

Shading



The February peak sales season for roses runs parallel with the pre-planning period for those growers who choose to use temporary shading paints for better air temperature management in late spring and summer. In tropical environments, the shading procedure may be a useful application all year round.

Reflection of short wave infrared

Photo-selective shading paints have become commercially available in recent years. They have been engineered to improve light transmission while maintaining the original advantage of “whitewashing”, which is primarily a reduction in the heat load entering greenhouses during high solar radiation seasons. With its headquarters in France, Sudlac is one of the companies active in the development of quality paints for horticultural use. Their experience in the field reveals some misconceptions about photo-selective paints, one of which is a common belief that the greenhouse temperature cannot be reduced with higher light transmittance. Since the

price attached to the more sophisticated shading products is two to three times more than white shading, growers can be doubly wary of trialling the relatively new product. Observations, however, in nurseries and by clients do reveal promising results. But first, what exactly is the difference between white shading and the photo-selective transparent paint, developed in this case by Sudlac? Olivier Berthelier from Sudlac says, “The properties of the two paints differ significantly. The use of a white application on the exterior cover of greenhouses, whether it is glass, polyethylene film or polycarbonate panel, limits the

solar radiation transmission across all wavelengths. The transparent paint (TransPAR) provides a differential reflection of the short wave infrared energy. The wavelengths in the photosynthetically active radiation (PAR) range, which drive plant growth, still enter the greenhouse. Depending on the targeted temperature reduction, with possibilities of 4 to 6°C, the dilution rate can be modified accordingly to give a PAR transmittance averaging 70 to 85%, respectively.” The controlled transmittance of the PAR range is made doubly interesting due to the fact that, similar to whitening, the transparent paint increases the fraction of diffused irradiance within the greenhouse. This is

by Anabel Evans



Photo-selective shading paints are an advance on the original whitening products, diffusing the incoming light with less reduction of the PAR range transmission values.

known to enhance the efficiency of plant radiation-use because a more uniform light interception over the plant canopy is achieved; there is a trend to study the potential of diffused light in protected horticultural crops. At a dilution rate of one part photo-selective paint to four parts water (equivalent to 350 kg/ha), the percentage of diffused light is 56%; a stronger dilution of 1:3 (450 kg/ha) will allow 69% diffused light (these diffusion levels are among the specificities of TransPAR).

Observations and consequences

The earlier reference to observations in the field reveal that the PAR transmittance of the transparent paint gives, on average, a seasonal production improvement of at least one rose stem per square metre. Translated into nursery economics and using Kenya as an example, the photo-selective production can therefore represent a minimum improvement of 60 to 80 eurocents/m², according to Olivier Berthelier.

“Much more than the price of the paint!” he adds. The field observations of crops grown under the transparent covering indicate benefits that go beyond yield, namely better control over pests and diseases, enhanced plant microclimates and the improved presentation quality of harvested roses. Olivier says, “As well as preventing scorching, the leaves are generally thicker with a darker green colour while the flower buds are heavier and more robust. In Kenya it is suggested that the shelf life of the roses are probably improved. The positive effects on the microclimate relate to reducing temperature and air vapour pressure deficit (VPD); one of the potential consequences of low air moisture relative to the leaf surface (or high VPD) is plant wilting, desiccation and injury. The effect on pests and diseases is an aspect currently being observed; suffice to say we notice there is a decrease in the attacks by powdery mildew and spider mites, among other crop enemies.” Finally, roses remain the main ornamental crop where photo-selective shading is used. Olivier adds, “This is due to the fact that we are only at the starting point of the developments with this product, which year by year reveals its advantages.” Gerbera growers are a secondary group that is becoming increasingly familiar with the product. The company’s new export manager, Jorien Schouten, adds, “The potential for TransPAR actually extends to all cut flowers with a high light demand (e.g. alstroemeria).” Schouten joined Sudlac in mid-2008 and apart from the cut flower sector is also involved in market developments surrounding pot and bedding plants. Scientific trials at the technical horticultural station, STEPP Bretagne, provide evidence of the production of more compact plants due to the shortening of the internodes, the plants response to the reduction in the amount of infrared light relative to red light under the photo-selective shading. The production advantages extending, therefore, to a potential moderation in the use of plant growth regulators and a presentation of compact plants for both transport and retail shelf-space efficiencies. |||

by Hans de Vries

Dust

Pay attention!

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Hans de Vries is a grower in Kudelstraat, the Netherlands.
hans@jdevries.nl
www.jdevries.nl

