

Figures below represent progress made during 2021 for tomato powdery mildew control by using UV-C light



Fig. 1. A custom-built UV -C cart that can be driven in between tomato rows at a designated speed to have powdery mildew infected tomato plants exposed to UV-C for a pre-optimized time.



Fig. 2. Bench top humid chamber to keep tomato plants infected with PM and get new plants exposed to PM



Fig. 3. Optimization of UV-C exposure time that can effectively suppress powdery mildew with minimum phytotoxic effect; A) One minute exposure time that was found to cause severe phytotoxicity; B) 45 second exposure time that caused moderate phytotoxicity; C) 20 seconds exposure time that caused minor phytotoxicity but effectively controlled powdery mildew.

Methods: Potted plants were kept inside the humid chamber together with previously infected plants to facilitate spread of the disease to new plants. When symptoms were visible, plants were moved next to the UV-C cart (12" apart from the bulbs). Plants were separately exposed to UV-C by turning on and off the lights with a remote-controlled switch. After a day of UV-C exposure, plants were again moved to a different humid chamber to observe if the disease comes back or fungal infection in the tissue were completely killed by UV-C.

Results: We did not observe the diseases coming back, which is an indication that PM inoculum was completely killed by UV-C light. Plants that received 20 S exposure could also recover from minor phytotoxicity within 10 days of exposure.