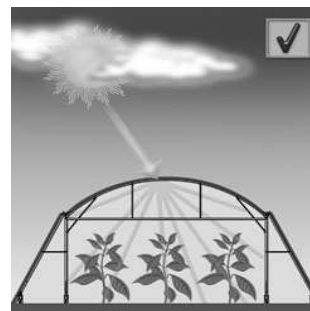




## Application/ Features & Additives/ Light Diffusion

### Diffused Light And The Plant As A Machine Which Transforms CO<sub>2</sub> And Water Into Dry Matter

What is the benefit to the plants in the greenhouse of diffusing the visible light which penetrates the



structure?

The answer lies in the basic structure of most plants, growing upward on a stem, or stalk or trunk, with branches growing out of the upright centerpiece in such a manner so as to face and absorb as much as possible of the available flux of visible, photosynthetic radiation. We must bear in mind that the leaf is the basic unit of production, the place where the conversion of water plus CO<sub>2</sub> into glucose takes place.

As a consequence of this growth behavior, with all the branch lets racing to compete for a "place in the sun", the central space of the plant volume sooner or later gets "shaded out" by the outer canopy and becomes non-functional. Whatever becomes non-functional is doomed to be discarded by the plant through the formation of an abscission layer which leads to the shedding of the (useless) leaf. The way in which we help the grower diminish this gradual closing down of so many work units (leaves) in order to increase the photosynthetic working surface of the plant, is to provide some manner of getting the visible radiation to penetrate into the plant interior. This is accomplished by facilitating the diffusing of the light passing through the greenhouse cover.

Diffused light is light whose angle of entry through the cover is changed, usually by the use of specific (mineral) additives which diffract the light as it goes through the plastic. The diffused portion of the light will largely bounce off the objects in the greenhouse and some of it will make its way into the central, shaded portions of the plant.

Diffusing the light in this manner with the use of mineral additives will invariably bring about a slight reduction of the total transparency of the film cover. Some of the light, especially in the early morning and late afternoon, impinges on the cover at very acute angles. If these rays encounter a light diffusing mineral molecule, they are liable to be diffracted at an angle which will take them out of the greenhouse and into space.

However, the global effect of light diffusion is almost always beneficial, in terms of increased photosynthesis and the reduction of the heat load in the greenhouse.