Polyethylene greenhouse covering

Do you need diffusion?

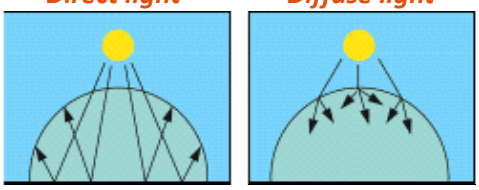
— by GHL —

You have questions on greenhouse covering, there are answers.

Spreading light

Do you suffer from confusion when it comes to diffusion? Is it a type of nuclear energy, like fusion? Will it mutate your greenhouse crop, making it glow in the dark? Will you grow a third eye?! No! Diffusion is your friend! Diffusion is a term used to describe the scattering of light. There is direct light, and scattered, or diffused light. Direct light comes directly from the source, in a straight line. If you go outside on a bright sunny day you will see shadows. Those shadows are sharp and crisp. Hold out your hand; you should see a pretty sharp shadow of your hand outline on the pavement. This is direct light. It is coming directly from the sun above, coming almost entirely in a straight line. However, on a cloudy day, that same shadow of your hand will start to blur and get fuzzy. It may be there, but it will be harder to see. That's because the clouds are acting as a filter, breaking up the light particles and scattering them about at different angles and directions. Light is coming at your hand from many different angles, not all directly from overhead.

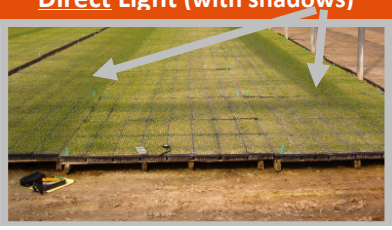
Direct light ***Diffuse light***

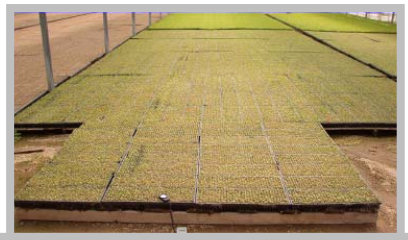


What does this have to do with growing plants?

Studies have shown that plants can have a 20 to 30 percent increase in growth rates with diffused light when compared to plants grown under clear plastic that has a small percentage of diffused light. Why does this happen? How can a plant with less light be more photosynthetically efficient? Because diffused light is able to penetrate beneath the foliage canopy on top of the plant and get down to the lower leaves. It is able to penetrate outer leaves and get light to leaves that don't normally receive much light. This allows more leaves on the plant to be photosynthetically active, turning that light into food, and growing.

Direct Light (with shadows)





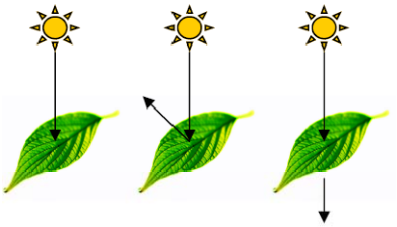
Diffuse light

Reactions to light

When light hits a surface it can be ***absorbed***, ***reflected*** or ***transmitted***. As anybody knows a car with black interior absorbs more light (and heat!) than a white car. A black shade cloth absorbs light/heat. An aluminum shade curtain reflects light/heat. An untreated glass panel transmits light/heat.

Plant reactions to light

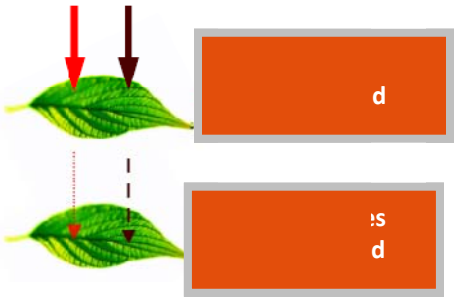
A plant leaf ***absorbs*** some light, using photosynthesis. The wavelenghts that are most absorbed are blue and red, which are the main wavelenghts used in photosynthesis. It ***reflects*** some light, particularly the green wavelengths. Some of the light passes through the leaf – it is ***transmitted*** to the lower leaves.



Red to Far-Red Ratio

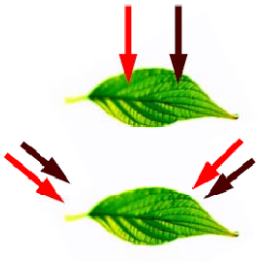
When light first hits the upper canopy, the ratio of red and far red is about even. The leaf absorbs and uses much of the red light in photosynthesis. It doesn't use as much of the far red and transmits it on through, to the lower leaves. The lower leaves receive both red and far red, however the ratio has now changed, with much more far red and less red. The plant senses it is being crowded out by other plants and **stretches** out seeking better light. It wants that 1:1 ratio again! Internode lenghts get longer, the plant gets leggy. Stretchning produces a poor looking plant and facilitates the need to apply more growth regulators, and more labor hours spent on pruning. Have you ever seen "mounding" in a greenhouse, where the edges of a bench are shorter than the middle? The edges are getting light from the sides, getting red and far-red in even amounts. The middle plants don't get as much light from the side, only from above. That's why they're

stretching higher in the middle, or mounding!



Diffusion

Now, imagine the light coming from many angles, not just overhead. The lower leaves would receive more red light this way, and the response of the plant is to grow more efficiently. The plant can create more biomass, more leaves, with the same light level, because it's better able to utilize the light that's coming in. The plant will grow fuller, more compact, and tighter. Less pruning and growth regulators are needed. It's as if you are spoon feeding light to lower leaves.



Temperature with direct light

A greenhouse with a lot of direct light will have "hot" spots where the radiation levels are stronger than others. A black nursery container can be as much as 20°F hotter in direct light versus diffused light. Media temperatures become uneven. This causes uneven drying and makes even watering more difficult. Surface temperatures heat up faster under direct light, and heat up more, then cool down more at night. These spikes in temperature create more stress on your crop and can also favor humidity and disease problems. Also during a bright day upper canopy leaves usually have more light than they can use, reaching a saturation point, and then they transpire the rest of the day, consuming energy that could be used for growth. Meanwhile, the lower leaves don't get enough light.

The use of an IR or thermal thermometer is recommended to measure surface temperature like leaves.

Temperature with diffuse light

With diffused light rapid fluctuations in temperatures are evened out. On hotter days canopy leaves tend to stay cooler, making photosynthesis rates better. Leaf surface, container, and soil temperatures will be cooler under diffused poly films when compared with standard clear films. This creates less stress on plants and their root systems, and reduces some humidity and disease problems.

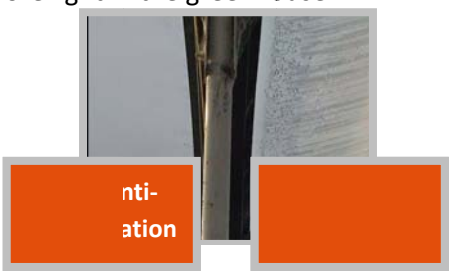
What other characteristics does KLERK'S poly have?

In addition to diffusion, plastic coverings can have other characteristics to be used on greenhouses. KLERK'S makes poly with the following characteristics: anti-condensate effect, thermal effect that retains infrared wavelengths to save heating costs, UV stabilisation for longe life (4years warranties for 6mil thick poly) and extra smooth film surfaces to avoid dust.

Anti-condensate effect (AC)

Today, many greenhouse producers install a plastic with an anti-condensate additive on the inner layer.

Condensation drops are blocking a part of the (PAR) light (up to 15%) and can also damage the plants. By adding special additives, the condensation on the film will form a thin water layer that is drained off to the side of the greenhouse/tunnel. Result: more light in the greenhouse.



Thermical effect (IR)

The addition of mineral fillers or co-polymers like EVA reduce longwave infra-red radiation (heat) leaving the greenhouse. The thermical (IR) film retains a part of escaping wavelengths that radiate from inside the greenhouse surfaces during the night. Slower cooling under thermic films keeps heating costs down.

GHL poly booking

For a 7th year, GHL offers you ''booking-prices'' on KLERK'S greenhouse coverings. You can benefit by pre-booking and take advantage of group pricing on KLERK'S poly products. Confirm your order by May 14th and take delivery at the end of June or the end of August. Contact your representative today for a no obligation quote.

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