Evaluation of flower, fruit, and juice characteristics of a multinational collection of cider apple cultivars grown in the U.S. Pacific Northwest.

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Summary

Little information exists on the bloom and fruit characteristics of cider apple (Malus ×domestica) cultivars grown in the United States for the juice and alcoholic beverage markets. In this study, a total of 17 cider apple cultivars, including 4 American, 9 English, and 4 French, plus 1 Danish standard dessert apple cultivar (Red Gravenstein, Worthen strain) commonly used for cider, all grown in northwest Washington, were evaluated from 2000 to 2015 for commercially relevant traits. Trees were rated each year and the cultivars were categorized accordingly by relative bloom time, bloom habit, and productivity. The mean full bloom (FB) date of the 18 apple cultivars evaluated ranged from 25 Apr. to 25 May, with 6 cultivars categorized as early season bloomers, 9 as midseason, and 3 as late season. The mean bloom density (BD) rating (measured on a scale of 1–5) for all cultivars was (mean ± SD) 3.8 ± 0.6 (moderate bloom), with the bloom habit of 1 cultivar categorized as biennial, 11 as consistent, and 6 as strongly consistent. The mean productivity rating (measured on a scale of 1–5) for all cultivars was 2.9 ± 0.6 (light fruiting), with the productivity of 4 cultivars categorized as biennial, 10 as consistent, and 4 as strongly consistent. The mean fruit diameter of the 18 apple cultivars was 2.7 ± 0.4 inches (medium sized), with the fruit size of 2 cultivars categorized as small-fruited, 15 as medium-fruited, and 1 as large-fruited. For the 18 cultivars, the mean tannin and titratable acidity (TA) were 0.20% ± 0.14% and 0.54% ± 0.28%, respectively, and using the English cider apple classification system of juice type, 4 of the cultivars were classified as bittersweet, 1 as bittersharp, 3 as sweet, and 10 as sharp. Three of the cultivars had tannin content lower than what was historically recorded at the Long Ashton Research Station (LARS) in Bristol, England, for those same cultivars. The mean specific gravity (SG) of the 18 cultivars was 1.052 ± 0.007, the average predicted alcohol by volume (ABV) was 6.9% ± 0.9%, and the mean pH was 3.68 ± 0.39. Classification of three cultivars in northwest Washington, based on juice characteristics, differed from their historical classification in England, likely because of differences in climate and management. Only cultivars Golden Russet (sharp), Grimes Golden (sharp), and Yarlington Mill (sweet, but borderline bittersweet) were strongly consistent in productivity, but none produced high levels of tannin, whereas only cultivars Bramtot (bittersweet), Chisel Jersey (bittersweet), and Breakwell Seedling (bittersharp) were consistent in productivity and produced high levels of tannin.