no mention of the origin of the reverted shoots. Such shoots were often juvenile in morphology. However, the presence of juvenile shoots arising from buds away from the apex does not necessarily indicate that the apical meristem has reverted.

Our results support Stoutemyer's inability to confirm Frank and Renner's results (1). This suggests that the reversion reported by Frank and Renner was due to an unexplained phenomenon, such as some undefined condition in the experiment, or that the reversion represents clonal differences.

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Kentucky Bluegrass Cultivar and Blend Response to Bluegrass Billbug

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Additional index words. *Poa pratensis, Sphenophorus parvulus*

Abstract. **A cultivar and blend trial of Kentucky bluegrass (*Poa pratensis* L.) demonstrated differential cultivar responses to larval infestation and injury by bluegrass billbug (*Sphenophorus parvulus* Gyllenhal). Correlation between billbug injury ratings and billbug larval density was r = 0.92. Injury ratings and larval density for blends approximated mean response for cultivars in pure stands. These results suggested that blending could be beneficial in reducing injury symptoms, if appropriate cultivars were selected.**

Table 1. Kentucky bluegrass cultivar and blend injury response to bluegrass billbug larval density.

	Billbug Larval	
Cultivar[z]	Density[y]	Injury[x]
Nugget	54	8
Sydsport	38	7
Fylking	23	7
Newport	18	4
Park	7	2
South Dakota	3	1
Blend		
Fylking, Nugget, Sydsport	28	7
Fylking, Park, South Dakota	16	4
Park, South Dakota, Newport	8	3
LSD 5%	7	2

[z] Cultivars and blends were seeded in September 1976. Blends were based on each component comprising 33.3% on a weight basis.

[y] Larval density was determined on larval count per 3170 cm^3. Values are averages of 4 replications and have been rounded to nearest whole number.

[x] Injury rating was based on a visual rating scale of 1 to 9 with 1 = no injury and 9 = all plants injured. Values are averages of 4 replications and have been rounded to nearest whole number.

Billbug larvae cause considerable turfgrass damage in Kentucky bluegrass lawns throughout the Great Plains region. Turfgrass damage from this pest occurs during the period of June to August, when lawns are exposed to heat and drought stress.

Several researchers have reported potential Kentucky bluegrass cultivar resistance to billbug larval injury (1, 2, 3). Two of these studies found that visual injury ratings were significantly correlated to billbug larval density (2, 3). There were exceptions reported. For example, 'Touchdown' had a low injury rating and a very high billbug larval density and 'Fylking' had a very high injury rating with low billbug larval density (2). Most researchers have found low injury and low larval densities in common-type Kentucky bluegrass cultivars (1, 2, 3).

A natural billbug infestation occurred in July 1981 on a Kentucky bluegrass cultivar and blend evaluation that was conducted at the University of Nebraska Field Laboratory located near Mead. The field trial was established in September 1976 on a Sharpsburg silty-clay, loam (*Typic argiudoll*). Six Kentucky bluegrass cultivars and 3 blends were established from seed in a randomized complete block design with 4 replications. Turfs were fertilized with 20 g N m^{-2} $season^{-1}$ applied at 5 g N m^{-2} $application^{-1}$ in May, June, September, and October. They were mowed weekly at 5.0 cm in spring and fall and at 7.5 cm in the summer. Water was supplied weekly at 2.5 cm to prevent visual drought stress. Dimethyl tetrachloroterephthalate (DCPA) at 13.6 kg ha^{-1} and 2,4-dichlorophenoxyacetic acid (2,4-D) at 1.2 kg ha^{-1} were applied in late Arpil and late May, respectively, but no insecticides or fungicides were applied (4).

Billbug injury was observed in late June and cultivars and blends were evaluated for injury on July 7, 1981, using a visual rating scale of 1 (no injury) to 9 (all plants injured). Billbug larval density was determined by counting larvae separated from a sod sample (3170 cm^3) taken from the center of each plot. 'Park' was selected as the standard cultivar for statistical comparisons due to its low mean billbug larval density and low injury ratings in previous studies (2, 3).

'South Dakota' was the only cultivar to show no visual injury symptoms (Table 1). Injury ratings ranged from a high of 8.0 for 'Nugget' to a low of 1.0 for 'South Dakota'. 'Park', which was considered the standard cultivar for comparison purposes, had an injury rating of 2.0. Larval density ranged from a high of 54 in 'Nugget' to a low of 3 in 'South Dakota'. Injury rating and billbug density were correlated significantly at the 1% probability level (r = 0.92). The results of this study were consistent with data reported in Nebraska and in 1974 and 1981 (2, 3) and in New Jersey in 1982 (1).

Injury and larval density for blends approximated mean response for cultivars comprising the blend, but growing in pure stand. Blends of cultivars with high injury ratings had high billbug larval density counts (Table 1). When common-type Kentucky bluegrasses were blended (i.e., 'Park', 'South Dakota', and 'Newport'), their injury ratings were very low as were their larval density counts. Blending a cultivar with a high injury rating (i.e., 'Fylking') with low injury-rating cultivars (i.e., 'Park' and 'South Dakota') resulted in an intermediate larval density count and a low billbug injury rating. These results indicate that blending could be used to reduce potential billbug injury, if the appropriate cultivars are selected for the blend.

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The Effects of Slow-release Fertilizers on the Growth and Postproduction Performance of Boston Fern

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Abstract. **Boston fern [*Nephrolepsis exaltata* (L.) Schott 'Compacta'] was grown with 3 rates of 2 slow-release fertilizers and with one rate of liquid fertilization. Greatest fern dry weight occurred with ferns grown with liquid fertilization (20N–0.8P–16.6K) or Osmocote (19N–2.5P–8.3K) at the 1.8 kg N/m^3 rate. After 16 weeks of simulated commercial production, one-third of the ferns were moved to a low-light interior environment, while one-third were held in the greenhouse. Six weeks later, ferns moved to the interior environment were greener in color, had greater nutrient content, and exhibited less growth than did ferns held in the greenhouse.**

Commercial fertilization of foliage plants is generally accomplished through either liquid fertilization or slow-release fertilizers; both systems produce quality foliage plants (1, 2, 4, 6, 8).

One area receiving increased attention is that of postproduction handling. Previous research has shown the benefits of acclimatizing of foliage plants prior to entering the interior environment (10). In accomplishing acclimatization of foliage plants, researchers have reported that plants grown under lower light levels require less fertilizer (3).

Many foliage plants are sold to garden centers and other retail outlets where the plants can remain for as long as 2 months. One of the problems often associated with liquid fertilization is that the plant's nutritional level is rapidly depleted once it is taken off the liquid-feed program. In view of the previous research on foliage plants with light and fertilizer levels, perhaps holding ferns in low-light conditions prior to retail sales would benefit both the garden center operator and the consumer. The objectives of our experiment were to determine the effects of 2 slow-release fertilizers and a liquid fertilization program on 'Compacta' Boston fern growth, foliar nutrient content during production, and postproduction quality under 2 environmental conditions.

Fern liners were potted on September 23, 1981 into 15-cm pots in a medium of 1 peat : 1 perlite (by volume), amended with 1.2 kg N/m^3 of gypsum. Seven fertilizer treatments were compared. An experimental, sulfur-coated, slow-release encapsulated fertilizer (SREF) 20N–1.6P–8.3K (O.M. Scott and Sons, Marysville, Ohio) and Osmocote 19N–2.5P–8.3K (Sierra Chemical Co., Milpitas, Calif.) were compared at 3 rates: 0.9, 1.8, and 3.6 kg N/m^3. All slow-release fertilizers were incorporated into the medium preplant. A control treatment of liquid fertilization with 20N–0.8P–16.6K (Miller Chemical and Fertilizer Co., Hanover, Pa.) was applied at the rate of 150 ppm N twice weekly. A randomized complete block design with 5 replications of 6 plants each was used.

Ferns were grown in a double-layer, polyethylene house with maximum illuminance of about 40 klx. Temperatures ranged from 18 to 24°C. Data collected included foliar analysis 6 weeks after potting, and dry weight, foliar analysis, and color difference determinations from 2 plants per replication 16 weeks after potting. Color differences were determined with a Hunter Color Difference Meter D25 D2 by placing frond midsections directly on the glass cover of the port. Pinnatifid leaves from mature fronds were removed from the midrib for foliar analysis. Tissue N was determined by a modified microKjeldahl method. Ca, Mg, Fe, Mn, Zn, and K were determined spectrophotometrically and P was determined colorimetrically (5).

At the end of 16 weeks (January 16, 1982), half of the remaining ferns (2 plants per replication) were moved to an interior environment, while the others were left in the greenhouse. Interior lighting was provided by Cool-White 40W fluorescent lamps plus natural light through windows. At plant height, maximum illuminance was about 2.5 klx and minimum illuminance was about 1 klx. No fertilizer was applied to the control treatment in either environment after January 13. Six weeks later, data taken included dry weight, foliar analysis, leachate analysis, and color difference measurements from 2 plants per replication in the interior environment and 2 plants per replication in the greenhouse environment.

Commercial production. The greatest fern growth during normal production (16 weeks) occurred with either the liquid feed program or incorporation of 1.8 kg N/m^3 of Osmocote (Table 1). Ferns grown with Osmocote at the 0.9 or 1.8 kg N/m^3 rate were larger than ferns in the corresponding SREF treatments. There was no difference in fern dry weight when comparing the highest slow-release N rates.

Simulated holding conditions. Little growth occurred on the ferns moved to the low-light conditions. With one exception, fern dry weight taken after 6 weeks in the interior environment was within 5% of the dry-weight data taken 6 weeks earlier. In contrast, ferns held in the greenhouse environment had dry-weight increases of 20% or more. Ferns grown with the liquid program increased 28% in dry weight, even though no fertilizer was applied during the 6-week holding period. These data indicate that fern growth occurred from stored N or N retained in the medium since no N was applied during the holding period.

The visual condition of the ferns at the end of the 2 holding periods was determined by the measurements of color difference (Table 1). At the beginning of the holding period, frond color was similar among all treatments with the exception of fronds grown with 0.9 kg N/m^3 of SREF, which were a lighter green. At the end of the holding period, all ferns in the greenhouse appeared lighter in color compared to their color at the beginning of the holding period, although statistical comparisons were not made. However, ferns held in the interior environment appeared greener in color, including the liquid control treatment which had no added fertilizer during those 6 weeks.

These results have several practical implications. Many retail garden centers have greenhouses to hold and maintain foliage plants prior to sale. Our data indicate that ferns actually improved in color under low-light

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