

'Redfree' Apple¹

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'Redfree' is an attractive high finish red apple (*Malus domestica* Borkh.) with field immunity to the apple scab organism (*Venturia inaequalis* (Cke.) Wint). The fruit is medium size. It matures 2 to 3 weeks before 'Prima' and 1 week before 'Paulared'. 'Redfree' is released as a potential commercial cultivar for use as a summer dessert apple.

'Redfree' is the 6th apple cultivar (1, 2, 3, 4, 5) developed by the cooperative apple breeding program (PRI) of Illinois, Indiana and New Jersey Agricultural Experiment Stations. This apple has been widely tested in the United States and in Western Europe. It appears to have broad climatic adaptation. It is unique in summer apples in that it has firm flesh and can be held in storage up to 2 months without loss of quality or firmness. The attractive glossy red fruits (Fig. 1) do not drop easily and will remain firm and retain quality on the tree up to two weeks after maturity. Ripening is somewhat uneven and may require more than one picking.

Description

Fruit of 'Redfree' have a smooth glossy skin with 80-90% medium washed to slightly striped red on a yellow ground. The flesh is light cream, medium grained, crisp, juicy, and mild subacid. Dessert quality is good for season.

In addition to field immunity to scab, 'Redfree' appears to be immune to cedar apple rust, incited by *Gymnosporangium juniperi-virginianae* Schw. It has moderate to good resistance to fire blight incited by *Erwinia amylovora* (Burr.) Winslow et al. and powdery mildew incited by *Podosphaera leucotricha* (Ell. & Ev.) Salm., and has shown little response to the European red mite (*Panonychus ulmi* Koch). It is a good pollinizer with most selections tested.

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The complete pedigree is shown in Fig. 2. It was selected on the basis of pomological characteristics in 1971. Propagated trees have been under test as Coop 13 at cooperating Experiment Stations in several states.

The tree is somewhat upright and sets average annual crops. Thinning is usually not necessary. It has been shown to be compatible on Malling 7, 26 and Malling-Merton III rootstocks.

The following detailed description follows Zielinski (6) and uses color designations according to the Royal Horticultural Society Colour Chart, issued by the Royal Horticultural Society of London.

FLOWER

Pedicle: 3.0 cm in length.

Corolla: 4.0 cm in diameter at anthesis.

Color: Magenta from 27/1 (bud) to 27/3 (open flowers).

FRUIT

Shape: Oblate, regular.

Size: Axial diameter 7.5 cm, transverse diameter 6.8 cm

Origin

The original seedling was planted in 1966 in a breeding orchard of the Indiana Experiment Station, Lafayette, Indiana. The seedling resulted from crossing an earlier scab immune seedling selection, PRI 1018-101, as pollen parent and 'Raritan' as seed parent.



Fig. 1. Fruits of 'Redfree' apple.

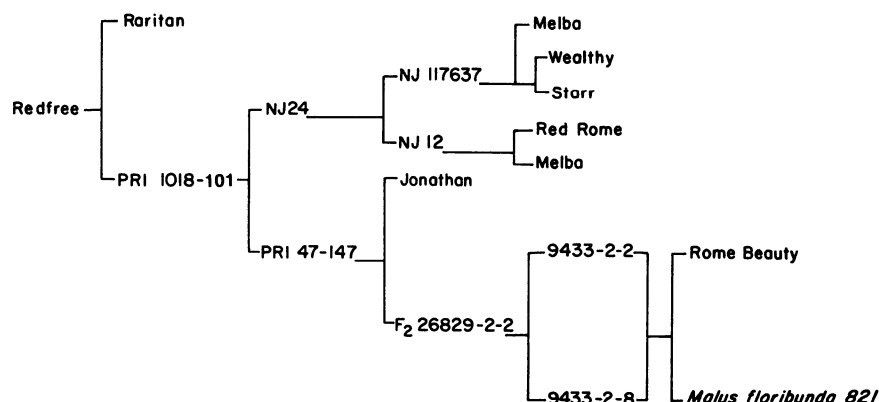


Fig. 2. Pedigree of 'Redfree' apple.

Color: Undercolor Aureolen (Plate 3/2), overcolor 90% Chrysanthemum Crimson (Plate 824), faint stripes on light side.
 Skin: Smooth, waxy with conspicuous white dots, medium thick but not tough, no russetting.
 Stem: 2.2 cm, medium thickness.
 Cavity: Acuminate, deep, medium width, smooth.
 Basin: Medium depth and broad.
 Calyx: Persistent, curved to upright, closed.
 Calyx tube: Urnshaped.
 Stamens: Marginal.
 Core line: Claspings.
 Core: Distant, closed, medium.
 Carpels: Roundish, truncate, smooth.
 Seed: Acute, not tufted.
 Flesh:
 Texture — medium, coarse, firm, breaking

Quality — Good, mild subacid.
 Color — Aurealin (Plate 3/1).
 Maturity season: 7 weeks before 'Delicious'.
 Keeping quality: Retains quality and texture 2 months or more at 1°C.
 Use: Summer dessert apple.

TREE

Tree: Upright and vigorous.
 Leaves: Ovate, serrate to double serrate margin, apex acute, base rounded, length to width ratio = 1.6.

Availability

Budwood is available only for test purposes at Federal and State Experiment Stations. Trees will be available from licensed nurseries. Plant Patent #4322 has been granted for this cultivar.

Literature Cited

1. Dayton, D. F., J. B. Mowry, L. F. Hough, C. H. Bailey, E. B. Williams, J. Janick, and F. H. Emerson. 1970. 'Prima', an early fall apple with resistance to scab. *Fruit Var. Hort. Dig.* 24:20-22.
2. DeCourtie, L. M., E. B. Williams, J. Janick, F. H. Emerson, D. F. Dayton, J. B. Mowry, L. F. Hough, and C. H. Bailey. 1974. 'Prima' Apple. *HortScience* 9:401-402.
3. Williams, E. B., J. Janick, F. H. Emerson, D. F. Dayton, J. B. Mowry, L. F. Hough, and C. H. Bailey. 1972. 'Priscilla', a fall red apple with resistance to apple crab. *Fruit Var. Hort. Dig.* 26:35.
4. Williams, E. B., J. Janick, F. H. Emerson, D. F. Dayton, J. B. Mowry, L. F. Hough, and C. H. Bailey. 1975. 'Stir Prize' Apple. *HortScience* 10:281-282.
5. Dayton, D. F., J. B. Mowry, E. B. Williams, J. Janick, F. H. Emerson, L. F. Hough, and C. Bailey. 1979. 'Jonafree' Apple. *HortScience* 14:551-552.
6. Zielinski, Q. B. 1955. *Modern systematic pomology*. Wm. C. Brown, Dubuque, Iowa.

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'Capital' Ornamental Pear¹

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It is now more than 2 decades since the release of *Pyrus calleryana* Dcne. cv. Bradford by the U.S. Department of Agriculture (3, 5). During this time it has become a very popular shade tree for landscape and street planting purposes. Widely grown throughout the Mid-Atlantic States, westward to the Mississippi and in parts of the West Coast, it is listed among the "Ten Most Recommended Trees" of several states. 'Bradford' has a broad globular crown and may grow to over 15 m in height and in width at maturity.

Since 1954, a test planting of 180 trees of 'Bradford' along the streets of a subdivision of University Park, Maryland, have been under close observation. At planting, the trees consisted of 1 year whips 1 to 2 m tall, budded on 2 year seedlings of *Pyrus calleryana* and spaced 15 m apart along the grass strips between curbs and sidewalks. During the late 1960s the crowns of many adjacent trees were touching each other. At that time, it was becoming increasingly evident that 'Bradford' would outgrow its location and become a maintenance problem, especially regarding electric power and telephone lines. The need for a less robust, more narrow crowned form of *Pyrus calleryana* especially suited for small suburban yards and narrow streets led to the release in 1977 of the cultivar

'Whitehouse' (1). In the short time since 'Whitehouse' was released, it has been well accepted by nurserymen and is being propagated widely.

During the 1960s, when efforts were underway toward the selection for columnar crowned *P. calleryana*, a selection quite distinct from 'Whitehouse' was chosen as having considerable ornamental value with potential for windbreak and screen plantings as a long-lived alternate for the Lombardy poplar. This clone has been named 'Capital'. In addition to its narrow, upright crown, 'Capital' is thornless, has abundant spring flowering, attractive summer foliage, bright purple-red autumn foliage and small unoffensive fruits; characteristics it shares with both 'Bradford' and 'Whitehouse'. Crown shape and ultimate size are the primary differences between these three cultivars. Silhouette drawings of the three cultivars, taken from photographs (Fig. 1) illustrate these differences.

Origin

The 'Capital' pear was selected in 1969 from a population of 2,500 seedlings growing at or near the U.S. Plant Introduction Station, Glenn Dale, Maryland. The original tree developed as an open pollinated seedling presumably resulting from 'Bradford' and one of the many *Pyrus* clones growing at the Glenn Dale Station. It was one of 12 preliminary selections made in 1969, vegetatively propagated and grown in orchard and landscape plantings at the station for further evaluation. Two clones among the 12 continued to show outstanding merit while the other 10 were

gradually discarded as unsuitable. 'Whitehouse' was named in 1977. The second selection from this group is now named 'Capital'. The original tree was 9.5 m tall and 2.5 m at its greatest crown width at the time of its selection in 1969. Vegetative propagations exhibit the same characteristics as those observed in the original tree.

Plants of 'Capital' grafted onto *P. calleryana* stocks were grown in orchard plantings along with an extensive collection of commercial pear introductions from 1970 to present. Trees were grown in a variety of soil types ranging from a heavy clay loam to a sassafras sandy loam, and from clean cultivation to an orchard grass sod. Fertilization ranged from none to 0.45 kg of 10N-4.3P-8.3K granular per 2.50 cm trunk diameter at 30 cm above ground level. The commercial pear plantings have been repeatedly subjected to severe outbreaks of fireblight caused by *Erwinia amylovora* (Burr.) Winslow et al., but no visible symptoms were observed in 'Capital'. Chip bud inoculations of disease infected

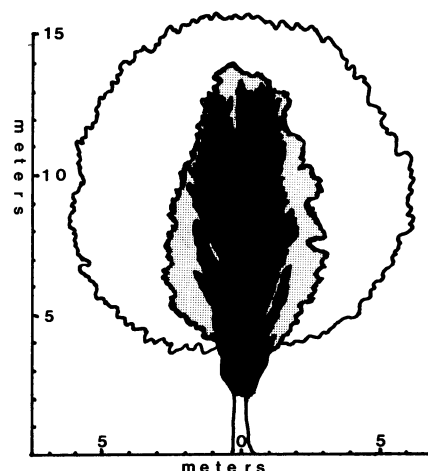


Fig. 1. Silhouette drawings taken from photographs of 'Capital' (center-black) 'Whitehouse' (intermediate-speckled) and 'Bradford' (outside-plain).

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