



Growing Lettuce Under Shade Conditions

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Introduction

Lettuce grows well during cool seasons and at high elevations in Hawaii. Over the years, the College of Tropical Agriculture and Human Resources (CTAHR) has evaluated many commercial lettuce varieties for heat tolerance at low elevation sites. Pearl City, Oahu is extremely hot during the summer months. The mean temperature range in the Honolulu area during the month of March 2023 was 79° F to 87° F (National Weather Service Now Data). February and April temperatures were within ± 2 degrees difference.

We know from previous field trials, that heat tolerant lettuce varieties such as Sparx, Alkindus, Cherokee, Green Forest, Red Sail, and Johnny Select Seed's Salanova® varieties do well when grown in full sun in Pearl City Oahu.

When heat tolerant varieties are not available to growers, growth conditions can be modified. For example, Manoa lettuce is a highly sought after local favorite. However, it often exhibits tip burn under high temperatures. An observational field trial was conducted to determine if selected varieties could be grown under 40% black shade netting in order to re-purpose an old greenhouse system at the Urban Garden Center, in Pearl City. Seedlings were transplanted in February 2023 at 6-8" spacing between seedlings. The crop was harvested in April 2023.



Photo 1. Lettuce grown under 40% shade. **Photo 2.** Manoa lettuce grown under shade and overhead irrigation.

Shade cloth over and around the greenhouse unit was retained to moderate temperatures, protect plants from UV rays and exclude caterpillar pests. Overhead sprinklers with portable water were installed to irrigate plants and supplement temperature reduction effects. About 40 lettuce cultivars (**Photo 1**) were evaluated in this simplified field trial. A basic evaluation system was developed using a 3 point scale to determine suitability to shade conditions: 1=poor growth (tip burn, needs more sun), 2=average growth (grows well but not to full potential), and 3=excellent growth (commercial scale). No yield data was taken. As it shows in **Table 1**, many of the evaluated varieties did not do well under these conditions. However, eight varieties including Manoa lettuce (**Photo 2**) grew well under 40% shade.

Table 1. Evaluation of select lettuce cultivars grown under 40% shade

Variety	Growth Rate	Notes
Adriana	3	Some tip burn
Black Summer	3	Pak Choy, not lettuce
Manoa	3	Grows well
Salanova® Green Sweet Crisp	3	
Salanova® Hydroponic Green Butter	3	Prone to bacterial infections
Salanova® Hydroponic Red Oakleaf	3	Exceptional
Salanova® Red Sweet Crisp	3	
Skyphos	3	
Alkindus	2	
Azika	2	
Cegolaine	2	
Grazion	2	
Salanova® Green Butter	2	
Monte Carlo	2	
Cherokee	2	Needed more sun, stretching
Sparx	2	Heat tolerant, needed more sun
Salanova® Red Butter	2	
Bauer	1	Tip burn
Blue Rock	1	Tip burn
Christabe	1	
Ezflor	1	
Green Forest	1	
Ilema	1	
Incise	1	
Intercut	1	
Nevada	1	
Newham	1	
Powerhouse	1	Needed more sun, stretching

Red Cross	1	Tip burn
Red Sail	1	Needed more sun, stretching
Rex	1	
Rosaine	1	
Rouxai	1	
Salanova® Hydroponic Green Batavia	1	
Salanova® Hydroponic Red Batavia	1	
Tropicana	1	Needed more sun, stretching
Xalbadora	1	Needed more sun, stretching

Rating scale, 1=poor growth (tip burn, needs more sun), 2=average growth (grows well but not to full potential), and 3=excellent growth (commercial scale).

Summary

The eight varieties which did well in this initial field evaluation are being actively grown under 40% shade at the Urban Garden Center to advance the student workforce development project in partnership with the Kapiolani Community College's (KCC) Culinary program. Due to this work, we have been able to re-purpose an old greenhouse and transform it into a food production facility. To date, KCC chefs have expressed satisfaction with the quality of the lettuce grown under shade and overhead irrigation (**Photos 3 & 4**). Students in the workforce development project enjoyed assisting with maintenance and harvesting of the crops, learning about the different varieties used in this trial, and knowing that it will be put to good use at KCC. Surplus lettuce was donated to the Hawaii Food Bank.

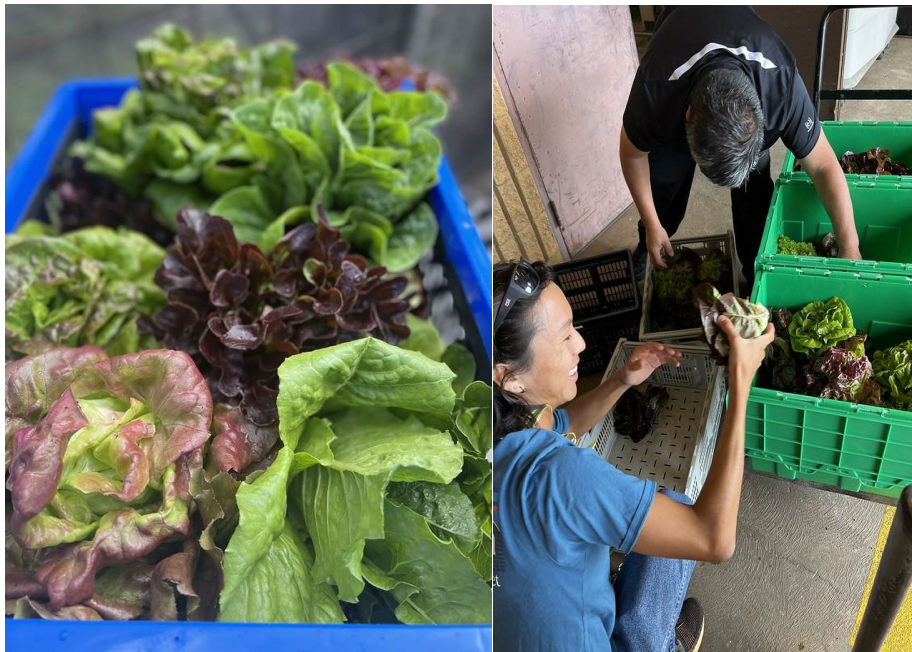


Photo 3. A variety of lettuce grown under 40% shade. **Photo 4.** Author delivers lettuce to KCC's storefront program for culinary programs and cafeteria sales.

References

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