germination EC<sub>50s</sub> listed in the compound phytotoxicity order: 69 ppm, 147 ppm, 666 ppm, and no inhibition). To further assess the suitability of the four suspected allelochemicals as pre-plant pesticides in strawberry production, we are performing additional weed and fungal assays in field soil.