# REPORT TO NCCC212, 2021
# Utah State University

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

- Grapes. County Extension faculty conducted a grape cultivar trial at the Thanksgiving Point facility in northern Utah County. This is in a typical landscaped setting and on clay soil. A progress report on this planting was published as an Extension fact sheet in 2021 (see below).
- Elderberry Our first wild selection of blue elderberry (*Sambucus cerulea*) officially released in 2019 has been distributed to nurseries in Oregon and Utah. We have several additional selections under testing at the UAES Kaysville Farm, along with several other commercial cultivars, including Bob Gordon, Wyldewood and Pocahontas. During 2021, we had canes on several plants collapse just after harvest, but have not been able to identify the cause. Our pathologist is trying to identify a possibl fungal cause (suspects Verticillium) but has not yet been able to confirm anything. (Table 1)
- Strawberry. Jennifer Reeve, USU's Organic Ag specialist has started a grant-funded project to evaluate strawberry cultivars for adaptation to organic management systems, with particular emphasis on N efficiency. Trials were started in Spring 2021 with commercially available cultivars. The primary research site is on a Millville Silt Loam soil with a native pH of 7.9. One major observation to date is the vast differences in resistance to iron chlorosis.

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

- Raspberry. We are wrapping up a 3-year project to evaluate soil heating to advance primocane fruiting. While we can significantly advance cane emergence and development with supplemental soil heating, we don't see any earlier fruiting than with high tunnels alone. We are currently analyzing the data in preparation for publication.

  In conjunction with the high tunnel raspberry project, we have tested multiple primocane raspberry cultivars and selections including: BP-1, Imara, Kweli, Mapema, Polka, ORUS 4291-1 and ORUS 4487-1. Of these, Polka is the earliest and most productive. Kweli had the second highest yields, but was not particularly early. ORUS4291-1 comes on early, but yields have been relatively low (although this was planted later than the cultivars). BP-1 has been the favorite in consumer preference surveys.
- Other. USU entomologists Diane Alston and Lori Spears are collaborating on a large multi-state project on Brown Marmorated Stink Bug monitoring and control. Several parasitic organisms have been identified in Utah for BMSB control. To date, BMSB has not been an economic problem in fruit crops.

Publications – research

Hansen, S., B. Black, D. Alston T. Lindstrom and S. Olsen. 2021. A comparison of nine primocane-fruiting raspberry cultivars for suitability in a high elevation arid climate. Intl. J. Fruit Science 21(1): 500-508. DOI: 10.1080/15538362.2021.1897921.

Publications - Extension (at http://utahpests.usu.edu, http://fruit.usu.edu, http://tunnel.usu.edu).

Caron, M., T. Beddes, M. Pace, T. Maughan and B. Black. 2021. Evaluation of cold-hardy grapes on the Wasatch Front. Horticulture/Grapes 2021-01pr.

Drost, D., B. Black and M. Stock. 2021. Irrigation Management in High Tunnels. USU Extension, Horticulture/High Tunnels/2021-pr (d.c. 2173).

**Appendix. Tables and Figures**

**Table 1. Elderberry comparison planting at Kaysville Utah, 2021 data.**

| Cultivar/selection | Est. date | Yield* Fruit+Pedicel | Season 1st harv.* | Berry Size | Fruit Sugar |
|---|---|---|---|---|---|
| | | (kg/plant) | (%) | (g/berry) | Brix |
| 'Rendezvous' | S.18 | 8.82 | 71 | 0.126 | 8.7 |
| USU So. | F.19 | 3.18 | 69 | 0.151 | 9.4 |
| USU Chev. | F.19 | 0.53 | 43 | 0.178 | 9.0 |
| 'Pocahontas' | S.20 | 2.26 | 34 | 0.083 | 11.5 |
| 'Bob Gordon' | S.20 | 1.89 | 34 | 0.131 | 9.6 |
| 'Wyldewood' | S.21 | 0 | | | |

Yield is based on total weight of harvested clusters, including fruit and pedicel tissue.
*First harvest was 13-August

**Table 2. Flavor preference of attendees at a farmers' market for primocane-fruiting raspberries produced in high tunnel plots. Scores are for two dates in September 2021 .**

| | Preference Score (1-10) | |
|---|---|---|
| Cultivar | Week 1 | Week 2 |
| BP-1 | 8.6 | 8.1 |
| Polka | 8.0 | 7.2 |
| ORUS 4487 | 7.2 | 6.8 |
| Kweli | 7.2 | 6.2 |
| Mapema | 7.1 | 6.5 |
| Imara | 7.1 | 6.4 |
| ORUS 4491 | 7.0 | 5.7 |

**Table 3. Harvest season and total yields of (spring-protected) high tunnel fall raspberries.**

| | **Early (20%)** | | | **Midpoint (50%)** | | | **Total Yield (kg/m)** | | |
|---|---|---|---|---|---|---|---|---|---|
| **Cultivar** | **2019** | **2020** | **2021** | **2019** | **2020** | **2021** | **2019** | **2020** | **2021** |
| **Polka** | 28-Aug | 28-Aug | 6-Aug | 6-Sep | 11-Sep | 23-Aug | 1.71 | 2.34 | 3.52 |
| **Bp-1** | 2-Sep | 11-Sep | 25-Aug | 13-Sep | 23-Sep | 10-Sep | 0.98 | 0.76 | 1.92 |
| **Kweli** | 2-Sep | 14-Sep | 25-Aug | 13-Sep | 25-Sep | 7-Sep | 0.46 | 1.02 | 2.69 |
| **Imara** | 13-Sep | 11-Sep | 3-Sep | 16-Sep | 25-Sep | 14-Sep | 0.63 | 1.18 | 1.88 |
| **ORUS 4491** | - | - | 30-Jul | - | - | 23-Aug | - | - | 1.36 |
| **ORUS 4487** | - | - | 2-Aug | - | - | 27-Aug | - | - | 2.21 |
| **Mapema** | - | - | 9-Aug | - | - | 27-Aug | - | - | 1.89 |