

Annual Report for the Project: Increasing Local Plum Production for Farm Market Diversification

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**Renaë Moran
Angela Myracle**

In this first year of a two-year study, we measured labor and spraying costs of six varieties and consumer acceptance of seven varieties. We are currently measuring the nutritional quality in six varieties. The labor requirement for harvest was not measured because of substantial hail damage which made fruit unmarketable, but pruning and fruit thinning costs were documented. We plan to continue the research with similar production cost measurements in 2016, and to increase the number of varieties in the sensory evaluation panel.

Overall Findings

Early estimates of plum production costs indicate that they are less than for apples when harvest costs are not included. Of the seven varieties evaluated in this study, Obilinaja, Abundance and Spring Satin had high consumer acceptance ratings, and, the two most commonly grown varieties in Maine, Shiro and Methley, were ranked the lowest.

Achievements

The orchard was maintained as a large-scale stone fruit orchard with a customized pest management schedule that is different from apple trees. Spray material costs for plums were approximately \$700 per acre and for apple were approximately \$800 per acre. The greater cost for apple was due to the longer growing season and the use of chemical thinners. The labor requirement for spraying plums was less than for apples since plums received 7 sprays compared to 11 for apple. Labor for mowing and fertilizing would be similar to apple trees.

The labor requirement for hand thinning fruit was measured for six varieties. Hand thinning is important for increasing the value of the fruit. The time required to hand thin Japanese plums averaged 13 hours per acre. Au Rosa and Black Amber suffered from winter injury and required very little fruit thinning. Methley, Shiro and Vanier were thinned in about 10 hours. In contrast, the high yielding Early Golden required 24 hours to hand thin an acre of trees. The time needed to hand thin Spring Satin was not measured since the trees of this variety are in poor health. Since plums cannot be chemically thinned, hand thinning is an added cost of production compared to apples.

The labor requirement for pruning was measured on six varieties and ranged from 5 to 20 hours per acre which was less than expected for the semidwarf tree size. Semidwarf apples typically are pruned in about 40 hours per acre. The large plum yield in 2014 may have inhibited shoot growth which normally reduces the pruning requirement. The time required to prune root suckers was not included in 2015 measurements, but will be included in 2016 since it can be significant and different from apples.

A severe hail storm occurred July 28 which damaged more than 50% of the fruit. Consequently, the commercial harvest was cancelled due to the high labor costs of sorting the fruit. There were enough fruit in good condition for measuring fruit quality and for consumer testing. Based on sensory evaluation by 80 to 100 people, the stage of ripeness at harvest had very little impact on consumer acceptance in the varieties Methley, Shiro and Abundance. In Obilinaja and Early Golden, there was a slightly greater liking of tree-ripened compared to mature plums. The ability to harvest fruit at a stage of slightly under ripe will allow growers more freedom in timing the harvest for marketing and to avoid weather related problems that can cause crop loss.

Spring Satin, Obilinaja, and Abundance scored the highest ratings by consumers, whereas Methley and Shiro were the lowest rated plums tested this year. Early Golden and Vanier were rated intermediately. These results indicate that new varieties may increase consumer acceptance of locally-grown plums compared with the more traditional varieties, Methley and Shiro. The variety, Superior, had severe rain-induced fruit cracking and could not be included. Toka was not included since it had too few fruit without hail damage. One new variety was planted in 2015, Beauty, which is a Santa Rosa type with red flesh. Trees of European varieties began to bear fruit in 2015 and were considered to have fruit quality that is suitable for commercial production. If trees bear enough fruit in 2016, these will be included in sensory evaluation.

Samples of each variety have been processed for the measurement of nutritional components. These measurements will be conducted during winter and spring 2016.

Results of this project were shared with apple growers attending the PreSeason IPM meeting in March 2015, and at the Maine Ag. Trades Show in Jan. 2016. Based on grower requests for information on new varieties, several have made plans to plant more plums for their farm markets.

Next Steps

In year two, we will repeat the horticultural measurements of pruning, hand thinning, and harvest since conditions vary from year to year. Marketable yield will be measured to calculate potential revenue.

Since the two stages of fruit ripeness had little effect on consumer acceptance, we will not measure this again in 2016, but will focus on testing more varieties in addition to some of the ones tested in 2015. Japanese varieties that we plan to include are Toka (Bubblegum), Alderman, Superior and others that are grown by local farmers. European plum varieties that we plan to include are Rosy Gage, Caselton, Valor, Long John and

Gras Ameloriat. European plums ripen later than Japanese plums, but may have greater consumer appeal.

Major findings will be summarized in a fact sheet and website in May.

Lessons Learned

Plums develop leaf spots in early summer that are not caused by the fungicides normally used in fruit production. Instead, they are caused by bacterial leaf spot, a disease that appears to have minimal impact on most varieties. To reduce production costs, the spraying protocol for apple trees will be adapted for plums in 2016.