RESEARCH REPORT

PERLITE AND POLYSTYRENE GROWING MEDIA

PERLITE
PLANT GUIDE

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COMPARATIVE GROWTH STUDIES PERLITE VS. POLYSTYRENE MEDIA

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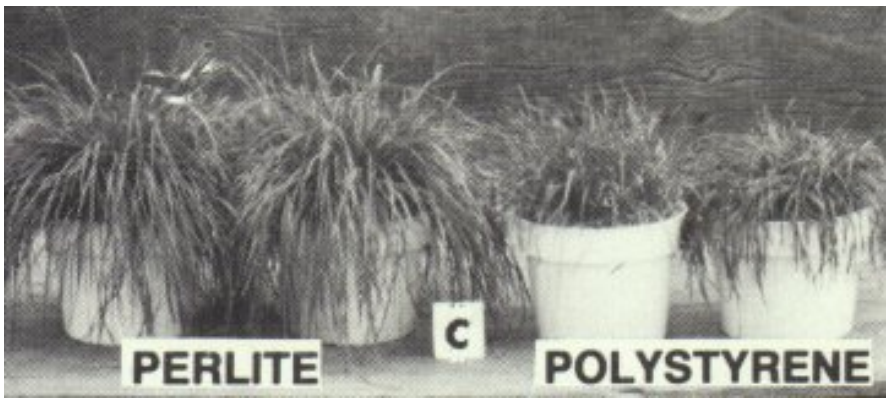
Previous measurements of physical properties of growing media comparing perlite with polystyrene beads have indicated higher density and moisture retention when perlite is used in the growing media. Since high moisture holding capacity combined with adequate aeration is an important asset in container production of plants, trials were carried out comparing ryegrass growth in mixes of watering schedules. Composition of the two amendment mixes is shown in Table 1.



Photograph comparing rygrass grown in perlite mix on left and polystyrene bead mix on right. Perlite mix C and polystyrene bead mix C were watered every three days beginning with the second week after seeding.

Table 1 Composition of Growing Media

Perlite Media	Polystyrene Media
0.5 cu. Yds. Perlite 0.5 cu. Yds. Sphagnum peat moss 5 lbs. Calcium carbonate lime 3 lbs. Dolomite lime	0.5 cu. Yds. Perlite 0.5 cu. Yds. Sphagnum peat moss 5 lbs. Calcium carbonate lime 3 lbs. Dolomite lime

Watering Schedule Varied

Containers used in growth trials were 6 inch plastic pots, 20 for each mix, 1400 milliliters of mix per pot. All pots were seeded to perennial ryegrass at the same time and maintained moist for 1 week at which time uniform germination had occurred. Beginning with the second week, the watering schedule was varied according to the schedule shown in Table 2.

The water that was supplied contained a balanced soluble nutrient and was supplied to each pot in the amount of 500 milliliters per pot at each scheduled irrigation. The excess liquid from each pot was collected and returned to the pot and drainage water was again collected, volume measured and recorded before discarding.

Table 2 Watering Schedule	
Perlite A Polystyrene A	Every Day
Perlite B Polystyrene B	Every 2 Days
Perlite C Polystyrene C	Every 3 Days
Perlite D Polystyrene D	Every 4 Days

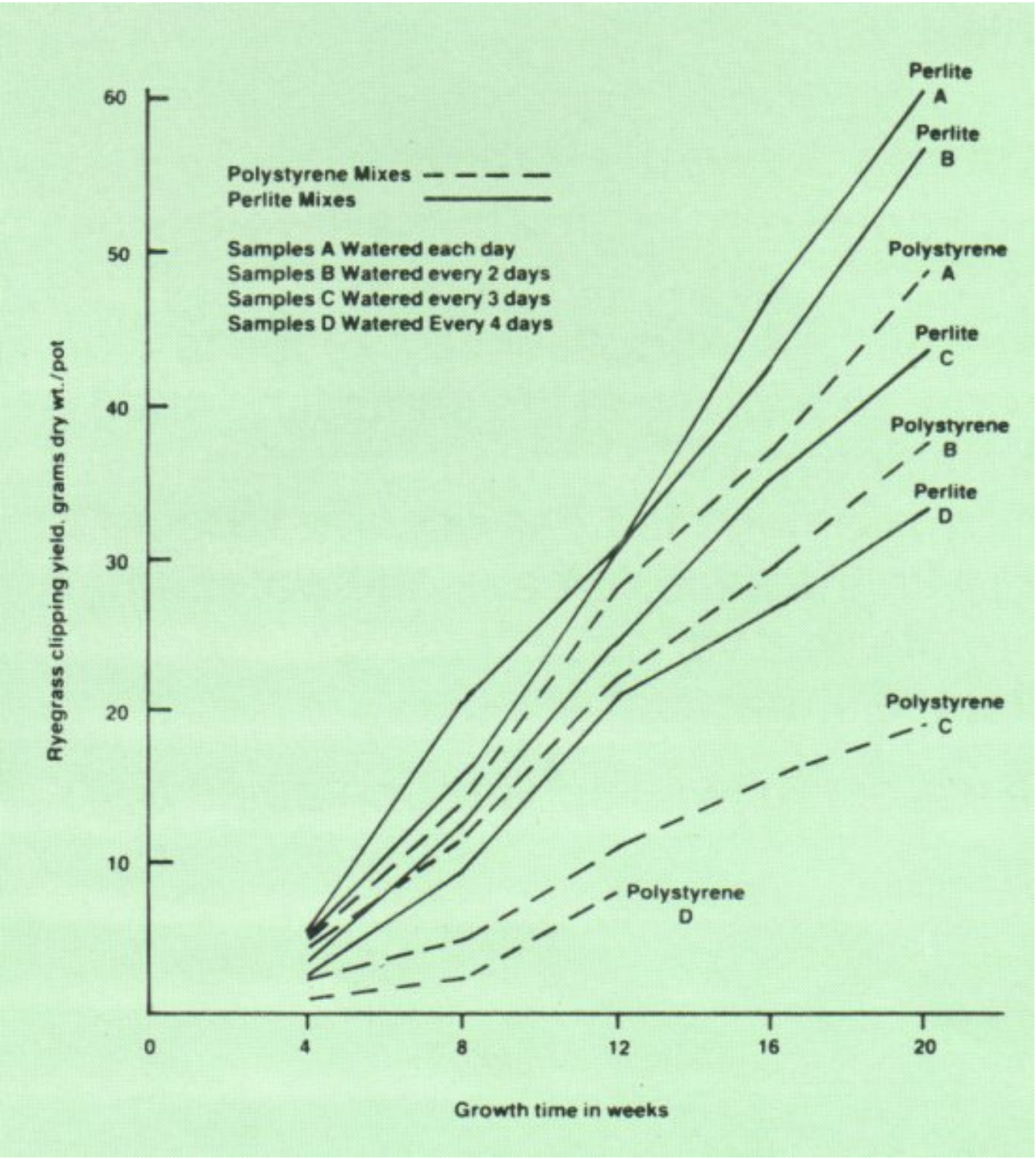
"...SAMPLES PLANTED IN POLYSTYRENE BEAD MIX AND WATERED ONCE EVERY 4 DAYS FAILED TO PRODUCE ADDITIONAL GROWTH AFTER 12 WEEKS."

Clippings Weighed

The use of ryegrass as the test crop permitted successive harvests at which time clippings were dried and weighed. Harvests were made at 4, 8, 12, 16 and 20 weeks

The maximum volume of water retained after drainage was determined to be 583 milliliters for the peat/perlite mix and 383 milliliters for the peat/polystyrene bead mix (1400 milliliters volume of mix).

During the course of the growth trials, some unusually high temperatures occurred in the greenhouses which placed severe stress on crops under the limited irrigation regime. The five ryegrass samples planted in a polystyrene bead mix and watered once every 4 days failed to produce additional growth after 12 weeks.



Accumulative yield of clippings of ryegrass grown in perlite media and polystyrene media at four different irrigation schedules.

Results

Growth, as measured by quantity of clipping yield (see curve), was best in most frequently water samples. Visual inspection confirmed parallel root development. The order of growth rating from highest to lowest was: Perlite A, Perlite B, Polystyrene A, Perlite C, Polystyrene B, Perlite D, Polystyrene C,

Polystyrene D.

"PERLITE CONTRIBUTES TO MOISTURE SUPPLY OF THE MEDIA TO A GREATER DEGREE THAN POLYSTYRENE BEADS."

Moisture utilization followed the same pattern that was noted for growth. Rating from highest moisture utilization to lowest was: Perlite A, Polystyrene A, Perlite B, Perlite C, Polystyrene D. Differences between Polystyrene A and Perlite B were minimal. Thus, irrigation every other day in the perlite mix was equivalent to irrigation every day in the polystyrene mix, and irrigation every 3 days in the perlite mix was equivalent to irrigation every 2 days in the polystyrene mix.

"POLYSTYRENE BEADS ARE INFERIOR TO PERLITE AS AN ADDITIVE IN GROWING MEDIA."

Conclusions

Growth and water use as measured in this set of studies confirm previous physical measurements of mixes prepared with perlite and polystyrene beads. Perlite contributes to moisture supply of the media to a greater degree than polystyrene beads. For some reason, growth was superior in Perlite B compared to Perlite A, both of which were provided about the same amount of moisture. Apparently, some other restricting factor in the polystyrene bead mix limited growth. Under conditions of high stress (irrigation every third or fourth day), perlite media out-performed polystyrene bead media.

From a cultural standpoint, polystyrene beads are inferior to perlite as an additive in growing media.