Title of Project: Postharvest and Quality Attributes of Rabbiteye Blueberry for Alabama

Final or Progress Report: Progress

Research or Extension Proposal: Research

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Objectives:
The aim of this project is to analyze fruit quality and postharvest life of established rabbiteye cultivars and advanced rabbiteye blueberry (*Vaccinium virgatum*) selections adapted for Alabama production while participating in outreach to help Alabama growers select cultivars with high postharvest quality. The specific objectives are:

Objective 1: Determine the postharvest life, composition, mineral content, and phytonutrient content of established and new rabbiteye germplasm

Objective 2: Provide outreach/extension activities to inform Alabama growers of the differences in postharvest quality among the advanced rabbiteye selections relative to currently grown rabbiteye cultivars.

Justification and Description:

Global blueberry production doubled between 2010 and 2019, exceeding 1.0 million metric tons (MT) (FAOState, 2021, accessed on 10-05-2023). Historically, the United States is the largest blueberry producer with 310,800 MT harvested in 2022 (USDA NASS, 2022, accessed on 10-05-2023). In the U.S., most blueberry production is in Washington, Georgia, Florida, Michigan and Oregon (USDA NASS, 2021 accessed on 10-05-2023). Alabama has a smaller blueberry acreage, with grower interest in expansion of u-pick farms, farmers markets and local wholesale markets. Three fresh market commercial blueberry genotypes dominate U.S. production; these types vary in cold hardiness, chilling hours, and fruit characteristics. Generally, southern highbush (*Vaccinium corymbosum*) and rabbiteye (*Vaccinium virgatum*) are grown in the southern U.S. (Wang and Nambeesan, 2022). In Alabama, rabbiteye is commonly planted as it is generally easier to manage than southern highbush, and is tolerant to drought,

has disease resistance and high yields (Miller-Buttler et al., 2009; Potter, 2011). Unfortunately, acceptance of rabbiteye blueberry in the wholesale market remains a serious issue (Itle, 2021), as fruit is considered inferior in quality and flavor (personal communication with Dr. Sushan) hindering the Alabama blueberry industry.

Blueberry consumption continues to increase due to desirable fruit quality, flavor and demonstrated health-promoting properties (Rodriguez-Mateos et al., 2016). Blueberries provide vitamins, phenolic compounds, anthocyanins, minerals and organic acids (Silva et al., 2020; Yang et al., 2023). Consumers also want fruit with high firmness, good ratio of sweet to acid, small seeds, thin peel and a long shelf-life (Cappai et al., 2018; Chiabrando et al., 2014). Unfortunately, rabbiteye fruit are viewed as inferior to southern highbush fruit in sensory quality and nutrition (Itle, 2021). Rabbiteye fruit are considered to be grittier, seedier and tougher compared to highbush (Itle, 2021), which reduces the financial return to growers, and can even cause exclusion of some rabbiteye varieties from the marketplace. These negative views on sensory quality are based on older rabbiteye varieties such as 'Tifblue' or 'Climax' (personal communication with Dr. Penny Perkins-Veazie). Additionally, recent rabbiteye releases lack mineral or phytochemical evaluation.

Postharvest data on shelf-life, fruit firmness, and composition is readily available for highbush cultivars (Blaker et al., 2014; Cappai et al., 2018; Chiabrando et al., 2014; Giongo et al., 2022; Kader et al., 1996; Sargent et al., 2013). Southern highbush blueberries can maintain firmness for 4 weeks at 4 °C while, rabbiteye blueberries seem to store better at lower temperatures ranging from 1.5 to 3 °C for 4 weeks (Nunez-Barrios et al., 2008; Wang, 2021; Schotsmans et al., 2007). A few studies conducted on older rabbiteye cultivars indicated shelf-life was as good as or better than highbush with fruit maintaining quality up to 6 weeks in storage (Schotsmans et al., 2007) However, newer rabbiteye blueberry cultivars have not been evaluated for shelf-life, composition, or phytonutrient content. The purpose of these experiments is to provide information on the postharvest quality of established cultivars and new rabbiteye germplasm adapted for Alabama conditions and to aid the selection of new cultivars with a long shelf-life and high fruit quality.

Materials and Methods

Fruit samples were collected from 11 rabbiteye cultivars (Overtime, Alapaha, Brightwell, Krewer, Ochlocknee, Titan, Vernon, Tifblue, Powederblue, Premier and Climax) and 9 advanced germplasm selections evaluated in Dr. Sushan Ru's small fruit breeding program and Dr. Elina Coneva's extension program. Bushes were planted at the E.V. Smith Research Center (Tallasee, AL, 32°29'48.7"N, 85°53'33.8"W) or Chilton Research and Extension Center (Clanton, AL, *32°56'39.8112"N, 86°39'39.9888*"W). In both locations, bushes were planted in a randomized complete block design with a minimum of three replicates and three plants per plot for each genotype. Bushes underwent conventional production and fertigation following the Southeast blueberry handbook (Krewer et al., 2015).

Fruit harvest began on 22 May 2024 and concluded 24 June 2024. In short, roughly 400 g of blueberry fruit was harvested at commercial maturity g. homogeneous fruit size, complete blue surface color and no white/red rings around the pedicel scar (Giongo et al., 2013). Blueberries were harvested into labeled plastic bags then placed in coolers equipped with ice packs. Following harvest, fruit was immediately transported to the postharvest laboratory located in Funchess Hall at Auburn University (Auburn, AL). Fruit was then sorted to remove unripe, decayed, or bruised fruit. Sorted berries were placed into separate, labeled containers with their respective timepoints, harvest date, cultivar/genotype, plot number, and replication number. The storage timepoints were day 0 (0d), day 14 (14d), day 28 (28d) and day 42 (42d). For timepoints 0d – 28d blueberries were placed into 9 oz solo cups with holes in the lid. The 42d blueberries were placed into 16 oz clamshells (Southern Container Corporation, Wilson, NC) and were subsequently evaluated for color, fresh weight throughout the storage experiments. All fruit were stored in a cold chamber held at 4 °C equipped with a humidifier to maintain ambient humidity between 80-90%.

Color data was taken from blueberries at each storage timepoints. Ten blueberries were pre-selected from 42d clamshells. At each timepoint, the ten individual berries were weighed (g), then, a CM-

600 Konica Minolta Colorimeter was used to assess L*, a*, b*, c* and hue angle. Color data was taken on the stem end and perpendicular side to the stem end of each berry. Color data is reported as an average across each replication and cultivar. Finally, berries were placed back into the clamshell to await firmness testing.

Measurements for firmness were taken using a FruitFirm1000. Ten berries per replication and timepoint were loaded onto the machine (n = 30 per cultivar and timepoint). Berries were loaded on perpendicular side to the stem end to allow the machine to take their diameter in mm and shear force firmness in (g/mm^2). After running the berries through the machine, they are placed into (VWR, Radnor, Pennsylvania) 50 mL conical tubes to be stored in -20°C (for up to 6 mo.) or -80 °C for up to 18 mo. for general composition.

Data for soluble solids content (SSC), titratable acidity (TA), and pH were taken for blueberries. A total of four replications per cultivar and storage time were assessed (n = 4 per cultivar and timepoint). During the thawing stage, 9 mm steel beads were placed into VWR 50 mL conical tubes while thawing occurs. Gloves were used for this step to avoid contamination. Homogenization is done using a Geno/Grinder 2010 with settings: Run Time: 1:30 minutes, Rate: 1000, Rest: 0:15 seconds, Cycle: 2 cycles. After homogenization steel beads were removed with a metal spatula. Then 0.5 g of the sample is weighed using a 5 mL plastic pipette into an unlabeled 50 mL tube. Deionized water (24.5 mL, DI H_2O) was added to each tube using a dispensette to dilute samples for TA.

To take SSC a square cut cheese cloth (approx. 4 cm^2) was placed onto the ATAGO refractometer set for blueberry. Using a 5 mL plastic pipette, homogenized samples are dispensed onto the cheese cloth and squeezed onto the lens. Following SSC, the diluted blueberry sample is gently poured on the ATAGO meter for the TA reading. Finally, pH was taken using an Oakton or Thermo Scientific pH meter equipped with a Ross Ultra Triode (product no. 263745-001, Thermo Scientific Orion, Waltham, MA). After pH, samples are then re-capped stored at -20°C for total phytonutrient assays. Some samples were also further sorted as either whole berry samples or homogenized and were sent to Dr. Penelope Perkins-Veazie at North Carolina State University chlorogenic acid testing.

Critical note: total phytonutrient assays are currently ongoing in the postharvest laboratory. Data has not been fully collected on the rabbiteye cultivar trial and is not being reported.

Data Analysis

All data was analyzed using JMP 18.0.0 (SAS Intitute, Cary, NC). Data was analyzed three different ways to identify location effects on the rabbiteye cultivars and within the two locations of E.V. Smith Research Center and Chilton County Research and Extension Center (CREC). A Three-Way ANOVA was used to model the independent effects of location, cultivar and storage timepoint on 5 uniform cultivars (Alapaha, Krewer, Ochlocknee, Titan and Vernon) across both production locations in Alabama. A Two-Way ANOVA was used to model the independent effects of cultivar and storage timepoint on the cultivars produced at the E.V. Smith Research Station or CREC. The dependent variables for all models include percent weight loss (%weight loss), berry firmness, berry diameter, colorimeter values (L*, a*, b*, c* and hue angle, SSC, TA, pH and SSC:TA ratio. A report on the overall statistical significance of each model is found in **Table 1**.

Data being presented is preliminary. Harvest date will also be considered in future analyses along with multivariate analysis of principal component analysis (PCA) and hierarchical cluster analysis (HCA). A correlation analysis of tissue firmness, berry diameter, storage time, cultivar, harvest date and location will also be done.

Current Preliminary Results

Overall, fruit firmness significantly decreased throughout the 42 days of cold storage. At day 0 fruit firmness was 209.6 g/mm^2 and reduced to 175.1 g/mm^2 by day 42 (**Fig. 1A**). Berry diameter decreased with increased storage time from 21.1 mm on day 0 to 20.4 mm on day 42 (**Fig. 1B**). Among the cultivars and advanced selections, ‘Titan’ (24.3 mm) and ‘T-3075’ (25.4 mm) had the largest berry

diameter, while 'Alapaha' (17.7) and 'Pink Lemonade' (16.9 mm) were the smallest, respectively (**Fig. 2**). No other notable significance was identified in the cultivar*timepoint interaction for berry diameter.

When comparing locations, the CREC cultivars had overall higher tissue firmness from day 0 through day 28 compared to E.V. Smith, but no differences were seen on day 42 between the two locations (**Fig. 3**). 'Titan' had the highest tissue firmness among the established RE cultivars at 259.6 g/mm^2 at day 0, and held its firmness until day 28 (251.7 g/mm^2) with a sharp decline at day 42 (214.1 g/mm^2) (**Fig. 4**). Conversely, 'Alapaha', 'Ochlocknee' and 'Pink Lemonade' had the lowest tissue firmness from day 0 (184.7, 169.9 and 148.7 g/mm^2) through day 42 (167.7, 149.8 and 142.2 g/mm^2) compared to all established REs (**Fig. 4**). While, the advanced selection 'T-3081' and 'T-3075' had the highest initial firmness at 248.7 and 262.3 g/mm^2 with little loss in firmness by day 42. Conversely, 'MS1110R' had the lowest starting tissue firmness at (162.1 g/mm^2) and slightly increased through storage (day 42) to 167.5 g/mm^2 (**Fig. 4**).

Significant differences were found among location and cultivars in the colorimeter values of L*, a*, b*, c* and hue angle. Fruit from CREC had higher L*, lower b* and higher c* compared to EV Smith (**Table 2**). Since differences were found among location, all CREC and E.V. Smith cultivars are being presented separately in **Table 3** and **Table 4**. Further assessment will be done to better understand the differences between cultivars and colorimeter values. There were no significant differences between the storage timepoint or the interaction of cultivar*timepoint.

Location did not significantly affect soluble solids content (SSC), titratable acidity (TA), and SSC:TA ratio. The pH was higher in fruit from EV Smith compared to CREC (3.41 vs 3.27). The interaction of timepoint*cultivar significantly differed for SSC, TA, pH and SSC:TA ratio among all rabbiteye cultivars grown in both Alabama locations. The established cultivar of 'Brightwell'(16.3), 'Ochlocknee' (16.3) and 'Climax'(15.5) indicated the highest SSC at harvest (0d) and all cultivars subsequently increased in SSC by day 42 (42d) in storage (18.3, 16.4 and 15.7, respectively). The advanced selections of 'MS1228R' (16.7) and 'T-3072' (14.8) also indicated the highest SSC at harvest (0d) and increased significantly through storage (18.0 and 19.1). While 'Alapaha', 'Pink Lemonade' and 'MS1221R' had the lowest SSC from harvest through storage compared to all other cultivars (**Fig. 5**).

Titratable acidity generally increased from harvest (0d, 0.41) throughout all storage times (42d, 0.51). Established cultivars of 'Tifblue'(0.67), 'Vernon' (0.60) and 'Climax' (0.61) indicated the highest TA compared to 'Alapaha' (0.36). The advanced selections 'MS1234R' and 'MS1228R' also had the highest TA at 0.67 and 0.65 compared to MS1110R (0.40), respectively (**Fig. 6**).

Fruit pH showed a similar trend to TA and increased throughout storage from 3.31 (0d) to 3.52 on day 42 (42d). 'Brightwell' (3.57) and 'Alapaha' (3.47) had the highest pH compared to 'Vernon' (3.32) which was the lowest. While the advanced selections 'MS1110R' and 'T-2467' had the highest pH at 3.54 and 3.46, respectively. 'T-3075' indicated the lowest pH from harvest through storage at 3.28 (**Fig. 7**).

The SSC:TA ratio did not significantly change from harvest (32.7) through 42d storage (31.5), however, d14 and d28 were lower at 28.6 and 28.8. 'Brightwell' (47.7) and 'Alapaha' (42.7) had the highest SSC:TA at harvest and both decreased by 42d to 32.4 and 37.9. While the advanced selection 'MS1595' and 'T-3072' had the highest SSC:TA ratio from harvest through storage, with 'T-3072' spiking to 59.7. 'Vernon' and 'MS1234R' indicated the lowest SSC:TA ratio at harvest 19.75 and 28.8 and decreased throughout storage to 18.8 and 17.9, respectively (**Fig. 7**).

Discussion

Blueberry quality is critical for consumer acceptance and ripe blueberries are known to vary widely in firmness, berry diameter (Giongo et al., 2013) and general composition . Fruit firmness is among the most important quality factors to determine consumer acceptance and is defined as the force required to break or fracture the blueberry sample between molars (Giongo et al, 2013). Unfortunately, RE blueberries are considered inferior in firmness due to their thick peel and gritty texture (Itle, 2021; Itle & NeSmith, 2016). Due to these quality issues, breeding programs have been working to replace inferior cultivars with improved quality and texture (personal communication with Dr. Sushan Ru, Auburn University).

Changes in tissue firmness have been largely related to environmental conditions at harvest, variable temperatures during storage and cell wall polysaccharide content (Trandel-Hayse et al., 2023) Storage time was a dominant factor that significantly impacted the fruit firmness with high variability throughout storage. 'Titan','T-3081' and 'T-3075' had the highest initial firmness and all three cultivars/selections maintained firmness throughout 28 days of storage. These increases in firmness may be related to higher amounts of hemicellulose content in both the peel and the pulp (Trandel-Hayse et al., 2023). 'Alapaha', 'Ochlocknee' and 'MS1110R' had the lowest tissue firmness which may be related to increased amounts of pectin, specifically homogalacturonan (Olmedo et al., 2021). Future cell wall work on these cultivars is planned to determine cell wall effects on tissue firmness.

Blueberry fruit general composition of soluble solids, titratable acidity and pH can be used as an indicator for overall liking and consumer acceptance. Among these factors, soluble solids and the ratio of SSC:TA are the two most important initial factors considered for flavor (Gilbert et al., 2014; Casozo et al., 2024). A study by Canales et al. (2024) indicated SSC ranging between 14-16 °Brix and SSC:TA ratio between 35-55 is most preferred by consumers. Among the RE cultivars, 'Brightwell'(16.3), 'Ochlocknee' (16.3), 'Climax'(15.5), 'MS1228R' (16.7) and 'T-3072' (14.8) had the highest SSC. Moreover, 'Brightwell', 'Alapaha' and 'T-3072' maintained an SSC:TA ratio between 35-55 from harvest through storage. This indicates these RE cultivars may be most preferred by consumers and can maintain high quality through storage (Itle et al., 2024).

Among general composition, pH has little to no predictable relationship to overall consumer acceptance and flavor (Redpath et al., 2021). However, pH is important to fruit shelf-life as a lower pH can inhibit microbial growth helping to preserve flavor and extend shelf-life in fruit (Casozo e al., 2024). 'T-3075' maintained the lowest pH in this study and ultimately had highest tissue firmness throughout storage indicating this may be a suitable cultivar for longer storage durations/transportation.

Current Conclusions and Impacts

This research is critically important to the RE blueberry industry as it can guide breeding efforts to select cultivars with firmer and better tasting fruit to meet consumer demands. The current research allowed for a deeper understanding of general composition, and specifically focused on SSC and SSC:TA ratio. Overall, this postharvest study identified RE blueberry fruit can maintain firmness plus meet the SSC and TA desires for consumer acceptance.

By delving into textural issues, we can identify what cell wall constituents (e.g., cellulose, hemicellulose, pectin and lignin) are assembling the peel and pulp. Pinpointing these differences may allow for a better understanding of what is causing the gritty peel and mealy texture associated with the pulp in RE cultivars. This information can be useful for RE breeding programs to select cultivars with improved textural qualities. Moreover, general composition was impacted by cultivar and storage time, but is still not fully explaining flavor. This indicates future work assessing volatiles, aroma and sensory analysis in established RE compared to advanced selections is needed.

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Table 1. Overall statistical results reporting significance on the independent variables and interactions within the 5 cultivars uniform across two Alabama locations, all cultivars grown at EV Smith Research Station (EV Smith) and all cultivars grown at the Chilton Country Research and Extension Center (CREC).

	Dependent Variables											
Independent Variables	**%Weight loss**	**SSC**	**TA**	**pH**	**SSC:TA**	**L***	**a***	**b***	**c***	**Hue Angle**	**Firmness**	**Berry diameter**
Location Effect	**3-Way ANOVA with Interactions**											
Location	NS	NS	NS	***	NS	*	NS	**	**	NS	NS	NS
Timepoint	**	*	*	***	*	NS	NS	NS	NS	NS	**	**
CV	*	**	*	***	**	**	**	**	**	*	*	*
Location*CV	*	**	NS	NS	*	**	NS	**	**	*	NS	NS
Location*Timepoint	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	**	**
Timepoint*CV	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	NS	NS
EV Smith	**2-Way ANOVA with Interaction**											
Timepoint	**	**	*	**	**	NS	NS	NS	NS	**	*	*
CV	*	**	**	**	**	**	**	**	**	**	*	*
Timepoint*CV	NS	NS	**	NS	**	NS	NS	NS	NS	NS	**	NS
CREC	**2-Way ANOVA with Interaction**											
Timepoint	**	*	*	**	**	NS	NS	NS	NS	**	**	**
CV	**	**	*	**	**	**	**	*	**	**	*	*
Timepoint*CV	NS	NS	NS	NS	NS	NS	NS	NS	*	NS	**	NS

ANOVA significance determined with $p \leq 0.05$.

NS = not significant; * = $p \leq$ 0.05 – 0.001; ** = $p \leq 0.000$;1 CV = cultivar; %weight loss = percent weight loss

Table 2. Effect of colorimeter readings (L*, a*, b*, c* and hue angle) on the five uniform cultivars between two production locations in Alabama during the 2024 growing season.

Color Value	Cultivars									
	EV Smith					Chilton County Research and Extension Center				
	Alapaha	Krewer	Ochlocknee	Titan	Vernon	Alapaha	Krewer	Ochlocknee	Titan	Vernon
L*	28.0cd	28.6cd	28.1cd	30.8bc	33.1ab	27.1d	34.1ab	33.3ab	34.6a	35.0a
a*	0.8ab	1.0a	0.6abc	0.8cd	0.4cd	1.0a	0.9a	0.4d	0.6abcd	0.5bcd
b*	-2.4ab	-3.0abc	-3.1bc	-2.3a	-3.9ef	-2.8abc	-3.8de	-4.5f	-3.3cde	-3.2cd
c*	2.8de	3.3cd	3.2cd	2.6e	4.0ab	3.1cde	4.0ab	4.6a	3.5bc	3.3cd
Hue	280.1ab	291.0ab	281.1ab	280.7ab	277.0ab	291.5a	284.7ab	274.9b	282.5ab	280.5ab

All values reported as means averaged across the four storage timepoints (e.g., day 0, day 14, day 28 and day 42The significance of cultivar*location was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
EV = EV Smith Research Center; CREC = Chilton County Research and Extension Center.

Table 3. Colorimeter readings (L*, a*, b*, c* and hue angle) on the advanced rabbiteye selections and established rabbiteye cultivars grown at EV Smith Research Station in 2024.

	Cultivar															
	Established RE								Advanced RE							
Color Value	Alapaha	Brightwell	Krewer	Legacy	Ochloc-knee	Over-time	Titan	Vernon	MS-1110R	MS-1228R	MS-1234R	MS-1595R	T2467	T3072	T3075	T3081
L*	28.0bcde	28.9cdef	28.6abcd	27.9abc	28.1defg	31.1fghi	30.8def	33.1fghi	30.3defg	30.4efgh	34.1i	33.4ghi	32.5fghi	34.4efg	32.1fghi	34.6de
a*	0.8cd	0.7cde	1.0bc	1.1ab	0.6def	0.2ij	0.8cde	0.4fgh	0.5efg	0.5fg	0.1j	0.2ghi	0.4ghi	0.6defg	1.1ab	0.8cde
b*	-2.8	-3.1e	-3.0e	-0.7b	-3.1ef	-4.0i	-2.3cd	-3.9hi	-3.6fgh	-3.4efg	-3.8ghi	-3.8ghi	-3.7ghi	-3.4efg	-2.3cd	-2.3cd
c*	2.8f	3.3de	3.3e	1.7g	3.2e	4.0a	2.6f	4.0ab	3.6bcd	3.5bcde	3.8abc	3.8abc	3.7abcd	3.5cde	2.8f	2.5f
Hue	280.1ab	279.5ab	291.0a	225.1c	281.1ab	273.6ab	280.7ab	277.0ab	264.0b	279.3ab	272.4ab	274.4ab	277.1ab	279.7ab	285.1a	292.4a

All values are reported as means averaged across the four storage timepoints (e.g., day 0, day 14, day 28 and day 42). The significance of cultivar/selection was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
RE = rabbiteye; Adv RE = advanced rabbiteye selection.

Table 3. Colorimeter readings (L*, a*, b*, c* and hue angle) on the established rabbiteye cultivars grown at the Chilton County Research and Extension Center in 2024.

Color value	Cultivar									
	Alapaha	Climax	Krewer	Ochlocknee	Pink Lemonade	Powderblue	Premier	Tifblue	Titan	Vernon
L*	27.1e	34.4bc	34.1bc	33.3cd	35.9ab	37.4a	35.1bc	32.1d	34.6bc	35.0bc
a*	1.0b	0.6bcd	0.9bc	0.4cd	10.5a	0.2d	0.3d	0.4cd	0.6bcd	0.5bcd
b*	-2.8b	-3.3bc	-3.8de	-4.5e	5.9a	-5.4f	-4.4de	-4.3de	-3.3bc	-3.2bc
c*	3.1e	3.4de	4.0cd	4.6c	12.8a	5.4b	4.4c	4.4c	3.5de	3.3e
Hue	291.5a	284.0bc	284.7b	274.9d	30.0e	273.1d	275.1d	276.4d	282.5bc	280.5c

All values are reported as means averaged across the four storage timepoints (e.g., day 0, day 14, day 28 and day 42). The significance of cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).

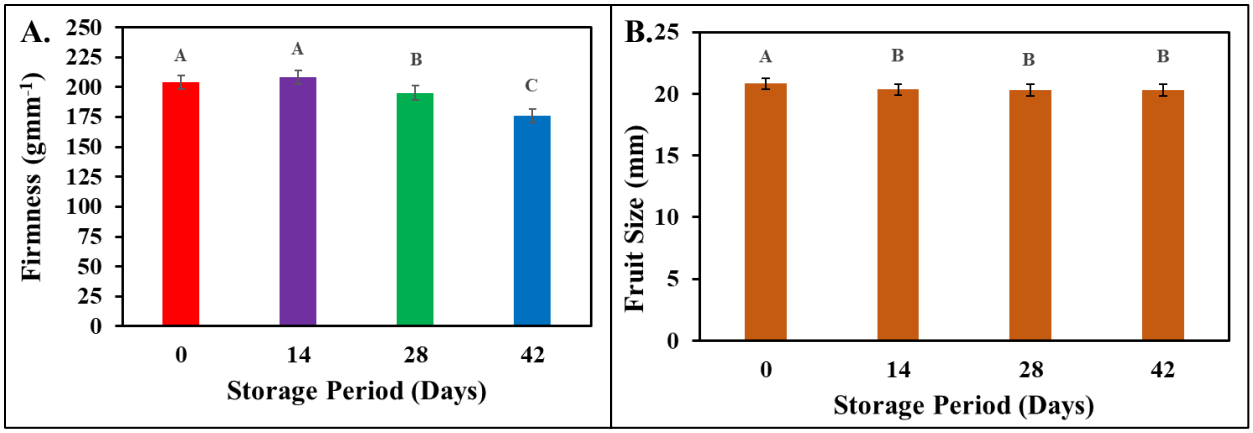

Figure 1. Overall tissue firmness (A) and berry diameter (B) among the four storage timepoints of day 0 (0), day 14 (14), day 28 (28) and day 42 (42). The significance of storage period (days in storage) was determined using Students T-Test ($p \leq 0.05$); different letters indicate significant differences.

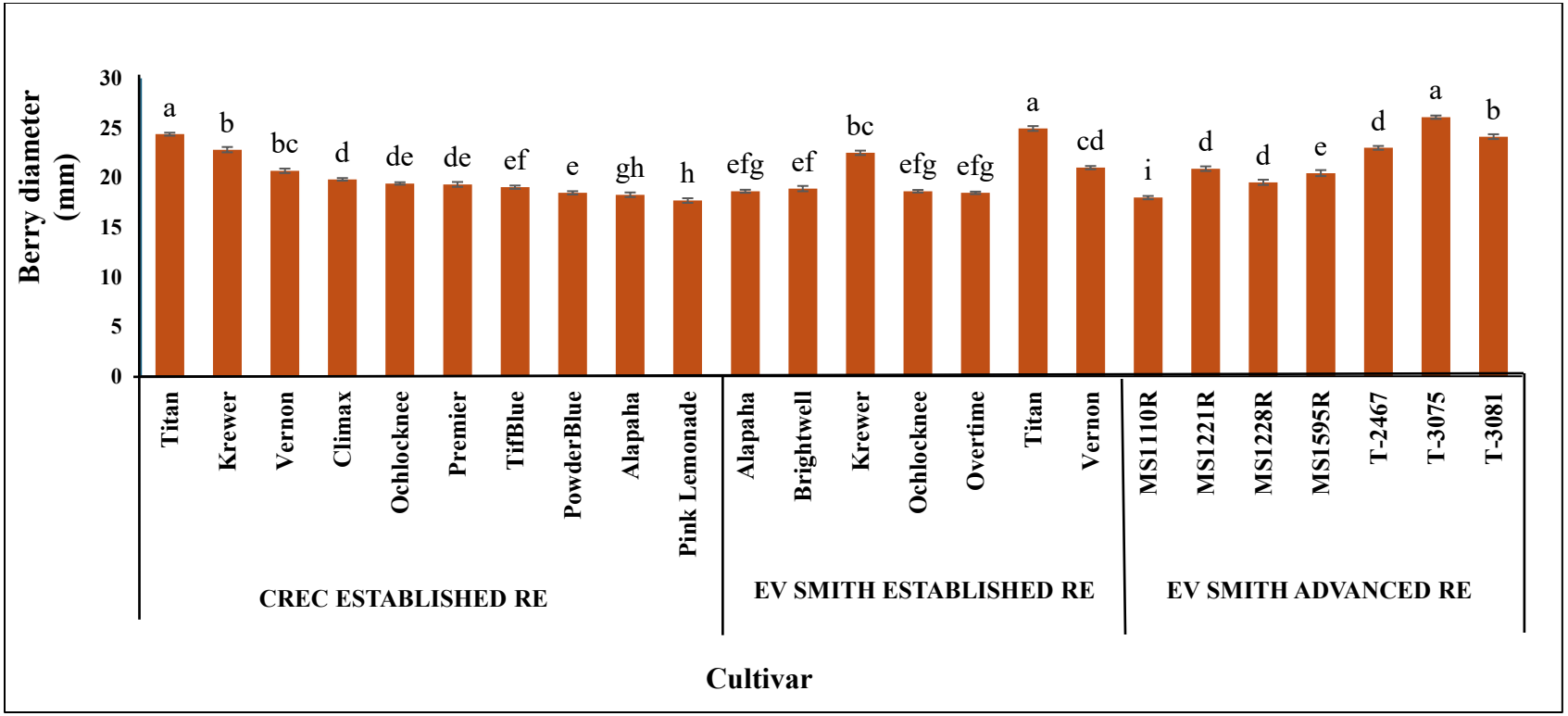

Figure 2. Berry diameter among the cultivars or advanced selections grown at the E.V. Smith Research Station (EV Smith) or Chilton County Research and Extension Center (CREC). The significance of cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).

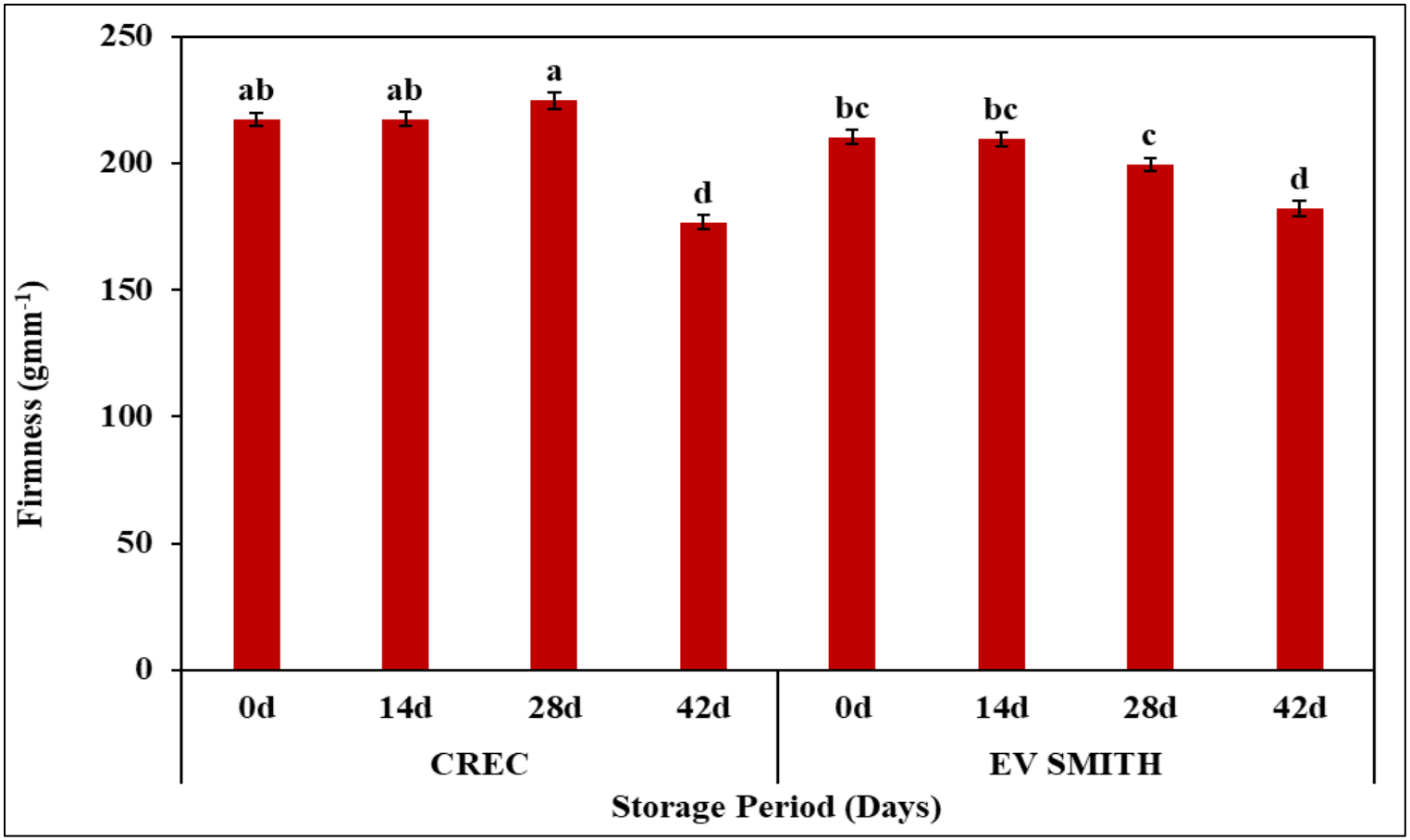

Figure 3. Comparison of tissue firmness between the two production locations of Chilton County Research and Extension Center (CREC) and E.V. Smiith Research Station (EV Smith). The significance of location*cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
0d = 0 days in storage (harvest day); 14d = 14 days in storage; 28d = 28 days in storage; 42d = 42 days in storage.

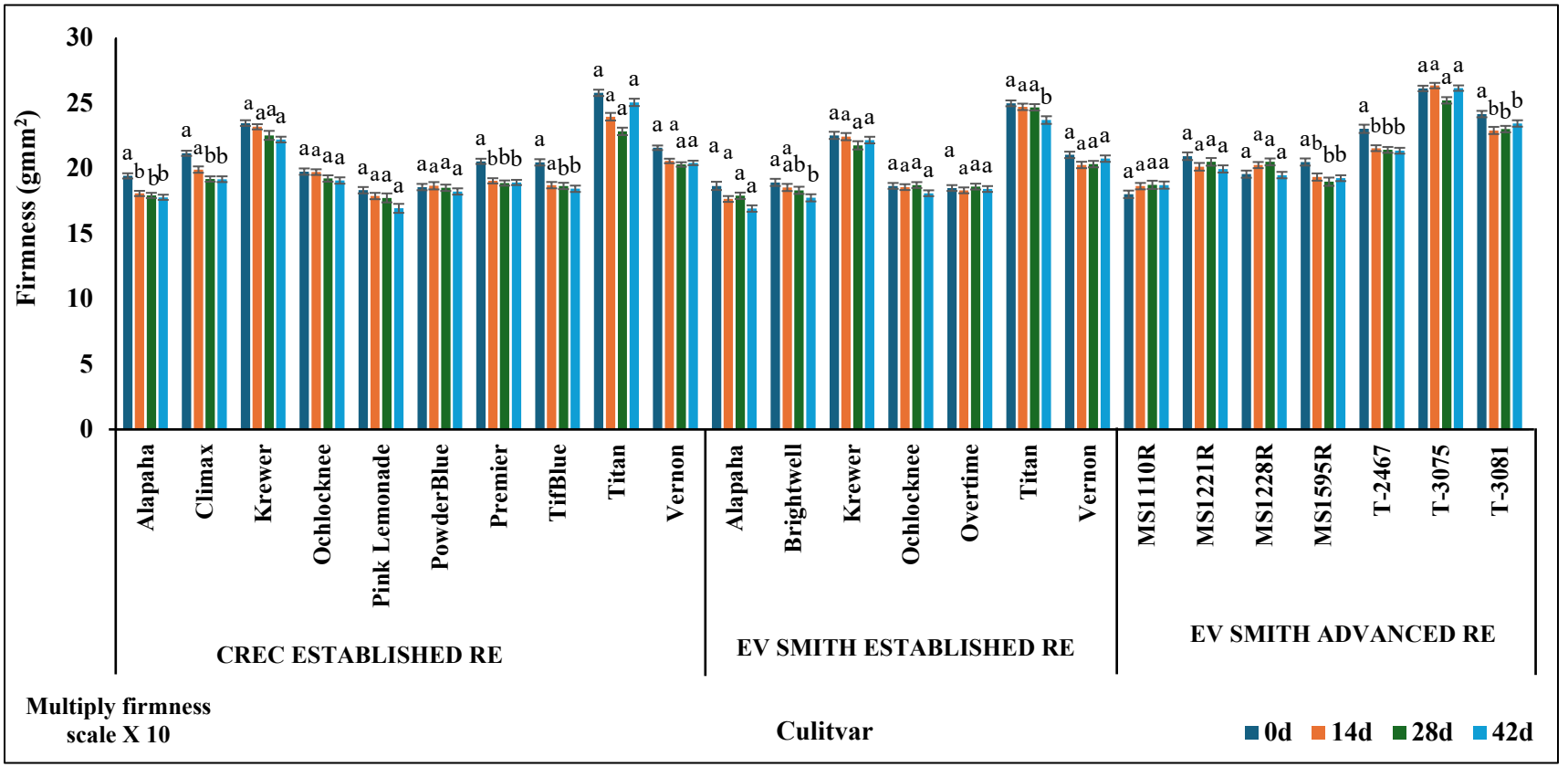

Figure 4. Tissue firmness (g/mm^2) of the established rabbiteye (RE) cultivars and advanced selections in the Chilton County Research and Extension Center (CREC) and E.V. Smith Research Station (EV Smith). The significance of timepoint*cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
0d = 0 days in storage (harvest day); 14d = 14 days in storage; 28d = 28 days in storage; 42d = 42 days in storage.

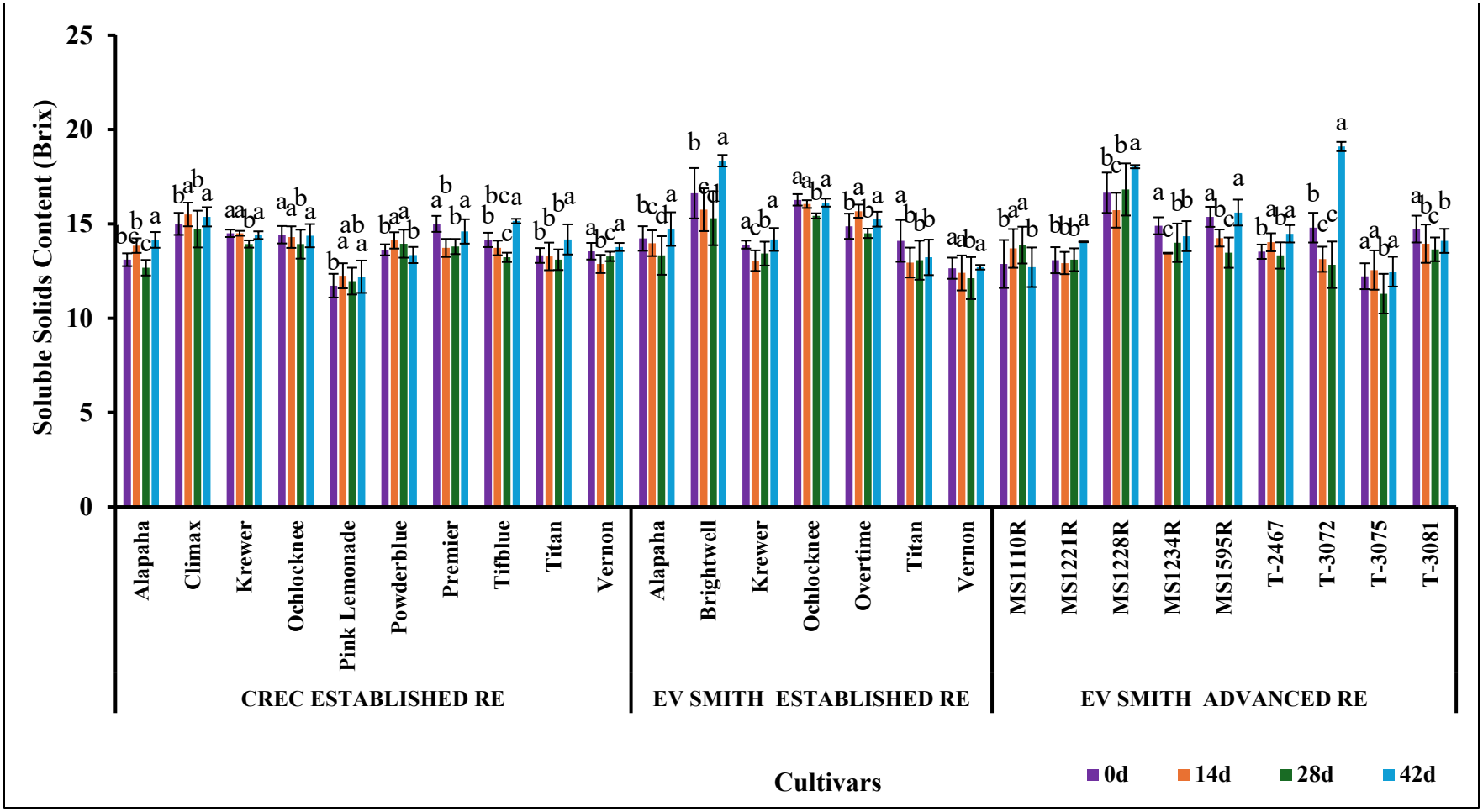

Figure 5. Soluble solids content (Brix) of the established rabbiteye (RE) cultivars and advanced selections in the Chilton County Research and Extension Center (CREC) and E.V. Smith Research Station (EV Smith). The significance of timepoint*cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
0d = 0 days in storage (harvest day); 14d = 14 days in storage; 28d = 28 days in storage; 42d = 42 days in storage.

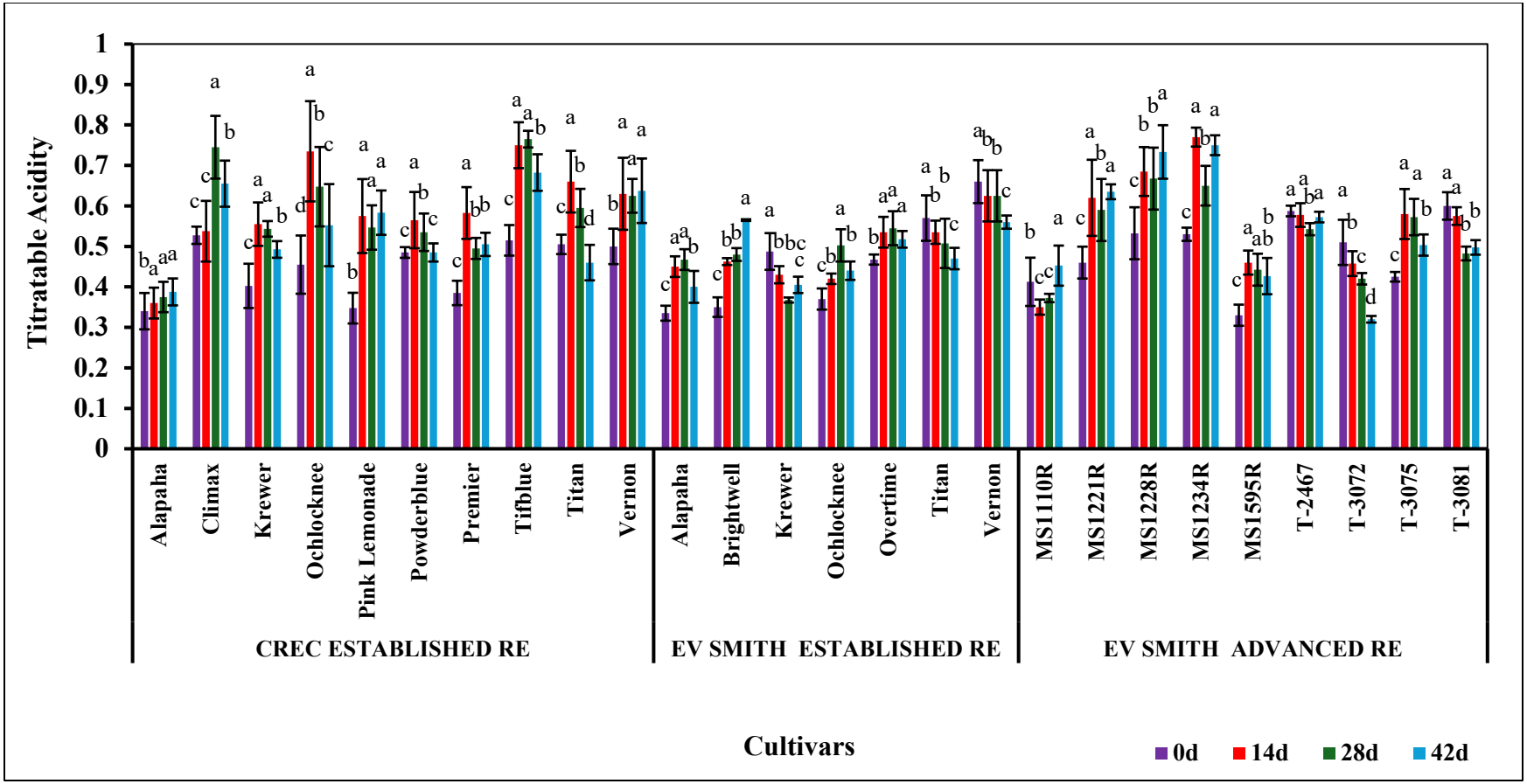

Figure 6. Titratable acidity (TA) of the established rabbiteye (RE) cultivars and advanced selections in the Chilton County Research and Extension Center (CREC) and E.V. Smith Research Station (EV Smith). The significance of timepoint*cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
0d = 0 days in storage (harvest day); 14d = 14 days in storage; 28d = 28 days in storage; 42d = 42 days in storage.

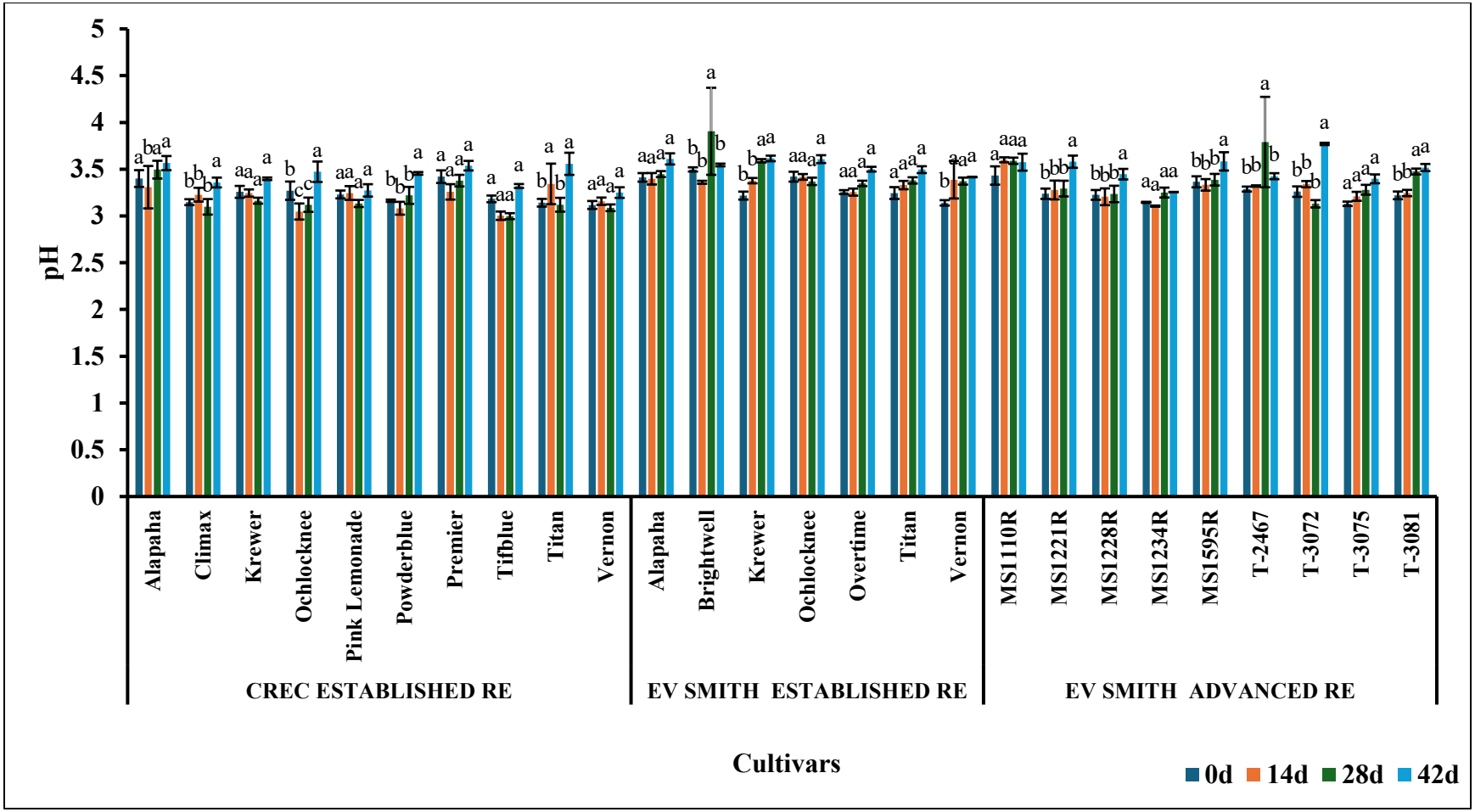

Figure 6. pH of the established rabbiteye (RE) cultivars and advanced selections in the Chilton County Research and Extension Center (CREC) and E.V. Smith Research Station (EV Smith). The significance of timepoint*cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
0d = 0 days in storage (harvest day); 14d = 14 days in storage; 28d = 28 days in storage; 42d = 42 days in storage.

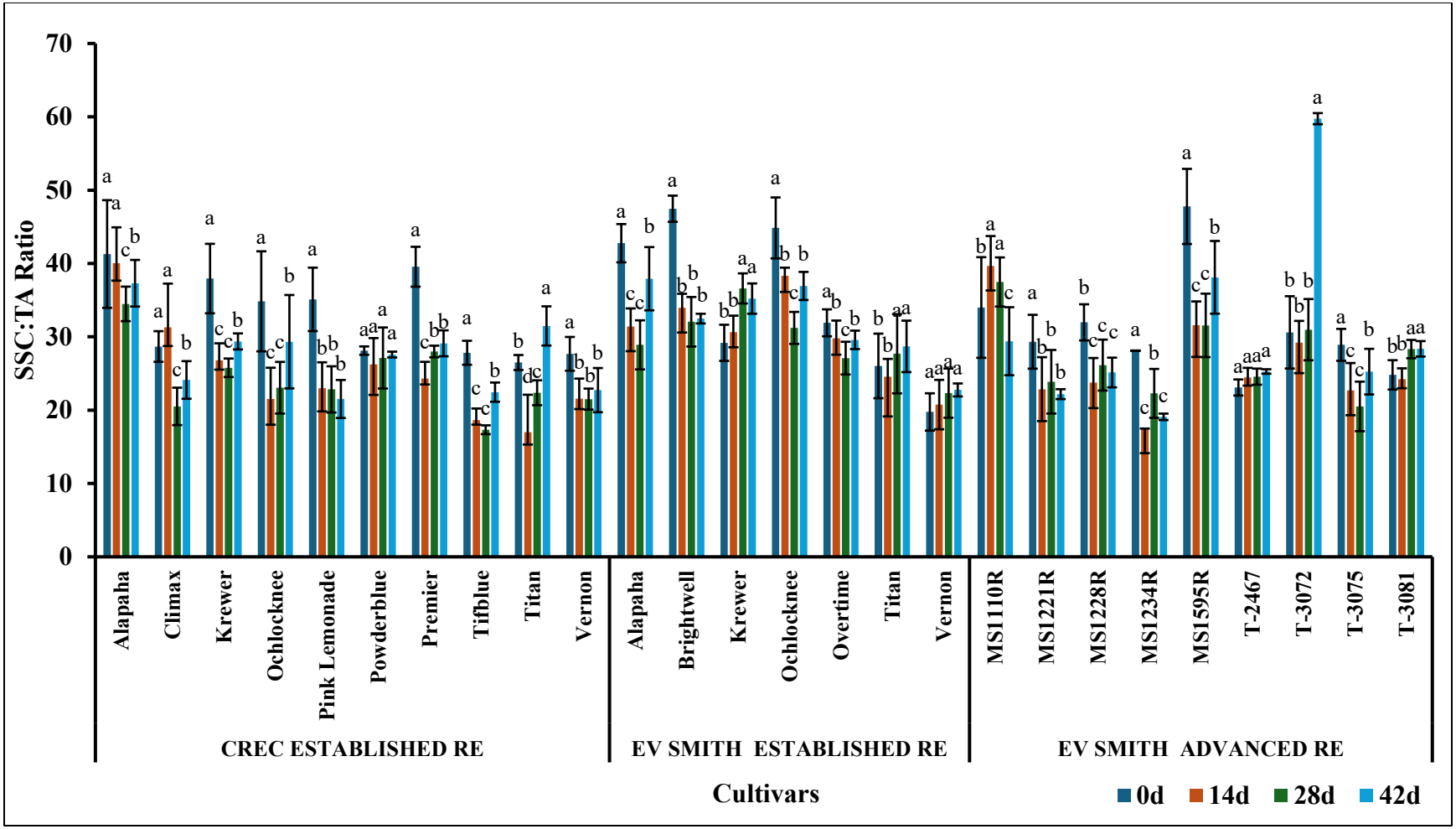

Figure 7. Soluble solids content: titratable acidity ratio (SSC:TA ratio) of the established rabbiteye (RE) cultivars and advanced selections in the Chilton County Research and Extension Center (CREC) and E.V. Smith Research Station (EV Smith). The significance of timepoint*cultivar was determined using Tukey Honestly Significant Difference; different letters indicate significance ($p \leq 0.05$).
0d = 0 days in storage (harvest day); 14d = 14 days in storage; 28d = 28 days in storage; 42d = 42 days in storage.