From Forest Nursery Notes, Winter 2013

128. Diffusion: how high-diffusion coverings can make a difference in your greenhouse.

Syngenta uses 8mm SoftLite covering for its Goldsmith Seeds production.

By Laura Allen

Diffusion

How high-diffusion coverings can make a difference in your greenhouse

Forty years ago, something happened in Europe that changed the greenhouse industry.

In 1972, according to Jim Ralles, a rep for AmeriLux International LLC, tomato growers in Spain asked manufacturers to create a diffused film for their field hoop houses, hoping that the film would give the tomatoes a faster and fuller growth coming out of winter when the light levels were lower.

So they did, and it worked. And although the IR (infrared) film made its way to the states in 1984, 40 years after its invention high diffusion is now the trend in greenhouse coverings.

Understand the benefits of high diffusion

Historically, the common choice for coverings was clear film, branching from an old industry motto that came from the Dutch: 1 percent par transmission is 1 percent production.

"But people are finding out that the distribution of energy has great benefits," says Ralles. "The distribution has benefits that can often outweigh the percent of transmission."

The trend isn't just localized, either. Ralles says that the benefits of using high or 100 percent polycarbonate diffused covering is being

Photos courtesy of AmeriLux

32(5): 28-29

Key Points

1. Quantity, quality, distribution and duration are four things a greenhouse grower needs to consider when choosing a greenhouse covering

2. Today's high-diffusion coverings offer minimal quantity reduction, unlike older versions

3. High-diffusion should not be used for vegetable transplants

No shadows present in the greenhouse show that high-diffusion coverings evenly disperse light.

realized worldwide by growers.

"Clear film is becoming an antique," he says.

So what are the benefits of high-diffusion coverings? The first is you're spreading more light to more leaves. You're also putting less stress on any one leaf and enabling the plant to tolerate higher quantities of energy.

"The leaves stop eating the sun at 82°F," says Ralles. "Diffusion … keeps the plant eating the sun longer into the day."

Polycarbonate coverings with 100 percent diffusion are made for both corrugated and twin wall, so if you're looking for a thermal value and energy savings, twin wall would be your best option.

Coverings are not the only option for light diffusion. Like the tomato growers in Spain, you could use IR polyethylene film, which also slows down the loss of re-radiation. But now non-IR film is being made that still offers high diffusion.

There is one group of growers who should avoid high-diffusion coverings. Vegetable transplant growers need to stick to clear film, or else they might find their crops have gone into shock after they've been transplanted into the direct sun. But other than vegetable transplants, every other greenhouse crop should be fine with a high-diffusion covering.

Consider light quantity

Perhaps the reason high-diffusion coverings are just now becoming popular is because they've caused problems in terms of light quantity.

"The development of these super-fine, micro-fine particles that will diffuse the light with minimal reduction and quantity, that's the deal," Ralles says. "The big mineral filters that they used back then in the 70s, and that we've been using for quite some time, are so big that they, besides diffusing, also tend to reduce quantity."

Ralles says recent discoveries have resulted in ways of having a film with 100 percent diffusion with extremely minimal quantity reduction. For example, AmeriLux has a polycarbonate covering that provides 100 percent diffusion with 89 percent light transmission, whereas its clear, polycarbonate twin wall has 91 percent light transmission. The difference is only 2 percent.

"The reason we can do that is that you're working with thin little layers," he says.

But what about corrugated? Since corrugated coverings only have one layer to work with, the light transmission goes from 90 percent to 85 percent.

"But still, the better distribution offsets the quantity reduction," he says.

Choose the right covering

Ralles can sum up the factors to consider in selecting the proper covering in four words: quantity, quality, distribution and duration.

"Those are the things growers need to consider when they're picking a roof," he says.

Ralles understands that the options for greenhouse coverings can be numerous when you try to factor in everything.

"Things aren't just black and white," he says. "You can combine things and come up with a formula for success by combining one quality with another.

"Growers who are successful are making intelligent decisions based on value and not price," he says.

In short: Assess your greenhouse and see if a high-diffusion covering could play a significant role in your production. GM