Finish Time. The 3.8-liter (1-gal) containerized plants are saleable or ready for shifting up to larger containers at 15 months from potting.

Production of 11.3-liter (3-gal) Containerized Plants. Each year a portion of the finished 1-gal crop is set aside for 11.3-liter (3-gal) production. We have found October to be an ideal time of year for canning-up one into 3 gal. Once again, plants are potted-up using a carrousel, and then transported to greenhouses for growing on. The same overwintering and production techniques used to produce healthy 1-gal camellias are followed for 3-gal production. However, fertilizer rates during top dressing are obviously different (45 g). When spaced, the 3 gal are placed on 48-cm (18-inch) centers. We consider mid-May to be the cut off date without adversely affecting flower bud set. A very light final pruning is performed in the fall only the longest shoots in order to maintain flower bud set. At 39 months from sticking, 11.3-liter (3-gal) *C. sasanqua* begin their show of autumn blooms and are saleable. The *C. japonica* cultivars are also saleable at this time but usually don't sell until the following spring.

Propagating Under Different Plastics and Shading Materials©

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The color of the shade material applied to greenhouse plastic influences rates of rooting as well as disease incidence. This reaction is governed by plant species as well as shade color. Some of the greatest potential for enhanced plant response may be in the area of pathogen control.

INTRODUCTION

A great variety of shading methods have been used in the nursery trade, from tall pines or lathe houses to spray on shade compounds and shade cloths. Available now are poly films with shading compounds incorporated during manufacturing. We have used two types of shaded poly film, one a white film rated at 55% shade and the other a gray aluminized (reflective) film rated at 40% shade. Whereas plant growth under the gray film was what would be expected for light shade, plant response under the white film raised many questions. The possibility of a shift in light quality under this film was raised when it was noticed that the sun viewed at midday was orange in color. Cuttings of Azaleas or *Rhaphiolepsis* did poorly, while cuttings of *Ilex decidua*, *Rosa banksiae*, and *Hydrangea macrophylla* did better than under conventional shade.

Since light used by plants for photosynthesis is in the 400 to 700 nm portion of the light spectrum, by shading to reduce light intensity portions of the desirable (and undesirable) light quality could be altered with the colored poly films or shading compounds utilized. As the proportions of light change with selective shading one would expect to see altered plant responses. From the perspective of the commercial

plant propagator, the desired response would be an enhanced rate of rooting and minimized plant stress and disease.

MATERIALS AND METHODS

Seven cultivars were evaluated:

- *Ilex crenata* 'Bennett's Compacta'
- *Lagerstroemia*'Natchez'
- *Ulmus parvifolia* 'Emerald Vase' Allee™ PP7552 Chinese elm
- *Clethra alnifolia* 'Ruby Spice'
- *Rhaphiolepsis indica* 'Clara'
- Azalea (*Rhododendron* sp.) 'Fashion'
- *Rosa* 'Nearly Wild'

Five shades were evaluated:

1) White shade 40% — 4 parts white latex paint + 16 parts water
2) Blue shade 40% — 3 parts white latex paint + one part cobalt blue acrylic paint + 16 parts water
3) Pink shade 40% — 3 parts white latex paint + one part red acrylic paint + 16 parts water
4) Orange shade 40% — 3 parts white latex paint + bright orange acrylic paint + 16 parts water
5) White plastic film 55% — (commercial)

Each film was mounted on a frame 1.7 m × 3 m (5.5 ft ×10 ft) orientated east to west with a 15° southward inclination. Height of the frame was 1.5 m (5 ft). Compounds for treatments Numbers 1 to 4 were sprayed directly onto the film surface using a small pump-up sprayer. Material was sprayed to give a "speckled" effect, short of runoff. Light intensity was measured in foot-candles with a phytotmetric light meter then compared to reading in the open. Treatment #5 was mounted directly to the frame without alteration.

RESULTS

See Table 1 for the results.

DISCUSSION

With the positive performance of the colored shade compounds, further research is needed. In rooting response the blue consistently was in the higher rankings, with the poorest response using conventional, commercial white plastic. However, with *R.* 'Nearly Wild' there was little difference among the white plastic and shading materials.

An unexpected response was the apparent disease suppression under blue shade. This was consistent throughout all taxa and was quite evident based on appearance of both foliage and stems.

The increased rooting under all colored films when compared to the white shade was unexpected with the broad range of light spectrum represented. Further tests using these treated films are planned to gain a more complete understanding of the effects of selective shading of greenhouse films.

Table 1. The effect of shading on rooting and disease incidence of selected cuttings.

	Rooting (%)	Roots (no.)	Root diameter (inch)	Root length (inch)	Diseased (%)	Dead (%)
***Ilex Crenata* 'Bennett'sCompacta'**						
White shade	100	12	—	1.3	10	0
Blue shade	100	16	—	1.3	3	0
Pink shade	100	15	—	1.3	0	0
Orange shade	100	9	—	1.0	7	0
White plastic	100	9	—	0.8	20	0
***Lagerstroemia* 'Natchez'**						
White shade	100	11	—	3.0	0	0
Blue shade	100	15	—	5.0	0	0
Pink shade	100	11	—	4.5	0	0
Orange shade	100	12	—	5.3	0	0
White plastic	100	7	—	3.0	0	0
***Ulmus parvifolia* 'Enerald Vase' Allee™ PP7552 Chinese elm**						
White shade	70	3	—	0.3	0	0
Blue shade	100	4	—	1.0	0	0
Pink shade	83	6	—	1.0	0	0
Orange shade	100	5	—	1.3	0	0
White plastic	40	4	—	0.5	0	60
***Clethra alnifolia* 'Ruby Spice'**						
White shade	100	28	—	1.8	7	0
Blue shade	100	40	—	2.5	0	0
Pink shade	100	27	—	1.8	3	0
Orange shade	100	41	—	2.3	0	0
White plastic	100	18	—	1.3	60	60
***Rhaphiolepsis indica* 'Clara'**						
White shade	100	11	—	2.3	23	0
Blue shade	100	9	—	1.8	0	0
Pink shade	100	16	—	2.0	43	0
Orange shade	97	7	—	1.5	10	0
White plastic	67	6	—	1.0	30	33

	Rooting (%)	Roots (no.)	Root diameter (inch)	Root length (inch)	Diseased (%)	Dead (%)
Azalea 'Fashion'						
White shade	100	—	0.60	—	0	0
Blue shade	100	—	0.75	—	0	0
Pink shade	100	—	0.50	—	0	0
Orange shade	100	—	0.50	—	0	0
White plastic	100	—	0.30	—	0	0
***Rosa floribunda* 'Nearly Wild'**						
White shade	83	17	—	1.5	10	0
Blue shade	80	16	—	1.3	0	0
Pink shade	73	13	—	1.0	17	0
Orange shade	90	19	—	1.3	3	0
White plastic	83	18	—	1.5	7	0
AVERAGE OF ALL TREATMENTS						
White shade	93.3	13.0	—	—	13	0
Blue shade	95.6	16.8	—	—	1	0
Pink shade	93.7	15.0	—	—	16	0
Orange shade	98.1	14.8	—	—	5	0
White plastic	84.3	8.8	—	—	29	21.9