

# Identification of Cranberry Bog Microclimatic Factors for Their Role In Fruit Quality

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**Introduction** - Cranberry fruit quality and fruit rot are the most critical challenges for cranberry growers in MA. Cranberry production is heavily reliant on the use of pesticides and high water input. With the issues of pesticide resistance, unsustainable practices, and other microclimatological factors, it is necessary to develop sustainable cultural management for cranberry production.

## Objectives

- Obtain microclimatic data from cranberry bogs to evaluate their roles in fruit rot, fruit quality, yield
- Correlate bog-level data-based parameters to develop more sustainable, easily adoptable management practices to improve fruit quality

## Methods – Obtain microclimatic data for various cranberry bogs by the following:

- Bloom Progression and Horteau Weather Data
- Canopy Light Penetration using a Ceptometer
- Tissue Testing, Canopy Density, Vegetative Vs. Reproductive Upright Ratio
- Fruit Quality and Yield



Honeybee pollinating flowers on in-bloom cranberry uprights, both buds and flowers present. June 14, 2021

## Results (Preliminary)

**Fruiting Uprights: Total Uprights of Various Experimental Sites, 2021 Growing Season**

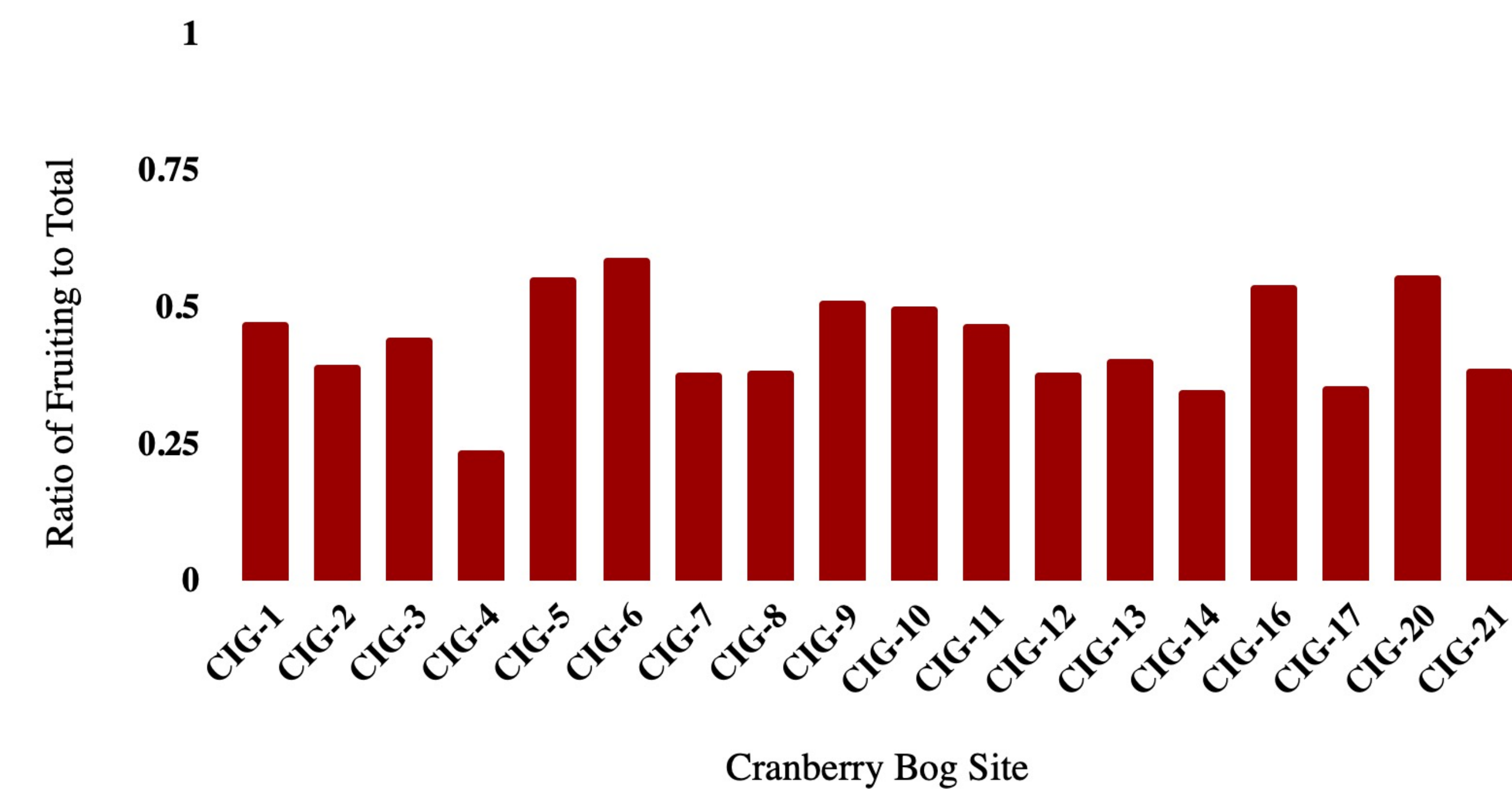


Figure 5. Ratio of Fruiting Uprights to Total Number of Uprights. Used to predict future yield based on flowering vs. total ratios.

**Cranberry Bloom Progression, 2021 Growing Season**

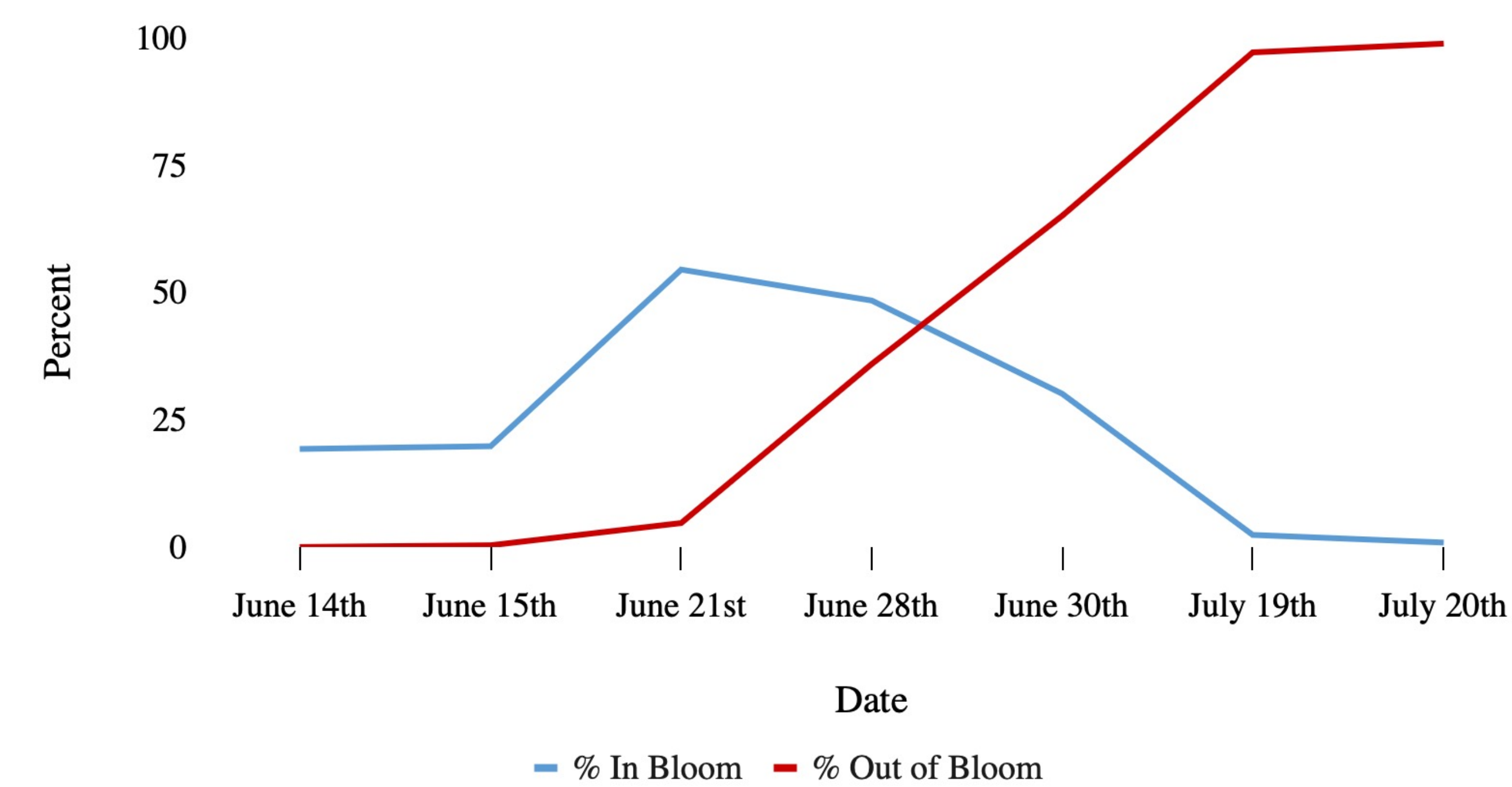


Figure 6. Cranberry Bloom Progression 2021 Growing Season. Blue trendline shows % In Bloom (buds, flowers). Red Trendline shows % Out of Bloom (pinheads, fruit). Average Trend for 24 bogs over June and July, relative to degree days and weather data based on time within the growing season

**Leaf Area Index of Various Experimental Sites, 2021 Growing Season**

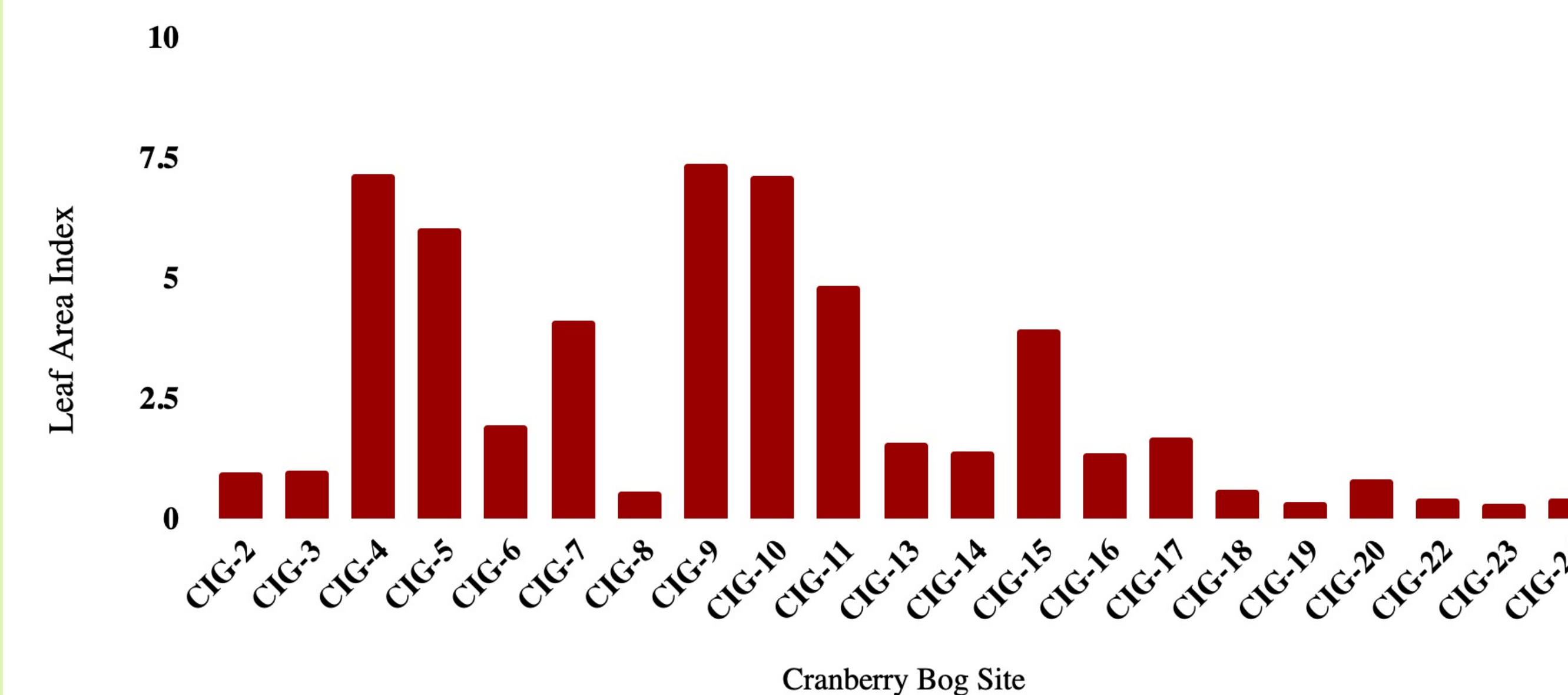


Figure 7. Leaf Area Index of Cranberry Bog Canopy. Farmers can use this data to make decisions about canopy density management including pruning.



Figure 1. Sampling method for canopy density and tissue testing



Figure 2. Ceptometer, used for light penetration measurements of leaf area index



Figure 3. Horteau Weather Station used for collecting weather data



Figure 4. Individual upright showing all four stages of bloom: bud, flower, pinhead, and early fruit

## Implications for Future Research

With 2021 being the first year of this research project, protocols were developed and will be used for the next two years. Preliminary data was collected as well. Further data will be collected each year, including also irrigation penetration and analysis of fruit rot and yield. Ultimately, this research will produce management methods adopted by cranberry growers that will improve fruit quality and sustainability.

## References and Acknowledgements

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