Feedback on Experimental Design

I like your approach, especially keeping all other things constant and only varying one thing (the type of light) in order to isolate the effect of your experimental treatments. I think the idea to test different types of light could be interesting.

Some things you may want to think about include how you’re framing your research question and your experimental design. For the question, since you are including sunlight as one of your experimental treatments, artificial light doesn’t really quite capture what you’re planning to do. The best science experiments that easily pass through peer review and get published are those in which the questions fit the experimental design and vice versa. Would you like to change your question to include sunlight? Or would you like to eliminate sunlight as a treatment? There are multiple reasons to think that they may respond well to sunlight as they do so in nature and sunlight has the full spectrum of visible light.

For the experimental design, what do you know about the different wavelengths of light emitted from each type of light? This might help to inform your predictions. Also, I like that you are measuring a number of different types of light but have you considered that one of your leaves might be a dud? In your current design, it might be impossible to know whether it’s the leaf or the treatment that is causing the outcome. I often incorporate replicates in my experiments so that I have multiple experimental units (usually 3 or more) subject to the same treatment. This way I have multiple data points for each treatment and can identify any outliers that may happen. How would you incorporate replication into your experimental design?

I look forward to seeing how your experiment progresses. I think you are well on your way to an interesting and successful experiment.