
**Investigators:**
Karrie Reid, Environmental Horticulture Advisor
UCCE, San Joaquin County

Jared Sisneroz, Staff Research Associate
UC Davis, Dept. of Plant Sciences

Loren Oki, UCCE Specialist in Landscape Horticulture
UC Davis, Dept. of Plant Sciences

Darren Haver, UCCE Water Resources Advisor and South Coast REC Director

Grant Johnson, Staff Research Associate
South Coast Research and Extension Center

**In cooperation with:**
David Fujino, Executive Director
California Center for Urban Horticulture, UC Davis

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UCDAVIS COLLEGE OF AGRICULTURAL & ENVIRONMENTAL SCIENCES

UCDAVIS California Center for Urban Horticulture

University of California Agriculture and Natural Resources

**Table 1. Average Overall Appearance Rating for Kurapia® standard and 'New White' for Year 2 on 3 levels of ETo-based irrigation in 2 California locations. There are no statistical differences between treatments within cultivars.**

| | Overall average quality rating on each irrigation treatment percentage of ETo | | | Recommended rate of ETo |
|---|---|---|---|---|
| **ETo treatment %** | **80%** | **50%** | **20%** | |
| **Davis** | | | | |
| Standard | 4 | 4 | 4..2 | 20% |
| New White | 4.5 | 4.5 | 4.5 | 20% |
| **Irvine** | | | | |
| Standard | 3.7 | 3.8 | 3.6 | 20%-50% |
| New White | 4 | 3.9 | 3.8 | 20%-50% |

## Research Methods

During the fall of 2016, 24 #1-sized plants of *Lippia* (*Phyla*) *nodiflora* 'Campagna Verde', trade name 'Kurapia® S1', (hereafter referred to as Kurapia or Kurapia standard) and 24 plants of *Lippia* hybrid 'Ecolopia1', trade name Kurapia® 'New White' (hereafter referred to as 'New White') were planted in the ground in full sun on the University of California campus in Davis, CA, (USDA Zone 9b, Sunset zone 14) and replicated at the UC Agriculture and Natural Resources South Coast Research and Extension Center (SCREC) in Irvine, CA (USDA Zone 10a, Sunset Zone 22). The soil in the Davis field is characterized as Yolo clay loam, a fairly heavy silty clay loam soil; the Irvine soil is San Emigdio fine sandy loam.

Plants were placed 3 meters apart in 1-meter wide planting beds covered with 3 inches of chipped wood mulch. Planted beds were separated by a 1-meter wide non-mulched path between rows. Each row was supplied with 3 water lines corresponding to one of 3 irrigation treatments. Rings of ¼" internal drip emitter tubing delivered irrigation at a combined emitter rate of 3.2 gph/plant. These were installed under the mulch in the root zone of each plant. The plants and treatments were randomized throughout the fields in two complete blocks with a total of 8 replications of each irrigation treatment for each species. The field was manually weeded between rows and post- and pre-emergent herbicide was applied around the perimeter of the field as needed. Throughout the trial, no pesticide or fertilizer treatments were applied to the plants. The plants were established on irrigation at 80% of evapotranspiration (ETo), as well as rainfall during fall 2016 through fall 2017. This irrigation level was to encourage the establishment of roots that reached deeply into the native soil.

All plants received their first irrigation on April 16 in Irvine and April 23 in Davis to fill the soil water reservoir and begin the deficit irrigation budgets. These treatments continued through October. Irrigation was based on reference evapotranspiration (ETo) as reported online by the California Irrigation Management Information System (CIMIS; http://wwwcimis.water.ca.gov/ ) using the weather station at the Davis campus and on site at SCREC for Irvine. ETo is defined as the total amount of water loss from a reference plant (in this case, a well-maintained tall

fescue) through evaporation and transpiration. There were three treatment levels: 80%, 50%, and 20% of ETo, corresponding to high, moderate, and low irrigation levels, as described in *The Water Use Classification of Landscape Species IV* (WUCOLS IV, 2014). An equal volume of water was applied at each irrigation equivalent to 50% of the Plant Available Water (PAW) to a depth of 0.5 m. The frequency of the irrigation was determined using a water budget for each treatment percentage of ETo.

Table 3 below shows the number and frequency of irrigation events at each site. The irrigation water at SCREC in Irvine is reclaimed water, subsequently 20% more water was applied at each irrigation according to best management practices for reclaimed water. The EC of the water averaged 1.033 dS/m, with a pH of 7.1, chlorides at 130 mg/L, and did not vary significantly throughout the study.

Measurements of length (l), width (w), and height (h) were taken monthly. These measurements were used to calculate a plant growth index (PGI = $[(l + w)/2 + h]/2$) (Irmak, S. et al., 2004). A relative plant growth index was also calculated (monthly PGI/ initial PGI) between July and subsequent months to evaluate the percentage of new growth as a result of treatment effects, along with final average plant size for each treatment. It should be noted that plants were trimmed during the first year when they were cut back to the edge of the planted bed; after measurements in June of the second growing season, each plant was again trimmed to a 1-meter diameter circle. For this reason, subsequent relative plant growth indexes are calculated from July's measurement (1 m) and reflect the percentage of growth put on during the most critical irrigation phase of the trial.

Qualitative ratings were also taken on a monthly basis. The plants were rated on a scale of 1-5 for foliage appearance, flowering, pest tolerance, disease resistance, vigor, and overall appearance, with 5 being highest rating and 1 lowest. In all categories except flowering, these ratings can be characterized as 5=exceptional, 4=very good, 3=average/acceptable, 2=below average/unacceptable, 1=very poor. The flowering rating reflects the percentage of the plant in bloom. Descriptions of the rubric for ratings are in Table 2.

**References**


1. California Irrigation Management Information System, 2009, State of California, http://wwwcimis.water.ca.gov/cimis/welcome.jsp
2. Irmak, Suat, D.Z. Haman, A. Irmak, J.W. Jones, K.L. Campbell, T.L. Crisman. 2004. Measurement and Analyses of Growth and Stress Parameters of *Viburnum odoratissimum* Grown in a Multi-pot Box System. HortScience 39(6):1445-1455.
3. WUCOLS IV. 2014. Water Use Classification of Landscape Species. Regents of the University of California. 2014. http://ucanr.edu/sites/WUCOLS/

Table 2. Explanation of Quality Ratings

| RATING | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| **Foliage** | perfect to excellent; plant is in full leaf with no signs of leaf burn, disease or insect damage, and has an appealing shape and uniformity | same as 5 except for minor tip burn, edge damage, or minor damage to only a few leaves that does not much affect the overall appearance | acceptable but not its best; non-uniform; minor damage to all leaves that is less evident from a distance, or severe damage to no more than 25% of plant | unacceptable; moderate damage to most of the plant or major damage to more than 25%; plant is declining and may not recover; may be extremely non-uniform | unacceptable; close to dead |
| **Flowering** | full bloom; the height of bloom for the species | 61-80% of plant in bloom | 41-60% of plant in bloom | 21-40% of plant in bloom | 1 bloom open to 20% in bloom |
| **Pest Tolerance/ Disease Resistance** | no visible damage | minor to moderate damage to one or two leaves or stems, or only very minor damage to a few leaves (<25%) | minor damage to many of the leaves or flowers; appearance still acceptable from a distance (25-50%) | major damage; appearance unacceptable<br>(51-75%) | severely damaged and probably dying<br>(>75% affected) |
| **Vigor** | pushing out a lot of new growth from every growing point | pushing out new growth from many growing points (50-75%) | Plant is surviving and healthy, but not pushing out much new growth, if any (<50%) | Plant is very small for the species or unhealthy, and declining | Plant is barely alive; close to death |
| **Overall Appearance** | **An impressive plant**; everything works together: flowers (if present), leaves, the shape and condition of the plant are all very appealing. It has the WOW factor that makes it an attractive garden plant, even if each individual factor isn't perfect. | **A very attractive plant**; may be a 5 when in bloom, or just a very nice plant that lacks the WOW factor or is not quite at its prime. | **An acceptable plant**; may be past or not quite to its prime; might be better if more uniform; may be described as an 'okay' plant. | **Unacceptable plant** for any of the above reasons | **Completely unacceptable** and not likely to improve |

## Results - Discussion

### DAVIS- Northern California

As noted in the Methods, all plants were trimmed to a 1-meter circle at the end of June. The average plant width subsequently attained by October for the standard Kurapia in Davis was 363.5 cm (143.1 in.) with an average height of 21.8 cm (8.6 in.). 'New White' had an average width in October of 255.5 cm (100.6 in.) and a height of 27.75 cm (10.9 in.). There were no significant differences in relative growth between treatments for either cultivar in any month, or when all individuals of each cultivar were compared over the entire period from July to October. In neither cultivar were there significant differences in any quality rating between irrigation treatments in any month.

A comparison between the cultivars reveals standard Kurapia was significantly bigger overall ($p \leq 0.01$ using ANOVA and Tukey's HSD) than the 'New White' due to longer internodes. 'New White' was consistently denser and more compact and responded more dramatically to the pruning in June by mounding up into more of a tuft in the middle than the standard. There were few significant differences in the ratings between the two cultivars. When compiling data from July through October, the Overall Appearance ratings of 'New White' and Kurapia were not significantly different, while the Flowering rating was significantly higher on the standard ($p \leq 0.01$) while the Foliage rating was significantly higher on 'New White' ($p \leq 0.01$). Although the flowering rating was high on 'New White' through August, it began to decline in September while the standard maintained a high level of flowering through October. This is an important distinction that should be taken into consideration when choosing cultivars. If planting for the ecological purpose of providing pollen and nectar for insects, the Kurapia standard is going to provide that service for a much longer period, though its ornamental value is not as high. If attracting bees is ***un***desirable, 'New White' may be preferable, as the need for mowing or trimming to remove flowers will slow down much sooner in the summer.

### IRVINE- Southern California

The average width attained by the standard Kurapia in October was 396.3 cm (156 in.) with an average height of 17.75 cm (7 in.). 'New White' had an average width of 303.3 cm (119.4 in.) with an average height of 21.25 cm (8.4 in.). Both cultivars were wider but shorter than their counterparts in northern California. There were no significant differences in relative growth between treatments for either cultivar in any month, or collectively over the entire period from July to October. The same significant difference in size *between* cultivars existed, though the difference was not quite as marked in Irvine as in Davis.

The 'New White' cultivar showed some signs of stress in Irvine on the lowest irrigation treatment beginning in September, but most of the plants maintained acceptable appearance. Overall, within each cultivar, there were no significant differences in any quality ratings between irrigation treatments.

The same distinctions that existed between cultivars in Davis also showed up in Irvine: Overall Appearance ratings over the season were similar on all irrigation treatments, while the

Flowering rating was significantly higher ($p \leq 0.01$) in the standard than the 'New White', though just as in the measurements, this difference was not as great as it was in Davis.

The height difference between the standard and 'New White' is an interesting artifact that appears to be the specific response of 'New White' to pruning, which was to add growth to the center mass before beginning to put on lateral growth again. This is an aspect of this cultivar's growth pattern which could be exploited by canny landscape managers who wanted a slightly taller groundcover. However, as other studies have shown, if this height is undesirable, mowing could reduce it.

The significantly higher ($p \leq 0.01$) average overall appearance ratings in Davis (Table 5) than in Irvine (Table 6) may be a soil preference, or a result of the use of reclaimed water at the Irvine site. The effects of the reclaimed water may have begun to accumulate over the summer. Although some plants seemed to be unaffected by the salinity of the irrigation water, others showed real signs of stress mid-summer and impending mortality by early fall. In a sandy soil like this, we would expect some plants to recover good appearance by spring in a good rain year, since any accumulated salts would wash from the soil profile.

Table 3. 2018 Irrigation frequency details for Year 2 trial of Kurapia and 'New White'

| Irrigation % of ETo | # of Irrigations | Avg. Interval (days) | Dates of Irrigation | Total water applied/plant | |
|---|---|---|---|---|---|
| **UC DAVIS** | | | **Initial irrigation 4/23** | **inches** | **gallons** |
| 80 | 10 | 16 | 5/10, 5/25, 6/7, 6/20, 7/3, 7/17, 7/29, 8/13, 8/29, 9/18 | 27.95 | 147 |
| 50 | 6 | 27 | 5/19, 6/11, 7/2, 7/23, 8/16, 9/12 | 16.77 | 88.2 |
| 20 | 2 | 60 | 6/25, 8/20 | 5.59 | 29.4 |
| **SOUTH COAST REC** | | | **Initial irrigation 4/16** | | |
| 80 | 11 | 15 | 5/5, 5/29, 6/11, 6/25, 7/5, 7/16, 7/29, 8/8, 8/21, 9/4, 9/18, | 24.5 | 128.7 |
| 50 | 6 | 28 | 6/12, 7/3, 7/21, 8/8, 8/29, 9/22 | 13.4 | 70.2 |
| 20 | 2 | 51 | 6/26, 8/10 | 4.4 | 23.4 |

## OPEN HOUSE RATINGS

At the UC Davis Trials site, we invited our participants at the late September Open House Ratings Days to rate a sample of the Kurapia and 'New White' cultivars. This group was comprised of a variety of landscape and nursery professionals, educators, academics, including

landscape designers and architects. Their ratings and opinions were somewhat different than trials staff and demonstrate the kinds of things people in the industry are looking for in landscape plant material. Their ratings are shown in Table 4 below this discussion.

The mean and median Overall Appearance rating between the cultivars were similar with Kurapia taking a slight edge over 'New White'. Normally when we summarize the data collected, we omit the mode values for brevity. Here we included mode values in the data table because they identify a marked preference between the two cultivars, with participants rating the Kurapia standard higher across all treatments than 'New White'. Based upon reading the comments, we hypothesize this is a response to the floral display. The "profuse flowers" of Kurapia were frequently mentioned; some preferred more flowers saying, "this feature is important to me." 'New White' is a more compact, less floriferous successor to Kurapia because while Kurapia has "lots more flowers, dead flowers detract" from the overall appearance. Trials staff preferred 'New White', because of its dense compact habit and some Open House participants agreed, writing, "Less blooms – not as aggressive" resulting in a "more controlled spread- same density – not as scary!!"

In addition to commenting on floriferousness and vigor, many participants commented on the mounding habit which developed in the center of our trial plants, remarking, "Mounding is really weird." As mentioned before, this condition seems to have resulted from trials staff cutting the plant back to 1-meter diameter circles several times over two years in response to its "Monster fill action!" It is worth re-emphasizing that the choice between cultivars will vary depending on the client's needs.

Table 4. Compiled ratings data from all Open House participants in Sep. 2018.

| | | Kurapia | | | 'New White' | | |
|---|---|---|---|---|---|---|---|
| | **ETo trt** | **80** | **50** | **20** | **80** | **50** | **20** |
| **Overall Appearance** | Max | 5 | 5 | 5 | 5 | 5 | 5 |
| | Mean | 4.2 | 4.3 | 4.2 | 3.9 | 3.9 | 4.2 |
| | Mode | 5 | 5 | 5 | 4 | 4 | 4 |
| | Median | 4 | 4 | 4 | 4 | 4 | 4 |
| | Min | 2 | 2 | 2 | 1 | 1 | 2 |
| **Foliage Quality** | Max | 5 | 5 | 5 | 5 | 5 | 5 |
| | Mean | 4.2 | 4.4 | 4.4 | 4.3 | 4.4 | 4.6 |
| | Mode | 5 | 5 | 5 | 5 | 5 | 5 |
| | Median | 4 | 5 | 4 | 4 | 4 | 5 |
| | Min | 3 | 2 | 2 | 3 | 3 | 3 |
| **Floral Display** | Max | 5 | 5 | 5 | 4 | 5 | 5 |
| | Mean | 4.2 | 4.1 | 4.2 | 1.7 | 1.9 | 2.0 |
| | Mode | 5 | 5 | 5 | 1 | 1 | 2 |
| | Median | 4 | 4 | 4 | 1 | 2 | 2 |
| | Min | 1 | 1 | 2 | 0 | 1 | 1 |

## Results - Data

Table 5. Average quality ratings for Kurapia standard and 'New White' on 3 ETo-based irrigation levels from July to October 2018 in Davis, CA.

| | | July | | August | | September | | October | | AVG | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Standard | New White | Standard | New White | Standard | New White | Standard | New White | Standard | New White |
| **Overall Appearance** | 80 | 5.0 | 5.0 | 4.7 | 5.0 | 4.7 | 5.0 | 4.0 | 4.0 | 4.6 | 4.8 |
| | 50 | 5.0 | 5.0 | 4.8 | 4.8 | 4.9 | 5.0 | 4.0 | 4.0 | 4.7 | 4.7 |
| | 20 | 5.0 | 5.0 | 5.0 | 4.8 | 5.0 | 5.0 | 4.3 | 3.9 | 4.8 | 4.7 |
| **Foliage** | 80 | 5.0 | 5.0 | 4.6 | 4.6 | 4.3 | 5.0 | 4.0 | 4.8 | 4.5 | 4.8 |
| | 50 | 5.0 | 5.0 | 4.4 | 4.7 | 4.6 | 4.6 | 4.0 | 4.9 | 4.5 | 4.8 |
| | 20 | 5.0 | 5.0 | 4.7 | 4.4 | 4.9 | 4.7 | 4.4 | 4.6 | 4.7 | 4.7 |
| **Flower** | 80 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 3.1 | 5.0 | 1.0 | $4.8^{a}$ | $3.5^{b}$ |
| | 50 | 5.0 | 5.0 | 4.0 | 4.9 | 5.0 | 3.5 | 5.0 | 1.0 | $4.8^{a}$ | $3.6^{b}$ |
| | 20 | 5.0 | 5.0 | 4.1 | 5.0 | 5.0 | 3.9 | 5.0 | 1.1 | $4.8^{a}$ | $3.7^{b}$ |
| **Pest Resistance** | 80 | 5.0 | 5.0 | 4.1 | 4.3 | 4.3 | 5.0 | 5.0 | 5.0 | 4.6 | 4.8 |
| | 50 | 5.0 | 5.0 | 4.0 | 4.5 | 4.6 | 4.6 | 5.0 | 5.0 | 4.7 | 4.8 |
| | 20 | 5.0 | 5.0 | 4.4 | 4.4 | 4.9 | 4.7 | 5.0 | 5.0 | 4.8 | 4.8 |
| **Disease Resistance** | 80 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| | 50 | 5.0 | 5.0 | 5.0 | 4.9 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| | 20 | 5.0 | 5.0 | 5.0 | 4.8 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 4.9 |
| **Vigor** | 80 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| | 50 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| | 20 | 5.0 | 5.0 | 5.0 | 4.8 | 5.0 | 5.0 | 5.0 | 4.8 | 5.0 | 4.9 |

**Different superscripts represent significant differences between ratings using ANOVA and Tukey's HSD at p≤0.01.**

Table 6. Average quality ratings for Kurapia standard and 'New White' on 3 ETo-based irrigation levels from July to October 2018 in Irvine, CA.

| | | July | | August | | September | | October | | AVG | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Standard | New White | Standard | New White | Standard | New White | Standard | New White | Standard | New White |
| **Overall Appearance** | 80 | 4.0 | 4.0 | 4.0 | 4.1 | 3.1 | 3.8 | 3.0 | 3.4 | 3.5 | 3.8 |
| | 50 | 4.0 | 4.0 | 4.1 | 3.9 | 3.6 | 3.8 | 3.0 | 3.1 | 3.7 | 3.7 |
| | 20 | 4.0 | 4.0 | 3.9 | 4.0 | 2.9 | 3.3 | 3.0 | 2.9 | 3.4 | 3.5 |
| **Foliage** | 80 | 4.0 | 4.3 | 4.3 | 4.9 | 4.0 | 4.0 | 3.3 | 3.5 | 3.9 | 4.2 |
| | 50 | 4.0 | 4.6 | 4.3 | 4.5 | 4.0 | 3.9 | 3.7 | 3.1 | 4.0 | 4.0 |
| | 20 | 4.0 | 4.3 | 3.9 | 4.5 | 3.5 | 3.5 | 3.1 | 3.0 | 3.6 | 3.8 |
| **Flower** | 80 | 4.1 | 3.1 | 4.9 | 3.9 | 2.1 | 1.0 | 1.6 | 1.0 | $3.2^{a}$ | $2.3^{b}$ |
| | 50 | 4.3 | 2.8 | 5.0 | 3.9 | 3.0 | 1.0 | 1.9 | 1.0 | $3.5^{a}$ | $2.2^{b}$ |
| | 20 | 4.1 | 3.1 | 5.0 | 3.9 | 2.1 | 1.0 | 1.5 | 1.0 | $3.2^{a}$ | $2.3^{b}$ |
| **Pest Resistance** | 80 | 5.0 | 5.0 | 5.0 | 5.0 | 4.7 | 4.0 | 5.0 | 4.9 | 4.9 | 4.7 |
| | 50 | 5.0 | 5.0 | 5.0 | 4.6 | 4.9 | 4.4 | 5.0 | 5.0 | 5.0 | 4.8 |
| | 20 | 5.0 | 5.0 | 5.0 | 4.9 | 4.6 | 4.5 | 5.0 | 4.9 | 4.9 | 4.8 |
| **Disease Resistance** | 80 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| | 50 | 5.0 | 5.0 | 5.0 | 4.8 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 4.9 |
| | 20 | 5.0 | 5.0 | 4.6 | 4.9 | 5.0 | 4.8 | 5.0 | 5.0 | 4.9 | 4.9 |
| **Vigor** | 80 | 5.0 | 4.9 | 5.0 | 5.0 | 4.7 | 4.9 | 4.0 | 3.8 | 4.7 | 4.6 |
| | 50 | 5.0 | 4.9 | 4.9 | 4.9 | 4.9 | 4.6 | 3.7 | 3.5 | 4.6 | 4.5 |
| | 20 | 5.0 | 4.8 | 4.8 | 4.8 | 4.5 | 4.3 | 4.0 | 3.5 | 4.6 | 4.3 |

**Different superscripts represent significant differences between ratings using ANOVA and Tukey's HSD at p≤0.01.**

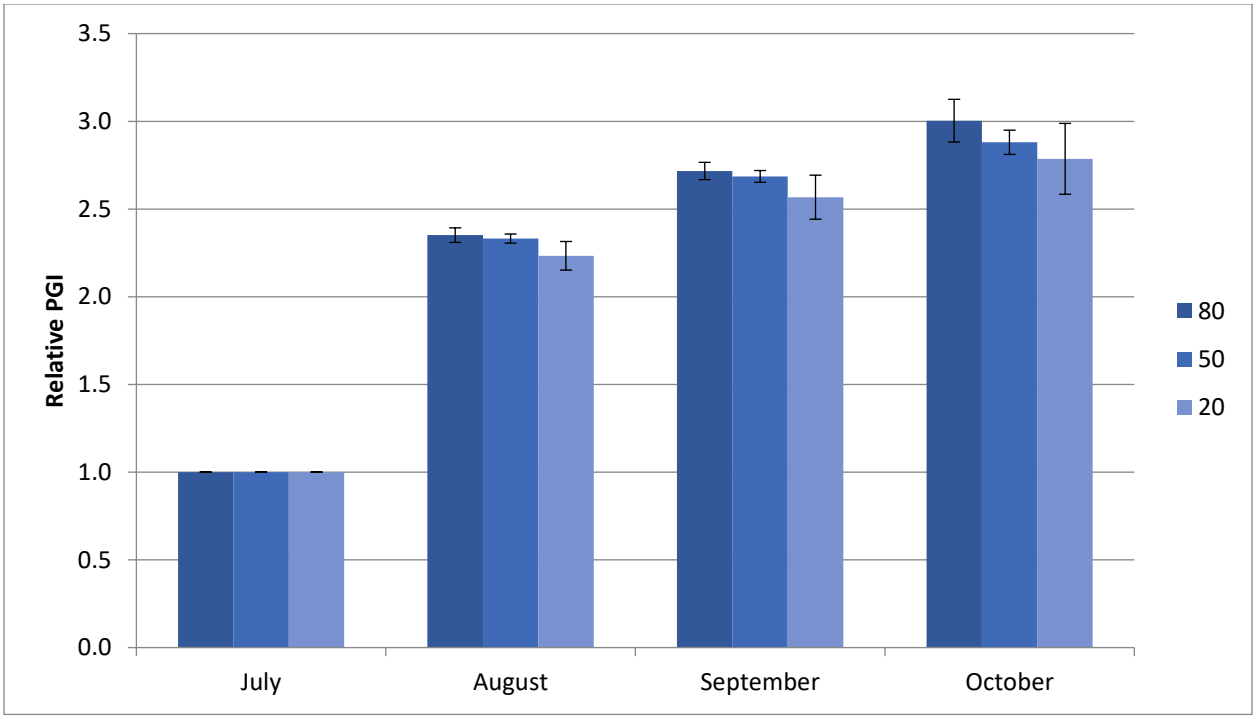


Figure 1. Average relative plant growth index for Kurapia standard in Davis, CA from July to October 2018 on 3 irrigation levels: 80%, 50% and 20% of ETo. There were no significant differences between treatments using ANOVA and Tukey's HSD at p≤ 0.05.

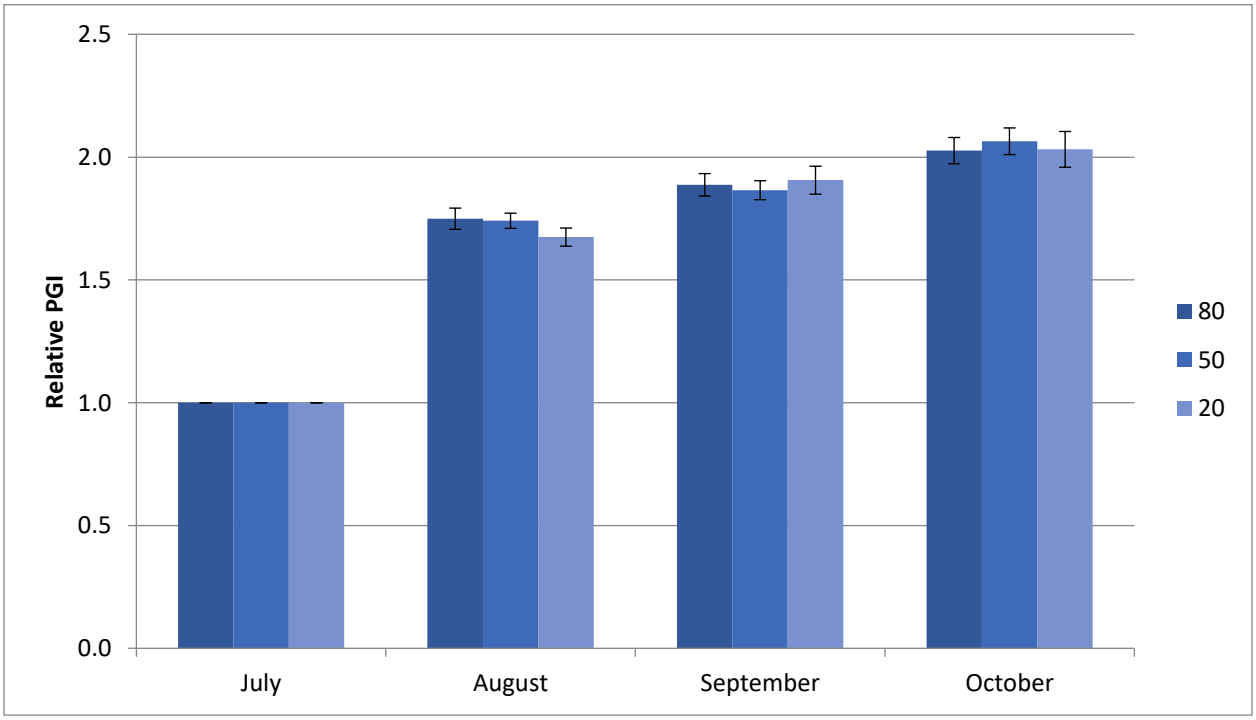


Figure 2. Average relative plant growth index for Kurapia 'New White' in Davis, CA from July to October 2018 on 3 irrigation levels: 80%, 50% and 20% of ETo. There were no significant differences between treatments using ANOVA and Tukey's HSD at p≤ 0.05.

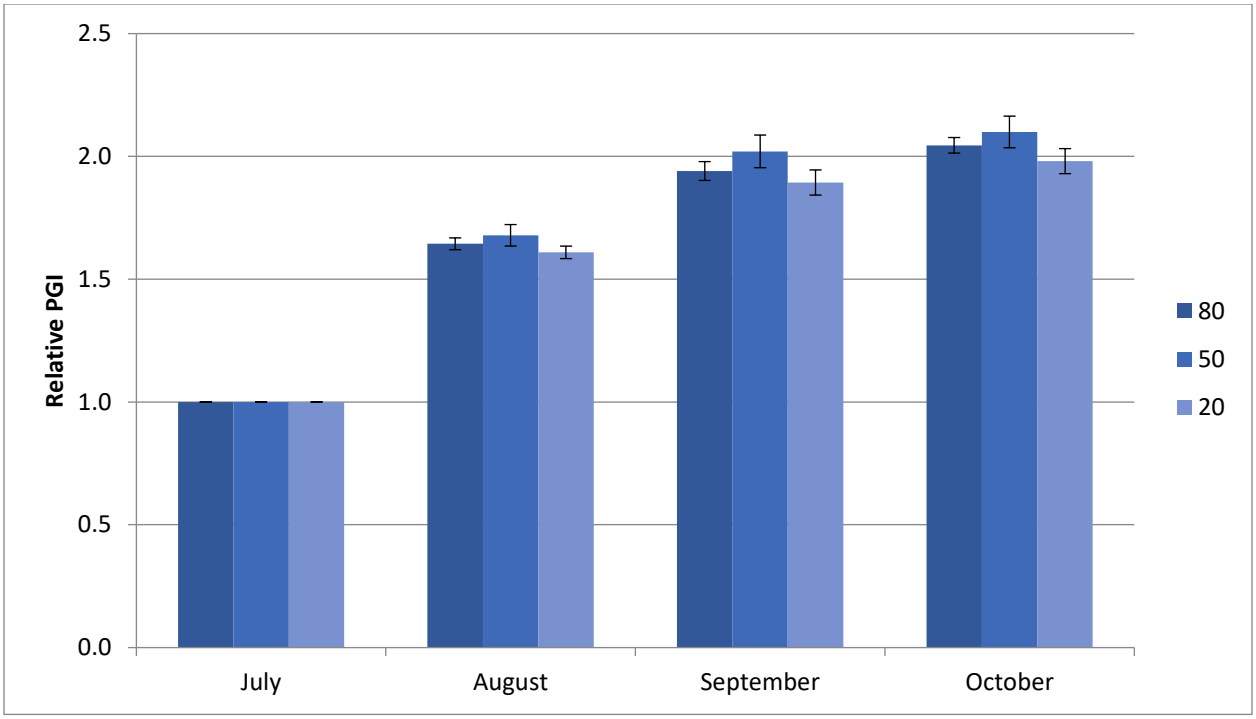


Figure 3. Average relative plant growth index for Kurapia standard in Irvine, CA from July to October 2018 on 3 irrigation levels: 80%, 50% and 20% of ETo. There were no significant differences between treatments using ANOVA and Tukey's HSD at p≤ 0.05.

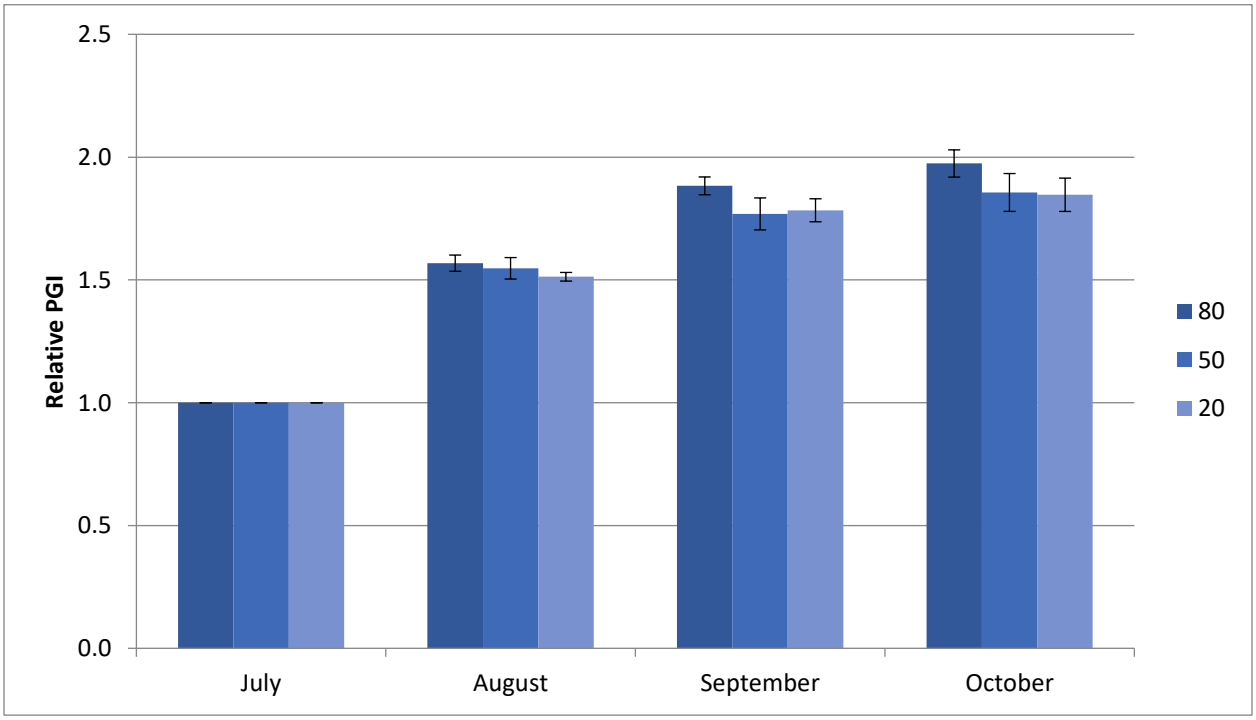


Figure 4. Average relative plant growth index for Kurapia 'New White' in Irvine, CA from July to October 2018 on 3 irrigation levels of 80%, 50% and 20% of ETo. There were no significant differences between treatments using ANOVA and Tukey's HSD at p≤ 0.05.

Figure 5. Kurapia standard on 80% of ETo irrigation treatment in September 2018 in Davis, CA.

Figure 6. Kurapia 'New White' on 80% of ETo irrigation treatment in September 2018 in Davis, CA. Mounding response to pruning is visible.

Figure 7. Kurapia standard on 50% of ETo irrigation treatment in September 2018 in Davis, CA.

Figure 8. Kurapia ‘New White’ on 50% of ETo irrigation treatment in September 2018 in Davis, CA.

Figure 9. Kurapia standard on 20% of ETo irrigation treatment in September 2018 in Davis, CA.

Figure 10. Kurapia 'New White' on 20% of ETo irrigation treatment in September 2018 in Davis, CA.

Figure 11. Kurapia standard on 80% of ETo irrigation treatment in Oct. 2018 in Irvine, CA.

Figure 12. Kurapia 'New White' on 80% of ETo irrigation treatment in Oct. 2018 in Irvine, CA. Mounding response to pruning is visible.

Figure 13. Kurapia standard on 50% of ETo irrigation treatment in Oct. 2018 in Irvine, CA.

Figure 14. Kurapia ‘New White’ on 50% of ETo irrigation treatment in Oct. 2018 in Irvine, CA.

Figure 15. Kurapia standard on 20% of ETo irrigation treatment in Oct. 2018 in Irvine, CA. Blooming is mostly finished, and some signs of accumulated stress are apparent.

Figure 16. Kurapia 'New White' on 20% of ETo irrigation treatment in Oct. 2018 in Irvine, CA. No blooms; some signs of accumulated stress are apparent.

Figure 17. Kurapia standard on 50% of ETo irrigation treatment in Irvine. Although some plants in the field were damaged by gophers, this mortality was unrelated to rodents and is apparently due to water stress. These plants were the exception rather than the rule.


Figure 18. Kurapia 'New White' on 20% of ETo irrigation treatment in Oct. 2018 in Irvine showing extreme water stress unrelated to rodent damage.