CORRELATION OF VISUAL RATINGS WITH QUANTITATIVE MEASUREMENTS OF
WEED CONTROL DURING CONTAINERIZED LANDSCAPE PLANT PRODUCTION

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Abstract. A herbicide experiment consisting of 19 treatments replicated five times was established at a commercial containerized landscape plant nursery. Thirty-four growers visually rated the plots for total weed coverage on a scale from 1 (best, no weeds) to 5 (worst, 100% weed coverage) and three researchers visually estimated weed coverage percentages on a species basis. Following visual evaluations, plots were weeded and dry weed weights determined. Comparison of grower ratings and weed dry weights using rank correlation (Spearman, \( r_s \)) yielded highly significant \( r_s \) values of 0.80 to 0.92 for the five replications and 0.88 for all plots. Product-moment correlation (Pearson, \( r_r \)) of researcher weed coverage estimates and dry weed weights were also highly correlated for all replications \( (r = 0.81 \text{ to } 0.90) \) and overall \( (r = 0.84) \). These results indicate that visual ratings of weed coverage can be a good indication of relative weed biomass.

The use of visual ratings of weed control by researchers is a common practice in herbicide experiments. Growers are sometimes asked to view these herbicide experiments at field days, but are not often asked to formally rate the plots. The purpose of this study was to determine how well visual ratings by researchers and growers would correlate with quantitative measurements of weed suppression.

Materials and Methods

A randomized complete block herbicide experiment with five replications was set up at a commercial containerized landscape plant nursery to compare experimental herbicides with herbicides already being used commercially. Treatments used in this study included an untreated control and 18 herbicide treatments applied at 3-4 month intervals. There were 12 4-liter containers in each 0.8 m X 0.9 m plot. Crops growing in the containers included Buxus microphylla japonica (Müll. Arg.) Rehd. & E. H. Wils. [Japanese boxwood], Chamaerops humilis L. [European fan palm], Cupressocyparis leylandii (A. B. Jacks. & Dallim.) Dallim. & A. B. Jacks. [lyeald cypress], Hemerocallis hybrid ‘Wilson’s Yellow’ [daylily], Ilex hybrid ‘East Palatka’ [holly], Juniperus chinensis L. ‘Nick’s Compacta’ [juniper], Liriope muscari (Decne.) L. H. Bailey ‘Evergreen Giant’ [giant lilyturf], Pinus palustris Mill. [longleaf pine], Pittosporum tobira (Thunb.) Ait. ‘Variegata’ [variegated pittosporum], Quercus virginiana Mill. [live oak], Raphiolepis indica (L.) Lindl. [Indian hawthorn] and Rhododendron indicum (L.) Sweet. ‘Ray’s Rubra’ [azalea]. Predominant weeds were Cardamine pensylvanica Muhl. ex Willd. [Pennsylvania bit- tercress], Chamaesyce maculata (L.) Small [spotted spurge] and Eclipta alba (L.) Hassk. [yerba-de-tagó].

On 16 Nov., 1988, seven weeks after the second herbicide applications had been applied, a field day was held. Growers were given plot maps of the experiment and asked to visually rate each plot using the following scale: 5 = best weed control—no weeds. 4 = good weed control, 3 = fair weed control, 2 = poor weed control and 1 = worst weed control—100% weed coverage. Two weeks after the growers made their ratings, three researchers determined visual weed coverage percentages (0-100%) by species for each plot. Overall weed coverage percentages were determined by totaling these species ratings. Two months later the plots were weeded and retreated. Total weed dry weights were determined after drying the weeds at 70°C. Composite treatment rankings were determined from grower ratings by totaling the individual ratings for each treatment. Spearman’s coefficient of rank correlation \( (r_s) \), a non-parametric statistic, was used to determine the association between these rankings and rankings based on actual weed dry weights \( (2) \). Significance levels of rank correlation coefficients were determined using tables \( (1) \). Pearson product-moment correlation \( (r) \) was used to test the association of researcher weed coverage percentage estimates and dry weed weights. Weed coverage percentages were transformed to the arcsin of the square root of the decimal fraction \( (% \text{ weed coverage} \div 100) \) prior to statistical analysis.

![Fig. 1. Association of grower weed coverage rankings of treatments (determined from grower visual ratings) and weed biomass rankings (determined from dry weights) using Spearman’s coefficient of rank correlation.](image)
Results and Discussion

Thirty-four growers rated all 5 replications using the rating system described above. Grower ratings of individual plots were generally highly clustered with a majority of the growers rating a plot the same; however, some plots received ratings from 1 to 5. Average ratings of individual plots ranged from 1 to 4.85 and overall treatment rating means ranged from 1.02 for the untreated control to 4.41 for the most effective herbicide.

Rankings of weed control using these ratings were highly correlated (P < 0.01%) with weed biomass (dry weight) rankings for all five replications. Spearman's coefficients of rank correlation values ranged from 0.80 to 0.92. The overall $r_s$ of 0.88 for the association between grower rankings, based on their 1 to 5 ratings of all 95 plots, and dry weed weights was highly significant. The $r_s$ value for the 19 pairs of treatments was 0.95 (Fig. 1).

Product-moment correlation, $r$, of researcher weed coverage estimates and dry weed weights were also highly correlated for each replication ($r = 0.81$ to 0.90) and for all 95 plots was 0.84. The overall $r$ value for the 19 treatments was 0.84 and Figure 2 shows that the deviation between visual ratings and dry weed weights for the untreated control may have been largely responsible for the lack of better correlation. It is likely that this deviation was due to inhibition of weed growth in the untreated controls caused by lack of adequate soil moisture and nutrients due to the great amount of weeds in these treatments. These limiting factors during the two month interval from the time the plots were rated until the plots were weeded reduced the plant biomass that accumulated in the untreated control plots during that period of time compared to other treatments containing less weed biomass.

These results indicate that visual ratings of weed coverage by growers or researchers can be a good indication of relative weed biomass and, therefore, herbicide efficacy, even when ratings are made well in advance of weeding. Grower participation in the evaluation of herbicide trials could be used to help researchers doing such studies.

Literature Cited


MARKETING LANDSCAPE MAINTENANCE THROUGH A SERVICES DIRECTORY

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Abstract. A novel new marketing approach involving a Directory of Services offered by members of the Tri-County Chapter of the Florida Landscape Maintenance Association is presented. The directory includes details on services and areas of operation plus a comprehensive landscape maintenance cultural calendar. Two thousand copies are being distributed to potential clients in Sarasota, Manatee and Charlotte counties.

During 1988, the Landscape Maintenance Association (L.M.A.) was organized to represent landscape maintenance practitioners in Florida. L.M.A. chapters were formed in a number of urbanized locations, including the Sarasota/Manatee area where the Tri-County Chapter was established. This chapter grew to be the largest in the State organization.

Acting in an advisory capacity, the Ornamental Horticulture Extension Agent for Sarasota County suggested to the Chapter Board of Directors improved methods to better market landscape maintenance services. This included recommendations to consider a Landscape Maintenance Services Directory patterned after wholesale plant locators widely used in the horticulture industry.

Plant locators have been produced for several years by wholesale growers of ornamental plants in Florida to draw customers and stimulate sales. However, such efforts with respect to promoting landscape maintenance businesses have not been evident.

Materials and Methods

The Chapter Board formed a special committee to work on the Directory. Examples of plant locators on hand at the County Extension office as well as a landscape