

Greenhouse Environment Checklist

As the days are getting shorter, light levels are decreasing and it's getting colder outside, now is a great time to check your greenhouse environmental control systems and equipment. In particular, ensure systems that regulate the major environmental parameters that influence plant growth and development (light, temperature, air flow, humidity and carbon dioxide) are working well and positioned properly. A well-functioning environmental control system can reduce energy consumption as well as improve crop quality and uniformity, and possibly reduce production times.

Horizontal air flow (HAF) fans. Check all fans to ensure they operate when the vents are closed. They should also be positioned parallel to the growing surface (not pointed at a downward angle) so that they primarily blow air above the crop, not toward the crop.

HAF fans mix the air, creating a more uniform thermal environment. In addition, they can bring some of the warmer air at the top of the greenhouse down to where the plants are growing.

Photoperiodic lighting. All bulbs should be functional. If you have incandescent or compact fluorescence bulbs, consider replacing them with more energy-efficient LEDs. Most types of LEDs can be used to inhibit flowering of short-day plants. However, under low-light conditions, bulbs that emit both red and far-red light more effectively promote flowering than conventional white bulbs.

Supplemental lighting. High-intensity lighting is expensive to purchase and operate and thus, it's wise to ensure the system is performing well. Most greenhouse growers still use high-pressure sodium (HPS) fixtures, which require more maintenance than newer, more energy-efficient LEDs (Figure 1). First, repair or replace inoperable or dim fixtures. Old bulbs

often begin by turning on and off. If replacing a bulb does not solve the problem, the fixture needs to be taken down and repaired. The problem can be a partially or completely failed capacitor, or less likely, a failed ignitor. For more information on repairing HPS fixtures, visit <https://bit.ly/2zh7aYM>. For information on maximizing the benefits of supplemental lighting, visit <https://bit.ly/30uaewN>.

Maximize light transmission. If you applied whitewash, ensure it has all been removed. Also, remove any unnecessary overhead obstructions that cast shade on plants below.

Energy curtains. If you have retractable energy (or shade) curtains, check their condition and repair or replace as needed. To maximize their value, the curtains should close tightly so the

warm greenhouse air is trapped inside the growing area.

Heating system. Clean and check all of your heaters to make sure they are operating efficiently. Clean the heat exchanger and look for any cracks that could allow contaminants (such as ethylene) into the greenhouse. Also, be sure the exhaust vents are unobstructed and release air sufficiently outside the greenhouse.

Temperature sensors. These sensors should be shielded and aspirated, and located near the middle of the greenhouse and as close to the crop canopy as possible.

Check each temperature sensor to ensure it is connected, clean and properly positioned.

Greenhouse insulation. Reduce air leaks, which includes patching or sealing gaps in the glazing material, and ensuring fan louvers and doors fully close. Growers with double poly should check all of the small fans that inflate the two layers to confirm they are working.

Misters. Growers who deliver mist during propagation should check that the misting/fogging nozzles are not clogged. Repair or replace as needed so that the mist is uniformly distributed to plants below. [gpn](https://www.gpn.com)



Erik Runkle is professor and floriculture extension specialist in the department of horticulture at Michigan State University. He can be reached at runkleer@msu.edu.



Figure 1. High-pressure sodium fixtures need periodic maintenance to achieve peak performance.