

# Greenhouse Lighting

Think of your light fixtures as a car. When you get a new car it gives you the best performance possible. But as you drive that car and put miles on it, you have to do some maintenance to keep it running smoothly and give you the best efficiency. The same is true with light fixtures. This article is about more light and less energy.



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## More light, less energy

As you put hours on your fixtures and bulbs they start to wear down. Bulbs start to fade in output, capacitors start to get weaker and after a few years you're not getting the performance you used to. Sure, some growers keep a re-lamping schedule, but some wait until the bulbs get dim and then wonder why the plants aren't growing like they used to. There are a few things that you can do to ensure your plants get the optimal light from your fixtures. One good example would be checking if the voltages specified for the fixture is what is actually wired in the greenhouse. Look also for the PAR rating of the bulb, test your reflectors and replace the capacitor every three bulb changes.

### Bulbs

Some companies try to save money and buy cheap bulbs for the greenhouse. Remember you get what you pay for. Most light fixtures are manufactured to run efficiently with certain components. Changing the bulb may affect this efficiency. The first thing to look for is the PAR rating of the bulb. The more PAR (photosynthetic active radiation) the bulb puts out the more your plants will respond to it. Buy a PAR meter and learn to use it. While two bulbs may put out the same foot-candles or lux, they can dramatically differ

in PAR outputs. Remember most light meters read what people see. You need a PAR or quantum meter to read the Micromoles of PAR from the bulb.

On that note, you should be changing your HPS bulbs at roughly 10,000 hours. Always remember you should be wearing cotton gloves before you touch a new bulb. 10,000 hours is when most HPS bulbs start to lose more than 10% of their output. A 10% PAR loss means a loss of 10% growth from your supplemental light.

Metal halide, while used in some instances (growth chambers, low natural light areas) deprecate in output much quicker than HPS. These are changed at roughly 8,000 hours. To find out your bulbs loss, use this simple trick..... Buy a new bulb and install it in the fixture. Burn it in for 100 hours to stabilize the gases in the bulb. Now take a reading at night at a set distance from the bulb. Record the reading. Now put your old bulb back in and take a reading. Now calculate the percentage of difference between the two readings. Remember if you're at 30% loss you're still using the same amount of energy. The plants are just going to grow slower.

### Reflectors

Now that you have good bulbs you need to look at your reflectors. Are they dirty? Do they have

calcium spots from water residue or pesticide residue? If your reflector is at a 20% loss of reflectivity, you're losing light and efficiency. Up to 60% of the light needs to be caught by the reflector and directed back toward the plants. Have your reflectors tested every 3-5 years and give them a cleaning every 2-4 years depending on conditions.

You will need to replace your reflectors if upon inspection you find they are bent, have dings or major scratches. In general, anything that reduces the reflect ability. To clean your reflector you should make up a 1:100 vinegar / water solution. Dip the reflector in this solution for a few seconds (depending on condition of reflector) and if necessary rub lightly with a fine nail brush to loosen the dirt. DO NOT SCRATCH FINISH! Once the dirt is loosened, you can then dip the reflector in plain water to rinse. The last step is to rinse once more in distilled water and let dry. The distilled water will eliminate any calcium or water impurities from drying on the reflector. If you find that there are still heavy deposits are will not wash off it may also be a sign that it is time to replace. If the reflector is clean and dry hang it back up and your ready to go!

### Capacitors

Most people complain about capacitor issues. Did you know the