Paul C. And Edna H. Warner Endowment Fund for Sustainable Agriculture
Report Form – Franklinton Farms and OSU Extension Franklin County.

Summary:

Being able to grow specialty crops outside of a normal planting/harvesting window can create financial benefits for the grower and more options for the consumer. The objective of this project was to test the effectiveness of two simple, low-tech practices to mitigate summer heat and thereby increase summer yields of heat-sensitive crops.

What was done?

Using a 2 x 2 factorial design, we tested the change in yield for lettuce grown in 30' beds watered with micro-sprinklers in response to two experimental conditions and their combination:

1. No treatment (watering for 40 minutes, once daily)
2. Shading (with 40% white shade cloth on low tunnels)
3. Evaporative cooling (watering for 10 minutes, four times daily)
4. A combination of both shading and evaporative cooling.

We applied these treatments in three blocks with staggered planting times from June 20 – September 10; however, we discarded data from one block due to problems with the irrigation treatment. As responses, we compared the mean harvested mass and mean latency until harvest of loose leaf lettuce mix, Salanova/Eazyleaf lettuce, and full-sized heads of lettuce.

What were the results?

We detected a clear effect of the combination treatment on mass of harvested lettuce mix, and an effect of the evaporative cooling treatment on time until harvest for heads of lettuce. The combination of the shading and evaporative cooling treatments increased the mass of harvested lettuce mix compared to the control treatment harvests in that same day. Specifically, the increased size of each bed's harvest meant that this treatment increased the total mass harvested per bed by 2.1 standard deviations in Salanova/Eazyleaf lettuce and 1.6 standard deviations in directed seeded lettuce mix (Figure 1). Furthermore, when receiving the evaporative cooling treatments, Cegolaine heads of lettuce were harvested about 12 days earlier and Muir heads of lettuce were harvested about 5 days earlier (Figure 2). Photos of germination suggest that germination rates were also affected by treatment, but this analysis is ongoing.

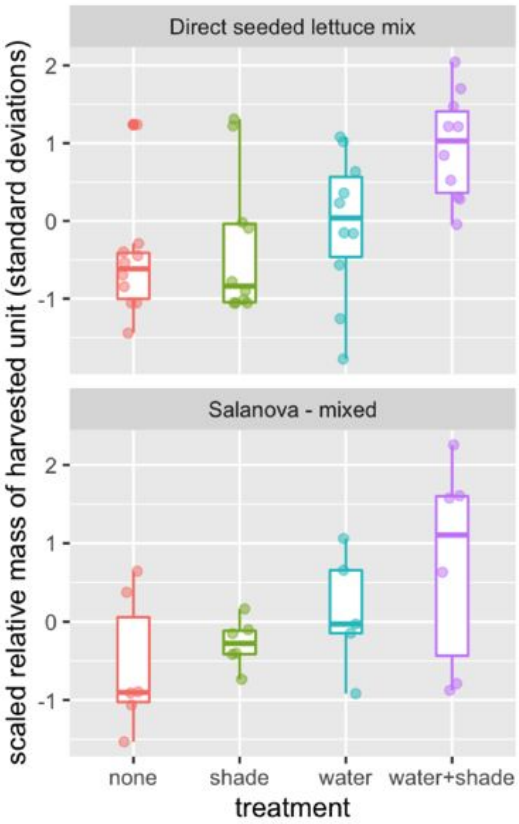

Figure 1. Effect of treatments on the relative mass of harvested lettuce. Y-axis shows scaled residual mass (relative mass controlling for lettuce variety and time block). Each data point shows value for one bed. Box plots show the median (line) and the quantiles (box) of the distribution of values.

How have the results contributed to or will they contribute sustainable agriculture?

The research data from this project provides helpful insights into low-cost techniques that can allow farmers to more successfully grow cool-season crops in the hot summer, when demand for local lettuce is high and availability low. Summer lettuce can command a higher price point at Farmer's Markets and for specialty sales. These techniques can be used for multiple seasons and also repurposed as needed for winter season extension. This process is applicable to not only urban farming organizations like Franklinton Farms, but also to any operation that wishes to extend the season for growing lettuce and other cool season leafy greens.

We hope to publish the results from this grant-funded study in the Journal of the National Association of County Agricultural Agents (JNACAA), and at the 2021 Ohio Ecological Food and Farm Association (OEFFA) Conference, where it has already been accepted for presentation.