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Agricultural Research Service

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Services  
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and

PENNSYLVANIA STATE UNIVERSITY  
Penn State Research and Extension Center  
Biglerville, Pennsylvania

## **NOTICE TO FRUIT GROWERS AND NURSERY GROWERS OF RELEASE OF THE PEAR TREE 'BELL'**

The U.S. Department of Agriculture-Agricultural Research Service and the Penn State Research and Extension Center announce the release of 'Bell' pear. The purpose of the release is to provide an early season fire blight resistant pear for the mid-Atlantic and other pear growing areas. 'Bell' has superior fire-blight resistance when compared with European varieties that are fire blight susceptible. Fire blight is especially dangerous to vigorous trees, thus eastern pear orchards in the Mid-Atlantic growing regions tend to be older trees that are managed for low vigor, resulting in low productivity and small fruit size. 'Bell' is resistant to fire-blight with good production traits and harvest timing similar to 'Bartlett', a proven industry standard for pears. In addition to its high production value, 'Bell' pears have intense flavor and sweetness that is well suited to fresh market production in the early season where taste, texture, and juiciness are the most important traits for consumer appeal.

'Bell' was created by ARS in 1984, was previously tested as US84909-391, and was selected at the USDA-ARS Appalachian Fruit Research Station in Kearneysville, WV, in the Mountain State of West Virginia by the long-time pear breeder Richard Bell. It has been extensively tested in West Virginia and has been evaluated at Penn State Research and Extension Center since 2013.

'Bell' trees are vigorous with semi-glossy leaves. Physical properties of fruit were measured over 2 seasons (2018 and 2021) against eleven commercial standards. Numbers reported here are 2018 and 2021 averages from unpruned trees that were not thinned and measurements from both years are similar. 'Bell' pears measured 5.9 cm diameter, 7.7 cm length, and 130 grams weight and are 20-30% smaller than standards for commercial varieties including 'Anjou', 'Bartlett', or 'Bosc', but similar in size to previous releases from USDA including 'Gem', 'Potomac', and 'Sunrise'. Sugar content measured as degrees Brix averages 14.67 and 15.2 in 2018 and 2021, making 'Bell' consistently one of the sweetest pears in commercial evaluations. Brix levels are

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slightly below the dessert varieties ‘Forelle’ and ‘Seckel’ but similar to the previous USDA release ‘Gem’ and consistently higher than standards for commercial pears ‘Bartlett’, ‘Bosc’, or ‘Anjou’. Soluble solids was high at 15.2 %. pH was 3.93 and 3.94 in 2018 and 2021, consistently similar to standards for commercial pears ‘Bartlett’, ‘Bosc’, or ‘Anjou’. The combination of higher brix and lower pH likely gives ‘Bell’ it’s higher flavor intensity. Low values for percent Malic Acid and titratable acidity support the chemistry profile of a sweet pear.

‘Bell’ sensory evaluations were conducted in 2018 by evaluators at Penn State Research and Extension Center to compare with early season pears such as ‘Gem’ and ‘Bartlett’. Panel members rated visual appeal, texture, flavor intensity, flavor balance, and juiciness on a scale of 1 to 9. ‘Bell’ scored highest for flavor intensity, flavor balance, and juiciness, and was within the top two varieties for visual appeal and texture. ‘Bell’ was the most highly-rated early-season pear in sensory evaluations making it highly desirable from a consumer perspective where marketing focuses on the number one consumer preference for pear taste.

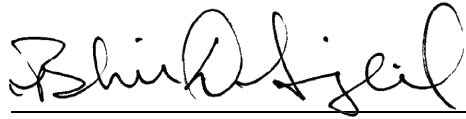
‘Bell’ has good resistance to fire blight (*Ewinia amylovora*) and was evaluated against other resistant varieties produced by USDA breeding program at USDA Kearneysville, WV and the Canadian breeding program at Vineland. Field evaluations were conducted with vertical axis (6’ x 14’ spacing for 518 trees per acre) and bi-axis orchard designs (4’ x 12’ spacing for 908 trees per acre). OHxF 87 rootstock was used for evaluations, which was the best all-around performer in previous rootstock trials and provides 30-40% tree size control with no suckering. Yield data was collected from 2014 through 2018 for three year averages of mature trees for cumulative yield per acre. When averaged over all years, ‘Bell’ was ranked third in yield out of the 13 varieties evaluated including standards for commercial pears ‘Bartlett’ and ‘Anjou’ and early-season pears such as ‘Gem’. Statistical analyses of yields in terms of fruit count and fruit weight indicated ‘Bell’ was similar to ‘Bartlett’ with ‘Bell’ averaging 34.3 kg fruit harvested per tree, 267 pears per tree, and 128 grams average fruit weight from 2014 to 2018 in the bi-axis orchard. ‘Bell’ trees in the bi-axis orchard were 10% smaller than same variety on vertical axis and ‘Bell’ measured 391 cm<sup>2</sup> in trunk cross-sectional after five years in the bi-axis orchard. Tree size is 131% of ‘Bartlett’. Numbers for vertical-axis orchards are not reported here.

‘Bell’ ripens the third week of August, similar to ‘Bartlett’. ‘Bell’ should be planted with other pears for cross pollination and has produced good cumulative yield of 400 bushel per acre over three years in plantings with ‘Potomac’, ‘Shenandoah’, and ‘Bartlett’ trained to a bi-axis training system on OHxF87 rootstock. While ‘Bell’ is expected to be adapted to areas where other early-season pears are can be successfully grown, it should be trialed in regions outside the mid-Atlantic region (including WV and PA) before being widely planted in the PNW or other pear-growing regions.

The Agricultural Research Service has no trees of Bell for distribution. A limited amount of heat-treated budwood of Bell will be available from Clean Plant Center Northwest, Washington State University, Prosser, WA 99350. Genetic material of this release will be deposited in the National Plant Germplasm System where it will be available for research purposes, including development and commercialization of new cultivars. It is requested that appropriate recognition be given when this germplasm contributes to the development of a new breeding line or cultivar.

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Signature:



Associate Dean for Research and Graduate Education  
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02/01/2022

Date

Acting Deputy Administrator, Crop Production and Protection  
Agricultural Research Service, U.S. Department of Agriculture

Date