In the high desert, Nevada farmers are challenged by a short growing season, slow crop establishment of warm-season vegetables and water availability. Grafting on squash hybrids and deficit irrigation have shown to be successful techniques for earlier harvests and increased crop water productivity. A field trial was conducted to evaluate the performance of cantaloupe grafted onto squash hybrid rootstocks under deficit irrigation. Incorporating soil moisture sensors to monitor water use and irrigation volumes could optimize water use when soil moisture content is replenished to 100% (i.e., field capacity) or to 70% of the maximum soil moisture content.

**RESULTS**

- **Soil moisture** (Figure 1)
  - The 100% irrigation treatment showed no water stress, while the 70% irrigation treatment crossed the maximum SWD threshold after DAT 43, suggesting that the crop experienced moderate water stress.

- **Canopy cover** (Figure 3)
  - Under the 100% irrigation no differences of canopy growth were observed
  - Ungrafted plants grew faster than grafted ones in the 70% irrigation.

- **Normalized difference vegetation index (NDVI)** (Figure 4)
  - Irrigation treatment did not significantly affect NDVI of phenotypes, which suggests that the 70% irrigation did not cause severe drought stress.
  - NDVI increased for all phenotypes during canopy growth.

- **Yield** (Figure 5)
  - Under the 100% irrigation, no differences in total yield were observed among phenotypes.
  - Under the 70% irrigation, the ungrafted plants produced 30% more number of fruits (data not shown) than the grafted plants.

- **Crop water productivity** (Figure 6)
  - The ungrafted plants have acclimated better to the moderate water stress and improved significantly the CWP compared to the grafted phenotypes.
  - The plants in the 100% irrigation treatment received 361 mm of water while the plants with the 70% irrigation received 284 mm.

**CONCLUSION**

- Grafting did not show a clear benefit on yield under both full irrigation and moderate water deficit. This suggests that either the type of grafting or the root system of the rootstocks did not provide any advantage to the common scion.
- Moderate irrigation deficit may induce earlier melon production and increase CWP to support local food systems and improve cultivation sustainability in high desert environments.