



UC Landscape Plant Irrigation Trials™ 2017-2019 Trial Results

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Executive Summary

During the 2017-2019 UC Landscape Plant Irrigation Trials™ (UCLPIT), 16 plant cultivars were evaluated at UC Davis (12 in full sun and 4 in 50% shade) and 15 were evaluated at South Coast REC in Irvine, CA. Several of the plants evaluated at South Coast Research and Extension Center (South Coast REC) had already been evaluated in Davis in a previous year: *Acacia cognata* 'ACGOG01' Cousin Itt, *Rosa* 'Meijocos' Pink Drift®, and *Rosa* 'Meiradena' Icecap™. No plants were evaluated in shade in Irvine, since the shade structure had not yet been constructed. Plants were installed in fall 2017 or spring 2018 and irrigated regularly over their first summer to establish the plants without inducing stress. During the second year, from April through October 2019, researchers subjected plants to deficit irrigation treatments corresponding to the Water Use Classification of Landscape Species' (WUCOLS) high, moderate, and low categories of water need.

Three "Open House Rating Events" were held at each site in the spring, summer, and fall of 2019. Participants rated one representative plant of each taxon on each of the three treatments. Participants were surveyed at the end of each event about their favorite plant, which plants they would utilize professionally, and their overall impressions of the plants, positive or negative.

UCLPIT is awarding a Blue Ribbon, our highest distinction, to those plants that maintained mean overall appearance scores of 4 or higher on the low irrigation treatment.

UC Davis Blue Ribbon Winners (WUCOLS zone 2)

- *Dianella revoluta* 'Allyn-Citation' Coolvista™
- *Elaeagnus × ebbingii* 'Viveleg' Olive Martini™
- *Grevillea × hybrida* 'Kings Fire'
- *Lavandula × allardii* 'Meerlo'
- *Rosa × hybrida* 'Meijecycka' Limoncello™
- *Rosa × hybrida* 'Meitraligh' Brick HousE™
- *Rosa × hybrida* 'Radwhite' White Knock Out®
- *Vitex × hybrida* 'Bailtexone' Flip Side®

South Coast REC Blue Ribbon Winners (WUCOLS zone 3)

- *Elaeagnus × ebbingii* 'Viveleg' Olive Martini™
- *Lavandula × allardii* 'Meerlo'
- *Vitex × hybrida* 'Bailtexone' Flip Side®

Results Summary

Table 1. Mean overall appearance rating in 2019 for 16 species grown in full sun from 2017 to 2019. Rating scale is 1-5, where 1 is lowest and 5 is highest.

Full Sun Field	UC Davis				South Coast REC			
	Mean overall appearance rating			Rec. rate ¹ (ETo%)	Mean overall appearance rating			Rec. rate ¹ (ETo%)
	80	50	20		80	50	20	
<i>Acacia cognata</i> 'ACGOG01' Cousin Itt	-	-	-	-	3.1	3.1	2.7	50
<i>Dianella revoluta</i> 'Allyn-Citation' Coolvista™	4.2	4.2	4.2	20	3.2	3.1	3.1	20
<i>Elaeagnus x ebbingii</i> 'Viveleg' Olive Martini™	4.6	4.5	4.5	20	3.6	3.9	3.7	20
<i>Grevillea</i> 'Kings Celebration'	-	-	-	-	3	2.9	2.9	20
<i>Grevillea</i> 'Kings Fire'	4.5	4.5	4.8	20	-	-	-	-
<i>Lavandula allardii</i> 'Meerlo'	4.5	4.6	4.4	20	3.8	3.5	3.6	20
<i>Lagerstroemia indica</i> 'Conlagras' Bellini® Raspberry	3.8	3.5	3.8	20	2.9	3.2	2.6	50
<i>Muhlenbergia capillaris</i> 'Irvine' Plumetastic®	-	-	-	-	3.6	3.2	3.3	20-80
<i>Rhaphiolepis umbellata</i> 'RutRhaph1' Southern Moon®	2.9	3.1	3	20	3.4	3.2	3.1	50-80
<i>Rosa</i> 'Meijecycka' Limoncello™	4.1	4.1	4.1	20	3	3.2	3.2	20
<i>Rosa</i> 'Meijocos' Pink Drift®	-	-	-	-	3.2	2.9	3.0	80
<i>Rosa</i> 'Meiradena' Icecap™	-	-	-	-	3.8	3.5	3.5	20
<i>Rosa</i> 'Meitraligh' Brick House™	4.1	4.1	4.1	20	3.2	3.1	3	20
<i>Rosa</i> 'Radwhite' White Knock Out®	4.1	4.2	4.3	20	3.2	3.0	3.1	20
<i>Vitex</i> 'Bailtexone' Flip Side®	4.4	4.4	4.4	20	3.3	3.5	3.4	20
50% Shade Field								
<i>Distylium</i> 'Vintage Jade'	3.7	3.8	3.4	50	-	-	-	-
<i>Hydrangea paniculata</i> 'Renhy' Vanilla Strawberry™	3.9	3.7	3.3	50	-	-	-	-
<i>Mahonia x media</i> 'Marvel'	3.7	3.5	3.6	20	-	-	-	-
<i>Rhododendron</i> 'Robleza' Autumn Bonfire™	3.9	3.6	3.4	50-80	-	-	-	-

1. Recommended irrigation rates are derived from the lowest irrigation level where growth and best aesthetics were not compromised. Where a range of ETo rates is shown, there were no significant differences between treatments, and the plant may be expected to succeed when irrigated on any of the ETo rates shown. Where dashes appear in the table, either the plant was not grown at that location or did not survive in large enough numbers to collect meaningful data.

Methods

PLANTING

Twenty-four plants of each taxon evaluated (Table 1) were placed 2 meters apart in rows 2 meters apart at each trial site. Plants were installed in fall 2017 and spring 2018, with bare-root roses planted in January or February 2018. In spring 2018 researchers replaced any plants that had perished after the initial planting, stock permitting. Rows were 1 meter wide and covered with 5-7 cm. (2-3") of chipped bark mulch. Rows were separated with a 1-meter wide exposed-soil path. Plants were placed according to a randomized complete block layout with two blocks (north and south) in the full sun field and with one block in the 50% shade field. The UC Davis trial field consists of Yolo silty clay loam soil and has the capability to evaluate plants in full sun or 50% shade conditions. The trial field in Irvine is located at the UCANR South Coast Research and Extension Center (South Coast REC). The field consists of San Emigdio fine sandy loam, is irrigated with reclaimed irrigation water, and had the capability to evaluate plants in full sun conditions only. Plants requiring partial shade conditions were only evaluated at UC Davis, while several that had previously evaluated in Davis were only evaluated during this trial period in Irvine. From fall 2017 to April 2019 researchers irrigated the plants regularly to fully establish them without stress. Irrigation was suspended during the winter as plants are expected to survive our mild, wet winters without irrigation.

IRRIGATION

From April 2019 to October 2019 researchers implemented deficit irrigation treatments at both sites. Plant material was irrigated according to a weather-based irrigation protocol with daily reference evapotranspiration (ET_o) information for each site retrieved from the California Irrigation Management Information System (CIMIS) and entered into a water budget worksheet. The irrigation treatment schedule is then arrived at by modifying the daily ET_o by the percentage associated with each treatment the way a crop or landscape coefficient is used. Researchers imposed three treatments 80%, 50%, and 20% of ET_o to correspond with the High, Moderate, and Low categories of water need listed in the Water Use Classification of Landscape Species (WUCOLS). Irrigation occurred for a particular treatment when it had accumulated an evapotranspiration (ET) deficit equal to 50% of plant available water (PAW), which aligns with common landscape irrigation practices. At each irrigation, any treatment received the same amount of water equal to 50% of PAW for its site. Researchers vary the frequency of irrigations based on each treatment's rate of ET_o accumulation, so that over the deficit season the highest treatment is irrigated more frequently than the lowest treatment. The hypothesis is that plants using water at a lower rate than the reference plant will take longer to use up the plant available water in the soil or, if all available water is used, they can withstand drought conditions until water is provided again.

Irrigation Notes:

1. Due to irrigator error, controllers in Davis were initially set to run 3 hours and 40 minutes instead of 3 hours and 4 minutes. Additional water was applied early in the season, however this water likely drained out of the wetted area. The scheduling system determining irrigation frequency was unaffected by this error. Additionally, unseasonably high precipitation in May effectively reset all treatments.

2. Because South Coast REC uses reclaimed water for irrigation, a 10% “leaching fraction” was added to the irrigation amount calculated as 50% of PAW, and the total volume was applied at each irrigation. This practice is used to prevent accumulation of salts in the soil, and potentially damaging plants. This is allowed in the Model Water Efficient Landscape Ordinance as a best management practice for landscapes using recycled or reclaimed water.

DATA COLLECTION

During the period of April to October when irrigation treatments were implemented, plant width, length, and height measurements were taken monthly. A plant growth index (PGI) was calculated to quantify the growth of plants using the formula $[(l + w)/2 + h]/2$, where l, w, and h represent length, width, and height of the plant. To account for differences in initial plant size, a relative plant growth index (RPGI) was calculated for each plant each month during the deficit irrigation treatments using the formula $PGIm/PGLi$, where PGLi stands for the initial PGI, and PGIm stands for the month’s PGI.

Qualitative performance ratings (on a scale of 1-5, 5 being the highest) were taken monthly in the following categories: foliage appearance, flowering abundance, pest tolerance, disease resistance, vigor, and overall appearance (the “WOW” factor). Researchers collected flowering abundance and overall appearance ratings twice monthly to more precisely capture flowering period and its effect on the overall appearance.

ANOVA and Tukey’s HSD post-hoc tests were used to assess differences between treatments. Irrigation recommendations represent the treatment with the least irrigation where growth, health, and aesthetics were not compromised.

Rating Note: After evaluating the ratings data collected at South Coast REC, the PIs feel that insufficient training using the ratings scale resulted in plants being consistently “under-rated.” The PI carried out the final ratings and based on a combination of Open House ratings and October ratings data collected by the more experienced plant judge, we have awarded the Blue Ribbon at South Coast REC to the three cultivars listed.

Outreach

In 2019, UCLPIT hosted three Open House Rating Events at each site (UC Davis and South Coast REC in Irvine, CA) in the spring, summer, and fall, corresponding to the beginning, middle, and end of deficit irrigation treatments. Participants evaluated established ornamentals planted 12-15 months before the first event: one individual plant each on the high (80%), moderate (50%), and low (20%) irrigation treatments for each taxon. Researchers selected the healthiest and best-looking individual on each treatment for each cultivar. The same individuals were then evaluated throughout the remaining events unless an individual died or ceased to accurately represent the aesthetic characteristics of its taxon.

At each event, participants rated plants on foliage quality, floral quantity, and overall appearance (See Table 5). All categories were evaluated on a 1-5 scale (1 being the lowest and 5 the highest). For the floral quantity category only, a score of 0 was included if flowers were absent at the time of evaluation. After rating the plants, participants were asked to complete a questionnaire indicating their professional background, if they learned anything about landscape irrigation, discovered any new plant material, if they would utilize any of the plant material observed, and to select their favorite and least favorite plants rated at the event.

Table 2. Site conditions at UC Davis and South Coast REC during the deficit season in 2019. All data obtained from CIMIS, <https://cimis.water.ca.gov/WSNReportCriteria.aspx>.

		April	May	June	July	August	Sept.	Oct.
UC Davis	Total ETo	5.93	6.25	8.86	8.25	7.52	5.85	5.39
	Total Precipitation	0.19	2.89	0.02	0.01	0.01	1.17	0.01
South Coast REC	Total ETo	4.93	4.84	4.67	7.13	6.89	5.17	4.91
	Total Precipitation	0.16	0.95	0.51	0.24	0.06	0.07	0.01

Table 3. Irrigation in full sun and shade fields at UC Davis.

SUN					
Irrigation % of ETo	Count of Irrigations	Avg. Interval (days)	Date		Total water applied (in.)
80	16	9	5/19, 5/31, 6/7, 6/14, 6/22, 6/30, 7/9, 7/18, 7/27, 8/4, 8/13, 8/22, 8/31		30.2
50	7	14	5/19, 6/6, 6/17, 6/29, 7/13, 7/27, 8/10, 8/25		18.3
20	4	36	5/19, 6/25, 7/29, 9/5		6.0
SHADE					
80	6	21	5/19, 6/10, 6/30, 7/22, 8/11, 9/1		11.7
50	4	32	5/19, 6/23, 7/22, 8/22		7.4
20	1	81	5/19, 8/8		1.9

Table 4. Irrigation in the full sun field at South Coast REC, includes the 10% leaching fraction.

Irrigation % of ETo	Count of Irrigations	Avg. Interval (days)	Date		Total water applied (in.)
80	16	10	4/5, 4/15, 4/26, 5/5, 5/25, 6/5, 6/14, 7/1, 7/7, 7/15, 7/24, 8/2, 8/11, 8/19, 8/27, 9/6, 9/15, 9/25, 10/10		27.1
50	7	18	4/5, 4/22, 5/10, 6/9, 7/1, 7/15, 7/28, 8/11, 8/25, 9/11, 10/3		14.9
20	4	58	4/5, 7/7, 8/13, 9/25		4.5

Table 5. Aesthetic rating rubric used by trials staff and open house participants.

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, glorious 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 (51-75%)	severely damaged and probably dying (>75% affected)
Vigor	pushing out a lot of new growth from every growing point	pushing out new growth from many growing points	Plant is surviving and healthy, but not pushing out much new growth, if any	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 species that lacks the WOW factor or is not quite at its prime	Acceptable but nothing special; may be past or not quite to its prime; might be better if more uniform; may be described as an 'okay' plant.	unacceptable for any of the above reasons	completely unacceptable and not likely to improve

Results & Discussion

Results are listed alphabetically by scientific name, with cultivar and trademark name, if applicable. In the individual narratives, the market or trademark name is used for simplicity. Recommended irrigation rates are derived from the lowest irrigation level where growth and best aesthetics were not compromised. Where a range of ETo rates is given, there were no significant differences between treatments, and while the plant may be expected to succeed when irrigated on any of the rates given, we recommend irrigating at the lowest level for water conservation. OA refers to the average Overall Appearance rating on the recommended irrigation level.

Full Sun Results

Acacia cognata 'ACGOG01' Cousin Itt

Location	Final W x H	Rec. Irr. Rate	Avg. OA Rating
South Coast REC	76 cm (30'') x 27 cm (11'')	Medium	3.1

Cousin Itt is a small shrub with fine leaves and a mounding, weeping habit. Over the trialing period, researchers observed non-uniform performance for this cultivar. Some individual plants appeared to enter a period of stasis at the beginning of their second fall in the ground (October 2018), while three plants in two different treatment groups died between January and April 2019 before the deficit treatment period started. This may be the result of poorly rooted material from the beginning, but we suspect Cousin Itt's incompatibility with reclaimed water for irrigation. By May, two more individuals on moderate water died and by July, three more plants on the low-water treatment died. The monthly overall appearance ranged from 2.3 to 3.5 out of 5 over the growing period (Table 6a) with the moderate irrigation scoring the highest (3.5) during the last three months. However, on each treatment there was one individual standout that established well and earned high overall appearance scores, both from researchers and open house participants. The disparity between open house ratings and researchers' ratings is a result of open house participants evaluating only the best-looking individual of each cultivar for each treatment (Table 6b) while the researchers' ratings are the mean of all individuals on the treatment. The high ratings from the open house participants show that Cousin Itt has the potential to be a really good-looking plant (Figure 19b). The uneven performance across treatments makes it difficult to ascertain the cause of poorly performing plants, and several had a shower of dropped yellow leaves under them that was quite unattractive (Figure 19a). They also tended to carry brown leaves on the lower canopy that were visible. During the deficit period there was no significant difference between treatments for either measurements or aesthetic ratings, although uneven mortality makes this a more uncertain calculation (Figure 1b). Based on a combination of quality ratings and survival rates, we recommend irrigating Cousin Itt on moderate water in WUCOLS zone 3, and not using reclaimed water.

In our experiences with Cousin Itt during this and a previous trial, we found this plant can be beautiful and highly impactful. During the open house, participants made note of the variation between the plant material in the field and their own challenges growing Cousin Itt. As a result, our recommendation is to carefully choose robust, well-rooted material when working with this Acacia.

***Dianella revoluta* ‘Allyn-Citation’ Coolvista™**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	96 cm (38") x 75 cm (30")	Low	4.2
South Coast REC Final	131 cm (52") x 85 cm (33")	Low	3.1

Coolvista™ is a short, grass-like plant with blue green leaves in the Asphodelaceae. Among open house attendees, Coolvista™ was more popular in Southern California than at UC Davis (Tables 7b and 7d). Participants “loved the form & small purple berries” which were described as intriguing (Figure 20c). In response to a query from some participants, we performed a brief online search and discovered the berries were not edible. Some participants did mention concerns of the spreading habit of this cultivar and of the dead flower stalks. At both UC Davis and South Coast REC we managed the previous year’s dried flower stalks in late winter by gently folding the foliage, causing them to break near the base of the plant. The stalks could then be cleaned out by combing through the plant with a pair of gloved hands. In both sites we observed that the plant will put on new growth from the base more rapidly and loosely than previously evaluated *Dianella* cultivars that formed tighter clumps.

The plants in Southern California were larger at the end of the trial than those in Northern California, though the growth rate between the plants was similar (Figures 2a and 2b). The larger size may be due solely to the longer growing season at South Coast REC. The final overall appearance score in both sites approached or exceeded a 4 out of 5 (Tables 7a and 7c). Differences in flowering between the sites were also observed. At UC Davis the plants put on a single show in May with nearly all plants scoring a 4 or 5. A few plants continued to score 4 or 5 until August, with a few more scoring 1 and 2, though there was no significance between treatments. Flowering at South Coast REC showed peak bloom in April 2019 (Figure 20a). The plants continued to bloom through October, albeit with a decrease in the number of flowers, with a majority of the plants continuing to push out some flowers, compared to the handful in Davis that continued. With comparable growth rates and quality ratings on all treatments, we recommend Coolvista™ be irrigated on low water in WUCOLS zones 2 and 3.

***Elaeagnus x ebbingei* ‘Viveleg’ Olive Martini™**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	112 cm (44") x 99 cm (39")	Low	4.5
South Coast REC Final	127 cm (50") x 108 cm (42")	Low	3.7

Olive Martini™ is an evergreen shrub with shimmery grey-green leaves edged with creamy yellow. This cultivar possesses metallic scales on the leaf typical of other cultivars. In

late winter/early spring, the new growth on this plant emerged with a matte finish, giving the plant a dull metallic hue for roughly a week before developing the leaf coloration described above (Figure 21a). The handsome, uniform shape, contributed to consistently high foliage quality and overall appearance ratings of this plant in both locations, making it a standout (Figure 21b). Participants mentioned this cultivar was “more interesting than other *Elaeagnus* in commercial landscaping.” Plants from at least one treatment were given high enough overall appearance ratings to earn a place in the top 3 ranked plants at the summer and fall open houses at both sites.

At UC Davis, the high treatment displayed significantly greater relative plant growth than the low treatment over the treatment period (Figure 3b). On a month by month basis, significant differences started occurring in August and continued to October. In October there was also significantly greater RPGI on the moderate compared to low treatment. In Irvine researchers observed significant differences in the RPGI only between the high and low treatments when looking over the entire treatment period, though not on a month by month basis (Figure 3d). No differences in the quality ratings were observed between treatments at either site, suggesting that growth may be controlled on low water resulting in a reduced pruning need without compromising plant health. Based on the data collected, we recommend Olive Martini™ be irrigated on low water in WUCOLS zones 2 and 3.

***Grevillea x hybrida* 'Kings Celebration'**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
South Coast REC Final	244 cm (96") x 190 cm (75")	Low	2.9

Researchers planted #1 sized material at both sites in October 2017. During the winter of 2017-2018, most (21 of 24) plants perished in Davis. Researchers were unable to source replacement plants for Davis and this species was not evaluated there. However, the survivors were left in the ground until the end of the trial and, anecdotally, they flowered as abundantly and reached sizes comparable to *Grevillea* ‘Kings Fire’ by the time the trial was removed in October 2019 (Figure 23).

The plants in Irvine were not affected by cold, though they were affected by chlorosis, most likely in response to reclaimed water (Figure 22b). (*Grevilleas* from Western Australia are known for being intolerant of phosphorous.) Over the entire deficit season the high treatment showed significantly more relative growth than the moderate treatment. We don’t put great store by the apparent significant differences in relative growth between the low and moderate treatment in October, because other characteristics of this plant, including a tendency to have branch breakage are likely responsible for the difference.

Quality ratings between the treatments were similar with no significant differences occurring (Table 9a). Chlorosis drove down the foliage and overall appearance ratings. While the high treatment produced larger plants, the relative growth rate between the high and low treatments was similar; as a result, researchers recommend irrigating Kings Celebration at low water in WUCOLS zone 3.

***Grevillea x hybrida* 'Kings Fire'**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	266 cm (105") x 174 cm (69")	Low	4.8
South Coast REC Final	54 cm (21") x 40 cm (16")	NR ¹	2.1

Researchers planted #1 sized material at both sites in October 2017. During the winter of 2017-2018, most (20 of 24) plants perished at UC Davis. Researchers were able to source #5-sized replacement plants for UC Davis and this cultivar was replanted in early May 2018. Adversity occurred at both sites. At UC Davis, the potting medium in the #5 containers deteriorated during establishment resulting in the upper portions of the root ball being exposed. Since the “skirt” of branches on this plant went to the ground, this went unnoticed until mid-winter when strong north winds caused substantial stem breakage and entire plants to lean over due to the lack of solid root ball anchorage. After researchers discovered the issue, plants were staked as needed, though some stem breakage continued throughout the growing season at both sites. In Irvine, plants became chlorotic and stunted, again as a result of the reclaimed water. While mortality occurred at UC Davis (n=3), the rate of mortality at South Coast REC was 11 individuals at the beginning of the deficit period, and 17 of 24 had perished by the end of the trial. That said, despite the issues mentioned there was a wide disparity in performance between UC Davis and South Coast REC, with Kings Fire performing well and scoring highly with open house participants in Davis (Table 10b).

At UC Davis there was no difference in growth between treatments (Figure 5b). Both researchers and open house participants rated ‘Kings Fire’ highly (Tables 10a and 10b). The continuous bloom from the cultivar was popular with bees, hummingbirds, and people (Figure 24a). During the Fall Open house, ‘Kings Fire’ was one of the top three rated plants based on overall appearance ratings and participants’ favorite plant of the event. Based on the data collected, researchers recommend ‘Kings Fire’ be irrigated on low water in WUCOLS zone 2. Cultivation recommendations include checking root structure when planting and pruning out potential branch splits to prevent damage and maintain a pleasing shape. Due to the amount of mortality we were unable to collect enough data to make an irrigation recommendation for WUCOLS zone 3, but do not recommend it for irrigation with reclaimed water.

***Lavandula x allardii* 'Meerlo'**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	97 cm (38") x 57 cm (22")	Low	4.4
South Coast REC Final	161 cm (63") x 72 cm (28")	Low	3.6

Lavandula ‘Meerlo’ is a small shrub with aromatic foliage possessing creamy yellow variegated leaf margins making it a lovely foliage contrast in the field (Figure 25a). ‘Meerlo’ performed well and was popular with open house participants in both Davis and South Coast REC. In Davis, participants enjoyed the compact shape, colors, and scent. Typically this cultivar

¹ Not recommended in this region using reclaimed water

is not grown for its blooms, but at South Coast REC we were surprised to discover that ‘Meerlo’ can be quite floriferous, especially when compared to the very few blooms observed in Davis (Figure 25b). ‘Meerlo’ was the #1 favorite plant of participants at the spring, summer, and fall open house events at South Coast REC and the highest rated plant based on overall appearance at each event. At UC Davis it was in the top three highly rated plants on overall appearance at the summer and fall events. In the fall it ranked #1 as the plant most were likely to use professionally.

Likely due to the longer growing season, plants at South Coast REC attained a greater height and width than those at UC Davis, though relative growth rates were similar between sites. At each site, no differences were observed between the high, moderate, and low treatments in either RPGI data or quality ratings. As a result we recommend ‘Meerlo’ be irrigated on low water in WUCOLS zones 2 and 3.

***Lagerstroemia indica* 'Conlagras' Bellini® Raspberry**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	80 cm (32") x 48 cm (19")	Low	3.8
South Coast REC Final	59 cm (23") x 52 cm (20")	Medium	3.2

Bellini® Raspberry is an ultra-compact version of the common *Lagerstroemia* shrubs on the market (Figure 26). This cultivar has orange-pink new growth and magenta-pink flowers. At open house events at UC Davis the most frequently mentioned aspect of Bellini® Raspberry was its smaller size relative to the more commonly grown shrub cultivars. While some were concerned about the size, one participant remarked that the small size was a strong selling point for them as they couldn’t fit a larger crape myrtle in their garden, but they would consider growing this variety as a potted plant. At UC Davis, there was no difference between treatments in the ratings data collected, except that the low and high irrigation levels had higher flowering rates overall than the moderately watered plants (Table 12a). At UC Davis, a significant difference in the relative growth rates between the high treatment compared to the moderate and low treatments was observed over the deficit period (Figure 7b). While maximum growth for this cultivar will be achieved on high water, due to the lack of difference in aesthetics rating, we recommend Bellini Raspberry be irrigated on low water in WUCOLS zone 2.

At South Coast REC the plants were affected by herbicide drift which stunted their growth and negatively affected their quality ratings (Table 12c), and since all treatments were not exposed equally to the herbicide, this confounds the statistical analysis. Over the deficit period there was a significant difference between the relative growth rates of the high and intermediate treatments (Figure 7d). During the same period there was a significant difference between the moderate and low treatments in the foliage and overall appearance ratings. In both the growth measurements and aesthetic ratings, differences were not observed on a monthly level. Based on our findings at South Coast Bellini Raspberry should be irrigated on

moderate water in WUCOLS zone 3. However due to the drift issue, researchers would welcome testing either this cultivar again or a related variety in the future.

***Muhlenbergia capillaris* 'Irvine' Plumetastic®**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
South Coast REC Final	202 cm (79") x 107 cm (42")	Low	3.3

Researchers planted #1-sized material at both sites in October 2017. During the establishment period in Davis most of the plants struggled and roughly half of the plants failed by March 2019. Based on the remaining number of plants and the variation in vigor and appearance, researchers did not collect data on Plumetastic® in Davis. We previously evaluated another *M. capillaris* cultivar at the Davis site, 'White Cloud', and had similar results. We would be interested in evaluating either this cultivar or another *M. capillaris* cultivar with spring planting to determine if the timing of planting (i.e. fall vs. spring) has an impact on survival and performance and to clarify if this species is or is not suitable for this area and/or perhaps our heavy soil, as both our soil and climate are quite unlike the region where the species is native (the southeastern U.S.).

The performance of this cultivar in Irvine was quite different than in Davis. Although this plant performed acceptably on low water, with the overall appearance on this treatment reaching "very good" by October, this plant performed best on high water in Irvine. Growth, flowering, and foliage quality were all significantly higher on high water at some point in the season (Table 13a, Figure 8a). Unfortunately, flowering started to take off roughly a month after the last open house, so attendees never got to see this cultivar at its best. Participant ratings at open houses in Irvine increased through the seasons as growth increased (Table 13b). The final mid-October ratings were collected by researchers as flowering was starting to hit its stride, and the mean floral score ranged from three to four depending on the treatment (Figure 27). If our protocols allowed, we would have liked to collect data for several more months to get a better picture of this grass's best feature. Based on the data collected, Plumetastic® may be grown successfully on low water in zone 3, though to obtain best results irrigating on high water should be considered. It should also be noted that this grass was tolerant of reclaimed water.

***Rhaphiolepis umbellata* 'RutRhaph1' Southern Moon®**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	36 cm (14") x 22 cm (9")	Low	3
South Coast REC Final	72 cm (28") x 38 cm (15")	Medium	3.2

Southern Moon® is a small shrub with deep green foliage and coppery new growth. As with several other plants evaluated in both sites this year, Southern Moon® grew much larger at South Coast REC and outperformed those at UC Davis. Southern Moon® was one of the top three highest rated plants as measured by overall appearance scores at the South Coast REC spring open house, where participants responded positively to the foliage quality and remarked

on the disease resistance relative to other *Rhaphiolepis* cultivars they knew (Table 14d; Figure 28b).

At UC Davis there was no difference in growth between treatments (Figure 9b). Unfortunately, plants in all three treatments declined in growth over the season, with only seven of 24 plants showing positive plant growth relative to their April size. Over the same period, mean overall appearance scores for each treatment declined as well, with no statistical difference between the treatments. A significant difference in disease resistance was observed between the high and low treatments, (the low treatment showed more resistance), but this difference was outgrown during the heat of summer (Table 14a). Researchers observed spotting and necrotic leaf tips that resembled *Entomosporium* leaf spot early on, but new growth covered most of it by July (Figure 28a). Based on our results we recommend irrigating Southern Moon® on low water in WUCOLS zone 2.

At South Coast REC there was a significant difference in relative growth rate between the high and low treatments, beginning in July and continuing for the remainder of the trial period, indicating a strong treatment effect (Figure 9d). The early difference in growth rates between moderate and low treatments was outgrown by August. Quality differences were observed between the high and low treatments in the vigor and overall appearance categories (Table 14c), and by October several plants on low water were showing drought stress symptoms yielding an additional difference between the moderate and low treatments. Due to the differences in performance between the high and low treatment, our data indicates this is not a low water use cultivar in sandy soil when using reclaimed water, even with a leaching factor. However, differences between the high and moderate water treatments were insignificant, and the aesthetic ratings between these treatments were comparable. We therefore recommend growing Southern Moon® on moderate irrigation in WUCOLS zone 3.

***Rosa x hybrida* 'Meijecycka' Limoncello™**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	164 cm (64") x 76 cm (30")	Low	4.1
South Coast REC Final	150 cm (59") x 77 cm (30")	Low	3.2

Limoncello™ is a low-growing shrub or groundcover rose with simple, vivid yellow flowers borne in clusters (Figure 29a). As they age, the flowers change from a bright to a pastel yellow and then to white before the petals shatter, giving the impression of multi-colored pastels most of the time (Figure 29b). This rose was exceptionally good at self-cleaning. In Davis, the first full flush of bloom was in early May and it repeated again in July, though there were some blooms on the plants all the time (Table 15a). In Irvine’s cooler weather and often gray June and July days, the flowering on this rose did not reach the same levels as it did in Davis (Table 15c). It did bloom throughout the growing season in Irvine, if at lower levels than Davis. At both sites Limoncello™ was cut back to 1/3 its size in winter 2019.

Limoncello™ was popular with participants at the spring open house at UC Davis when it was in its first flush of bloom, earning it the number three spot on participants’ favorite plant

lists (Table 15b). Although some insect damage was observed in Davis it didn't much affect overall appearance, and it was virtually disease-free. Some minor powdery mildew was observed on plants in Irvine. These roses suffered some from the side effects of herbicide drift at our South Coast REC site. Roses are highly sensitive to herbicides, and the lower scores on this are due to these effects in some part. There was some leaf stunting and chlorosis, which we put down more to the herbicide than to any reclaimed water effect. There were no significant differences between treatments in growth (Figures 10b and 10d) or quality ratings at either site, with the exception of transitory vigor differences at South Coast REC. We recommend irrigating Limoncello™ on low water in WUCOLS zones 2 and 3.

***Rosa x hybrida* 'Meijocos' Pink Drift®**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
South Coast REC Final	98 cm (39") x 30 cm (12")	High	3.2

Pink Drift® is a low spreading groundcover rose (generally under 18" tall) with bright pink single flowers (Figure 30). As the flowers age the petals change to white before shattering. Maintenance consisted of cutting the canes to a height of 6-8" in January 2019 using an electric hedge trimmer. Pink Drift® was not as floriferous as other roses trialed; the highest floral display rating earned by an individual plant over the deficit season was 3 of 5 (Table 16a). However, 16 of 24 were flowering each time researchers collected ratings. We previously evaluated this plant in Davis (2014-2016) where it bloomed prolifically and was disease-free. By contrast, the flowering in Irvine was 2 to 3 points lower in each month and leaves suffered from chlorosis, tip burn (presumably from reclaimed water), and powdery mildew. In short, we recommend this plant be used in hotter, drier, sunnier inland locations rather than on the coast where it never scored higher than average overall appearance in any month on any treatment, and sometimes lower.

Over the deficit season the low treatment showed significantly lower growth than the high and moderate treatments (Figure 11b). Throughout the treatment period, only the high irrigation level maintained acceptable overall appearance each month with a significant difference between it and the low and moderate treatments. Based on the data collected, we recommend irrigating Pink Drift® on high water in WUCOLS zones 3 if using reclaimed water. This is in stark contrast to our zone 2 location where this rose performed beautifully with high scores on low water.

***Rosa x hybrida* 'Meiradena' Icecap™**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
South Coast REC Final	158 cm (62") x 122 cm (48")	Low	3.5

Icecap™ is a shrub rose purported to be a competitor for *Rosa* 'KORbin' Iceberg. Icecap™ has a handsome, rounded, dense form with eggshell white, almost cuplike rosette-shaped blooms which fade to sepia and hold on the plant a long time before shattering (Figure 31). Icecap™ bloomed throughout the season with peak bloom in May. Shrubs were virtually

smothered in blooms in May with mean floral display ratings of each treatment ranging from 4.4 to 4.8 (1-5 scale, 5 is highest). A second flush occurred in July, albeit with lower mean floral display ratings ranging from 3 to 3.7 (Table 17a). All plants had at least one flower open each time researchers rated them. Its tendency to hold on to dead flowers, however, was a notable detractor from the overall appearance.

Researchers cut back the plants to 1/3 size in February 2019. The only significant difference in subsequent relative plant growth index observed was between the moderate and low treatment in October. However, there were only minor differences in quality between the treatments until October, and we recommend irrigating Icecap™ on low to moderate water in WUCOLS region 3 if using reclaimed water.

***Rosa x hybrida* 'Meitraligh' Brick House™**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	118 cm (46") x 78 cm (31")	Low	4.1
South Coast REC Final	116 cm (46") x 78 cm (31")	Low	3

Brick House™ is a shrub rose with rich red semi-double blooms. Roses were planted in both sites in February 2017. In February 2019, roses at both sites were pruned to 1/3 their size. One participant recorded that “the color is gorgeous, but the blossom is not that pretty.” We had several conversations about this amongst ourselves and others. Brick House™ flowers do not meet classical standards of cut rose beauty. However this rose is not for cutting, it is a shrub rose that churns out bold, rich, red flowers, and the overall impression is lovely (Figure 32a). Brick House™ was well received by UC Davis open house participants generally scoring above 4 in the overall appearance ratings. At the UC Davis spring open house participants were queried if they would use any of the plants evaluated, the highest scoring UCLPIT plant was Brick House™, 46 people (55%) responded they would use it.

In Davis, peak bloom occurred in May and July 2019. All but one plant were rated as 4 or 5 for floral display (1-5 scale, 5 is highest). Aside from the two major flushes of bloom, plants maintained some level of bloom continuously over the treatment season (Figure 32b). Whereas the mean overall appearance rating for each treatment at UC Davis was 4.1 out of 5, at South Coast REC the same ratings only reached 3 - 3.2 out of 5. This is likely due to the lower floral display scores at South Coast REC. In Davis, the mean Floral Display score ranged from 1.6 to 4.9 out of 5 (Table 18a). At South Coast REC, mean Floral Display scores ranged from 1.0 to 2.3 of 5 (Table 18c). Unlike Davis, researchers did not observe any large flushes of bloom at South Coast REC. Also, unlike Davis, powdery mildew was observed on some plants in Irvine. It should also be noted that in our California sites, this rose’s foliage began to decline in September, looking as though its growing period was drawing to a close, which is somewhat earlier than other roses we have evaluated.

No differences in relative plant growth or quality ratings between the treatments were observed at UC Davis or South Coast REC. Based on our findings, we recommend irrigating Brick House™ on low water in WUCOLS zones 2 and 3.

***Rosa x hybrida* 'Radwhite' White Knock Out®**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	117 cm (46") x 67 cm (26")	Low	4.3
South Coast REC Final	113 cm (44") x 67 cm (26")	Low	3.1

White Knock Out® is a shrub rose bearing simple, white flowers with contrasting yellow stamens and an impressively long and consistent blooming habit (Figure 33a). At the UC Davis spring open house, White Knock Out® was one of the highest rated plants, achieving mean overall appearance ratings on all treatments with scores of 4.4 to 4.6 out of 5 (Table 19b). At the summer South Coast REC open house, a similar feat was achieved with two plants ranking in the top 3 of the highest mean overall appearance ratings for their treatment (Table 19d). White Knock Out® flowers fade to tan and they can persist a bit long on the plant before self-cleaning (Figure 33b). At UC Davis, this tendency negatively impacted scoring by both open house participants and researchers, but not negatively enough to keep it from receiving our Blue Ribbon award for outstanding low-water performers (Table 19a). At UC Davis, White Knock Out® bloomed heavily in May and June and then continued to be a strong bloomer until the end of the treatment period in October. As with other roses in our trials, White Knock Out® was not as floriferous at South Coast REC as in Davis, though there were constantly some blooms on the plants from April through October (Table 19c).

At UC Davis, no difference in relative growth rates between the treatments was observed (Figure 13b). In Irvine, the relative growth was noticeably and significantly greater on the high treatment than either the moderate or low treatments, though the moderate treatment had outgrown this difference by September (Figure 13d). That said, none of the health or aesthetic ratings were significantly different between the treatments except for vigor, and large size alone is not necessarily preferable. Therefore, we recommend irrigating White Knock Out® on low water in WUCOLS zones 2 and 3.

***Vitex x hybrida* 'Bailtexone' Flip Side®**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	239 cm (94") x 120 cm (47")	Low	4.4
South Coast REC Final	272 cm (107") x 146 cm (57")	Low	3.4

The trade name Flip Side® was derived from this *Vitex* cultivar's foliage, where the upper side of the leaf is green while the underside is silvery lavender. As the breezes blow, the leaves flip around giving a two-tone shimmery look. At UC Davis Flip Side® was completely deciduous, dropping its leaves in late November 2018. At South Coast REC Flipside dropped most of its foliage in January 2019, though some foliage remained on the plants. At both sites plants had completely leafed out with new foliage by April 2019. To maintain uniformity and prevent these from encroaching on neighbors during the 2019 growing season, all plants were pruned in March 2019 to reduce the size by 1/3.

At UC Davis, participants rated Flip Side® highly at the open houses, with mean overall appearance scores for most treatments qualifying in the top three highest scoring plants for

both summer and fall (Table 20b). At South Coast REC, spring open house scores were depressed as the plant had just started to leaf out (Table 20d). Researchers poorly timed this first event and Flip Side® was among several plants that had not fully emerged from dormancy. As the season progressed scores increased. At South Coast REC, however, Flip Side® was somewhat negatively affected by the same early summer herbicide drift issue that affected some roses, and some new growth emerged distorted just in time for the summer open house. Symptoms disappeared by July and foliage was rated highly on all treatments from July through October (Table 20c). These blooms were among the favorites of our pollinators in the field.

At UC Davis and South Coast REC no differences in growth between the treatments were observed (Figures 14b and 14d). At both locations, the Flip Side® bloomed heavily in mid-summer, in July and August in Davis, and August and September at South Coast REC (Tables 20a and 20c; Figure 34). In August there was a significant difference in floral quantity between the moderate and low treatment in Davis. Other than this difference there were no other statistically significant differences between the treatments on either a month-to-month basis or over the entire deficit season in Davis. At South Coast REC, a significant difference in overall appearance ratings was observed between the high and moderate treatments, with the moderate treatment achieving higher scores. No other significant differences between treatments appeared at South Coast REC. Based on the data collected, we recommend irrigating Flip Side® on low water in WUCOLS zones 2 and 3.

50% Shade Results

Distylium 'Vintage Jade'

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	100 cm (39") x 39 cm (16")	Medium	3.8

‘Vintage Jade’ is a low-growing plant used as a foliage or “foundation” shrub. It has interesting leathery, bright green leaves that are held on branches that fan out around the center and are held mostly horizontally (Figure 35). It was previously evaluated in the full sun at UC Davis during the 2016-2018 trial, where it did not perform well and frequently showed symptoms of sunburn. To discover if this species would prefer some shade in our Central Valley conditions, we evaluated it under the 50% shade cloth in the 2017-2019 trial. With light but consistent shade, the foliage remained green, with lighter coppery-green new growth and no signs of sunburn. With mean overall appearance scores at open houses between 3.2 and 3.9, participants found this plant acceptable to good (Table 21b).

Plant growth was not significantly different between treatments until October 2019 when the mean high-treatment RPGI was greater than the low treatment (Figure 15b). Half of

the plants on the low treatment actually declined in growth over the season, with dieback showing up in August. Another interesting thing to note: Growth on the high treatment began to pull away from the moderate treatment as well as the low in October, though it is not statistically significant at this point. Since the trial ends in October, we can only speculate that this pattern may have continued in subsequent months or years until that difference was significant. Keep in mind that the difference in total irrigation events between the high and moderate is a mere 2 (Table 3). Traditionally the deficit treatment season starts in early/mid-April when rainfall has ended. April measurements are then used as a baseline for the relative plant growth index and May data collection is typically the first instance after treatments have been imposed. However, after the high treatment had received one irrigation, enough rain fell in mid-May to refill the soil profile, effectively delaying any potential treatment effects.

Similar to the measurements pattern, quality ratings in September and October showed significant differences between the high and low treatments, and moderate and low treatments in foliage quality and overall appearance (Table 21a). These two ratings tracked closely since this is a shrub grown for foliage rather than flowers. This led to the average for the year being definitively lower on the low treatment. Overall this plant performed in the good to very good range, with the highest appearance scores on moderate water in September. We recommend ‘Vintage Jade’ be grown in at least partial shade and irrigated on moderate water in WUCOLS region 2.

***Hydrangea paniculata* 'Renhy' Vanilla Strawberry™**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	105 cm (41") x 66 cm (26")	Medium	3.7

Vanilla Strawberry™ gets its name from its blooms starting out white and fading to light pink, eventually turning deep pink with a sepia tinge (Figures 36a and 36b). Plants were pruned in February 2018 and 2019 in accordance with common horticultural practices. In our consistent light shade, these plants had an open, loosely fountain-form shape especially when the large, heavy blooms weighed the branches down. It’s possible that full morning sun and afternoon shade may have produced a denser form. In the spring, new stems were colored red with similar appearance to *Cornus sericea* (red osier dogwood). Flowering began in mid-June and peaked in July 2019, with high floral display scores maintained through September 2019 due to the continued interest provided by the changing colors of the bloom rather than new blooms (Table 22a). Though some flowers remained in October, they ceased to provide floral impact. Based on mean overall appearance scores at the open house, participants found Vanilla Strawberry™ acceptable to good at the spring and summer open houses, scoring equally as well at each event. Although this plant did not score as high on the ratings as other plants at the open house in summer (Table 22b), more participants nevertheless listed it as their favorite at the summer open house by a wide margin (21 votes, 46 participants). Its charming blooms and lovely color won them over.

A significant difference between the relative growth rates of the high and low treatments was observed beginning in July (Figure 16b), showing that, even in shade, this is not a low-water plant. Over the deficit season, differences in overall appearances between all treatments were significant (Table 22a).

Floral quantity ratings of the high and moderate treatments are notably different from the low rating. Based on comments collected during the aesthetic ratings, the low treatment appeared to produce smaller flowers than other treatments, though this was not something we measured. Significant differences in vigor, foliage quality, and overall appearance of the high and moderate treatments compared to those qualities of the low were observed from July through October. By the end of the season the plants on the low treatment were noticeably stressed. We recommend Vanilla Strawberry™ be irrigated on high water in WUCOLS region 2 for best appearance, though acceptable health and flowering may be experienced on moderate irrigation.

***Mahonia x media* 'Marvel'**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	105 cm (42") x 132 cm (52")	Low	3.6

Mahonia ‘Marvel’ is a shrub composed of layers of stiff green leaves with a spine at each tip. These are arranged along upright, unbranching stems (Figure 37b). The new buds emerge almost cycad-like and grow in a vertical fashion reaching a shape reminiscent of a closed fan. Then the tight growth bursts open revealing a cluster of soft fleshy leaves colored either fresh chartreuse or earthy, copper-brown, depending on their stage of growth (Figure 37a). In early winter, this plant hosts racemes of yellow flowers followed by clusters of small, oblong blue berries. Flowering did not occur during the first or second winter during the trial. Through happenstance we left roughly half of the plants in the ground, and this most recent winter (their third), all remaining plants flowered.

No significant differences in relative growth were observed between the treatments (Figure 17b). The quality ratings also showed no differences between treatments, making this truly a low-water plant. Rust pustules were observed using microscopy on some plants during the establishment year, but it was completely outgrown in the second year and no evidence of it was later found. In the late winter/early spring of 2019, researchers observed what appeared to be thrips damage, indicated by misshapen new growth with gray necrotic portions remaining on the leaves as they aged. While mature growth on this cultivar is thick and stiff, new growth is fairly tender and fleshy making it more prone to early pest damage. This pest issue weighed down the foliage quality, pest resistance, and overall appearance scores, but there was no irrigation treatment effect related to it, yielding very good scores late in the season (Table 23a), and no lasting effect on plant health. As the plants grew and new growth covered damaged foliage, scores improved to very good by September. This pest issue had not been observed by our cooperator or the primary investigator who planted it in her own garden and may be unique to our situation where roses are hosts to a healthy thrips population. Foliage damaged

by the stiff leaves scraping or piercing the leaflets below them in the wind was also observed. That said, ‘Marvel’ attracted many admirers due to its strong architectural stature and striking presence, and from a distance the foliage damage was all but unnoticeable. Based on participants votes, ‘Marvel’ was voted the favorite plant at the summer open house and came in second at the spring and fall events. The striking foliage and form along with the interesting changes during the season also made this a staff favorite. Based upon our results we recommend irrigating ‘Marvel’ on low water in WUCOLS zone 2.

***Rhododendron* 'Robleza' Autumn Bonfire™ Encore® azalea**

Location	Final W x H	Rec. Irr. Rate	Avg. O/A Rating
UC Davis Final	42 cm (17") x 28 cm (11")	High	3.9

Autumn Bonfire™ is a dwarf azalea with vivid red flowers, whose buds sparkle like garnets among the green foliage (Figure 38a). In the early spring before data collection began, there was a short period where the plants were covered in bloom and more red than green. This cultivar was very slow growing at our site, attaining only a fraction of its listed height (3.5' x 3') in two years. Azaleas are known for preferring slightly acidic conditions and good water quality, as well as rich, well-drained soil. None of these conditions are found in our UC Davis site where the soil is heavy and neutral, and the water contains boron. This may account for the decline in foliage ratings in October (Table 24a; Figure 38b). The differences in quality ratings between the treatments occurred in both monthly ratings and when looked at over the entire period. Significant differences between the treatments began in June and continued through October in at least one, if not all, of the following parameters: foliage quality, vigor, and overall appearance. The general pattern that prevails is that the high treatment is significantly better in overall appearance than the moderate or the low treatment. However, by October, even the moderate treatment had better overall appearance than the low. Over the entire treatment period there was no statistical difference between the moderate and low treatment’s overall appearance. It should be noted that the low treatment failed to rebloom in Autumn.

No differences in growth were observed on a monthly level or over the season as a whole. As with other plants trialed in the shade, it is possible that Autumn Bonfire™ would prefer a location with morning sun and afternoon shade, rather than continuous semi-shade. Based on the combination of data collected, we recommend irrigating Autumn Bonfire™ on high water in WUCOLS zone 2 to obtain the best quality of plants.

Appendix A

Data Tables & Charts



Full Sun Data

Table 6a. *Acacia cognata* 'ACGOG01' Cousin Itt average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET ₀ %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.9	3.0	2.7	3.1	3.3	3.3	3.2	3.1
	50	2.5	3.0	2.8	3.0	3.5	3.5	3.5	3.1
	20	2.5	2.3	2.7	2.7	3.0	3.0	3.1	2.7
Foliage	80	3.1	3.1	2.9	2.9	3.1	3.3	3.3	3.1
	50	2.7	3.5	2.8	3.0	3.5	3.3	3.4	3.1
	20	2.8	2.3	2.7	2.8	3.2	3.4	3.6	3.0
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pest Resistance	80	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
	20	5.0	4.9	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	2.9	3.1	2.7	2.7	2.7	2.7	3.7	2.9
	50	2.8	3.8	3.3	3.3	3.0	3.0	4.0	3.3
	20	2.8	2.5	2.3	2.3	2.6	2.8	3.6	2.7

Table 6b. Open House participant ratings for *Acacia cognata* 'ACGOG01' Cousin Itt on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET ₀ %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	4
	Mean	3.8	3.5	3.0	3.2	3.2	3.1	4.3	4.3	2.8
	Median	4.0	4.0	3.0	3.0	3.0	3.0	5.0	4.0	3.0
	Min	2	2	1	2	2	2	1	3	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	4
	Mean	3.9	3.6	3.1	3.4	3.4	3.2	4.3	4.3	2.9
	Median	4	4	3	3	3	3	5	4	3
	Min	2	2	2	2	2	2	1	3	1
Floral Display	Max	0	4	3	0	0	5	1	3	2
	Mean	0.0	0.1	0.1	0.0	0.0	0.4	0.0	0.1	0.1
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

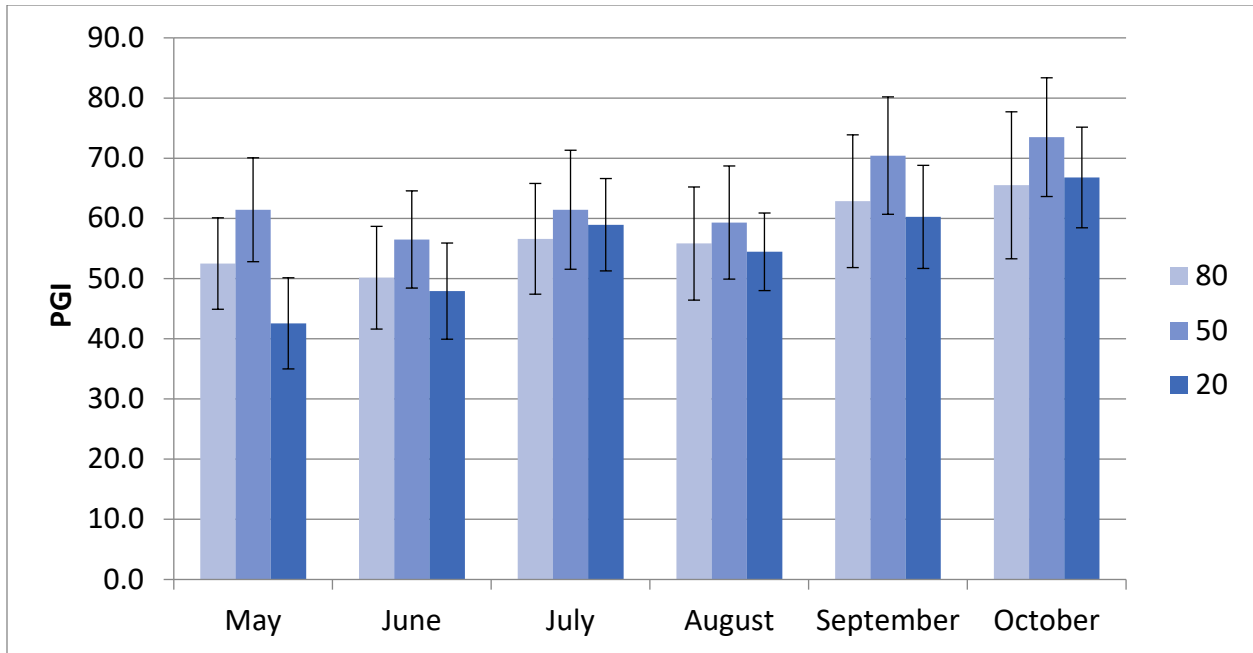


Figure 1a. *Acacia cognata* 'ACGOG01' Cousin Itt average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

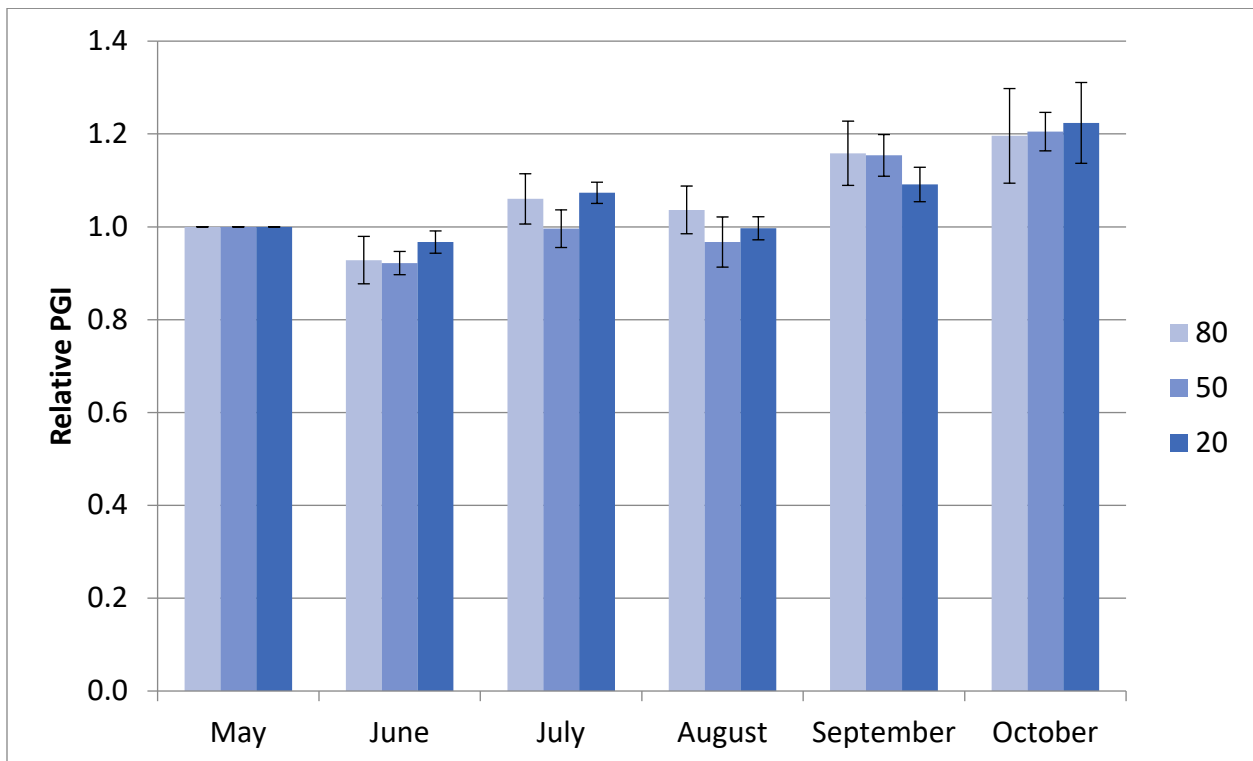


Figure 1b. *Acacia cognata* 'ACGOG01' Cousin Itt average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 7a. *Dianella revoluta* ‘Allyn-Citation’ Coolvista™ average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	4.0	4.8	4.0	4.3	4.0	4.0	4.1	4.2
	50	4.0	4.9	4.3	4.3	4.0	4.0	4.0	4.2
	20	4.0	4.9	4.0	4.1	4.0	4.0	3.7	4.1
Foliage	80	4.0	4.9	4.1	4.9	4.2	4.1	4.9	4.4
	50	4.5	5.0	4.8	5.0	4.1	4.0	4.9	4.6
	20	4.6	4.9	4.3	4.9	4.0	4.0	4.6	4.4
Flower	80	0.0	4.3	0.1	0.6	0.6	0.0	0.0	0.8
	50	0.0	4.5	1.8	0.3	0.0	0.0	0.0	0.9
	20	0.0	4.3	0.1	0.0	0.0	0.0	0.0	0.6
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.9	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
	20	4.9	4.9	4.9	5.0	4.9	5.0	5.0	4.9

Ratings with different superscripts are significantly different using ANOVA and Tukey’s Post-Hoc, $p \leq .05$.

Table 7b. Open House participant ratings for *Dianella revoluta* ‘Allyn-Citation’ Coolvista™ on 3 ETo-based irrigation levels at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	3.9	3.9	3.9	3.4	3.6	3.5	3.5	3.5	3.5
	Median	4	4	4	3	4	3	4	3	4
	Min	2	2	3	0	2	2	2	0	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	4.0	4.1	4.1	4.0	4.0	3.9	3.9	3.8
	Median	4	4	4	4	4	4	4	4	4
	Min	2	3	2	3	3	2	3	3	1
Floral Display	Max	5	5	5	3	3	3	4	5	5
	Mean	0.8	1.3	1.4	0.4	0.2	0.2	0.4	0.5	0.5
	Median	0	1	1	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

Table 7c. *Dianella revoluta* 'Allyn-Citation' Coolvista™ average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.1	3.1	3.1	3.1	3.1	3.1	3.7	3.2
	50	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.1
	20	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.1
Foliage	80	3.0	3.0	3.0	3.0	3.0	3.0	4.1	3.2
	50	3.0	3.0	3.0	3.0	3.0	3.0	4.1	3.2
	20	3.0	3.0	2.9	2.9	2.9	2.9	3.9	3.0
Flower	80	3.3	1.1	1.0	1.0	0.6	0.0	0.0	1.0
	50	3.0	1.0	0.9	1.0	0.3	0.0	0.0	0.9
	20	2.6	1.3	0.7	1.0	0.1	0.1	0.0	0.8
Pest Resistance	80	5.0	5.0	5.0	5.0	5.0	4.9	5.0	5.0
	50	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	20	4.7	4.9	4.9	4.9	5.0	5.0	5.0	4.9
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.1	4.1	3.7	3.7	3.6	3.4	4.7	3.9
	50	4.0	4.0	3.6	3.6	3.5	3.1	5.0	3.8
	20	3.9	3.9	3.6	3.6	3.6	3.3	4.4	3.7

Table 7d. Open House participant ratings for *Dianella revoluta* 'Allyn-Citation' Coolvista™ on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	4
	Mean	3.9	4.1	4.2	3.3	3.1	3.4	3.0	3.0	2.8
	Median	4	4	4	3	3	3	3	3	3
	Min	2	1	3	2	1	1	1	2	1
Foliage Quality	Max	5	5	5	5	4	5	5	5	5
	Mean	3.8	4.1	4.1	3.7	3.2	3.5	3.6	3.4	3.4
	Median	4	4	4	4	3	3	4	4	3
	Min	2	2	2	2	2	3	2	2	1
Floral Display	Max	5	5	5	5	4	5	3	4	3
	Mean	1.0	1.3	1.2	1.3	1.5	1.5	0.3	0.2	0.3
	Median	0	0	0	1	1	1	0	0	0
	Min	0	0	0	0	0	0	0	0	0

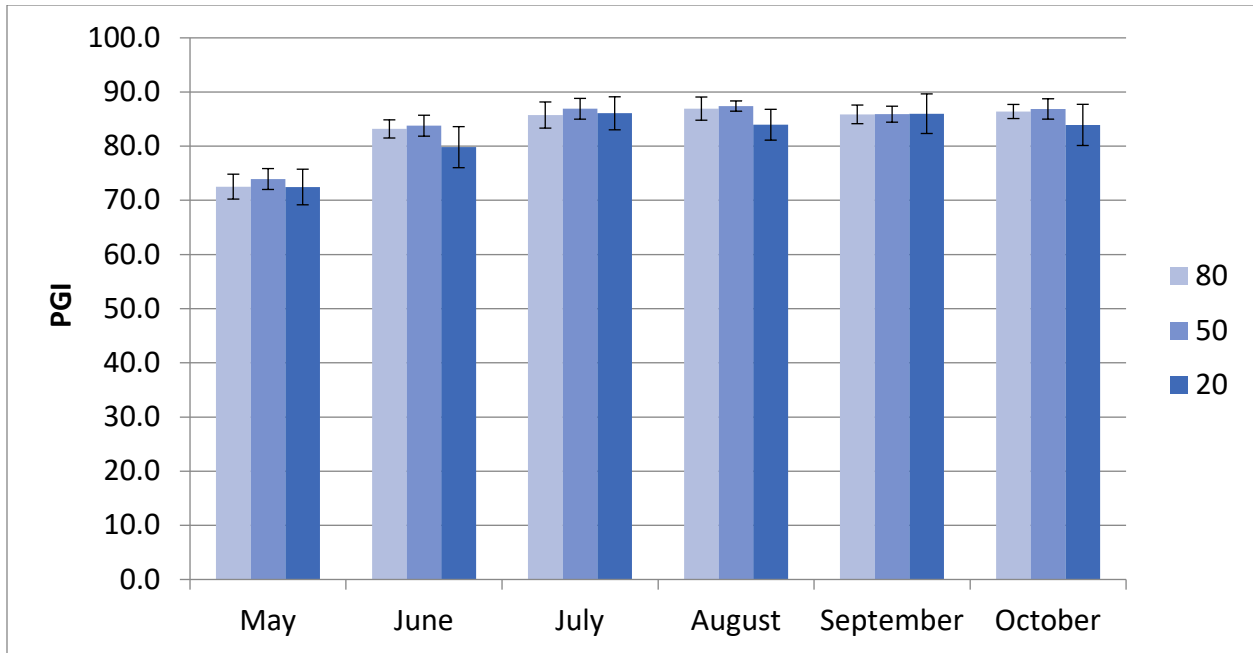


Figure 2a. *Dianella revoluta* 'Allyn-Citation' Coolvista™ average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

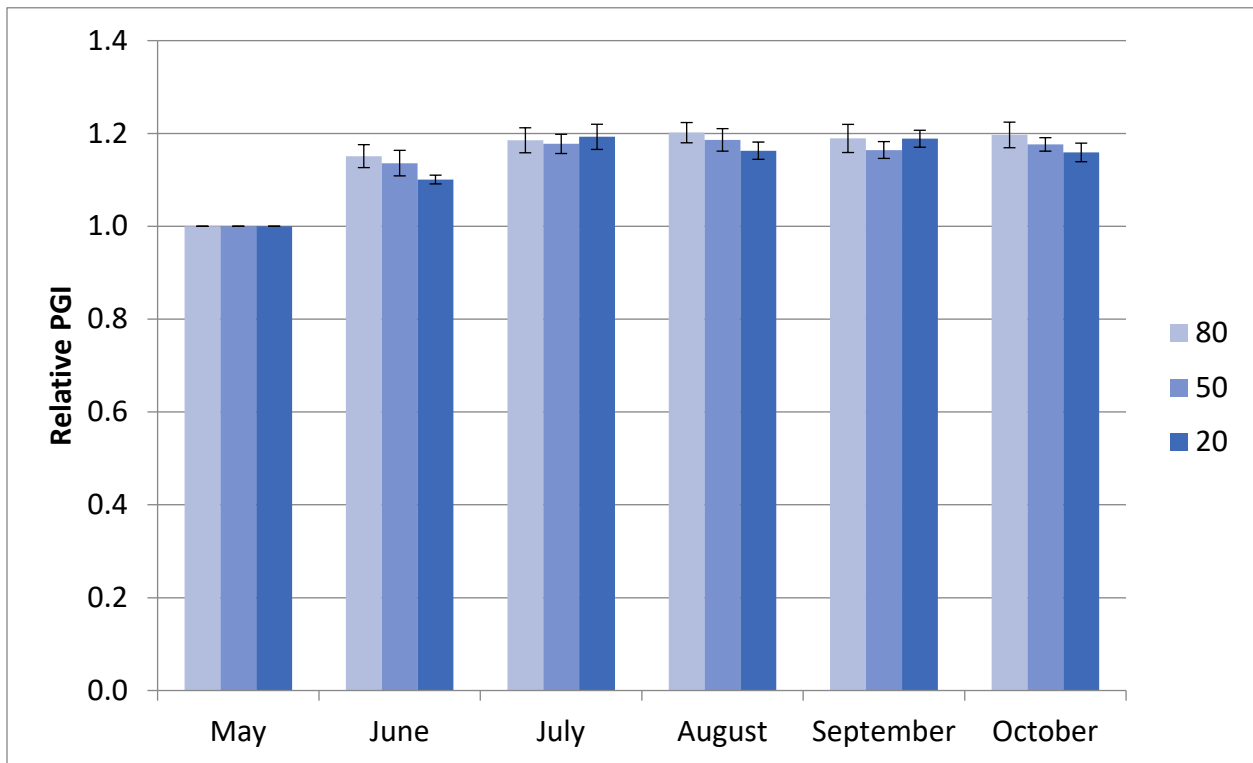


Figure 2b. *Dianella revoluta* 'Allyn-Citation' Coolvista™ average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

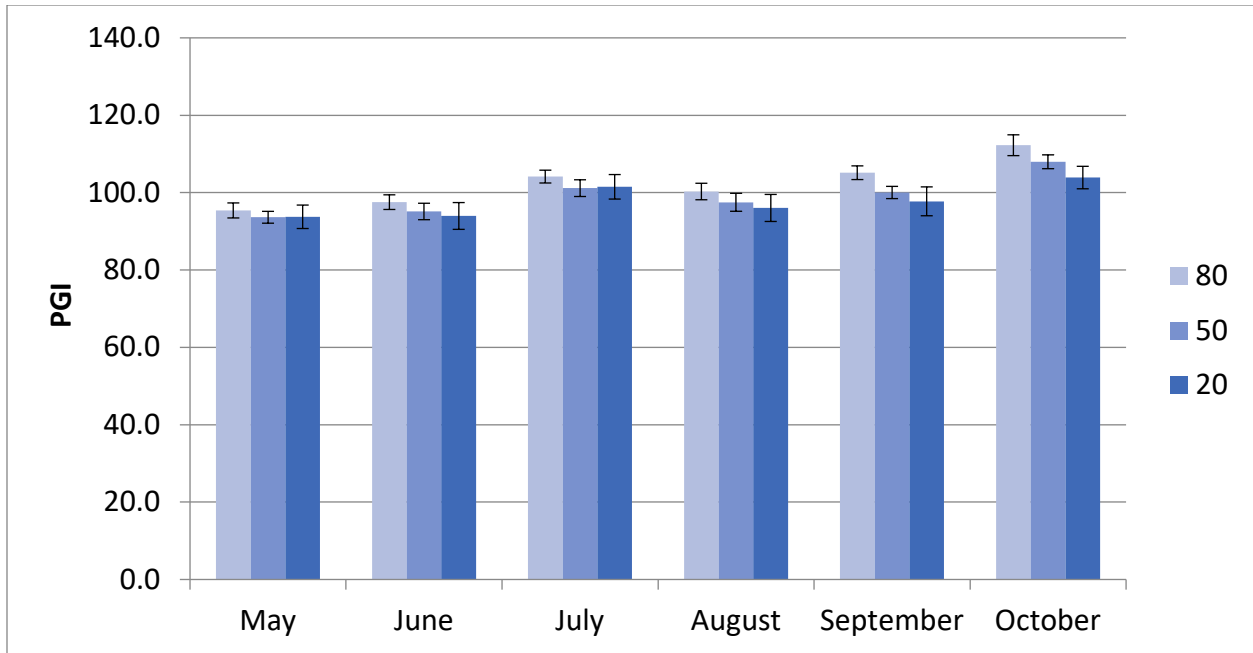


Figure 2c. *Dianella revoluta* 'Allyn-Citation' Coolvista™ average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

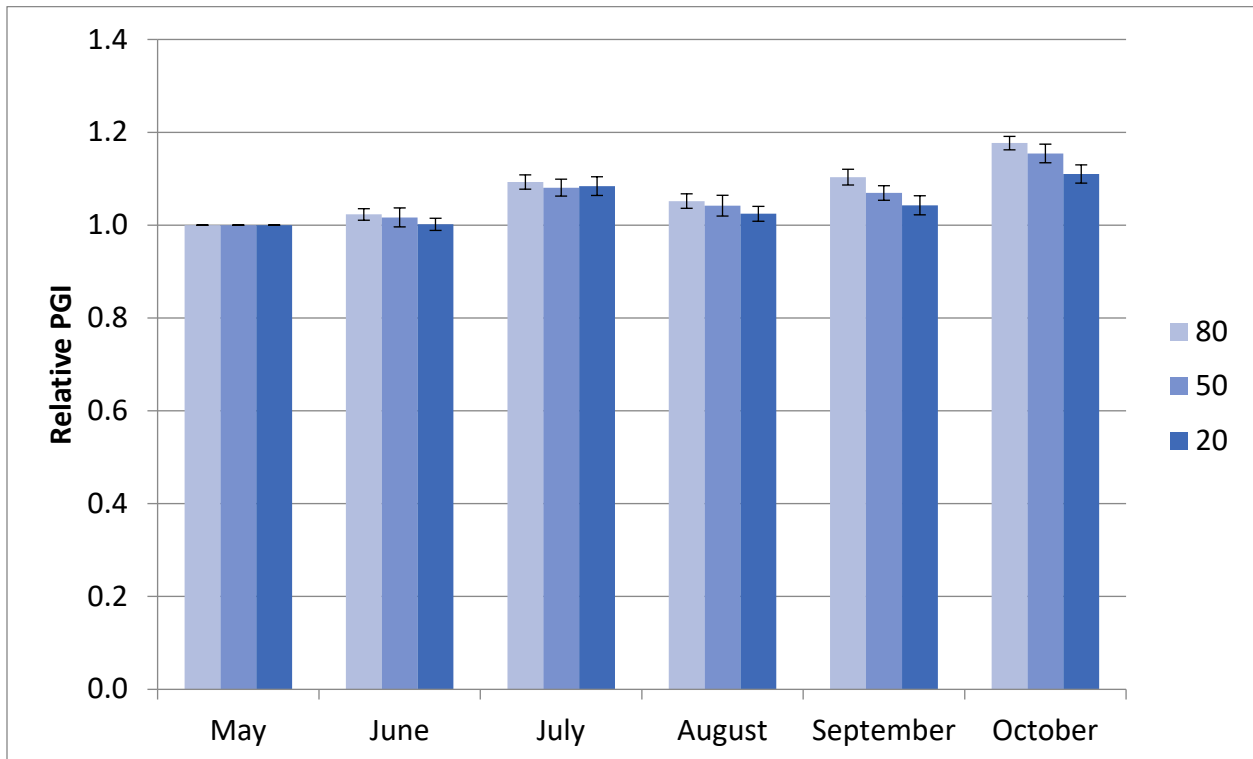


Figure 2d. *Dianella revoluta* 'Allyn-Citation' Coolvista™ average monthly relative plant growth index (rPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 8a. *Elaeagnus x ebbingei* ‘Viveleg’ Olive Martini™ average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	4.0	4.1	4.4	4.6	4.9	4.9	5.0	4.6
	50	3.8	4.0	4.2	4.9	5.0	4.8	4.9	4.5
	20	3.9	4.0	4.7	5.0	5.0	4.2	4.6	4.5
Foliage	80	5.0	5.0	4.9	5.0	4.9	4.7	4.9	4.9
	50	5.0	5.0	5.0	5.0	4.9	4.5	4.5	4.8
	20	5.0	5.0	5.0	5.0	4.9	3.8	4.5	4.7
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	5.0	5.0	4.9	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.3	4.7	4.9	4.7	5.0	5.0	5.0	4.8
	50	4.4	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.4	5.0	5.0	5.0	5.0	4.9	5.0	4.9

Table 8b. Open House participant ratings (scale 1-5, 5 = highest) for *Elaeagnus x ebbingei* ‘Viveleg’ Olive Martini™ on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.1	3.8	4.0	4.1	4.0	4.1	3.9	3.5	3.6
	Median	4	4	4	4	4	4	4	3	3
	Min	2	2	2	1	0	2	2	2	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.4	4.2	4.3	4.4	4.5	4.4	3.8	3.5	3.4
	Median	5	4	4	5	5	5	4	4	3
	Min	2	1	2	1	1	2	1	1	0
Floral Display	Max	4	4	3	5	5	5	0	0	0
	Mean	0.1	0.1	0.0	0.3	0.3	0.3	0.0	0.0	0.0
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

Table 8c. *Elaeagnus x ebbingei* 'Viveleg' Olive Martini™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	3.4	3.4	3.5	3.8	3.6	4.6	3.6
	50	3.4	3.5	3.8	3.9	4.0	3.8	4.9	3.9
	20	3.0	3.6	3.8	3.8	3.8	3.5	4.3	3.7
Foliage	80	4.4	4.4	4.3	4.5	4.4	3.8	4.4	4.3
	50	4.0	4.3	4.9	4.8	4.8	4.0	4.9	4.5
	20	4.1	4.4	4.3	4.4	4.5	3.8	4.0	4.2
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pest Resistance	80	4.9	4.9	4.6	4.6	4.8	4.3	5.0	4.7
	50	4.8	4.6	4.9	4.8	4.6	4.6	5.0	4.8
	20	4.8	4.8	4.5	4.8	4.6	4.5	5.0	4.7
Disease Resistance	80	5.0	5.0	4.9	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
	20	5.0	5.0	4.9	4.9	4.9	5.0	5.0	4.9
Vigor	80	4.0	4.0	4.3	4.3	4.0	3.4	4.9	4.1
	50	4.0	4.0	4.1	4.1	3.8	3.4	5.0	4.1
	20	4.0	4.0	4.0	3.9	3.9	3.4	4.8	4.0

Table 8d. Open House participant ratings (scale 1-5, 5 = highest) for *Elaeagnus x ebbingei* 'Viveleg' Olive Martini™ on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	3.9	3.9	3.7	4.5	4.5	4.2	4.2	3.9	3.9
	Median	4	4	4	5	5	4	4	4	4
	Min	2	2	2	3	3	3	1	1	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.1	4.0	3.8	4.8	4.6	4.5	4.4	4.0	4.3
	Median	4	4	4	5	5	5	5	4	5
	Min	2	1	1	4	3	3	1	1	1
Floral Display	Max	3	4	3	10	3	0	5	0	0
	Mean	0.1	0.1	0.1	0.6	0.2	0.0	0.2	0.0	0.0
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

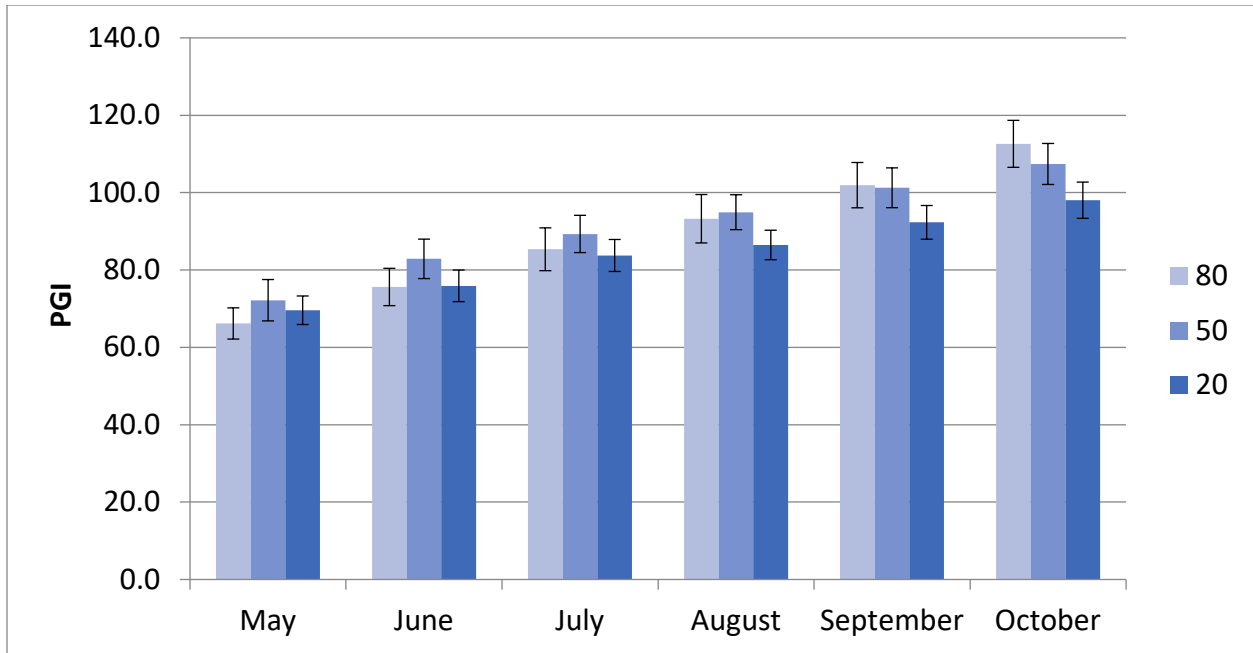


Figure 3a. *Elaeagnus x ebbingei* 'Viveleg' Olive Martini™ average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

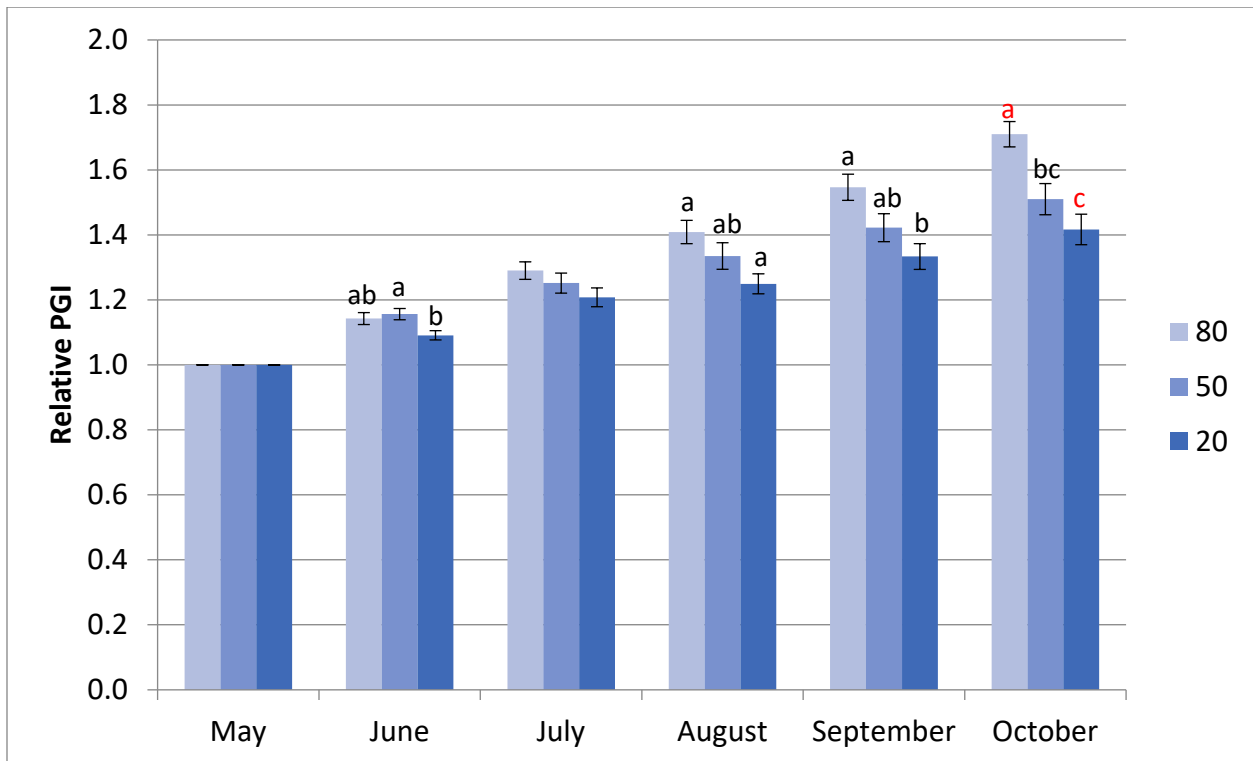


Figure 3b. *Elaeagnus x ebbingei* 'Viveleg' Olive Martini™ average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or $p \leq 0.01$ (in red).

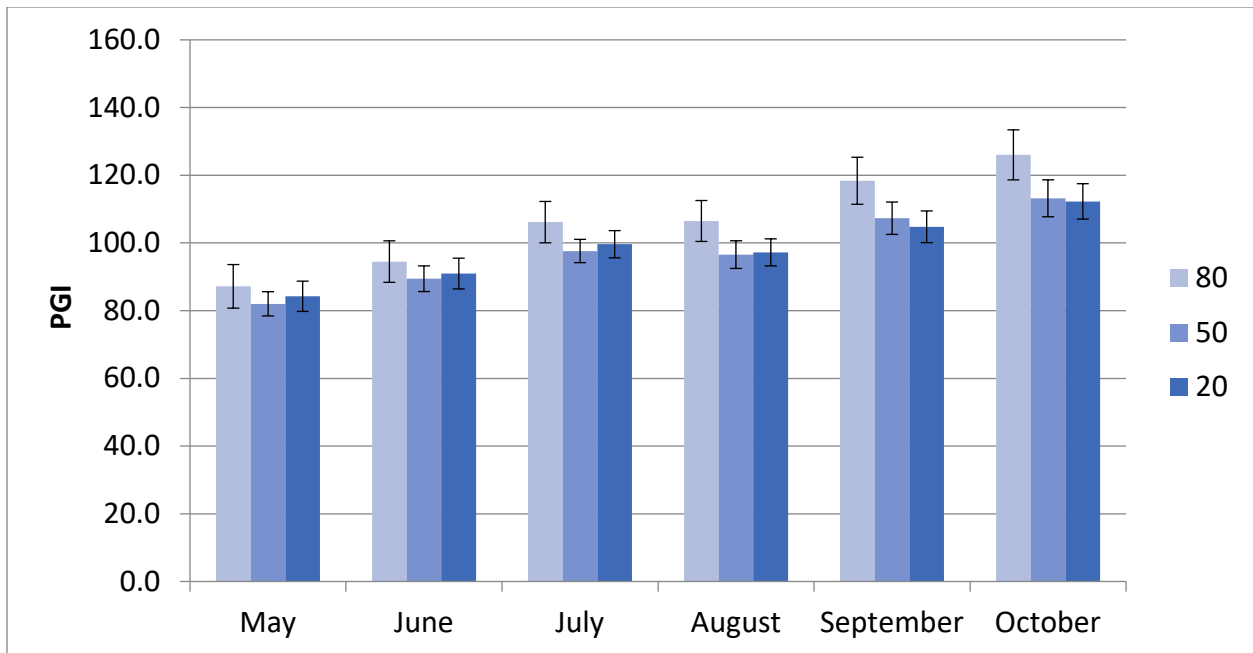


Figure 3c. *Elaeagnus x ebbingei* 'Viveleg' Olive Martini™ average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

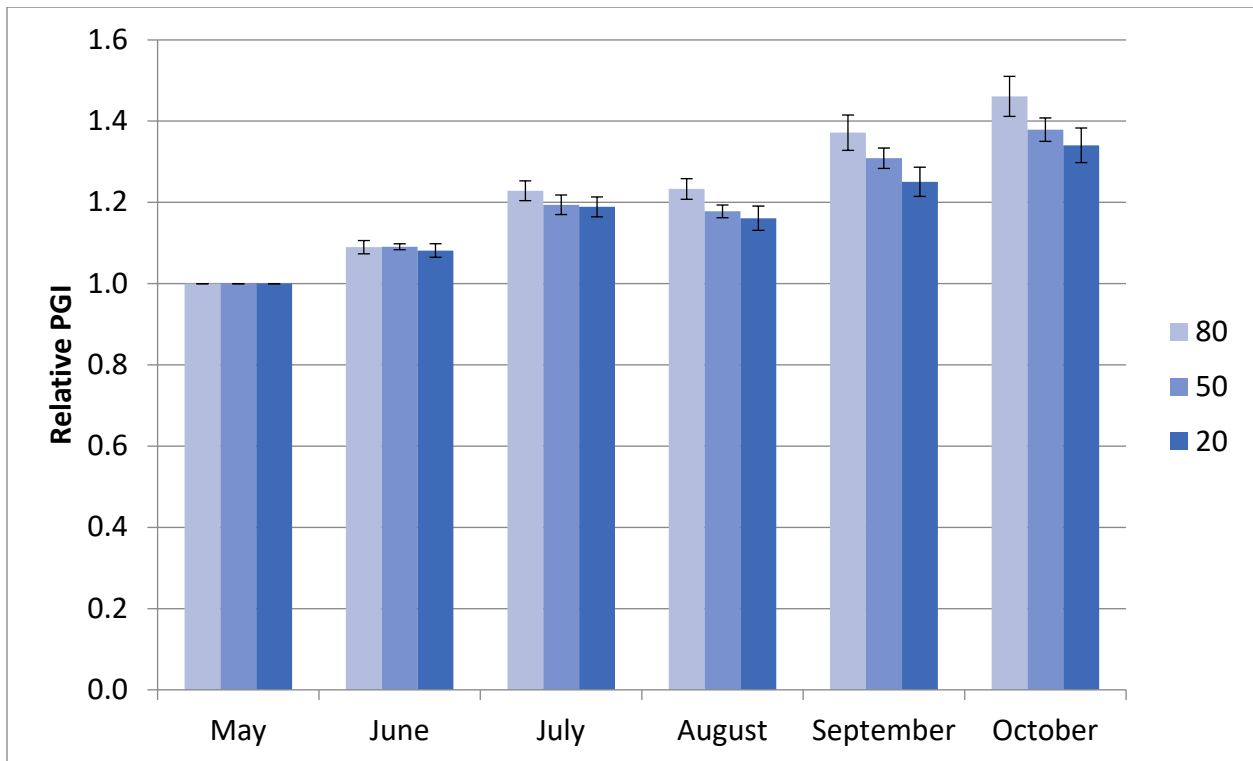


Figure 3d. *Elaeagnus x ebbingei* 'Viveleg' Olive Martini™ average monthly relative plant growth index (rPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 9a. *Grevillea* 'Kings Celebration' average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.0	3.2	3.3	3.3	3.3	2.2	3.0
	50	3.0	3.1	3.1	3.1	3.1	3.1	1.9	2.9
	20	3.0	3.0	3.0	3.0	3.0	3.2	1.9	2.9
Foliage	80	3.0	3.0	3.2	3.2	3.2	3.0	2.2	3.0
	50	3.0	3.0	3.0	3.0	3.0	3.0	1.9	2.8
	20	3.0	3.0	3.0	3.0	3.0	3.0	1.8	2.8
Flower	80	3.7	3.2	3.3	3.3	2.8	2.5	1.0	2.8
	50	3.6	3.3	3.3	2.6	2.4	2.3	0.9	2.6
	20	3.0	2.8	3.2	3.2	2.3	2.3	0.8	2.5
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.0	4.0	4.2	4.2	3.7	3.5	2.8	3.8
	50	4.0	4.0	4.1	4.1	3.7	3.6	2.1	3.7
	20	4.0	3.8	4.0	4.0	3.7	3.5	2.8	3.7

Table 9b. Open House participant ratings (scale 1-5, 5 = highest) for *Grevillea* 'Kings Celebration' on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.3	4.2	4.4	4.6	3.8	3.8	3.8	3.5	3.6
	Median	4	4	5	5	4	4	4	3	4
	Min	2	2	1	3	3	2	2	2	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.0	4.0	4.2	4.5	3.6	3.7	3.8	3.6	3.4
	Median	4	4	4	5	3	4	4	4	3
	Min	2	2	2	3	2	2	2	2	2
Floral Display	Max	5	5	5	5	5	5	5	5	5
	Mean	4.0	4.1	4.3	4.6	4.3	4.1	3.5	2.5	3.1
	Median	4	4	4	5	4	4	4	2	3
	Min	2	2	0	4	3	2	1	0	1

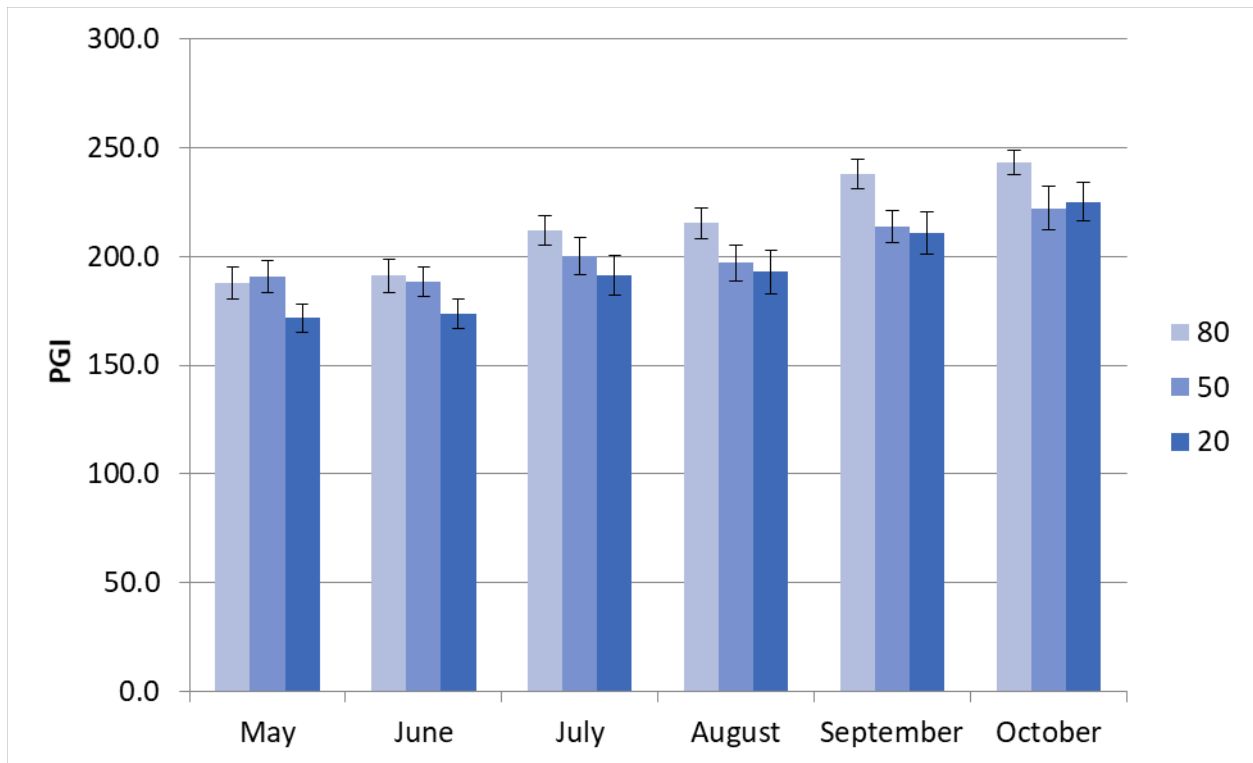


Figure 4a. *Grevillea* 'Kings Celebration' average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

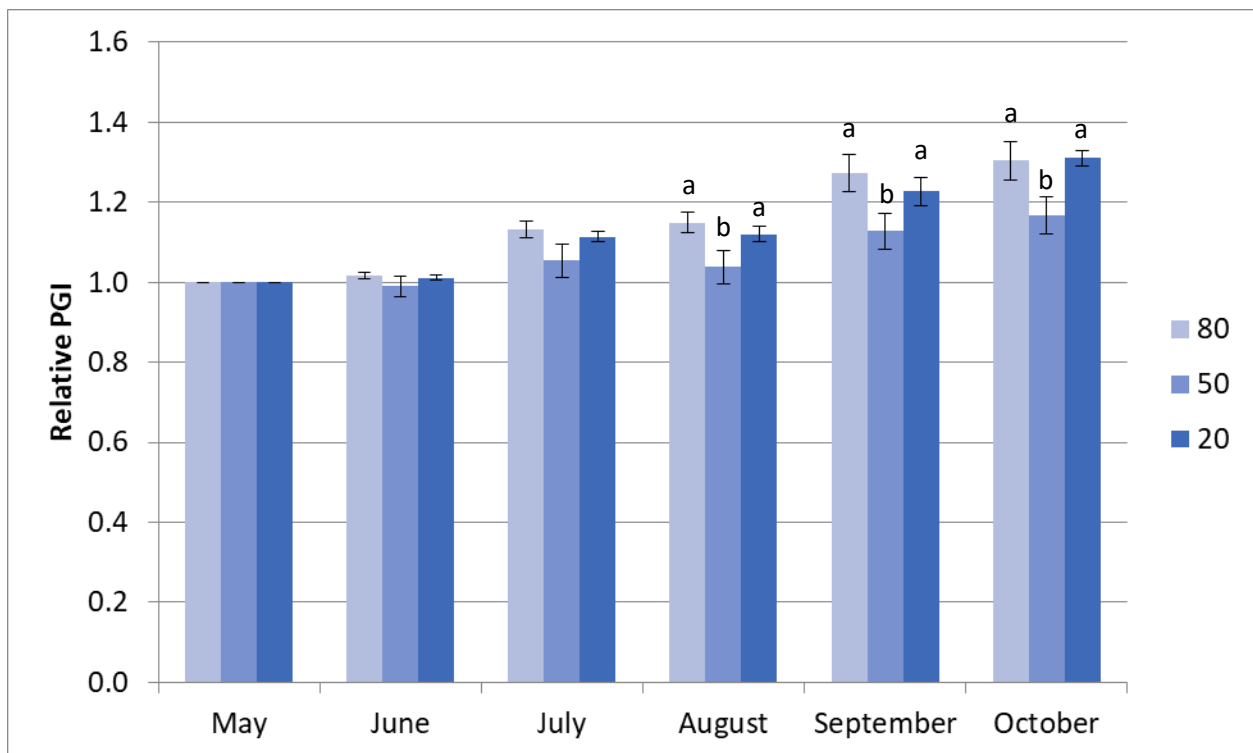


Figure 4b. *Grevillea* 'Kings Celebration' average monthly relative plant growth index (rPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Table 10a. *Grevillea* 'Kings Fire' average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.6	4.6	4.8	4.4	5.0	4.8	4.6	4.5
	50	3.8	4.3	4.8	4.3	4.8	4.9	4.8	4.5
	20	3.9	4.4	4.6	4.8	4.9	4.8	4.5	4.6
Foliage	80	4.3	4.9	4.7	4.7	4.9	4.4	3.9	4.5
	50	4.8	4.8	4.8	4.8	5.0	5.0	4.5	4.8
	20	4.5	4.6	4.9	4.9	4.9	4.5	3.8	4.6
Flower	80	1.1	1.6	4.9	2.4	4.7	4.1	4.1	3.3
	50	1.0	1.5	4.8	2.5	4.7	4.7	3.8	3.3
	20	0.8	1.8	5.0	3.4	4.9	4.9	4.4	3.6
Pest Resistance	80	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	50	4.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	5.0	5.0	5.0	4.9	5.0	5.0	5.0	5.0
	50	4.8	4.7	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.9	4.9	5.0	4.9	5.0	5.0	5.0	4.9

Table 10b. Open House participant ratings for *Grevillea* 'Kings Fire' on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.0	4.0	4.0	3.8	4.0	4.2	4.3	4.4	4.6
	Median	4	4	4	4	4	4	4	5	5
	Min	2	2	2	2	2	0	2	3	3
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.3	4.4	4.6	4.5	4.5	4.8	4.4	4.5	4.9
	Median	4	5	5	5	5	5	5	5	5
	Min	2	1	2	3	2	3	2	3	3
Floral Display	Max	5	5	5	5	5	5	5	5	5
	Mean	2.9	1.8	1.9	3.0	3.1	3.1	4.0	4.0	4.0
	Median	3	2	2	3	3	3	4	4	4
	Min	0	0	0	0	1	1	0	2	2

Table 10c. *Grevillea* 'Kings Fire' average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	1.8	1.8	1.8	2.0	1.7	1.7		1.8
	50	2.0	2.0	2.0	2.2	2.2	2.8	1.3	2.1
	20	1.7	2.0	2.5	2.5	2.5	2.5	1.0	2.1
Foliage	80	2.0	1.5	2.0	2.5	2.0	2.0		2.0
	50	2.0	2.0	2.0	2.2	2.2	2.8	1.3	2.1
	20	1.7	2.0	2.5	2.5	2.5	2.5	1.0	2.1
Flower	80	0.3	0.3	0.3	0.3	0.5	0.5	0.0	0.3
	50	0.3	0.3	0.3	0.5	0.3	1.0	0.7	0.5
	20	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	2.0	1.8	2.3	3.0	2.0	2.0		2.2
	50	2.2	2.3	2.3	2.6	2.6	3.0	1.0	2.3
	20	2.0	2.5	3.0	3.0	3.0	2.5	1.0	2.4

Table 10d. Open House participant ratings for *Grevillea* 'Kings Fire' on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	4	5	4	4
	Mean	2.3	2.7	3.1	2.4	3.3	2.8	1.3	2.4	2.3
	Median	2	2	3	2	3	3	1	2	2
	Min	1	1	1	1	2	2	1	1	1
Foliage Quality	Max	5	5	5	5	5	5	5	4	4
	Mean	2.3	2.9	3.2	2.4	3.4	3.3	1.3	2.5	2.4
	Median	2	3	3	2	4	4	1	2	2
	Min	1	1	1	1	2	2	1	1	1
Floral Display	Max	4	5	5	5	3	2	4	4	3
	Mean	1.3	0.1	1.1	1.6	0.2	0.9	0.9	1.6	1.3
	Median	1	0	1	1	0	1	1	1	1
	Min	0	0	0	1	0	0	0	0	0

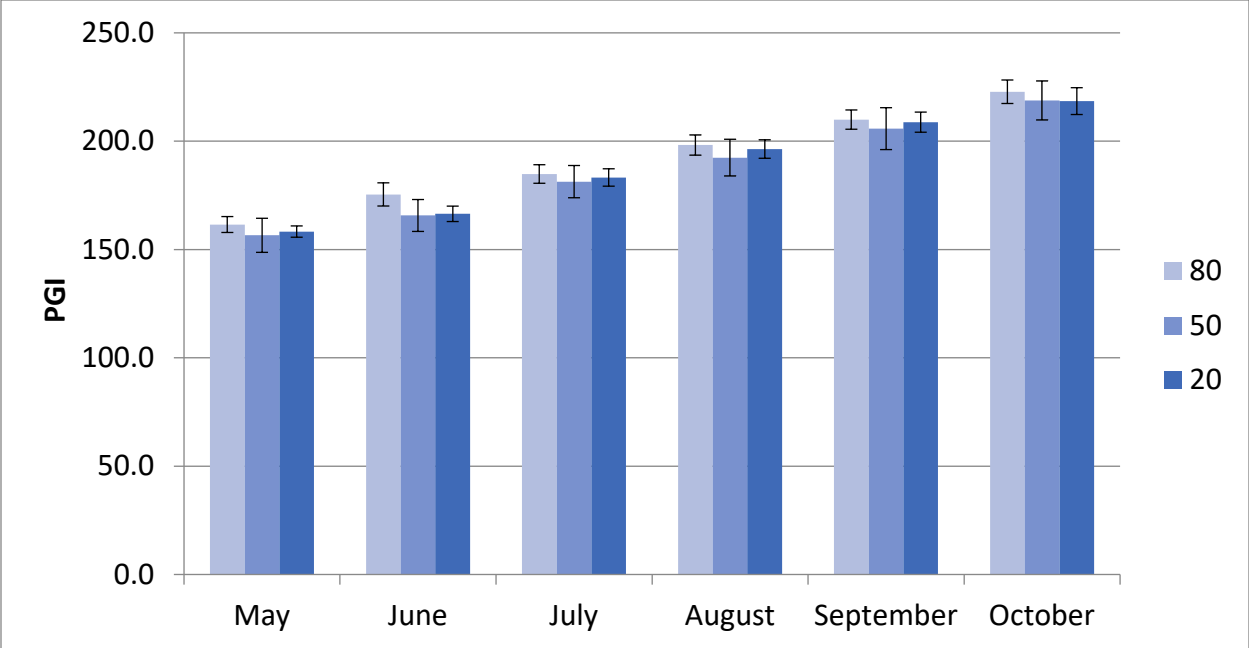


Figure 5a. *Grevillea* 'Kings Fire' average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

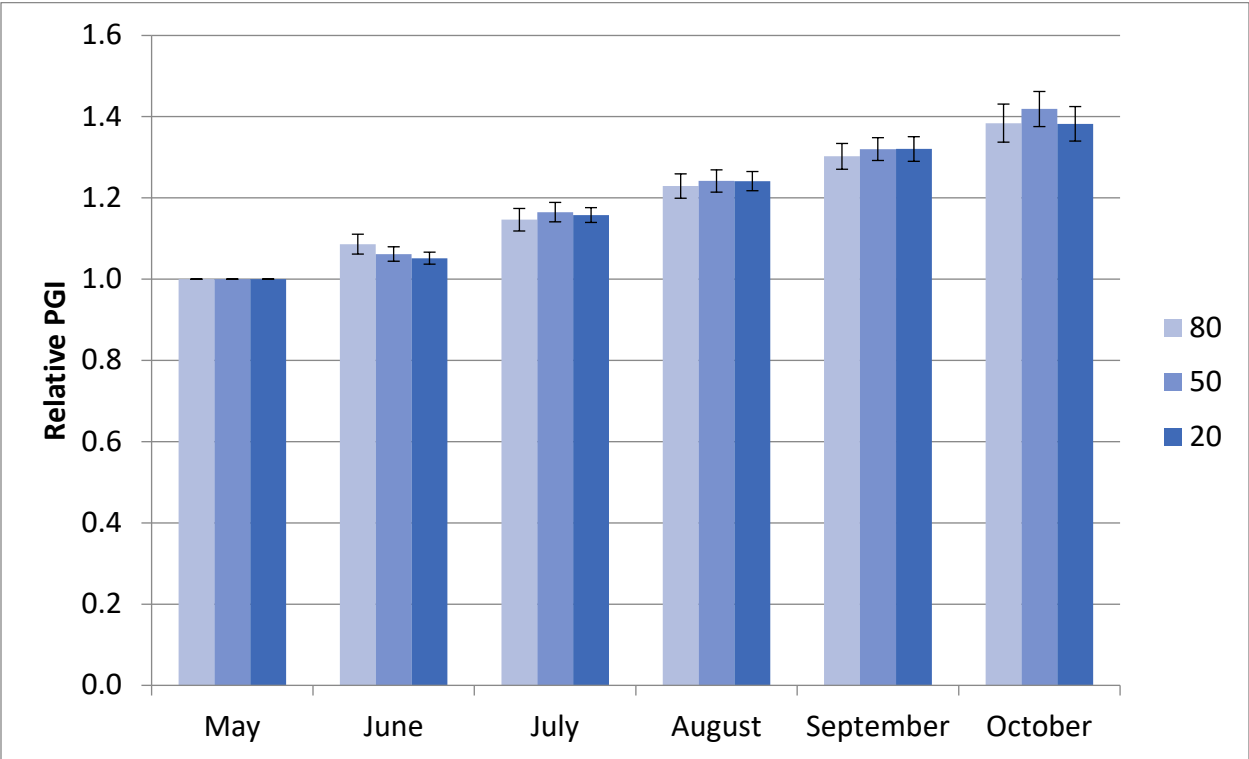


Figure 5b. *Grevillea* 'Kings Fire' average monthly relative plant growth index (rPGI) at UC Davis on 3-ETo based irrigation levels in 2019. Error bars represent ± 1 SE.

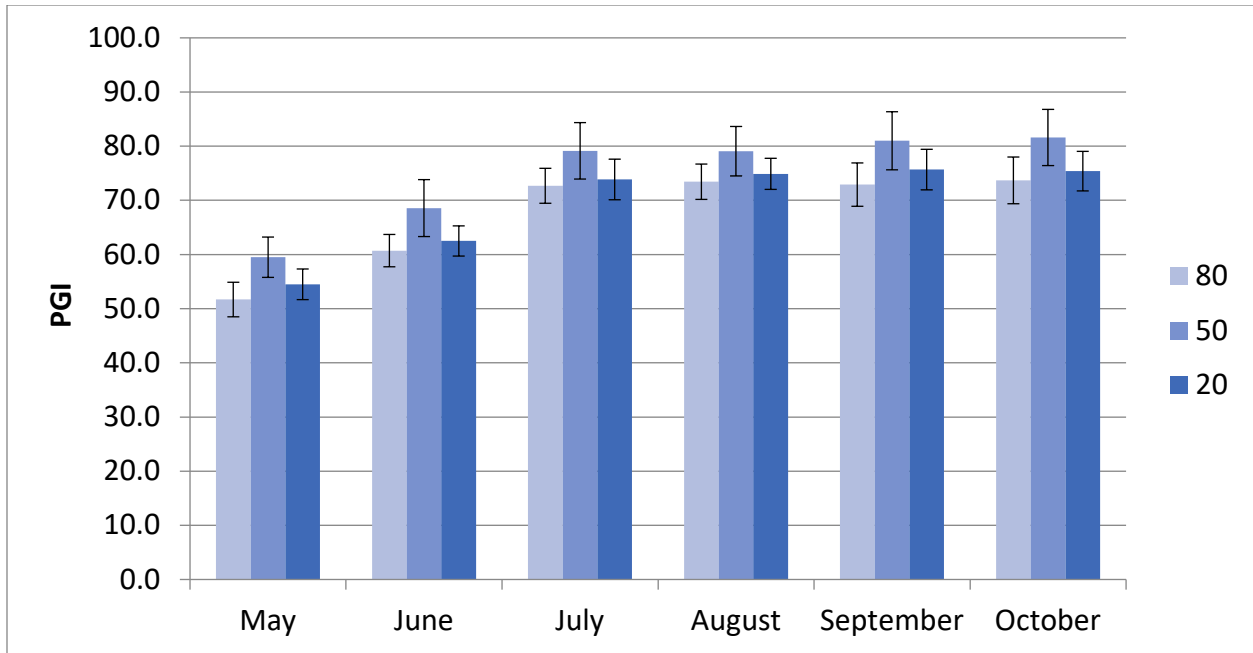


Figure 5c. *Grevillea* 'Kings Fire' average monthly plant growth index (PGI) at South Coast REC on 3-ETo based irrigation levels in 2019. Bars represent ± 1 SE.

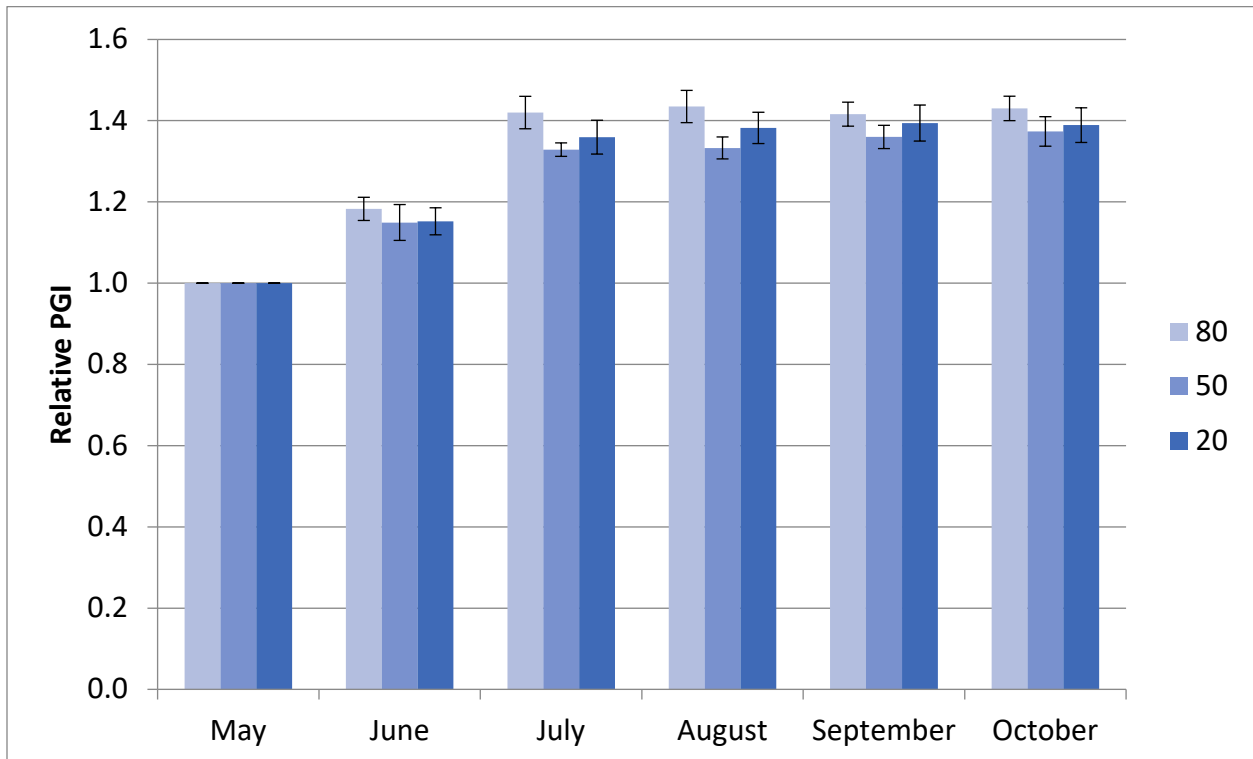


Figure 5d. *Grevillea* 'Kings Fire' average monthly relative plant growth index (rPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Table 12a.

Table 11a. *Lavandula × allardii* 'Meerlo' average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.5	3.8	4.6	4.9	4.9	4.8	4.9	4.5
	50	3.7	4.0	4.6	5.0	5.0	5.0	5.0	4.6
	20	3.5	3.7	4.3	4.8	4.9	4.8	4.9	4.4
Foliage	80	3.6	4.4	4.9	5.0	5.0	5.0	5.0	4.7
	50	3.7	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	20	3.7	4.5	4.8	5.0	5.0	5.0	5.0	4.7
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.4	0.6	0.0	0.0	0.1
	20	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	3.9	4.8	5.0	4.9	4.9	4.9	4.9	4.7
	50	4.3	5.0	5.0	4.9	5.0	5.0	5.0	4.9
	20	3.7	5.0	5.0	5.0	5.0	5.0	5.0	4.8

Table 11b. Open House participant ratings for *Lavandula × allardii* 'Meerlo' on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	3.8	4.2	4.6	4.5	4.5	4.5	4.5	4.4
	Median	4	4	4	5	5	5	5	5	5
	Min	1	1	3	3	2	3	2	2	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.4	4.0	4.5	4.9	4.9	4.8	4.6	4.7	4.6
	Median	5	4	5	5	5	5	5	5	5
	Min	2	1	3	4	4	3	3	3	2
Floral Display	Max	4	0	0	5	5	5	5	1	0
	Mean	0.1	0.0	0.0	0.3	0.6	0.2	0.1	0.0	0.0
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

Table 11c. *Lavandula × allardii* 'Meerlo' average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.6	3.9	3.8	3.8	3.8	3.6	4.5	3.8
	50	3.4	3.4	3.3	3.3	3.3	3.4	4.9	3.5
	20	3.3	3.6	3.6	3.6	3.6	3.4	4.5	3.6
Foliage	80	4.3	4.3	4.3	4.4	4.3	4.0	4.4	4.3
	50	3.9	4.0	3.9	4.0	4.0	4.1	4.9	4.1
	20	4.0	4.0	4.3	4.3	4.1	4.1	4.5	4.2
Flower	80	0.8	0.6	0.5	1.3	3.3	3.3	1.0	1.5
	50	0.6	0.6	0.1	1.1	2.6	3.0	1.1	1.3
	20	0.9	0.9	0.1	1.1	3.3	3.9	1.0	1.6
Pest Resistance	80	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	4.9	5.0	5.0
	20	5.0	5.0	5.0	5.0	5.0	4.9	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	3.9	4.0	4.3	4.3	4.3	4.0	5.0	4.2
	50	4.0	4.0	4.1	4.1	4.0	4.1	5.0	4.2
	20	3.9	3.9	4.3	4.3	4.1	3.9	5.0	4.2

Table 11d. Open House participant ratings (scale 1-5, 5 = highest) for *Lavandula × allardii* 'Meerlo' on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.6	4.3	4.6	4.7	4.7	4.6	4.7	4.6	4.7
	Median	5	4	5	5	5	5	5	5	5
	Min	3	1	3	3	4	3	4	3	4
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.7	4.5	4.8	4.6	4.9	4.7	4.8	4.8	4.7
	Median	5	5	5	5	5	5	5	5	5
	Min	3	1	3	1	4	4	4	4	4
Floral Display	Max	0	5	0	1	1	1	5	5	5
	Mean	0.0	0.1	0.0	0.6	0.1	0.2	3.5	3.4	3.5
	Median	0	0	0	1	0	0	4	3	4
	Min	0	0	0	0	0	0	2	1	2

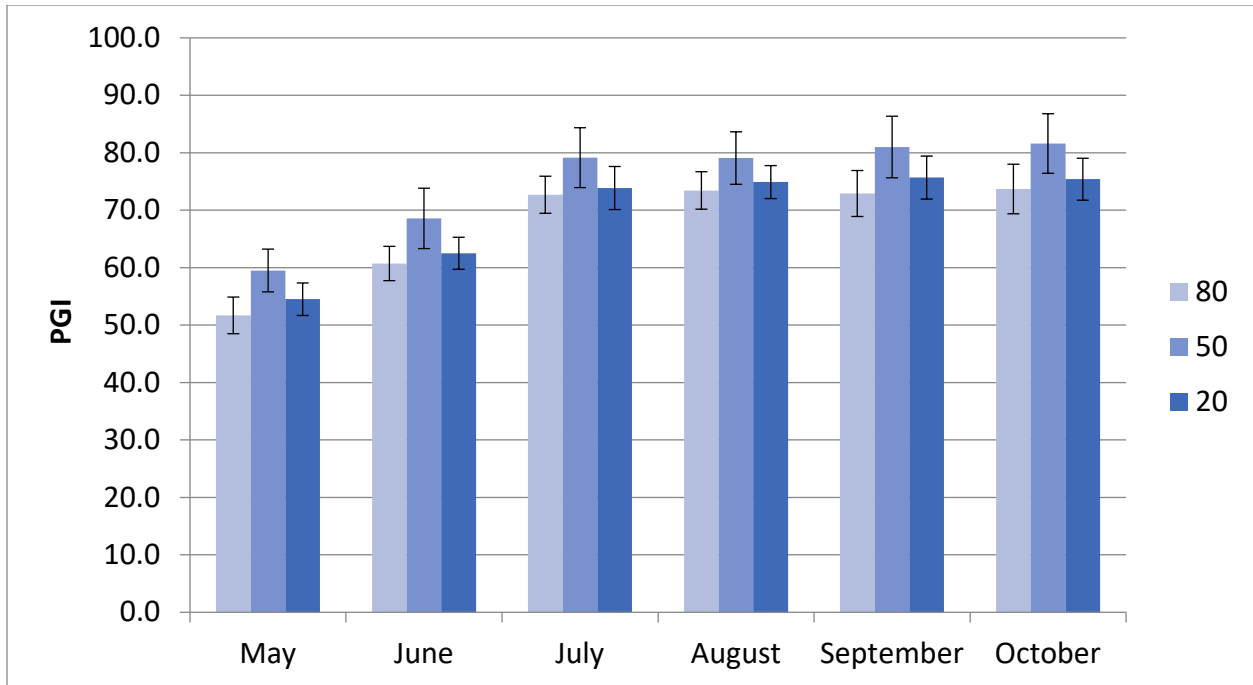


Figure 6a. *Lavandula x allardii* 'Meerlo' average monthly plant growth index (PGI) at UC Davis in on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

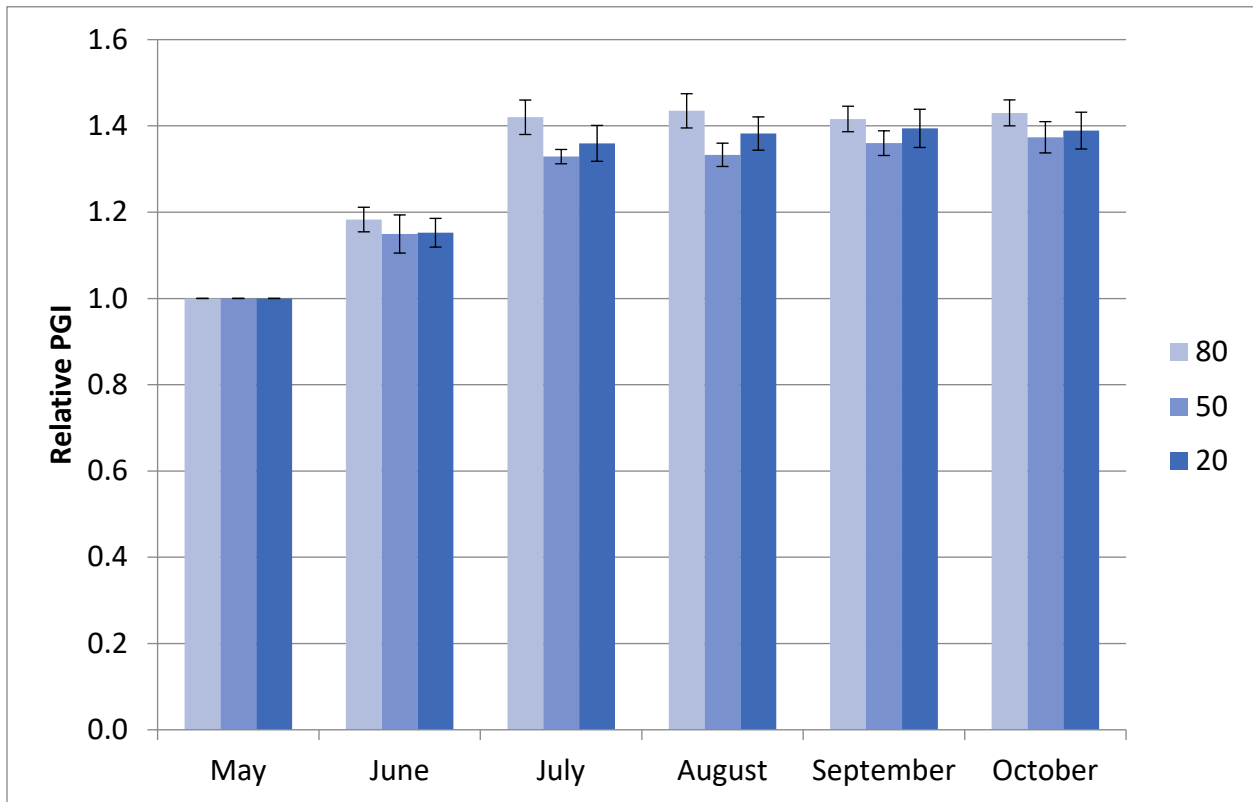


Figure 6b. *Lavandula x allardii* 'Meerlo' average monthly relative plant growth index (rPGI) at UC Davis in on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

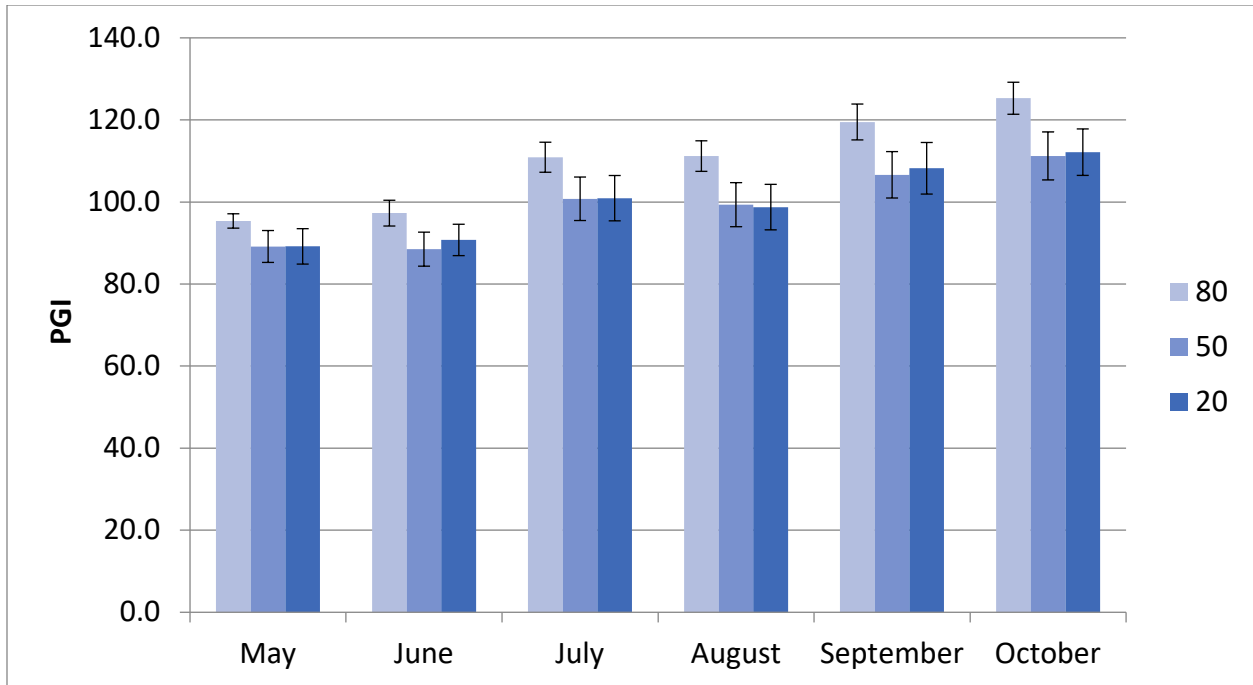


Figure 6c. *Lavandula x allardii* 'Meerlo' average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

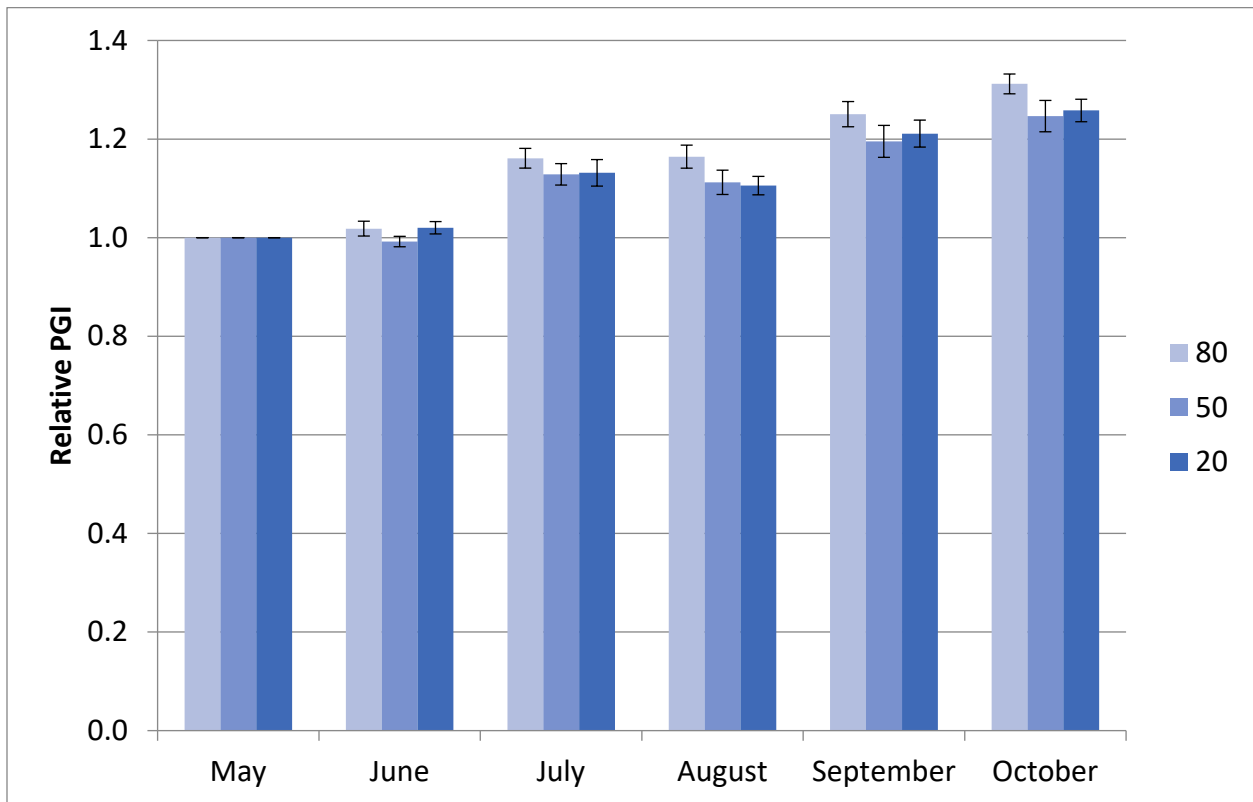


Figure 6d. *Lavandula x allardii* 'Meerlo' average monthly relative plant growth index (rPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 12a. *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ET_o-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at p≤0.05.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80		3.9	3.8	3.9	4.3	3.5	3.3	3.8
	50	3.0	3.8	3.8	3.9	3.9	3.3	2.8	3.5
	20		3.8	3.9	4.4	4.3	3.5	2.9	3.8
Foliage	80		5.0	4.1	4.1	4.0	3.4	3.0	3.9
	50	5.0	4.8	4.3	4.2	3.6	3.0	2.7	3.9
	20		4.8	4.5	4.0	3.8	2.9	2.8	3.8
Flower	80	0.0	0.0	0.0	2.4	2.8	2.6	1.8	1.4 ^a
	50	0.0	0.0	0.2	1.2	1.3	1.5	1.0	0.7 ^b
	20	0.0	0.0	1.0	3.0	2.9	2.5	1.5	1.6 ^a
Pest Resistance	80	4.0	5.0	4.8	4.3	4.0	3.5	4.0	4.2
	50	5.0	4.8	4.7	4.3	3.5	3.2	3.8	4.2
	20		5.0	5.0	4.3	3.9	3.4	3.9	4.2
Disease Resistance	80		5.0	4.5	4.8	5.0	5.0	5.0	4.9
	50	5.0	5.0	4.5	4.7	5.0	5.0	5.0	4.9
	20		5.0	4.8	4.8	5.0	5.0	5.0	4.9
Vigor	80		5.0	4.6	4.1	4.4	3.6	3.6	4.2
	50	4.0	4.8	5.0	4.7	4.3	3.8	3.2	4.3
	20		4.9	4.9	4.9	4.5	3.3	2.9	4.2

Table 12b. Open House participant ratings for *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry on 3 ET_o-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	4	4	5	5	5
	Mean	3.6	3.5	3.2	4.2	3.1	2.7	3.2	3.1	2.4
	Median	3	4	3	4	3	3	3	3	2
	Min	1	1	1	3	0	0	1	2	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	4.0	3.8	4.7	4.1	3.5	3.6	3.4	2.9
	Median	4	4	4	5	4	3	4	3	3
	Min	1	1	1	2	3	2	1	2	1
Floral Display	Max	4	0	0	5	5	4	5	5	4
	Mean	0.1	0.0	0.0	4.1	1.7	1.3	1.7	1.9	1.2
	Median	0	0	0	4	2	1	2	2	1
	Min	0	0	0	3	0	0	0	0	0

Table 12c. *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ET_o-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	3.3	2.7	2.6	2.9	2.8	3.0	2.9 ^{ab}
	50	3.3	3.5	2.8	3.0	3.2	3.3	3.3	3.2 ^a
	20	3.0	3.0	2.3	2.1	2.3	2.3	3.2	2.6 ^b
Foliage	80	3.6	3.6	2.6	2.7	2.9	3.2	3.1	3.1 ^{ab}
	50	3.5	3.5	2.8	3.2	3.2	3.2	3.5	3.3 ^a
	20	3.1	3.0	2.4	2.4	2.6	2.3	3.5	2.7 ^b
Flower	80	0.0	0.0	0.0	0.0	0.4	0.6	0.7	0.2
	50	0.0	0.0	0.0	0.0	0.8	0.7	0.3	0.3
	20	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.1
Pest Resistance	80	4.7	4.7	5.0	4.9	4.9	4.8	4.7	4.8
	50	5.0	5.0	5.0	5.0	4.8	5.0	4.5	4.9
	20	5.0	5.0	5.0	5.0	5.0	5.0	4.8	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.4	4.3	3.0	3.0	2.9	3.2	3.3	3.4
	50	4.3	4.2	3.2	3.2	3.2	3.5	3.8	3.6
	20	3.8	3.6	2.6	2.6	2.9	2.7	3.8	3.1

Table 12d. Open House participant ratings for *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry on 3 ET_o-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	4	3	5	5	4	3	5	5	4
	Mean	1.5	1.7	1.5	3.2	3.5	2.3	3.5	3.3	2.9
	Median	1	1	1	3	4	2	4	3	3
	Min	1	1	1	2	1	1	2	1	2
Foliage Quality	Max	4	1	4	5	5	5	5	5	5
	Mean	1.2	1.0	1.2	3.9	3.9	5.4	3.6	3.8	3.1
	Median	1	1	1	4	4	3	4	4	3
	Min	1	1	1	3	2	1	2	2	2
Floral Display	Max	1	1	1	1	0	1	4	4	4
	Mean	0.1	0.5	0.1	0.1	0.0	0.1	2.6	2.0	2.8
	Median	0	1	0	0	0	0	2	2	3
	Min	0	0	0	0	0	0	1	1	1

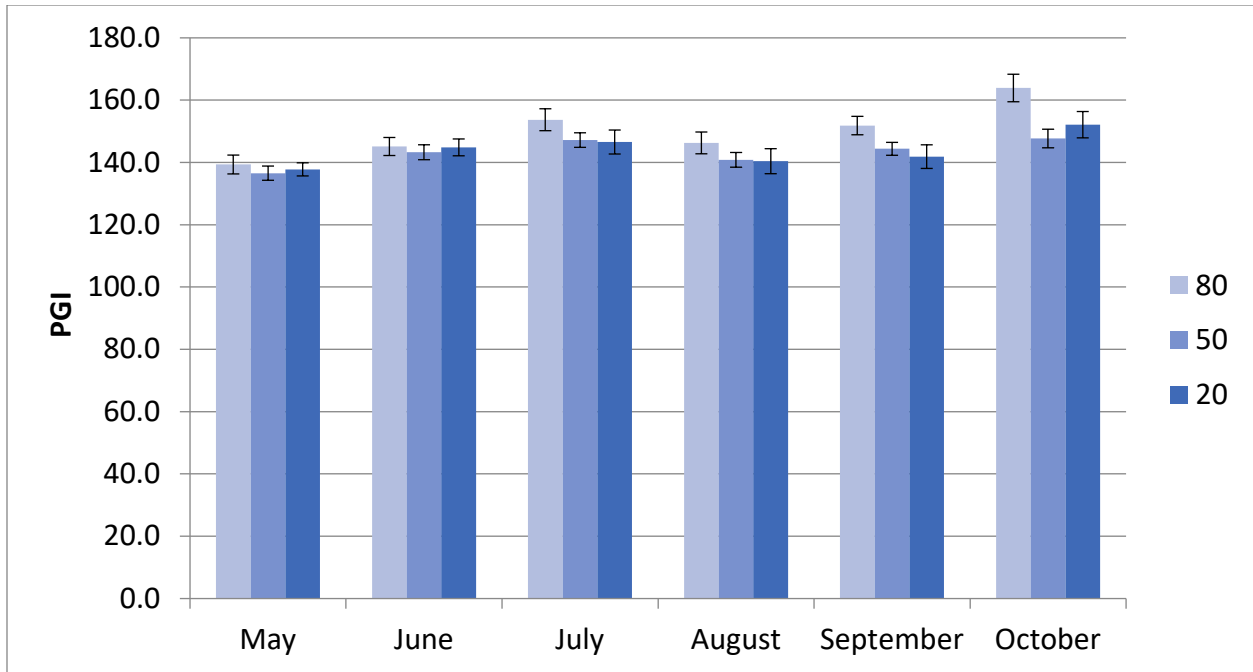


Figure 7a. *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

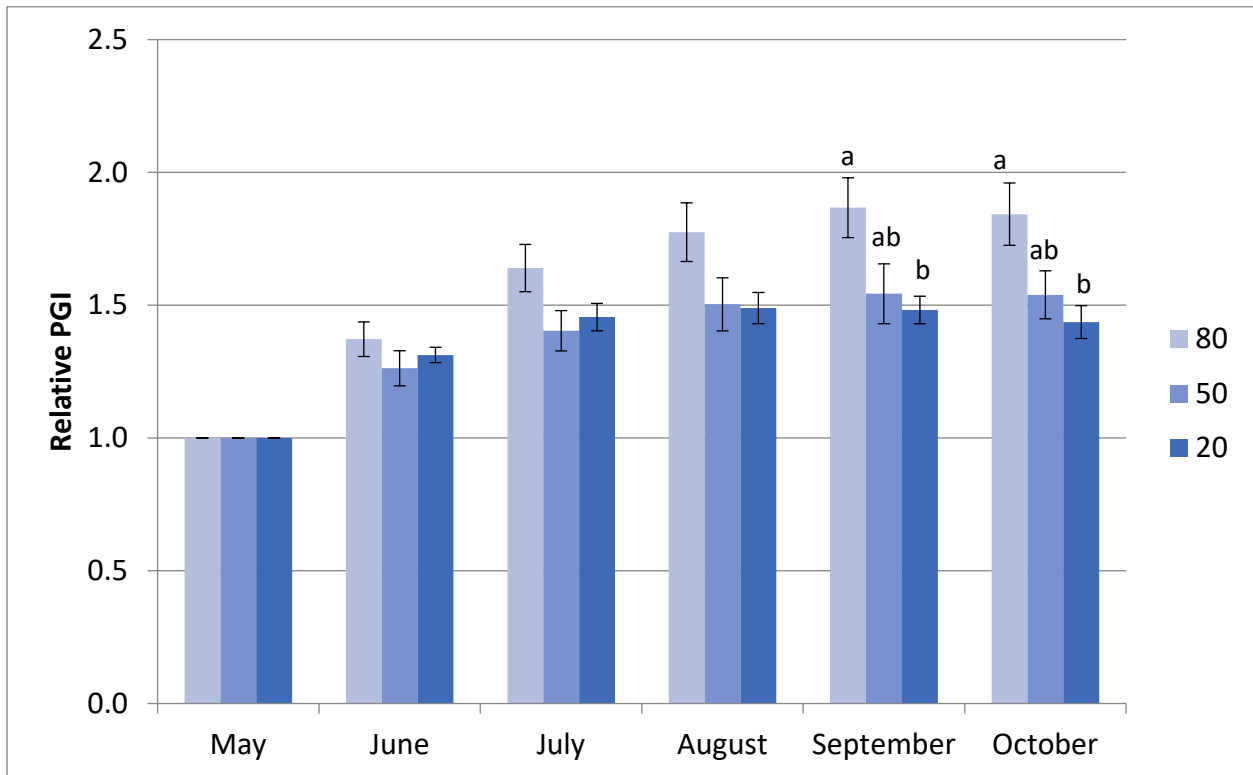


Figure 7b. *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry average monthly relative plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

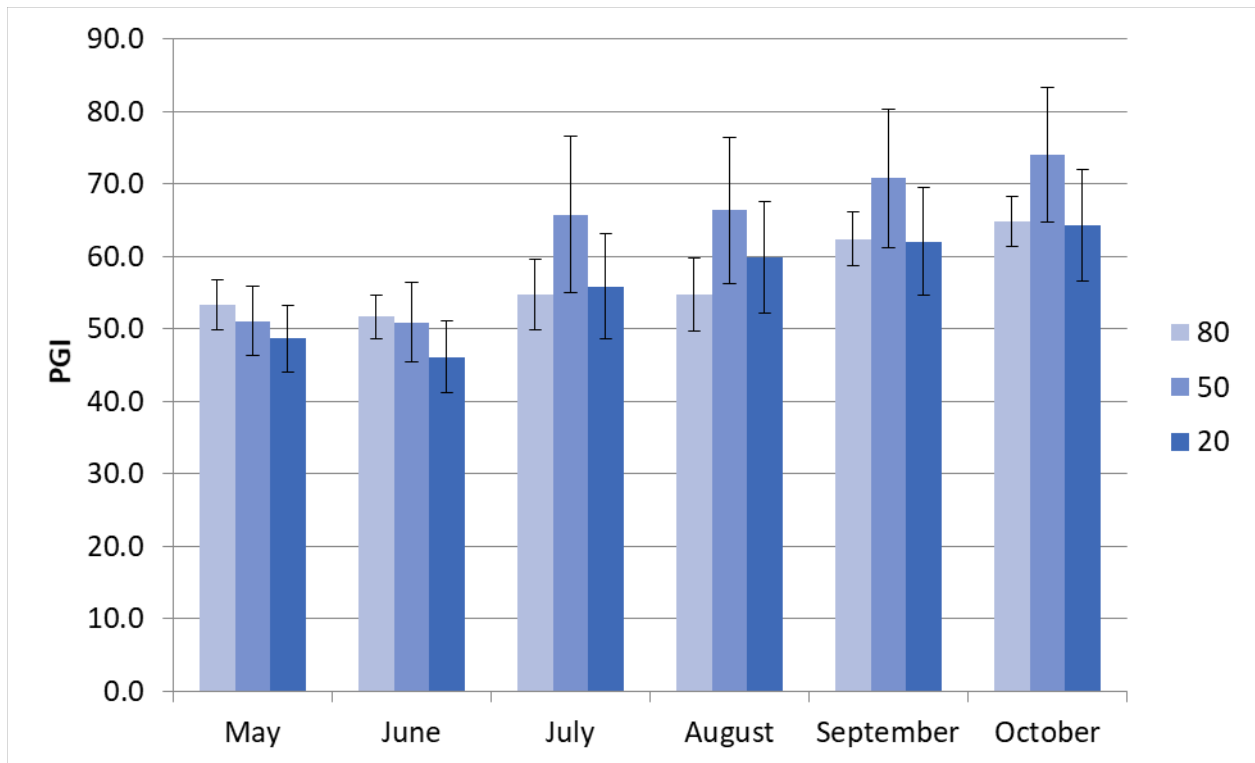


Figure 7c. *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

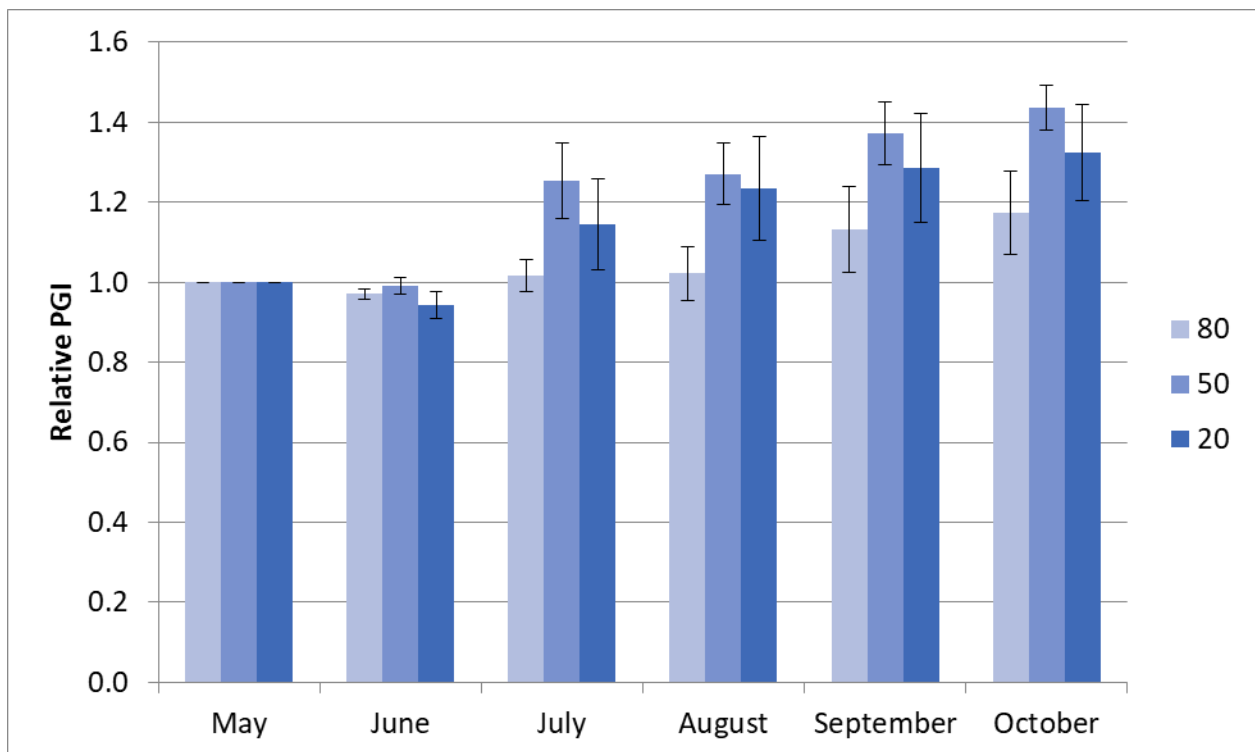


Figure 7d. *Lagerstroemia indica* 'Conlagras' Bellini® Raspberry average monthly relative plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 13a. *Muhlenbergia capillaris* 'Irvine' Plumetastic® average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or ≤ 0.01 (in red).

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.0	3.4	3.8	3.6	3.8	4.5	3.6 ^a
	50	3.0	3.0	3.0	3.1	3.3	3.4	3.7	3.2 ^b
	20	3.0	3.1	3.1	3.4	3.4	3.3	4.1	3.3 ^{ab}
Foliage	80	3.1	3.0	3.5	4.3	3.8	3.9	4.0	3.6 ^a
	50	3.1	3.0	3.1	3.5	3.4	3.4	3.3	3.3 ^b
	20	3.0	3.0	3.4	3.5	3.5	3.4	3.8	3.4 ^b
Flower	80	0.0	0.1	0.1	0.5	0.6	0.9	3.1	0.8
	50	0.0	0.1	0.3	0.5	0.8	0.8	2.1	0.6
	20	0.0	0.1	0.4	0.8	0.9	0.9	2.0	0.7
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.0	3.3	3.6	3.6	3.6	3.6 ^a	4.4	3.7 ^a
	50	3.9	3.0	3.5	3.5	3.4	2.9 ^b	3.8	3.4 ^b
	20	4.0	3.0	3.4	3.4	3.4	3.3 ^{ab}	4.3	3.5 ^{ab}

Table 13b. Open House participant ratings for *Muhlenbergia capillaris* 'Irvine' Plumetastic® on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	3.1	3.0	3.2	3.8	3.1	3.4	3.9	3.0	3.5
	Median	3	3	3	4	3	3	4	3	4
	Min	1	1	1	3	2	2	1	1	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	3.2	3.2	3.2	3.9	3.2	3.4	4.0	3.1	3.4
	Median	3	3	3	4	3	3	4	3	3
	Min	1	1	1	3	2	2	1	1	1
Floral Display	Max	4	4	5	0	1	0	5	1	1
	Mean	0.7	0.7	0.8	0.0	0.1	0.0	0.5	0.0	0.3
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

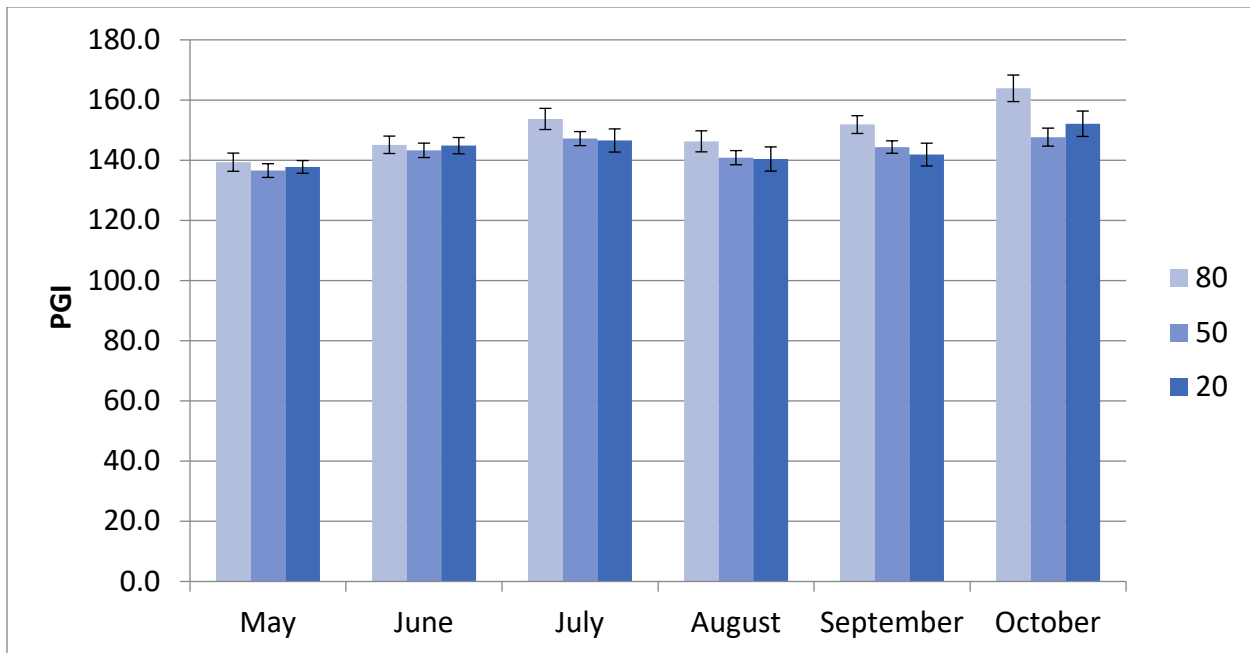


Figure 8a. *Muhlenbergia capillaris* 'Irvine' Plumetastic® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

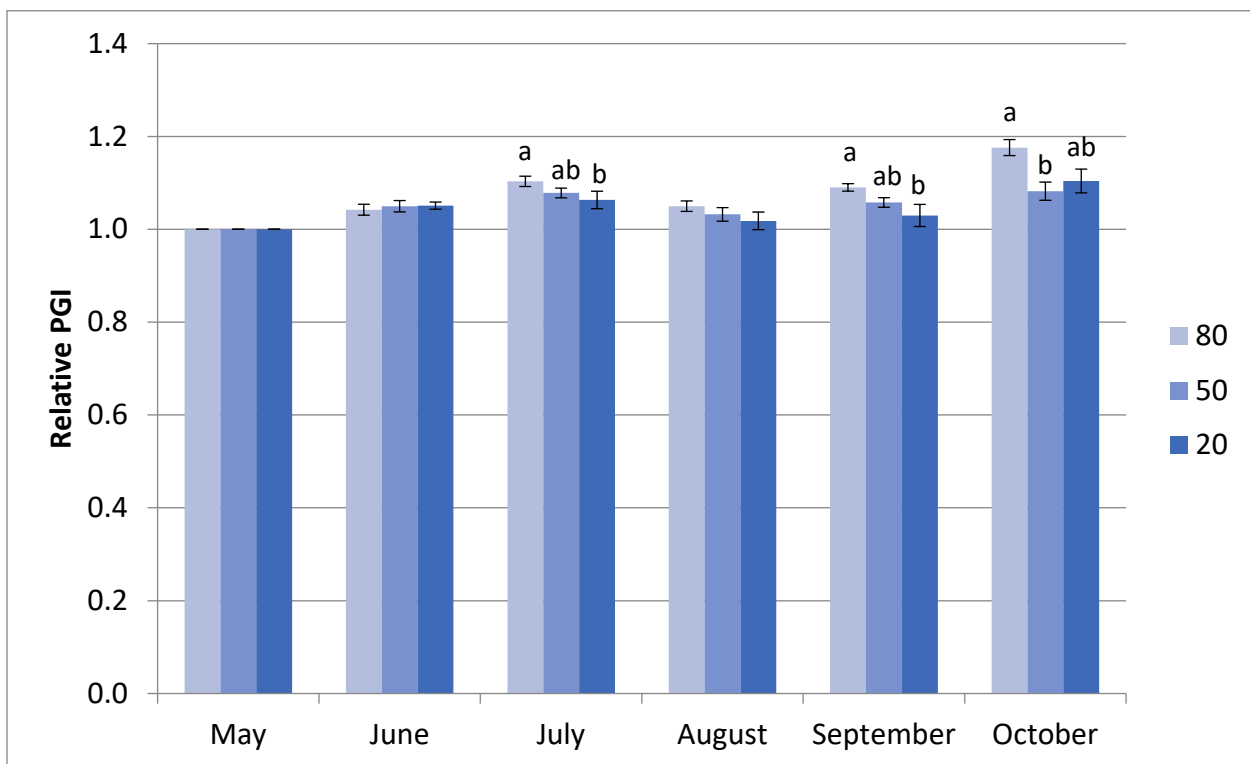


Figure 8b. *Muhlenbergia capillaris* 'Irvine' Plumetastic® average monthly relative plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Table 14a. *Rhaphiolepis umbellata* 'RutRhaph1' Southern Moon® average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or ≤ 0.01 (in red).

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.6	2.8	2.6	2.8	2.5	3.1	2.9
	50	3.6	3.6	3.3	3.0	2.8	2.8	2.5	3.1
	20	3.6	3.5	3.4	3.2	2.8	2.1	2.6	3.0
Foliage	80	3.1	3.9	2.9	2.9	2.8	2.6	3.1	3.0
	50	3.5	4.8	3.4	3.3	2.8	2.8	2.6	3.3
	20	3.6	4.3	3.6	3.4	2.8	2.1	2.6	3.2
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.4	0.5	0.0	0.0	0.0	0.5	0.0	0.2
	20	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.1
Pest Resistance	80	5.0	5.0	4.8	5.0	5.0	5.0	4.8	4.9
	50	5.0	5.0	4.9	5.0	5.0	4.8	5.0	4.9
	20	5.0	5.0	4.9	5.0	5.0	5.0	4.9	5.0
Disease Resistance	80	3.9	4.1 ^a	3.4 ^a	3.6	4.4	4.8	4.6	4.1 ^a
	50	3.9	4.8 ^{ab}	4.0 ^{ab}	4.4	4.3	4.9	4.4	4.4 ^{ab}
	20	3.9	4.9 ^b	4.1 ^b	4.3	4.7	5.0	4.5	4.5 ^b
Vigor	80	4.3	4.0	2.8	2.9	2.8	2.5	3.4	3.2
	50	4.4	4.0	3.4	3.4	2.6	3.1	2.6	3.4
	20	4.4	3.9	3.4	3.8	2.8	2.5	3.0	3.4

Table 14b. Open House participant ratings for *Rhaphiolepis umbellata* 'RutRhaph1' Southern Moon® on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	4	5	5	5	5
	Mean	3.3	3.2	3.4	2.9	2.5	3.1	3.3	2.6	3.2
	Median	3	3	3	3	3	3	3	3	3
	Min	1	2	1	2	1	1	0	1	1
Foliage Quality	Max	5	5	5	5	4	5	5	5	5
	Mean	3.7	3.5	3.9	3.2	2.7	3.7	3.8	2.8	3.7
	Median	4	3	4	3	3	4	4	3	4
	Min	1	2	1	1	1	1	2	1	2
Floral Display	Max	0	4	4	3	0	3	1	3	0
	Mean	0.0	1.2	1.2	0.1	0.0	0.1	0.0	0.1	0.0
	Median	0	1	1	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

Table 14c. *Rhaphiolepis umbellata* 'RutRaph1' Southern Moon® average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC in Irvine, CA on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or ≤ 0.01 (in red).

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	3.4	3.4	3.4	3.4	3.3	4.0 ^a	3.4
	50	3.0	3.1	3.1	3.1	3.3	3.0	4.0 ^a	3.2
	20	2.6	3.1	3.0	3.0	3.1	3.0	3.3 ^b	3.0
Foliage	80	4.0	4.0	3.8	3.9	3.9	3.9	4.9 ^a	4.0
	50	4.0	4.3	4.0	4.1	4.0	4.1	4.6 ^a	4.2
	20	4.0	4.3	3.9	4.0	4.1	3.6	3.5 ^b	3.9
Flower	80	1.1	0.1	0.0	0.3	1.0	0.9	0.5	0.6
	50	1.1	0.4	0.0	0.3	1.0	1.1	0.8	0.7
	20	0.8	0.1	0.0	0.0	0.5	0.4	0.5	0.3
Pest Resistance	80	4.9	5.0	5.0	5.0	5.0	4.9	5.0	5.0
	50	4.9	4.8	4.9	4.8	4.8	4.8	4.9	4.8
	20	4.9	4.6	4.8	4.9	4.9	4.9	5.0	4.8
Disease Resistance	80	5.0	5.0	4.3	4.8	4.8	4.9	4.9	4.8
	50	4.9	5.0	4.4	4.6	4.6	5.0	4.6	4.7
	20	5.0	5.0	4.5	4.6	4.5	4.6	4.4	4.7
Vigor	80	4.4	4.4	4.0	4.0	4.0	3.6 ^a	4.8	4.2 ^a
	50	4.1	4.3	4.0	4.0	3.9	3.1 ^b	4.6	4.0 ^a
	20	3.9	4.1	3.9	3.9	3.6	3.0 ^b	4.1	3.8 ^b

Table 14d. Open House participant ratings for *Rhaphiolepis umbellata* 'RutRaph1' Southern Moon® on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.0	4.3	4.4	3.7	3.7	4.0	3.9	3.6	3.5
	Median	4	4	4	4	4	4	4	4	4
	Min	3	2	2	3	2	3	1	1	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	4.5	4.5	4.2	4.3	4.4	4.2	3.9	3.9
	Median	4	5	5	4	4	4	4	4	4
	Min	3	3	2	4	3	3	1	1	1
Floral Display	Max	5	5	5	0	5	5	5	2	1
	Mean	1.3	2.0	2.3	0.0	0.6	0.3	0.2	0.6	0.0
	Median	1	2	2	0	0	0	0	1	0
	Min	0	0	0	0	0	0	0	0	0

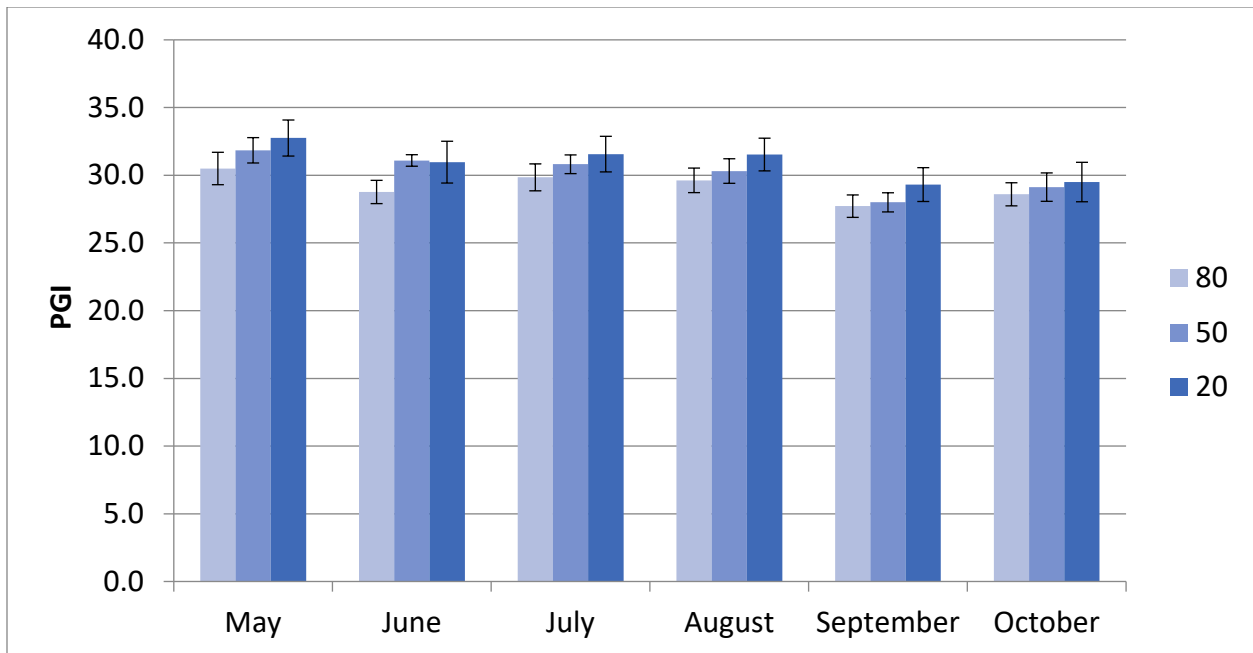


Figure 9a. *Rhamphiolepis umbellata* 'RutRhaph1' Southern Moon® average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

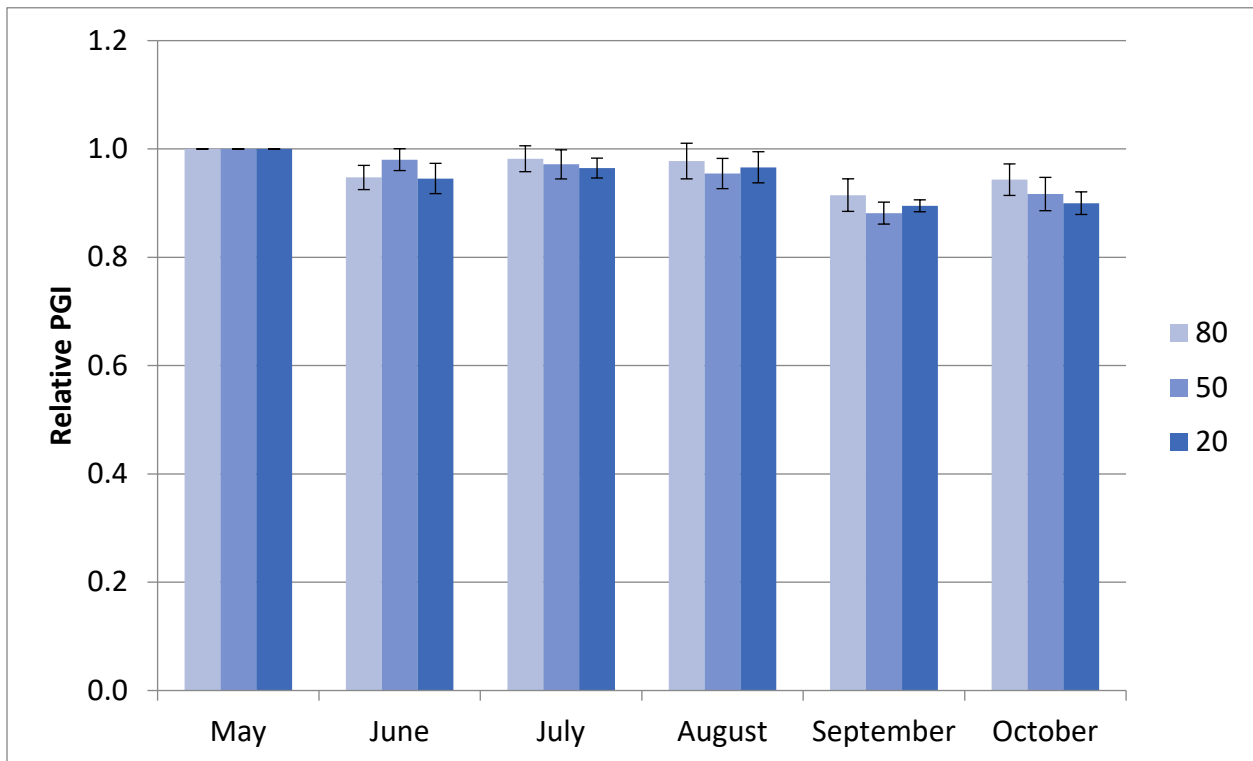


Figure 9b. *Rhamphiolepis umbellata* 'RutRhaph1' Southern Moon® average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

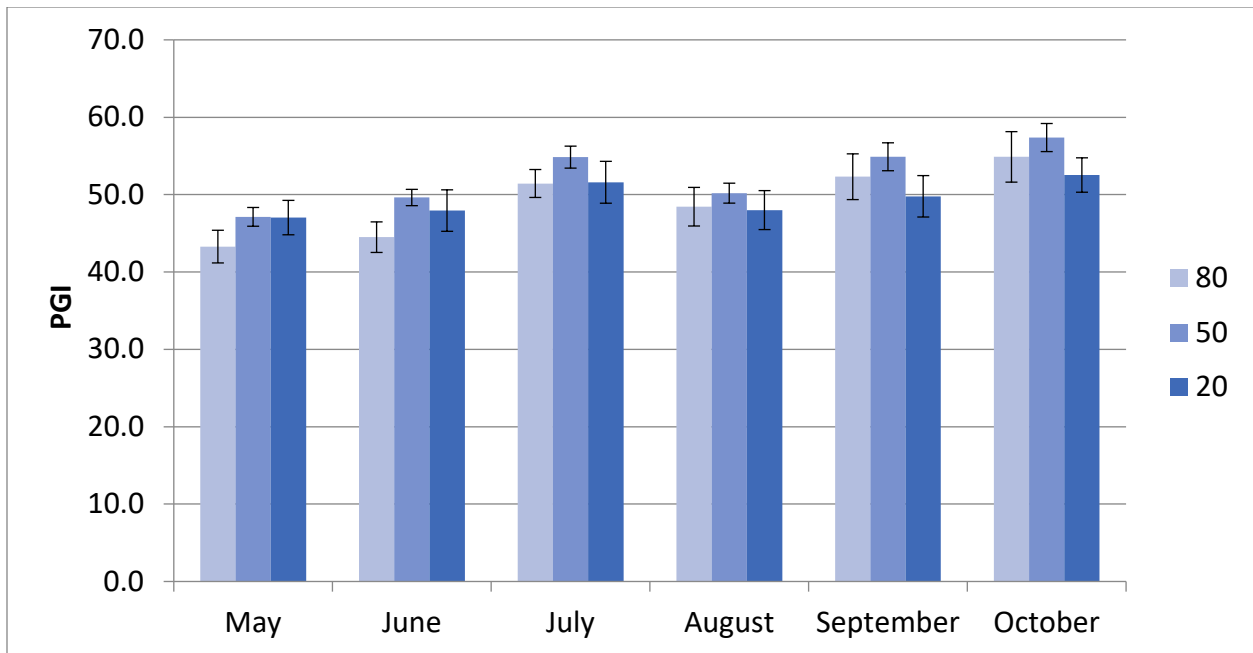


Figure 9c. *Rhapsiolepis umbellata* 'RutRhaph1' Southern Moon® average monthly plant growth index (PGI) at South Coast REC on 3-ETo based irrigation levels in 2019. Error bars represent ± 1 SE.

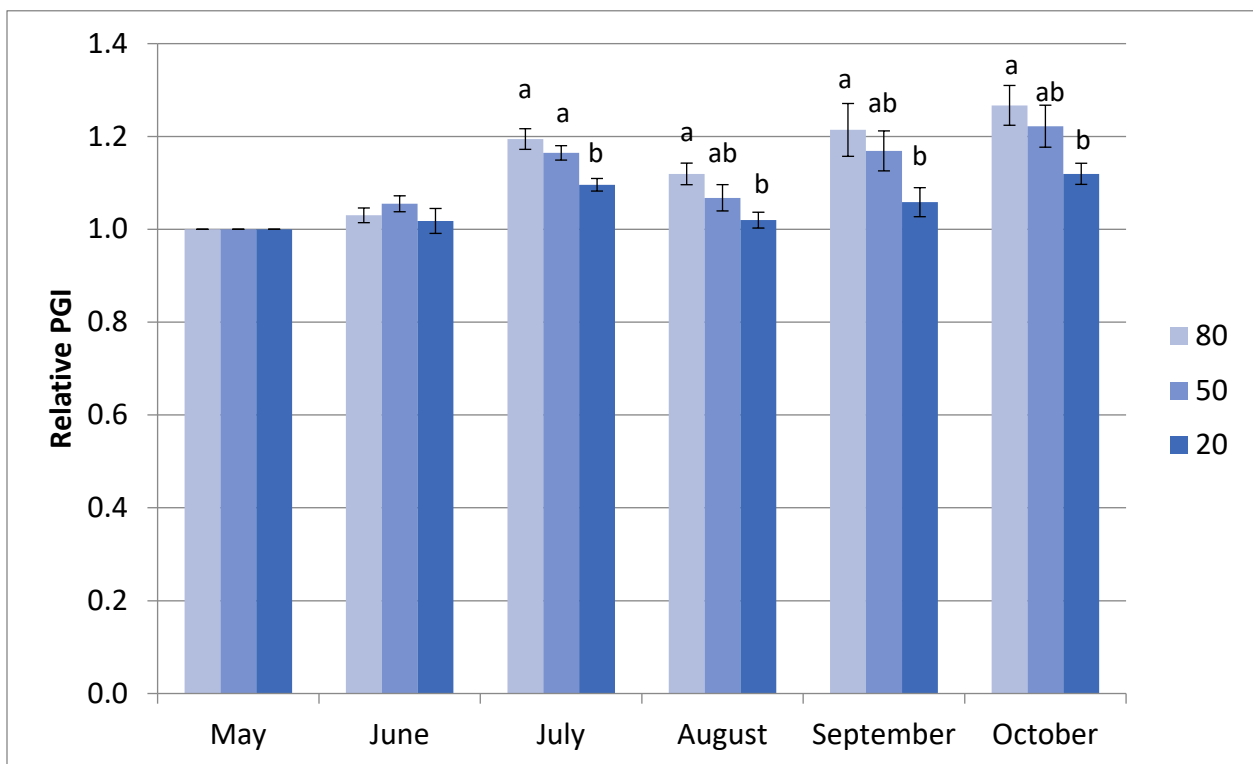


Figure 9d. *Rhapsiolepis umbellata* 'RutRhaph1' Southern Moon® average monthly relative plant growth index (rPGI) at South Coast REC on 3-ETo based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Table 15a. *Rosa* 'Meijecycka' Limoncello™ average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	4.0	4.9	4.1	4.7	3.9	3.5	3.9	4.1
	50	4.0	5.0	3.9	4.7	3.6	3.7	3.6	4.1
	20	4.0	4.9	4.0	4.7	4.0	3.9	4.1	4.2
Foliage	80	4.6	4.0	3.8	3.8	3.3	2.6	2.9	3.6
	50	4.9	3.8	4.1	4.0	3.8	2.8	2.9	3.8
	20	4.7	4.0	4.3	3.8	3.7	3.0	3.3	3.8
Flower	80	0.0	5.0	1.3	4.4	1.0	2.3	2.9	2.4
	50	0.0	5.0	0.8	4.3	1.0	2.5	2.1	2.2
	20	0.0	5.0	0.9	4.1	1.3	2.0	2.9	2.3
Pest Resistance	80	4.8	4.6	3.9	3.8	3.3	3.0	3.3	3.8
	50	4.9	4.4	4.4	4.1	3.9	2.9	3.4	4.0
	20	5.0	4.7	4.3	3.7	3.7	3.1	3.1	4.0
Disease Resistance	80	5.0	4.1	4.3	4.8	5.0	5.0	4.9	4.7
	50	4.9	3.8	4.1	5.0	5.0	4.9	4.9	4.6
	20	4.7	4.0	4.4	5.0	5.0	5.0	5.0	4.7
Vigor	80	5.0	5.0	5.0	4.9	5.0	4.5	4.6	4.9
	50	5.0	5.0	5.0	4.9	5.0	4.3	4.4	4.8
	20	5.0	4.9	5.0	4.9	5.0	4.6	4.6	4.8

Table 15b. Open House participant ratings for *Rosa* 'Meijecycka' Limoncello™ on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	4.4	4.1	3.5	3.7	3.8	3.4	3.4	3.6
	Median	4	4	4	4	4	4	3	3	4
	Min	3	3	3	2	0	2	2	2	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.6	4.7	4.5	4.1	4.3	4.5	3.8	3.7	4.0
	Median	5	5	5	4	4	5	4	4	4
	Min	3	3	2	2	3	3	2	2	2
Floral Display	Max	5	5	5	5	5	5	5	5	5
	Mean	3.0	2.8	2.5	3.4	3.4	3.0	2.3	2.5	2.8
	Median	3	3	2	3	3	3	2	3	3
	Min	1	1	1	1	0	1	0	0	0

Table 15c. *Rosa* 'Meijecycka' Limoncello™ average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.0	2.9	2.9	3.0	3.1	3.1	3.0
	50	3.1	3.3	3.0	3.0	3.0	2.9	3.9	3.2
	20	3.1	3.1	3.1	3.1	3.1	3.0	3.5	3.2
Foliage	80	3.6	7.1	3.4	3.4	3.3	3.0	2.4	3.7
	50	3.9	3.7	3.1	3.1	3.1	2.9	3.1	3.3
	20	4.0	3.9	3.4	3.6	3.3	3.1	2.8	3.4
Flower	80	1.8	2.1	0.9	2.6	1.6	1.1	2.9	1.9
	50	2.4	2.9	1.1	2.4	1.6	1.1	2.7	2.0
	20	2.0	2.6	1.0	2.6	1.6	1.4	2.7	2.0
Pest Resistance	80	4.4	4.9	4.4	4.4	4.1	4.0	3.0	4.2
	50	4.7	4.7	3.9	4.0	4.0	4.0	3.0	4.0
	20	4.6	4.6	4.6	4.6	4.3	4.0	3.1	4.2
Disease Resistance	80	4.6	4.5	3.9	4.1	4.4	4.3	4.9	4.4
	50	4.6	4.1	4.0	4.0	4.0	4.6	5.0	4.3
	20	4.6	4.4	3.9	4.0	4.1	4.6	5.0	4.4
Vigor	80	4.0	4.0 ^a	4.1	4.1	4.0	3.1 ^a	3.8	3.9
	50	4.1	4.0 ^a	4.0	3.7	3.9	3.3 ^{ab}	4.3	3.9
	20	4.6	4.4 ^b	4.0	3.9	4.0	3.7 ^b	4.1	4.1

Table 15d. Open House participant ratings for *Rosa* 'Meijecycka' Limoncello™ on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	4	5	5	5	5	5	5	4	4
	Mean	2.6	2.9	2.8	3.8	3.2	3.9	3.3	2.7	3.1
	Median	3	3	3	4	3	4	3	3	3
	Min	1	1	1	2	1	3	1	2	2
Foliage Quality	Max	4	5	4	5	5	5	5	4	5
	Mean	2.7	3.1	2.7	3.6	3.8	4.1	4.0	3.0	3.7
	Median	3	3	3	3	4	4	4	3	4
	Min	1	2	1	2	2	3	2	2	2
Floral Display	Max	0	0	3	5	4	5	5	3	3
	Mean	0.0	0.0	0.1	3.5	1.7	3.5	2.1	1.3	1.3
	Median	0	0	0	3	2	3	2	1	1
	Min	0	0	0	2	1	2	1	0	0

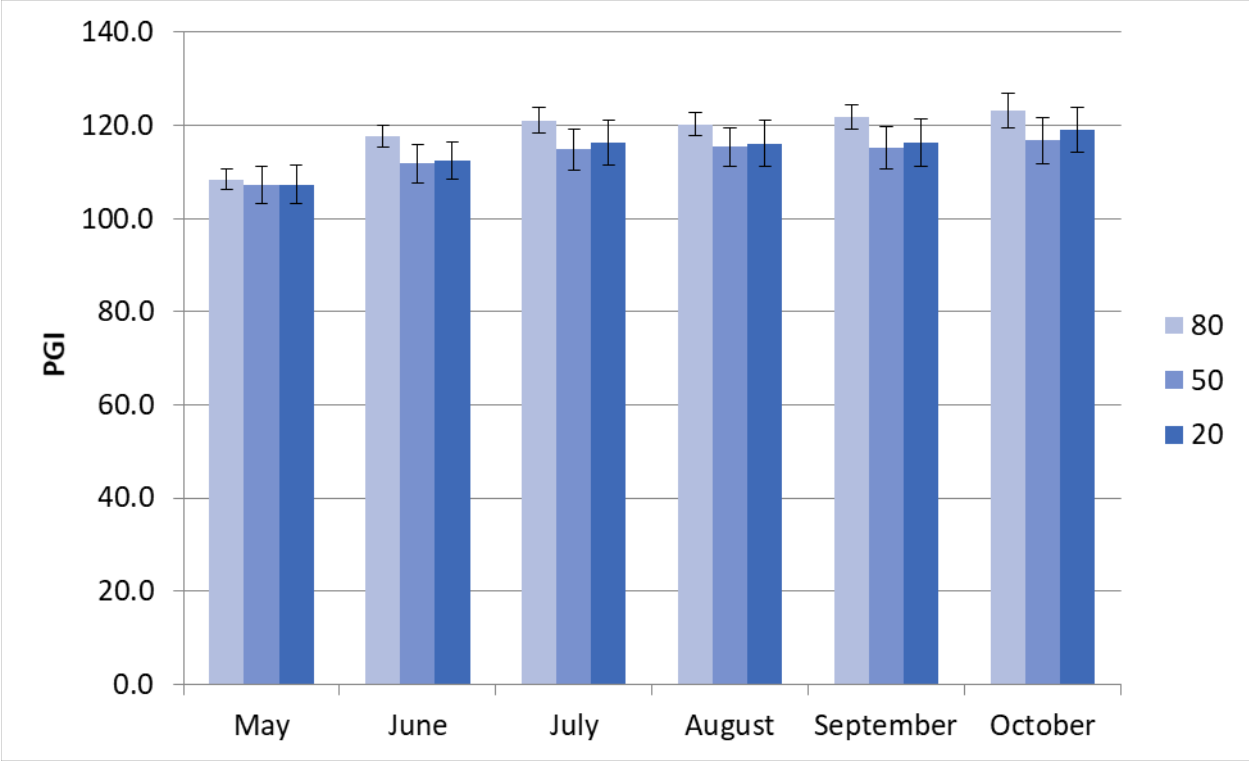


Figure 10a. *Rosa* 'Meijecycka' Limoncello™ average monthly plant growth index (PGI) at UC Davis in Davis, CA on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

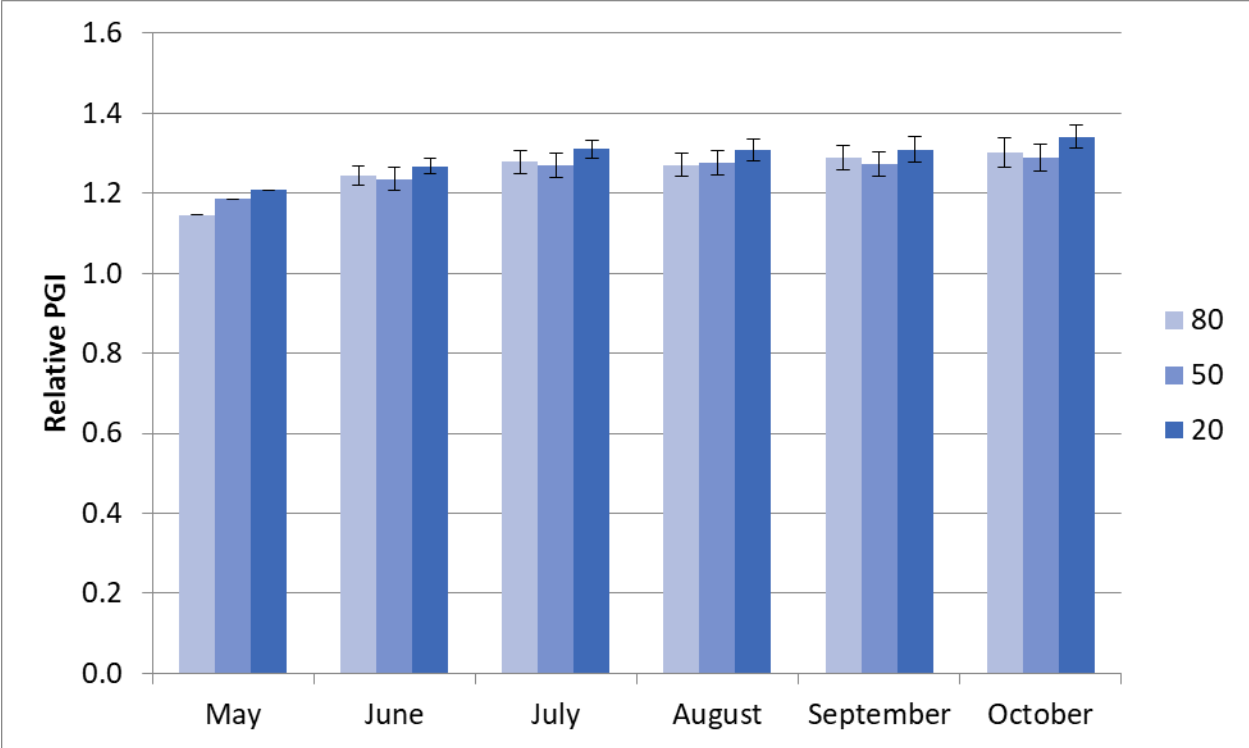


Figure 10b. *Rosa* 'Meijecycka' Limoncello™ average monthly relative plant growth index (RPGI) at UC Davis in Davis, CA on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

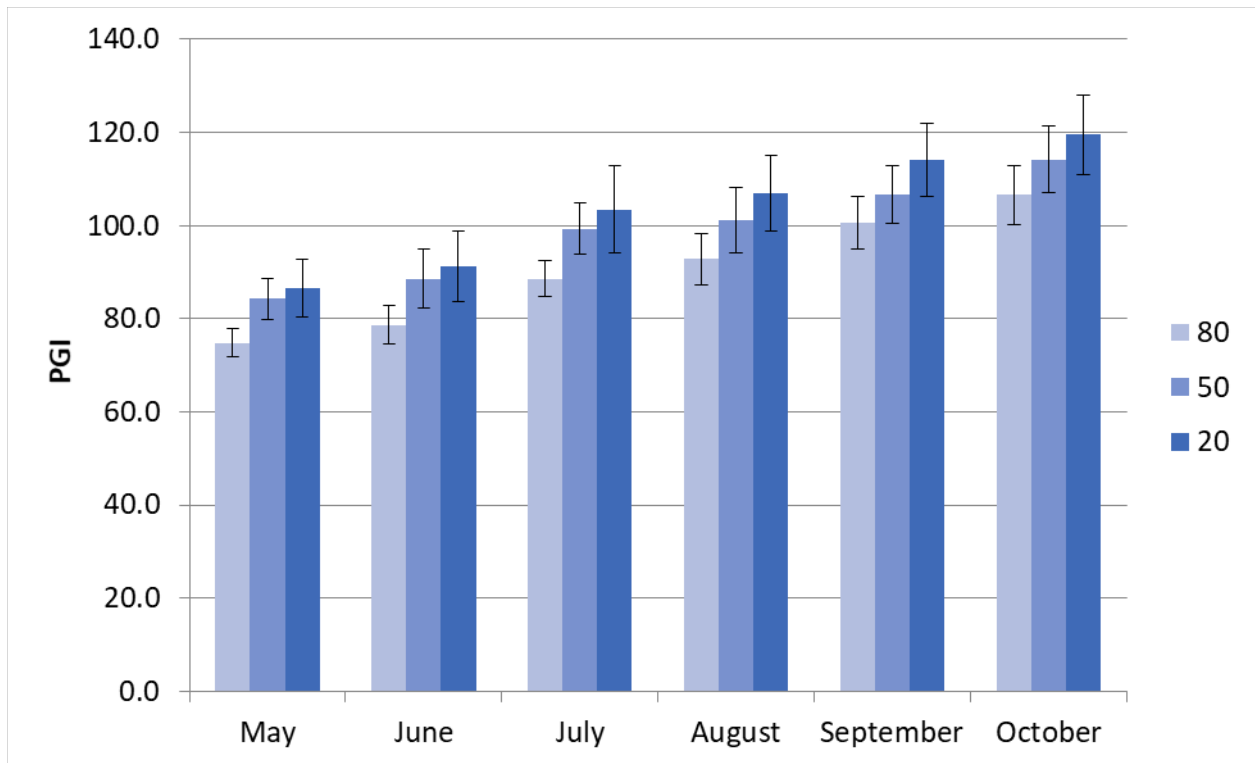


Figure 10c. *Rosa* 'Meijecycka' Limoncello™ average monthly plant growth index (PGI) at South Coast REC in Irvine, CA on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

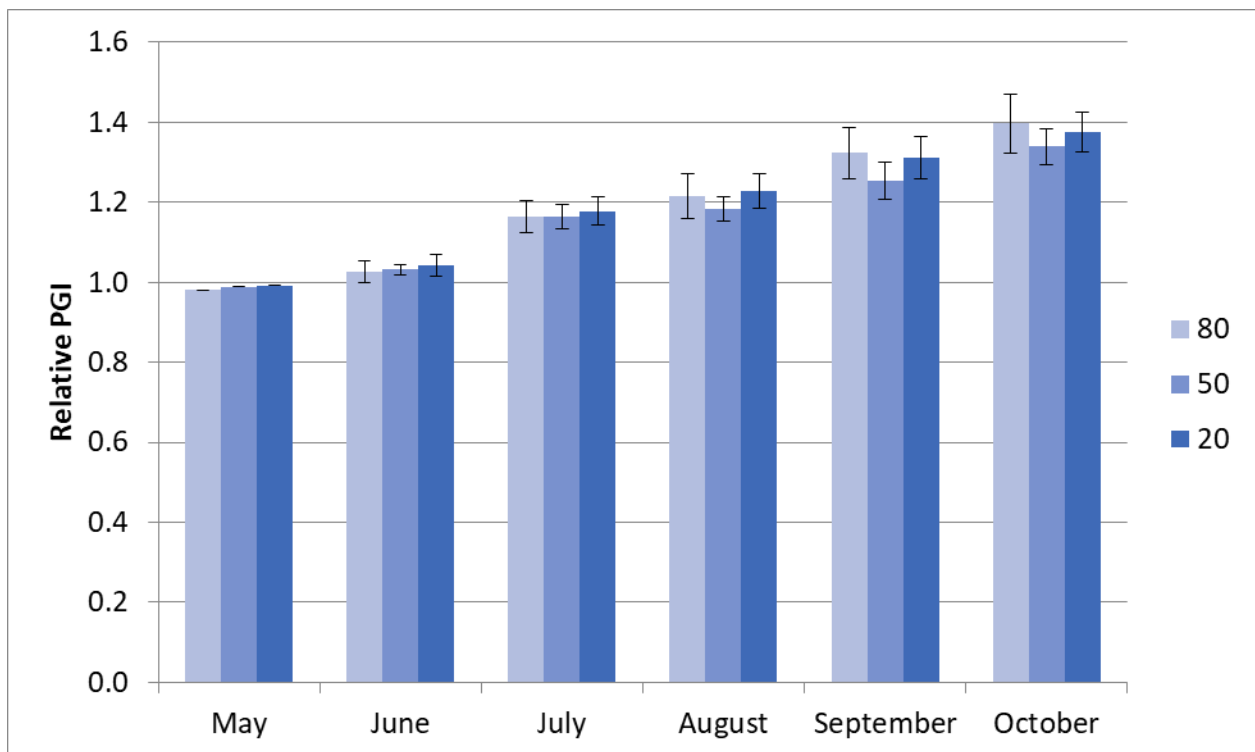


Figure 10d. *Rosa* 'Meijecycka' Limoncello™ average monthly relative plant growth index (RPGI) at South Coast REC in Irvine, CA on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 16a. *Rosa* 'Meijocos' Pink Drift® average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC in Irvine, CA on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or ≤ 0.01 (in red).

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.4	3.1	3.1	3.1	3.1	3.4 ^a	3.2 ^a
	50	2.9	3.0	3.0	2.9	2.9	3.0	2.7 ^{ab}	2.9 ^b
	20	3.1	3.0	3.0	3.0	3.0	3.0	2.6 ^b	3.0 ^b
Foliage	80	3.9	3.8	3.5	3.4	3.3	3.1	2.9	3.4
	50	3.5	3.3	3.3	3.4	3.3	3.1	2.5	3.2
	20	4.0	3.9	3.4	3.4	3.6	3.0	2.5	3.4
Flower	80	1.1	2.3	0.9	2.0	1.3	1.1	1.1	1.4
	50	1.0	1.5	0.8	1.9	1.1	1.1	1.0	1.2
	20	1.0	1.4	0.5	1.5	1.1	1.3	1.3	1.1
Pest Resistance	80	4.5	4.9	4.1	4.1	4.3	4.1	3.3	4.2
	50	4.3	4.6	4.1	4.3	4.0	4.0	3.0	4.0
	20	4.4	4.8	4.6	4.5	4.4	4.3	3.1	4.3
Disease Resistance	80	4.6	4.1	4.0	4.3	4.1	4.1 ^{ab}	5.0	4.3
	50	4.9	4.8	3.9	3.9	4.4	4.6 ^a	5.0	4.5
	20	5.0	4.5	4.1	4.3	4.4	3.9 ^b	5.0	4.4
Vigor	80	4.3	4.3	3.9	3.8	3.9	3.4	3.8	3.9
	50	4.4	4.3	3.8	3.8	3.6	3.4	2.9	3.7
	20	4.3	4.1	3.6	3.6	3.5	3.1	3.0	3.6

Table 16b. Open House participant ratings for *Rosa* 'Meijocos' Pink Drift® on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	4	4	4	4	4	4	5	4	4
	Mean	3.0	2.2	2.3	3.1	3.3	3.0	3.8	2.8	2.5
	Median	3	2	2	3	3	3	4	3	3
	Min	1	1	1	2	2	2	2	2	1
Foliage Quality	Max	5	4	4	5	5	4	5	5	4
	Mean	3.4	2.4	2.5	4.2	3.8	3.4	4.1	3.3	2.7
	Median	3	3	3	4	4	3	4	3	3
	Min	2	1	1	3	3	2	3	2	1
Floral Display	Max	3	3	3	3	5	4	5	4	3
	Mean	0.1	0.1	0.1	1.9	2.8	2.4	3.7	2.2	2.3
	Median	0	0	0	2	3	2	4	2	2
	Min	0	0	0	1	1	1	2	1	1

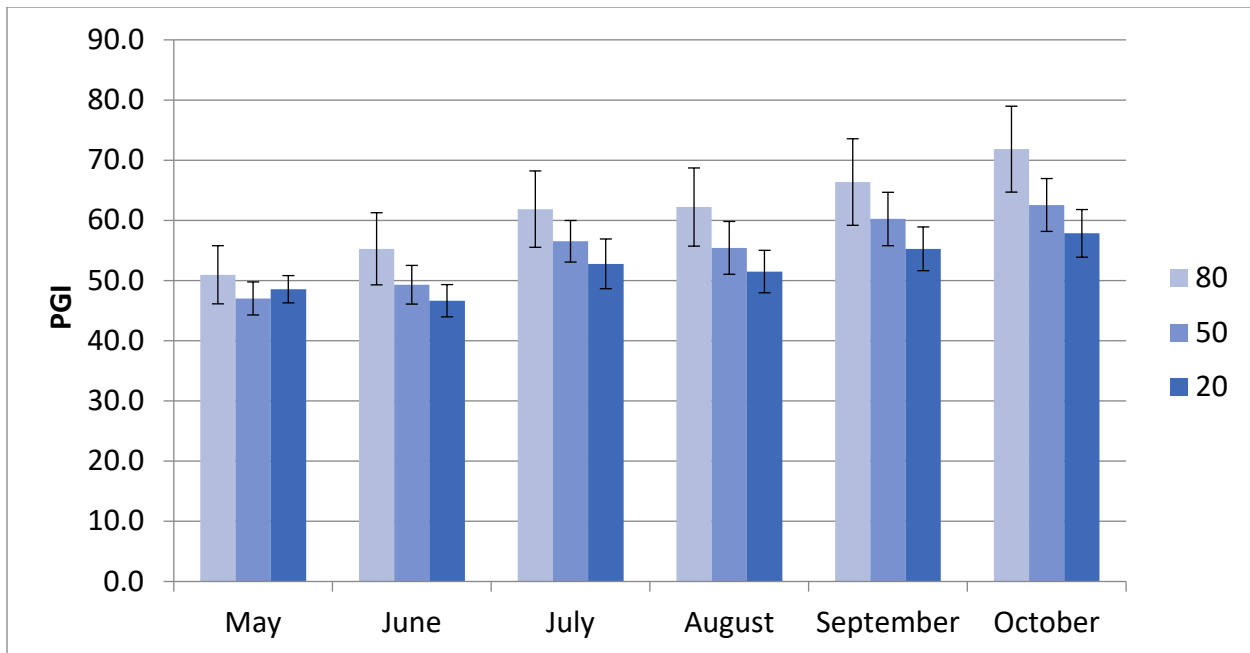


Figure 11a. *Rosa* 'Meijocos' Pink Drift® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

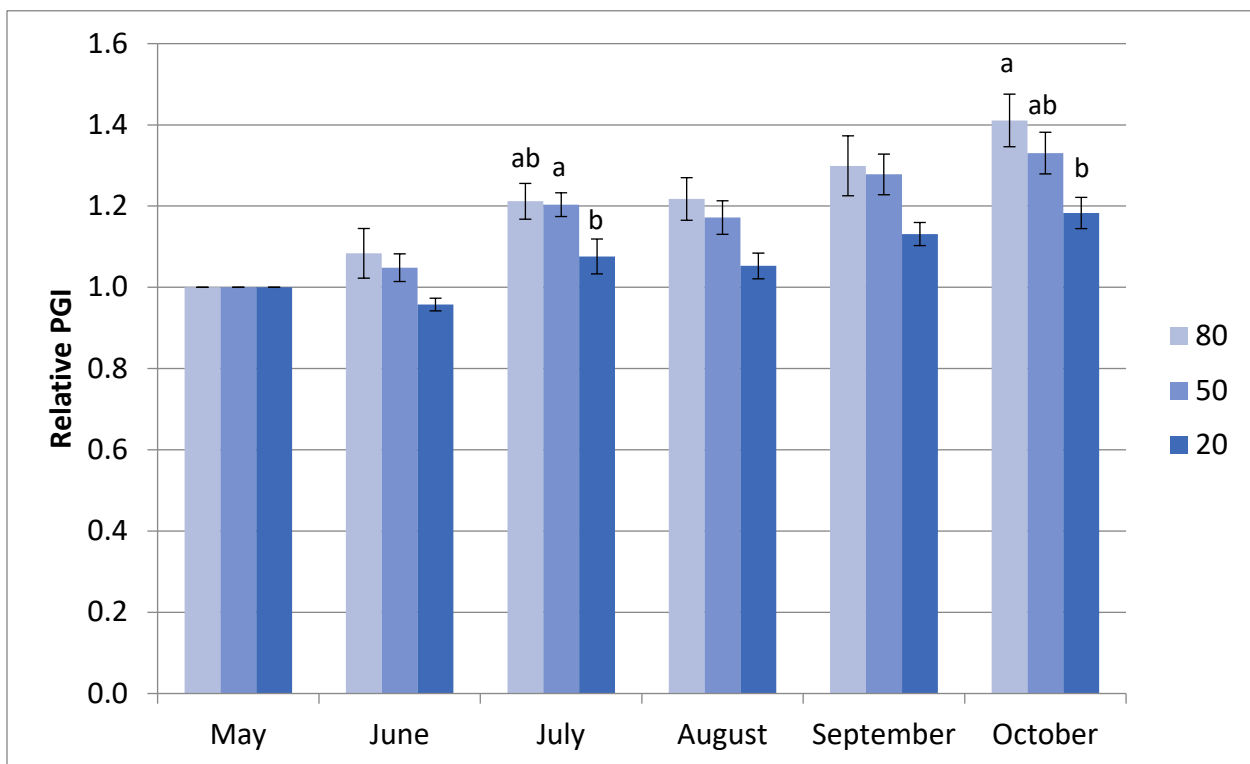


Figure 11b. *Rosa* 'Meijocos' Pink Drift® average monthly relative plant growth index (R13b)PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Table 17a. *Rosa* 'Meiradena' Icecap™ average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	4.0	4.4	3.9	4.0	3.9	3.3	3.2	3.8
	50	3.4	3.9	3.5	3.5	3.5	3.5	3.4	3.5
	20	3.6	4.3	3.8	3.6	3.6	3.0	2.9	3.5
Foliage	80	4.0	4.0	4.0	3.9	3.9	3.6	2.8	3.7
	50	4.0	3.9	3.9	3.9	4.0	3.6	3.2	3.8
	20	4.0	4.0	4.0	4.0	3.9	3.3	2.8	3.7
Flower	80	3.6	4.7	1.0	3.7	2.6	2.1	2.7	2.9
	50	3.4	4.4	1.0	3.6	2.6	2.4	3.0	2.9
	20	3.3	4.8	1.0	3.0	2.0	1.6	2.3	2.6
Pest Resistance	80	4.6	4.3	4.1	4.3	4.0	3.7	2.7 ^a	4.0
	50	4.4	4.9	4.1	4.0	3.9	4.0	3.4 ^b	4.1
	20	4.6	4.8	4.1	4.3	4.0	4.1	2.9 ^{ab}	4.1
Disease Resistance	80	4.9	4.9	4.7	4.7	4.7	4.7	4.3	4.7
	50	4.9	4.6	4.6	4.8	4.8	4.5	4.4	4.6
	20	4.9	4.6	4.8	4.9	4.9	4.5	4.4	4.7
Vigor	80	4.1	4.1	4.0	4.0	4.0	3.6	3.3	3.9
	50	4.0	4.1	4.0	4.0	4.0	3.8	3.1	3.9
	20	4.4	4.3	3.6	3.6	3.5	3.5	3.3	3.7

Table 17b. Open House participant ratings for *Rosa* 'Meiradena' Icecap™ on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	4	4	4	5
	Mean	2.9	3.2	2.6	3.7	3.6	3.2	3.2	3.1	3.6
	Median	3	3	3	4	4	3	3	3	4
	Min	1	2	1	2	2	2	2	2	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	3.0	3.3	2.6	4.2	4.6	4.5	3.6	3.6	4.2
	Median	3	3	3	4	5	5	4	4	4
	Min	1	2	1	3	3	3	3	2	3
Floral Display	Max	3	3	0	5	4	2	5	4	5
	Mean	0.1	0.1	0.0	3.3	2.0	1.1	2.7	3.0	3.6
	Median	0	0	0	3	2	1	3	3	4
	Min	0	0	0	2	1	0	1	2	2

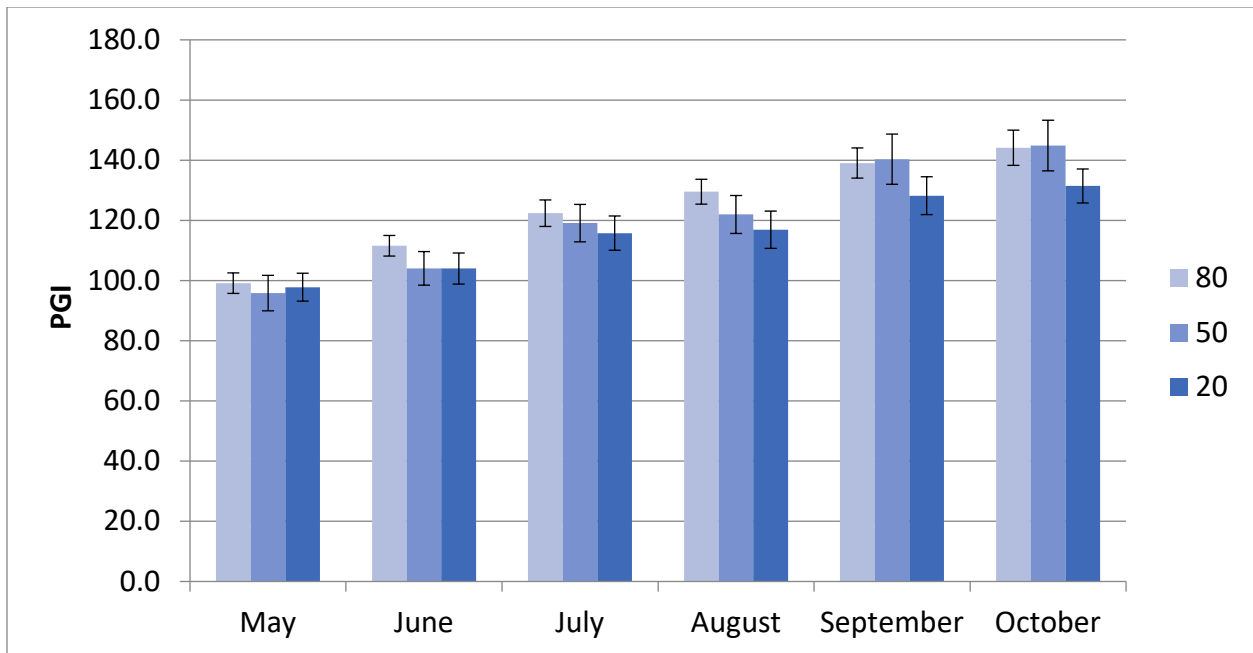


Figure 11a. *Rosa* 'Meiradena' Icecap™ average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

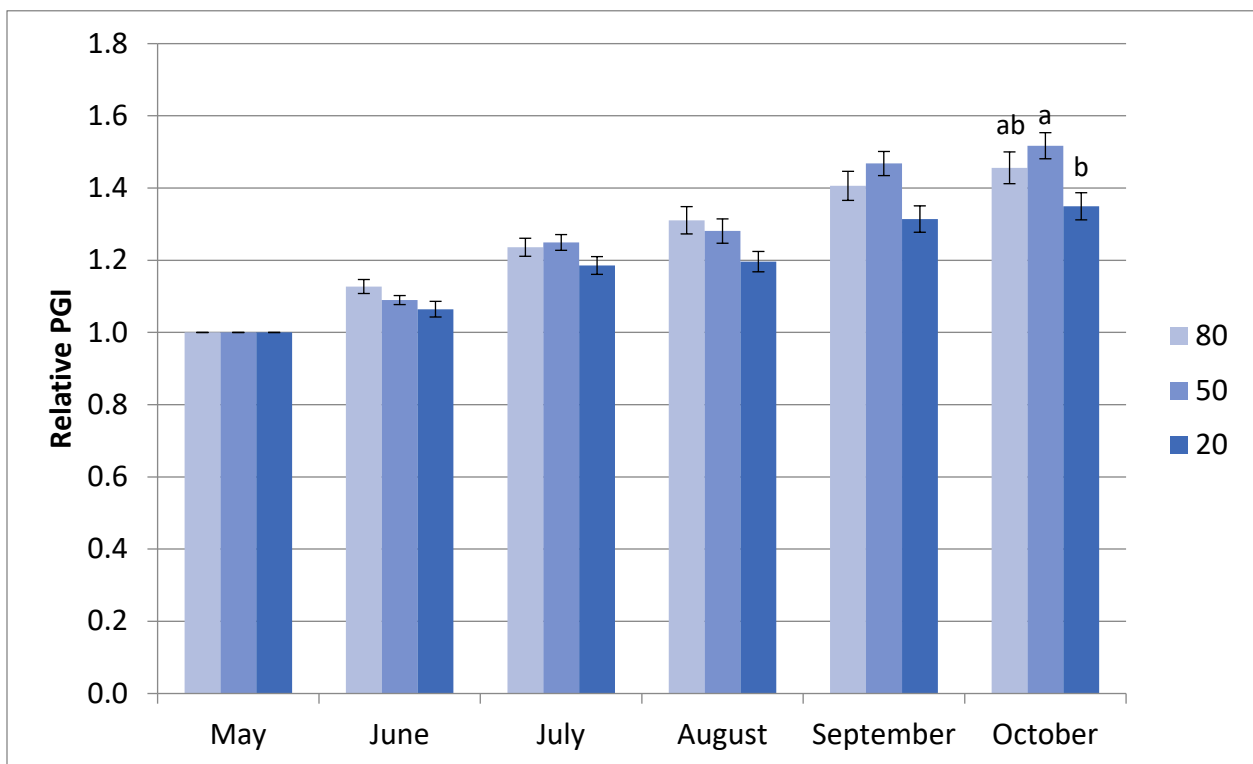


Figure 11b. *Rosa* 'Meiradena' Icecap™ average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Table 18a. *Rosa* 'Meitraligh' Brick House™ average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	4.0	4.7	3.7	4.8	4.2	3.8	3.7	4.1
	50	4.0	4.9	3.9	4.8	3.9	3.7	3.8	4.1
	20	4.0	4.9	3.9	5.0	3.9	3.6	3.4	4.1
Foliage	80	4.9	4.3	4.0	3.8	3.4	2.9	3.2	3.8
	50	4.9	4.8	4.3	3.9	3.6	3.0	3.1	3.9
	20	4.8	4.5	4.1	3.6	3.4	2.9	2.9	3.8
Flower	80	0.1	4.5	1.3	4.5	1.8	2.6	2.0	2.4
	50	0.1	4.8	1.1	4.4	1.5	2.3	2.5	2.4
	20	0.0	4.5	1.1	4.9	1.4	1.8	1.6	2.2
Pest Resistance	80	4.8	4.8	4.4	3.8	3.5	2.9	3.4	3.9
	50	5.0	4.9	4.5	3.8	3.5	3.4	3.0	4.0
	20	5.0	4.5	4.4	3.5	3.3	3.0	3.1	3.8
Disease Resistance	80	5.0	4.4	4.1	5.0	5.0	5.0	5.0	4.8
	50	4.9	4.8	4.4	4.9	5.0	5.0	5.0	4.8
	20	4.9	4.8	4.1	5.0	5.0	5.0	5.0	4.8
Vigor	80	4.8	4.6	4.8	4.8	4.8	4.9	3.9	4.6
	50	4.9	4.5	4.8	4.9	4.5	4.4	3.8	4.5
	20	5.0	4.5	4.9	4.8	4.9	4.4	3.8	4.6

Table 18b. Open House participant ratings for *Rosa* 'Meitraligh' Brick House™ on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.0	4.4	4.2	3.6	4.3	4.0	4.2	4.0	3.2
	Median	4	4	4	4	4	4	4	4	3
	Min	2	3	3	0	3	3	3	3	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.5	4.6	4.7	4.1	4.6	4.4	4.2	4.1	3.6
	Median	5	5	5	4	5	4	4	4	4
	Min	3	3	3	2	3	2	2	2	2
Floral Display	Max	5	5	5	5	5	5	5	5	5
	Mean	2.0	3.2	2.2	3.6	4.1	4.2	3.9	3.2	1.5
	Median	2	3	2	4	4	4	4	3	1
	Min	0	1	0	2	3	3	2	1	0

Table 18c. *Rosa* 'Meitraligh' Brick House™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	3.3	3.1	3.3	3.1	3.1	2.9	3.2
	50	3.1	3.3	3.1	3.1	3.0	3.0	2.8	3.1
	20	3.0	3.0	3.0	3.0	3.1	3.0	3.1	3.0
Foliage	80	3.6	3.4	3.6	3.6	3.8	3.4	2.6	3.4
	50	4.0	3.8	4.0	3.9	4.0	3.3	2.4	3.6
	20	3.8	3.5	3.4	3.6	3.5	3.1	2.8	3.4
Flower	80	1.5	1.8	0.6	2.3	1.9	1.4	1.5	1.6
	50	1.3	2.0	0.6	2.1	1.5	1.1	1.1	1.4
	20	1.3	2.1	0.6	1.6	1.3	1.0	1.3	1.3
Pest Resistance	80	4.8	4.9	4.3	4.4	4.3	4.0	3.1	4.2
	50	4.5	4.6	4.8	4.9	4.3	4.1	3.0	4.3
	20	4.8	5.0	4.7	4.8	4.1	4.1	3.4	4.4
Disease Resistance	80	3.8	3.8	4.0	3.9	4.0	4.0	4.0 ^b	3.9 ^a
	50	4.0	3.9	4.4	4.1	4.4	4.1	4.8 ^{ab}	4.2 ^b
	20	4.0	3.9	3.9	3.9	4.1	4.3	5.0 ^a	4.1 ^{ab}
Vigor	80	4.1	4.0	4.0	4.0	3.9	3.5	4.0	3.9
	50	4.0	4.0	4.0	4.0	4.0	3.3	3.5	3.8
	20	4.1	4.1	4.0	4.0	3.9	3.1	3.4	3.8

Table 18d. Open House participant ratings for *Rosa* 'Meitraligh' Brick House™ on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	4	5	5	4	4	5	5	4	5
	Mean	2.9	3.3	3.2	3.6	3.4	3.2	2.9	3.0	3.3
	Median	3	3	3	4	3	3	3	3	3
	Min	1	1	2	2	2	2	1	2	2
Foliage Quality	Max	4	5	5	5	5	5	5	5	5
	Mean	3.1	3.3	3.2	4.5	4.0	3.6	3.5	3.2	3.7
	Median	3	3	3	5	4	4	3	3	4
	Min	1	1	2	3	3	2	2	2	2
Floral Display	Max	4	2	0	3	4	5	4	4	4
	Mean	0.1	0.4	0.0	1.2	1.4	1.2	2.1	2.2	2.4
	Median	0	0	0	1	1	1	2	2	2
	Min	0	0	0	0	0	0	1	0	1

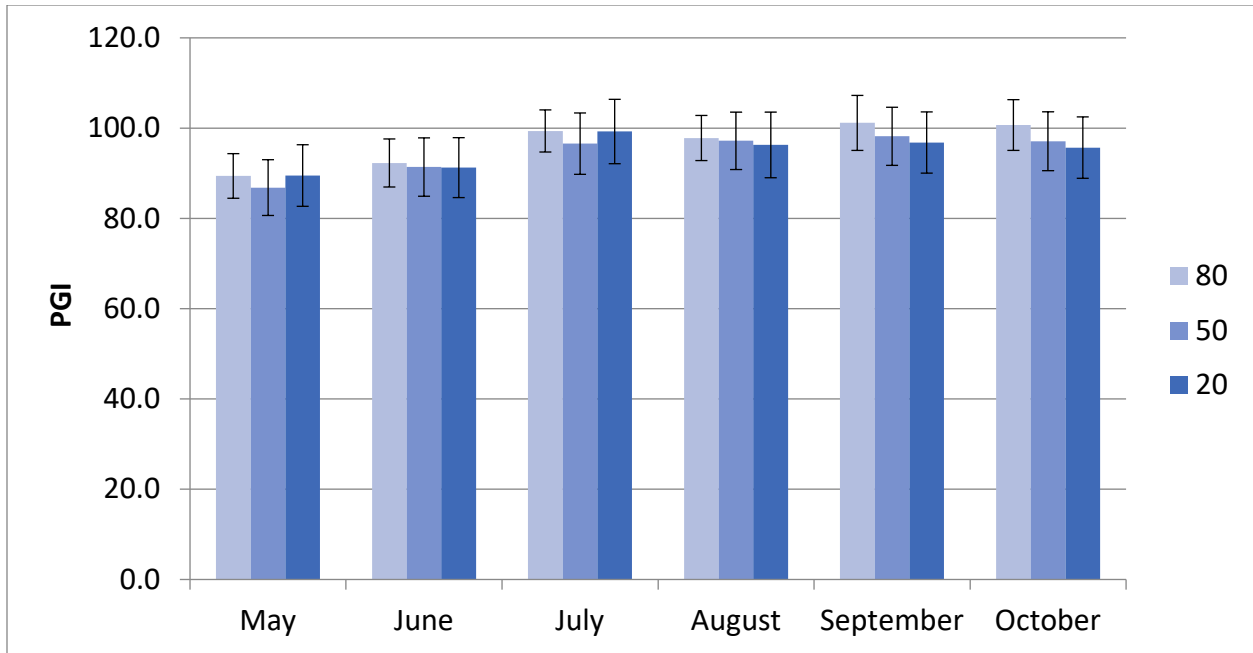


Figure 12a. *Rosa* 'Meitraligh' Brick House™ average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

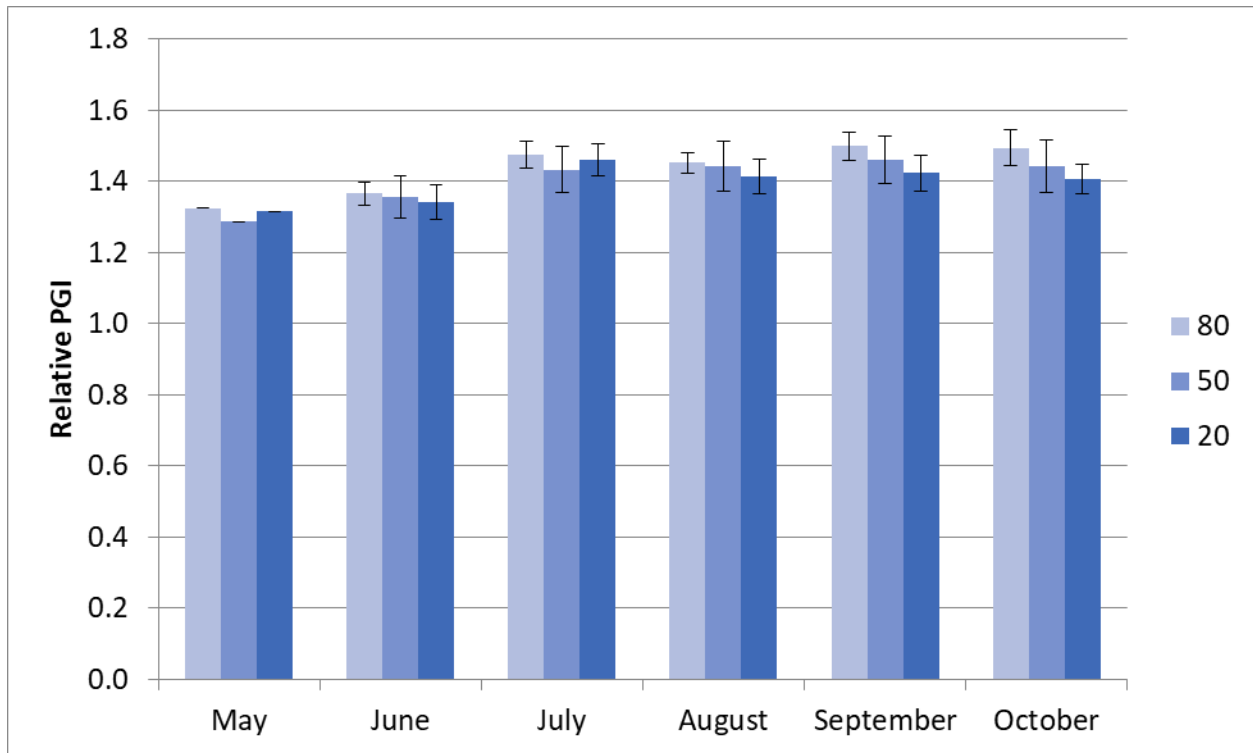


Figure 12b. *Rosa* 'Meitraligh' Brick House™ average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

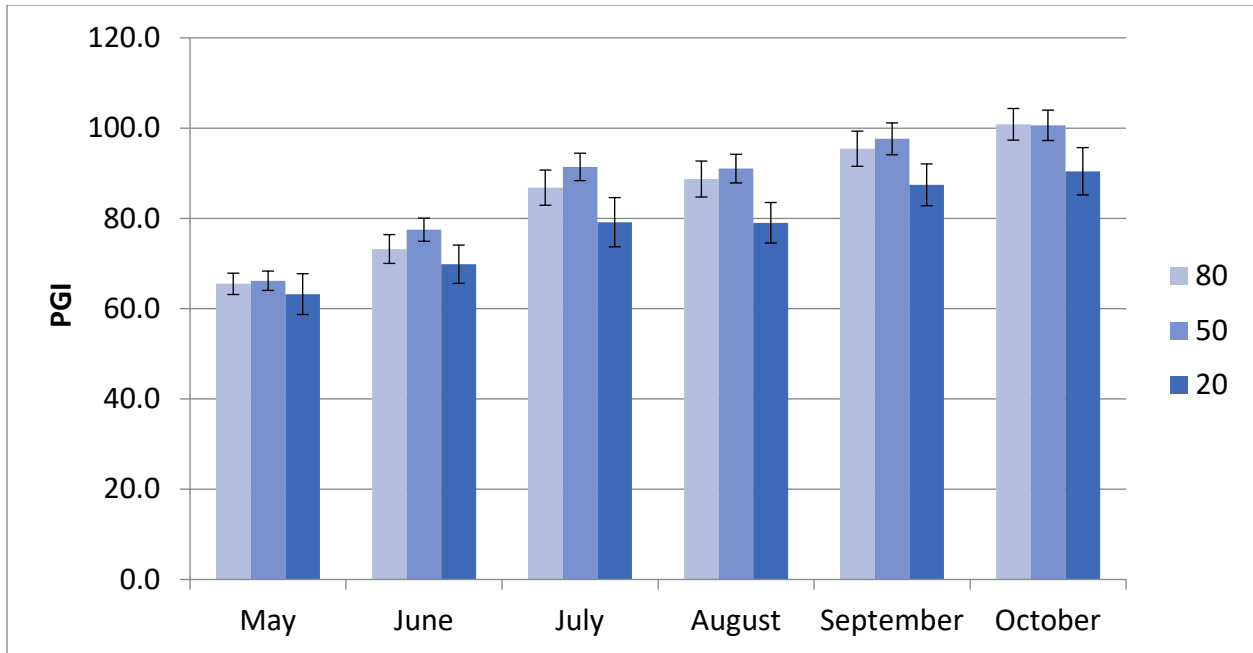


Figure 12c. *Rosa* 'Meitraligh' Brick House™ average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

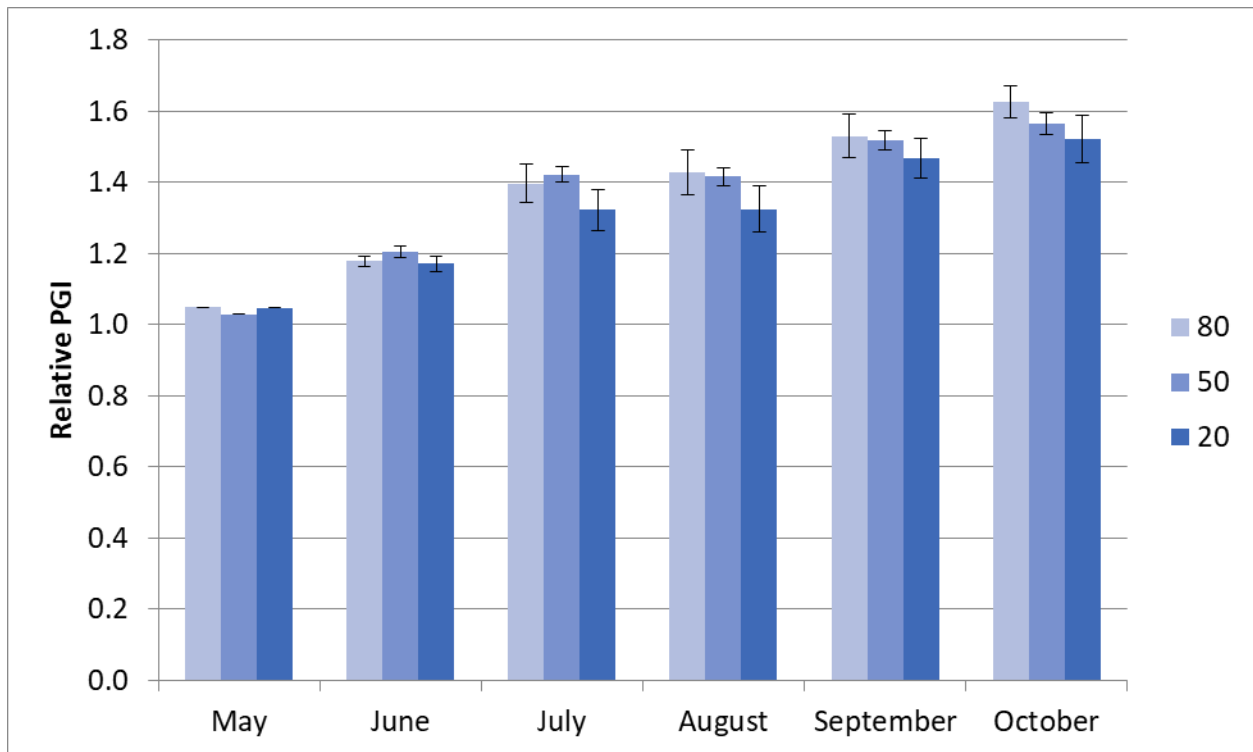


Figure 12d. *Rosa* 'Meitraligh' Brick House™ average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 19a. *Rosa* 'Radwhite' White Knock Out® average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.9	4.4	4.7	4.3	4.0	3.7	3.6	4.1
	50	3.8	4.5	4.8	4.3	4.2	4.1	3.5	4.2
	20	4.0	4.9	4.8	4.3	4.4	3.9	3.6	4.3
Foliage	80	4.1	2.9	3.7	4.4	3.6	3.3	3.4	3.6
	50	4.5	3.5	3.9	4.4	4.0	3.8	3.6	4.0
	20	4.6	3.5	4.0	4.1	3.8	3.3	3.5	3.8
Flower	80	0.4	4.6	4.7	3.3	2.6	3.3	2.9	3.1
	50	0.3	5.0	4.8	2.8	3.0	4.3	2.5	3.2
	20	0.4	5.0	4.6	2.8	3.8	3.4	2.4	3.2
Pest Resistance	80	4.3	4.1	4.0	4.4	3.8	3.7	4.0	4.1
	50	4.9	4.8	4.1	4.4	4.0	3.8	3.6	4.2
	20	4.6	4.6	4.6	4.1	3.8	3.6	3.9	4.2
Disease Resistance	80	4.6	3.3	4.0	5.0	5.0	5.0	5.0	4.6
	50	4.5	3.6	4.4	5.0	5.0	5.0	5.0	4.6
	20	4.8	3.9	3.9	4.8	5.0	4.9	5.0	4.6
Vigor	80	4.6	4.0	4.3	4.4	4.3	4.0	3.9	4.2
	50	4.4	4.1	4.6	4.4	4.8	4.4	4.0	4.4
	20	4.9	4.1	4.6	4.3	4.8	4.1	3.9	4.4

Table 19b. Open House participant ratings (scale 1-5, 5 = highest) for *Rosa* 'Radwhite' White Knock Out® on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.5	4.6	4.4	3.5	3.3	3.6	3.4	3.0	3.4
	Median	5	5	4	3	3	4	3	3	3
	Min	3	3	2	2	2	2	2	1	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.3	4.5	4.4	4.3	4.0	4.4	4.0	3.8	4.0
	Median	4	5	4	4	4	5	4	4	4
	Min	2	3	2	3	2	3	2	2	1
Floral Display	Max	5	5	5	5	5	5	5	5	5
	Mean	4.4	4.5	4.1	2.9	3.3	3.3	2.7	2.5	3.0
	Median	4	5	4	3	3	3	3	2	3
	Min	3	3	2	1	2	2	1	1	0

Table 19c. *Rosa* 'Radwhite' White Knock Out® average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or ≤ 0.01 (in red).

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	2.9	3.0	3.1	3.1	3.0	3.8	3.2
	50	2.9	2.8	3.0	3.0	3.0	3.0	3.6	3.0
	20	3.1	2.9	3.0	3.0	3.0	3.0	3.4	3.1
Foliage	80	3.8	3.3	3.1	3.1	3.5	3.8	3.8	3.5
	50	3.8	3.3	3.5	3.5	3.8	3.6	3.7	3.6
	20	3.6	3.4	3.4	3.4	3.4	3.5	3.9	3.5
Flower	80	2.6	1.8	1.9	1.9	2.1	1.8	2.8	2.1
	50	2.4	1.3	1.5	1.6	1.9	1.6	2.9	1.9
	20	2.9	2.1	1.4	1.6	2.5	2.0	1.9	2.1
Pest Resistance	80	4.8	4.8	4.4	4.4	4.5	4.4	4.0	4.4
	50	4.9	4.9	4.4	4.5	4.4	4.4	3.7	4.4
	20	4.4	4.6	4.4	4.4	4.1	4.3	3.9	4.3
Disease Resistance	80	5.0	4.4	4.5	4.5	4.5	4.8	4.9	4.6
	50	4.3	3.9	4.3	4.5	4.6	4.9	5.0	4.5
	20	4.5	4.1	4.1	4.5	4.6	5.0	5.0	4.6
Vigor	80	4.0	4.0	3.9	4.0	3.9	3.6	4.6	4.0 ^a
	50	4.0	3.9	3.8	3.8	3.6	3.4	4.0	3.8 ^b
	20	3.9	3.8	3.6	3.6	3.6	3.4	3.9	3.7 ^b

Table 19d. Open House participant ratings *Rosa* 'Radwhite' White Knock Out® on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	4	4	4	5	5	5	5	5	5
	Mean	2.5	2.3	2.9	3.7	4.4	4.2	3.3	2.9	3.5
	Median	3	2	3	4	4	4	3	3	4
	Min	1	1	1	2	4	3	2	1	2
Foliage Quality	Max	4	4	4	5	5	5	5	5	5
	Mean	2.6	2.3	3.1	4.4	4.4	4.7	4.1	3.7	4.1
	Median	3	2	3	4	4	5	4	4	4
Floral Display	Max	3	2	3	5	5	5	5	3	5
	Mean	0.1	0.0	0.1	3.4	4.4	4.1	3.2	1.3	3.3
	Median	0	0	0	4	4	4	3	1	3
	Min	0	0	0	0	4	3	0	0	2

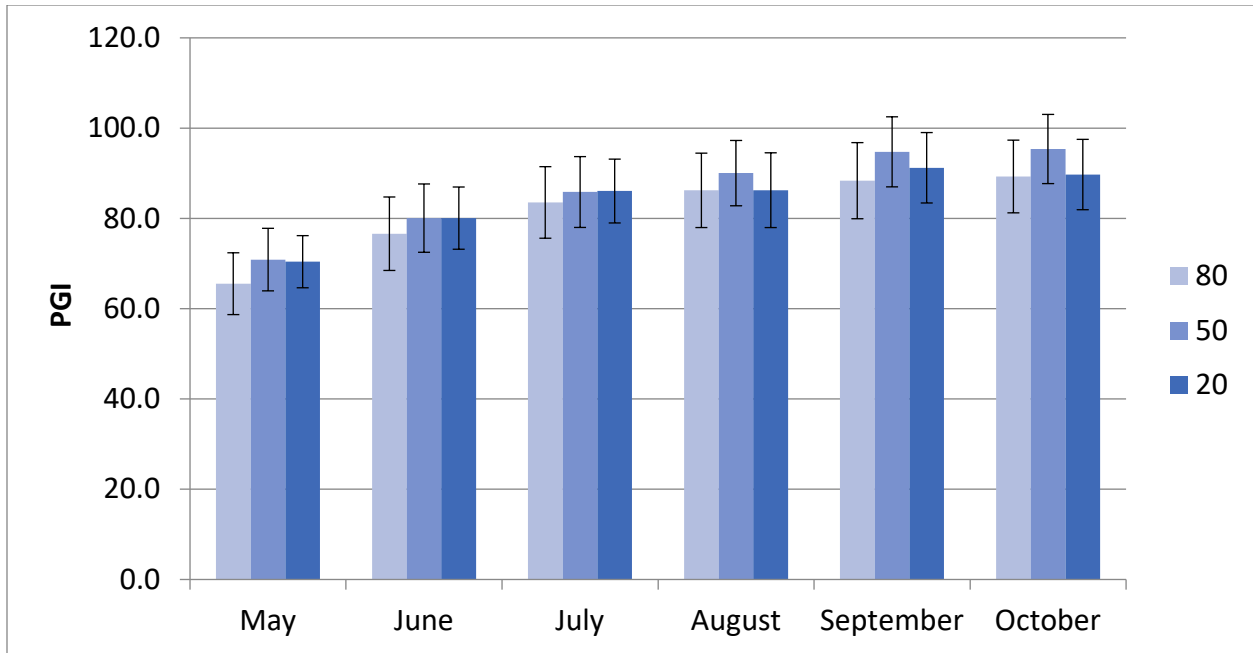


Figure 13a. *Rosa* 'Radwhite' White Knock Out® average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

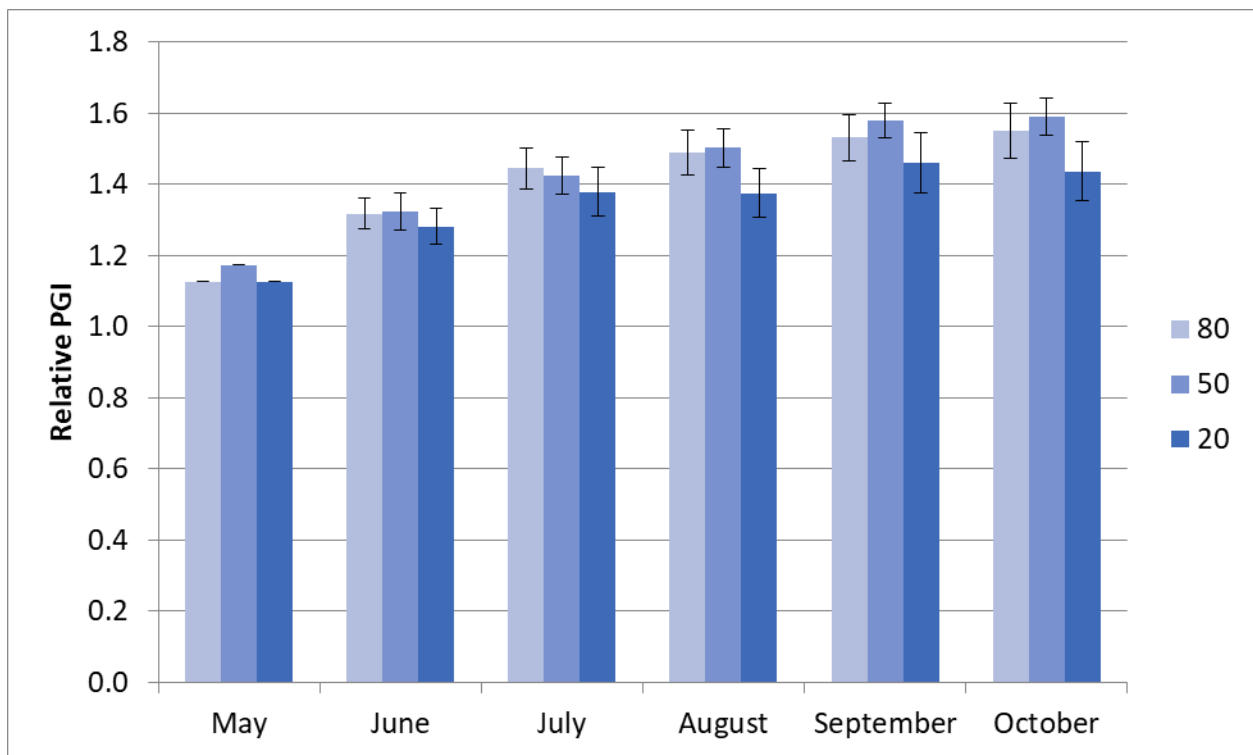


Figure 13b. *Rosa* 'Radwhite' White Knock Out® average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

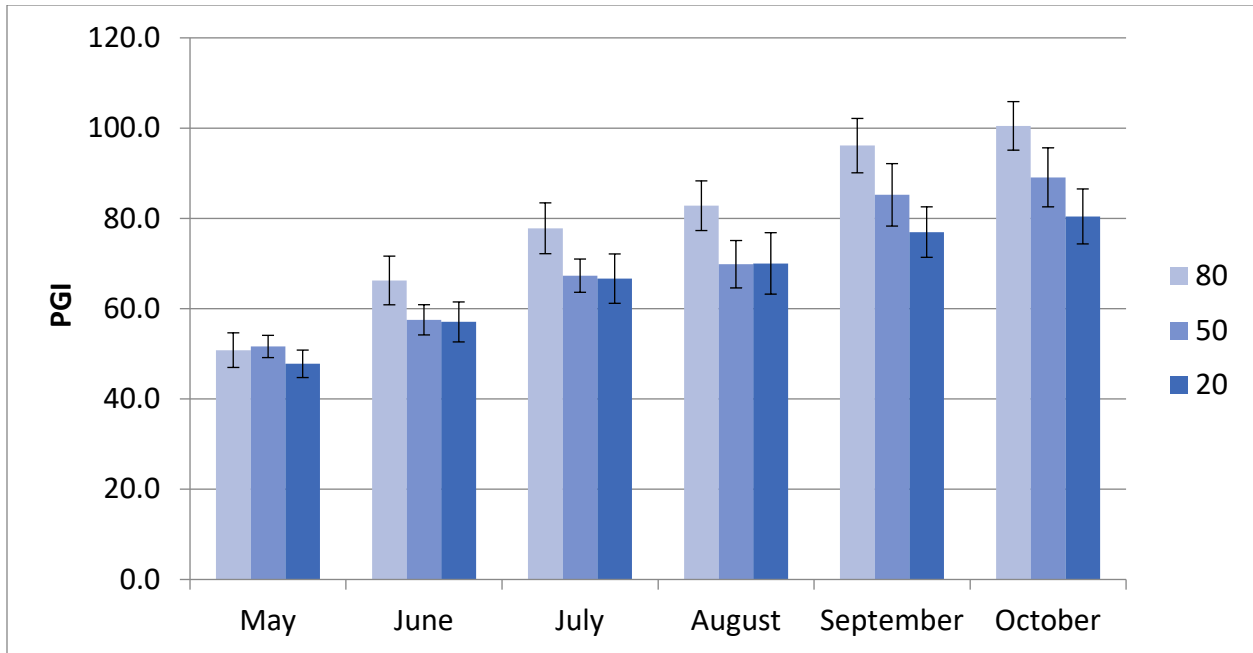


Figure 13c. *Rosa* 'Radwhite' White Knock Out® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

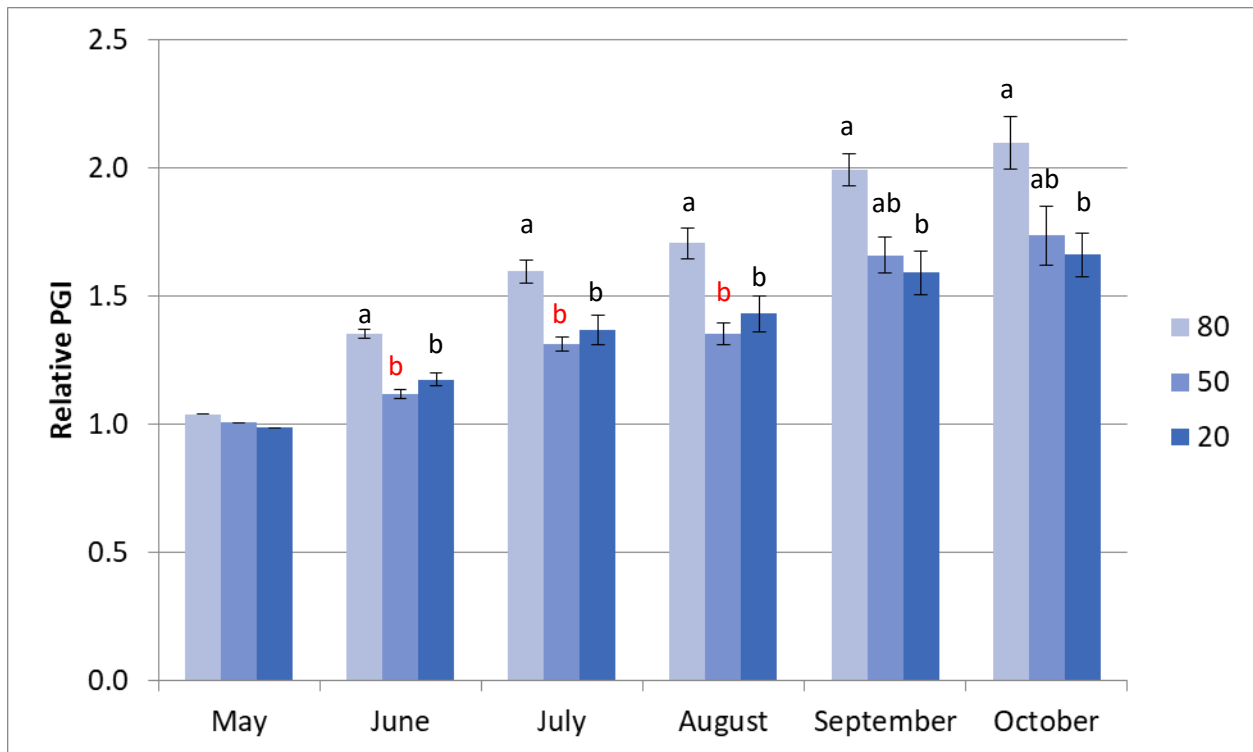


Figure 13d. *Rosa* 'Radwhite' White Knock Out® average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (black) and $p \leq 0.01$ (red).

Table 20a. *Vitex* 'Bailtexone' Flip Side® average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts are significantly different using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Category	ET ₀ %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80		3.9	4.0	5.0	4.8	4.1	4.6	4.4
	50	4.0	4.0	4.0	5.0	4.9	4.1	4.8	4.4
	20		4.1	4.0	5.0	4.6	4.1	4.4	4.4
Foliage	80		5.0	5.0	5.0	4.3	4.3	5.0	4.8
	50	4.0	5.0	5.0	5.0	4.3	4.1	5.0	4.6
	20		5.0	5.0	5.0	4.4	4.1	5.0	4.8
Flower	80	0.0	0.6	0.1	5.0	3.4 ^{ab}	1.1	1.8	1.7
	50	0.0	0.6	0.1	5.0	3.8 ^a	1.3	2.1	1.8
	20	0.0	0.0	0.4	5.0	2.4 ^b	1.3	1.5	1.5
Pest Resistance	80		5.0	5.0	5.0	4.3	4.3	5.0	4.8
	50	5.0	5.0	5.0	5.0	4.1	4.1	5.0	4.8
	20		5.0	5.0	5.0	4.4	4.1	5.0	4.8
Disease Resistance	80		5.0	5.0	5.0	5.0	5.0	5.0	5.0
	50	4.0	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80		5.0	5.0	5.0	4.9	4.9	5.0	5.0
	50	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	20		5.0	5.0	5.0	4.9	5.0	5.0	5.0

Table 20b. Open House participant ratings (scale 1-5, 1 = lowest, 5 = highest) for *Vitex* 'Bailtexone' Flip Side® on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET ₀ %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	4.2	4.0	4.3	4.4	4.3	3.9	4.1	3.8
	Median	4	4	4	4	4	4	4	4	4
	Min	3	2	2	0	3	3	1	2	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.6	4.7	4.4	4.8	4.8	4.6	4.6	4.6	4.4
	Median	5	5	5	5	5	5	5	5	5
	Min	3	2	3	4	4	3	2	2	3
Floral Display	Max	0	0	4	5	5	5	5	5	5
	Mean	0.0	0.0	0.0	3.9	4.0	3.6	2.0	2.4	1.7
	Median	0	0	0	4	4	4	2	2	1
	Min	0	0	0	2	2	2	1	0	0

Table 20c. *Vitex* 'Bailtexone' Flip Side® average monthly quality ratings (scale 1-5, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts are significantly different using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.1	3.1	3.0	3.0	3.0	3.5	4.2	3.3 ^b
	50	3.3	3.4	3.3	3.5	3.5	3.5	4.1	3.5 ^a
	20	3.3	3.3	3.3	3.3	3.3	3.4	4.5	3.4 ^{ab}
Foliage	80	4.0	3.5	3.0	4.1	4.1	4.1	5.0	4.0
	50	4.0	4.0	3.1	4.1	4.3	4.4	4.9	4.1
	20	4.0	3.9	3.0	4.1	4.1	3.9	5.0	4.0
Flower	80	0.0	0.0	0.3	0.6	3.5	2.4	0.9	1.1
	50	0.0	0.1	0.8	1.3	2.9	1.9	1.1	1.1
	20	0.1	0.0	0.6	0.8	3.1	2.8	1.1	1.2
Pest Resistance	80	4.8	4.8	4.8	4.9	4.9	4.9	5.0	4.8
	50	4.3	4.5	4.8	4.9	5.0	5.0	5.0	4.8
	20	4.8	4.9	4.8	4.8	4.9	4.9	5.0	4.8
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.5	4.6	4.3	4.3	4.1	4.1	5.0	4.4
	50	4.9	4.9	4.6	4.6	4.5	4.0	5.0	4.6
	20	4.6	4.6	4.4	4.4	4.4	4.0	5.0	4.5

Table 20d. Open House participant ratings (scale 1-5, 1 = lowest, 5 = highest) for *Vitex* 'Bailtexone' Flip Side® on 3 ETo-based irrigation levels in March, June, and September 2019 at South Coast REC.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	4	5	4	5	5	5	5	5	5
	Mean	2.4	3.1	2.6	3.9	4.1	4.1	4.0	4.5	4.0
	Median	2	3	3	4	4	4	4	5	4
	Min	1	2	1	3	3	3	2	3	3
Foliage Quality	Max	4	5	4	5	5	5	5	5	5
	Mean	2.3	3.3	2.7	4.3	4.4	4.7	4.6	4.7	4.4
	Median	2	3	3	4	5	5	5	5	5
	Min	1	2	1	3	3	4	3	4	3
Floral Display	Max	4	4	3	3	5	4	5	5	5
	Mean	0.3	0.4	0.2	1.2	1.6	2.2	3.0	3.6	2.5
	Median	0	0	0	1	1	2	3	4	3
	Min	0	0	0	0	0	1	1	1	0

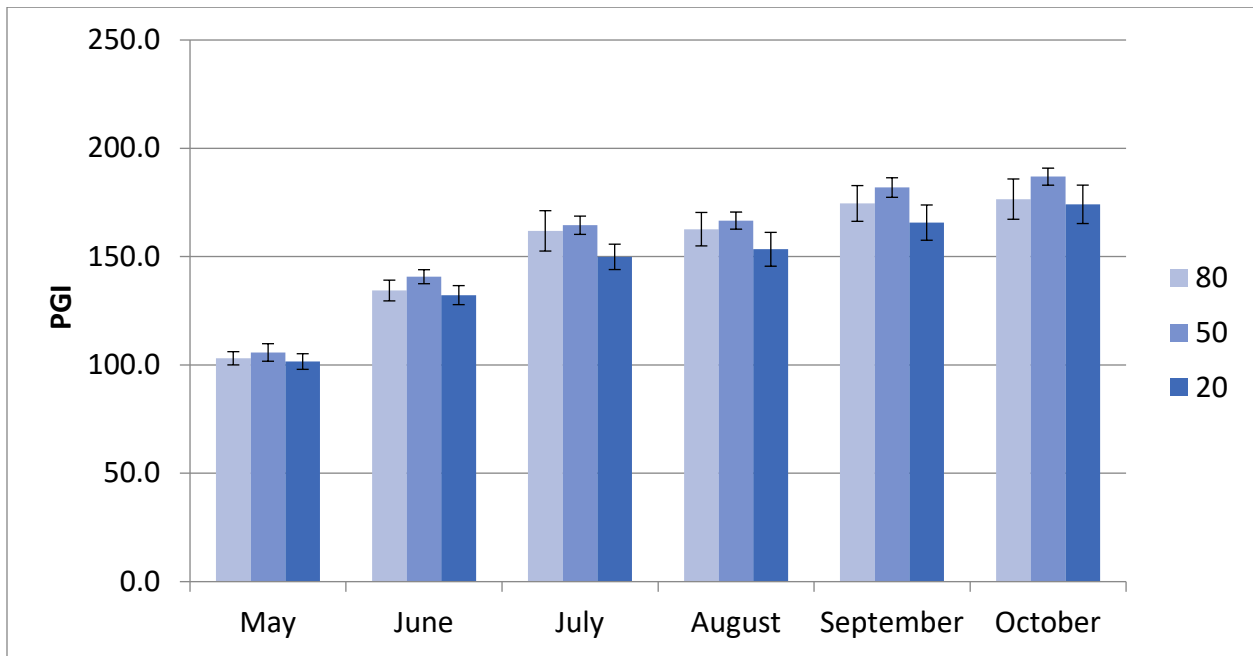


Figure 14a. *Vitex* 'Bailtexone' Flip Side® average monthly plant growth index (PGI) at UC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

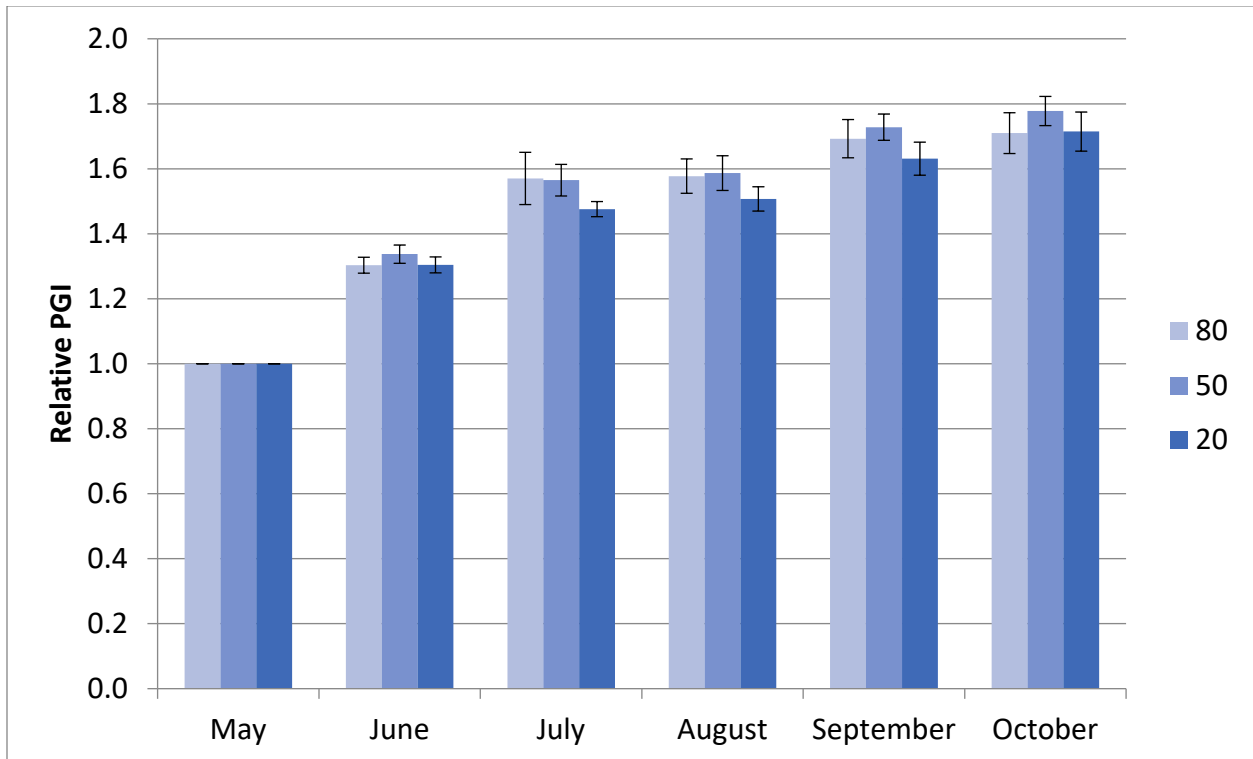


Figure 14b. *Vitex* 'Bailtexone' Flip Side® average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

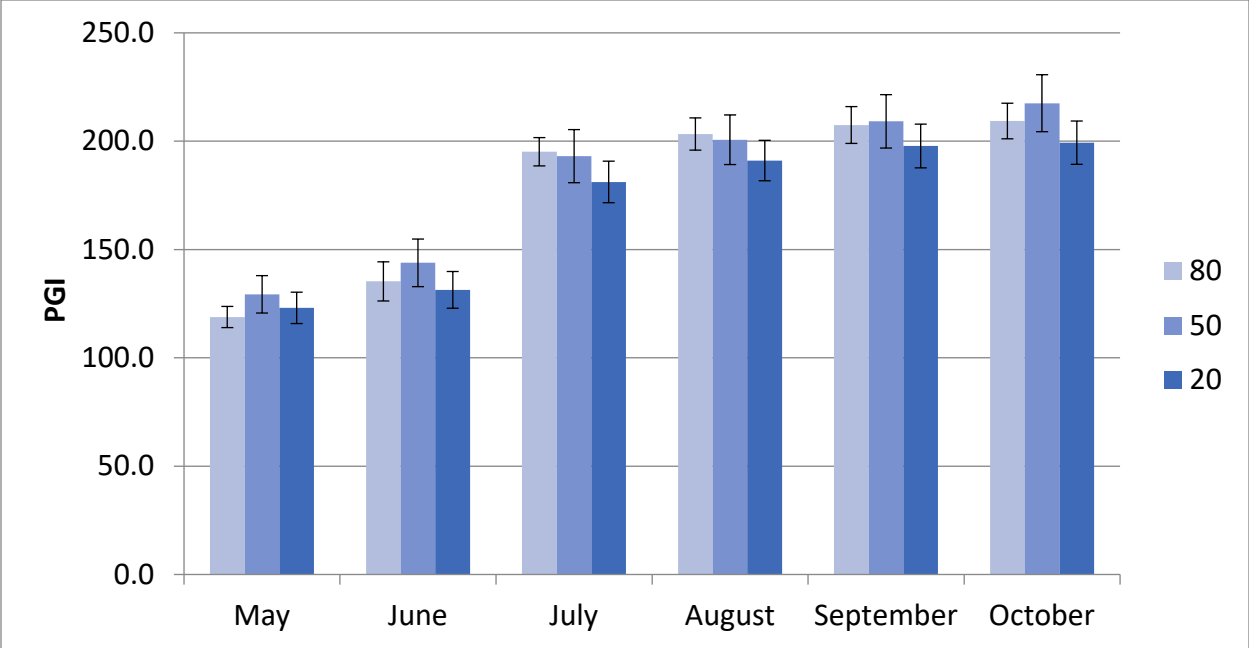


Figure 14c. *Vitex* 'Bailtexone' Flip Side® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

20b)

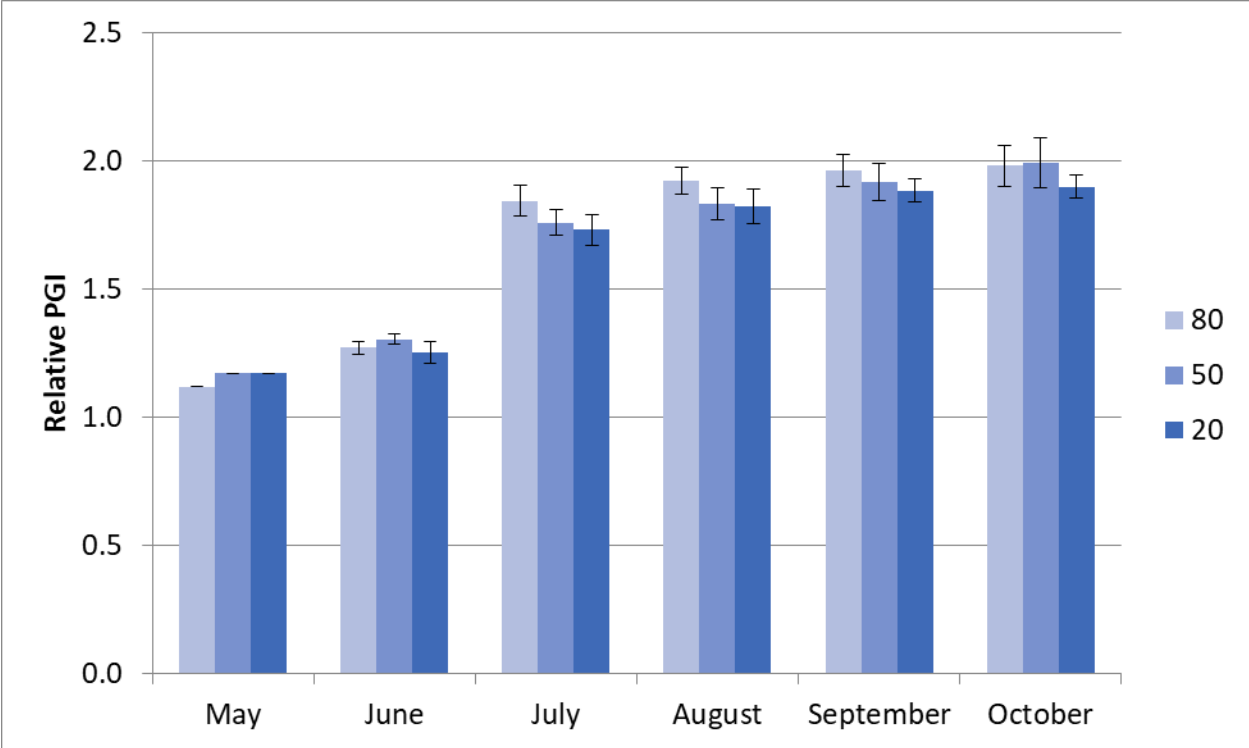


Figure 14d. *Vitex* 'Bailtexone' Flip Side® average monthly relative plant growth index (rPGI) at South Coast REC on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 21a. *Distylium* 'Vintage Jade' average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (in black) or ≤ 0.01 (in red).

Category	ET ₀ %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.5	3.8	3.6	3.6	3.8	3.9 ^{ab}	3.8 ^a	3.7 ^a
	50	3.6	3.8	3.8	3.6	3.9	4.1 ^a	3.9 ^a	3.8 ^a
	20	3.6	4.1	3.6	3.3	3.3	3.1 ^b	2.9 ^b	3.4 ^b
Foliage	80	5.0	5.0	3.9	4.1	4.4	4.1 ^a	3.9 ^a	4.3 ^a
	50	5.0	5.0	4.0	4.3	4.1	3.7 ^{ab}	3.9 ^a	4.3 ^a
	20	4.9	4.9	3.6	3.5	3.5	3.1 ^b	2.9 ^b	3.8 ^b
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pest Resistance	80	5.0	5.0	5.0	4.6	5.0	5.0	5.0	4.9
	50	5.0	5.0	5.0	4.7	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
Disease Resistance	80	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	4.9	5.0	5.0
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.4	4.0	3.6	3.3	3.4	3.9	3.8 ^a	3.8
	50	4.6	4.0	3.6	3.0	3.3	4.3	3.6 ^a	3.8
	20	4.5	4.3	3.8	3.1	3.1	3.4	2.8 ^b	3.6

Table 21b. Open House participant ratings for *Distylium* 'Vintage Jade' on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET ₀ %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	4	5	5	5	5
	Mean	3.9	3.3	3.8	3.4	3.2	3.3	3.4	3.4	3.4
	Median	4	3	4	3	3	3	3	3	3
	Min	2	2	2	0	0	0	2	2	2
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.1	3.7	4.3	3.7	3.4	3.8	3.5	3.6	3.7
	Median	4	4	4	4	3	4	3	4	4
	Min	2	2	2	2	1	2	2	2	2
Floral Display	Max	0	4	0	0	5	0	3	4	5
	Mean	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

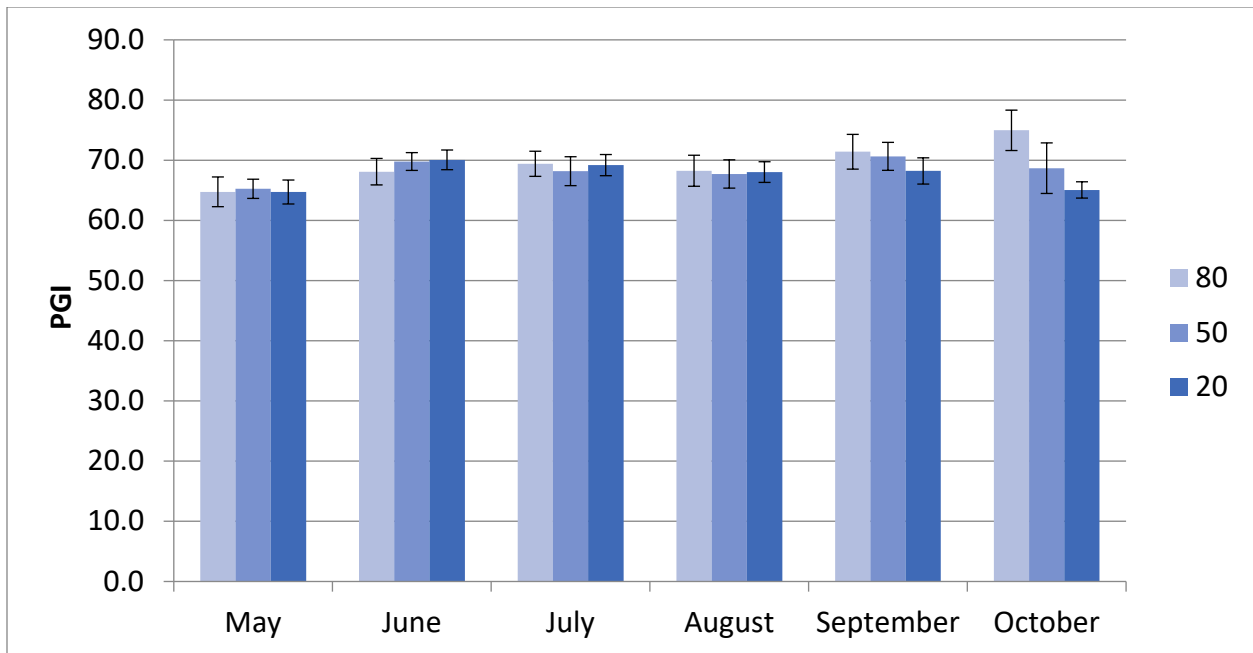


Figure 15a. *Distylium* 'Vintage Jade' average monthly plant growth index (PGI) at UC Davis in Davis, CA on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

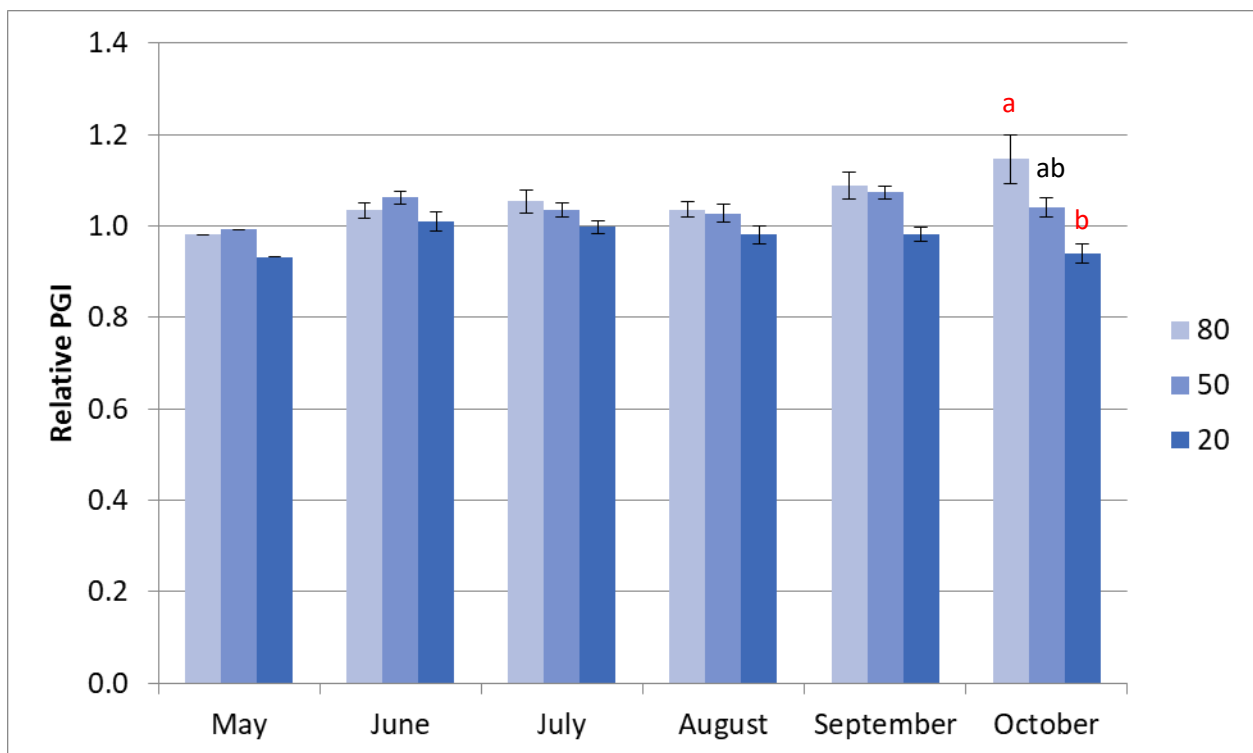


Figure 15b. *Distylium* 'Vintage Jade' average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$ (black) or $p \leq 0.01$ (red).

Table 22a. *Hydrangea paniculata* 'Renhy' Vanilla Strawberry™ average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ET_o-based irrigation levels in 2019. Ratings with different superscripts represent significant difference using ANOVA and Tukey's Post-hoc at p ≤0.05 (in black) or ≤0.01 (in red).

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	4.3	3.8	4.4 ^a	4.2 ^a	4.3 ^a	3.6 ^a	4.0 ^a
	50	3.0	3.9	3.7	4.1 ^{ab}	3.9 ^{ab}	3.7 ^a	3.3 ^a	3.7 ^b
	20		4.1	3.7	3.5 ^b	3.3 ^b	2.9 ^b	2.3 ^b	3.3 ^c
Foliage	80	5.0	5.0	4.1	4.0	4.0	4.0 ^a	3.5 ^a	4.2
	50	5.0	5.0	4.1	3.9	4.0	4.0 ^a	3.3 ^{ab}	4.2
	20		5.0	4.5	4.0	3.8	3.3 ^b	2.3 ^b	3.8
Flower	80	0.0	0.0	0.0	4.4 ^a	4.6 ^a	4.5	0.8	2.0 ^a
	50	0.0	0.0	0.0	4.0 ^a	4.1 ^{ab}	4.1	0.8	1.9 ^a
	20	0.0	0.0	0.0	2.0 ^b	2.8 ^b	2.0	0.1	1.0 ^b
Pest Resistance	80	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
	20		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	5.0	5.0 ^a	4.8	4.3	4.3 ^a	4.3 ^a	3.0 ^a	4.4 ^a
	50	5.0	4.8 ^{ab}	4.0	4.1	3.8 ^{ab}	3.9 ^{ab}	3.0 ^a	4.1 ^a
	20		4.4 ^b	4.1	3.4	3.4 ^b	3.0 ^b	2.3 ^b	3.4 ^b

Table 22b. Open House participant ratings for *Hydrangea paniculata* 'Renhy' Vanilla Strawberry™ on 3 ET_o-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	3.8	3.7	4.0	4.0	3.7	3.8	3.2	3.7	3.3
	Median	4	4	4	4	4	4	3	4	3
	Min	2	2	2	0	0	0	1	2	1
Foliage Quality	Max	5	5	5	5	5	5	4	5	5
	Mean	4.3	4.2	4.5	3.8	3.8	3.8	2.9	3.2	3.1
	Median	5	4	5	4	4	4	3	3	3
	Min	2	2	3	2	2	2	2	2	2
Floral Display	Max	0	0	0	5	5	5	5	5	5
	Mean	0.0	0.0	0.0	4.3	3.7	4.3	3.9	4.0	4.0
	Median	0	0	0	4	4	4	4	4	4
	Min	0	0	0	0	0	3	0	0	0

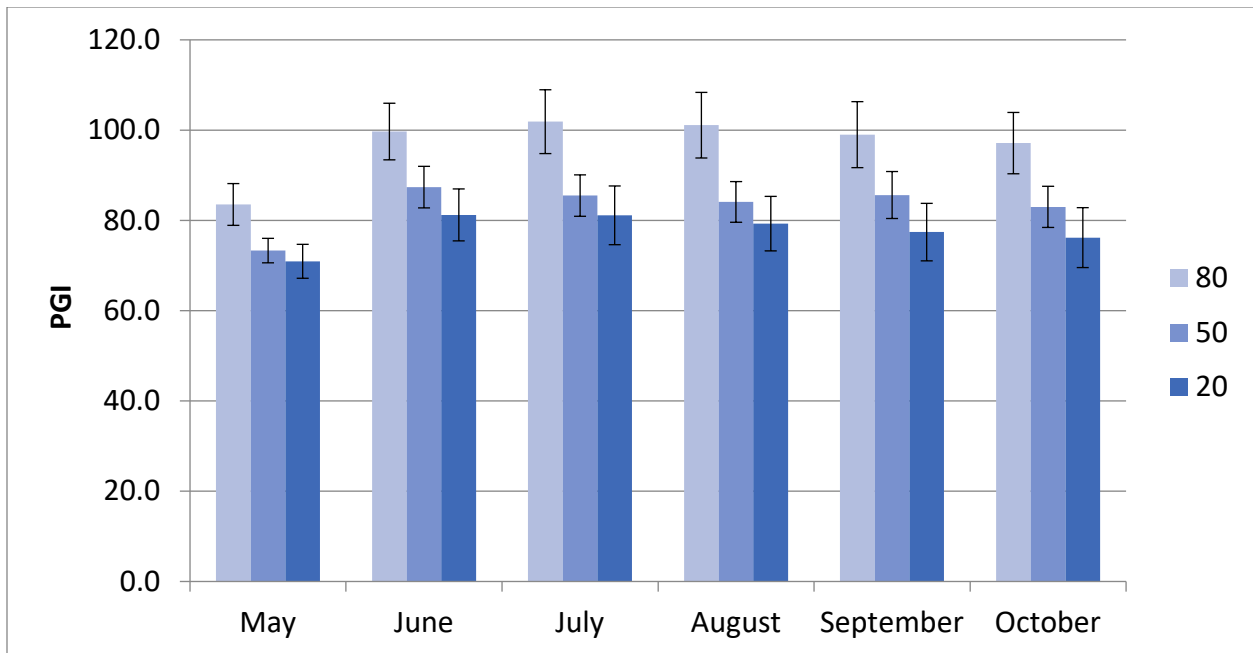


Figure 16a. *Hydrangea paniculata* 'Renhy' Vanilla Strawberry™ average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

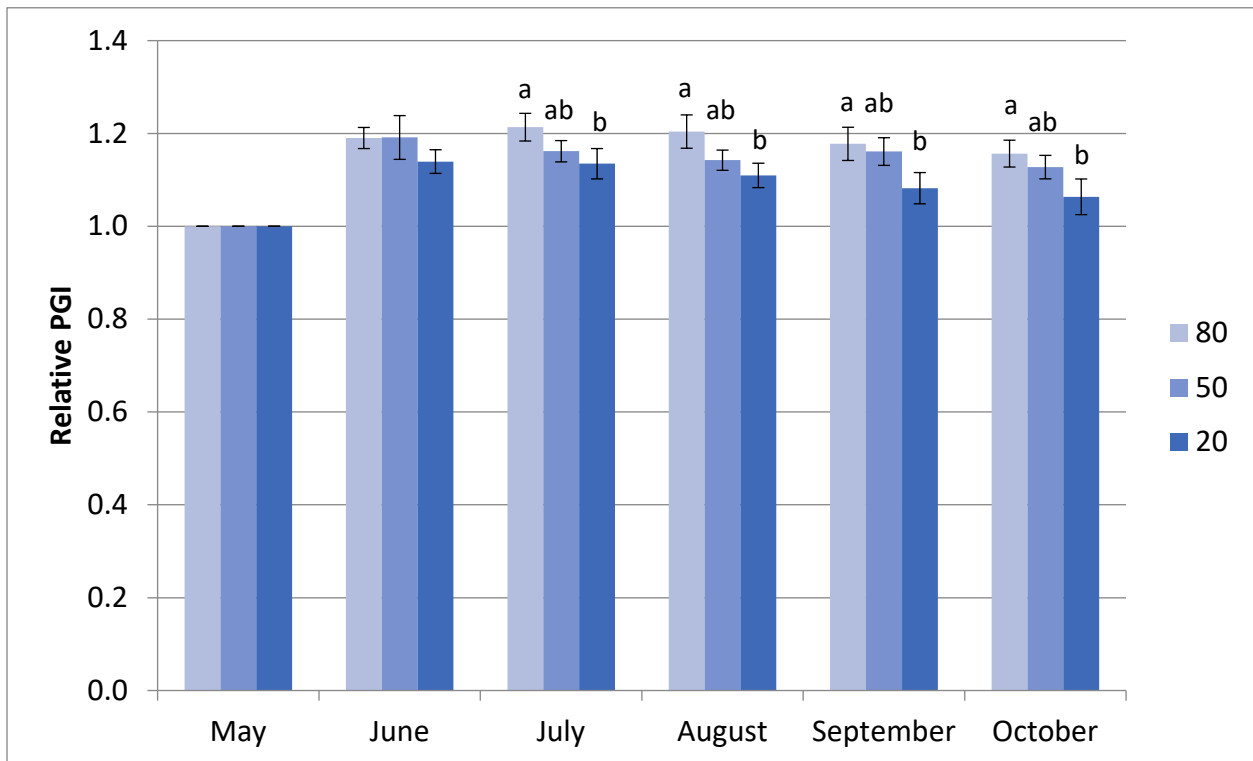


Figure 16b. *Hydrangea paniculata* 'Renhy' Vanilla Strawberry™ average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE. Bars with different letters represent significant difference using ANOVA and Tukey's Post-hoc at $p \leq 0.05$.

Table 23a. *Mahonia x media* 'Marvel' average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.4	3.8	3.1	4.0	3.5	4.0	3.9	3.7
	50	3.2	3.6	3.4	3.7	3.3	3.8	3.8	3.5
	20	3.4	3.6	3.0	3.7	3.4	4.0	3.7	3.6
Foliage	80	3.8	4.0	3.3	3.9	3.6	4.0	4.0	3.8
	50	3.3	4.0	3.6	3.8	3.4	4.0	3.8	3.7
	20	3.6	3.9	3.1	4.0	3.6	3.9	3.6	3.7
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pest Resistance	80	5.0	5.0	4.8	4.4	3.5	4.0	3.9	4.4
	50	5.0	5.0	4.9	4.8	3.1	3.9	4.0	4.4
	20	5.0	5.0	4.6	4.6	3.1	3.9	3.9	4.3
Disease Resistance	80	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	50	5.0	4.8	4.9	5.0	5.0	5.0	4.9	4.9
	20	5.0	5.0	5.0	5.0	5.0	5.0	4.7	5.0
Vigor	80	3.4	3.9	3.3	4.0	3.1	3.9	3.5	3.6
	50	3.8	3.8	3.4	3.5	3.6	3.4	3.9	3.6
	20	4.0	4.0	3.4	3.6	3.7	3.9	3.7	3.8

Table 23b. Open House participant ratings for *Mahonia x media* 'Marvel' on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	3.7	3.4	3.6	3.3	3.2	3.8	3.5	3.4	3.5
	Median	4	3	4	3	3	4	3	3	4
	Min	1	2	2	0	0	2	2	1	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	3.6	3.8	3.8	3.5	3.2	4.0	3.7	3.5	3.6
	Median	4	4	4	4	3	4	4	4	4
	Min	1	2	2	1	2	2	2	1	2
Floral Display	Max	5	1	4	0	0	0	5	1	5
	Mean	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.2
	Median	0	0	0	0	0	0	0	0	0
	Min	0	0	0	0	0	0	0	0	0

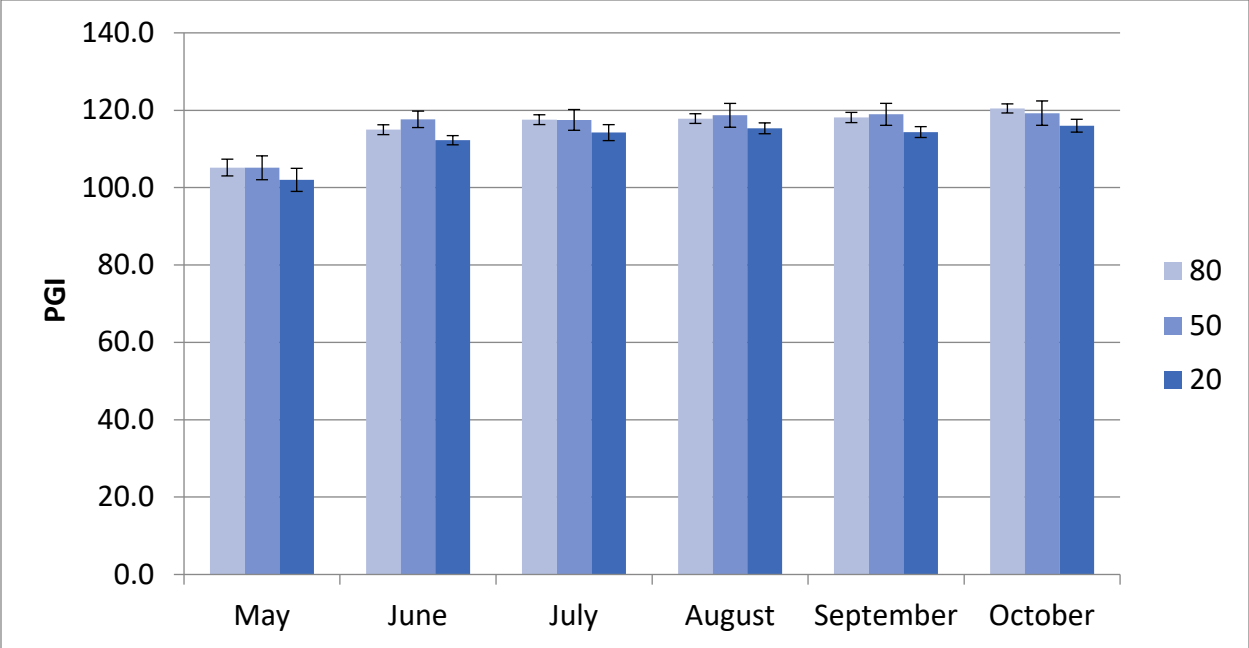


Figure 17a. *Mahonia x media* 'Marvel' average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

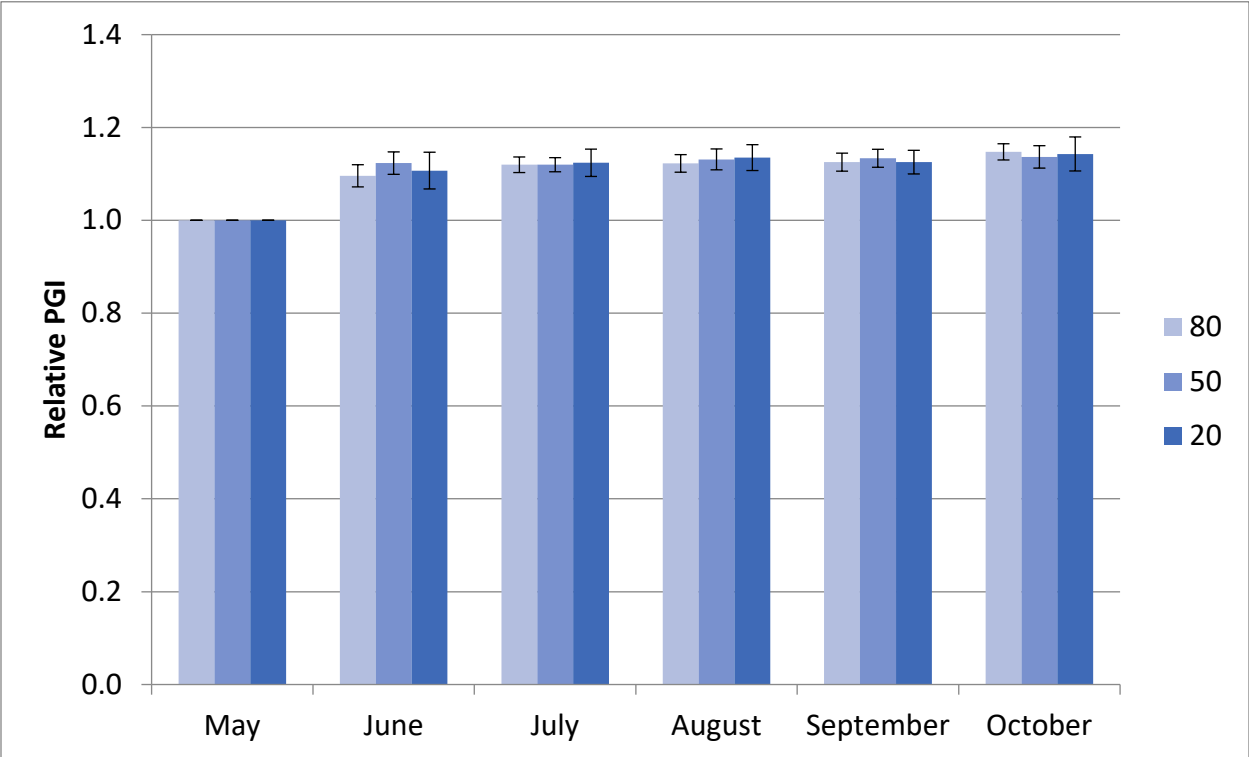


Figure 17b. *Mahonia x media* 'Marvel' average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Table 24a. *Rhododendron* 'Robleza' Autumn Bonfire™ average monthly quality ratings (scale 1-5, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2019.

Category	ET _o %	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.6	3.8	4.0 ^a	3.8 ^a	4.1 ^a	4.3 ^a	3.4 ^a	3.9 ^a
	50	3.8	3.8	3.4 ^{ab}	3.8 ^a	3.6 ^b	3.4 ^b	3.3 ^a	3.6 ^b
	20	4.1	3.7	3.8 ^{ab}	3.3 ^b	3.5 ^b	3.2 ^b	2.0 ^b	3.4 ^b
Foliage	80	5.0	5.0	4.9 ^a	4.0	4.6	4.1	3.4 ^a	4.4
	50	5.0	5.0	3.9 ^b	4.4	4.4	3.8	3.0 ^a	4.2
	20	4.9	5.0	4.7 ^a	4.1	4.1	3.7	2.0 ^b	4.1
Flower	80	1.5	0.6	0.0	0.3	0.4	1.0	0.8	0.6
	50	1.8	0.5	0.0	0.1	0.0	0.4	0.8	0.5
	20	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.4
Pest Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Disease Resistance	80	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
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.8	4.4	4.9	3.9 ^a	4.0 ^a	4.3 ^a	4.0 ^a	4.3 ^a
	50	4.5	4.5	4.1	3.4 ^{ab}	3.1 ^b	3.4 ^b	3.9 ^a	3.8 ^b
	20	4.7	4.1	4.6	3.1 ^b	3.1 ^b	3.4 ^b	2.0 ^b	3.6 ^b

Table 24b. Open House participant ratings (scale 1-5, 5 = highest) for *Rhododendron* 'Robleza' Autumn Bonfire™ on 3 ETo-based irrigation levels in April, July, and September 2019 at UC Davis.

	ET _o %	Spring			Summer			Fall		
		80	50	20	80	50	20	80	50	20
Overall Appearance	Max	5	5	5	5	5	5	5	5	5
	Mean	3.7	3.2	3.4	3.3	3.0	2.9	3.5	3.0	2.8
	Median	4	3	3	3	3	3	4	3	3
	Min	2	2	2	0	0	0	2	1	1
Foliage Quality	Max	5	5	5	5	5	5	5	5	5
	Mean	4.2	3.9	3.8	3.8	3.6	3.4	3.7	3.5	3.3
	Median	4	4	4	4	4	3	4	4	3
	Min	3	2	2	1	1	1	2	2	2
Floral Display	Max	3	5	4	1	1	2	4	2	4
	Mean	0.9	1.6	1.8	0.1	0.0	0.1	1.8	0.8	0.1
	Median	1	1	2	0	0	0	2	1	0
	Min	0	0	0	0	0	0	0	0	0

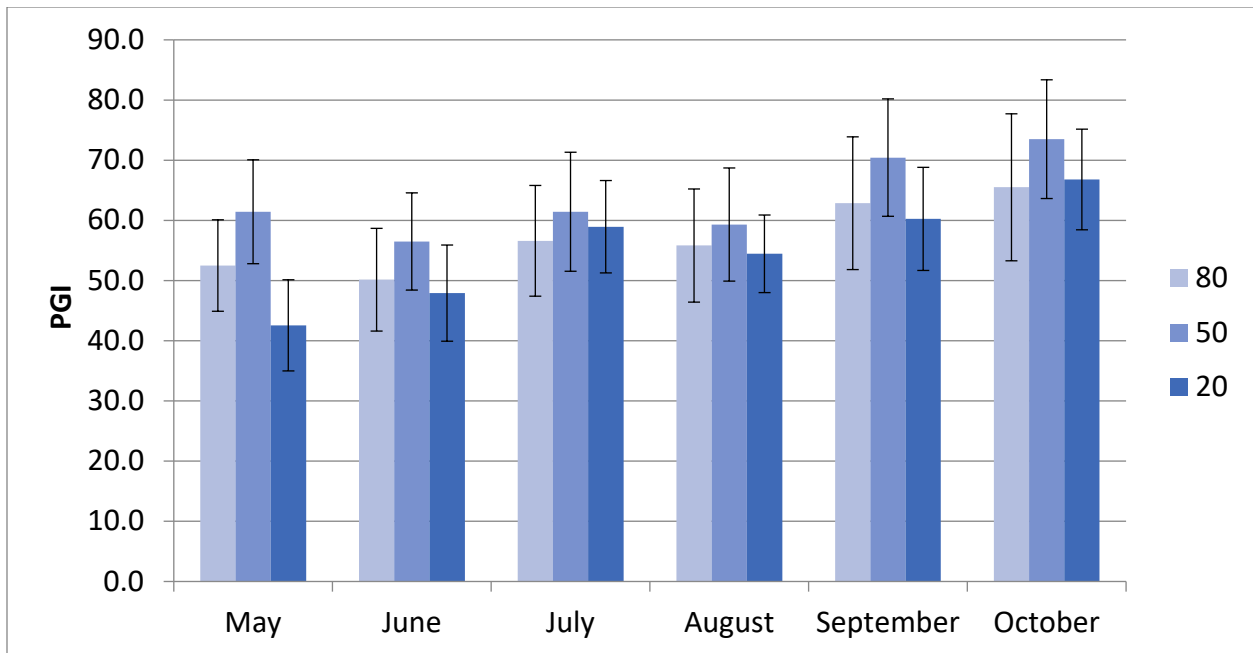


Figure 18a. *Rhododendron* 'Robleza' Autumn Bonfire™ average monthly plant growth index (PGI) at UC Davis in Davis, CA on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

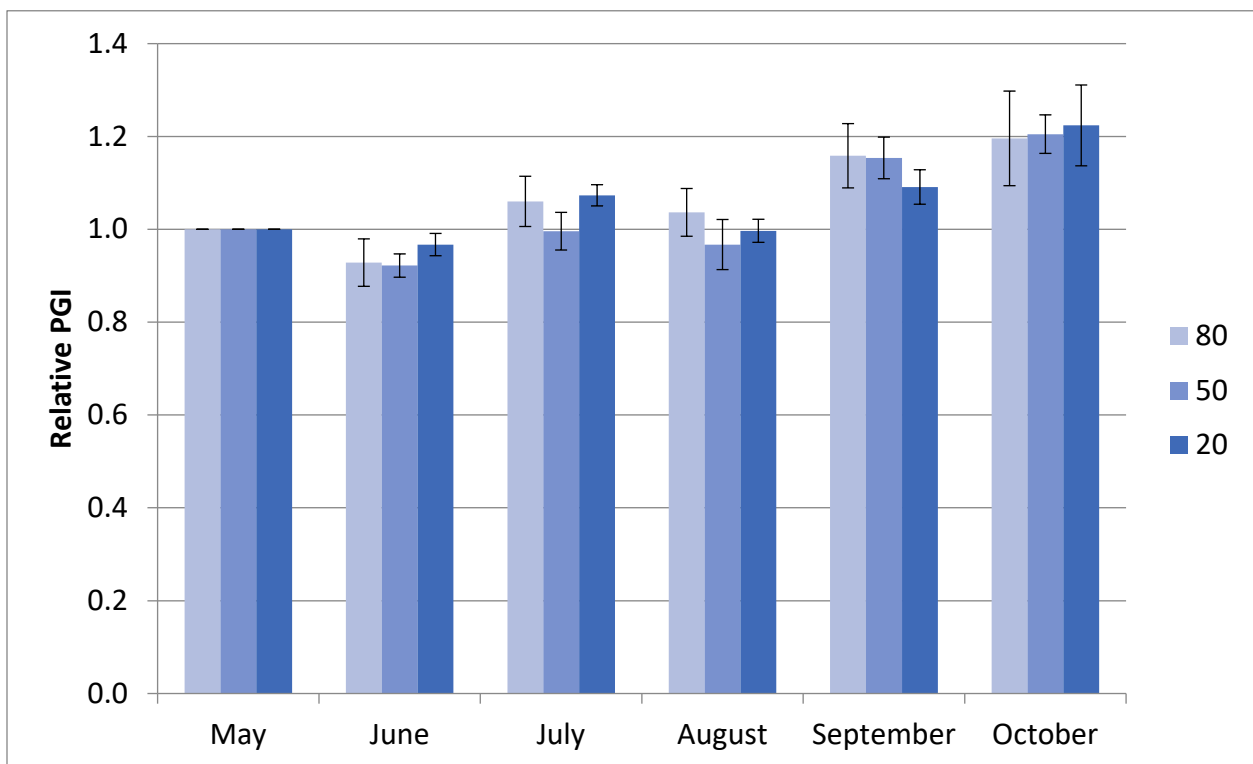


Figure 18b. *Rhododendron* 'Robleza' Autumn Bonfire™ average monthly relative plant growth index (rPGI) at UC Davis on 3 ETo-based irrigation levels in 2019. Error bars represent ± 1 SE.

Appendix B

Photos



Summer Open House at UC Davis

2019 OPEN HOUSES



The research team at the South Coast REC Fall Open House. From left to right: Loren Oki, Karrie Reid, Jared Sisneroz, Darren Haver, and Bridget Giffei



Summer Open House at South Coast dealt with some June gloom



Spring Open House at UC Davis saw record attendance. We hosted a group of landscape designers from APLDCA for a private orientation to the trials followed by ratings.



Figure 19a. Acacia 'Cousin Itt' in June at South Coast REC showing the shower of dead leaves under each plant.



Figure 19b. A good specimen of Acacia 'Cousin Itt' at South Coast REC in September 2019.



Figures 20a. and 20b. *Dianella revoluta* 'Coolvista'[™] in May in full bloom with blossom close-up.



Figure 20c. *Dianella revoluta* 'Coolvista'[™] showing bright purple berries in July 2019.



Figure 21a. *Elaeagnus x ebbingei* 'Olive Martini'[™] in Sept 2019 showing new foliage without edge variegation characteristic of this cultivar.



Figure 21b. *Elaeagnus x ebbingei* 'Olive Martini'[™] on low water in Davis in October, 2019.



Figure 22a. and 22b. *Grevillea* 'King's Celebration' at South Coast REC in 2019 showing the vivid blooms which were bee magnets (left) almost year-round. Chlorosis was also present year-round (right).



Figure 23. *Grevillea* 'King's Celebration' survivor (left) growing next to *Grevillea* 'King's Fire' in Davis, Aug. 2019, showing slight chlorosis on 'Celebration' but no lack of pinkish red blooms.



Figure 24a. *Grevillea* 'King's Fire' in full vibrant bloom on low water in Davis in September 2019.



Figure 24b. *Grevillea* 'King's Fire' in March 2019 at South Coast REC with graduate student Bridget Giffei for color match and size comparison.



Figure 25a. *Lavandula* 'Meerlo' in the foreground displaying its tidy form and striking color contrast at South Coast REC at the Sept. 2019 Open House event. Nan Sterman joined us for rating.



Figure 25b. *Lavandula* 'Meerlo' in Sept. 2019 in Davis. Performance on all treatments was excellent at both sites.



Figure 26. *Lagerstroemia* 'Bellini Raspberry' on low water in August 2019 in Davis.



Figure 27. *Muhlenbergia capillaris* 'Irvine' Plumetastic® in October 2019 at South Coast REC showing its wine blooms just beginning to show.



Figure 28a. and 28b. *Raphiolepis umbellata* 'Southern Moon'® on high water in July at UC Davis showing leaf spots and edge bleaching (left). Beautiful blooms at South Coast REC appeared in June (right).



Figure 28c. *Raphiolepis umbellata* 'Southern Moon'® on low water in Davis in Sept. 2019. Its extremely diminutive size in Davis is apparent when one compares its size to the bark mulch chunks in the photo.



Figure 29a. *Rosa* 'Limoncello'[™] just coming into full bloom in May 2019, with lots of buds left to open.



Figure 29b. *Rosa* 'Limoncello'[™] pumping out a second round of profuse bloom in July 2019, even on low water; this photo in Davis.



Figure 29c. *Rosa* 'Limoncello'™ can be seen in the left foreground at South Coast REC in late September, 2019; beginning to look a bit tired, but still blooming.



Figure 30. *Rosa* 'Pink Drift'® at South Coast REC on high water in September 2019.



Figure 31. *Rosa* 'Icecap' in Sept. 2019 at South Coast REC holding lots of old blooms with the new.



Figure 32a. The vivid warm red blooms of *Rosa* 'Brick House'™ at first flush in May 2019 in Davis.



Figure 32b. *Rosa* 'Brick House'™ on moderate water in Oct. 2019 in Davis.



Figure 33a. *Rosa* 'White Knock Out'® with first bloom flush in May 2019 in Davis.



Figure 33b. *Rosa* 'White Knock Out'® in Sept. 2019 in Davis showing its tendency to hold onto its old blooms while pushing out new pure white ones.



Figure 34. *Vitex* 'Flip Side'® blooming on low water in July 2019 in Davis.



Figure 35. *Distylium* 'Vintage Jade' on low water under 50% shade in Davis in July 2019.



Figure 36a. *Hydrangea paniculata* 'Vanilla Strawberry'™ on low water in Davis in July 2019.



Figure 36b. *Hydrangea paniculata* 'Vanilla Strawberry'[™] bloom showing its antique rosy hue in September 2019 in Davis under 50% shade.



Figures 37a and 37b. *Mahonia* 'Marvel' on low water in 50% shade in May (left) and October 2019 (right) in Davis.



Figure 38a. *Rhododendron* 'Autumn Bonfire'[™] in May 2019 in 50% shade in Davis.



Figure 38b. *Rhododendron* 'Autumn Bonfire'[™] in Oct. 2019 on high water in 50% shade in Davis. The small size can be seen from the size of the bark mulch.