

Washington Red Raspberry Commission – Terminal Report

Project number: 3455-6640

Title: Comparison of Alternate- and Every-Year Production in Summer-Bearing Red Raspberry

Personnel: Lisa Wasko DeVetter (PI), Suzette Galinato, and Chris Benedict. Jonathan Maberry is a farmer collaborator/cooperator for both experiments.

Reporting Period: 2015-2019

Accomplishments:

- Alternate-year (AY) and every-year (EY) treatments were maintained in Mr. Jon Maberry's field in Lynden, WA.
- Modified bed experiment was established in Mr. Jon Maberry's field in Lynden, WA, in 2018.
- All data collection occurred as planned, although we are collecting additional cultivar data from 'Meeker' and 'WakeField' in addition to 'Whatcom' and 'WakeHaven' for the modified bed experiment.
- A focus group and survey data led to the creation and publication of a red raspberry enterprise budget (listed in publications).
- Economic data for the AY-experiment were collected and analyzed.
- Results from the AY-experiment were presented at the 2019 Small Fruit Conference and Michigan Great Lake's Expo.
- A newsletter article summarizing the AY-experiment was to be published in July 2019, but that has been postponed to 2020 given the *Whatcom Ag Monthly* was not active in 2019 due to co-PI Benedict's sabbatical leave.

Results:

1) AY/EY Experiment: Project data were collected according to plan. Figure 1 shows treatment effects on yield and primocane growth. Overall, yield was lower in the AY treatment during non-fruiting years, which was expected given treatment rows were managed to produce a crop every-other year. No statistical effects were found for primocane height, node number, and internode length. However, primocane height tended to be lower in AY-treated plots in 2017 and 2019.

Primocane number per hill was also lower in AY-treated plots in 2017 and 2019. Tissue nutrient analyses for some micronutrients different in some but not all years and there were no consistent patterns nor trends (data not presented). Economic analyses revealed AY production is not economically viable based on the assumptions of our model with production practices, crop

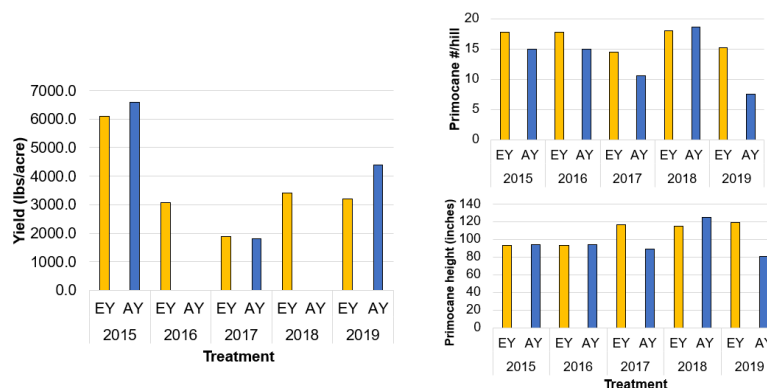


Figure 1. Yield, primocane number/hill, and primocane height of 'Meeker' red raspberry grown in alternate-year (AY) and every-year (EY; control) production systems, 2015-2019.

yield, price received [\$0.76/lb (average of IQF and blend)], and total production costs provided by our trial, grower cooperator, and Henry Bierlink. Even though AY systems had lower operating costs (48% of costs in the EY system was labor, while it was only 42% of the costs in AY), the loss in yield was too great to offset these savings. Based on our analyses, the price of raspberries must be \$0.73/lb in the EY system in order to recover the total cost of production and \$0.87/lb in the AY system. Our sensitivity analysis showed that varying price while holding all else the same, AY profit = EY profit when the price of raspberries in AY is ~\$0.91/lb. Therefore, market price has to be higher and/or yields increased to make AY more profitable than the grower standard of EY. Higher planting densities and different training and primocane suppression techniques could promote higher yields, but remain untested. One important consideration that we are now modeling is extended planting longevity– if the AY planting were to have a longer lifespan than EY and be slower to get raspberry bush dwarf virus, resulting in a higher proportion of fruit that goes to the individually quick frozen market, this may make AY more economically viable. We are currently working on additional analysis with scenarios that take into account greater longevity of AY versus EY.

2) Modified Bed Experiment. Data were collected according to plan and this was the first year yield could be collected from the planting. Yield, primocane height, and primocane number per hill are presented below in Figure 2. Overall, yield showed a response due to cultivar and tended to be greater among plants grown with 10-ft centers (3-ft raised beds; control) versus 12-ft centers (6-ft raised beds). Primocane height and number did not differ by bed size, but height tended to be greater among plants grown on 12-ft centers. However, acquired UAV data that quantified total plant biomass found no statistical effects due to our treatments. While we are not submitting a continuation proposal for this project in 2020, we will continue to monitor this trial in case treatment effects become more visible in the second harvest year. If there are treatment effects in the second harvest year, we may submit another proposal for more in-depth study.

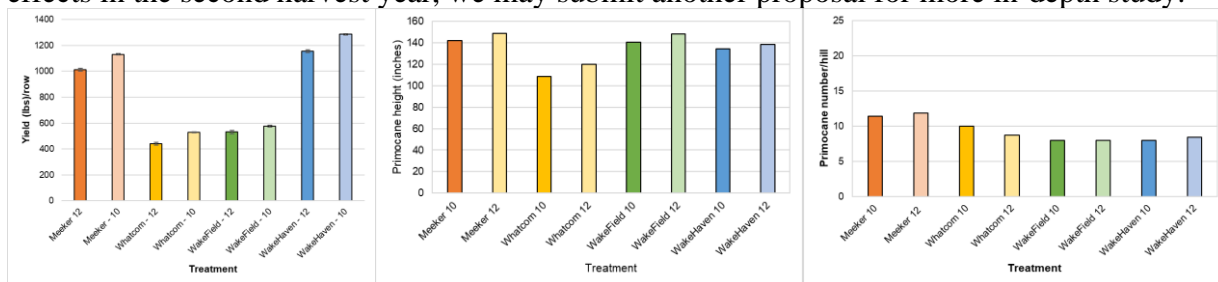


Figure 2. Yield, primocane height, and primocane number per hill of ‘Meeker’, ‘Whatcom’, ‘WakeTMField’, and ‘WakeTMHaven’ red raspberry grown on 10- and 12-ft centers (3- and 6-ft wide raised beds, respectively) in Whatcom County, WA, 2019. Data were collected from 10 plants per row. Only means are presented, as the design in the field did not permit statistical analysis.

Publications:

- Galinato, S. and L.W. DeVetter. 2016. 2015 Cost Estimates of Establishing and Producing Red Raspberries in Washington State. Washington State University Extension Bulletin. TB21. Available at: <http://pubs.cahnrs.wsu.edu/publications/pubs/tb21/>.
- Website (project website to be updated in 2020): <https://smallfruits.wsu.edu/projects-and-activities/comparison-of-alternate-and-every-year-production-in-summer-bearing-red-raspberry/>
- A publication summarizing the AY study is to be submitted by Galinato and DeVetter in 2020