The tremendous supply of apple cultivars in Wyoming

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A study out of the University of Wyoming sought to identify heritage apple cultivars planted in the state's homesteads, orchards, and nurseries from as early as 1870. Using microsatellite markers, surviving apple trees identified across Wyoming's rugged landscape provide future specialty crop growers with recommendations for cultivar selection.

Researchers Jonathan Magby, Gayle Volk, Adam Henk, and Steve Miller engaged in this daunting investigation to reveal information that should allow production and breeding programs to select existing cultivars to improve drought- and cold-tolerance in apple cultivars.

The results of their investigations are detailed in the article "Identification of Historic Homestead and Orchard Apple Cultivars in Wyoming", published in *HortScience*.

Heritage apples in Wyoming are largely defined as historically recognized apple trees that were planted in the state's orchards and homesteads in the 1800s. There were thousands of these trees planted, many of which are still alive today. Unfortunately, cultivar identity of these trees has mostly been lost or obscured over time.

Although most original Wyoming heritage apple trees are reaching the end of their life span, many surviving trees continue to produce fruit. This strongly suggests that, despite lower resistance to certain pathogens than many modern cultivars, these heritage trees identified in Wyoming should be considered for their lingering utility today.

The state of Wyoming has some of the driest and coldest winters in the lower 48 states, ranking fourth in average low temperature and fifth in average low precipitation. Although apples are not usually grown in conditions such as these, remnants of apple orchards from the late 19th and early 20th centuries can still be found surviving in Wyoming's rugged landscape.

Between 1870 and 1940, more than 200 apple cultivars were tested and reported to be successfully growing in Wyoming. These cultivars came from breeding programs in 28 states and six countries, and they were successfully grown under windy, cold, and drought-prone Wyoming conditions.

Many heritage apple trees in Wyoming have not been maintained for up to a century, and a number of them have succumbed to winter damage as well as diseases and pests. Trees that have survived these harsh conditions may yield insights into cultivars that could be grown by homeowners and future Wyoming fruit crop producers.

Morphological traits have most commonly been used to identify apple cultivars. However, apple trees have high levels of phenotypic plasticity, making typical methodology unreliable. A more reliable method for identification uses molecular techniques.

A total of 510 apple leaf samples were collected from 91 historic orchards, farms, ranches, and homesteads in 19 locales across Wyoming. The source locales and sites were selected using information obtained from word-of-mouth interviews and from Wyoming Agricultural Bulletins and Experimental Fruit Farm Bulletins that listed owners and cultivars of apples trees grown between 1870 and 1940.

Adds Magby, "The dry and cold seasons come and go in Wyoming, but apple trees planted by its earliest settlers still remain."

The findings revealed in this article provide insight into possible cultivars that could be grown in Wyoming and also in other states with similar harsh growing conditions.

More information: Jonathan Magby et al, Identification of Historic Homestead and Orchard Apple Cultivars in Wyoming, *HortScience* (2019). DOI: 10.21273/HORTSCI13436-18

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