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Journal of the Azalea Society of America

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President's Letter

Rick Bauer—Yorktown, Virginia

As I write this message. I'm reflecting on the great time I just had hiking in the Smoky Mountains with other society members. A major benefit of membership is the ability to enjoy azaleas in their native habitat with fellow knowledgeable members. I'm continually learning about azaleas, both deciduous and evergreen. For example, during this year's trip we were treated to a well-researched presentation on identifying different native azalea species by our society vice president, Charlie Andrews.

There has been a lot of activity in the society over that past few months. Dave Banks and Paul Beck continue to enhance the functionality of our website. One issue we face is content management. The webmaster is not expected to be a subject matter expert (though he or she may be). We're looking for knowledgeable members to step forward to manage the content of various portions of the site. Our website is our society's face to the world. Outdated or invalid content doesn't reflect well on our society. We will be looking for volunteers to assist in this regard. I encourage you to volunteer.

Our society logo has gotten a little long in the tooth. We are currently developing a new logo which reflects the beauty of our azaleas, both deciduous and evergreen and which can be used for a multitude of uses such as business cards, letterhead and clothing. This will be another way in which we can get exposure for our society.

We continue to focus on the Legacy Project. Members of the Central Carolinas chapter are going to great lengths to preserve the Strickland azaleas. The Northern Virginia chapter is working with different public gardens to establish Legacy Gardens to highlight the hybrids of chapter hybridizers. The Texas chapter has stepped forward to sponsor a number of Legacy hybrid groups and they are actively propagating azaleas. Information on sponsoring a Legacy hybrid is located on our website or you can contact me directly. Our website also has a list of current Legacy hybrids.

We will continue to leverage our Azalea Research Fund to encourage studies of import to our community. We are exploring identifying areas of particular concern and soliciting studies in these areas. We are also encouraging the application and designation of Azalea Cities, especially as it can be used to increase membership in the society.

Planning is well underway for our 2018 convention in Little Rock, Arkansas. I always look forward to meeting in different parts of the country and seeing the local gardens and hearing local speakers.

Finally, I want to reemphasize that the WE are the society. Our society is only as good as we make it. I encourage all of you to volunteer at your local level. Set goals for your chapter and plans to achieve them. Sponsor a Legacy Hybrid group, propagate plants and feature them in your local plant sales. And finally, step forward when calls go out for volunteers. Don't let what you can't do keep you from doing what you can.

Ant mynorthe. Rink

Deadlines for input for The Azalean

October 30-Winter 2017 issue December 1—Spring 2018 issue February 1-Summer 2018 issue July 1-Fall 2018 issue



The Azalea Society of America, organized December 9, 1977 and incorporated in the District of Columbia, is an educational and scientific non-profit association devoted to the culture, propagation, and appreciation of azaleas which are in the subgenera Tsutsusi and Pentanthera of the genus Rhododendron in the Heath family (Ericaceae).

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On the Cover

An accession of the Florida Azalea, *R. austrinum*, growing at the David G. Leach Research Station of The Holden Arboretum in Madison, Ohio. Following deep frosts in winter 2015, this species bloomed fully. The elepidote rhododendron flowering in the background is David Leach's *R.* 'Edmund Amateis'. Photo Steve Krebs



Preliminary Study to Investigate Variation in Flooding Tolerance Across Six *Rhododendron viscosum* (L.) Torr. Subpopulations

By Alexander Q. Susko, Steven McNamara, and Stan C. Hokanson—Minneapolis, MN

Abstract

The ability for ornamental shrubs to withstand periodic poorly drained and waterlogged soils greatly improves their utility in the landscape. Many cultivars of deciduous azaleas (Rhododendron subg. Hymenanthes sect. Pentanthera (G.) Don), while ornamental and cold hardy, are poorly characterized for adaptations to flooded or waterlogged soils often present in commercial or residential landscapes. We present research illustrating the flooding tolerance of one species, Rhododendron viscosum (L.) Torr., a deciduous azalea that occurs naturally in flooded sites throughout many parts of the southern and southeastern United States. Periodic inundation of seedling root zones was conducted over a 53-day period to simulate severe flooding events. Rhododendron viscosum maintained vigor and growth based on accumulated root and shoot biomass despite periodic flooding. However, significant variation in the flooding response existed between subpopulations collected in four states in the southeastern US. Other notable responses to flooding included leaf discoloration and changes in root architecture. This research suggests that some R. viscosum subpopulations are tolerant of periodic inundation, and would serve as good places to identify parents for the breeding of future deciduous azalea cultivars with improved tolerance of flooded or waterlogged soils.

Introduction

In many urban and suburban landscapes, woody plants are frequently subjected to flooding stress due in part to heavy clay soil composition, soil compaction, excessive runoff from buildings and paved surfaces, or poor drainage designs.¹ Flooding stress manifests in many ways and can include root system decay, chlorosis due to poor nutrient uptake from the soil, and disease infestation of stressed plants.² Briefly, such issues can include limited phosphorous uptake under flooded conditions and increased susceptibility to Phytophthora root rot disease. Woody plants with poor flooding tolerance, even if not killed outright through the processes mentioned above, will lose vigor over time and underperform in a landscape setting. The ability to tolerate poorly drained or waterlogged soils is, therefore, a valuable selection trait when developing new woody landscape plant cultivars.

Many woody plant species and cultivars are known to have vigorous growth despite being subjected to periodic flooding, and thus are frequently recommended for landscape sites subjected to flooding.³ However, the genus *Rhododendron*

has long been regarded as a taxon whose cultivation requires exacting soil requirements, including avoidance of heavy, wet soils.⁴ Only one study to date has indirectly assessed flooding tolerance in Rhododendron taxa. Krebs (2013) rated 24 elepidote rhododendron (R. subg. Hymenanthes) cultivars and species to determine growth responses following periodic flooding stress and Phytophthora cinnamomi Rands exposure in a field experiment. The species R. hyperythrum was identified as possessing resistance to P. cinnamomi under flooded conditions.⁵ Though this study quantified the impact of flooding on phytophthora susceptibility and plant survival, it is not known how tolerant North American deciduous azaleas (R. subg. Hymenanthes sect. Pentanthera) are of flooded conditions in the absence of disease pressure. Within North American deciduous azalea germplasm, the species Rhododendron viscosum, commonly known as swamp azalea, is frequently observed growing along riverbanks and wetlands where periodic inundation occurs.^{6,7} Rhododendron viscosum has also proven to be sufficiently cold hardy and ornamental for utilization as a parent in breeding R. sect. Pentanthera interspecific hybrids (Northern Lights Series) developed for cultivation in the upper Midwestern United States.⁸ Thus, R. viscosum potentially represents a source of germplasm for developing hardy new azalea cultivars with improved tolerance to poorly drained soils. Characterizing the variation for flooding tolerance existing within R. viscosum will facilitate development of new varieties better adapted to wet soil conditions.

Herein, we present the results of a preliminary experiment designed to investigate variation in the flooding tolerance of *R. viscosum* seedlings originating from six subpopulations found in four states in the southeastern U.S (Figure 1; Table



▼ Figure 1—Map showing the approximate location of *R. viscosum* subpopulations sampled for this study.

Subpop.	State	Abb.	%Org.	Latitude	Longitude	Nfamilies	Nseedlings	Precip (in)
Ouachita 1	AR	Oua	3	34°44'34.57"N	94° 6'28.87"W	2	34	50.7
Ouachita 2	AR	Oua2	7	34°41'6.27"N	94°19'5.38"W	2	32	52.9
Angelina	TX	Ang	7	31° 4'33.51"N	94°16'32.65"W	2	29	56.2
DeSoto	MS	Des	20	31° 8'42.37"N	89°14'11.49"W	2	36	59.2
Apalachicola	FL	Apa	15	30°25'10.22"N	84°27'42.22"W	2	38	59.2
Ocala	FL	Oca	40	29°33'55.89"N	81°52'17.51"W	2	39	52.8

▲ Table 1—Location, state, latitude, longitude, percent soil organic matter (%Org.), number of families used, and total number of seedlings tested and annual precipitation in inches for the *R. viscosum* subpopulations tested.

1). Specifically, we measured the response of seedlings to three cycles of root zone inundation and drainage imposed over 53 days, to mimic severe flooding events in a cultivated landscape. As a measure of flooding impact, we measured cumulative shoot and root dry mass and the relationship between the two in seedlings derived from the six R. viscosum subpopulations. Finally, we discuss these results in the context of adaptation to flooding and breeding for flooding tolerance in *Rhododendron* sect. *Pentanthera* germplasm.

Materials and Methods

Seedlings derived from the six R. viscosum subpopulations were used to estimate the variation for flooding tolerance in the species (Figure 1, Table 1). Locations for germplasm collections were chosen to maximize variation for soil type according to maps available through the NRCS with exact locations of possible collection sites narrowed using online herbarium records.^{9,10} Subpopulations were identified within US National Forests during the summer of 2014 under the auspices of plant collection permits. We returned to the R. viscosum subpopulations between October 24th and 31st of 2014 to collect open pollinated seed capsules from individual plants identified previously (hereafter seed collected from each individual plant is referred to as maternal half sib families). A more detailed description of the identification and collection of subpopulations have been described.⁶ Percent soil organic matter and average annual precipitation values (http://www.ncdc.noaa.gov/cdo-web/) for each collection location are presented in Table 1.

Seed from these wild collected, maternal half sib families was germinated at the University of Minnesota Horticultural Research Center (HRC) in Excelsior, MN during February of 2015 on milled sphagnum moss under 24-hour fluorescent lighting. In May of 2015, seedlings from the maternal half sib families were transplanted into 1" vented plug trays containing a 90% sieved pine bark and 10% perlite growing medium. Seedlings were fertilized as needed throughout the 2015 growing season with 200 ppm N Peter's Excel liquid solution (Grace-Sierra CO., Milipitas, CA). Seedlings were vernalized in a greenhouse maintained at 4.5 °C during the winter of 2015-2016. In April of 2016, seedlings were transplanted into 3x8" square plastic pots with large drainage openings (Anderson Die & Manufacturing, Portland, OR) containing the same growing medium. Seedlings were fertilized monthly between April and July of 2016 with 200 ppm N Peter's Excel solution as they became established in the pots prior to initiating the flooding experiment.

The flooding experiment consisted of two treatments, flooded and non-flooded, with 12 maternal half-sib families (two from each subpopulation) replicated twice in each treatment (Figure 2). The total number of seedlings available for testing per maternal half-sib family ranged between 29 and 39 (Table 1). Similarly-sized seedlings from each maternal half-sib family were randomly assigned to treatments and spatially randomized within each of the treatment replicates. Prior to initiation of treatment, 5 seedlings per subpopulation were harvested to provide an initial determination of seedling root and shoot dry mass as described below.

The flooding treatments were initiated on July 25th, 2016. Flooding was achieved by filling a large plastic tub containing the individual pots with water to the point where it covered the pots to the top of the potting media (Figure 2).

▼ Figure 2—Experimental set up on July 25th, 2016. The two treatments are shown flooded, in plastic tubs (1st and 3rd groups), and non-flooded (2nd and 4th groups) with two replicates each.



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The flooding was maintained for 36 hours for each inundation. Subsequent inundations occurred August 1st through August 4th and August 22nd through 26th (36 hours for each inundation). Between inundation treatments, seedlings were removed from the water, allowed to drain and then watered daily as needed. Seedlings in the non-flooded treatment were watered daily as needed throughout the duration of the experiment. Seedlings from both replicates of the flooded and non-flooded treatments were harvested on September 14th and 15th, 2016 at 52-53 days following the start of the initial inundation period. Seedlings were removed from the containers and the roots were gently washed free of growing medium. Seedlings were labeled, placed in paper bags, and dried for 72 hours at 70°C.

plants Following drying, were partitioned into roots and shoots by cutting the stem just above the location of the first lateral root. Shoot and root dry mass were determined with an electronic balance and recorded in milligrams. Data were analyzed in Rstudio v.3.2.1, using analysis of variance (ANOVA) and least significant difference (LSD) tests to determine the significance of the observed differences between subpopulations and treatments. Root and shoot mass data required a base-2 logarithmic transformation (log2) prior to analysis, as the variation between root and shoot masses was not equal across seedlings with different sized root systems.

Results and Discussion

Pre-experiment ANOVAs of dried root and shoot mass data revealed no significant differences among subpopulations with

Initial Shoot Mass				
Source of Variation	df	Mean Square	F value	P value
Subpopulation	5	2.52	2.02	0.11
Residuals	30	1.25		
		Initial Root Mass		
Source of Variation	df	Mean Square	F value	P value
Subpopulation	5	4.12	1.98	0.11
Residuals	30	2.12		

▲ Table 2—ANOVA for pre-flooding *R. viscosum* seedling shoot, root dry mass.

initial dried root and shoot mass ANOVA p-values of 0.11, indicating that seedling root and shoot mass sizes were statistically equivalent at the start of the experiment (Table 2). After the experiment, flooding alone did not significantly affect *R. viscosum* shoot (p = 0.34) or root (p = 0.41) dry masses in this experiment (Table 3, Table 4). This result suggests *R. viscosum* germplasm appears to have some tolerance for flooding.

We were also interested in examining whether the flooding treatment had any impact on the correlation between dried root and shoot mass. The relationship between dried shoot and root mass within both treatments was linear and highly correlated (r = 0.87) with no difference in the degree of correlation, or distribution of points around the trendline, between the flooded and non-flooded treatments (Figure 3). A correlation between dry shoot and root mass indicates that there is no substantial effect of the flooding treatment on how the *R. viscosum* seedlings allocated growth to the roots vs. shoots based on mass alone. Based on this highly linear trend, there appeared to be no limit on root or shoot growth induced by the flooding treatment.

Although *R. viscosum* appears to be tolerant to flooding, it must be recognized that adaptability to waterlogged conditions varied depending on the subpopulation in which the seedlings originated. Subpopulation mean root and shoot dry masses varied significantly following the experiment (p < 0.001) in a linear model accounting for subpopulation, treatment, and replicate effects on dried shoot masses (Table 3). Detection of significant variation for flooding tolerance at the subpopulation level indicates that some populations would serve as better sources of flooding tolerance for breeding than others. Significant differences between subpopulation dried shoot mass means were detected and are demarcated at a p-value of 0.05

Source of	df	Mean Square	F value	P value
Variation				
Subpopulation	5	6.967	4.463	<0.001 ***
(S)				
Treatment (T)	1	1.43	0.92	0.34
Replicate (R)	1	6.95	4.45	0.04 *
SxT	5	0.40	0.26	0.94
SxR	5	2.40	1.60	0.16
TxR	1	2.54	1.63	0.20
SxTxR	5	0.74	0.48	0.79
Residuals	184	1.56		

Signif. codes: p-value < 0.001, '***'; 0.01, '**'; 0.05, '*'; 0.1, '.'



▲ Figure 4— Boxplots and distributions of shoot dry mass data by subpopulation. Red circular points indicate observations from the non-flooded treatments, while blue square points indicate observations from the flooded treatments. Subpopulations are ordered left to right with increasing mean log²Mg shoot mass, with unique superscripts denoting significantly different means at alpha = 0.05.

Table 4—ANOVA results of R. viscosum final root mass data.



(Figure 4). Dried root mass means displayed a similar trend between subpopulations regarding ranking based on means and the lack of differentiation between flooded and non-flooded treatments, but possessed more significant differences based on the LSD test overall (Figure 5).

Differences in soil organic matter within subpopulations could also be responsible for some of these differences in flooding tolerance noted. We used a soilless potting media with high organic matter (90%) in these experiments. This mix was chosen because it is the optimal azalea growing mixture used in the breeding program and it allowed us to control for soil variability during the experiment. However, in regards to organic content, this mix was not representative of the soils from the locations where the subpopulations originated, which contain between 3% (Ouachita) and 40% (Ocala) organic matter (Table 1).⁶ Soils with high levels of organic matter often retain water for longer periods than the low organic matter, fast draining alluvial soils found in the Ouachita 1 and 2, Angelina subpopulations. Seedlings from the Ouachita, Ouachita2, and Angelina subpopulations in the flooded treatment displayed discolored (reddened) foliage at the conclusion of the 53-day experiment relative to the seedlings from the same subpopulations in the nonflooded treatment (Figure 6). Seedlings from the Desoto, Apalachicola, and Ocala subpopulation in the flooding treatments

Source of Variation	df	Mean Square	F value	P value
Subpopulation (S)	5	7.79	4.72	<0.001 ***
Treatment (T)	1	1.11	0.67	0.41
Replicate (R)	1	7.78	4.71	0.03 *
SxT	5	0.60	0.36	0.87
SxR	5	3.39	2.06	0.07.
TxR	1	4.82	2.92	0.09.
SxTxR	5	2.68	1.62	0.16
Residuals	184	1.65		

Signif. codes: p-value < 0.001, '***'; 0.01, '**'; 0.05, '*'; 0.1, '.'

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exhibited little to no reddening and looked similar to nonflooded seedlings (Figure 6). The foliage reddening observed is similar to the fall color seen in these subpopulations and is also a common symptom of stress in numerous plant taxa under drought or flooding conditions.¹¹ Such discoloration could stem specifically from nutrient deficiencies, such as a lack of available phosphorous, induced by changes in the soil redox potential as oxygen becomes scarce.¹² Generally speaking, phosphorous can become limited in soils which are subject to periodic flooding as the redox potential fluctuates and causes the transition of phosphorous to insoluble forms during dry periods, manifesting in phosphorous deficiency.¹²

Root Masses of Six R. viscosum Subpopulations Ξ c Root Mass (log2Mg Oua2 C BA Oua A CB **Oca** Subpopulatio

Red circular points indicate observations from the non-flooded treatments, while blue square points indicate observations from the flooded treatments. Subpopulations are ordered left to right with increasing mean log²Mg root mass, with unique superscripts denoting significantly different means at alpha = 0.05.

▼ Figure 6—Experimental layout for the flooding treatment, showing *R. viscosum* seedlings organized by subpopulation, replicate, and treatment. Seedlings were re-organized for photographing after being randomized within replicates during the duration of the flooding study.

Such deficiencies can discolor foliage and reduce the vigor of the plant over time and could explain the discoloration observed in our experiment, although nutrient analysis of plant tissue and potting media would be necessary to confirm this.

Differences were also observed between subpopulations for root architecture. Root systems from the Desoto, Apalachicola, and Ocala seedlings in the flooded treatment appeared to grow and branch profusely just below the surface of the media (Figure 7); a response not noted in the other subpopulations. These root systems were not necessarily more massive, (Figure 2), but they were observed to have

> 3 - 3°

▲ Figure 7—R. viscosum seedling from the Ocala subpopulation showing densely matted, branched rooting habit near the media surface.





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produced more new roots. Roots from seedlings from the Ouachita, Ouachita2, and Angelina subpopulations were noticeably more woody and thick following the experiment compared to the other subpopulations. Root branching and proliferation in response to flooding has been observed in other woody plant taxa, where elevated levels of ethylene in flooded roots increase auxin production and subsequent root branching.^{13,14} Such differences in root architecture across *R. viscosum* subpopulations merit further study to determine what if any role they play in flooding response.

Finally, in looking at these shoot and root mass results, it is worth noting that seed from all subpopulations but Apalachicola was collected from plants growing adjacent to or near bodies of water.⁶ Signs of flash flooding and periodic inundation, including bent *R. viscosum* plants and debris in branches, abounded in all except the Apalachicola subpopulation.⁶ However, this Apalachicola subpopulation did receive high annual rainfall relative to the other subpopulations (Table 1). These observations from the wild suggest that some *R. viscosum* populations are subjected to periodic inundation or increased annual precipitation, and may thus be more tolerant to flooding.

In summary, *R. viscosum* germplasm evaluated in this trial does not appear to be significantly affected by flooding when measured by root and shoot dry mass. Nonetheless, there exists variation in vigor among subpopulations as measured by root and shoot dry masses when subjected to periodic flooding conditions. These results suggest *R. viscosum* may serve as a good potential source for flooding tolerance



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for deciduous azalea breeding. We stress that these results are preliminary: It is also possible that genetic variation for other traits beyond root and shoot growth that could influence flooding tolerance in *R. viscosum* exist. Additional research on flooding tolerance in *R. viscosum* should focus on these more complex responses and analyze a larger number of maternal half sib families per subpopulation. It will also be imperative to compare the flooding tolerance of *R. viscosum* to other commercially available cultivars in order to determine the potential for improvement that could be gained from the germplasm. Such efforts would broaden our understanding of flood tolerance in *R. viscosum* and potentially facilitate development of more durable *Rhododendron* sect. *Pentanthera* cultivars.

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Alexander Susko, PhD Student, Department of Agronomy and Plant Genetics, University of Minnesota Twin-Cities, where he studies plant breeding. His Master's research focused on North American deciduous azaleas. He is currently advised by Dr. Kevin Smith, where his doctoral study is involved in determining the physiological, environmental, and genetic factors underlying lodging in oats.

Steven McNamara, Research Scientist, University of Minnesota Horticultural Research Center, Excelsior, MN.

Stan C. Hokanson, Professor, Department of Horticultural Science, University of Minnesota Twin-Cities.

Acknowledgements

We thank Charles Frahm and Kim Drewiske for their help with setting up the flooding experiment and collecting data. The research for this article was funded in part by a grant from the ASA's Research Fund.

For the Record

On page 31 in Part II of Barbara Bullock's article in the Summer 2017 issue, R. 'Lohengrin' was incorrectly identified as a Glenn Dale hybrid. Author Bullock has sent in this correction: "It's an old Kaempferi cultivar from the 19th century that Morrison planted probably for comparison reasons. (As stated in the text, p. 29, column 2, 2nd paragraph.)"

Also, the caption to Figure 13 on p. 46 should have read: Rick Bauer (1) presented J. Jackson (r) with a commemorative President's gavel for his service 2013-2017.

Recognizing Generous ASA Members

By Paul Beck, Treasurer

I would like to recognize and thank the following members who made donations to the Operating Fund of the Azalea Society of America in 2016-2017 by paying dues in excess of the \$30 annual regular amount or by making direct payments to the ASA. We have three categories for donations – **Contributing** (payment of \$25 to \$99 for the year); **Supporting** (\$100 to \$199), and **Endowing** (\$200 or more). My apologies if I missed anyone.

Contributing Members

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Recognizing Other Donations

In addition to the donations as part of membership renewal, the ASA has also received the following special donations, for which we are very grateful.

Operating Fund: Lloyd & Margaret Willis, in honor of Paul & Carolyn Beck. Budne & Diane Reinke, in memory of Francis Louer.

The **2016 ARS/ASA Joint Convention** donated a very generous \$5,000 contribution to the Operating Fund. A big THANK YOU to the convention committee for this donation.

Azalea Research Fund: Fred Anderson, Dave & Virginia Banks, Hale & Susan Booth, Mark Crawford, Jerry O'Dell, David & Joan Taylor, Margaret Vogel

The Azalea Research Fund also received a very generous \$2,000 donation from the Dolan Gardens Foundation.

The **Great Gardens of America** donated \$2,100 to support an unspecified purpose. The BOD will be looking at how best to use this donation.

The George Harding Memorial Garden donated \$3,200 to help continue the legacy and memory of George W. Harding.

Recruiting New ASA Members

By Robert Thau—Jasper, Texas

For those of you who don't know me, I'm Robert Thau from the Texas Chapter and the new membership chairman for the ASA. Many of us at the 2017 ASA convention in Hammond had thoughts about membership running through our minds. I was able to get some good ideas from some of our fellow members. I'm hoping we can start a dialogue among chapters to share good ideas about techniques to



▲ Robert Thau

use for gaining (and retaining) members. We have recently been very successful in recruiting members for the Texas Chapter. Below are some techniques which you might be able to use in your recruiting efforts:

- Give presentations to other plant societies if you have speakers on azaleas in your chapter, contact other local plant societies, including the Master Gardeners. I show these members a book I maintain of azalea photos. These photos blow people away. I also propagate and give away azaleas, which is always a big hit. I make connections through these presentations that result in more connections to folks who are interested in hearing about azaleas. You can also refer people to our ASA website for additional information.
- Engage local community organizations I have pushed the Azalea City program to community leaders in Jasper, TX. I have spoken to the head of the Chamber of Commerce (who has also joined the society). The Azalea City concept has energized some of these leaders to recruit other members. Even the mayor of Jasper and his wife have joined! Jasper has recently submitted paperwork to become an Azalea City.
- 3. Invite members of other plant societies Open your gardens to other society members. Invite them to participate in your meetings. Make them aware of what a great organization this is.

A new idea was given to me by Allen Owings at the convention. Our conventions occur all around the country, sometimes in places where we don't have active chapters. A good idea is to present a workshop the day prior to the convention to include topics such as propagating, care and planting of azaleas, and slideshows on many of the beautiful varieties. These workshops would be advertised through local media, garden centers and plant societies. A registration fee could be charged to pay for supplies (as necessary), provide compensation to the sponsoring chapter, and even to pay for a society membership. We could also give workshop attendees the ability to participate in our plant sales (which are normally restricted to society members) or even give them a plant to take with them. I will be pursuing this idea with the sponsors of the Little Rock convention; however, this could be something we consider for all future conventions.

The word "visibility" comes to mind in our recruiting efforts. We need to increase the visibility of our society and its benefits to the public. Each of our chapters should set goals for increasing their membership and finding new ways to make the society's benefits visible and tangible. I look forward to working with all of you. If you have any recruiting ideas that have been effective for you, please send them to me and I will share with all our chapters. Finally, a big thank you to all of you for gaining new members!

Contact Robert at: <u>rwbubbathau@yahoo.com</u> or 409-481-8318.

Renewal Time Is Approaching By Paul Beck, Treasurer

Important reminder: emails will be sent out in November to remind you to renew. This year I will be using the new email address, <u>treasurer@azaleas.org</u>. Please be sure to add this to your contact list to ensure the email gets through. This is especially important for those with an <u>earthlink.net</u> email address, since they actively block anything from our email server as spam.

That time of year, when your annual dues need to be paid, is fast approaching. Dues are still \$30 per year. Paper mailing of reminders will go out in early December. If you use email, and were not notified last year about your renewal via email, please send me your email address at treasurer@azaleas.org. If you wish for your email address to not be viewable by other members (membership information is not publicly viewable) on our website, please let me know and I will mark is as private. It saves the ASA money by not having to mail the paper reminder and it saves you time & money not having to mail the payment. If you choose to not renew electronically, you may use the renewal form on the wrapper of this issue and the winter issue of The Azalean. This application form is also available on the ASA website, at the Join Us, Renew or Donate link.

This year I am strongly encouraging the use of our new **subscription service**, via the **PayPal[™]** credit card payment service. This will allow you to register your credit card with PayPal, and have your annual membership fees deducted automatically. Click on the "Yearly Automatic Subscription" accordion near the bottom of the **Join Us** page.

Ben Morrison Chapter

Harold Belcher, Secretary

The chapter held its business meeting and plant exchange and auction May 24, 2017 at Christopher's Restaurant in Crofton, MD, with 10 members attending. President Budne informed us that the chapter had received its non-profit, tax exempt status under Section 501c(3) of the Internal Revenue Code and gave an abbreviated treasurer's report. The chapter's check in the amount of \$400 had been disbursed to the Benjamin Yoe Morrison Memorial Garden at the Pineville Presbyterian Church in Pass Christian, MS, and they received a thank you letter from Sylvia McLaurin.

We also received a check in the amount of \$2,000 from the Estate of Ms. Jean White. Bob McWhorter read the letter we received from Ms. White's niece concerning the bequest. The estate sold the property to folks who will restore the property and gardens, which is a fitting tribute to Frank and Jean White.

Summer events included a cutting picnic on July 1st at Wake Robin, the home and garden of Joe Miller. Joe allowed members to take some cuttings. Bee Hobbs mentioned that she had talked to Wanda Hanners. Wanda is still living on the Hanners' property in Huntingtown, MD, and offered her plants for cuttings as well. For our collectors, there were some Back Acres plants as well. Bob McWhorter has CDs with pictures of the azaleas that were formerly sold by the Hanners at Azalea Trace.

New member: Fred Newlan, Temple Hills, MD.

<u>Cutting Picnic Tip</u>: Take them early the morning of the picnic, label them, and place them in a cooler for transportation to a cutting picnic.

Alabamense Chapter

New member: Amanda Wilkins, Mobile Botanical Gardens, Mobile, AL.

Central Carolinas Chapter

New member: Andrea Sprott, Charlotte, NC.

Louisiana Chapter

Allen Owings, President

The chapter has been quiet after a very successful national azalea convention in late March. We appreciate everyone who attended or helped. Buddy Lee and Allen have been working with Arkansas members of the ASA to plan the national meeting for April 2018 in Little Rock, AR. It will be a great time and we hope you will mark your calendars for our first ever trip to Arkansas.

Plans for this fall include a BBQ social at LSUAgCenter's Hammond Research Station and we are also working to finalize the application for Hammond, LA, to become an ASA Azalea City.

Northern Virginia Chapter

Barry Sperling, Corresponding Secretary

After the March Mini-Conference and April lecture our club participated in the Green Spring Gardens annual plant sale. While the date in May was after the peak blooming period, Carolyn and Paul Beck provided a good selection of late-blooming plants and deciduous varieties so that the results were our best ever. Additional members providing muscle and expertise were Rick and Susan Bauer, Dick Cecka, Barb and John Kirkwood, Dan Krabill, Lars Larson, Lee McElvain, and Barry Sperling.

In July, we held our popular July cutting exchange with demonstrations by Carolyn Beck and Barry Sperling. The annual fall sale and auction will be held on September 23. The fall meeting with a speaker is planned for October 15 and the holiday social will be at the home of the Larsons on December 3rd. Meeting activities are held at the Kirkwood Presbyterian Church in West Springfield, VA. Details of our calendar are available on the club website: www.nv-asa.org

New member: Dr. Celeste Szewczyk, Arlington, VA; William Hitt, Charlottesville, VA.

▼ Shown at the Green Spring Gardens sale: (I. to r.) Lars Larson, Paul Beck, Susan Bauer, Rick Bauer



Texas Chapter News

Sherrie Randall, Secretary

In preparation for our annual summer cutting/sticking party held at the Randall's home, chapter members traveled to member Robert Thau's garden in Jasper, Texas, to collect cuttings from his vast evergreen hybrid collections. Added to those were cuttings from the Gayla Mize Garden on the campus of Stephen F. Austin State University in Nacogdoches, Texas. This has become a very popular activity for our chapter members.

Our fall meeting September 15 will begin at the IDEA garden in Tyler, Texas. This garden is maintained by the

Smith County Master Gardeners with the goal of inspiring visitors to "Innovate, Demonstrate, Educate & Apply" good gardening practices. Following the tour, members will then travel to Blue Moon Gardens in Chandler, Texas, for lunch, a business meeting, and of course, a tour in this garden which specializes in perennials, herbs, natives, hardy roses, and cottage garden flowers.

New members: Teressa Bailey, Petty Chapman, David and Ginger Godefroy, and John and Cristy Talbott, Jasper, TX; Jennifer Miranda, Brookeland, TX.

New At-Large Members

New members: Janet Carson, Little Rock, AR; Dr. Sukumar Desai, Weston, MA; Jerry Rice, Callahan, FL; Richard Royce, Kennett Square, PA.

Yes, You Can Write for *The Azalean*

The Azalean needs more good articles about azaleas, their care, and their use in the landscape. Example topics include:

- Seasonal care of azaleas, planting and pruning tips, and pest and disease prevention.
- Articles about new public gardens or special azalea collections being created in your areas.
- Descriptions and photographs of ASA member gardens.
- Current research in azaleas being conducted at local universities, extension service gardens, or junior colleges.
- Information about azalea festivals and sales.
- Historic garden restoration stories.
- Articles about noteworthy azalea hybrid groups or new species or cultivar introductions.

Format: Send articles as Microsoft Word document attachments to theazalean@gmail.com.

Illustrations: Color or black-and-white print or digital photographs, or drawings can be used for illustrations. Provide captions and photographer or artist name.

Deadlines: Send finished copy and illustrations by the following dates to ensure careful review and production:

Winter 2017 Issue—October 30 Spring 2018 Issue—December 1 Summer 2018 Issue—February 1 Fall 2018 Issue—July 1

Call for Gardens' Deciduous Azalea Collections Data

Patrick Thompson of the Davis Arboretum at Auburn University is doing a survey of public gardens with deciduous azalea collections. Ideal candidates for participation have full time staff dedicated to the longterm maintenance of living collections, or seed banks with sufficient record-keeping to provide information on the source of wild collected and nursery grown plant material.

The goal is to compare lists and source information to perform a gap analysis to determine which types of deciduous azaleas, and even which portions of a native species' range are represented well, and which are rare in US collections. Detailed provenance information is crucial for conservation of wild genetic material, as many of our native azalea populations are lost to development.

So far, the following gardens have provided records for this study:

- Atlanta Botanical Garden
- Auburn's Davis Arboretum
- Bartlett Arboretum
- Connecticut College Arboretum
- Huntsville Botanical Gardens
- Jenkins Arboretum
- Mt. Cuba
- North Carolina Arboretum
- Stephen F. Austin State University Gardens
- US National Arboretum
- US NPGS GRIN Global.

Results of the survey will be published in a future issue of *The Azalean*. If you know of gardens which would like to participate, check to see if they can provide accession numbers, and source information for the plants in their collection. If so, have the garden's plant recorder or curator contact Patrick to get the format in which records must be submitted to be included.

Patrick Thompson President Alabamense Chapter ASA Davis Arboretum Auburn University http://thomppg.wix.com/auburnazalea thomppg@auburn.edu (334) 332-0283

Remembrances of Jane Newman

From NVA "Azalea Clipper" July 2017

Barry Sperling: always enjoyed Ι talking with Jane and once asked how it all got started. She told me that the man who worked on her car invited her over to see his azaleas. She particularly liked 'Quakeress' and that remained a favorite. I remember the huge plants in her driveway (12' tall or more) that showed the possibilities when they are cared for as she could. As you will read below, Jane was a stalwart of the NVA Chapter who helped to make



▲ Jane Newman

our meetings a gathering of experts as well as friends. We'll all miss her and think of her.

Dan Krabill: The Northern Virginia Chapter and the Azalea Society of America lost a very good friend and great azalea person with the death of Jane Newman on May 16, 2017 at the age of 91 at her home in Great Falls, Virginia. Jane joined the ASA in 1979 and was a founding member of the Northern Virginia Chapter. She was an avid collector of azaleas, growing many hundreds of varieties in her garden. She was particularly interested in the Glenn Dale collection of 454 varieties, of which she grew and photographed the great majority and was one of the premier experts. Jane happily shared her plant material and knowledge with chapter members and others. She was a very active participant at the ASA's Harding Garden at the American Horticulture Society for many years, both in weekly work sessions and regularly donating plants that one participant described at the time as being "bigger than Jane." She was a member of the Editorial Advisory Board of The Azalean from 1993 through 2012, and wrote articles for it for years. In recognition of all this, the ASA awarded Jane the Distinguished Service Award at its 2009 convention.

One of my favorite memories of Jane is a phone call I got from her years ago in which she said, "Come over and dig it up." She was referring to the hard-to-find Glenn Dale azalea 'Pied Piper', from which she had previously provided me with cuttings several times and which I had been singularly unsuccessful in rooting. We will miss Jane's good humor, sharp wit, knowledge, and generosity. Don Hyatt: I knew Jane for many years but she never shared too much about herself with me. We just talked azaleas. I do know that 'Quakeress' was the plant that sparked her interest and started it all. She had a huge plant on her driveway loop and I planted the variety at my street edge as a remembrance of her. She was probably one of the best people we ever had for azalea identification. She studied her azaleas very closely, especially the Glenn Dales. I was sure she could tell all 454 Glenn Dales apart by sight, even at a distance of 20 ft. :) Jane and I discussed battling deer and we had mutual interests in companion plants. She did take loads of pictures of her azaleas but she was very "camera shy" herself. She didn't want her own picture taken.

Jane's Unique Design Idea

Don Hyatt reported this very clever idea of Jane Newman's for grouping hostas, but a similar idea could work for azaleas—as a change from arranging them by hybrid groups, colors, or season of bloom: Jane decided to arrange her hostas in her garden in small clusters according to some general theme related to the name. For instance, she liked putting all the hostas named for foods together like 'Guacamole,' 'Gumdrop,' 'Espresso,' and 'Ribbon Candy'. Those that were named for song titles were planted together like 'White Christmas,' 'Rhapsody in Blue', and 'Tiny Dancer'. Those whose names related to US history were planted together like 'Patriot', 'Liberty', 'Independence Day', and 'American Eagle'.

In Memory of Jim Thornton

Hale Booth—Signal Mountain, TN

Jim Thornton was a real bulldog. I don't say that just because he lived near the home of the University of Georgia Bulldogs. Jim had an amazing ability to tackle big projects, get a good grip and hold on to whatever it was till he could shape it to what he wanted. I think he is the only person who has ever written an article for *The Azalean* about pruning azaleas with a chainsaw.

Jim was well respected in the ASA for his years of service as vice president (1995-1997) and president (1997-1999) of our organization. He helped charter the Oconee Chapter in 1991 and worked with it until it closed in 2015 and helped organize both the 1997 Atlanta and 2013 Athens conventions. In 2013, he was awarded the society's Distinguished Service Award. His long record of work, coupled with his ability to bulldog tasks, led to Jim being the logical choice to be charged with organizing what would become the society's highly successful azalea research program. Jim Thornton organized what was initially named the ASA Azalea Research Foundation Committee and composed of members that were appointed by the ASA board. We never had a meeting. He was the first chairman of this committee. Jim saw to it that everything was done by email. Jim never seemed to sleep. We would get emails from him at all hours, often beginning around 5 am. After a few hours Jim would following be up politely hounding us to respond to his ideas. "Hey y'all anybody out there?" There was a lot to do to actually turn a research program idea into a real ASA program. Jim tasked us with developing areas of focus based on input from members: figuring



▲ Jim Thornton

out what questions to ask in a research proposal; how to rank proposals; when to take applications; how to raise money; figuring out how much we could afford to award and so on. Often, I and others would get a phone call from Jim to discuss these various issues. Through his efforts within a year we had organized our azalea research program, solicited proposals, and were on our way to making our first research grants on behalf of ASA within a few months. Jim stepped down from the committee chairmanship after this first year of organization and development, but remained an active and supportive committee member until his unfortunate death in early July 2017.

Jim was very dedicated to the society and would volunteer to tackle many jobs that most of us would more likely want to dodge. One of my fondest memories was seeing this intense looking man that turned out to be Jim come roaring up to the 2013 convention hotel in Athens, Georgia, in a pickup truck that was literally groaning under the weight of a huge helter-skelter mound of azaleas in the back bed. The plant sale had arrived.

I doubt that I will ever need to crank up my chainsaw to prune my azaleas, but Jim Thornton with the support of his wife Patsy gave much to the Azalea Society of America and a lot of that gift was as a dedicated role model from which many of us have benefitted.

In Memory of Kathleen L. Van Veen

Courtesy of Van Veen Nursery website and The Oregonian

Kathy Van Veen (Jan. 6, 1947 - April 26, 2017), of the Van Veen Nursery in Portland, OR, joined the ASA as an at-large member in 1985. She also advertised in *The Azalean* and on the Sources page on the ASA web, specializing in rhododendrons and azaleas, custom propagation, heritage trees, and promising "80-year-old rhododendrons... and the Japanese version of rhododendrons in America."

The nursery had been started by her grandfather, Theodore Van Veen, Sr. in 1926 "...as a means of supplying his landscape clients." A native of The Netherlands, he was a forward thinker who produced cutting-grown rhododendrons in nursery. his The operation passed down to his son Ted in 1961, and then granddaughter to Kathy in 2003. According to the nursery's website, she carried on



▲ Kathy Van Veen

the knowledge of her ancestors and was said to have been able to "root a pencil." She was active with the American Rhododendron Society and was awarded the ARS Gold Medal in 2011.

She attended the University of Washington in Seattle where she ran track and graduated with a doctorate. She was a life-long member of Mensa. Rhododendrons were Kathy's life. Her career began when she was still in high school, working part time at the Van Veen Nursery, moving to full time after college, and taking control in 2003. With her work and innovations in rhododendron propagation, she soon became a respected leader in the international rhododendron community, following in the family's footsteps.

Kathy also served as President of the Portland Chapter of the American Rhododendron Society and Chair of Friends of Crystal Springs Rhododendron Garden. She never stopped learning and teaching about rhododendrons, and always enjoyed volunteering on the subject. In addition to the nursery, Kathy loved her family and friends, her several cats, and her two garrulous cockatiels. She regularly jogged to the top of Mt. Tabor, had a wicked sense of humor, a ready smile, and walked her daily errands. She was always happy and found humor everywhere.

LOST Aromi Azaleas

The Aromi Legacy Project is seeking members' help in locating any (crossing fingers for all), of the following hybrids: 'Four Sisters', 'Indian Yellow', 'Jack of Hearts', 'Sundown', 'Lavender Lad', 'Red Echo', 'Red Embers', 'Salmon Sequin', 'Sea Spray', 'September Song', or 'Twilight Queen'. If you have, or know a location for, any of these, please contact Sherrie Randall, Aromi Legacy project lead, at: frecklesr1@ hotmail.com.

Azalea Care in the Fall By Charles A. Andrews III—Cumming, Georgia

Gardening wise, we tend to slack off by the time fall begins. Yet, there are several tasks to consider for this time of year. Here are two.

First is to make sure your azaleas and other plants are still well mulched. We all know this but sometimes it becomes a low priority. Natural mulch needs to be replaced because it slowly decays, putting organic matter back into the soil. Mulching conserves water, helps keep the soil from compacting, and protects the roots in winter. Coarse pine bark and pine straw are two excellent mulches. There are many others. Two or three inches is best. Make sure the mulch is kept a few inches off the shoots and trunks. You do not want a nice cozy home for insects next to your azalea trunks.

The "Western Azalea"

Deciduous azalea *Rhododendron occidentale* is often called the "Western Azalea" because it is the only deciduous azalea to thrive in the West: "Rhododendron occidentale is distributed within the Coast Ranges of California, the Klamath Ranges of northern California and southern Oregon, the Sierra Nevada, and the Peninsular Ranges of southern California."¹ While it can withstand, and regrow, after wild fires, it cannot live in the hot humid-night areas where our other southeastern American deciduous azaleas thrive. However, because of its natural fragrance and genetic makeup it has been used in hybridization of very colorful azalea hybrid groups, including the Knap Hill and Exbury azaleas, since the late 1800s. *Please see photo on page 69*.

References and Notes

- 1 Hrusa, Fred. "Morphological and Isoenzyme Variation in *Rhododendron Occidentale* (Western Azalea) (Section *Pentanthera*, *Ericaceae*). *Madroño*. 2012. 59(3): 128–142.
- 2 An important resource for researching genetic makeup of azaleas (and rhododendrons) of all groups, is the <u>https://www.hirstum.info</u> website. Thanks to Richard ("Red") Cavender of Red's Rhodies in Sherwood, Oregon, for assistance in providing this information and photos of *R. occidentale* azaleas that he and others have hybridized.
- 3 More information is also available on the ASA website at: <u>https://www.azaleas.org/deciduous-</u> azaleas/the-white-group/

Next is planting. For much of the country, fall is the absolute best time to plant. Except in the areas where the ground freezes deeply, fall planting gives azaleas and other plants significant time to establish roots before the hot days of summer begin. Many nursery plants do not survive when planted in late spring, especially if planted in poorly prepared holes and when they have a poorly developed root system. Nursery plants are often on a hi-octane fertilizer diet, will look healthier than they are, and may not be ready to be weaned from the bottle. Unfortunately, most people only visit nurseries in the spring when many plants are in bloom, and even if some azaleas bloom in summer or later, nurseries and garden shops do not carry many plants at these times because there are so few customers.

If you are in a mild climate area, consider adopting a fallplanting regimen. A raised bed of fine pine bark can hold over small plants throughout the summer, and with a soaker hose and a couple of light applications of fertilizer during spring and summer, the plants will grow amazing roots. In the meantime, you can prepare nice, wide, well-amended planting holes ahead of time, ready for the plants come fall.



Save the Dates – April 5-7, 2018 for Azaleas in Arkansas!

By Gerald Klingaman—Fayetteville, Arkansas

For several years there has been discussion of bringing the ASA convention to Arkansas, a state where our group has never met. In 2018 our time has come. Thanks to the courage and generous support of the Louisiana Chapter and the organizing skills of Buddy Lee and Allen Owings, next year's ASA convention will be held in Little Rock on April 5, 6 and 7. Mark your calendars now.

Details are still being firmed up but we plan two days of tours, including a visit to Ronnie Palmer's Azalea Hill Gardens and Nursery where he propagates and grows a wide assortment of azaleas including groups such as numbered Gartrell hybrids, Glenn Dales, Holly Springs, Linwood Hardy, North Tisbury, Robert Stewart, and others.

Woodlands Garvan Garden, a jewel of southern gardens and the botanical garden of the University of Arkansas, is an incredible blending of architecture and nature in a woodland setting where meandering trails lead the visitor through sculptured Japanese gardens, beautiful floral displays and architectural features designed by award winning architects such as Arkansas' own Fay Jones. Private gardens will round out the Arkansas experience and showcase two gardens in the southern Ozarks, including the spectacular hillside azalea and rhododendron garden developed by Larry Coleman.

Allen Owings, in brainstorming with Janet Carson, Arkansas' leader of over 600 Master Gardeners, decided to initiate a daylong workshop for gardeners new to the world of azaleas. The workshopintended to introduce a new generation of gardeners to azaleaswill be held on Thursday, the day the



▲ Larry Coleman's hillside garden has been a 20-year labor of love for this long time ASA member.

The Moon Bridge at Garvan Woodlands Garden is one of the many iconic architectural feature you will enjoy during the 2018 ASA convention.



convention starts. This workshop is not a part of the ASA convention.

So, mark your calendars now and plan on joining us April 5 through 7 in Little Rock for the 2018 ASA convention. For more information on the 2018 convention contact Gerald Klingaman, gklingaman@bgozarks.org. Watch the Winter 2017 issue of The Azalean and the ASA website for registration information and convention details.

Chillin' Up North with the Florida Azalea, Rhododendron austrinum

By Steve Krebs—Madison, Ohio

In 2004, a group of nine native azalea species were planted in field rows at the David G. Leach Research Station of The Holden Arboretum in northeast Ohio. The source of the plants was Natural Landscapes Nursery (West Grove, PA), which specializes in growing native plants from wild-collected seed. Although most of the azalea species were already represented by existing accessions at the Arboretum's main campus (Kirtland, OH) and at the Leach Station (Madison, OH), plants of Rhododendron austrinum, the Florida Azalea, were a new addition to Holden's botanical collections.

The original purpose of this material was to document the extent of azalea flower bud "dehardening" when exposed to warm temperatures during their dormant, cold-acclimated state in winter.¹ Once the research was completed, the azaleas were kept in the field so that their beautiful displays could be

enjoyed by the staff and visitors. With time, the R. austrinum collection, a dozen plants in all, began to assert itself as one of the best native azalea performers at the Leach Station as well as one of the most attractive (Fig. 1). A few years later, we acquired several cultivars of R. austrinum hybrids and planted those in the field as well - R. 'Coleman's Sunshine' (possibly a R. alabamense x R. austrinum hybrid²), R. 'Earl's Gold' (R. austrinum seedling), R. 'Evening Sunset' (natural hybrid), and R. 'Millie Mac' (described as a species selection by Galle, 1985, but as a natural hybrid by Voss, 2000).^{3,4}

The native range of R. austrinum is fairly restricted, from northwest Florida into adjacent Georgia, Alabama, and southeast Mississippi. The species plants received from Natural Landscapes Nursery were grown from seed provided by Aaron Varnadoe, a grower of native azaleas who collected

▼ Figure 1— R. austrinum accessions in bloom at the Leach Station, spring 2015





▲ Figure 2— Daily winter air temperatures 2015. Data were recorded by the OSU-OARDC phenology project weather station at Sunleaf Nursery, Madison, OH, approximately 2 miles from the Leach Station.

R. austrinum from the wild in southern Alabama. According to the USDA plant hardiness zone map, the species' range includes climates with average annual maximum low temperatures of 10° to 20° F/- 12° to -7° C (hardiness zones 8a - 8b).

Despite its southern origins, the Florida Azalea is a highly ornamental plant that is often grown in gardens further north. A search of literature (Table 1) indicates a consensus that the northern limit for successful growth and flowering is hardiness zones 6a-6b, where the maximum low temperatures during winter average 0° to -10° F/-18° to -23° C. The Azalea Society of America assigns their list of R. austrinum cultivars hardiness ratings of 5B, meaning that flower buds can tolerate winter frosts in the -10° to -15°F/-23° to -26°C range. Another authority, the father-son team of Peter and Kenneth Cox based in Scotland, places a warmer limit on northern culture of R. austrinum (H3-H4, equivalent to zone 7 in the USDA ranking system) and state that this species "performs poorly in cooler and more northerly climates where it will not ripen its young growth or flower freely..."5

Recent events suggest that R. austrinum exceeds current estimates of its cold hardiness. In 2015, winter temperatures logged near the Leach Station reached record lows in February, with a minimum of -24°F/-31°C on February 20 (Fig. 2). For the Jan – March period, a total of 13 daily minimums at or below -10°F/-23°C were recorded, and average daily temperatures were at or below 0°F/-18°C for five days over a nine-day period in February. The cold was severe enough to damage blooms on some of the rhododendrons in the collection that had been selected by David Leach (his cutoff criteria for bud hardiness was a minimum of -15°F/-26°C). A collection of rhododendron hybrids derived from R. hyperythrum, a zone 6 species useful for disease resistance and heat tolerance breeding, were more severely damaged, with frost injury occurring in both flower buds and woody stem tissue.

Surprisingly, the collection of R. austrinum plants sailed through the winter of 2015 unscathed, as seen in photos of individuals taken the following spring (Fig. 1). Both

wild-collected R. the austrinum accessions (from Natural Landscapes Nursery) and the R. austrinum-derived cultivated forms appeared equally cold hardy. Although no close inspection for injured flower buds was made, an abundant floral display throughout the collection suggests that these azaleas experienced zero to near-zero bud damage at temperatures much lower than prior estimates of their cold hardiness. Plants that are bud hardy to -24°F/-31°C are classified as suitable for USDA hardiness zone 4b, which could place them in gardens in upper Michigan or lower Minnesota. It should be noted that factors other than minimum temperatures, such as the duration of cold spells or dehydration stress due to frozen soils, could prevent success with R. austrinum further north. Nonetheless, the 2015 experience of the Florida Azalea in northeast Ohio suggests that freezing injury to flower buds occurs well below -24°F/-31°C. The actual limit won't be known until the species is tested in a controlled freezing experiment or in additional garden trials at colder locations.

Considering its wide range of temperature adaptations in USDA hardiness zones 9 to 5 (and possibly colder), R. austrinum joins the ranks of other southern taxa notable for being grown well north of their native ranges. One famous example is the Franklin tree, Franklinia alatamaha, which is suitable for a zone 5 climate even though it was originally collected by William Bartram from the only known population in southeast Georgia (zone 8) where it is now extinct. The bald cypress, Taxodium distichum, is another warm climate species that can be grown far north of its native range – an extreme example is the Central Experimental Farm Arboretum in Ottawa (zone 4), where it occasionally experiences some damage to new growth following very cold winters. Other examples of cold adaptable southeastern natives include the mountain magnolia, Magnolia fraseri (hardy to zone 4); the fringe tree, Chionanthus virginicus, which is considered suitable for zone 3 climates; and the bottlebrush buckeye, Aesculus parviflora, an Alabama and Georgia native that can be grown in hardiness zone 5a climates.

Source	Northernmost USDA Hardiness Zone Rating
University of Florida IFAS Extension*	6b
Missouri Botanical Garden*	6
American Rhododendron Society*	6b
Azalea Society of America*	5b
Cox and Cox ⁵	7a (H3-H4)
Dirr ⁶	6
Galle ³	6b

▲ Table 1— Published plant hardiness ratings for *R. austrinum*.

The origin of high freezing tolerance in southern species is a matter of some speculation, although it is often attributed to Pleistocene Ice Age events that pushed former northern-distributed species south to refugia from which they never returned after the climate warmed. Although the cold hardiness trait may not have contributed significantly towards adaptation to the new, warmer environment, it may have remained as a "cryptic" trait that did not negatively affect overall plant fitness and therefore was never eliminated by natural selection. Moved to colder climates and receiving the appropriate environmental cues, these cold hardiness genes could once again be expressed.

Whatever its source, the deep frost tolerance of the Florida Azalea is a boon to horticulturists who can now enjoy this beautiful plant in many regions of North America. Furthermore, while *R. austrinum* has been a foundation species for many deciduous azalea hybridizers in the South (Aromi, Dodd, Lee), it should also be considered a valuable resource for developing colorful and fragrant hybrids for the far north.

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Steve Krebs, Director of the David G. Leach Research Station of The Holden Arboretum, continues the rhododendron breeding and research project started by David Leach and now operated by The Holden Arboretum. While the traditional focus on ornamental plants with USDA hardiness zone 5 cold tolerance is still in place, a more recent emphasis has been placed on selection for rhododendrons with root rot disease resistance, heat tolerance (for the Gulf South), compact growth habit, and improved foliage. A research project is also underway to test the abilities of grafted rootstocks to provide high pH tolerance (proprietary INKARHO rootstock) and/or root rot disease resistance (experimental rootstocks) in southern and northern field trials.



Newest Azalea City—Brookings, OR

By Teri Davis—Brookings, Oregon

[Brookings, with its 77-year history of celebrating azaleas, received its ASA Azalea City designation February 2017, Ed.]

A round 1943, State Park Historian W.A. Langille wrote of Brookings Oregon's Azalea State Park that "No one traveling this portion of the Oregon Coast highway in flower season, should miss the opportunity for a short diversion into this Azalea Park for a glimpse of its floral splendor. The flowers are well worth [your] while and the peaceful restfulness of the surroundings is an added inducement to tarry in the presence of their sweet scented loveliness."

Be that as it may, Azalea State Park actually got off to a rocky start in 1937 when local chamber of commerce president W.L. Crissy initiated correspondence trying to pique the interest of state officials in Salem to designate the area as a state park. The reception to the idea was lukewarm at best. But Crissy, refusing to be outdone, sought the support of the Portland Garden Club. Through a series of visits to the area, he garnered the backing of garden club member Mrs. Henry Cabell, whose husband, fortuitously, was the chairman of the State Highway Commission. With his support, and because of an impassioned speech given by Mrs. Cabell, the motion to develop the state park carried.

By the time Langille penned his report, he was able to declare that Azalea Park in the middle of May had "...been pronounced by competent authorities to be the handsomest and most impressive showing of native azaleas anywhere within the whole United States." Much the same can be said about the park in these modern times.

However, that wasn't always the case. In the years between Langille's report in 1943 until the State of Oregon conveyed it to the City of Brookings in 1992, the park and its riotously colorful indigenous inhabitants had been mostly neglected. It had, in fact, reverted to its "natural" overgrown state. It was this hefty burden of maintenance that prompted the state to transfer ownership to the city.

After the park was turned over to the city, a group of dedicated citizens, mostly seniors, began clearing away the years of accumulated debris, freeing the native azaleas from the stranglehold of berry vines and invasive brush. The trees and shrubs were pruned and the ancient native azaleas were freed from the smothering undergrowth.

From this grassroots effort, in November of 1994, came the idea of forming the Azalea Park Foundation in order to raise the funds necessary to create a three-acre garden at the western corner of the park for the benefit of the community and all the many visitors to the area. The effort was led by Academy Award winning filmmaker Elmo Williams, his wife Lorraine, and an assembly of volunteers. In 2008, Williams funded construction of the "Capella by the Sea" at Azalea Park, which has become a popular respite for park visitors.

Since the founding of the Azalea Park Foundation, a vast array of plantings and improvements have been done



R. occidentale in full bloom in Azalea Park, taken May 2017 by new ASA member, Brookings City Councilor Dennis Triglia.

This very fragrant, colorful deciduous azalea ('August Sunrise' x a large double *R. occidentale*) bloomed the last week of July 2017, in Sherwood, OR.



inside the garden, including the mounting of a monument memorializing the World War II bombing in Brookings executed by Japanese pilot Nobuo Fujita. The bombing was the only time in history that bombs were dropped on the American mainland.

With its medley of enhancements, Azalea Garden serves as a gateway to the park and to the city as well. Brookings Azalea Park, with its enchanting bedlam of color, is the catalyst that drives all-things-azalea within the most-recently recognized ASA Azalea City in the US.

Brookings Oregon is an incorporated city on the southernmost coast of the state with a population of about 6,550 people, but boasts a population of azaleas that is estimated to be almost a third of that. In fact, Azalea Park and sister park, Stout Park, have nearly 1,000 azaleas alone.

"They're everywhere," said Brookings City Manager

Gary Milliman with a laugh. "Including all over my front yard."

The Brookings azaleas include a species known as *Rhododendron occidentale*, which is the only variety native to the Pacific coast. According to Langille's report, some authorities assert that these native azaleas have "... weathered sun and storm for at least one hundred fifty years. Others [assert] they have attained to even four hundred years of continuous life." In either case, it is firmly agreed that "not a single azalea in the park has been planted by man. Every plant is just as it occurred in nature," according to a July 1960 report by E.P. Breakey.¹

The City of Brookings likes to garnish the story with another tidbit which contends the azaleas have been around since Lewis and Clark wintered in Oregon in 1805-06. City officials won't be so bold as to suggest Lewis and Clark actually walked through the park however.

Other endeavors to celebrate the vibrant, sweet scented azaleas include an annual Azalea Festival each Memorial Day weekend. This three-day event, now in its 77th year, features a parade, the crowning of the Azalea Festival Queen and Court, musical entertainment, and a variety of other activities. Besides Azalea Park, the azalea is also lauded in the City of Brookings through monikers such as Azalea Middle School and Azalea Gardens Senior Living.²

In an effort to encourage even more azalea excitement, City of Brookings City Council recently passed a measure to offer funding assistance to businesses in town which opt to include azaleas in their landscaping. The resolution further establishes a policy in the city to use azaleas in all its landscaping.

The City of Brookings invites azalea enthusiasts to visit at the height of the blooming season in May, but points out that with its mild climate, a visit to Brookings is a savory delight yearround.

> Closeup of R. occidentale in Azalea Park showing the species' tendency for variation in color.



References and Notes

- 1 Breakey, E. P., "Notes on Our Western Azalea Rhododendron occidentale." Journal American Rhododendron Society. July 1960. 14(3): 1-8.
- 2 For much more information, visit the city website: www.brookings.or.us/

Teri Davis has been the City Recorder for the City of Brookings since March 2016. One of her many passions is promoting tourism in the city.

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