Investigating the Feasibility of Berry Production in Central Oregon under Protected and Unprotected Culture

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Abstract : The high desert of central Oregon, USA is a challenging growing environment: short growing season (70-100 days); average annual precipitation of 280 mm; drastic swings in diurnal temperatures; possibility of frost any time of year; and sandy soils low in organic matter. Despite strong demand, there is almost no fruit grown in central Oregon due to potential yield loss caused by early and late frosts. Elsewhere in the USA, protected culture (i.e., high tunnels) has been used to extend fruit production seasons and improve yields. In central Oregon, high tunnels are used to grow multiple high-value vegetable crops, and farmers are unlikely to plant a perennial crop in a high tunnel unless proven profitable. In May 2019, two berry trials were established on a farm in Alfalfa, OR, to evaluate raspberry and strawberry yield, season length, and fruit quality in protected (high tunnels) vs. unprotected culture (open field). The main objective was to determine whether high tunnel berry production is a viable enterprise for the region. Each trial was arranged using a split-plot design. The main factor was the production system (high tunnel vs. open field), and the replicated, subplot factor was berry variety. Four day-neutral strawberry varieties and four primocane-bearing raspberry varieties were planted for the study and were managed using organic practices. Berries were harvested once a week early in the season, and twice a week as production increased. Harvested berries were separated into 'marketable' and 'unmarketable' in order to calculate percent cull. First-year results revealed berry yield and quality differences between varieties and production systems. Strawberry marketable yield and berry fruit size increased significantly in the high tunnel compared to the field; percent yield increase ranged from 7-46% by variety. Evie 2 was the highest yielding strawberry, although berry quality was lower than other berries. Raspberry marketable yield and berry fruit size tended to increase in the high tunnel compared to the field, although variety had a more significant effect. Joan J was the highest yielding raspberry and out-yielded the other varieties by 250% outdoor and 350% indoor. Overall, strawberry and raspberry yields tended to improve in high tunnels as compared to the field, but data from a second year will help determine whether high tunnel investment is worthwhile. It is expected that the production system will have more of an effect on berry yield and season length for second-year plants in 2020.

Keywords : berries, high tunnel, local food, organic

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1