Wolkovich Phenological Monitoring Protocol
Dark Horse Site

Contents

1 Objectives

We aim to characterize the phenology of a large number of V. vinifera varieties planted in vineyards around the Okenagan Valley area in BC. Our primary goal is to improve grower models of phenological timing with relation to climate, To do this we need to understand how genetics and correlations with other plant traits fundamentally drive the hyper-phenological diversity of V. vinifera. To this end, we aim to sample a large diversity of phenologies, from very early to very late varieties. BDue to the difficulties of undertaking fieldwork in a time of Corvid-19 spread, we were not able to undertake all the surveying we wanted this year, but Mike Watson has agreed to some surveying through Arterra employees at the Dark Horse vineyard.

2 Sampling population at Dark Horse

(describe how many vines and where)

3 Sampling frequency and timing

1. Lizzie's team (Mira and Faith) flagged vines and started surveying phenology in early May. We did not get out early enough for budburst.

2. We will aimed to monitor four phenological stages, but missed budburst:

   (a) Budburst (approximately mid April/early May)
   (b) Bloom (approximately May/early June)
   (c) Verasion (approximately mid July-mid August)
   (d) Ripening (Brix - approximately mid August-end September)

3. Our intention is ho bring someone back at least for Brix sampling, so we mostly need help with flowering and verasion monitoring.

4. We aim for sampling at least once a week. If you have more time, especially if it has been a warm week, then twice a week would be even better.

4 Finding the right buds to monitor

We have flagged three buds/shoots on each of the vines in our monitoring program. We randomly chose one of the canes or cordons on each plant, and flagged three arms or spurs on the chosen cordon (Figure **??**) or three buds/shoots on the chosen cane (Figure **??**). We flagged as close to the bud as we could when we initially placed the flagging tape, and later flagged some of the shoots once they were big enough. For the cordon pruned vines, we monitor the lowest bud/shoot of the highest spur of the arm (Figure **??**).

5 Establishing clusters

1. Once the shoot we are monitoring becomes well developed (E-L stage 17 or later) you can move the flagging to a specific bloom. This is probably best done as you move to monitoring % bloom.

2. We will sample one cluster per shoot. (I dont know how they should chose the clusters)

6 Observing Phenology

We are using the Eichhorn-Lorennz system for monitoring phenology described in this PDF:

Our goal is to have standardized observations of phenological stages for analysis. There are four main widely observed stages for grapevine: (1) budburst, (2) flowering or bloom, (3) veraison, and (4) ripening and harvest. For the first stage, budburst, we will use the stage numbers from the Modified Eichhorn Lorenz system (a stage number between 1-17, with 4 meaning budburst; see Figure **??** below).For stages 2 and 3, we will estimate the percent occurrence of the stage (proportion of berries on a selected cluster have gone through the stage of bloom or color change,

respectively). We will measure ripening quantitatively, using a refractometer to measure Brix (sugar) accumulation.

For each vine:

1. Stand facing the vine. Double-check Plant ID, block row number and bud number before recording in correct place on data sheet that we will provide. We don't keep information on the varieties within each block on the field data recording sheets.

2. For pre-bloom, record the appropriate E-L stage for the shoot that was flagged, or the shoot closeted to the flagging that matches our selection criteria laid out in the section above.

3. For bloom (EL 23) and veraison (EL 35), look at each cluster (#1, #2, #3) and estimate the percent (from 0-100%) of berries on the sample cluster that have achieved that stage.

4. Take photos of representative illustrations for different varieties of target % at stage (e.g., clusters at 5%, 25%, 50%, 75%, 95% bloom) for different varieties. Make sure vine number and date are visible in photo for identification.

5. For ripening, our current plan is to send one of our team to collect berries so we can analyze Brix. We will aim to collect samples starting around 18 Brix until commercial harvest level.

7 Establishing clusters

8 What to do with the data

9 Contact details