



1. List your research and extension projects under the official NCCC 212 objectives, emphasizing collaborative projects with other researchers.

Objective 1 - Develop improved small fruit germplasm through cooperative breeding and evaluation programs:

Strawberry:

Winter survival and second-year spring yields of day-neutral strawberry in the Northeast are influenced by cultivar and the presence of low tunnels. R.G. Sideman and K.M. Orde, University of NH, Durham NH

Objective 2 - Develop practices for small fruit production tailored for climatic and market needs of growers.

Strawberry:

Advancing Strawberry Production in the Northeast. R.G. Sideman and K.M. Orde, University of NH, Durham NH; L. McDermott, Cornell Cooperative Extension, Hudson Falls NY; E Hodgdon, Cornell Cooperative Extension, Plattsburgh NY; D. Conner, University of VT, Burlington VT.

Photoselective film, mulch color, and low tunnel effects on the day-neutral strawberry cv. Albion. K. Orde and B. Sideman, University of NH, Durham NH; K. Demchak and R. Marini, Pennsylvania State University, State College, PA.

Grapes:

Yield and performance of eight seedless table grape cultivars grown in two training systems (Munson and VSP) in New Hampshire. NH Agricultural Expt. Station, Hatch Project NH00685. R.G. Sideman, M. Cogswell and K.M. Orde, University of NH, Durham NH; G. Hamilton, University of NH Extension, Goffstown NH.

Other small fruit crops:

Feasibility of in-ground production of fig in USDA hardiness zone5B using various winter protection strategies. NH Agricultural Expt. Station, Hatch Project NH00685. R.G. Sideman, University of NH, Durham NH.

Objective 3 - Explore the association between fruit constituents and human health impacts

Grapes:

Effects of cultivar and training system on human health-beneficial phytochemicals in seedless table grape. NH Agricultural Expt. Station, Hatch Project Acc. No. 1020314. M. Lima, A. Chandrakala, M.K. Hanlon, and R.G. Sideman, University of NH, Durham NH.

2. How have the results been disseminated to communities of interest?
What do you plan to do during the next reporting period to accomplish the goals?

During the reporting period, results have been disseminated to target audiences via 1) written extension newsletter articles, 2) virtual twilight meetings, 3) presentations at grower conferences and inservices, 4) promotion through social media, and 5) farm tours/field days.

Strawberry: We will initiate experiments designed to test the following hypotheses: the use of heavier weight rowcover will increase winter survival of strawberries, and earlier fall application of rowcover will increase yields of June-bearing strawberry the following year.

Grape: In 2021, we will add seven newly-released table grape varieties to the vineyard to evaluate performance (hardiness, yield, susceptibility of diseases, etc.) in our region, and will continue to collaborate with M. Lima (see her Hatch Accession No. 1020314 for details), using mature vines of 'Mars' and 'Canadice'.

Fig: We will continue to collaborate with stakeholders to assess both crop quality and market potential of fresh fig growing in minimally protected environments. Established plantings will be protected for a second winter using the same experimental design as was used in the first winter. In 2021, we will assess winter survival and timing and quantity of fruit production.

3. Include any data, gemplasm/cultivar descriptions, research results, etc. that you would like to discuss at the meeting. Please keep this brief, highlighting no more than three discussion points within 500 words. Additional information (data tables, abstracts, etc...) can be included in an appendix.

Strawberry: Building upon the USDA-AFRI SCRI project 'Optimizing protected culture environments for berry crops', e.g. TunnelBerries, we compared the performance of several dayneutral strawberry cultivars in NH in a two-year study. While typically grown as annuals that are harvested for one fall season only, many growers in our region hold these plantings and obtain a spring crop as well. We observed that both cultivar AND the use of low tunnels influenced winter survival and fall as well as spring yields of dayneutral strawberry. For some cultivars, winter survival was consistently high, and spring yields even exceeded first-year fall production in some cases.

Grape: In 2015, we established a research vineyard containing eight seedless table grape cultivars using two training systems: vertical-shoot positioning (VSP) and Munson (M). During the past five years, we assessed vine vigor and incidence of diseases and insect pests, and collected yield data. We have observed significant differences among varieties in incidence of powdery mildew, downy mildew, and anthracnose, as well as in fruit yield and quality. We found that the VSP training system reached harvest maturity at least one year earlier than the other systems, thus increasing early yield potential; but vines trained to the MM system have produced higher annual yields once established. In the past year, we have begun to collaborate with other researchers to expand research objectives to include assessment of nutritional phytochemicals.

Fig: We have just begun to study systems of winter protection of figs grown in-ground, and to investigate the effects of different protection strategies on growth and fruiting patterns for four fig cultivars: Violette de Bordeaux, St. Rita, J.H. Adriatic, and Takoma Violet. In Winter 2019-2020, we measured the effects of different winter protection systems (winter blankets, heavy rowcover, leaves, low tunnels, and high tunnels) on overwinter survival and subsequent plant growth and fruit set for several fig cultivars. We observed significant effects of protection system (but not cultivar) on winter survival, and significant effects of both production system AND cultivar on fruit set and timing of fruit ripening. We continue to collect data and will publish a preliminary research report in Winter 2021.

4. List retrievable or archived publications arising from your collaborative research projects including journal articles, book chapters, review articles, theses, proceedings, and extension publications. Please use ASHS style.

- Orde KM and RG Sideman. 2020. Winter survival and second-year spring yields of day-neutral strawberry in the Northeast are influenced by cultivar and the presence of low tunnels. *Accepted for publication, HortTechnology.*
- Orde KM and RG Sideman. 2019. Low tunnel and cultivar effects on day-neutral strawberry yield and characteristics in New Hampshire. *HortTechnology 29(6): 795-810.*
- Lima M, RG Sideman, A Chandrakala, and MK Hanlon. 2020. From harvest to consumer: Are grape's health-beneficial properties modified with time in storage? Nutrition 2020 Conference. June, 2020.
- Sideman RG. 2020. Extension Research Report: Seedless table grape variety & training system evaluation, 2019. Sideman RG. Available at:
<https://extension.unh.edu/resources/files/Resource007159_Rep10342.pdf>