

**Paul C. and Edna H. Warner Endowment Fund for Sustainable Agriculture
Progress Report
December 2018**

Project Title: Optimizing Anaerobic Soil Disinfestation to Increase Ohio Strawberry Productivity
Strawberries

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Introduction: Black root rot of strawberry is a destructive disease caused by one or more multiple fungal pathogens including *Fusarium* spp., *Rhizoctonia* spp. and, *Phythium* spp. Black root rot can occur on strawberry produced using matted rows and black plastic. Historically, soil fumigation with methyl bromide was used to control black root rot. However, methyl bromide is no longer registered for strawberries in Ohio. Other soil fumigants can be used but they typically don't control all of the pathogens responsible for black root. Four to five years of rotating out of strawberries can lower black root rot incidence and severity but long rotations are not economical for strawberry growers. Anaerobic soil disinfestation (ASD) is a relatively new practice that encourages anaerobic decomposition of carbon based amendments, allowing for the accumulation of volatile compounds that kill pathogens and weed seeds. In tomatoes and other vegetable crop production systems one ASD treatment has been shown to control soilborne diseases for 2-3 years. Anaerobic soil disinfestation is a promising tool for strawberry growers to manage black root rot (and weeds) and will work directly in conjunction with current plasticulture production systems. The objectives of this project were to evaluate the efficacy of ASD in reducing black root rot disease incidence and severity on strawberry and to identify the most effective and economical carbon source to be used against black root rot during ASD.

Methods: An on-farm trial to evaluate ASD was initiated at Catalpa Grove Farm. Two carbon sources (wheat bran and molasses), a mixture of the two carbon sources, a chemical control (azoxystrobin plus aluminum tris) and a non-treated control (Table 1) were evaluated in a field with a history of black root rot disease. The trial consisted of four replications. Carbon treatments were incorporated into the test plots on 17 Jul, flooded, and covered with black plastic. Ten soil temperature probes were randomly placed under the black plastic to monitor soil temperature and removed on 2 Nov. Bare root strawberry (cv. Chandler) plants were planted on 5 Sep. Transplants for the chemical treatment were dipped in a mixture of azoxystrobin (8 fl oz/100 gal) and aluminum tris (2.5 lb/100 gal) prior to planting. Foliar disease incidence was rated on 5 Oct, 19 Oct and 2 Nov. Foliar disease incidence will be rated an addition two times in the spring and root disease severity will also be assessed (see proposal).