**Responses (will go into interactive review site):**

**Round 2 (or sort of 3) July 2020**

Editor #1:

Dear Dr. Brillante,

Thank you for the opportunity to revise our manuscript. We have provided a revised manuscript addressing reviewer #3’s concerns. Specifically we have worked to clarify that phenology should advance up to some temperature before it delays (as most of our references show), added the requested figure (as a panel to Figure 3) and added a number of additional references. Also, we have clarified that all the data are publicly available and have been since we first submitted this manuscript.

We provide point-by-point responses to Reviewer 3’s concerns separately.

Thank you.

Lizzie & Nicole, on behalf of our co-authors

Reviewer #3:

Q1 (general review of paper): The aim of this research was to explore the relationship between grapevine phenology and high temperatures, under controlled conditions (climate chamber). The manuscript is interesting and the research is pertinent. The idea and formulation of the objectives are somewhat clear because I would expect it to be a research paper but it turns out to be a mix of a review and a research paper. The manuscript is well written. Overall, there are some major issues with the study. Based on these considerations I can recommend the paper to be accepted after a major revision.

We are glad the reviewer found the research pertinent and interesting. We understand the concern that the paper is a mix of a research and review paper. Previous reviewers raised concerns that we felt were best addressed by including this literature review, which was appreciated by a concerned reviewer. We thus believe the combination of our study and the literature review will be useful to readers, even if unorthodox. We have tweaked the abstract in our new version to try to better prepare the reader for the format of the article, but would welcome any other suggestions to address this concern.

Q2: The manuscript is interesting and the research is pertinent. The idea and formulation of the objectives are somewhat clear because I would expect it to be a research paper but it turns out to be a mix of a review and a research paper. From my view point there are some issues:

We appreciate the reviewer’s concerns and address them as they are raised below.

Q3: Line 298 - Here i have a big problem with this statement. Many ohter phenological studies predict advances not delays. Your reference list should include this studies. I would expect that at "lower" high temperatures an advancement in data would occur, while at extreme temperatures development should stop meaning that flowering could delay.

This is a very good point, as we did not mean to suggest that warmer temperatures generally delay phenology, though after receiving this review we can see the concern. Most of our cited studies find phenology advances up to some temperature (generally 35-40°C) then delays, but in focusing on the delays we were not clear about advances at lower temperatures. Thus we have changed the text in several places:

(1) We changed the introduction, lines XX-XX: “Studies of vegetative growth and photosynthesis in other perennial crops exposed to a range of temperatures exhibited that extreme temperatures tend to slow or inhibit certain processes in the plants (e.g., below 5-10°C and above 30-35°C in Zaka et al., 2016, 2017), with temperatures in between extremes generally speeding development.”

(2) We changed the first paragraph of the discussion for clarity on this, lines XX-XX now read, “For example, Greer & Weedon found a curvilinear ripening response to temperature (with warmer temperatures speeding development up to some high temperature, above which development slowed) across three varieties—but the temperature yielding the highest ripening varied for each variety (25°C, 35°C and 40°C for Chardonnay, Semillion and Merlot, respectively; 2014).”

(3) We also changed lines XX-XX (near line 278 of the previous submission) to clarify: “We expected development may slow (and thus phenology delay) at temperature extremes, especially at our upper temperature extreme of 37 °C, however, phenology should generally advance until that extreme temperature. Our results suggest 37 °C is not high enough to induce delays, a result in line with much of our literature review which found growth and phenology generally advanced up to 40**°**C (Table 1).”

(Note that Line 298 is about fruit set and does not mention delays, we assumed the reviewer was referring to Line 278, which specifically discusses delays.)

Line 337 - this is a major limitation of the current study, the study should be replicated more times with older vines.

We agree and have tried to stress this in the paragraph, by re-writing the opening sentences (lines XX-XX), “Our vines, taken from field cuttings, were in only their first growing season, and this represents a major limitation of our study. We expect flowering success across varieties would be greater for older, larger vines and our findings should be interpreted cautiously until further studies are completed on older vines.”  
  
Minor  
  
1 – Line 53. Add ref.

We have added references to Mocell & Thach, 2014 and Wang et al. 2020.

2 – Line 81 – Link to the table of the paper data.

Done.

3 – Line 104- What temperatures are considered extreme herein?

Zaka et al. 2016 refers to extremes as 5°C and 35°C while Zaka et al. 2017 defines extreme growth temperatures as “below 10°C and above 30°C”. Thus we have added these extremes as “below 5-10°C and above 30-35°C in Zaka et al., 2016, 2017).”

4 – Line 113 – Why not with flowering itself?

Good question, this was a logistical choice. Our field observations are designed to best estimate 50% flowering (by observing and recording flowering from 0-100%), but for our lab plants we aimed to expose many to heat *during* flowering preventing robust estimates of 50% flowering in the lab.

5 – Line 125 – is this search “and” or “or”?

Apologies for this, we ran multiple searches each with `Vitis vinifera’ and one of the following terms (e.g., Vitis vinifera AND heat toleran\* was one search). We have now clarified this.

6 - Line 171 – Add a figure where you show the daily temperature curve inside each chamber.

We have added a panel to figure 3 showing this (we are limited to only four display items and thus could not add it as a separate figure without removing another figure).

7 – Line 172 - how did you estimate this 600? any previous study on this?

We reviewed a number of studies that examined diurnal and seasonal CO2 variation near plants (but outside chambers) after finding CO2 could spike very high some nights in our chambers in pilot work.

The highest values we found in the literature found were roughly 550 ppm so we set the chambers at 600 ppm. We have adjusted the text to explain this briefly and provided several references (lines 177-180 now include, “we used 600 ppm given a review of the literature in natural and crop systems where we found little evidence of levels above 550 ppm near plants, e.g., Buchmann & Ehleringer, 1998, Mortazavi  and Chanton, 2002, though we did not find grape-specific studies”).

8 – Line 196 Link to table

Thanks for catching this. We have added a reference to Table 1.

9 – Line 203 to 205 - this sentence is confusing please rephrase

Agreed, we have rephrased to, “Certain varieties were studied often (e.g., Semillon, Shiraz and Cabernet-Sauvignon); given the overlap in varieties across studies, all 10 studies yielded information on only a total of 10 varieties (Table 1).”

Q4 Checklist  
  
c. Does the reference list cover the relevant literature adequately and in an unbiased manner?  
- No

We have added a number of references in addressing the reviewer concerns and also clarified that many of our references show phenological advances. If other references would be useful, please let us know.   
  
f. Are the results presented correctly and interpreted in light of previous knowledge?  
- No

We agree our language was not clear in describing phenological advances up to some temperature before delays, and have revised the text to clarify this.   
  
g. Do the discussion and conclusion address the research questions or hypothesis posed in the introduction?  
- No

We hope our revisions have addressed this concern.   
  
h. Are the data underlying the study available in either the article, supplement, or deposited in a repository? (Sequence/expression data, protein/molecule characterizations, annotations, and taxonomy data are required to be deposited in public repositories prior to publication.)  
- No

The data are freely available on the KNB via two datasets:

<https://knb.ecoinformatics.org/view/doi:10.5063/F18G8J29>

<https://knb.ecoinformatics.org/view/urn%3Auuid%3A59f80d14-bc09-49a6-8143-0e2823bab9a2>

(links given on lines 147 and line 196 in this revision, we apologize as we believe the second link may not previously have been provided but the data were posted last year when we initially submitted the manuscript).

Q5: No answer given

Q12: Substantial revisions

We have worked to highlight that most studies (including ours and those we review) find phenological advances until some high temperature. We also have worked to provide references and clarity to our methods (including a new figure panel). We believe our revised Brief Report is much improved from these changes, and hope the reviewer may find it suitable for publication in its revised form.