Researching the effects on Photosynthesis that are caused by the growth of a plant in space

My idea is to investigate how plants grow and undergo photosynthesis in space where there is no gravity and slightly more radiation. My idea will make it possible to see how the natural processes of plants, gets affected by the environment in space and how the growing conditions get affected. The code that I will create for Phase 2 will be able to measure the different aspects that a plant needs to photosynthesize like the amount of light due to possibly having to use artificial light and having to change to amount of light emitted from the light bulb because of the position of the sun and the amount of water because zero-gravity might make watering the plant a struggle.

I plan to have two identical experiments running simultaneously, with on in the ISS and one in the control centre so that they can compare results and see how the change in gravity effects the aspects like whether the change in gravity would mean that it’s not as humid as on earth and whether the soil dries out quicker. The idea is a environment controller that will allow the astronauts to see how humid the surrounding environment is, how moist the soil is, how healthy the plant is and how hot the environment is. The humidity sensor will tell the astronauts that it is not humidity isn’t correct for the optimum growing condition for the plant, the Pi NoIR camera will be used with the blue filter so that they can measure the amount of chlorophyll in the plant so that they know whether it’s healthy, the thermometer will be used to allow the astronauts to keep the heat the same as it is on earth, the light sensor will allow them to control the light level depending on the level on and the moister sensor will allow them to make sure that the plant is getting enough water.

The sensors that I will be using that are already in built into the Hardware Attached on Top (HAT) board, include the thermometer, humidity sensor and the Pi NoIR (with the blue filter). I will also use additional sensors that will use the GPIO pins that are on the HAT board. The additional sensors are light sensors and a moister sensor.

To test my idea I could test it on Earth by an avid gardener to set the control for my idea is how space effects the growth and the bare necessities like water and heat. I expect the results to differ slightly as with there being zero gravity I think it would be harder to water the plant and to keep the plant in the soil.