UC Landscape Plant Irrigation Trials™

2019-2021 Trial Results

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Executive Summary

During the 2019-2021 UC Landscape Plant Irrigation Trials™ (UCLPIT) 12 taxa were evaluated in the trial fields located at UC Davis and 13 at South Coast Research and Extension Center (South Coast REC or SCREC) in Irvine, CA. Plants were installed in Fall 2019 or Spring 2020 and irrigated regularly over their first summer to establish the plants. Researchers imposed deficit treatments corresponding to the Water Use Classification of Landscape Species (WUCOLS) high, moderate, and low categories of water need from April 2021 to October 2021. Plants have been assigned a water-use category based upon the level of irrigation that yielded optimal performance; where there were no significant differences, the lowest irrigation level that produced acceptable quality and growth was designated, though plants may be expected to perform adequately on more than one level of irrigation.

Based on the data collected, UCLPIT awards a Blue Ribbon, our highest distinction, to plants that maintained mean overall appearance scores of 4 (very good) or higher on the low irrigation treatment throughout the second year. The Happy Medium award is given when mean overall appearance is rated 4 or higher on the moderate/medium irrigation treatment.

UC Davis Blue Ribbon Winners (WUCOLS Region 2)

- *Lomandra confertifolia* 'LOLTCS08' Del Sol
- *Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty
- *Rosa* 'Sprogreatpink' Brick House® Pink
- *Rosa* 'Zlepolone' Pretty Polly® Pink
- *Rosa* 'Zlepoltwo' Pretty Polly® White

UC South Coast Research and Extension Center Happy Mediums Award Winner (WUCOLS Region 3)

- *Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty

Results Summary

Table 1. Mean overall appearance ratings on each treatment percentage of ETo on a 1-5 scale where 1 is lowest, 5 is highest. Recommended irrigation rate indicates the minimum irrigation level where aesthetics and growth were not compromised.

	UC Davis				South Coast REC			
	Average Overall Appearance rating (by ETo% treatment)			Rec. Rate	Average Overall Appearance rating (by ETo% treatment)			Rec. Rate
Plants in Full Sun Field	80	50	20	ETo%	80	50	20	ETo%
Abelia × *grandiflora* 'Bailbeliaone' Vanilla Brandy™	2.7[a]	2.9[a]	2.3[b]	**50**	3.2[a]	2.8[b]	2.6[b]	**80**
Lippia 'ECOLOPIA2' Pink Kurapia®					3.3	3.5	3.1	**20**
Lomandra confertifolia 'LOLTCS08' Del Sol	3.7[a]	3.6[a]	4.2[b]	**20**	3.7[a]	2.7[b]	3.7[a]	**20**
Lomandra confertifolia ssp. *pallida* 'Pom Pom' Shorty	4.1	4.4	4.2	**20**	3.5[a]	4.1[b]	3.9[b]	**20**
Nandina domestica 'Zhnan28' Cool Glow™ Peach	2.4[a]	2.5[a]	1.9[b]	**NR**	2.3[a]	3.3[b]	2.2[a]	**50**
Nandina domestica 'Zhnan102' Cool Glow™ Lime	2.2	2.2	2.0	**NR**	2.3[a]	3.0[b]	2.5[a]	**50**
Rosa 'Meiswetdom' Sweet Drift®	3.7	3.9	3.7	**20**	3.3	3.2	3.3	**20**
Rosa 'Radtkopink' Pink Double Knock Out®	3.6	3.7	3.4	**50**	2.8	2.8	2.7	**NR**
Rosa 'Sprogreatpink' Brick House® Pink	3.9	4.0	4.0	**20**	2.9	3.0	2.9	**20**
Rosa 'Zlepolone' Pretty Polly® Pink	3.6	3.8	4.0	**20**	3.9	3.8	3.7	**20**
Rosa 'Zlepoltwo' Pretty Polly® White	3.7	3.9	4.1	**20**	3.5	3.5	3.5	**20**
Plants in 50% Shade Field								
Agapanthus hybrid 'MP003' Ever Amethyst™	3.2	3.2	3.2	**20**	3.5	3.6	3.4	**20**
Camellia sasanqua 'Green 02-003' October Magic® Ruby™	3.1	3.2	3.0	**50**	1.3	1.4	1.3	**NR**

Significant differences between ratings are represented by different superscript letters. Letters in black represent significance at p≤0.5; red letters represent significance at p≤ .01. An absence of superscript indicates no significant difference between the treatments.

Methods

Twenty-four plants of each taxon evaluated (Table 1) were placed 2 m apart in rows 2 m apart at each trial site, except for Pink Kurapia® which was planted on 3 m spacing and only at South Coast REC. Plants were installed in fall 2019 and spring 2020, with bare-root roses planted in January or February 2020. In spring 2020, researchers replaced any plants that had perished after the initial planting. In Davis, the 1-m wide planting rows were covered with 2-3" (5-7cm) of chipped wood mulch while at South Coast Research and Extension Center (REC), the entire field was covered with a 3" chipped wood mulch layer. Plants were placed according to a randomized complete block layout with two blocks (north and south) in the full sun field and one block in the 50% shade field. At South Coast REC, Pink Kurapia, which had previously been evaluated in Davis, was planted in a separate randomized plot with rows and planting spaces 3 meters apart to accommodate the rapid growth rate of this genus. The UC Davis trial field consists of Yolo clay loam soil while the trial field at the UCANR South Coast REC consists of San Emigdio fine sandy loam and is irrigated with reclaimed irrigation water. As of 2019, both sites had a facility to evaluate plants in 50% shade as well as full sun conditions. Except for Kurapia, all species in this trial round were evaluated at both sites.

From fall 2019 to April 2021 researchers irrigated the plants at 80-100% of reference evapotranspiration (ETo) with a 25% management allowable depletion (MAD) of plant available water to fully establish the plants with a deep, healthy root system and avoid stress during the first year. Irrigation was stopped during the winter as there was sufficient rain during the cool weather months of November through March for plants to be maintained in good health.

From April 2021 to October 2021, researchers implemented deficit irrigation treatments at both sites. Plant material was irrigated according to a weather-based water budget using daily ETo information for each site retrieved from the California Irrigation Management Information System (CIMIS). There were three treatments: 80%, 50%, and 20% of ETo to correspond with the High, Moderate, and Low categories of water need listed in the Water Use Classification of Landscape Species (WUCOLS). The daily ETo is multiplied by each respective treatment percentage, then summed until the accumulated loss reaches 50% of plant available water (PAW) for the soil type, which aligns with smart irrigation controller standard practice.

The irrigation volume is based on an imaginary cylinder of soil surrounding the plant that is 1 m wide and 0.5 m deep. For each site's soil type, 50% of PAW in that volume of soil is then applied by Dramm drip irrigation rings in several pulses separated by at least 2 hours to prevent runoff. For the South Coast REC site, a leaching fraction of 20% is added to this volume to prevent salt build-up. All treatments at a site, therefore, receive the same volume of water at each irrigation event, but how frequently a treatment receives that irrigation and the total volume of water for each treatment between April and October is dependent on the respective treatment percentages of ETo (Tables 3-6). The hypothesis being tested is that plants that use 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.

During the treatment period of April to October, plant width, length, and height measurements were taken monthly. To quantify plant growth, a plant growth index (PGI) was

calculated using the formula [(*l* +*w*)/2 +*h*]/2, where *l*, *w*, and *h* represent length, width, and height of the plant (Irmak et al. 2004). To account for differences in initial plant size a relative PGI was calculated for each plant each month during the deficit irrigation treatments using the formula PGI_m/PGI_i, where PGI_i stands for the initial PGI, and PGI_m 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 (Table 5). Researchers collected a second flowering abundance and overall appearance rating for each plant in bloom two weeks after each monthly measurements. This helps more closely track the blooming period for flowering plants.

PGI, RPGI, foliage quality, floral abundance, disease and pest resistance, vigor, and overall appearance results were compared using an Analysis of Variance (ANOVA) test with pairwise comparisons conducted using Tukey's HSD test. Irrigation recommendations are based on the lowest irrigation level where growth, plant health, and aesthetics were not compromised. Plants with a mean Overall Appearance score of 4 or higher on Low water received the UC Blue Ribbon award; those performing at a mean Overall Appearance score of 4 or higher on Moderate water received our Happy Medium designation.

Table 2. Evapotranspiration and precipitation at UC Davis and South Coast REC during the deficit season in 2021. All data obtained from CIMIS, https://cimis.water.ca.gov/Default.aspx

	Parameter	Apr	May	June	July	Aug	Sept	Oct
UC Davis	Total ETo	6.17	8.67	8.60	8.48	7.08	6.02	3.82
	Total Precipitation	0.05	.09	0	0	0	0	5.52
South Coast REC	Total ETo	5.2	5.84	6.86	7.05	6.36	4.99	3.98
	Total Precipitation	.06	.07	.01	.06	.19	.11	.81

October precipitation and ETo are included for the entire month, though final data collection occurred without October irrigation at UC Davis and only once at South Coast REC on the highest treatment plants in full sun before final data collection.

Table 3a. Irrigation in full sun field at UC Davis during 2021.

Irrigation % of ETo	Count of Irrigations	Mean Interval (days)	Dates Irrigated (Deficit Period: 4/1/21-10/7/21)	Total water applied (in.)
80	18	10	4/19, 5/1, 5/10, 5/20, 5/28, 6/5, 6/15, 6/23, 7/1, 7/9, 7/18, 7/26, 8/4, 8/14, 8/25, 9/4, 9/17, 9/29	34.5
50	11	15	5/1, 5/14, 5/29, 6/11, 6/24, 7/7, 7/20, 8/3, 8/19, 9/5, 9/25	21.1
20	4	36	5/24, 6/26, 7/30, 9/8	7.6

Table 3b. Irrigation in 50% shade field at UC Davis in 2021.

Irrigation % of ETo	Count of Irrigations	Mean Interval (days)	Dates Irrigated (Deficit Period: 4/1/21-10/8/21)	Total water applied (in.)
80	9		4/14, 5/10, 5/13, 6/3, 6/21, 7/9, 7/29, 8/19, 9/13	11.4
50	6		5/7, 5/13, 6/15, 7/14, 8/15, 9/23	9.4
20	2		5/13, 7/29	3.8

Table 4a. Irrigation in the full sun field at South Coast REC in 2021. Total Water Applied includes the 20% leaching fraction applied to prevent salt buildup.

Irrigation % of ETo	Count of Irrigations	Mean Interval (days)	Dates Irrigated (Deficit Period: 4/1/21-10/11/21)	Total water applied (in.)
80	18	10	4/21, 5/2, 5/13, 5/24, 6/2, 6/11, 6/20, 6/28, 7/7, 7/15, 7/23, 8/2, 8/10, 8/21, 8/31, 9/13, 9/22, 10/6	26.9
50	10	16	4/29, 5/15, 5/31, 6/15, 7/1, 7/16, 7/31, 8/16, 9/5, 9/21	15.1
20	3	51	5/27, 7/11, 9/5	4.5
			Dates for Kurapia Irrigation	
80	18	10	4/20, 5/2, 5/12, 5/23, 6/1, 6/11, 6/19, 6/26, 7/6, 7/15, 7/23, 7/31, 8/10, 8/20, 8/31, 9/13, 9/22, 10/6,	26.9
50	10	16	4/29, 5/15, 5/30, 6/15, 7/1, 7/16, 7/31, 8/16, 9/5, 9/21	15.1
20	4	36	5/27, 7/12, 9/7, 9/12	6.0

Table 4b. Irrigation in the 50% shade field at South Coast REC in 2021. Total Water Applied includes the 20% leaching fraction applied to prevent salt buildup.

Irrigation % of ETo	Count of Irrigations	Mean Interval (days)	Dates Irrigated (Deficit Period: 4/1/21-10/11/21)	Total water applied (in.)
80	18	10	4/20, 5/2, 5/12, 5/23, 6/1, 6/11, 6/19, 6/26, 7/6, 7/15, 7/23, 7/31, 8/10, 8/20, 8/31, 9/13, 9/22, 10/6	26.9
50	10	16	4/29, 5/15, 5/30, 6/15, 7/1, 7/16, 7/31, 8/16, 9/5, 9/21	15.1
20	4	36	5/27, 7/12, 9/7, 9/12	6.0

Table 5. Aesthetic ratings 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 (1% or less) of leaf burn, disease or insect damage, and leaves are distributed uniformly in an appealing shape for the genus/species.	Very nice. Same as 5 except for minor tip burn, edge damage or other minor damage to only a few leaves (1-10%) that does not much affect the appearance (not noticeable from 3-4').	Acceptable; may have non-uniform distribution of leaves or minor damage to 11-25% of leaves that is less evident from a distance.	Unacceptable; loss of leaves or moderate damage to more than 25% of leaves; unattractive; plant is declining and may not recover; may be extremely non-uniform.	Completely unacceptable; close to dead.
Flowering	Full, glorious bloom; 80-100% of plant's potential for bloom coverage is open	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 (1% or less) especially from 3-4' away.	Minor to moderate damage to one or two leaves or stems, or very minor damage to a few leaves (1-25%) Not noticeable from 3-4 ft.	Minor damage to many of the leaves or blooms (25-50%); appearance still acceptable from a distance of 3-4'.	Major damage (51-75%) ; appearance unacceptable	Severely damaged and probably dying (>75% affected).
Vigor	Pushing out new growth from every growing point.	Pushing out new growth from several growing points.	Plant is surviving and healthy, but not noticeably pushing out new growth.	Plant is very small for the species or is declining; dead/dying branches or leaves present.	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 good plant: may be a 5 when in bloom, or just a very nice species that is not quite at its prime or just lacks the WOW factor. Many foliage plants fall here, while exceptional ones may be 5s.	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.

Outreach

For 2021, the UCLPIT team continued the investment in online and virtual outreach due to COVID-19 pandemic restrictions still in place. Twenty-five of our clientele attended a "Lunch-and-Learn" style webinar held by the team in June to outline our 2020 results, highlight the Blue Ribbon™ winners and promote the 2021 online surveys we would subsequently use in place of our usual in-person Open House events.

The four survey events (two at UC Davis and two at South Coast REC) were also promoted via Facebook and Twitter, and we sent the survey links to all who had previously participated in one of our Open Houses at each site. A Qualtrics survey was then launched with high quality photos of one plant of each taxon in Davis and Irvine accompanied by floral close ups where appropriate, giving participants the opportunity to score plants in their region in several categories and provide feedback on whether they would use them or recommend them to clients. In this way we were able to maintain interest and connection with our target audience and provide additional exposure to the plants and value to our cooperators. While this format yields less information than the more comprehensive in-person field ratings, researchers are still able to share the progress of plant performance and receive feedback about the aesthetic preferences of participants.

We received 93 responses in total, which is lower than our typical in-person attendance. It should be reiterated at this point that participants saw 1-2 photos of the best-looking plant of each taxon in each field site for the survey (Table 6). Of the 93 responses, 92 stated they would use at least 1 plant professionally, i.e. growing or offering that plant for sale in a nursery, recommending the plant to their clientele, or specifying the plant in a landscape. Eighty-two participants noted they would use at least 50% of the plants professionally and 84 of the 93 reported discovering new plant material by participating in the survey (Table 7). We did not include fall results for South Coast REC as we received only 3 responses to the survey.

We continued to post photos on our Facebook page to feature plants that were performing well. Between May of 2020 and 2021, there were over 12,200 individual page views on our website and almost 7,700 individual views of plant profile pages. In spring of 2021, the online magazine *Pacific Horticulture* solicited from us two articles we submitted on the trials and the best performing plants. They subsequently interviewed us and our broader team from our multi-state "Climate Ready Landscape Plants" project for a YouTube feature in their series "Landscapes of Change". Links to these are below.

- https://www.pacifichorticulture.org/articles/the-quest-for-the-best/
- https://www.pacifichorticulture.org/articles/best-plants-in-low-water-field-trials-named-blue-ribbon-winners/
- https://youtu.be/lvzLnwC29yU

Table 6. Mean overall appearance ratings from participants in online 2021 surveys (scale of 1-5, where 5 is highest). Asterisks represent plants not rated in fall due to high mortality.

	UC DAVIS		SCREC
Full sun	Spring	Fall	Spring
Abelia x *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™	3.2	3.0	3.8
Lippia 'ECOLOPIA2' Pink Kurapia®	-	-	4.8
Lomandra confertifolia 'LOLTCS08' Del Sol	4.0	4.1	4.4
Lomandra confertifolia ssp. *pallida* 'Pom Pom' Shorty	4.3	4.6	3.9
Nandina domestica 'Zhanan28' First Editions® Cool Glow™ Peach	2.9	*	4.5
Nandina domestica 'Zhnan102' First Editions® Cool Glow™ Lime	2.9	*	4.6
Rosa 'Meiswetdom' Sweet Drift®	4.5	3.8	4.5
Rosa 'Radtkopink' Pink Double Knock Out®	4.8	3.7	4.9
Rosa 'Sprogreatpink' Brick House® Pink	5.0	4.4	4.7
Rosa 'Zlepolone' Pretty Polly® Pink	4.4	4.0	4.5
Rosa 'Zlepoltwo' Pretty Polly® White	4.6	4.2	4.8
50% Shade			
Agapanthus 'MP003' Ever Amethyst™	4.1	3.3	4.6
Camellia sasanqua 'Green 02-003' October Magic® Ruby™	4.0	3.7	3.6
NUMBER OF RESPONSES	**46**	**27**	**20**

Table 7. Results from 2021 Open House surveys. Votes for favorite plants (FAV), number who had not seen the plant before (NEW), and number who would use the plant professionally (USE).

	UC Davis						SCREC		
	Spring			Fall			Spring		
Full Sun	**NEW**	**USE**	**FAV**	**NEW**	**USE**	**FAV**	**NEW**	**USE**	**FAV**
Abelia x *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™	8	16+	0	4	11	1	2	13	0
Lippia 'ECOLOPIA2' Pink Kurapia®	-	-	0	-	-	0	**10**	**19**	**6**
Lomandra confertifolia 'LOLTCS08' Del Sol	6	34	1	9	21	3	2	14	2
Lomandra confertifolia ssp. *pallida* 'Pom Pom' Shorty	5	38	14	10	**22**	**13**	5	13	0
Nandina domestica 'Zhanan28' First Editions® Cool Glow™ Peach	12	19	0	-	-	0	6	18	1
Nandina domestica 'Zhnan102' First Editions® Cool Glow™ Lime	11	12	0	-	-	0	5	16	0
Rosa 'Meiswetdom' Sweet Drift®	12	36	2	6	17	1	3	14	1
Rosa 'Radtkopink' Pink Double Knock Out®	13	38	0	6	21	0	5	15	2
Rosa 'Sprogreatpink' Brick House® Pink	7	**41**	**23**	9	16	1	8	17	0
Rosa 'Zlepolone' Pretty Polly® Pink	3	31	2	8	21	1	4	15	1
Rosa 'Zlepoltwo' Pretty Polly® White	4	34	2	5	19	6	3	18	3
50% Shade									
Agapanthus 'MP003' Ever Amethyst™	**19**	39	1	**16**	15	0	8	**19**	3
Camellia sasanqua 'Green 02-003' October Magic® Ruby™	10	28	1	13	20	1	5	11	0
Number of responses			**46**			**27**			**20**

Results & Discussion Introduction

Results are listed alphabetically by scientific name, with plants in full sun first, followed by those planted in shade. The cultivar and trademark name are listed in the header for each taxon. In the discussion for each cultivar, the market name is used for simplicity. Irrigation recommendations represent the treatment with the least irrigation where growth and aesthetics were not significantly compromised. Final W X H indicates the mean width and height obtained from all individual plants of the taxon at the end of the second year. Where 'NR' is listed in the header for 'Recommended Irrigation Rate', it means the plant is not recommended in this region or, in the case of South Coast REC, it may additionally mean not recommended for use with reclaimed water. It should be noted that 2021 had extreme high temperatures early on in Davis.

Full Sun Results

***Abelia* x *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	49 cm (19'') x 31 cm (12.5'')	50	2.9
SC REC Final	98 cm (36'') x 57 cm (22'')	80	3.2

Vanilla Brandy is a compact Abelia that struggled in the hot, bright conditions of our full sun fields (Photos 1a-1e). It only approached acceptable appearance in Davis on the moderate irrigation level and only reached an acceptable appearance rating on reclaimed water in our cooler coastal site in Irvine on high irrigation; in both cases these differences were statistically significant (Tables 8a-8b).

There were no significant differences in growth at UC Davis, but the moderate irrigation treatment at South Coast REC produced significantly more growth than either the low or high irrigation. This did not translate to better appearance scores, however, as the foliage and overall appearance ratings were significantly highest on the high-water treatment (Table 8b). Plants were somewhat sparse, and the older interior foliage was often dry. A number of plants in the Irvine field showed reversion to non-variegation and most plants had a significant number of dead leaves by the end of the season. We would recommend growing this cultivar with afternoon shade on moderate water in Davis, and we would not recommend it for use with reclaimed water where a high amount was needed to maintain acceptable appearance.

***Lippia nodiflora* 'ECOLOPIA2' Pink Kurapia®**

Location	Final W	Rec. Irr. Rate	Mean O/A Rating
SC REC Final	318 cm (125''; 10' 5")	20/50 (reclaimed)	3.1/3.5

Pink Kurapia (Photo 2a.) was only evaluated in Irvine since it had been previously trialed in Davis. Some of the data for this cultivar may have been inconsistently skewed by the effects of random gopher activity in the area. All treatments put on significant growth, reaching 2.5X

their diameter which was trimmed to be a 1m-wide circle at the beginning of the second growing season (Photo 2b; Fig. 2a-2b).

There were no significant differences in growth or ratings between treatments and we have assigned this a low water rating. However, it should be noted that foliage, flowering, vigor, and overall appearance were all marginally higher on the moderate treatment with reclaimed water (Table 9a). All treatments had an issue with some foliage yellowing throughout the season and issues with an unidentified scale insect caused some additional foliage damage beginning in August (Photo 2c). As with previous Kurapia cultivars, Pink Kurapia was highly attractive to bees and other pollinators.

***Lomandra confertifolia* 'LOLTCS08' Del Sol**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	104 cm (41") x 78 cm (31")	20	4.2
South Coast REC Final	116 cm (46") x 75 cm (29")	20	3.7

Del Sol is a blousy, golden-tipped cultivar of *Lomandra confertifolia* (Photos 3a-3d). It had significantly better vigor and overall appearance on low irrigation than the other treatments at UC Davis earning it our Blue Ribbon Award (Table 10a). There were no differences in growth between treatments at either site (Figures 3a-3d). Del Sol scored slightly lower at South Coast REC, and mysteriously received the lowest overall appearance score on moderate water, with both high and low treatments scoring the same mean overall appearance rating. Plants did show some speckling on the leaves at South Coast REC, and though the source was speculated to be thrips damage, this was not firmly diagnosed by the data collectors there, and the plants nevertheless scored very well. Where a loose informal grass-like plant is desired, Del Sol should be a solid performer.

***Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	81 cm (32'') x 64 cm (25'')	20	4.2
South Coast REC Final	93 cm (37'') x 58 cm (23'')	20/50	3.9/4.1

Shorty is a very dense, somewhat upright, bright lime green *Lomandra* cultivar that reminded researchers of a dwarf Lime Tuff mat rush (Photos 4a-4d). It performed beautifully on all irrigation treatments in Davis, earning it our Blue Ribbon Award and a low WUCOLS rating (Table 11a). It was appealing in form and color in all seasons and though it showed a small significant difference in growth between the moderate and low irrigation treatments (Figure 4b), this did not translate into a difference in overall appearance.

Plants in Irvine showed significantly better overall appearance on the moderate and low treatments compared to the high irrigation level (Table 11b). Plants on the moderate irrigation treatment also put on the most relative growth compared to both low and high (Figure 4d). Clearly, with reclaimed water, most is not best for Shorty. Because the overall appearance rating nudges over 4 on moderate water, we recommend this level with reclaimed water and award this our Moderate Marvel award for WUCOLS Region 3.

***Nandina domestica* 'Zhnan28' First Editions® Cool Glow™ Peach**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	34 cm (13'') x 28 cm (11'')	NR	2.5
South Coast REC Final	46 cm (18'') x 34 cm (13'')	50	3.3

The Cool Glow Peach heavenly bamboo did not perform well from the start in Davis in our full sun trial. From the data collected throughout the season, we do not recommend this cultivar for use in our region in full sun (Table 12a). It showed signs of sunburn and dieback to such an extent that no significant increase in size was seen between June and October on any treatment and the low treatment showed significant dieback (Figure 5a-5b). We are subsequently evaluating it in 50% shade for the 2022 irrigation treatment season.

At the cooler South Coast REC site, Cool Glow Peach did attain an acceptable overall appearance rating on the moderate irrigation treatment with significantly better performance than either the high or low treatment (Table 12b). There was also significantly more growth on the moderate treatment with mortality rates of 57% and 25% on the high and low irrigation levels, respectively. For these reasons, in this region we suggest this plant be placed where it will receive afternoon shade and, when using reclaimed water, irrigated at the moderate level.

***Nandina domestica* 'Zhnan102' First Editions® Cool Glow™ Lime**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	31 cm (12'') x 26 cm (10'')	NR	2.2
South Coast REC Final	46 cm (18'') x 34 cm (14'')	50	3.0

The Cool Glow Lime heavenly bamboo did not perform well from the start in Davis in our full sun trial. Only the high and moderate irrigation treatments put on a very small amount of growth over the season and no treatment approached an acceptable appearance at any time (Figures 6a-6d; Table 13a). All plants looked stressed and showed signs of sunburn and dieback (Photo 6a). We are subsequently evaluating it in 50% shade for the 2022 irrigation treatment season. We do not recommend it for full sun in our region.

At South Coast REC, this cultivar attained a mean overall appearance rating of 3.0 based on scores early in the season, but by fall it was performing below an acceptable level with a few exceptions (Photo 6b.), even on the best treatment of 50% (Table 13b). There were significant differences in growth with only the moderate treatment achieving any positive growth while the low and high treatments saw significant loss in size. For these reasons, in this region we suggest this plant be placed where it will receive afternoon shade and, when using reclaimed water, irrigated at the moderate level.

***Rosa* 'Meiswetdom' Sweet Drift®**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	131 cm (51'') x 46 cm (18'')	20	3.7
South Coast REC Final	166 cm (65'') x 53 cm (21'')	20	3.2

Sweet Drift is a low-growing, wide-spreading rose for the front of a border or use as a tall groundcover. It began blooming in April and was never without at least a few blooms through the end of data collection in the first half of October. The small, tight pink rosettes were most plentiful in late April/early May, July, and August in Davis (Photo 7a) and in June, July, and September in Irvine (Photo 7b). Blooms began deep pink, became paler during the hotter months, and deepened again later in the season.

There was some edge burn at each location beginning in the hotter months which may be simply a response to extreme heat or the result of boron levels in Davis and reclaimed water in Irvine. In Irvine there were issues with tip and edge burn most likely due to reclaimed water usage, and as with many roses there, “June gloom” fostered black spot and powdery mildew on foliage. Although plants were often non-uniform and sometimes gangly in their growth habit, overall they had acceptably good appearance due in large part to their floriferousness, and we would recommend planting en masse rather than as single specimens, as this would disguise any peculiarities in the growth pattern of individual plants. There were no significant differences in growth or aesthetics at either trial location, we therefore recommend Sweet Drift receive irrigation at the low level (Tables 14a-14b; Figures 7a-7d).

***Rosa* 'Radtkopink' Pink Double Knock Out®**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	119 cm (47'') x 79 cm (31'')	50	3.7
South Coast REC Final	134 cm (53'') x 100 cm (39'')	NR	2.8

Pink Double Knock Out rose, like others in this series, bloomed from April through last data collection in October with the largest show of flowers in May, June, and August in Davis and late May/early June in Irvine. While individual blooms are not particularly well-formed, as a shrub rose, the effect of large numbers of flowers offsets this deficit, especially from a distance (Photo 8a-8b). One mark against the flowers is that they tended to hang on the shrub too long after fading and calyces did not clean as quickly as we would have liked. Plant form was also not as consistently uniform and full as other roses in this series we have evaluated (Photo 8c).

At both sites there were plants with black spot, though the prevalence was much higher in Irvine where powdery mildew was also an issue with their cooler, more humid summers. In Irvine, plants on both the low and high irrigation treatments were significantly smaller than those on the moderate irrigation treatment, but due to lower flowering scores, diseased foliage, and poor form yielding an overall unacceptable appearance on all irrigation levels, we do not recommend this rose in coastal environments (Table 15b; Figures 8c-8d). In Davis, there were no statistical differences between treatments in growth and appearance, but plants were rated modestly better on the moderate level of irrigation (Table 15a; Figures 8a-8b).

***Rosa* 'Sprogreatpink' Brick House® Pink**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	101 cm (40'') x 83 cm (33'')	20	4.0
South Coast REC Final	113 cm (44'') x 94 cm (37'')	20/50	2.9/3.0

Pink Brick House was an outstanding performer on low irrigation in Davis earning it our Blue Ribbon™ award. This is a dense, well-formed shrub with extremely clean, deep green foliage and a unique color of reddish-pink blooms which appear in abundance from April through at least October (Photo 9a). The deep color of the rugged foliage was excellent at disguising the typical chilli thrips damage we usually see during the summer months. The open form of the blooms gave easy access to the pollen-laden stamens making them highly attractive to all kinds of bees and other pollinators (Photo 9b). The only real knock against Pink Brick House in Davis was that the prolific blooming led to a period when dried, tan-colored petals clung to the calyces and detracted from the overall appearance until they dropped, which wasn't as quickly as we would have liked. However, the mint-colored calyces left behind were attractive, and in fall, hips began to form from these which would be a bonus in the winter garden. There were no differences in growth or any aesthetic qualities between treatments (Figures 9a-9d; Table 16a-16b).

At our South Coast REC site, Pink Brick House had similar issues as other roses there with black spot, powdery mildew, and leaf miner and thrips damage to foliage. Though there were no significant differences in growth or ratings between treatments, and we recommend the low level of irrigation, there was a modest improvement into the acceptable range on moderate water. We believe this rose is best planted inland where it thrives in heat, bright sun, and lower humidity.

***Rosa* 'Zlepolone' Pretty Polly® Pink**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	109 cm (43'') x 59 cm (23'')	20	4.0
South Coast REC Final	121 cm (48'') x 65 cm (26'')	20	3.7

Pretty Polly Pink is a polyantha shrub rose that covers itself with prolific clusters of tiny pink cup-shaped blooms with easily accessible pollen for insect visitors (Photo 10a-10b). Bloom begins in April, increases through May and peaks in early June with significant flushes continuing through July and August. Occasional plants put on a significant flower show into September. Fortunately, even the faded blooms were a pleasant pastel pink or white until they shattered and fell from the plants (Photo 10c). Because of its excellent performance on low water in Davis, it has earned the Blue Ribbon award. It displayed significantly more growth and better foliage and overall appearance scores on low water in Davis compared to the high water treatment (Figures 10a-10b; Table 17a). By October plants were beginning to look tired and some leaf edges were showing signs of drying, but this could be handled in a typical landscape situation by cutting plants back after late August flowering to allow new clean growth through fall.

In Irvine, Pretty Polly Pink bloomed throughout the treatment period with huge flushes in June that yielded the highest possible overall appearance scores (Table 17b). Secondary flushes of bloom in August and September continued to keep the scores in the good to very good range throughout the season. Foliage was disease resistant and showed only the typical insect damage other roses in the trial displayed and began to fade by late September/ early October. Pretty Polly Pink displayed no differences in growth or quality ratings between treatments and we recommend it be irrigated on the low water level in this region (Figures 10c-10d).

***Rosa* 'Zlepoltwo' Pretty Polly® White**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	111 cm (44'') x 63 cm (25'')	20	4.1
South Coast REC Final	143 cm (56'') x 92 cm (36'')	20	3.5

Pretty Polly White is a polyantha shrub similar to Pretty Polly pink but with clusters of open white rosettes covering plants beginning in April and continuing through the season (Photos 11a-11b). Its excellent performance on low water has earned it our Blue Ribbon award. In general, plants bloomed better in the heat and bright sun of Davis than in Irvine, with ratings peaking in May and July in Davis and June in Irvine (Tables 18a-18b). Spent petals were an antique white color that didn't detract from the overall appearance of the shrub and shattered and dropped quite easily with a light brushing (Photo 11c.). The form of the shrub is quite consistently uniform as was the flowering, which, even when light, was evenly distributed over the plant, rather than being on one side or the other. This was a very appealing feature. Though older, lower leaves were showing signs of edge burn by late August and into September, good form and consistent flower coverage kept the overall appearance scores high (Photo 11c). There were no significant differences between treatments in growth or quality ratings (Table 19a; Figures 11a-11b).

In Irvine there were more issues with foliage damage from reclaimed water and insect pressure. As previously mentioned, flowering was not as prolific as in Davis and plant consequently scored lower there, though still maintained good enough quality to be an acceptable flowering landscape plant. Since there were no differences in growth or quality ratings between treatments, we recommend the low level of irrigation in this region (Table 19b; Figures 11c-d).

50% Shade Results

***Agapanthus hybrid* 'MP003' Ever Amethyst™**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	58 cm (23”) x 36 cm (14”)	20	3.2
SC REC Final	77 cm (30”) x 36 cm (14”)	20	3.6

Ever Amethyst is a newer agapanthus cultivar hybridized in South Africa and reputedly selected for its flower color and re-blooming potential. After observing Ever Amethyst over two years we can attest that the deep, rich purple flower color is unique relative to other cultivars in the marketplace which tend towards blue or indigo. While we typically assess floral display on a 1-5 scale based on percentage of plant in bloom, for this cultivar we opted to record the number of individual flowering stalks that had at least one floret open (Tables 19a-b). Once flowers had finished blooming, we manually brushed off the dried florets, leaving the green stems on the plant until they had dried, at which time the dried stems were removed. An interesting side note is that we observed multiple instances of fasciation of the flowering stalks in the UC Davis field though it was at random and not related to irrigation treatment. Because the shade field at UC Davis was not to be immediately replanted after the trial ended in October 2021, plants were left in the ground and all treatments were observed to have multiple stems in bud or bloom when the plants were removed in January 2022. While the flowers were beautiful and bountiful (one plant had 39 stalks of blooming flowers), the foliage quality weighed down the overall appearance scores. At the outset of the growing season any dried or yellowing leaves were removed by hand but leaves routinely turned yellow throughout the entire season. Based on our observations this is less due to any sort of pest or disease issue and more likely just due to high turnover for individual leaves in this cultivar under our conditions. Unfortunately, new growth did not occur quickly enough to cover older foliage. For a home gardener with a few plants in a small area, removing yellowing leaves throughout the growing season may not be an issue, but this regular maintenance is likely not feasible at a larger scale.

The relative plant growth for most individuals was less than 1 at the end of the season (meaning they got smaller), a trend observed across treatments at both South Coast REC and UC Davis. There were no differences between treatments in either growth or quality ratings (Figures 12a-12d). While in general it is not a good sign for a plant to have declined over the growing season, Ever Amethyst is marketed as a semi-dwarf and plants on average exceeded or maintained the 12-18” in width listed for this cultivar. Based on our results we recommend irrigating Ever Amethyst on low water in WUCOLS Regions 2 and 3.

***Camellia sasanqua* 'Green 02-003' October Magic® Ruby™**

Location	Final W x H	Rec. Irr. Rate	Mean O/A Rating
UC Davis Final	41 cm (16”) x 45 cm (18”)	50	3.2
SC REC Final	Ø	N/A	-

Ruby is a *Camellia sasanqua* cultivar in the October Magic series with glossy, forest green leaves and velvety, deep red flowers occurring in late fall. This cultivar did not perform well on deficit irrigation with reclaimed water at South Coast REC, resulting in high levels of mortality by mid-July. We would not recommend this cultivar, or other camellias for irrigation with reclaimed water in that region (Table 20b).

Ruby performed much better at UC Davis, where the main issues were lack of uniformity and sparse foliage on all treatments (Table 20a). We also observed late season mortality for several plants on the lowest treatment. While foliage scores started out fairly high, yellowing leaves and leaf drop were observed beginning in July. This coincided with the observation of disease-like symptoms on the leaves such as spotting and dieback. While the standard deficit period for the trial is April to October, staff were able to continue collecting data in November and December to assess whether irrigation treatment affected fall flowering scores. While there were no statistical differences among treatments regarding floral display scores, plants on all treatments pushed out new foliage during these months resulting in late-season increases in foliage, vigor, and overall appearance scores. Based on our observations, installing larger sized plants of this cultivar may be desirable, as it would likely overcome the non-uniformity observed in our #1-sized plants over two years. We also speculate that siting this camellia where it would receive morning sun and afternoon shade, rather than the constant bright shade experienced in our shade structure, might yield better performance. Due the mortality observed on the lowest treatment, we would recommend irrigating Ruby on moderate/medium irrigation in WUCOLS zone 2.

Appendix A

QUALITY RATINGS TABLES AND GROWTH CHARTS

Pink Brickhouse rose with easily accessible pollen.

In all tables significant differences between treatments are indicated by ratings in the AVG column with different lower-case superscripts. In charts, significant differences between treatments in a month are indicated by different lower-case letters over the bars. Letters in black indicate a significant difference at p ≤ 0.5; red letters indicate significant difference at p ≤ .01. If no superscripts are present, there were no significant differences between treatments.

Table 8a. *Abelia* × *grandiflora* 'Bailbeliaone' Vanilla Brandy™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.5	2.6	3.4	3.4	2.6	2.2	2.3	2.7[a]
	50	2.1	2.3	3.3	3.7	3.4	2.9	2.6	2.9[a]
	20	2.4	1.9	2.4	2.5	2.6	1.8	2.3	2.3[b]
Foliage	80	2.6	2.6	4.1	3.7	2.9	2.3	2.3	2.9[a]
	50	2.2	2.4	4.4	4.6	3.6	2.9	2.4	3.2[a]
	20	2.4	2.1	2.6	2.6	2.9	1.8	2.3	2.4[b]
Flower	80	0.0	0.0	0.0	0.4	0.7	0.6	0.1	0.3[a]
	50	0.0	0.0	0.0	0.7	0.6	0.9	0.0	0.3[a]
	20	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0[b]
Pest Resistance	80	5.0	5.0	5.0	5.0	4.3	4.3	4.3	4.7
	50	4.7	4.9	4.9	4.7	5.0	5.0	3.6	4.7
	20	4.9	5.0	5.0	5.0	5.0	5.0	3.1	4.7
Disease Resistance	80	5.0	5.0	5.0	5.0	4.3	4.3	4.3	4.7
	50	5.0	5.0	5.0	5.0	5.0	5.0	3.6	4.8
	20	5.0	5.0	5.0	5.0	5.0	5.0	3.1	4.7
Vigor	80	2.9	2.6	4.1	4.1	3.0	2.6	2.6	3.1[a]
	50	2.7	2.4	4.6	4.9	4.3	3.1	2.7	3.5[a]
	20	2.8	2.0	2.6	2.8	2.9	1.8	2.3	2.4[b]

Table 8b. *Abelia* × *grandiflora* 'Bailbeliaone' Vanilla Brandy™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.3	3.5	3.5	3.4	3.1	2.8	3.2[a]
	50	2.7	2.9	3.1	2.9	2.7	3.0	2.6	2.8[b]
	20	2.9	2.6	3.0	2.8	2.4	2.5	2.0	2.6[b]
Foliage	80	3.0	3.5	3.9	3.7	3.7	3.2	2.6	3.4[a]
	50	2.7	3.1	3.2	2.9	2.6	3.0	2.4	2.8[b]
	20	2.8	2.6	3.0	2.9	2.4	2.5	2.1	2.6[b]
Flower	80	0.0	0.0	0.8	2.1	1.9	1.0	0.6	0.9
	50	0.0	0.1	0.8	2.1	2.9	2.0	1.8	1.4
	20	0.0	0.0	0.8	1.6	1.5	1.4	1.1	0.9
Pest Resistance	80	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	50	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.5	5.0	5.0	5.0	5.0	5.0	4.4	4.8
Disease Resistance	80	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	50	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.5	5.0	5.0	5.0	5.0	5.0	4.4	4.8
Vigor	80	3.2	5.0	5.0	4.9	4.9	3.9	3.8	4.4[a]
	50	3.1	4.9	4.8	4.6	4.3	4.3	4.1	4.3[ab]
	20	3.1	4.6	4.5	4.3	3.6	3.3	3.1	3.8[b]

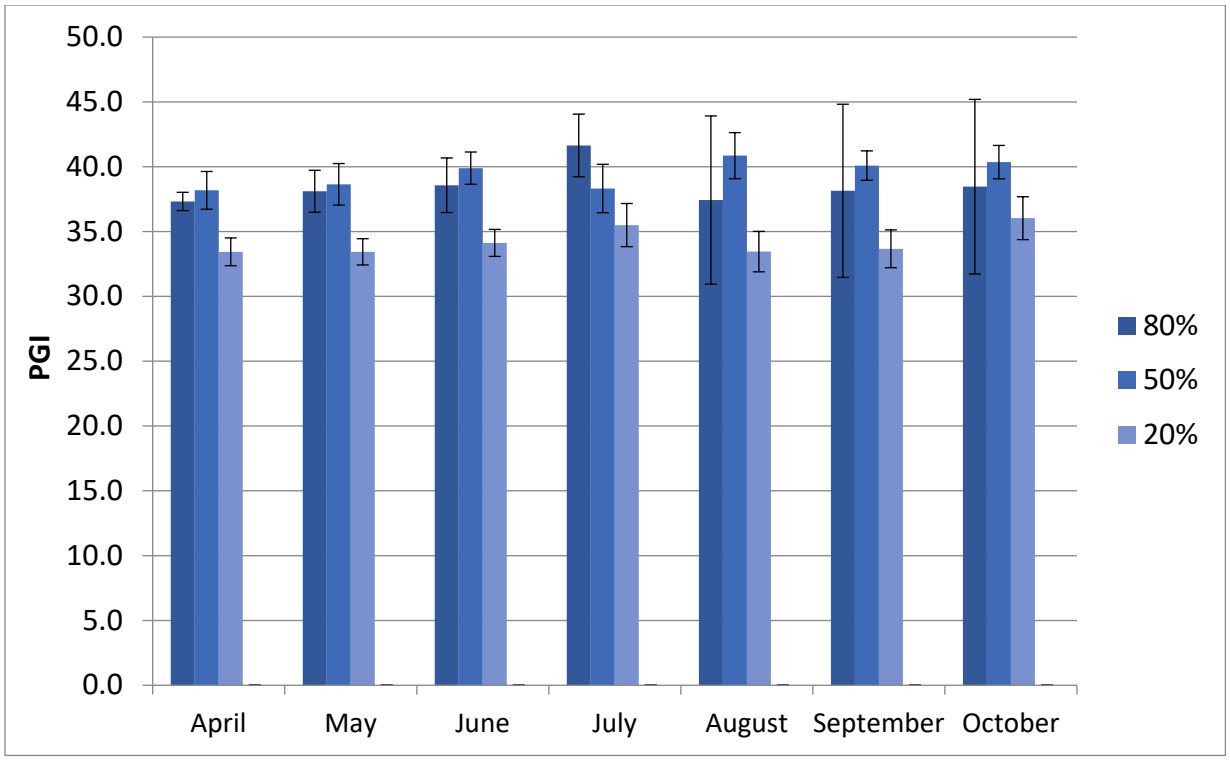

Figure 1a. *Abelia* × *grandiflora* 'Bailbeliaone' Vanilla Brandy™ average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

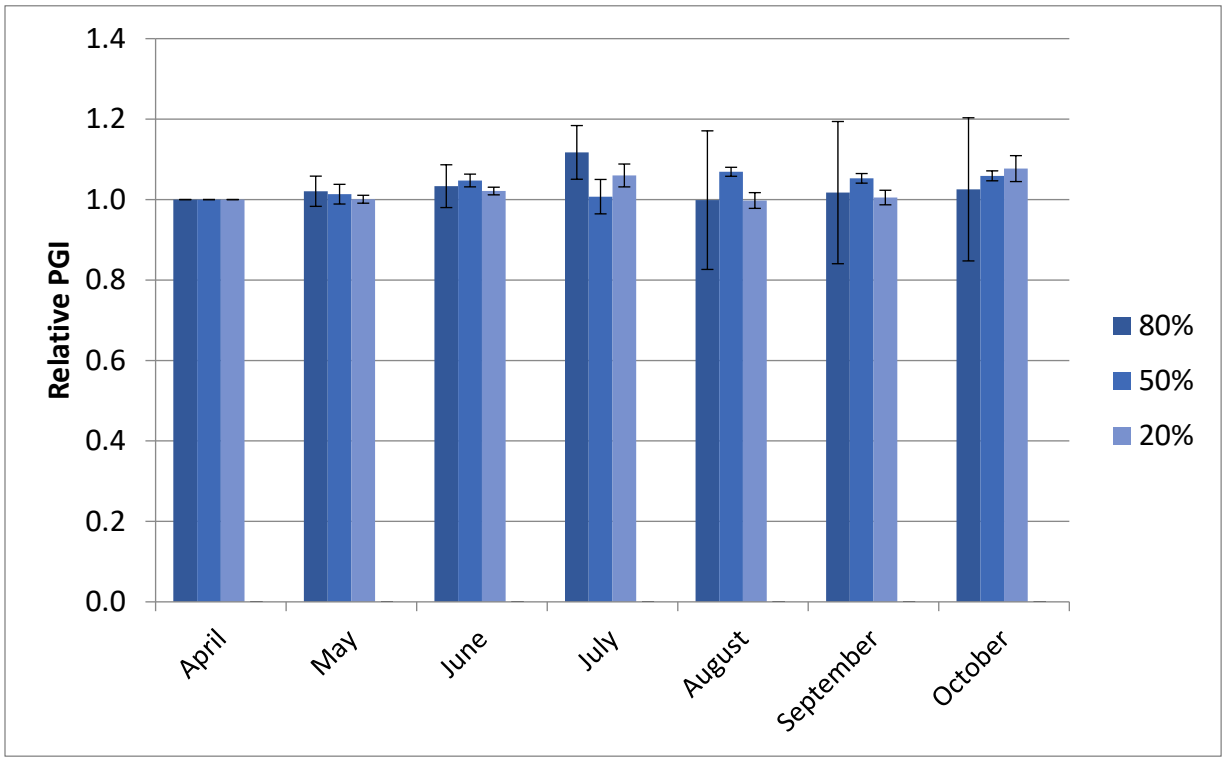

Figure 1b. *Abelia* × *grandiflora* 'Bailbeliaone' Vanilla Brandy™ average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

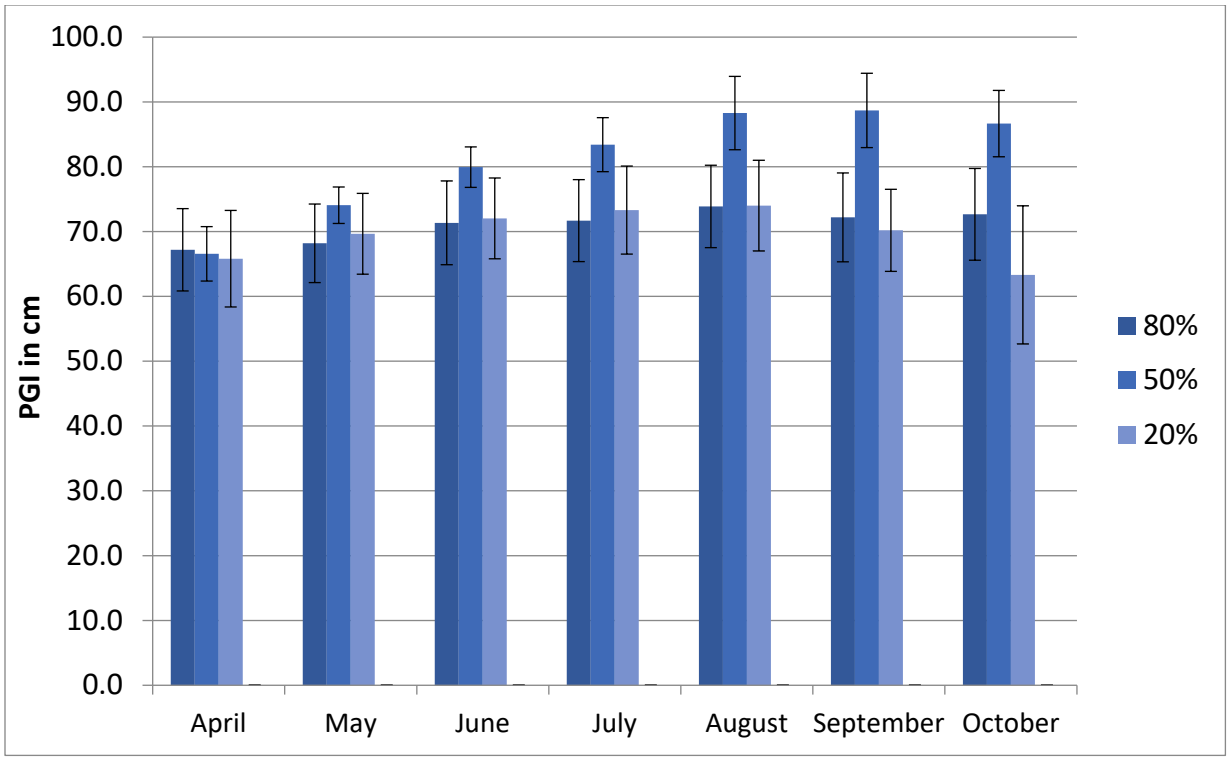

Figure 1c. *Abelia* × *grandiflora* 'Bailbeliaone' Vanilla Brandy™ average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

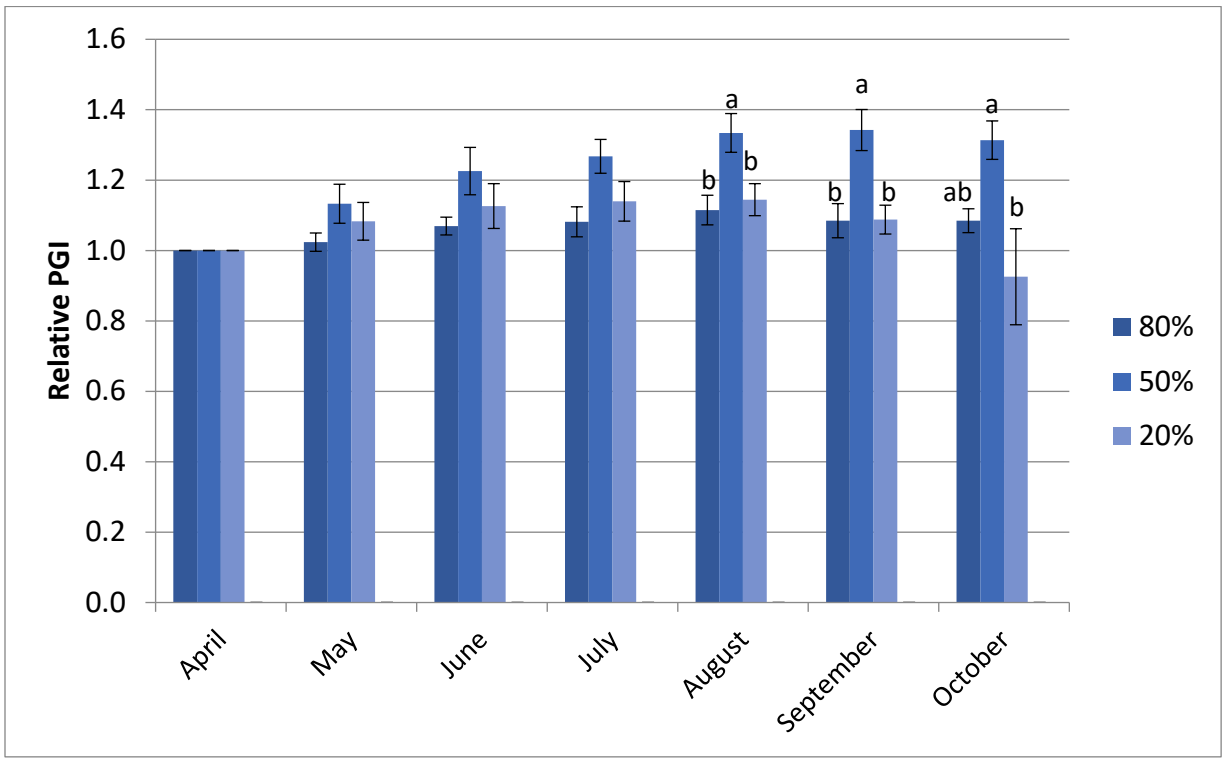

Figure 1d. *Abelia* × *grandiflora* 'Bailbeliaone' Vanilla Brandy™ average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 9a. *Lippia* 'ECOLOPIA2' Pink Kurapia® average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.0	3.6	3.7	4.0	2.9	3.2	3.1	3.3
	50	3.0	3.4	4.3	4.8	3.3	3.1	3.0	3.5
	20	3.0	3.6	3.9	3.9	2.7	2.5	2.5	3.1
Foliage	80	3.1	4.5	4.1	4.1	3.1	3.1	3.1	3.6
	50	3.1	4.8	4.9	5.0	3.3	3.0	2.8	3.8
	20	3.0	4.5	4.6	4.1	2.6	2.5	2.5	3.4
Flower	80	0.5	1.6	3.4	4.0	2.9	2.1	2.4	2.4
	50	0.5	1.5	3.9	4.8	3.3	2.4	2.5	2.7
	20	0.5	1.6	3.8	4.0	2.9	1.6	1.9	2.3
Pest Resistance	80	4.5	5.0	4.5	4.5	3.7	4.0	3.8	4.3
	50	4.5	5.0	5.0	5.0	3.3	3.9	3.3	4.3
	20	4.5	5.0	4.9	4.5	3.3	2.9	2.8	4.0
Disease Resistance	80	4.5	5.0	4.5	5.0	5.0	5.0	5.0	4.9
	50	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.5	5.0	4.9	5.0	5.0	5.0	5.0	4.9
Vigor	80	3.5	5.0	4.5	4.5	4.5	4.8	3.6	4.3
	50	3.5	5.0	5.0	5.0	5.0	4.9	3.5	4.6
	20	3.5	5.0	5.0	4.5	4.5	3.9	3.0	4.2

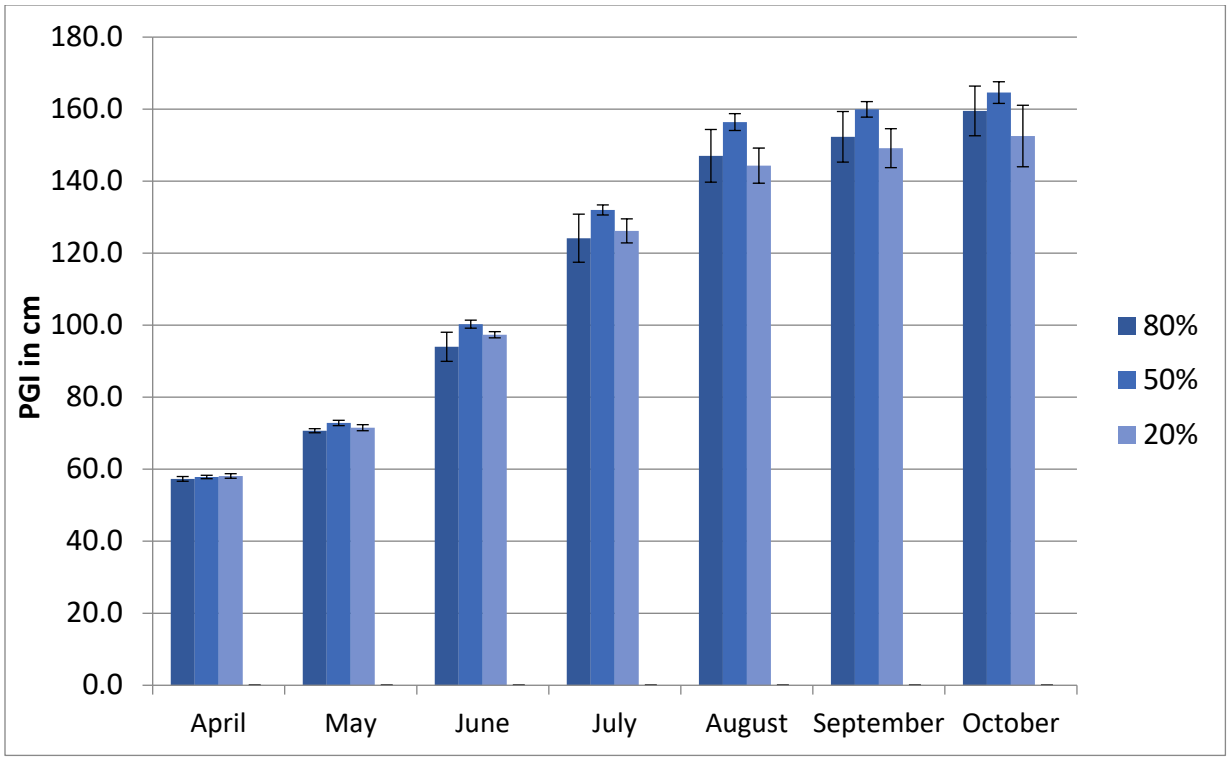

Figure 2a. *Lippia* 'ECOLOPIA2' Pink Kurapia® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

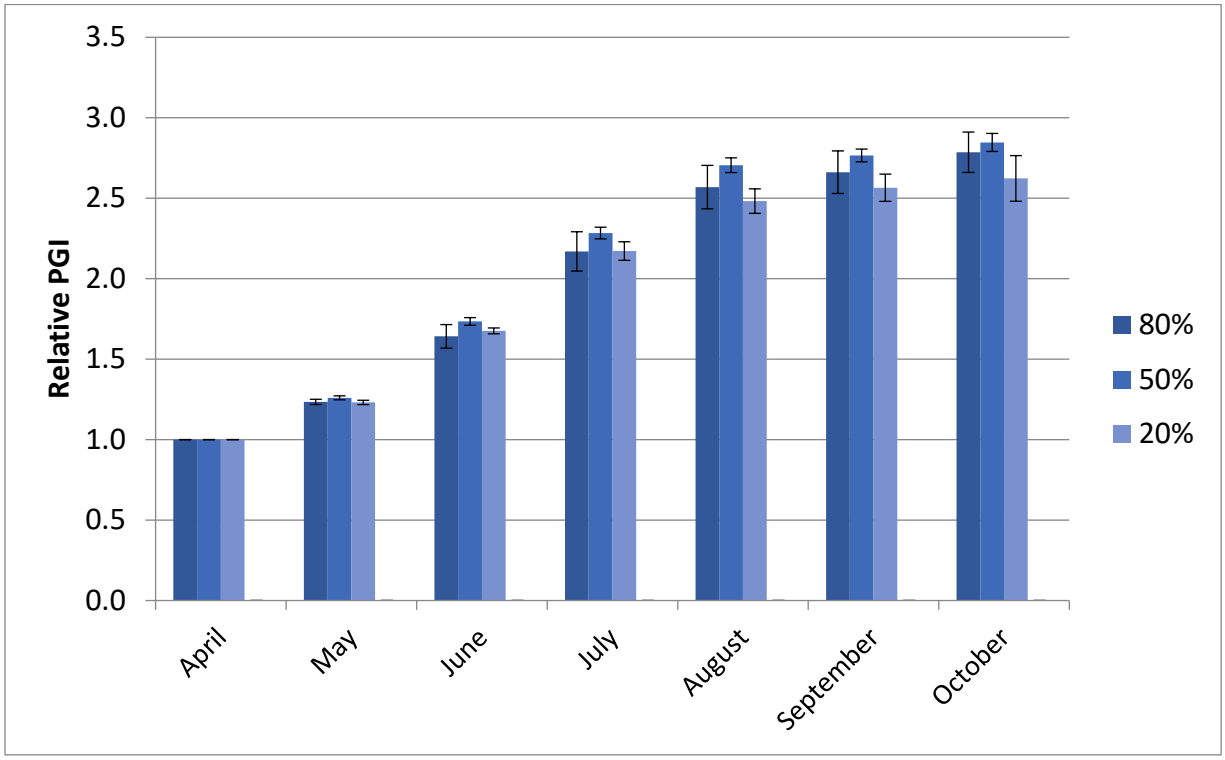

Figure 2b. *Lippia* 'ECOLOPIA2' Pink Kurapia® average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 10a. *Lomandra confertifolia* 'LOLTCS08' Del Sol average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.6	3.4	3.8	3.8	4.1	3.7	4.3	3.7[a]
	50	3.2	3.4	3.6	3.8	3.8	3.8	3.9	3.6[a]
	20	3.6	3.6	4.4	4.3	4.7	4.4	4.6	4.2[b]
Foliage	80	2.6	3.6	3.7	3.7	4.1	3.7	4.3	3.7[a]
	50	3.6	3.6	3.6	4.0	3.9	3.8	3.9	3.8[a]
	20	3.9	4.1	4.8	4.4	4.9	4.4	4.8	4.4[b]
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.3	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	4.3	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	50	4.9	5.0	5.0	5.0	5.0	5.0	4.4	4.9
	20	5.0	5.0	5.0	5.0	5.0	5.0	3.8	4.8
Disease Resistance	80	4.3	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	50	4.9	5.0	5.0	5.0	5.0	5.0	4.4	4.9
	20	5.0	5.0	5.0	5.0	5.0	5.0	3.8	4.8
Vigor	80	3.0	4.3	4.6	4.3	4.1	4.1	4.3	4.1[a]
	50	3.6	3.9	4.3	4.3	4.0	4.0	4.3	4.0[a]
	20	4.4	4.6	5.0	4.8	4.8	4.5	4.9	4.7[b]

Table 10b. *Lomandra confertifolia* 'LOLTCS08' Del Sol average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.2	3.8	3.9	3.9	3.7	3.8	3.8	3.7[a]
	50	2.1	2.6	2.4	2.6	2.7	3.3	3.3	2.7[b]
	20	3.1	3.4	3.4	3.8	3.8	4.1	4.1	3.7[a]
Foliage	80	3.1	3.7	3.9	3.6	3.6	3.4	3.5	3.6[a]
	50	2.3	2.7	2.4	2.8	2.9	3.3	3.2	2.8[b]
	20	2.7	3.4	3.4	3.5	3.5	3.9	3.6	3.4[a]
Flower	80	0.1	0.1	0.9	1.0	1.0	1.0	1.0	0.7
	50	0.1	0.0	0.4	0.6	0.8	0.9	0.9	0.5
	20	0.0	0.1	0.7	1.0	1.0	1.0	1.0	0.7
Pest Resistance	80	3.5	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	50	2.5	5.0	4.5	4.9	5.0	5.0	5.0	4.6
	20	3.2	5.0	5.0	5.0	5.0	5.0	5.0	4.7
Disease Resistance	80	3.5	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	50	2.5	5.0	4.5	5.0	5.0	5.0	5.0	4.6
	20	3.2	5.0	5.0	5.0	5.0	5.0	5.0	4.7
Vigor	80	3.4	4.9	4.9	4.8	4.9	4.9	4.9	4.7[a]
	50	2.6	3.3	2.9	3.4	3.6	3.8	3.9	3.4[b]
	20	3.2	4.4	4.4	4.6	4.9	5.0	4.9	4.5[a]

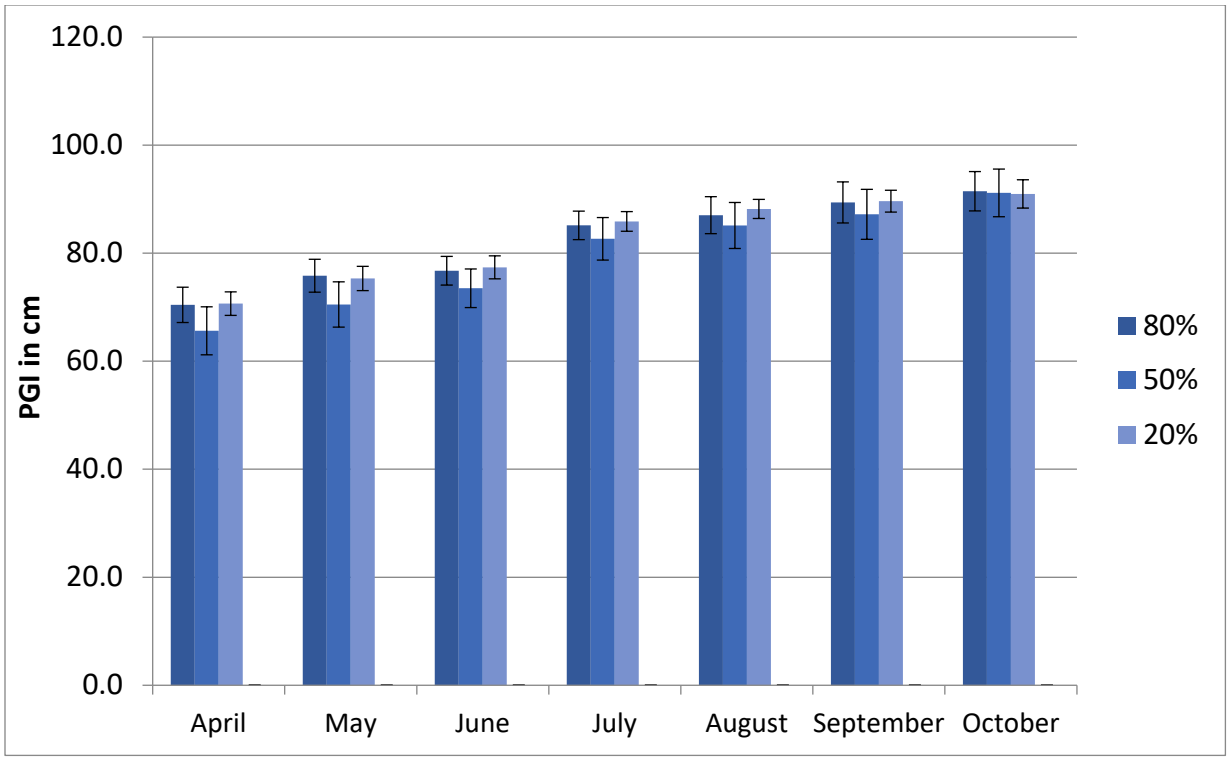

Figure 3a. *Lomandra confertifolia* 'LOLTCS08' Del Sol average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

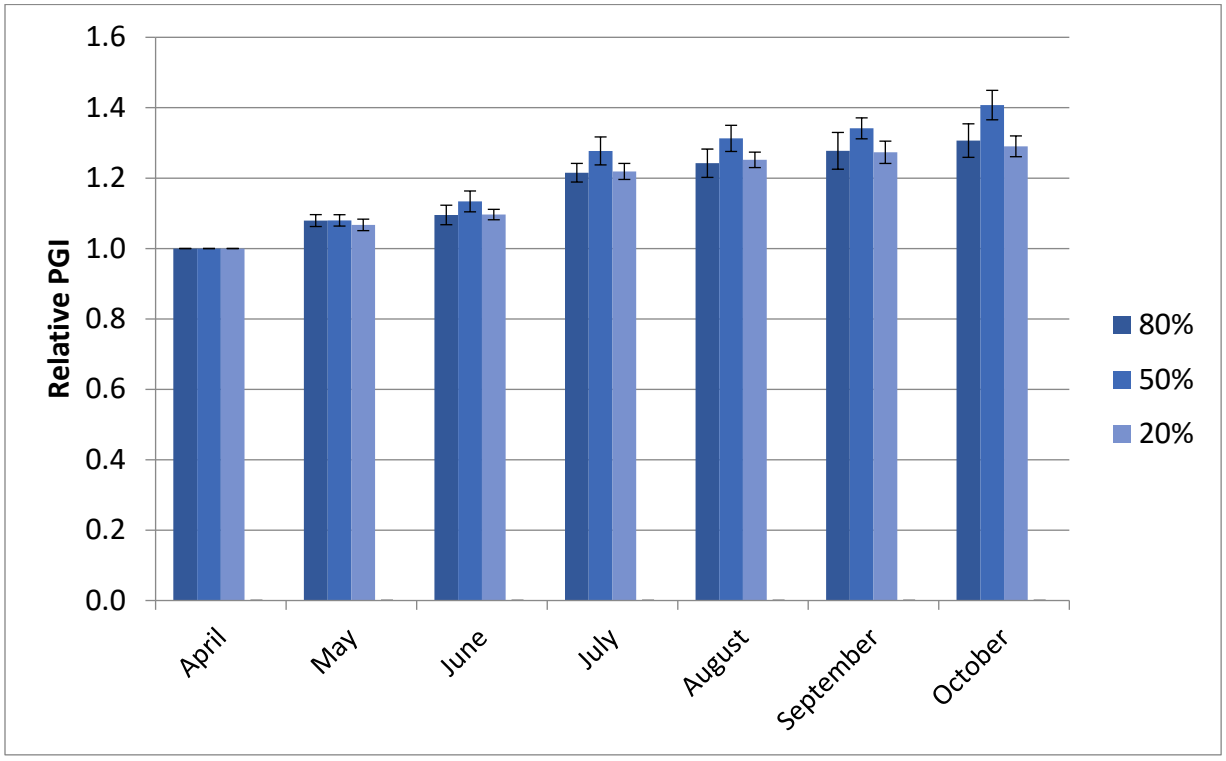

Figure 3b. *Lomandra confertifolia* 'LOLTCS08' Del Sol average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

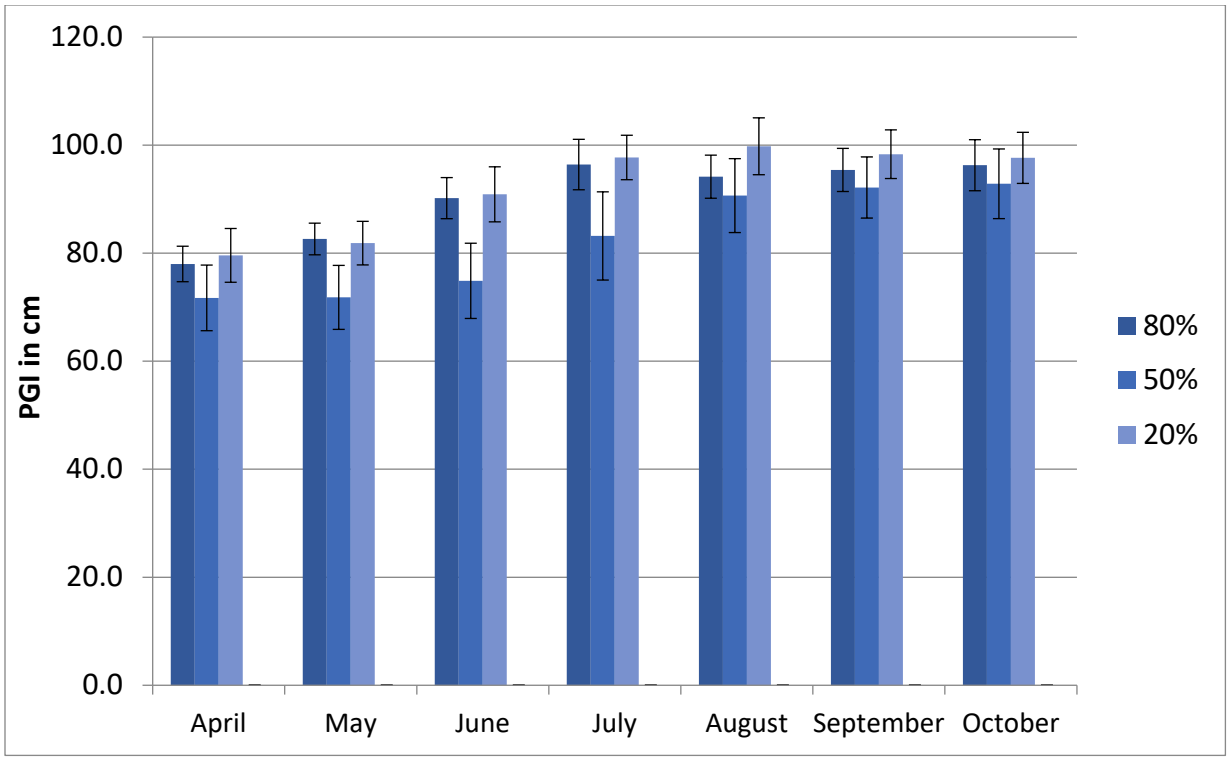

Figure 3c. *Lomandra confertifolia* 'LOLTCS08' Del Sol average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

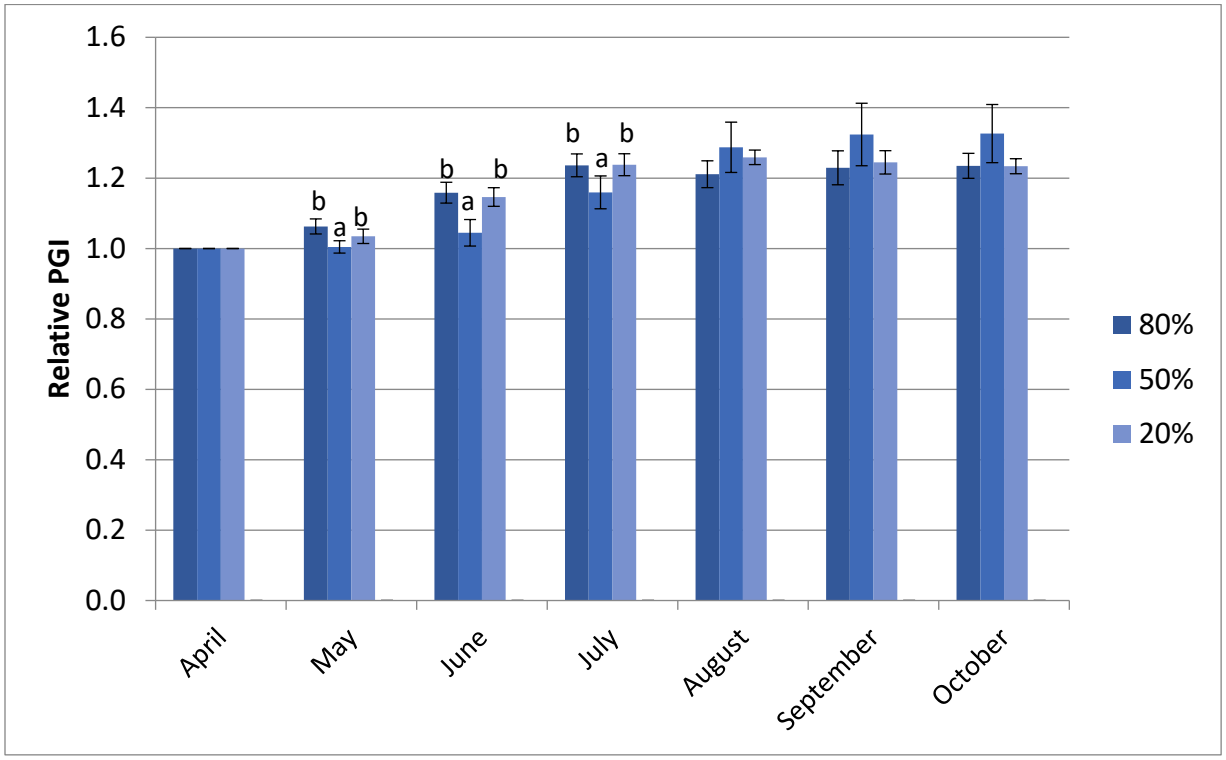

Figure 3d. *Lomandra confertifolia* 'LOLTCS08' Del Sol average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 11a. *Lomandra confertifolia ssp. Pallida* 'Pom Pom' Shorty average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	4.0	3.8	3.9	4.6	4.7	4.7	4.1
	50	3.9	3.9	4.4	4.3	4.7	4.8	4.8	4.4
	20	3.7	3.8	4.1	4.3	4.3	4.5	4.7	4.2
Foliage	80	3.6	4.4	4.0	4.0	4.4	4.7	4.7	4.3[a]
	50	4.3	4.5	4.5	4.6	4.6	5.0	4.8	4.6[b]
	20	4.0	4.3	4.4	4.6	4.5	4.8	4.8	4.5[b]
Flower	80	0.0	2.3	0.9	0.1	0.0	0.0	0.0	0.5
	50	0.0	3.0	1.6	0.5	0.0	0.0	0.0	0.7
	20	0.0	2.0	1.8	0.3	0.0	0.0	0.0	0.6
Pest Resistance	80	5.0	5.0	5.0	5.0	5.0	5.0	3.6	4.8
	50	4.9	4.9	5.0	5.0	5.0	5.0	4.4	4.9
	20	4.9	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	3.6	4.8
	50	5.0	4.9	5.0	5.0	5.0	5.0	4.4	4.9
	20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vigor	80	4.1	4.9	4.6	4.7	4.7	4.9	4.7	4.7
	50	4.9	4.9	5.0	4.8	4.8	4.9	4.8	4.8
	20	4.5	4.9	4.9	4.4	4.4	4.8	4.8	4.6

Table 11b. *Lomandra confertifolia ssp. Pallida* 'Pom Pom' Shorty average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.9	3.6	3.4	3.8	3.6	3.8	3.8	3.5[a]
	50	3.4	3.8	3.9	4.2	4.4	4.4	4.5	4.1[b]
	20	3.3	3.9	3.7	4.4	4.1	4.1	4.1	3.9[b]
Foliage	80	2.9	3.8	3.8	3.9	3.6	3.7	3.4	3.6[a]
	50	3.2	4.0	4.0	4.3	3.9	4.3	3.9	3.9[b]
	20	3.1	4.1	4.0	4.1	4.1	3.9	3.9	3.9[b]
Flower	80	0.7	1.0	1.0	1.1	1.0	1.0	1.0	1.0
	50	0.6	0.8	1.0	0.9	1.0	0.9	0.9	0.9
	20	0.5	0.7	1.0	1.0	1.0	1.0	1.0	0.9
Pest Resistance	80	3.3	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	50	3.6	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	20	3.6	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Disease Resistance	80	3.3	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	50	3.6	5.0	5.0	5.0	5.0	5.0	5.0	4.8
	20	3.6	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Vigor	80	3.4	5.0	4.6	5.0	5.0	5.0	4.9	4.7
	50	3.6	4.6	4.8	4.8	4.8	4.8	4.8	4.6
	20	3.6	5.0	5.0	5.0	5.0	5.0	4.9	4.8

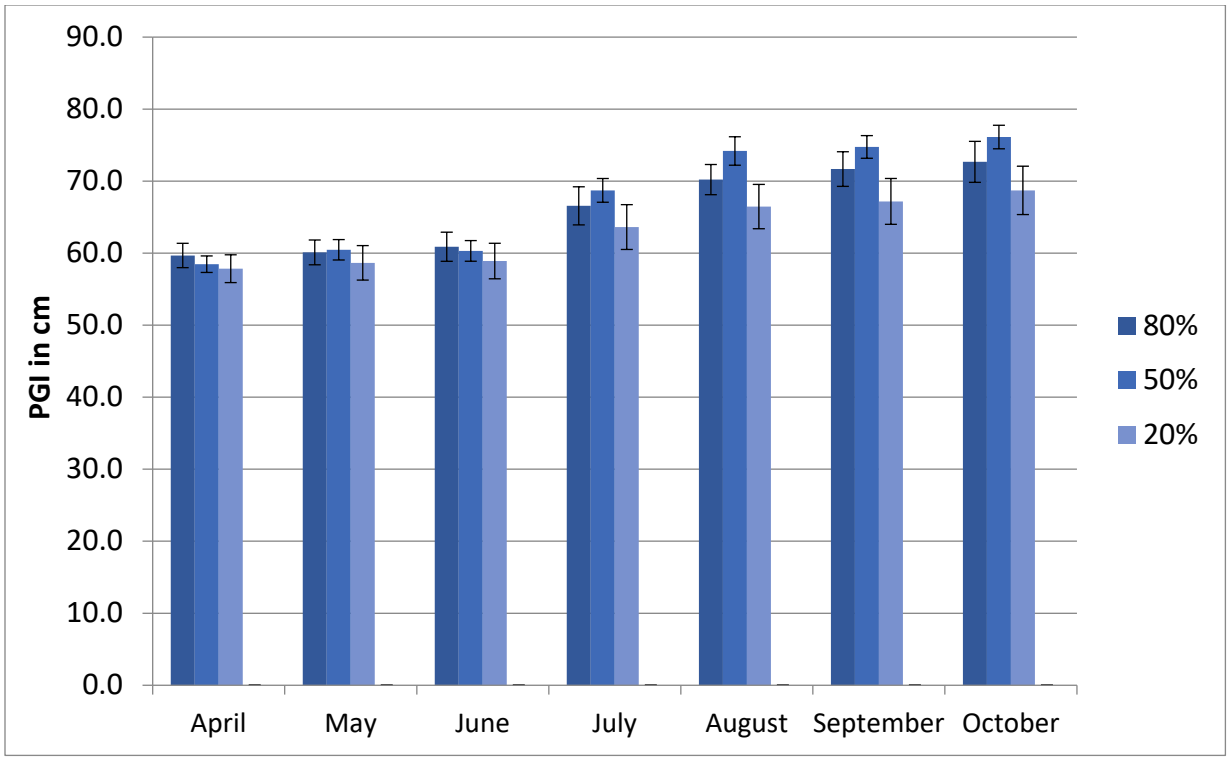

Figure 4a. *Lomandra confertifolia ssp. Pallida* 'Pom Pom' Shorty average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

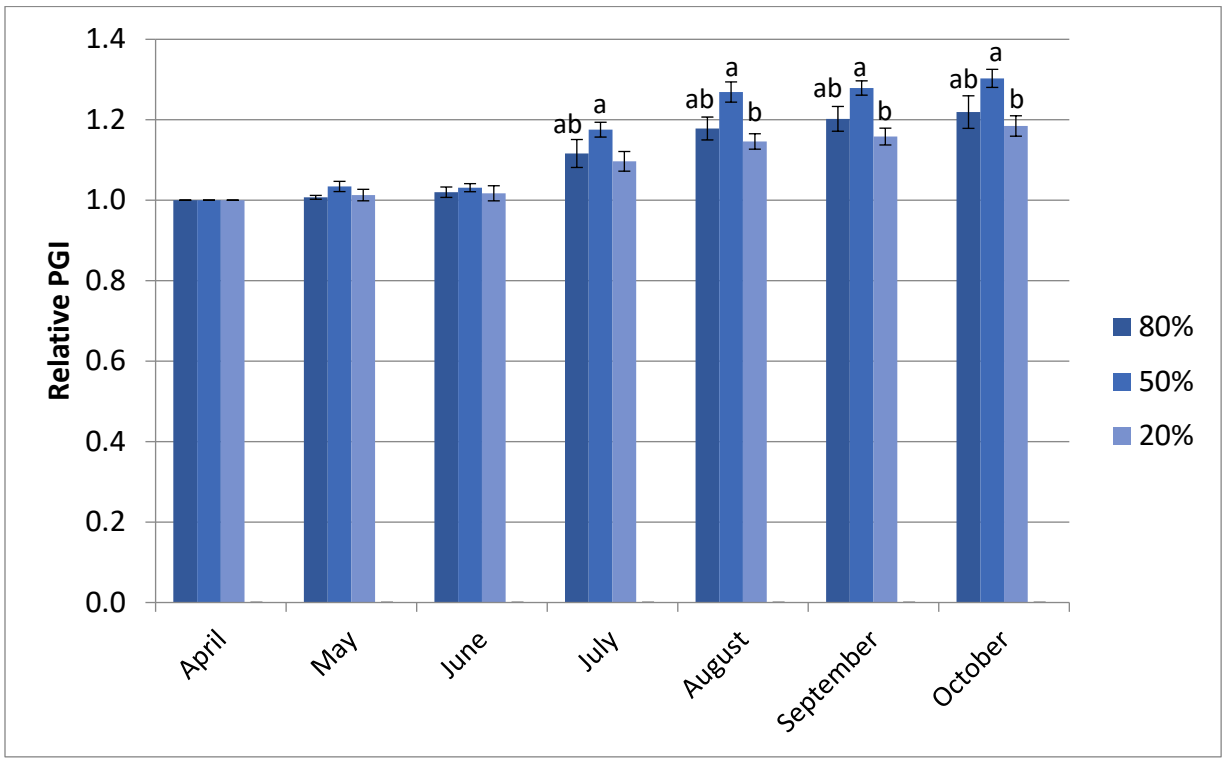

Figure 4b. *Lomandra confertifolia ssp. Pallida* 'Pom Pom' Shorty average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

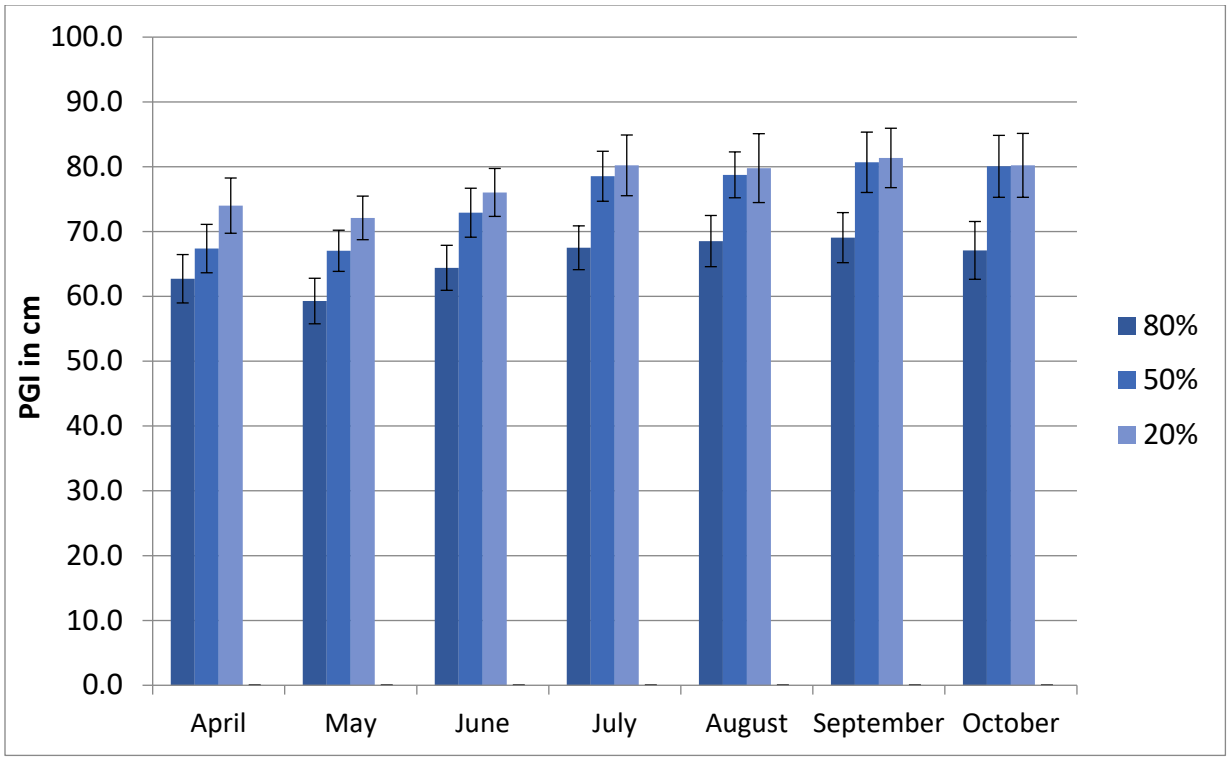

Figure 4c. *Lomandra confertifolia ssp. Pallida* 'Pom Pom' Shorty average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

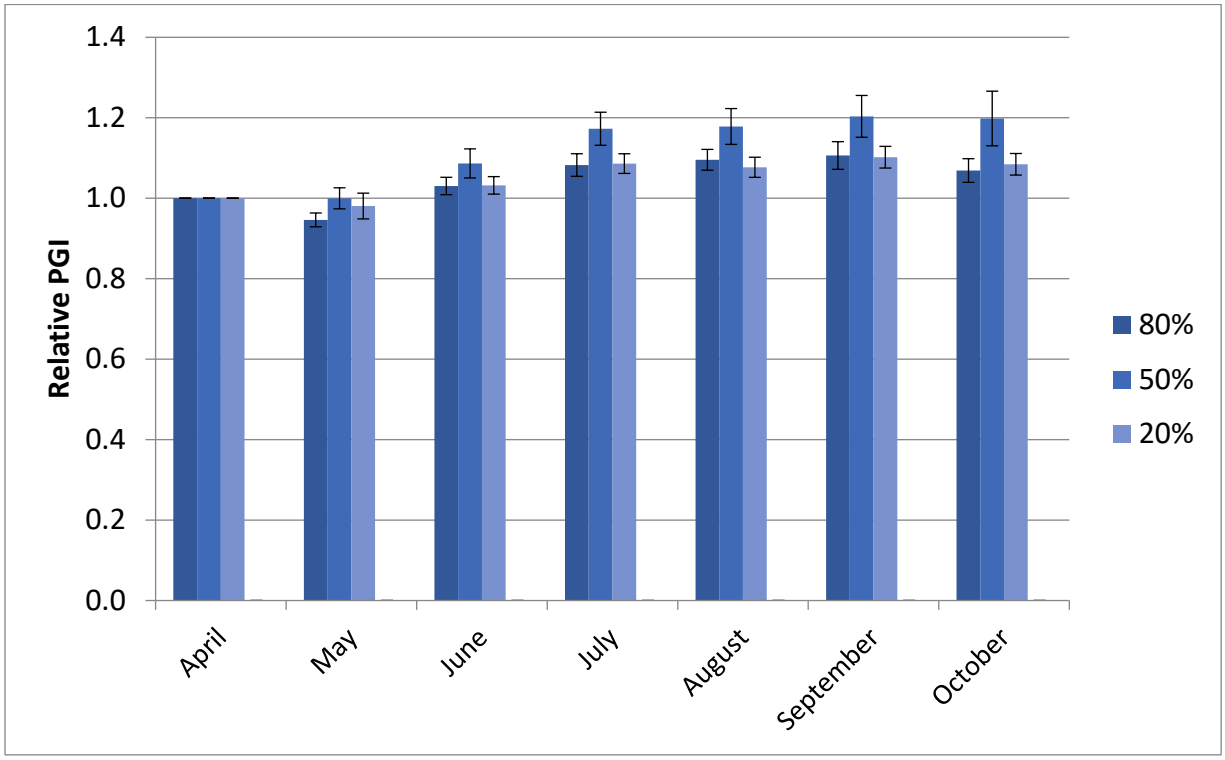

Figure 4d. *Lomandra confertifolia ssp. Pallida* 'Pom Pom' Shorty average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 12a. *Nandina domestica* 'Zhnan28' Cool Glow™ Peach average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.9	2.1	2.6	2.1	2.2	2.4	2.7	2.4[a]
	50	2.9	2.3	2.4	2.5	2.6	2.5	2.6	2.5[a]
	20	2.4	2.1	2.1	2.0	1.6	1.6	1.6	1.9[b]
Foliage	80	3.1	2.1	2.6	2.1	2.1	2.4	2.6	2.5[a]
	50	2.9	2.4	2.5	2.6	2.6	2.6	2.6	2.6[a]
	20	2.3	2.1	2.1	2.0	1.6	1.6	1.6	1.9[b]
Flower	80	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.0	0.0	0.0	0.5	0.5	0.1	0.1	0.2
	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pest Resistance	80	4.9	5.0	5.0	5.0	5.0	5.0	4.3	4.9
	50	4.9	5.0	5.0	4.9	5.0	5.0	4.4	4.9
	20	5.0	5.0	5.0	4.8	5.0	5.0	3.1	4.7
Disease Resistance	80	5.0	5.0	5.0	5.0	5.0	5.0	4.3	4.9
	50	4.9	5.0	5.0	5.0	5.0	5.0	4.4	4.9
	20	5.0	5.0	5.0	5.0	5.0	4.6	3.1	4.7
Vigor	80	3.3	2.6	2.9	2.6	2.4	2.4	3.0	2.7[a]
	50	3.3	2.6	3.0	2.9	2.6	2.8	2.9	2.9[a]
	20	2.5	2.4	2.8	2.0	1.6	2.0	1.8	2.1[b]

Table 12b. *Nandina domestica* 'Zhnan28' Cool Glow™ Peach average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.3	3.4	3.4	2.5	1.6	1.0	0.8	2.3[a]
	50	3.1	3.3	3.4	3.4	3.5	2.9	3.3	3.3[b]
	20	2.9	3.2	3.1	1.9	1.7	1.1	1.4	2.2[a]
Foliage	80	3.5	3.6	3.5	2.5	1.7	1.1	0.8	2.4[a]
	50	3.3	3.5	3.6	3.7	3.3	3.0	3.3	3.4[b]
	20	3.2	3.1	3.1	2.1	1.6	1.1	1.3	2.2[a]
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	4.5	5.0	5.0	5.0	3.6	3.6	2.1	4.9
	50	4.4	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.4	5.0	5.0	4.4	4.4	3.1	3.1	4.8
Disease Resistance	80	4.5	5.0	5.0	5.0	3.6	3.6	2.1	4.9
	50	4.4	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.4	5.0	5.0	4.4	4.4	3.1	3.1	4.8
Vigor	80	3.0	4.1	4.2	2.6	2.2	1.1	0.9	2.6
	50	3.1	4.3	4.1	3.5	4.1	3.0	3.8	3.7
	20	3.1	3.8	3.9	2.1	1.6	1.3	1.5	2.5

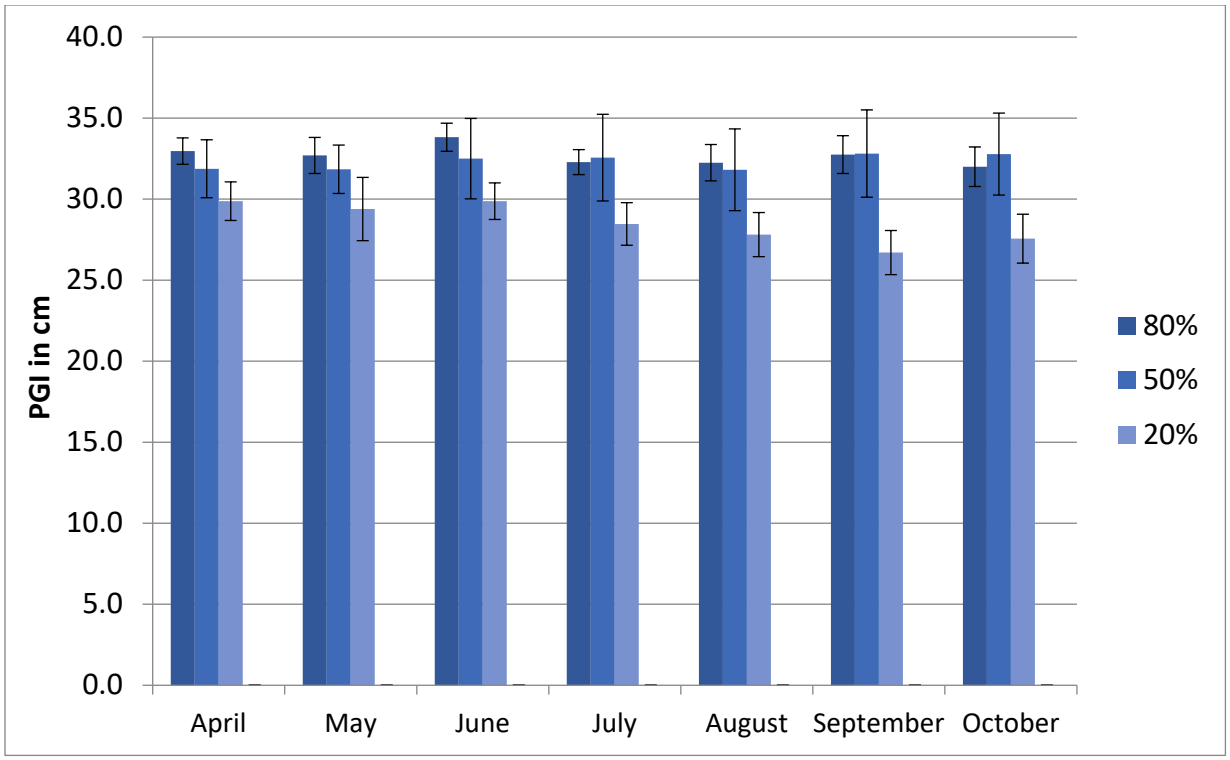

Figure 5a. *Nandina domestica* 'Zhnan28' Cool Glow™ Peach average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

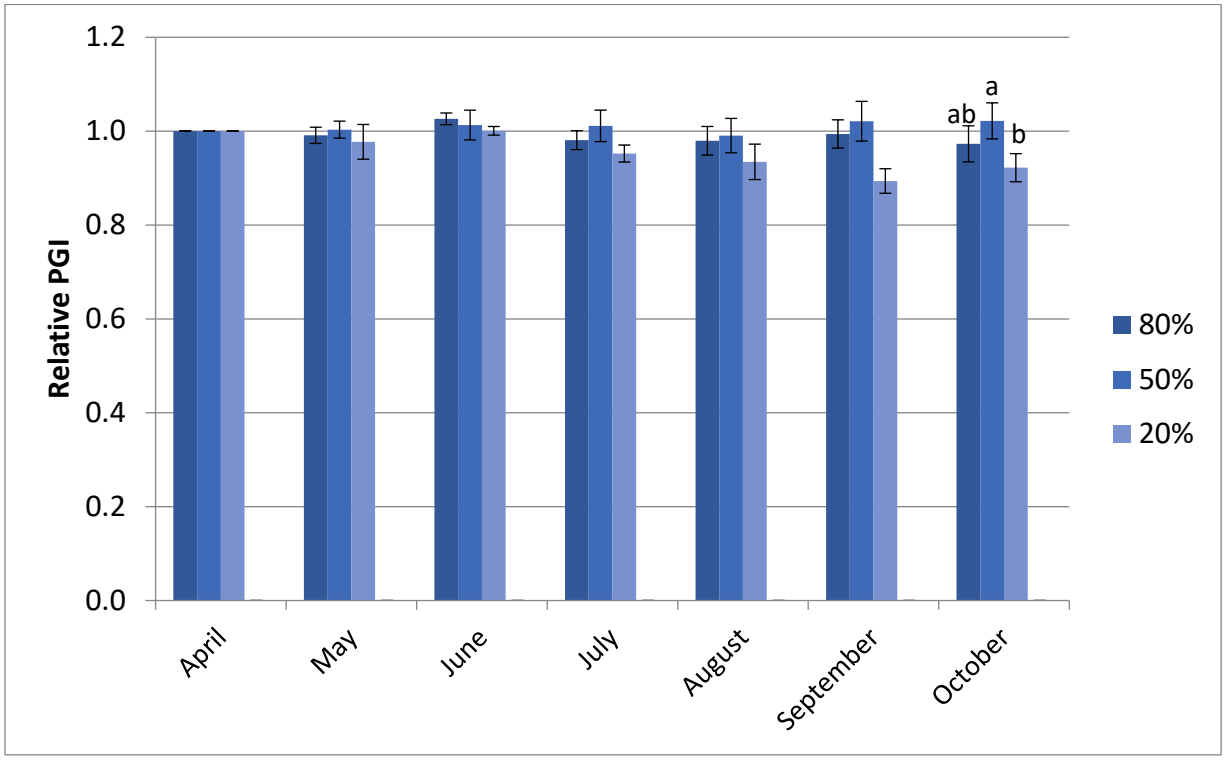

Figure 5b. *Nandina domestica* 'Zhnan28' Cool Glow™ Peach average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

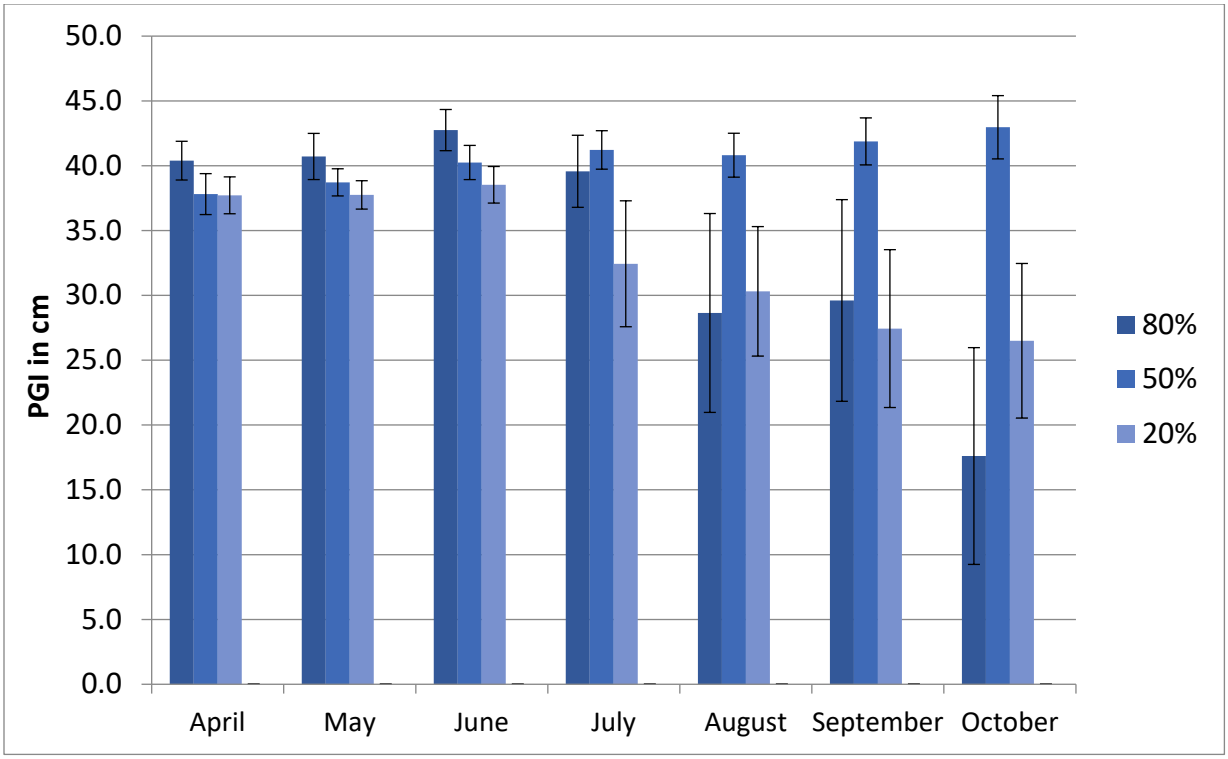

Figure 5c. *Nandina domestica* 'Zhnan28' Cool Glow™ Peach average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

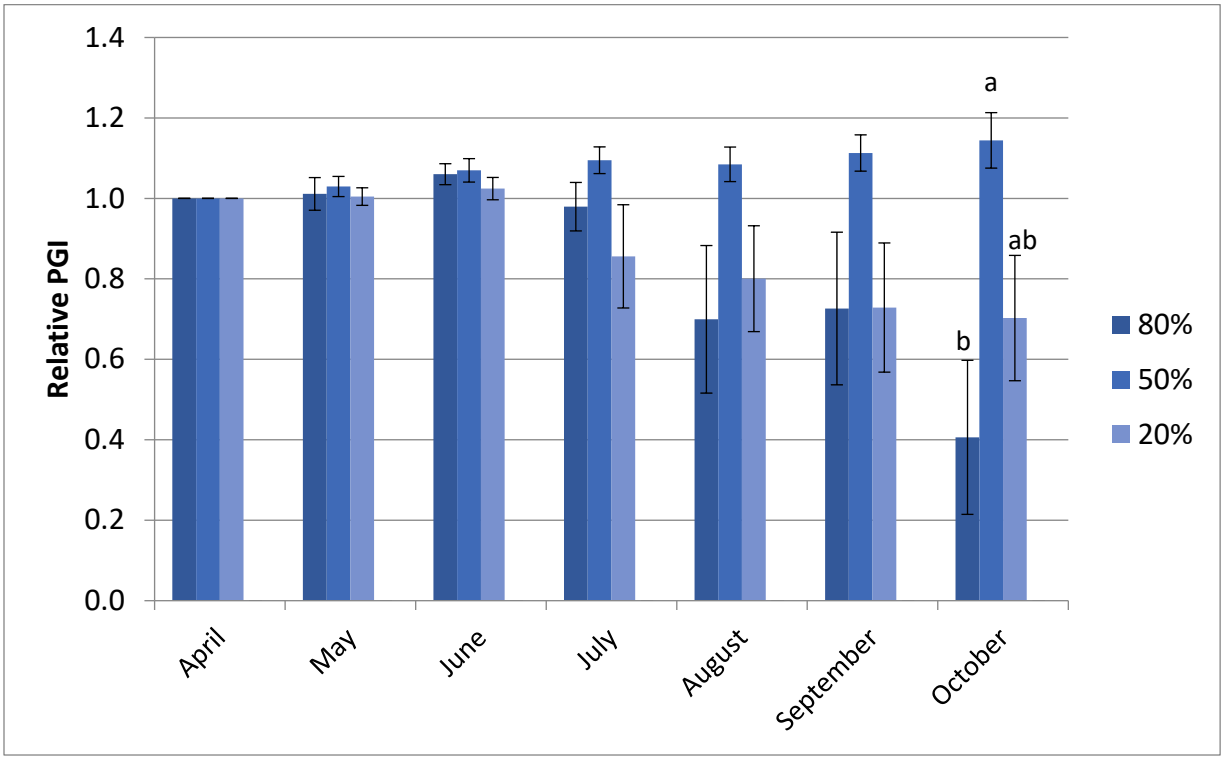

Figure 5d. *Nandina domestica* 'Zhnan28' Cool Glow™ Peach average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 13a. *Nandina domestica* 'Zhnan102' Cool Glow™ Lime average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.8	2.0	2.0	2.5	2.0	2.3	2.1	2.2
	50	1.9	2.0	2.0	2.1	2.3	2.5	2.6	2.2
	20	2.4	1.6	2.0	1.9	1.9	2.0	2.1	2.0
Foliage	80	3.0	2.0	2.0	2.5	2.0	2.3	2.0	2.3[a]
	50	1.8	2.0	2.0	2.0	2.4	2.5	2.5	2.2[ab]
	20	2.4	1.6	2.0	1.9	1.9	1.9	2.1	2.0[b]
Flower	80	0.1	0.0	0.0	0.8	0.0	0.0	0.0	0.1
	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	4.5	5.0	5.0	4.6	5.0	5.0	3.8	4.7
	50	4.4	5.0	5.0	4.6	5.0	5.0	5.0	4.9
	20	4.9	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	4.6	3.8	4.8
	50	4.4	5.0	5.0	5.0	5.0	5.0	5.0	4.9
	20	5.0	5.0	4.6	5.0	5.0	5.0	5.0	4.9
Vigor	80	3.4	2.1	2.6	3.1	2.4	2.3	2.1	2.6[a]
	50	2.0	2.4	2.4	2.6	2.6	2.5	2.5	2.4[ab]
	20	2.9	1.9	2.0	1.9	2.0	1.9	2.3	2.1[b]

Table 13b. *Nandina domestica* 'Zhnan102' Cool Glow™ Lime average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	2.9	2.9	2.8	2.5	1.9	1.5	1.4	2.3[a]
	50	2.9	3.4	3.3	3.2	2.8	2.7	2.8	3.0[b]
	20	2.9	3.1	2.9	2.5	2.4	1.8	2.0	2.5[a]
Foliage	80	2.8	3.1	3.0	2.3	1.8	1.4	1.1	2.2[a]
	50	2.9	3.4	3.3	2.9	2.8	2.9	2.6	3.0[b]
	20	2.8	3.3	3.0	2.6	2.4	1.9	2.1	2.6[c]
Flower	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50	0.1	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	4.3	5.0	4.9	5.0	5.0	5.0	4.3	4.8
	50	4.4	4.9	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
Disease Resistance	80	4.3	5.0	4.9	5.0	5.0	5.0	4.3	4.8
	50	4.4	4.9	5.0	5.0	5.0	5.0	5.0	4.9
	20	4.5	5.0	5.0	5.0	5.0	5.0	5.0	4.9
Vigor	80	3.2	3.9	3.7	3.1	2.4	1.6	1.4	2.8[a]
	50	3.2	4.5	4.4	3.5	4.1	3.0	3.5	3.8[b]
	20	3.2	4.1	3.7	2.9	3.0	2.1	2.6	3.1[a]

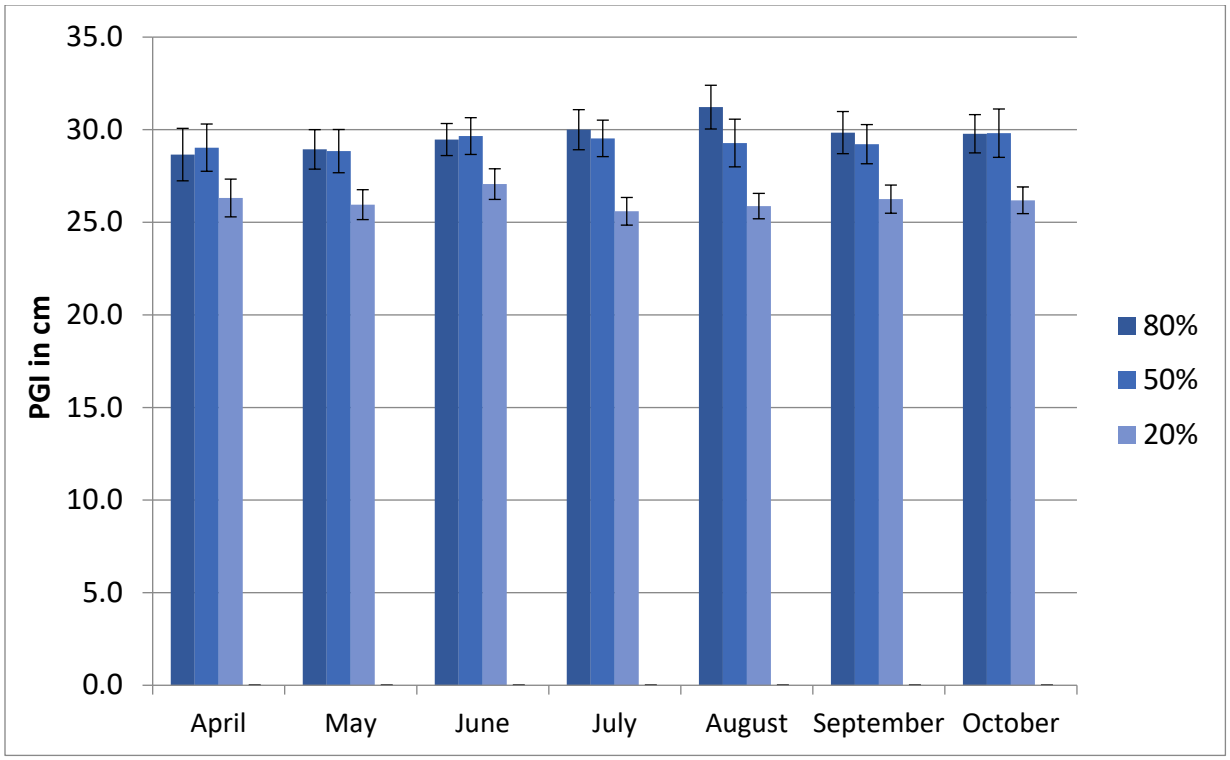

Figure 6a. *Nandina domestica* 'Zhnan102' Cool Glow™ Lime average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

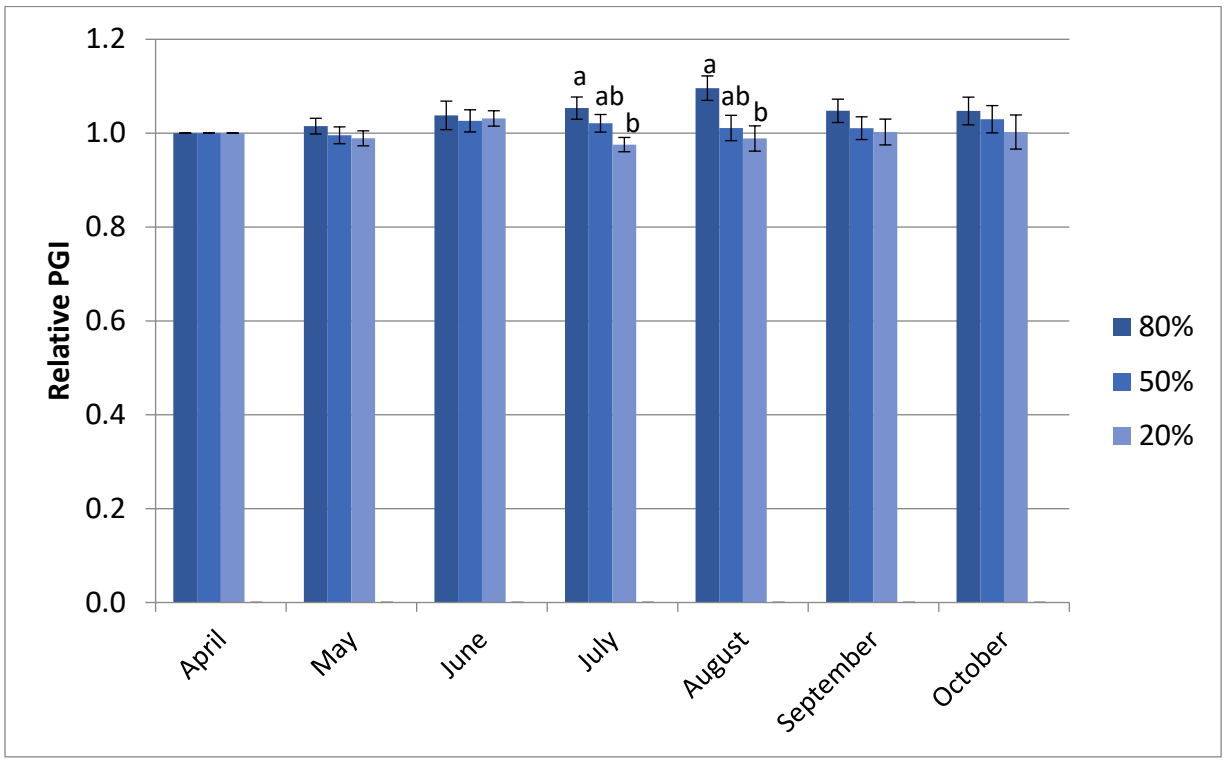

Figure 6b. *Nandina domestica* 'Zhnan102' Cool Glow™ Lime average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

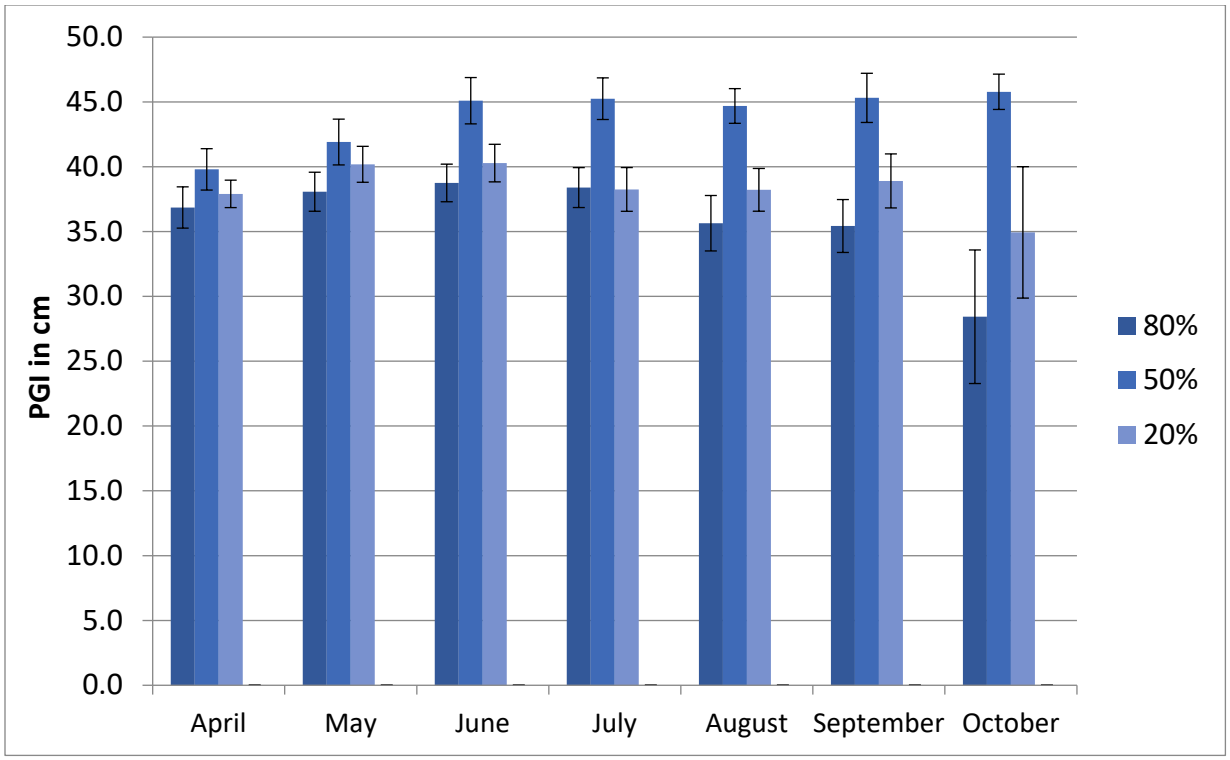

Figure 6c. *Nandina domestica* 'Zhnan102' Cool Glow™ Lime average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

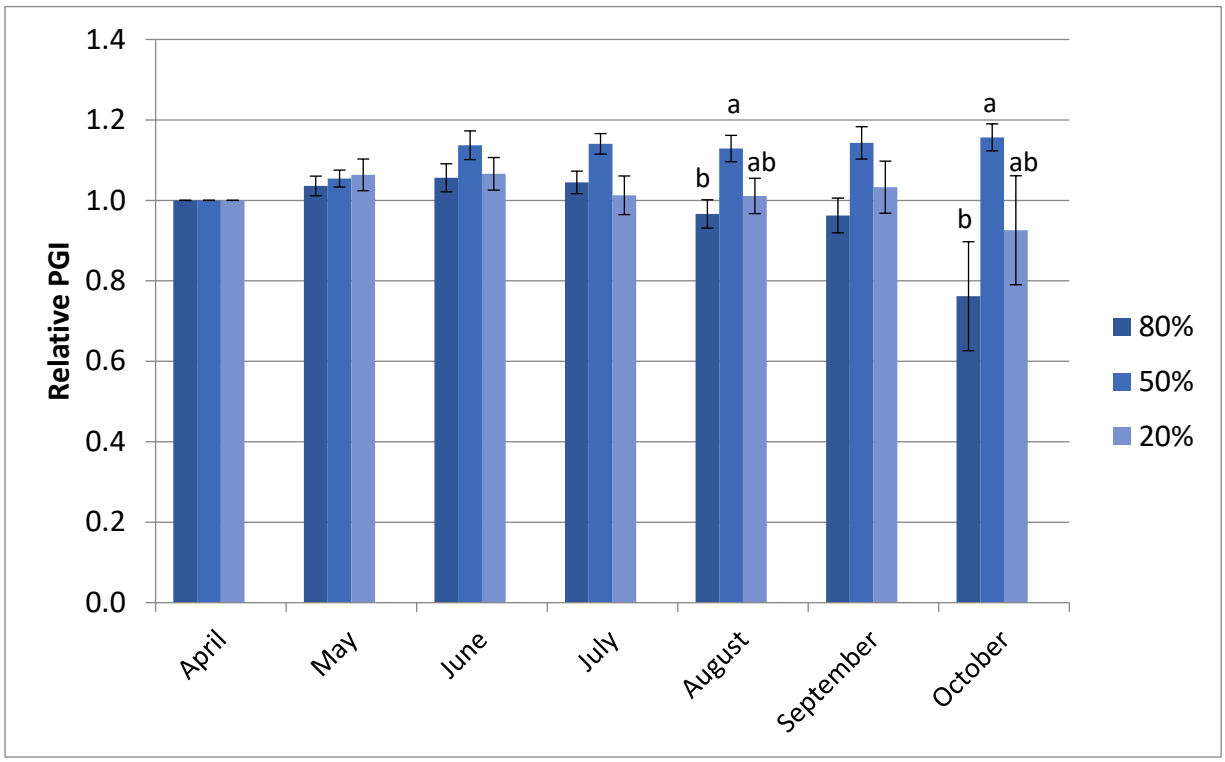

Figure 6d. *Nandina domestica* 'Zhnan102' Cool Glow™ Lime average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 14a. *Rosa* 'Meiswetdom' Sweet Drift® Lime average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.4	3.7	3.6	3.8	4.1	3.9	3.6	3.7
	50	3.6	3.9	3.9	4.1	4.3	4.0	3.7	3.9
	20	3.9	3.6	3.6	4.1	3.7	3.6	3.2	3.7
Foliage	80	3.6	3.5	3.7	3.4	3.4	3.5	3.8	3.6
	50	4.0	3.7	4.0	3.6	3.6	3.4	3.4	3.7
	20	4.6	3.7	3.4	3.4	3.1	3.1	3.0	3.5
Flower	80	0.1	3.4	1.3	2.6	3.3	1.9	1.3	2.0
	50	0.0	3.0	1.3	3.1	3.1	2.4	1.7	2.1
	20	0.0	3.1	1.6	3.1	2.7	1.9	1.4	2.0
Pest Resistance	80	4.3	3.8	3.9	4.1	3.6	3.8	4.1	3.9
	50	4.0	3.9	4.1	4.0	3.7	3.9	4.0	3.9
	20	4.6	3.6	4.1	3.9	3.7	3.3	3.7	3.8
Disease Resistance	80	4.9	4.4	4.3	5.0	5.0	5.0	5.0	4.8
	50	4.9	4.3	4.1	5.0	5.0	5.0	5.0	4.8
	20	4.9	4.6	4.3	5.0	5.0	5.0	5.0	4.8
Vigor	80	4.1	4.8	4.9	4.5	4.9	4.5	4.6	4.6
	50	5.0	5.0	4.9	4.9	4.9	4.7	4.7	4.9
	20	5.0	4.9	5.0	4.4	4.9	4.3	4.3	4.7

Table 14b. *Rosa* 'Meiswetdom' Sweet Drift® Lime average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.4	3.4	3.2	3.6	2.7	3.6	3.2	3.3
	50	3.4	3.2	3.1	3.3	2.9	3.4	3.2	3.2
	20	3.6	3.2	3.3	3.1	2.7	3.6	3.2	3.2
Foliage	80	3.5	3.5	3.1	3.0	2.9	3.1	3.1	3.2
	50	3.4	3.3	3.1	2.9	2.6	3.1	3.1	3.1
	20	3.5	3.2	3.1	2.9	2.6	3.0	3.1	3.1
Flower	80	0.8	1.4	1.9	3.0	1.6	3.1	1.5	1.9
	50	0.7	1.8	2.3	3.5	1.1	2.9	1.3	1.9
	20	0.8	1.5	2.5	2.8	1.3	3.3	1.1	1.9
Pest Resistance	80	4.5	3.6	3.1	3.3	2.9	3.3	3.0	3.4
	50	4.3	3.5	3.1	3.0	2.9	3.0	3.0	3.3
	20	4.4	3.4	3.1	2.6	2.9	3.3	3.0	3.2
Disease Resistance	80	4.5	3.6	3.1	3.0	2.4	3.1	3.6	3.3
	50	4.3	3.5	3.1	2.8	2.4	3.4	3.6	3.3
	20	4.4	3.4	3.1	3.0	2.4	3.3	3.5	3.3
Vigor	80	3.6	5.0	4.8	4.9	4.8	5.0	4.9	4.7
	50	3.7	4.9	4.9	4.6	4.9	4.9	5.0	4.7
	20	3.8	5.0	4.9	4.8	4.9	5.0	4.9	4.7

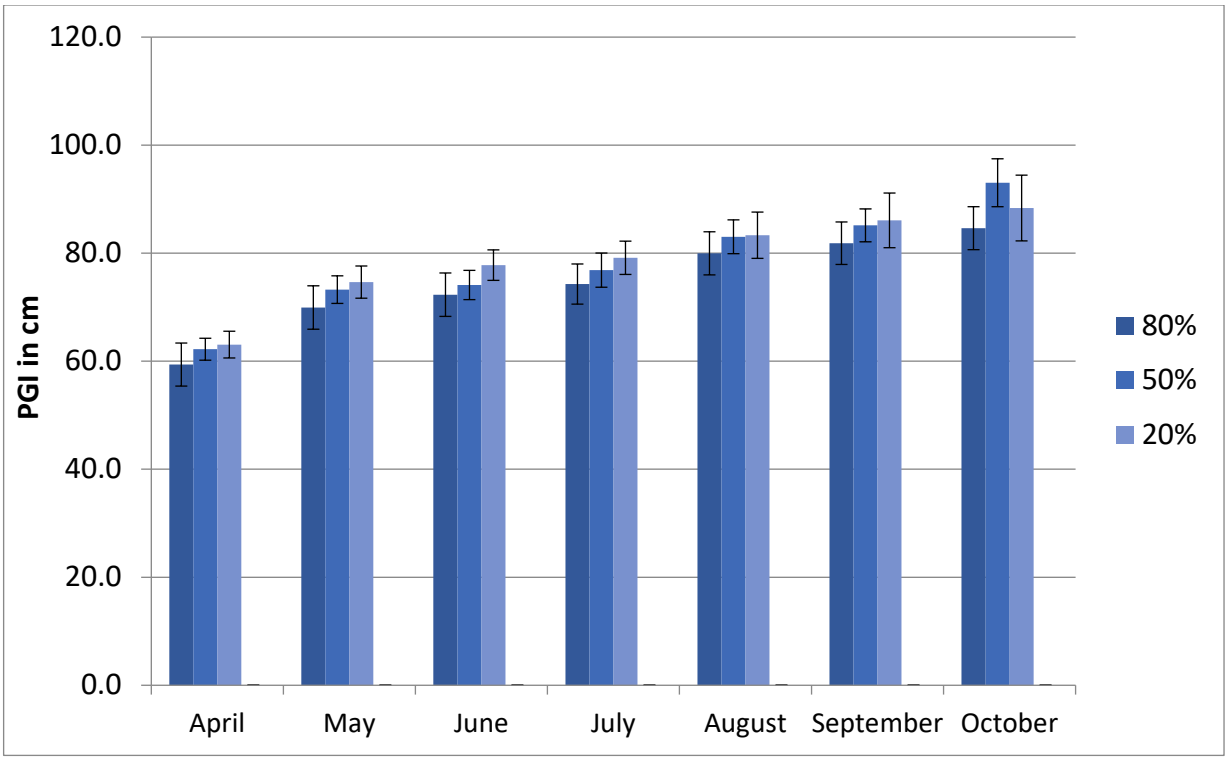

Figure 7a. *Rosa* 'Meiswetdom' Sweet Drift® average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

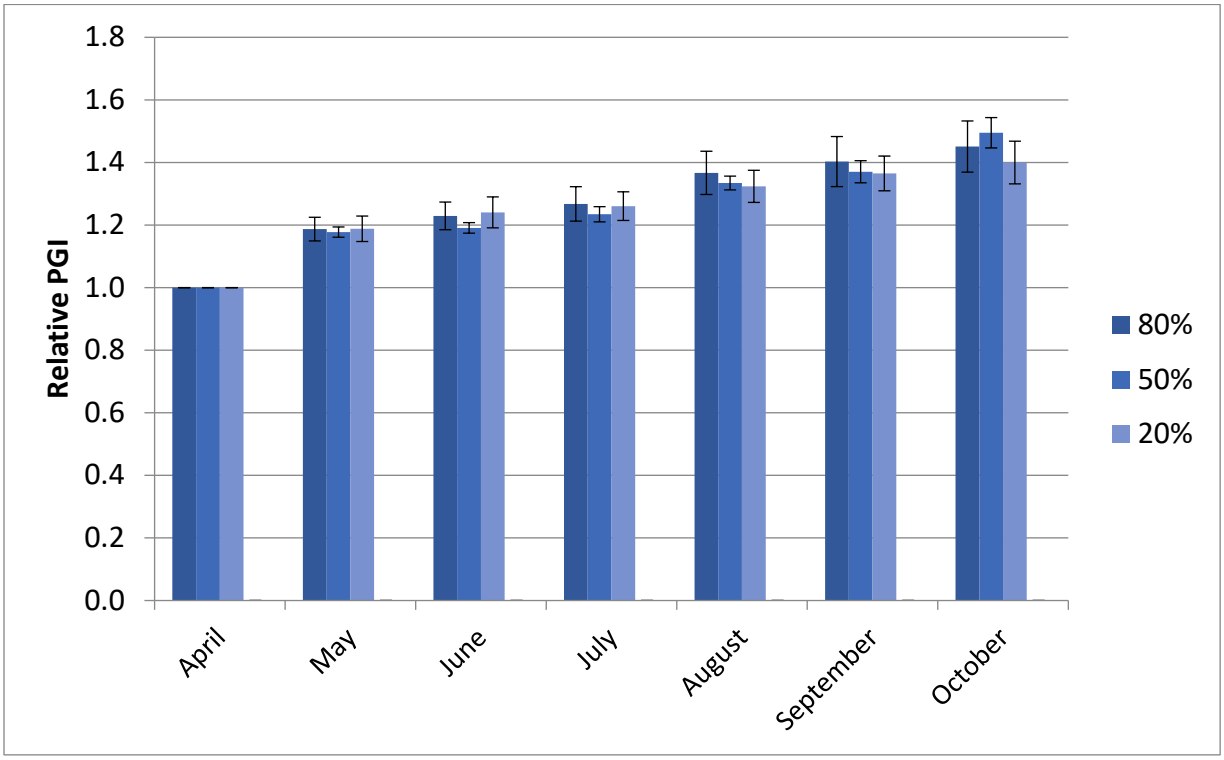

Figure 7b. *Rosa* 'Meiswetdom' Sweet Drift® average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

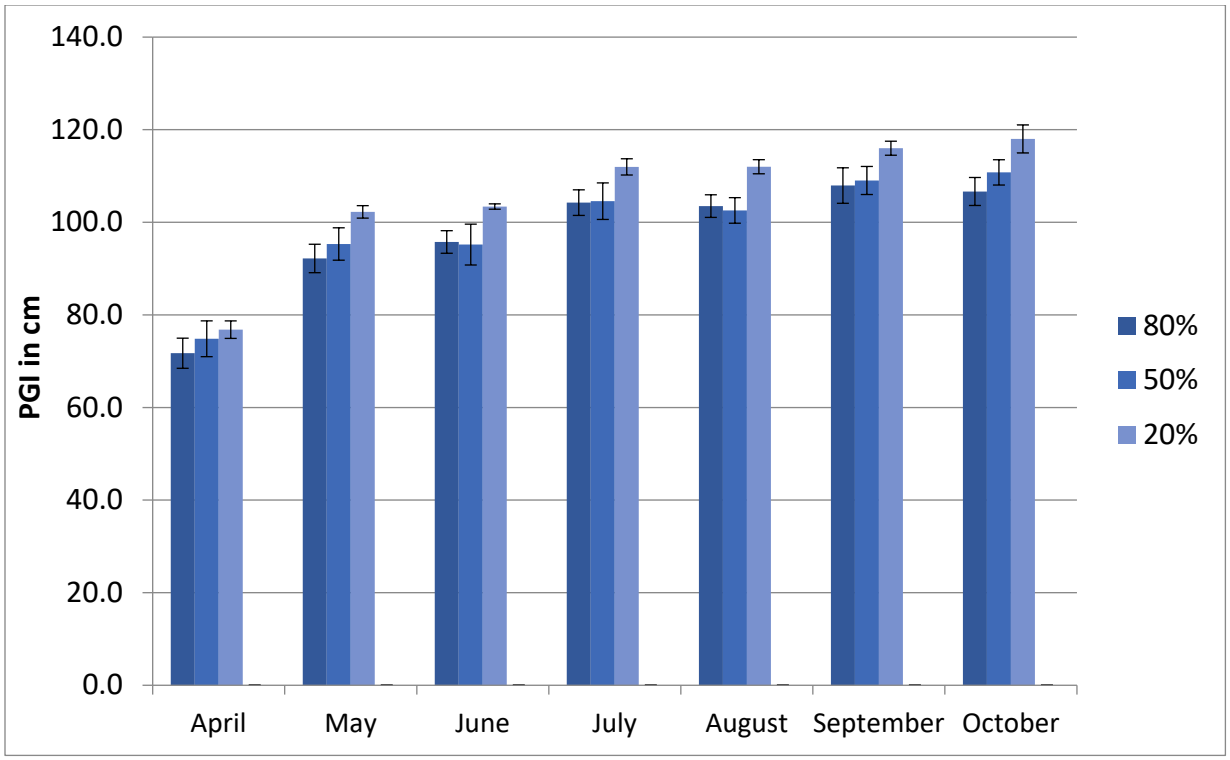

Figure 7c. *Rosa* 'Meiswetdom' Sweet Drift® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

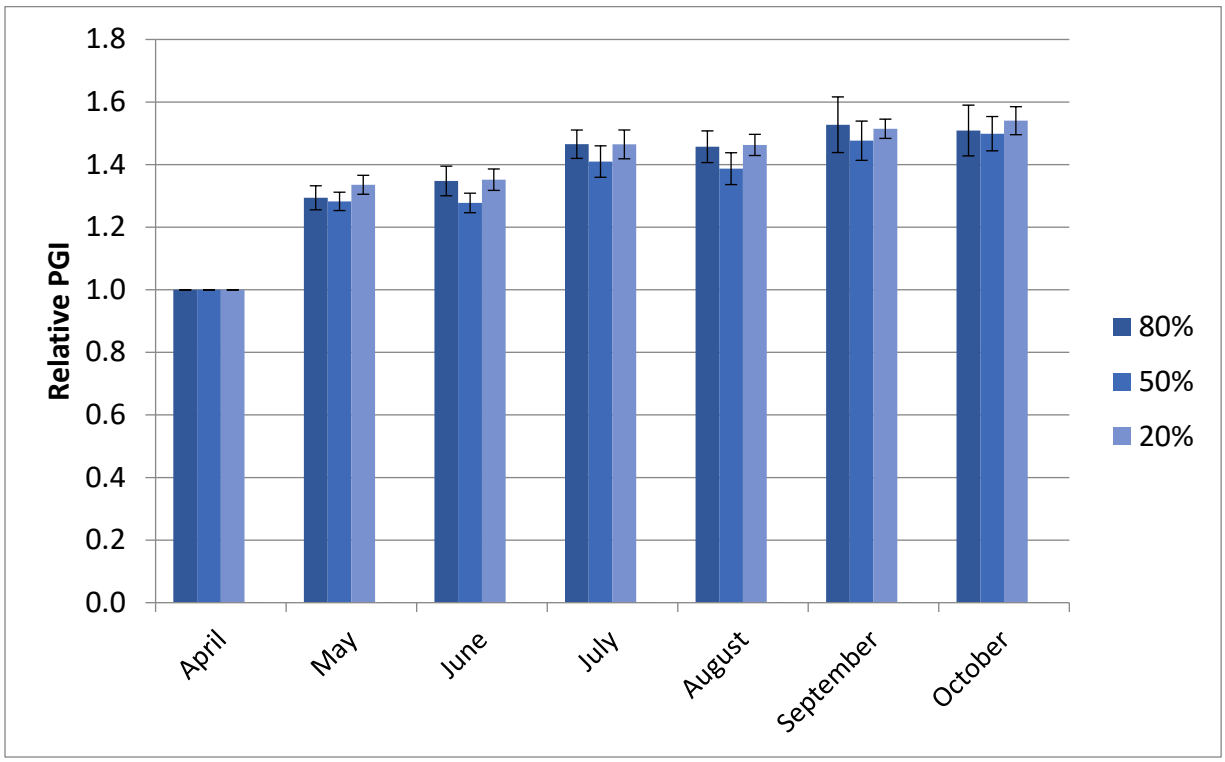

Figure 7d. *Rosa* 'Meiswetdom' Sweet Drift® average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 15a. *Rosa* 'Radtkopink' Pink Double Knock Out® average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.7	3.3	3.9	3.8	4.1	3.7	3.0	3.6
	50	3.9	3.4	3.8	3.9	4.1	3.6	3.0	3.7
	20	3.5	3.1	4.1	3.6	3.4	3.3	2.9	3.4
Foliage	80	3.9	2.3	3.8	4.5	4.1	3.8	2.6	3.6
	50	4.3	2.4	3.6	4.3	4.1	3.5	2.6	3.5
	20	3.9	2.7	3.5	4.0	3.3	3.1	2.5	3.3
Flower	80	0.5	1.8	1.6	1.8	2.8	1.9	1.1	1.6
	50	0.4	2.5	1.6	1.8	2.4	1.5	0.8	1.6
	20	0.1	1.4	2.8	1.5	1.9	1.3	1.0	1.4
Pest Resistance	80	4.4	3.4	4.8	4.9	4.8	4.5	3.9	4.4
	50	4.5	3.5	4.9	4.9	4.9	4.1	3.6	4.3
	20	4.6	3.9	4.9	4.8	4.8	4.4	3.9	4.4
Disease Resistance	80	4.0	2.4	3.8	4.5	4.1	3.9	3.0	3.7
	50	4.5	2.3	3.6	4.4	4.3	3.8	3.4	3.7
	20	4.5	2.8	3.5	4.0	3.4	3.5	2.8	3.5
Vigor	80	4.4	4.3	4.8	4.9	4.6	4.6	3.6	4.4
	50	4.6	4.5	5.0	4.6	4.6	4.3	3.4	4.4
	20	4.1	4.3	4.8	4.5	3.9	4.3	3.3	4.1

Table 15b. *Rosa* 'Radtkopink' Pink Double Knock Out® average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.5	3.4	3.5	2.7	2.0	2.1	2.1	2.8
	50	3.6	3.4	3.6	2.6	1.9	2.4	2.0	2.8
	20	3.3	3.6	3.3	2.5	2.1	2.4	1.8	2.7
Foliage	80	3.3	3.4	3.5	2.1	1.8	2.0	2.1	2.6
	50	3.5	3.4	3.5	2.1	1.8	2.0	1.9	2.6
	20	3.3	3.8	3.0	2.0	2.0	2.0	1.3	2.5
Flower	80	1.0	1.1	3.1	1.4	1.1	1.1	1.1	1.4
	50	0.5	1.1	3.8	2.1	1.8	1.5	1.3	1.7
	20	0.6	1.0	3.3	1.5	1.5	1.2	1.5	1.5
Pest Resistance	80	4.2	3.7	3.1	2.4	2.4	2.4	2.1	2.9
	50	4.5	3.4	3.2	2.3	2.3	2.3	2.3	2.9
	20	4.4	3.8	2.9	2.2	2.8	2.3	2.2	2.9
Disease Resistance	80	4.2	3.7	3.1	2.2	2.1	2.1	2.0	2.8
	50	4.5	3.4	3.2	2.0	2.0	2.3	2.0	2.8
	20	4.4	3.8	2.9	2.2	2.0	2.3	2.0	2.8
Vigor	80	4.1	5.0	5.0	4.4	4.4	4.3	4.3	4.5[a]
	50	4.0	5.0	5.0	4.4	4.6	4.5	4.8	4.6[a]
	20	3.9	5.0	4.7	3.8	4.3	3.8	3.7	4.2[b]

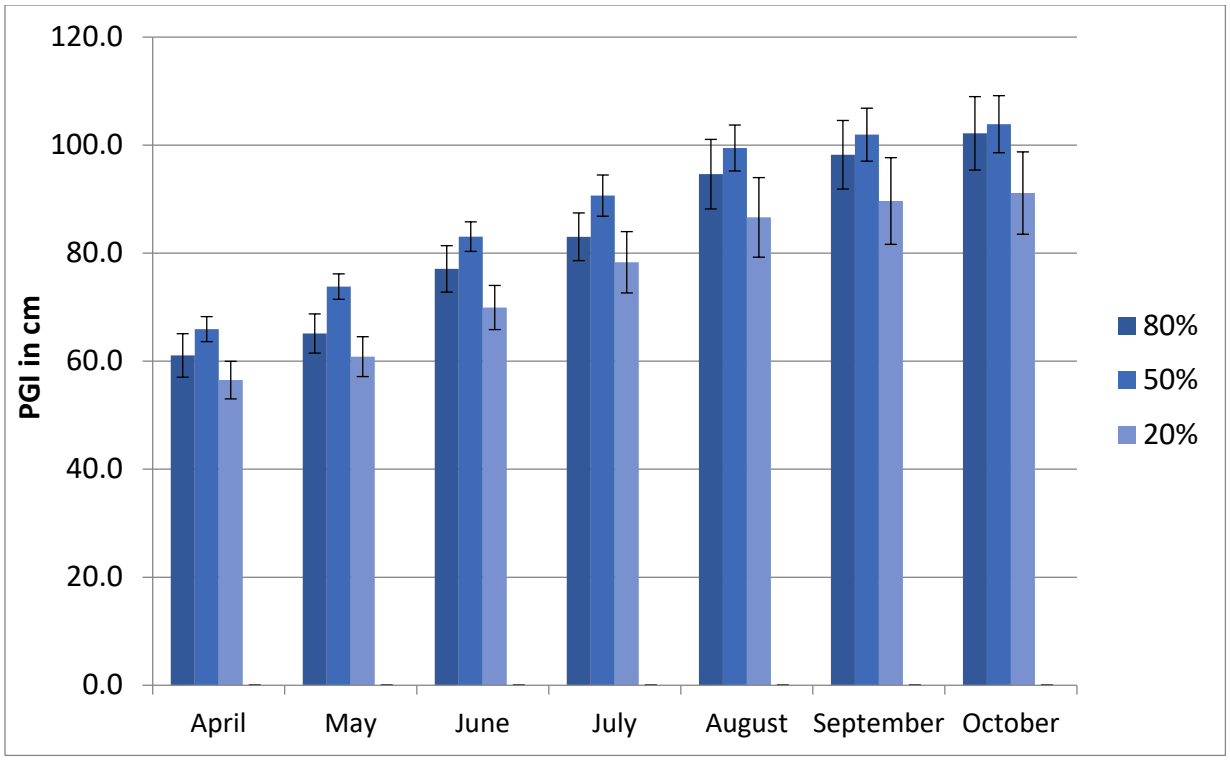

Figure 8a. *Rosa* 'Radtkopink' Pink Double Knock Out® average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

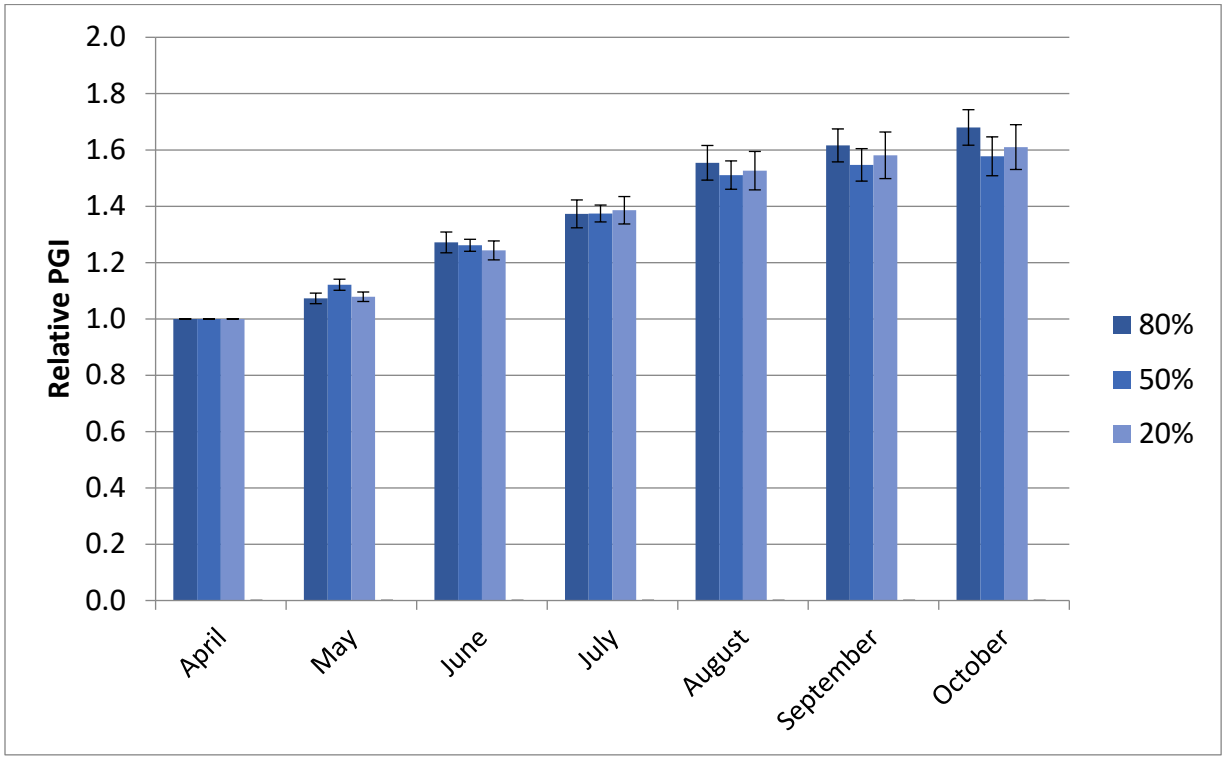

Figure 8b. *×Pyracomeles* 'NCXP1' Juke Box® average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2020.

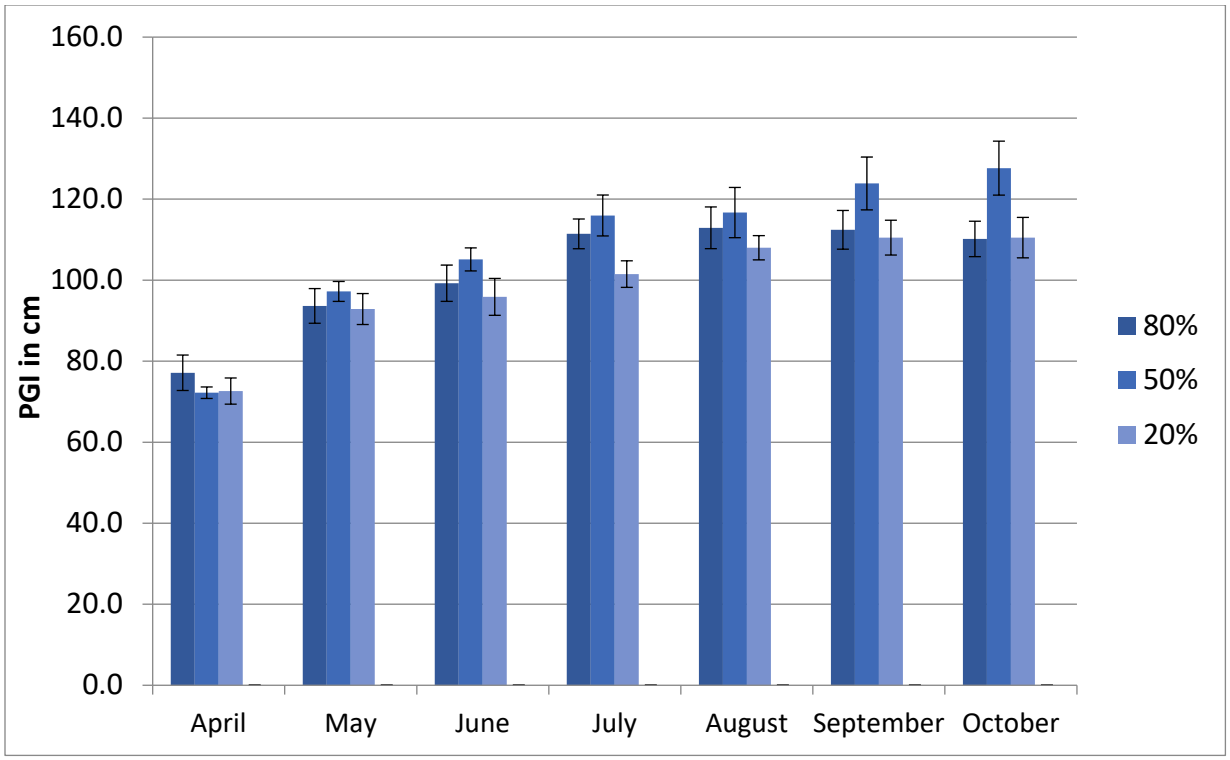

Figure 8c. *Rosa* 'Radtkopink' Pink Double Knock Out® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

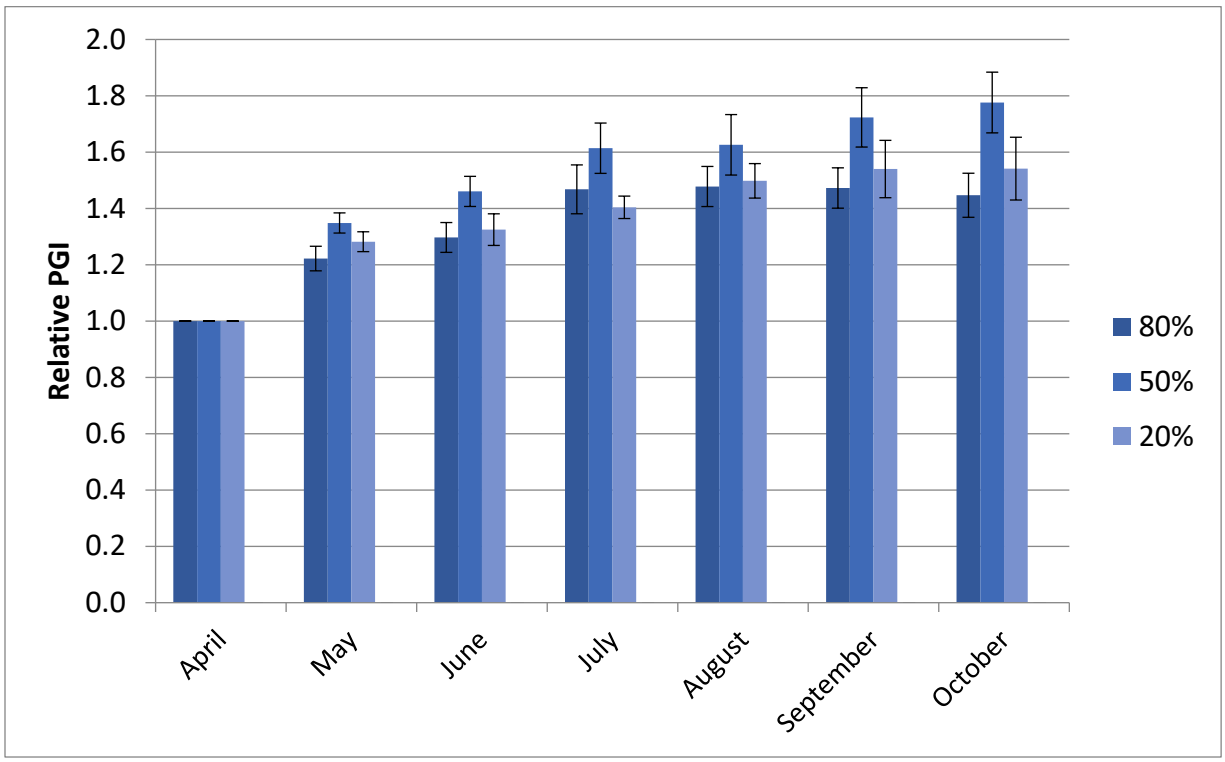

Figure 8d. *Rosa* 'Radtkopink' Pink Double Knock Out® average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo based irrigation levels in 2021.

Table 16a. *Rosa* 'Sprogreatpink' Pink Brick House® average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.6	4.1	4.2	3.9	3.8	4.0	3.5	3.9
	50	3.7	4.2	4.1	3.8	4.1	3.9	3.9	4.0
	20	3.4	4.1	4.3	4.1	4.1	3.9	3.8	4.0
Foliage	80	4.0	4.1	5.0	4.6	4.6	4.3	3.9	4.4
	50	4.0	4.6	4.8	4.8	4.9	4.5	3.8	4.5
	20	3.9	4.5	5.0	5.0	4.9	4.3	4.1	4.5
Flower	80	0.0	3.3	2.0	1.5	1.5	1.6	1.1	1.6
	50	0.5	3.1	2.0	1.3	2.0	1.6	2.0	1.8
	20	0.1	3.1	2.5	1.4	2.1	2.0	1.1	1.8
Pest Resistance	80	4.4	4.3	5.0	4.6	4.6	4.3	4.1	4.5
	50	4.4	4.6	4.8	5.0	4.9	4.5	4.1	4.6
	20	4.5	4.6	5.0	5.0	4.8	4.4	4.6	4.7
Disease Resistance	80	4.9	4.6	5.0	5.0	5.0	5.0	5.0	4.9
	50	4.8	4.9	4.9	5.0	5.0	5.0	5.0	4.9
	20	4.9	4.6	5.0	5.0	5.0	5.0	5.0	4.9
Vigor	80	4.8	4.9	5.0	4.6	4.9	4.3	4.1	4.6
	50	4.5	4.9	4.9	4.6	4.5	4.3	4.4	4.6
	20	4.6	4.8	5.0	4.8	4.8	4.3	4.5	4.7

Table 16b. *Rosa* 'Sprogreatpink' Pink Brick House® average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.4	2.9	2.9	2.8	2.6	2.9	2.7	2.9
	50	3.4	2.9	3.1	2.7	2.6	3.0	3.1	3.0
	20	3.2	3.1	2.9	2.7	2.3	2.9	3.1	2.9
Foliage	80	3.4	2.9	2.9	2.6	2.3	2.6	2.6	2.7
	50	3.4	2.9	3.1	2.3	2.3	2.5	2.9	2.8
	20	3.2	3.1	2.9	2.3	2.1	2.7	2.8	2.7
Flower	80	1.4	2.0	2.9	1.3	1.0	1.7	1.6	1.7
	50	1.5	2.1	2.9	1.9	1.3	2.0	1.3	1.8
	20	1.2	2.4	2.6	1.6	1.4	1.3	1.4	1.7
Pest Resistance	80	4.1	2.4	2.7	2.7	3.1	2.9	2.9	3.0
	50	4.1	2.9	2.9	2.4	3.1	2.6	2.7	2.9
	20	3.8	3.0	2.7	3.1	3.0	3.0	3.0	3.1
Disease Resistance	80	4.1	2.4	2.7	2.6	2.1	2.6	2.9	2.8
	50	4.1	2.9	2.9	2.6	2.3	2.6	3.1	2.9
	20	3.8	3.0	2.7	2.9	2.3	2.5	3.3	2.9
Vigor	80	3.4	4.9	4.6	4.1	4.6	4.3	4.1	4.3
	50	3.4	4.7	4.7	4.3	4.7	4.6	4.7	4.4
	20	3.4	4.5	4.8	4.4	4.5	4.0	4.8	4.3

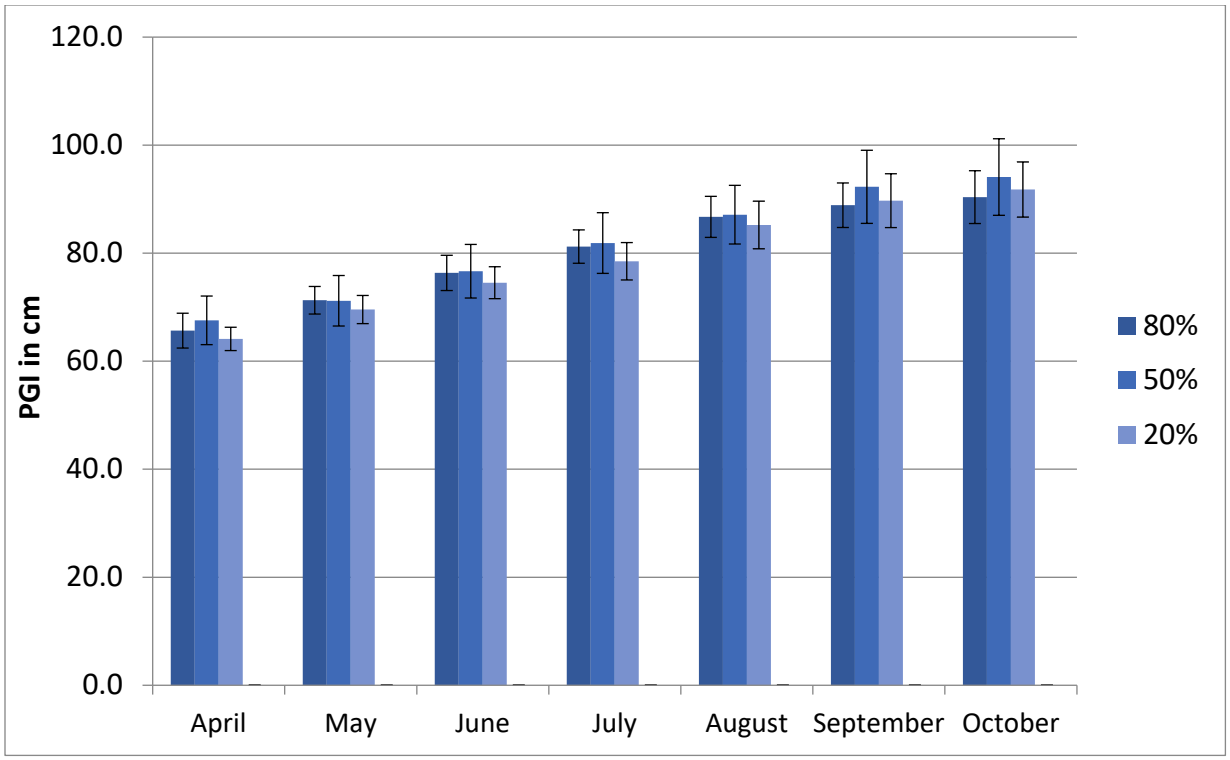

Figure 9a. *Rosa* 'Sprogreatpink' Pink Brick House® average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

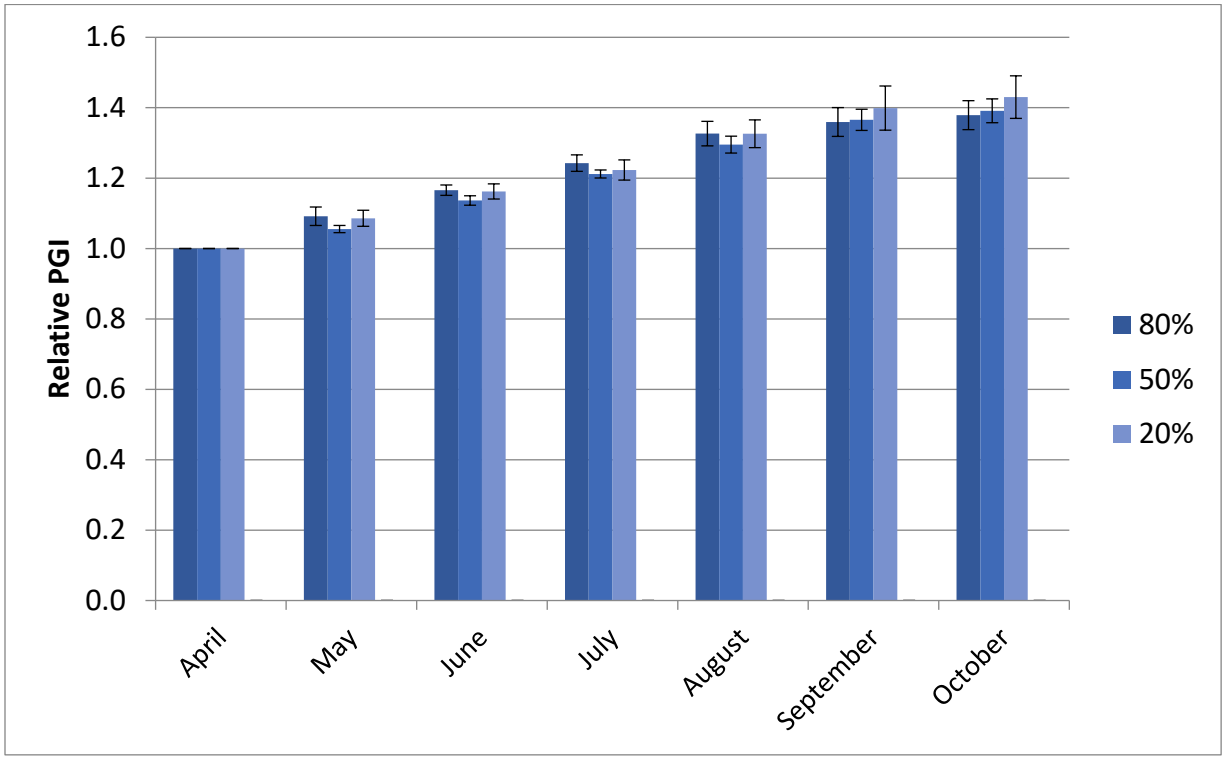

Figure 9b. *Rosa* 'Sprogreatpink' Pink Brick House® average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

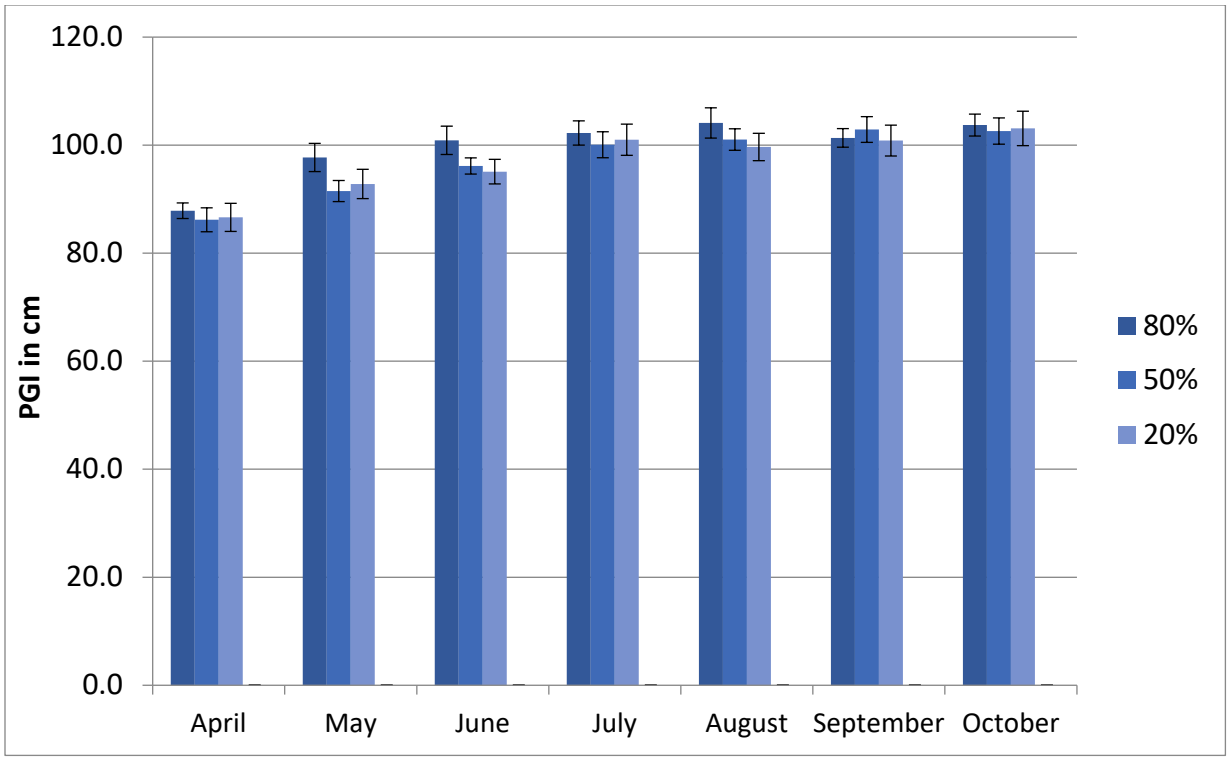

Figure 9c. *Rosa* 'Sprogreatpink' Pink Brick House® average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

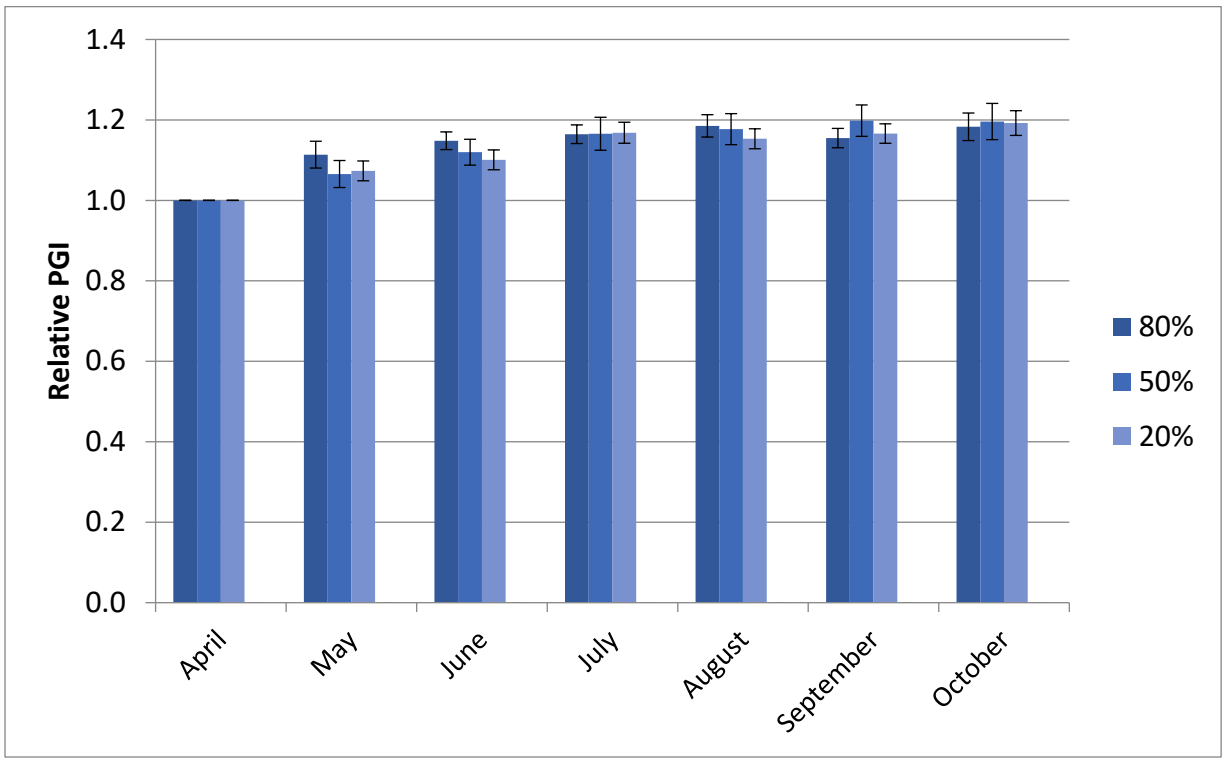

Figure 9d. *Rosa* 'Sprogreatpink' Pink Brick House® average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 17a. *Rosa* 'Zlepolone' Pretty Polly® Pink average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.1	4.0	3.8	4.2	3.5	3.7	2.8	3.6[a]
	50	3.8	4.1	3.8	4.4	3.6	4.0	2.8	3.8[ab]
	20	3.6	4.4	4.2	4.5	3.9	4.2	3.1	4.0[b]
Foliage	80	3.9	3.4	4.1	3.6	3.3	3.0	2.4	3.4
	50	4.4	3.5	3.9	3.8	2.9	3.1	2.5	3.4
	20	4.1	3.5	4.0	4.0	3.9	3.4	3.0	3.7
Flower	80	0.0	2.6	1.1	3.3	0.7	3.1	1.0	1.7
	50	0.1	3.3	1.1	3.6	0.9	3.0	0.9	1.8
	20	0.0	3.1	1.9	3.9	1.1	3.1	1.0	2.0
Pest Resistance	80	4.9	3.6	4.6	4.0	4.0	3.7	3.4	4.0
	50	4.5	3.8	3.9	4.3	3.9	3.6	3.3	3.9
	20	4.5	3.8	4.1	4.0	3.9	3.6	3.5	3.9
Disease Resistance	80	5.0	3.9	4.3	5.0	4.9	5.0	4.9	4.7
	50	5.0	4.0	4.4	5.0	5.0	5.0	4.9	4.8
	20	5.0	4.3	4.4	5.0	5.0	5.0	5.0	4.8
Vigor	80	4.0	5.0	4.6	4.6	4.3	3.9	3.3	4.2[a]
	50	4.9	5.0	4.5	4.6	4.5	4.4	3.4	4.5[ab]
	20	4.6	5.0	4.8	4.8	4.9	4.5	3.8	4.6[b]

Table 17b. *Rosa* 'Zlepolone' Pretty Polly® Pink average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.6	3.5	5.0	4.0	4.0	3.6	3.6	3.9
	50	3.3	3.6	5.0	3.9	3.8	3.6	3.6	3.8
	20	3.4	3.6	4.9	3.9	3.7	3.3	3.1	3.7
Foliage	80	3.5	5.0	4.3	4.1	3.5	3.6	3.1	3.9
	50	3.2	5.0	4.2	4.0	3.5	3.6	3.1	3.8
	20	3.3	5.0	4.3	3.8	3.3	3.3	3.0	3.7
Flower	80	0.4	1.1	5.0	0.6	2.7	1.1	2.1	1.9
	50	0.1	1.1	5.0	0.5	2.6	1.0	2.1	1.8
	20	0.2	1.0	5.0	0.7	1.8	1.0	1.3	1.6
Pest Resistance	80	4.5	5.0	4.0	4.4	3.1	3.7	3.1	4.0
	50	4.5	5.0	4.1	4.3	3.3	3.3	3.1	3.9
	20	4.5	5.0	4.0	4.3	3.3	3.8	3.3	4.0
Disease Resistance	80	4.5	5.0	4.0	4.4	4.0	4.1	4.0	4.3
	50	4.5	5.0	4.1	4.3	3.9	3.9	3.8	4.2
	20	4.5	5.0	4.0	4.5	3.5	3.8	4.0	4.2
Vigor	80	4.0	5.0	5.0	5.0	5.0	4.9	4.9	4.8
	50	4.0	5.0	5.0	4.8	5.0	5.0	4.9	4.8
	20	4.2	5.0	5.0	5.0	5.0	4.5	4.0	4.7

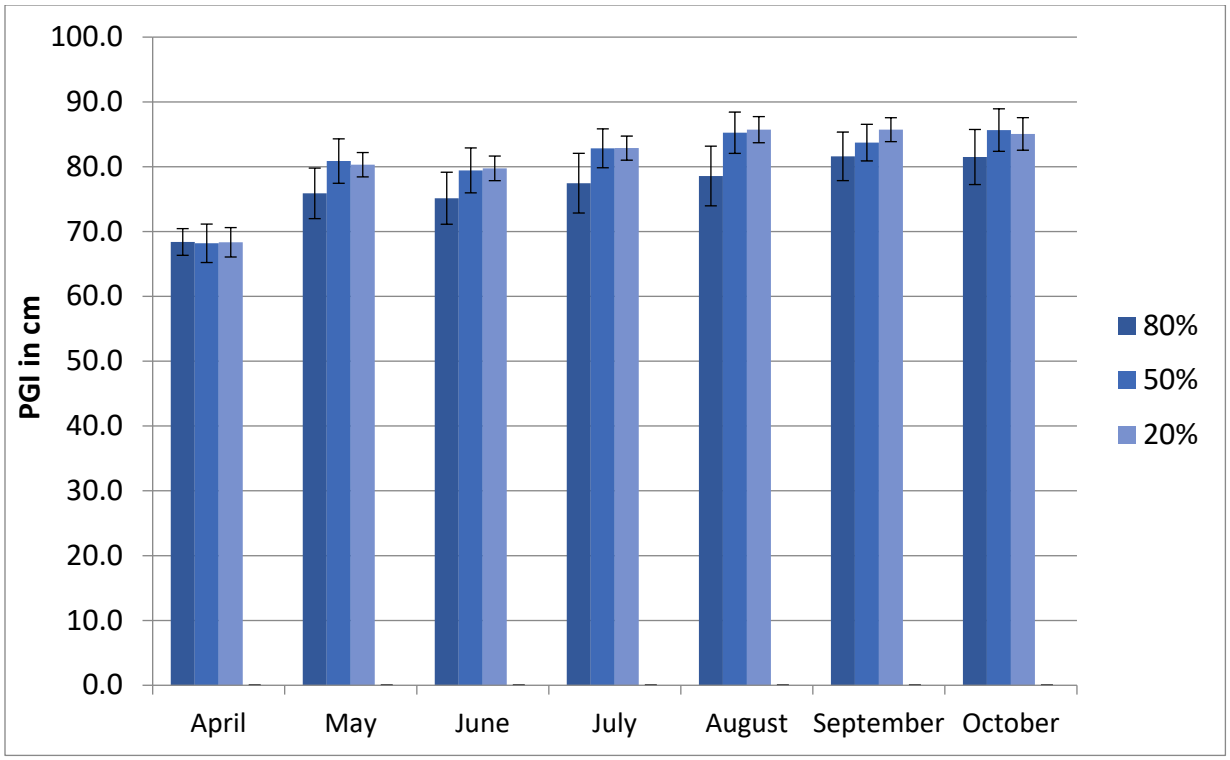

Figure 10a. *Rosa* 'Zlepolone' Pretty Polly® Pink average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

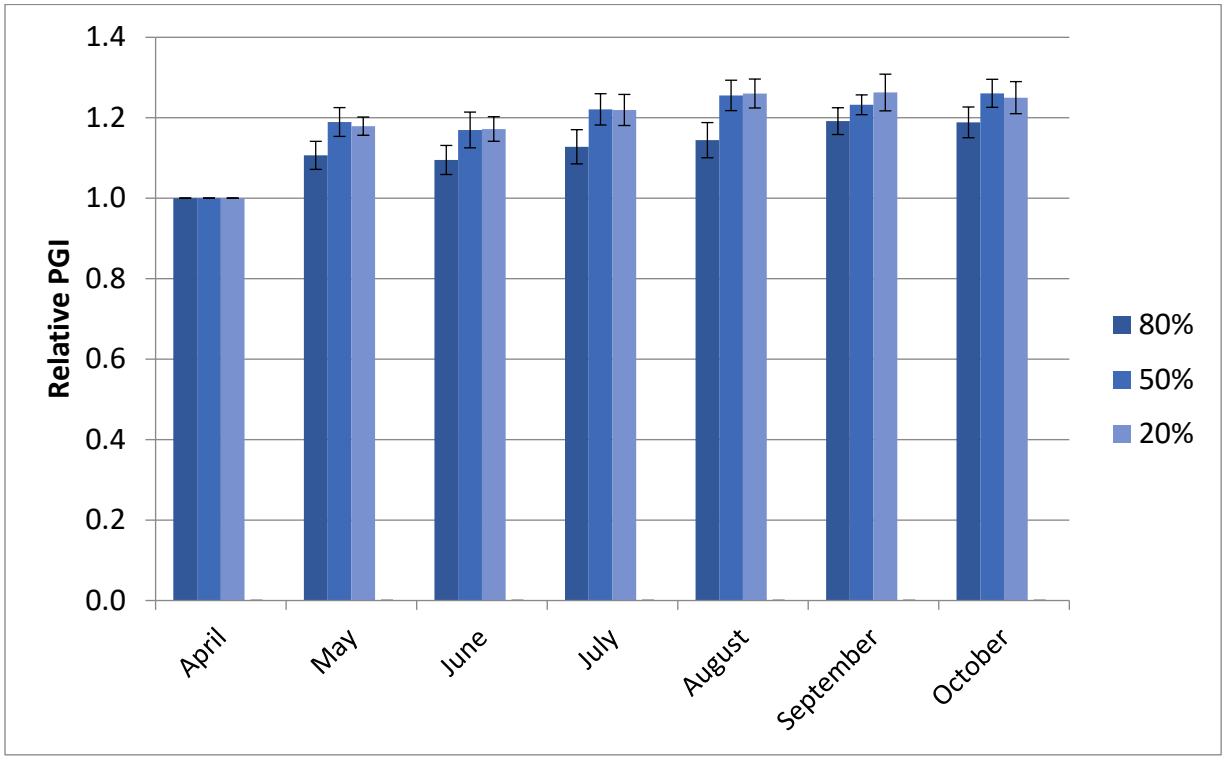

Figure 10b. *Rosa* 'Zlepolone' Pretty Polly® Pink average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

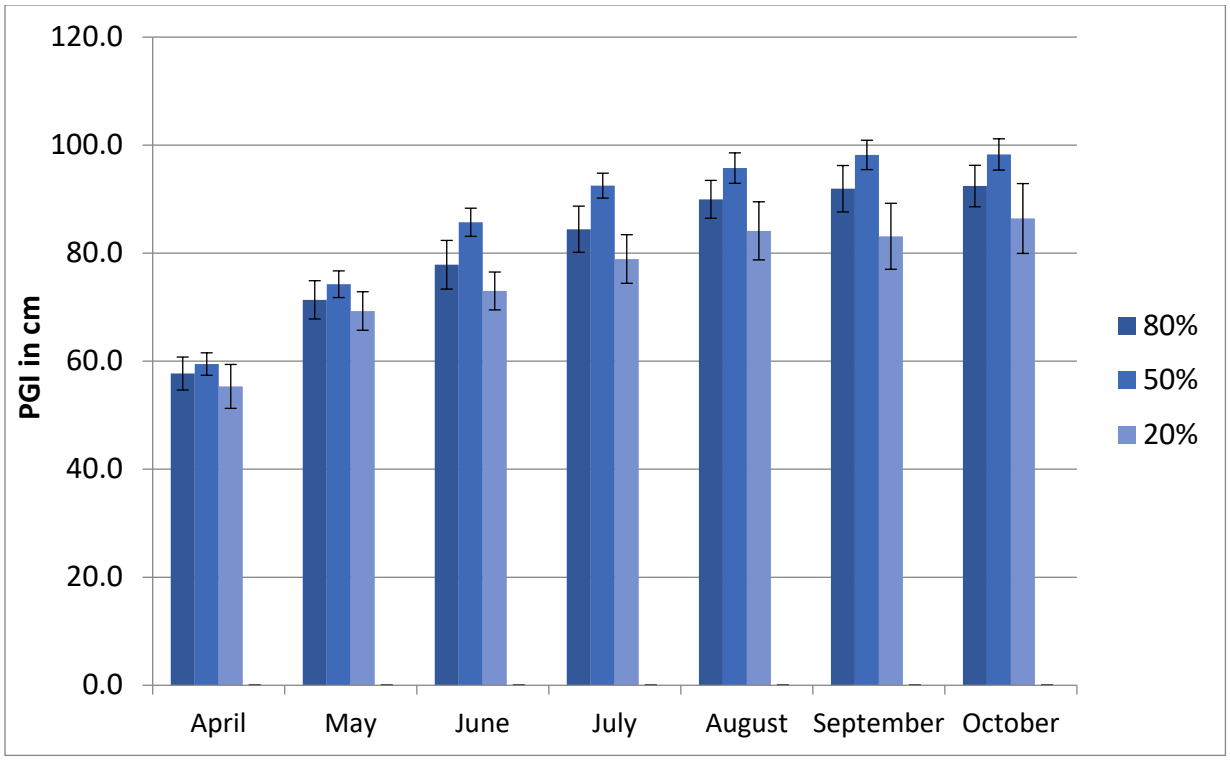

Figure 10c. *Rosa* 'Zlepolone' Pretty Polly® Pink average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

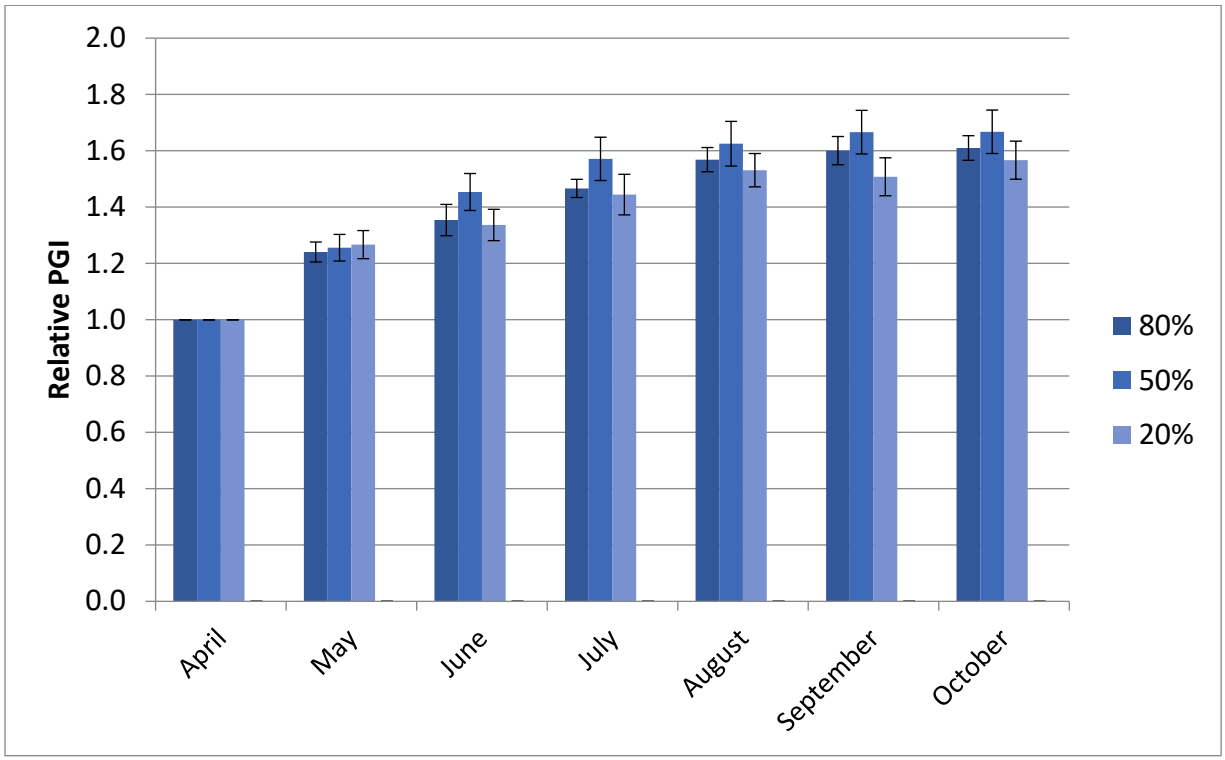

Figure 10d. *Rosa* 'Zlepolone' Pretty Polly® Pink average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 18a. *Rosa* 'Zlepoltwo' Pretty Polly® White average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.6	4.3	3.9	3.9	3.9	3.4	3.0	3.7[a]
	50	3.9	4.1	4.3	4.3	3.7	3.8	3.3	3.9[ab]
	20	3.6	4.5	4.5	4.3	4.3	4.1	3.6	4.1[b]
Foliage	80	4.6	4.6	4.4	3.6	2.8	2.6	2.8	3.6
	50	4.6	4.7	4.7	4.3	3.3	3.4	3.0	4.0
	20	4.4	4.6	4.5	4.0	3.6	3.5	3.5	4.0
Flower	80	0.0	2.9	1.5	2.5	2.3	1.4	1.0	1.6
	50	0.4	3.0	1.6	3.0	2.0	1.6	1.1	1.8
	20	0.0	3.0	2.9	2.9	2.5	2.5	1.0	2.1
Pest Resistance	80	4.6	4.6	4.5	3.8	3.3	3.4	3.5	3.9
	50	4.6	4.7	4.9	4.4	3.9	3.9	3.9	4.3
	20	4.8	4.9	4.6	4.0	3.9	3.8	3.6	4.2
Disease Resistance	80	5.0	4.8	4.9	5.0	5.0	5.0	5.0	4.9
	50	5.0	4.9	4.7	5.0	5.0	5.0	5.0	4.9
	20	5.0	4.8	4.8	5.0	4.9	5.0	5.0	4.9
Vigor	80	5.0	5.0	4.5	4.5	4.3	4.4	4.0	4.5
	50	4.9	5.0	5.0	4.9	4.7	4.3	4.1	4.7
	20	4.6	5.0	5.0	5.0	4.8	4.6	4.4	4.8

Table 18b. *Rosa* 'Zlepoltwo' Pretty Polly® White average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.5	3.4	4.0	3.9	3.5	3.5	2.9	3.5
	50	3.4	3.5	4.0	3.8	3.4	3.8	2.9	3.5
	20	3.4	3.5	4.1	3.7	3.3	3.2	2.9	3.5
Foliage	80	3.6	5.0	4.8	3.6	3.1	2.9	2.7	3.7
	50	3.3	5.0	4.6	3.6	3.1	3.3	2.7	3.7
	20	3.6	5.0	4.7	3.9	3.2	3.0	2.6	3.7
Flower	80	0.3	0.9	1.4	2.5	1.8	1.8	1.0	1.4
	50	0.1	1.1	1.5	3.4	2.0	1.8	1.5	1.6
	20	0.3	1.3	1.7	2.6	2.3	1.6	1.4	1.6
Pest Resistance	80	4.5	5.0	4.6	4.0	3.0	2.9	2.5	3.8
	50	4.5	5.0	4.5	3.9	2.9	3.3	2.6	3.8
	20	4.5	5.0	4.8	4.3	2.7	2.9	2.3	3.8
Disease Resistance	80	4.5	5.0	4.6	3.9	3.9	3.5	3.8	4.2
	50	4.5	5.0	4.5	4.0	3.5	4.0	3.6	4.2
	20	4.5	5.0	4.8	4.4	3.7	3.7	3.4	4.2
Vigor	80	4.1	5.0	5.0	5.0	5.0	4.6	4.9	4.8
	50	3.9	5.0	5.0	5.0	5.0	5.0	4.9	4.8
	20	4.1	5.0	5.0	5.0	5.0	4.9	4.9	4.8

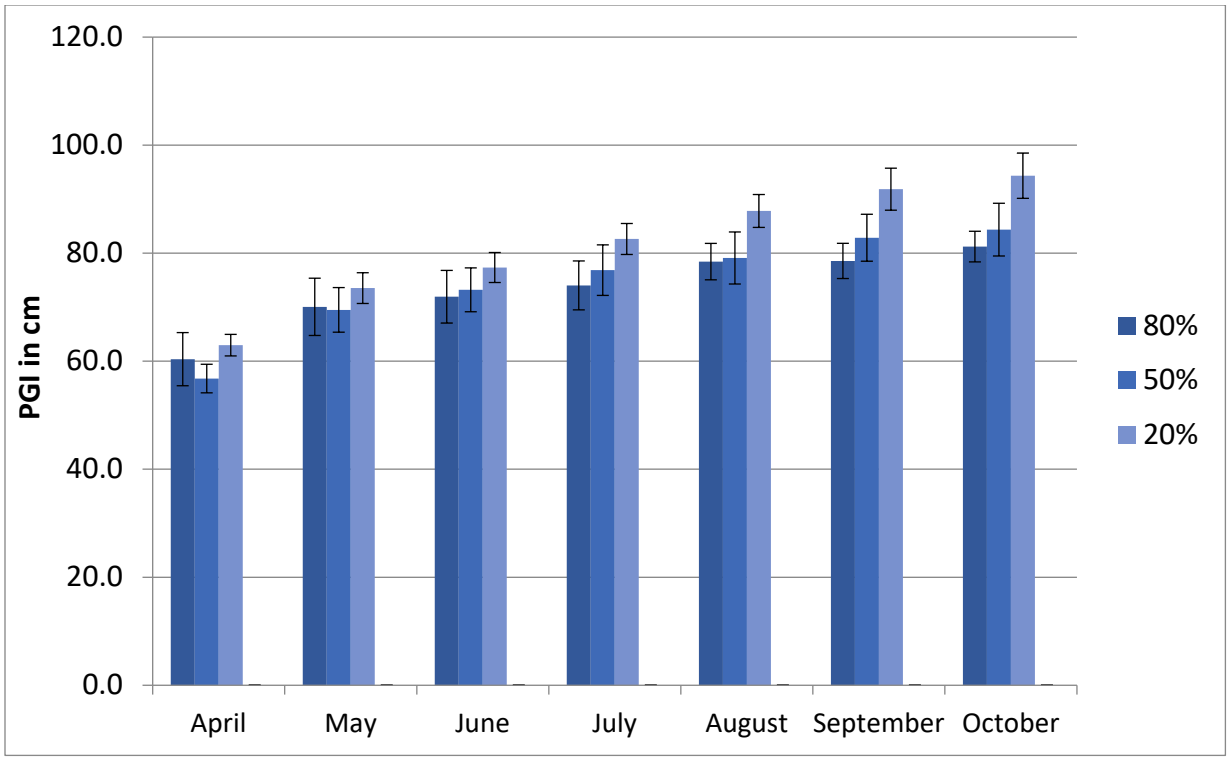

Figure 11a. *Rosa* 'Zlepoltwo' Pretty Polly® White average monthly plant growth index (PGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

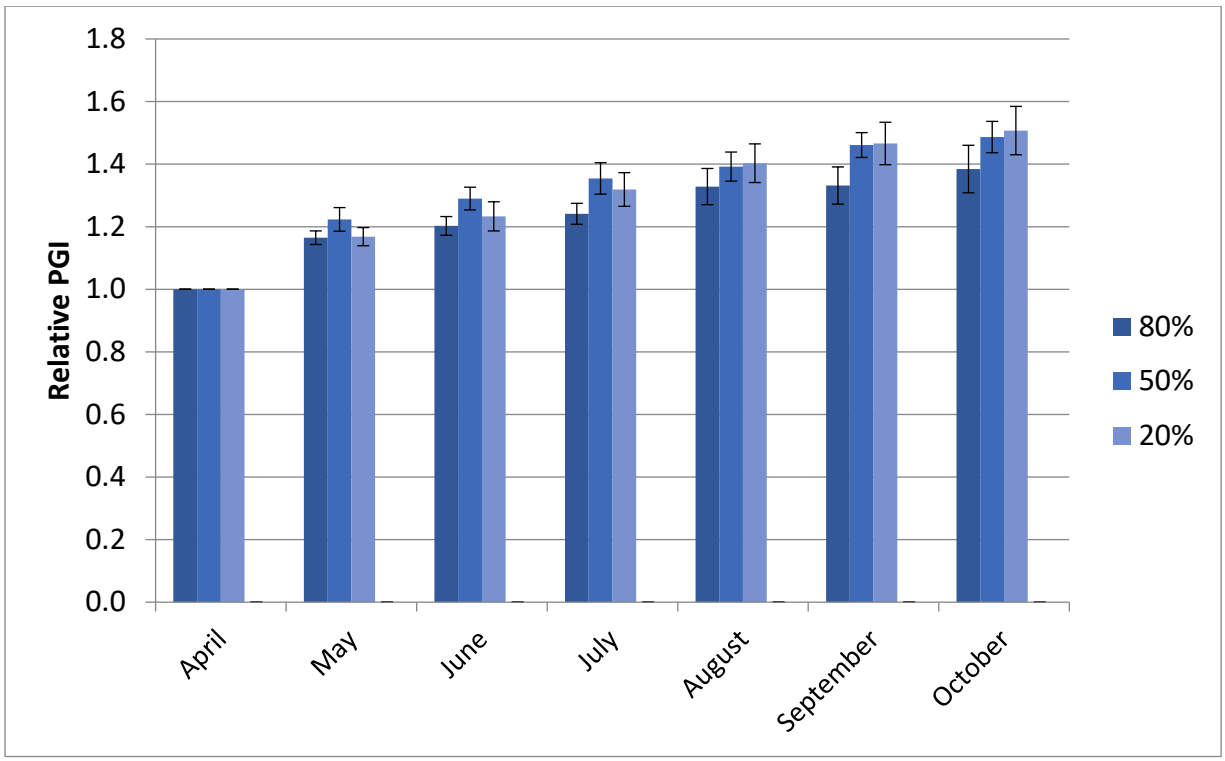

Figure 11b. *Rosa* 'Zlepoltwo' Pretty Polly® White average monthly relative plant growth index (RPGI) at UC Davis on 3 ETo-based irrigation levels in 2021.

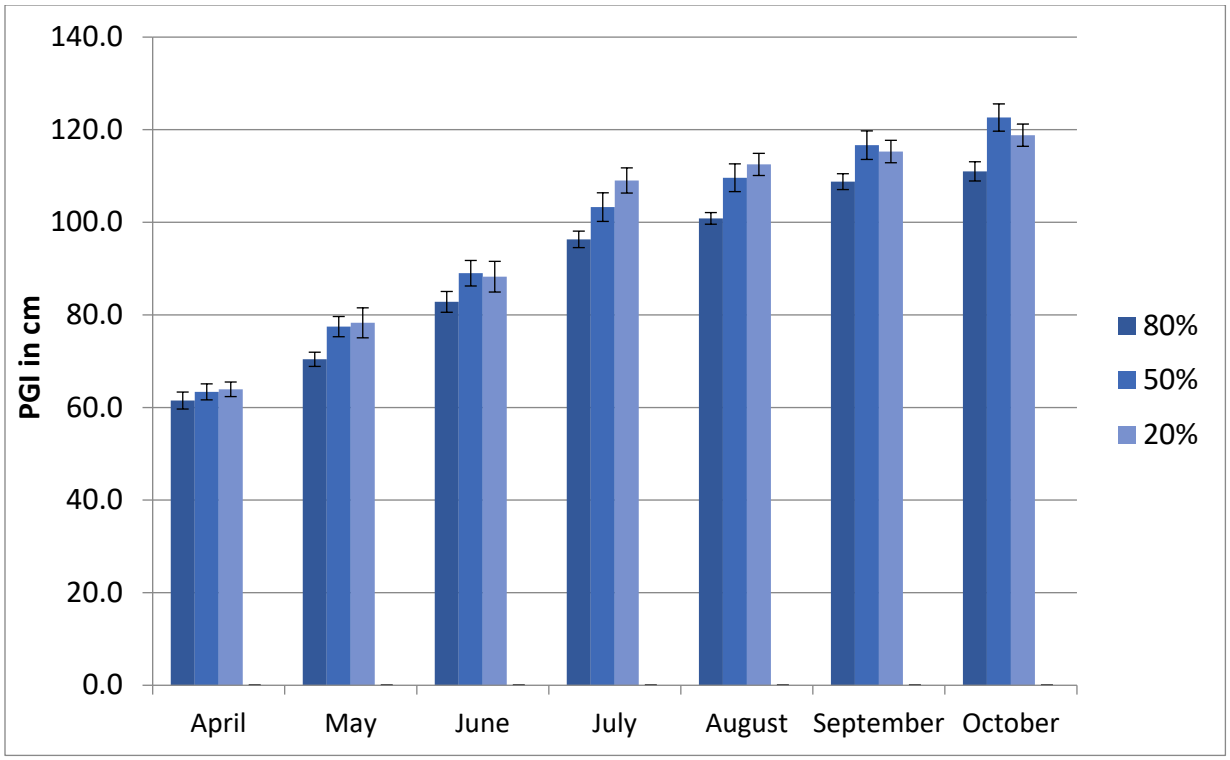

Figure 11c. *Rosa* 'Zlepoltwo' Pretty Polly® White average monthly plant growth index (PGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

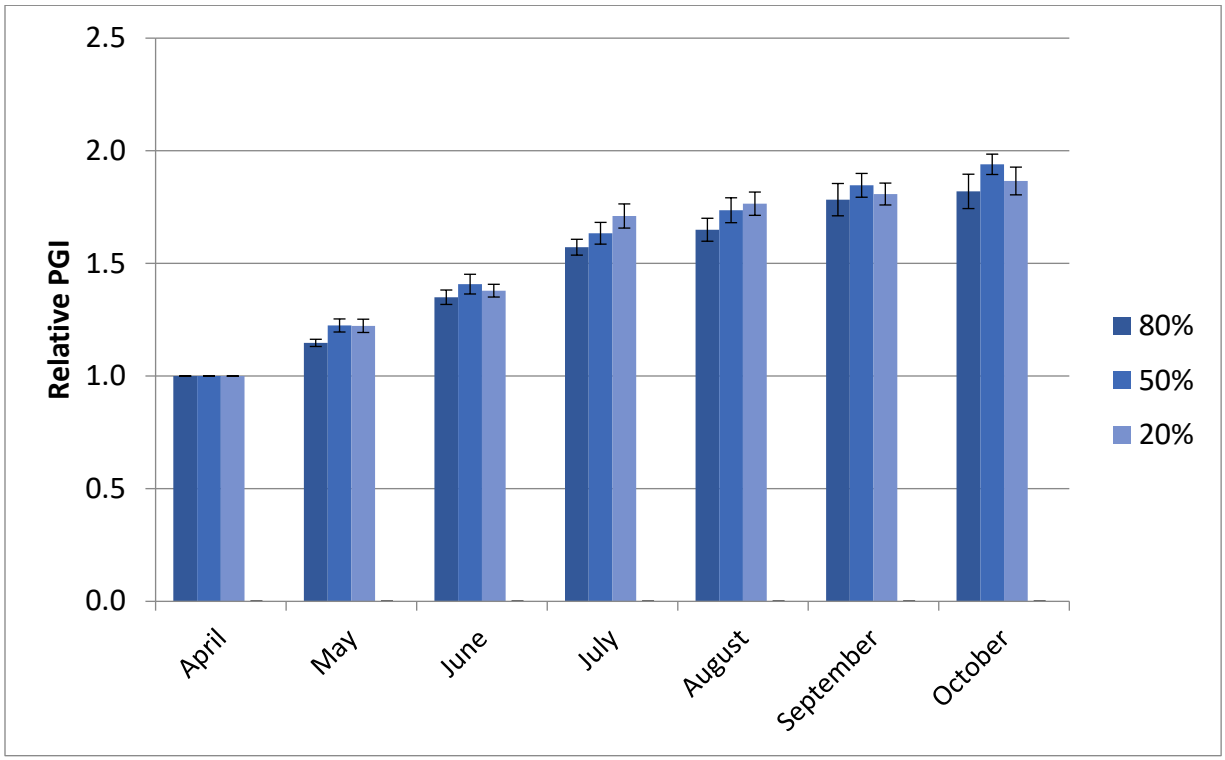

Figure 11d. *Rosa* 'Zlepoltwo' Pretty Polly® White average monthly relative plant growth index (RPGI) at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 19a. *Agapanthus* 'MP003' Ever Amethyst™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) in 50% shade at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.8	3.3	3.8	3.3	2.9	3.1	2.4	3.2
	50	3.9	3.6	3.7	3.5	2.8	2.6	2.6	3.2
	20	4.1	3.4	3.6	3.1	2.9	2.9	2.4	3.2
Foliage	80	5.0	3.6	3.7	3.0	2.7	3.0	2.7	3.4
	50	5.0	4.1	3.7	3.3	2.7	3.1	2.9	3.6
	20	5.0	3.5	3.8	3.0	3.0	3.2	2.8	3.5
Flower	80	0.0	0.1	0.9	15.7	5.1	0.0	0.0	3.1
	50	0.0	0.1	0.9	17.9	3.9	0.0	0.0	3.2
	20	0.2	0.3	0.2	14.0	3.0	0.0	0.0	2.5
Pest Resistance	80	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	50	4.7	5.0	4.9	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
Disease Resistance	80	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	50	5.0	5.0	4.9	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	4.6	4.0	4.6	4.3	3.7	3.6	3.1	4.0
	50	4.7	4.1	4.9	4.6	3.6	3.9	3.4	4.2
	20	5.0	3.8	5.0	4.2	3.0	4.0	3.2	4.0

Table 19b. *Agapanthus* 'MP003' Ever Amethyst™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) in 50% shade at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.2	3.4	4.2	4.3	3.5	3.2	2.9	3.5
	50	3.3	3.6	3.9	4.2	3.7	3.3	3.1	3.6
	20	3.3	3.4	3.6	4.2	3.5	3.1	2.9	3.4
Foliage	80	3.3	4.3	4.3	3.7	3.3	3.3	3.1	3.6
	50	3.7	3.9	3.8	3.9	3.8	3.3	3.0	3.6
	20	3.5	4.1	4.1	3.9	3.6	3.2	3.1	3.7
Flower	80	1.8	3.3	7.8	20.8	2.9	0.1	0.1	5.2
	50	2.1	4.9	8.9	20.6	1.3	0.3	0.4	5.5
	20	1.9	5.1	7.1	19.4	1.7	0.0	0.0	5.1
Pest Resistance	80	3.7	4.8	4.8	4.9	4.5	5.0	5.0	4.7
	50	3.6	4.8	4.9	4.5	4.6	5.0	5.0	4.6
	20	3.4	4.7	4.9	4.6	4.3	5.0	5.0	4.6
Disease Resistance	80	3.7	4.8	4.8	5.0	5.0	5.0	5.0	4.7
	50	3.6	4.8	4.9	5.0	5.0	5.0	5.0	4.7
	20	3.4	4.7	4.9	5.0	5.0	5.0	5.0	4.7
Vigor	80	3.5	5.0	4.9	4.5	4.6	4.5	3.6	4.4
	50	3.6	5.0	4.9	4.9	4.8	4.8	3.7	4.5
	20	3.6	5.0	5.0	4.6	4.6	4.1	3.4	4.3

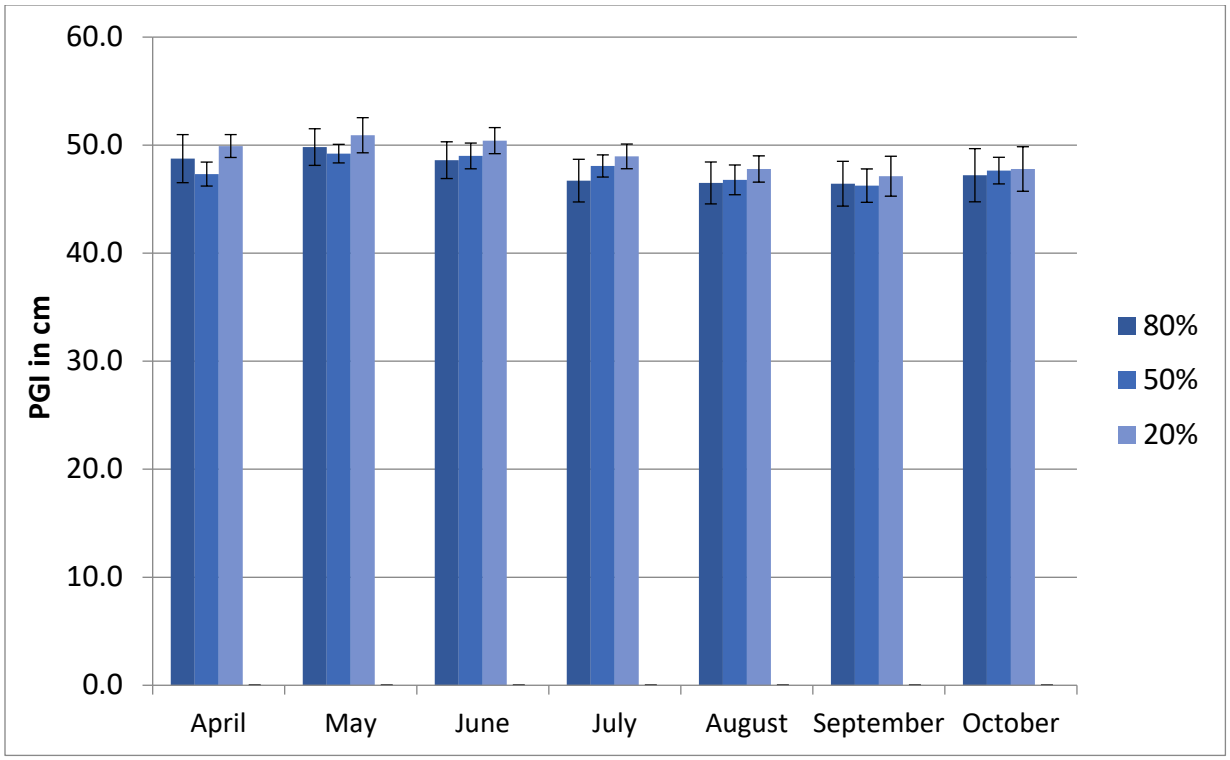

Figure 12a. *Agapanthus* 'MP003' Ever Amethyst™ average monthly plant growth index (PGI) in 50% shade at UC Davis on 3 ETo-based irrigation levels in 2021.

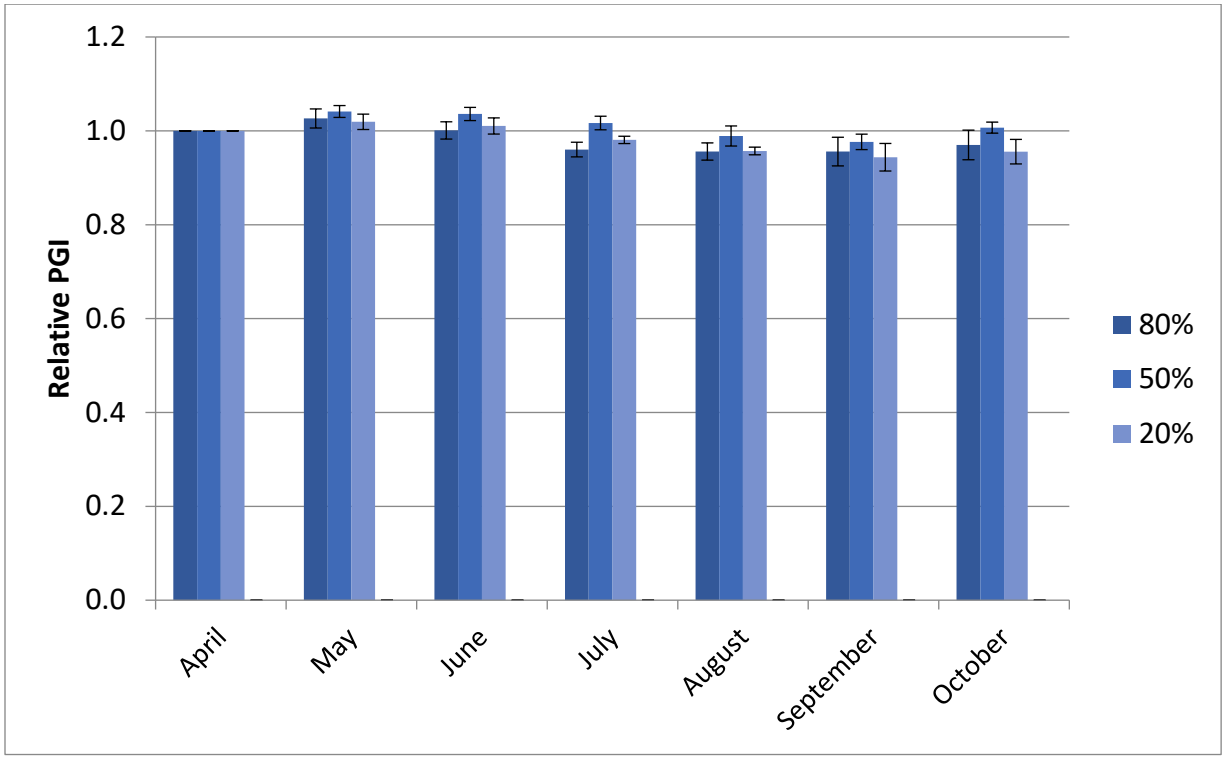

Figure 11b. *Agapanthus* 'MP003' Ever Amethyst™ average monthly relative plant growth index (RPGI) in 50% shade at UC Davis on 3 ETo-based irrigation levels in 2021.

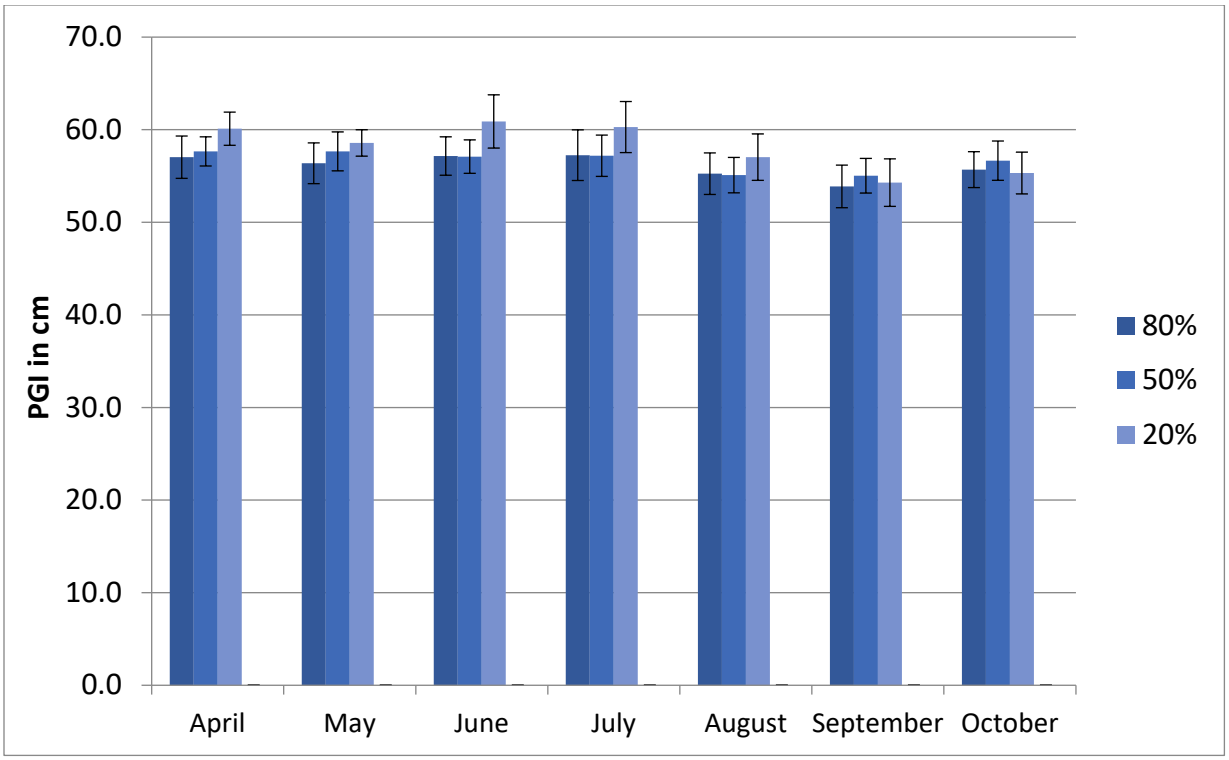

Figure 12c. *Agapanthus* 'MP003' Ever Amethyst™ average monthly plant growth index (PGI) in 50% shade at South Coast REC on 3 ETo-based irrigation levels in 2021.

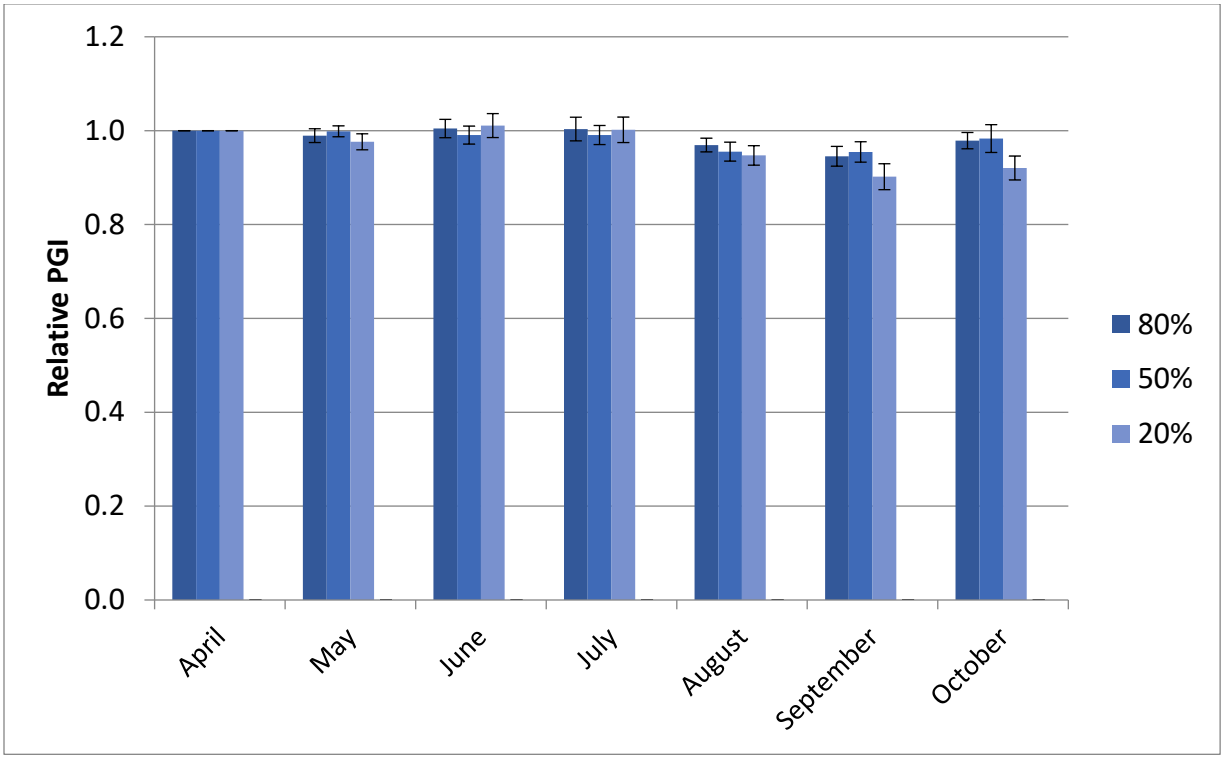

Figure 12d. *Agapanthus* 'MP003' Ever Amethyst™ average monthly relative plant growth index (RPGI) in 50% shade at South Coast REC on 3 ETo-based irrigation levels in 2021.

Table 20a. *Camellia sasanqua* 'Green 02-003' October Magic® Ruby™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) in 50% shade at UC Davis on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.5	3.4	3.7	2.9	2.9	2.7	2.5	3.1
	50	3.6	3.9	3.9	2.9	3.1	2.9	2.9	3.3
	20	3.7	3.7	4.0	3.1	2.7	2.5	2.2	3.1
Foliage	80	4.5	4.3	4.6	3.4	4.1	3.6	2.9	3.9
	50	4.4	4.6	4.4	3.1	4.0	4.0	3.6	4.0
	20	4.5	4.6	4.9	3.3	3.5	3.1	2.9	3.8
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	4.9	5.0	5.0	5.0	4.4	4.4	3.8	4.6
Disease Resistance	80	5.0	5.0	5.0	4.6	4.6	4.3	4.6	4.7
	50	5.0	5.0	5.0	4.6	4.7	4.7	4.6	4.8
	20	4.9	5.0	5.0	4.8	4.1	4.3	3.6	4.5
Vigor	80	4.6	4.0	4.0	3.1	3.1	3.3	2.6	3.5
	50	4.9	4.1	4.1	3.1	3.3	3.4	3.1	3.7
	20	4.9	4.3	3.8	3.0	2.6	2.9	2.3	3.4

Table 20b. *Camellia sasanqua* 'Green 02-003' October Magic® Ruby™ average monthly quality ratings (scale 1-5, 1= lowest, 5 = highest) in 50% shade at South Coast REC on 3 ETo-based irrigation levels in 2021.

Category	ET_o%	Apr	May	Jun	Jul	Aug	Sep	Oct	AVG
Overall Appearance	80	3.1	3.2	3.1	0.0	0.0	0.0	0.0	1.3
	50	3.3	3.1	2.9	0.4	0.0	0.0	0.0	1.4
	20	3.2	2.9	2.6	0.0	0.0	0.0	0.0	1.3
Foliage	80	3.3	3.4	3.4	0.0	0.0	0.0	0.0	1.5
	50	3.4	3.2	3.1	0.4	0.0	0.0	0.0	1.4
	20	3.4	3.4	2.6	0.0	0.0	0.0	0.0	1.3
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	3.8	4.4	4.1	0.0	0.0	0.0	0.0	1.8
	50	4.1	4.8	3.8	0.6	0.0	0.0	0.0	1.9
	20	4.0	4.4	3.1	0.0	0.0	0.0	0.0	1.6
Disease Resistance	80	3.8	4.4	4.1	0.0	0.0	0.0	0.0	1.8
	50	4.1	4.8	3.8	0.6	0.0	0.0	0.0	1.9
	20	4.0	4.4	3.1	0.0	0.0	0.0	0.0	1.6
Vigor	80	3.4	5.0	4.8	0.0	0.0	0.0	0.0	1.9
	50	3.6	5.0	3.9	0.6	0.0	0.0	0.0	1.9
	20	3.4	5.0	3.6	0.0	0.0	0.0	0.0	1.7

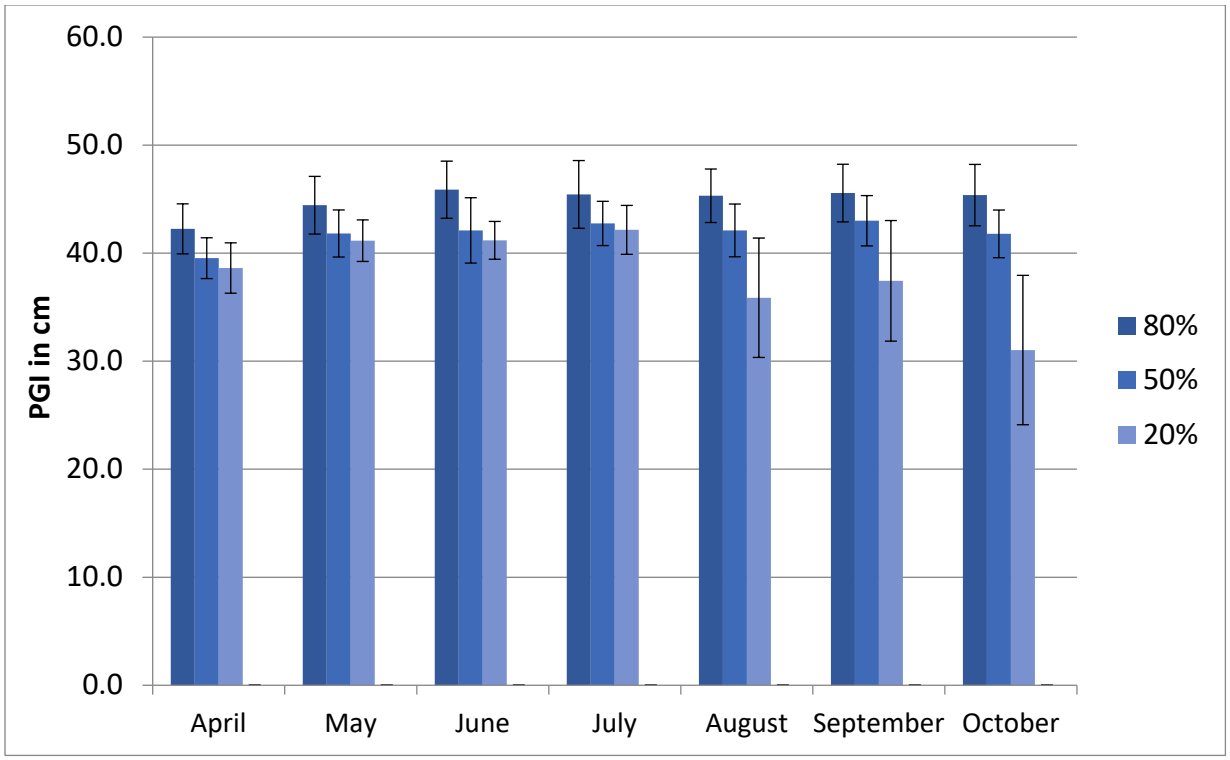

Figure 13a. *Camellia sasanqua* 'Green 02-003' October Magic® Ruby™ average monthly plant growth index (PGI) in 50% shade at UC Davis on 3 ETo-based irrigation levels in 2021.

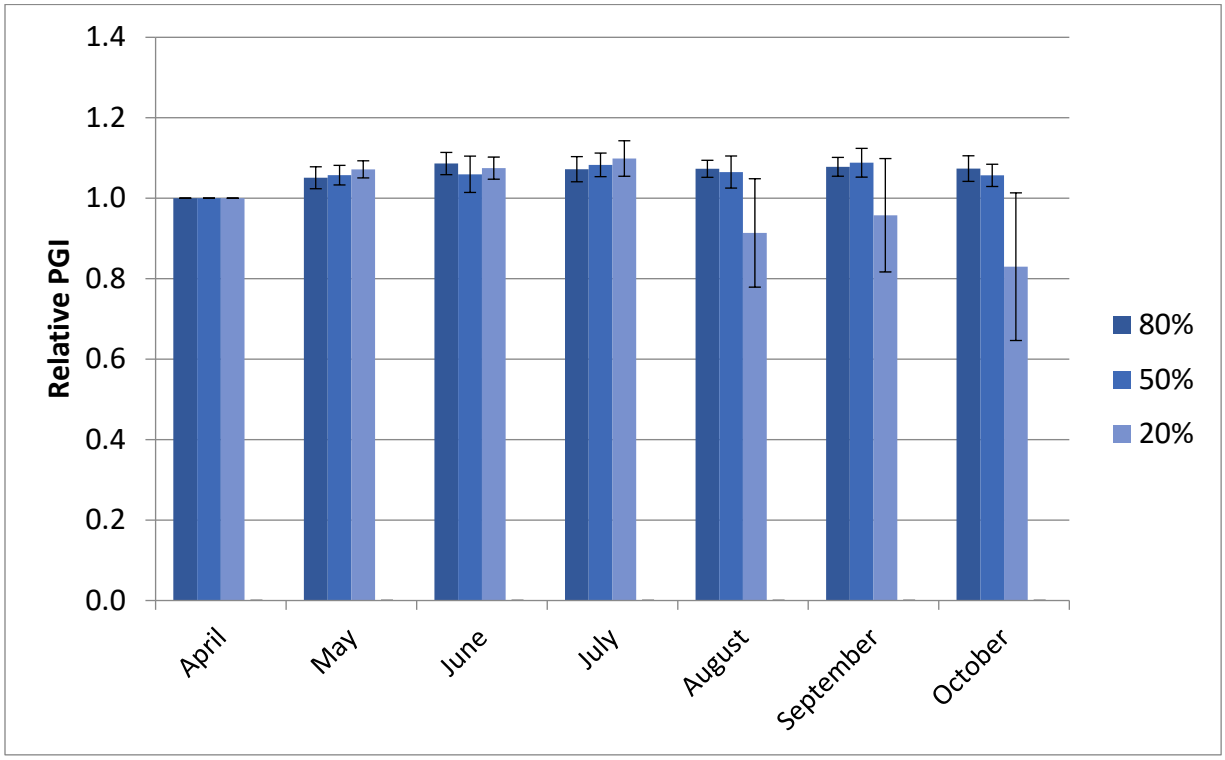

Figure 13b. *Camellia sasanqua* 'Green 02-003' October Magic® Ruby™ average monthly relative plant growth index (RPGI) in 50% shade at UC Davis on 3 ETo-based irrigation levels in 2021.

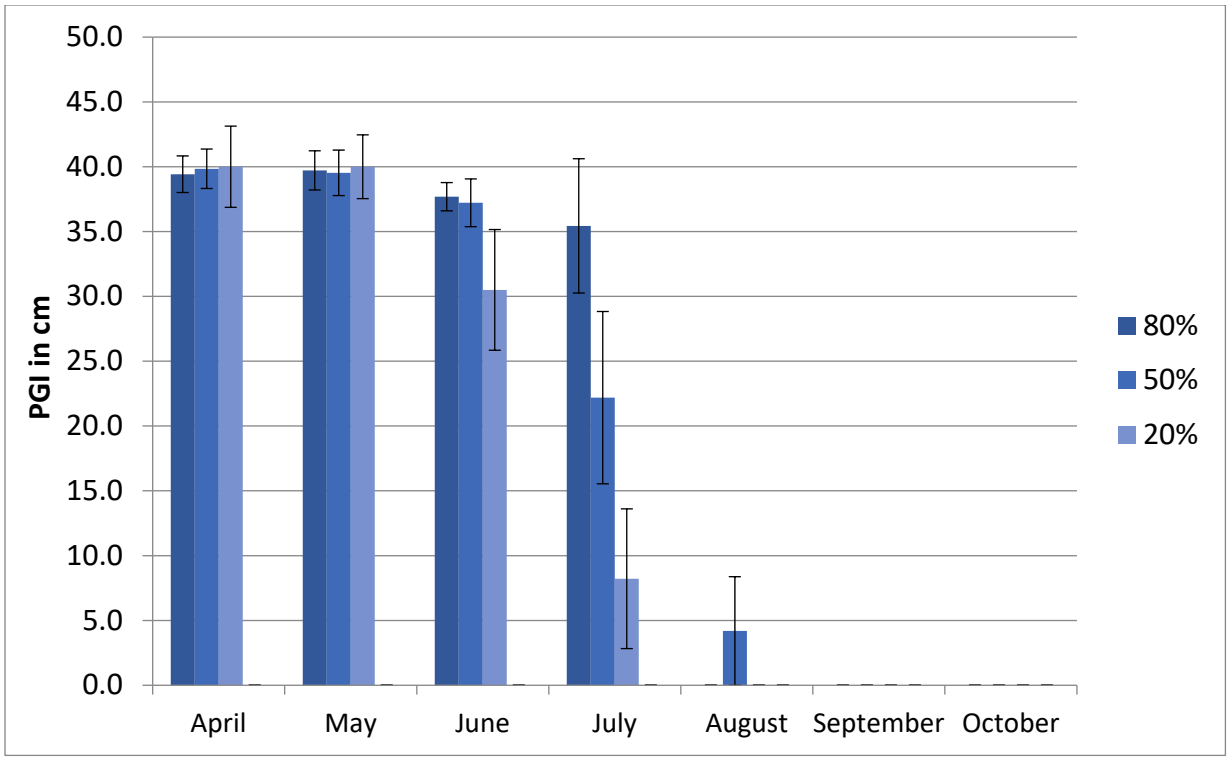

Figure 13c. *Camellia sasanqua* 'Green 02-003' October Magic® Ruby™ average monthly plant growth index (PGI) in 50% shade at South Coast REC on 3 ETo-based irrigation levels in 2021.

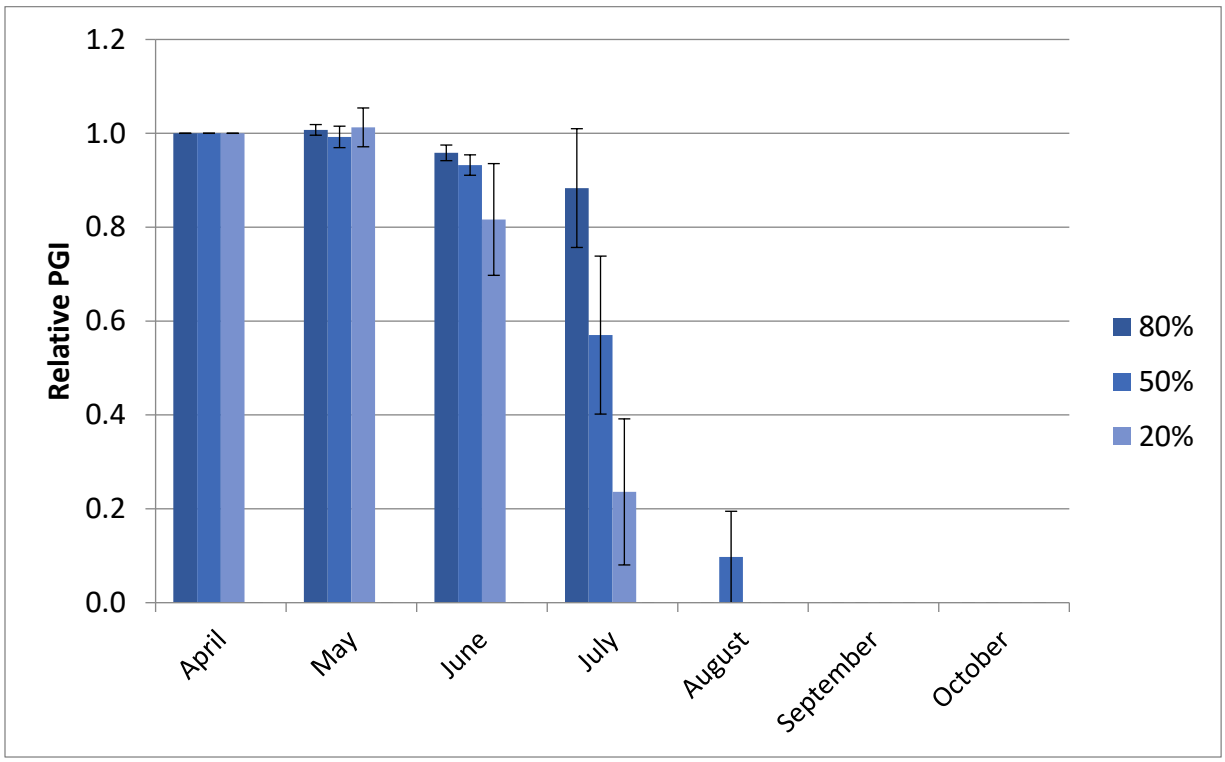

Figure 13d. *Camellia sasanqua* 'Green 02-003' October Magic® Ruby™ average monthly relative plant growth index (RPGI) in 50% shade at South Coast REC on 3 ETo-based irrigation levels in 2021.

Appendix B

PHOTOS

UC Davis Full Sun 2-m field in April 2021.

All photos in Davis: Karrie Reid unless noted as Jared Sisneroz. All photos at South Coast REC: Kaitlyn Berry. No photos used without explicit written permission.

Photo 1a. *Abelia* × *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™ on moderate water at the end of April 2021 at UC Davis with some of the wine color that lends it the name.

Photo 1b. *Abelia* × *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™ in July 2021 on moderate water at UC Davis showing modest floral display and fading reddish hues.

Photo 1c. *Abelia* × *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™ in Oct. 2021 on moderate water showing significant dead interior foliage with wine color washed out.

Photo 1d. *Abelia* × *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™ with lovely foliage coloration on low irrigation at South Coast REC in April 2021.

Photo 1e. *Abelia* × *grandiflora* 'Bailbeliaone' First Editions® Vanilla Brandy™ on low water in Oct. 202i at South Coast REC still performing well and retaining its rosy tones.

Photo 2a. *Lippia* 'ECOLOPIA2' Pink Kurapia® close-up on low water at South Coast REC in June 2021.

Photo 2b. *Lippia* 'ECOLOPIA2' Pink Kurapia® at South Coast REC in April 2021 just beginning to outgrow its end of winter trim into a circle.

Photo 2c. *Lippia* 'ECOLOPIA2' Pink Kurapia® on low water in Oct. 2021 at South Coast REC having more than doubled its width since April.

Photo 3a. *Lomandra confertifolia* 'LOLTCS08' Del Sol at UC Davis in April 2021.

Photo 3b. *Lomandra confertifolia* 'LOLTCS08' Del Sol on low water at UC Davis in Sept. 2021.

Photo 3c. *Lomandra confertifolia* 'LOLTCS08' Del Sol in April 2021 at South Coast REC on low water.

Photo 3d. *Lomandra confertifolia* 'LOLTCS08' Del Sol in Oct. 2021 at South Coast REC on low water.

Photo 4a. *Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty in April 2021 at UC Davis.

Photo 4b. *Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty on low water in Oct. 2021 at UC Davis.

Photos 4c. *Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty on low water in April 2021 at South Coast REC.

Photo 4d. *Lomandra confertifolia* ssp. *pallida* 'Pom Pom' Shorty on low water in Oct. 2021 at South Coast REC.

Photo 5a. *Nandina domestica* 'Zhnan28' First Editions® Cool Glow™ Peach in April 2021 at UC Davis.

Photo 5b. *Nandina domestica* 'Zhnan28' First Editions® Cool Glow™ Peach showing tip dieback in July 2021 on moderate water at UC Davis.

Photo 5c. *Nandina domestica* 'Zhnan28' First Editions® Cool Glow™ Peach on moderate water in October 2021 at South Coast REC .

Photo 6a. *Nandina domestica* 'Zhnan102' First Editions® Cool Glow™ Lime on moderate water in Davis in July 2021. Scorch on leaves is apparent.

Photo 6b. *Nandina domestica* 'Zhnan102' First Editions® Cool Glow™ Lime on moderate water in October 2021 at South Coast REC. Plants are small but in good condition.

Photo 7a. *Rosa* 'Meiswetdom' Sweet Drift® on low water in late April 2021 in Davis.

Photo 7b. *Rosa* 'Meiswetdom' Sweet Drift® on moderate water in late September 2021 at South Coast REC.

Photo 7c. *Rosa* 'Meiswetdom' Sweet Drift® bloom close up in May 2021.

Photo 8a. *Rosa* ‘Radtkopink’ Pink Double Knock Out® in full bloom in late April at South Coast REC.

Photo 8b. *Rosa* ‘Radtkopink’ Pink Double Knock Out® close up.

Photo 8c. *Rosa* ‘Radtkopink’ Pink Double Knock Out® in July 2021 on low water in Davis. Healthy, but non-uniform and holding on to faded blooms.

Photo 9a. *Rosa* ‘Sprogreatpink’ Brick House® Pink in Davis in April 2021.
The brilliant color is difficult to capture.

Photo 9b. *Rosa* ‘Sprogreatpink’ Brick House® Pink being visited by a European honeybee.

Photo 9c. *Rosa* ‘Sprogreatpink’ Brick House® Pink on low water in Sept. 2021 at South Coast REC. Mint green calyces are visible.

Photo 10a. *Rosa* ‘Zlepolone’ Pretty Polly® Pink on low water at South Coast REC in May 2021.

Photo 10b. *Rosa* ‘Zlepolone’ Pretty Polly® Pink closeup in May 2021 in Davis.

Photo 10c. *Rosa* ‘Zlepolone’ Pretty Polly® Pink on low water in Oct. 2021 in Davis.

Photo 10d. *Rosa* ‘Zlepolone’ Pretty Polly® Pink on moderate water at South Coast REC in October 2021 showing the formation of attractive hips.

Photo 11a. *Rosa* 'Zlepoltwo' Pretty Polly® White in April 2021 in Davis.

Photo 11b. *Rosa* 'Zlepoltwo' Pretty Polly® White in May 2021 at South Coast REC.

Photo 11c. *Rosa* 'Zlepoltwo' Pretty Polly® White on low water in Davis in Sept. 2021.

Photo 11d. *Rosa* 'Zlepoltwo' Pretty Polly® White on low water at South Coast REC in Sept. 2021.

Photo 12a. *Agapanthus* hybrid ‘MP003’ Ever Amethyst™ on low water in Davis in July 2021.

Photo 12b. *Agapanthus* hybrid ‘MP003’ Ever Amethyst™ on low water at South Coast REC in May 2021.

Photo 13a. *Camellia sasanqua* 'Green 02-003' October Magic ® Ruby™ on high water in May 2021 in Davis.

Photo 13b. *Camellia sasanqua* 'Green 02-003' October Magic ® Ruby on high water in October 2021 in Davis.

Photo 13b. *Camellia sasanqua* 'Green 02-003' October Magic ® Ruby™ on high water at South Coast REC, the only treatment remaining in July 2021