

'GoldRush' Apple

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'GoldRush' (plant patent 9392), a late-maturing, scab-resistant apple with excellent fruit quality and long storage life, is truly a breakthrough cultivar. Its name reflects its "old-gold" color combined with a "rush" of flavor. It ripens at the end of October in West Lafayette, Indiana but without hard freezes can be picked in November. Thus, 'GoldRush' is most adapted to areas parallel or south of Indiana. The apple contains a number of desirable characteristics including field immunity to apple scab along with reasonable resistance to apple mildew and fireblight, but is subject to sooty blotch and flyspeck. The tree shows strong central leader growth with moderate vigor (eliminating the need for frequent pruning). It is highly precocious, producing fruit in the second leaf. Fruit quality is extremely rich and spicy with a full, complex flavor. It has high acidity and high sugars. Storage quality is outstanding. While the flavor is sprightly and tart at harvest, the acidity mellows in storage while the rich flavor persists — up to 8 months or longer. Quality is truly exceptional after January. The texture is crisp and maintains an exceptional crunchy mouth feel for its entire storage life without off flavors. The apple does not get greasy in storage, but it may shrivel if stored under low humidity, yet even shriveled apples do not lose their texture. 'GoldRush' has been consistently classified as the best tasting apple each year in Purdue evaluations during the winter and spring.

'GoldRush' shows a tendency to overbear and size can suffer, but with proper thinning, can produce fruit 2-3/4 to 3 inches in diameter. The shape is ovate. Lenticels are conspicuous and in some years can be somewhat russeted. Under some conditions the surface is only mod-

erately smooth, but finish seems to improve with tree age. 'GoldRush' does not have a porcelain finish but is close to Midwestern-grown 'Golden Delicious'. Because the apple is so late, color can be a problem in some years. Before it is fully ripe the apple can be somewhat greenish, but properly matured fruit colors to a rich, deep, old-gold yellow, sometimes with a bronze blush. Yellow color can intensify in storage.

'GoldRush' makes an excellent processed product with better yellow color than 'Golden Delicious'. Because of high sugar content, it is unnecessary to add sugar to sauce. Processed slices hold up extremely well. Dried slices have a wonderful taste because of the acidity and high sugar. 'GoldRush' is an excellent apple for cider, once again due to its high acid and high sugar. Over the last three years, the winning cider in the Indiana Cider contest was made with a blend where 'GoldRush' was the predominant cultivar.

'GoldRush' is a product of the PRI cooperative scab-resistant apple breeding program between Purdue University, Rutgers—The State University of New Jersey, and the University of Illinois. The program has a long and colorful history involving many scientists and collaborators (2,5). The cooperative program dates to a formal 1945 collaboration between J. Ralph Shay (1918-1980), pathologist at Purdue University and L. Fredric Hough, (1915-1993), horticulturist at the University of Illinois to develop scab resistant apples. The germplasm exploited by Shay and Hough can be traced to breeding studies of Professor C. S. Crandall (1852-1929) at the University of Illinois carried out as early as 1907. Crandall had assembled a large collection of *Malus* species

and forms at the beginning of the century and initiated an intensive study of crosses between cultivated apples and crab-like forms. A summary of his work was published in *Bulletin 275* of the University of Illinois (1) that describes all the material in the program. A selection labeled *Malus floribunda* 821 was the original source of scab resistance identified by Hough in an epidemic in Urbana Illinois in 1943 when Hough was a graduate student. Resistance was later identified as a single gene called $V_f(7)$.

Interestingly, the joint apple breeding program to incorporate scab resistance through backcrossing was initiated before the environmental implications of the program were realized, and the goal was simply one of serving the needs of fruit growers. In 1948, Hough moved to the Department of Horticulture and Forestry at Rutgers, The State University of New Jersey and shortly thereafter Rutgers joined Illinois and Purdue as the third partner in the collaboration and a large volume of valuable susceptible apple germplasm developed by the late Professor M. A. Blake was thereby made available to the program. In 1950, Daniel F. Dayton joined the program at Illinois while pursuing graduate studies as did Edwin B. Williams, a graduate student of Shay at Purdue. Both Dayton and Williams remained with the program upon completion of their PhD degrees with Dayton continuing leadership for the Illinois team while Williams assumed leadership of the Purdue program when Shay left to join the University of Oregon in 1966. J. B. Mowry, stationed at the Illinois Horticultural Experiment Station, Carbondale, Illinois joined the collaboration in 1952 and tested material until his death in 1986. In 1955, Catherine H. Bailey, a graduate student of Hough and research associate became a participant at Rutgers. Jules Janick of the Department of Horticulture joined the Purdue program in 1954 while Frank H. Emerson, was a part of the program from 1967 to 1988. Schuyler S. Korban replaced Dayton at the University of Illinois upon his retirement in 1982. Shawn A. Mehlenbacher replaced Hough after his

retirement in 1981, remained with the program from 1982 – 1986, and was in turn replaced by Joseph C. Goffreda in 1989. Other participants in PRI included Jeffry A. Crosby and Paul C. Pecknold at Purdue University, P.A. O'Connor and S.M. Ries at the University of Illinois, and A. Voordeckers at Rutgers University, H.F. Goonewardene, a USDA employee stationed at Purdue, investigated insect resistance in PRI germplasm from 1973 to 1988.

'GoldRush' was the tenth release of the PRI program (4). The original seedling was planted in May 1973 at the Purdue University Horticulture Farm in West Lafayette and derives from a cross of 'Golden Delicious' as the seed parent and Co-op 17 as the pollen parent. 'GoldRush' is heterozygous for the V_f gene (4). The seedling was selected in 1980 by E.B. Williams and was placed for advanced testing as Co-op 38 in 1993 (3). It almost didn't make it because the two trees in second test plantings were mouse girdled but were saved by inarching by Jeff Crosby, then a technician in the program.

The tree is being widely tested in the United States where the quality has been continually extolled. Because of its strong flavor at harvest and lack of finish, 'GoldRush' has not been immediately accepted as a commercial apple but is building support. Mitch Lynd, Johnstown, Ohio, Steve Doud, Wabash Indiana, Ed Fackler, New Salisbury, Indiana, and Ian Merwin, Ithaca, New York have become champions for this apple. The lack of immaculately clean finish has slowed its acceptance in the supermarket trade and it may be a challenge to break into this market. However, 'GoldRush' has excelled in retail farm markets, where flavor and eating quality are much more important than appearance, and it is gaining popularity. Early indications are that 'GoldRush' is an excellent parent and in the future we expect it to be found in the pedigrees of 21 Century apples.

Literature Cited

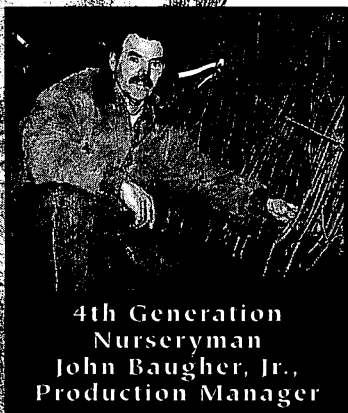
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Erratum J.Amer.Pom.Soc. 55(3):146-153

On page 146 the sentence that begins in the tenth line of the abstract should read "Supplemental decline ratings of trees in the Iowa planting in conjunction with the black heart injury support reports that trees on Mark and B.9 rootstocks lack cold hardiness in mid to later winter when exposed to fluctuating temperatures." The remainder of the abstract should be the first paragraph of the introduction.

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