Pyrus Species and Pear Cultivar Germ Plasm Collection in Oregon

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A previous report (7) emphasized that "single-clone specimen" *Pyrus* collections in arboretums and botanic gardens were generally unsuitable materials for use in agriculture. The genus consists of about 22 species, all of which are self-sterile, and thus require more than one clone of a species to obtain seedling populations for testing which are not inter-specific hybrids. Natural hybridization occurs readily in this genus, so that controlled crosses are needed for any plants used in research. During the past 10 years, we have collected seeds from wild *Pyrus* throughout the world, and have established populations of each primary species at Corvallis (Table 1). Studies on rootstock potential, pest resistance and inheritance characteristics are underway (1, 2, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17). Materials were also made available to others for a number of different studies (3, 4, 5, in Table 2).

Besides the primary species collection, we have a collection at Medford of cultivars which includes 187 varieties of *P. communis*, 6 of *P. pyrifolia*, 17 of *P. ussuriensis* and about 20 hybrids of these species. Many of these show various degrees of resistance to fire blight.

The many uses made of our authentic collection gives some indication of the need for similar collections of *Malus, Prunus* and other important fruit genera. Recent visits to the botanic gardens of Europe confirmed the earlier observation that such collections generally are incomplete at best; and, at worst, are biological garbage dumps consisting of misnamed orboretum hybrids, mislabelled specimens of unknown origin, and atypical specimens of many of the species found there. For years we have given lip service to the populational concept of the species, yet we continue to run arboretums as if we still believed the typological concept.

It seems to us that large arboretums dealing with hundreds of genera cannot hope to do an adequate job of maintaining any one genus for use

Table 1. *Pyrus* species at Corvallis, Oregon State University W-6 and rootstock collection.

Pyrus species*	Number of Individuals
amygdaliformis	many
betulaefolia	"
calleryana	"
dimorphophylla	"
caucasica	"
communis	"
cordata	"
elaeagrifolia	"
fauriei	"
gharbiana	"
hondoensis	7
regelii	7
koehnei	many
longipes	2
mamorensis	many
nivalis	"
pyraster	"
pashia	"
pyrifolia	"
syriaca	"
ussuriensis	"
salicifolia	2

*Species not listed here such as *P. serrulata, P. phaeocarpa, P. Bretschneideri, P. canescens,* P. malifolia, etc., are either natural hybrids or arboretum hybrids of unknown origin. Also not listed, are the several synonyms for many of the above listed primary species.

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Table 2. Uses to which the Oregon *Pyrus* collection has been put in recent years.

Use	Area where work done
1. Rootstock studies	Oregon, Calif., Wash.
2. Species cytology & chromosome counts	Oregon
3. Psylla resistance studies	Oregon
4. Chemical identification & chemotaxonomy	Calif., England
5. Virus testing	Wash., Oregon
6. Pear decline study	Calif., Wash., Oregon, Colo.
7. Species sent to Arboretums	Illinois, Wash., England, Md.
8. Winter hardiness & dormancy study	Western states & Minn.
9. Fire blight testing	Oregon
10. Screening for root aphid resistance	Oregon
11. Screening for crown gall resistance	Oregon
12. Screening for nematode resistance	Oregon
13. Ornamental value of species	Oregon
14. Taxonomy of *Pyrus*	Oregon, England
15. Genetic studies of *Pyrus*	Oregon
16. Nucleic acids as related to juvenility	Oregon
17. Rooting of dormant cuttings	Oregon

in agriculture. Rather, if single genus collections were established at different stations, the limited number of species would make it possible to keep complete authentic populations of each species. Since it has been successful with *Pyrus* in Oregon, there is no reason it would not work for other important fruit genera.

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The Golden Delicious Story*

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It is quite fitting, in my opinion that, we delve into the history and development of the Golden Delicious apple, which, in the U.S.A. alone, yielded 21 million boxes of fruit in 1969. In the following paragraphs I shall refer to and quote from the sayings and writings of some of the people who have been involved with the discovery, development, evaluation, production and marketing of the variety.

First of all, there was Bewel W. Mullins and Anderson Mullins who found the precocious seedling on a West Virginia mountain side, who recognized its possible value, and sent samples to us for testing.

Then, there was my father, who recognized its quality, and made the famous trail of the "golden apple" an international legend. Joe Sicker helped put Golden Delicious on the map in the New York markets, as did Queen Marie of Roumania, who cooperated in the greatest publicity feat in horticultural history when she sampled one during her tour of the U.S.A. Bill Blizzard of the Charleston, West Virginia Gazette Mail, wrote a comprehensive documentation.

We look to the Cowins, Ryans, and Shells, American Fruit Growers, Inc., The Peters, Louis Mallin, Frank Hough, Roy Dougherty of Skookum Packers, Frank Cole and Tom Francomb of Tasmania, Gerald Wight of Capetown, South Africa, Charles Andre of France, and many others all over the world who recognized the potential of this fine fruit, and had the intestinal fortitude to plant and market it in substantial volume. We owe a great deal to the professional pomologist, L. P. Batjer and his chemical thinning to eliminate bi-annual bearing; Edwin Gould, Marshall Ritter, Ronald Tukey for improving production methods; Norman Childers for his nutrition work, and Bob Smock for his contribution to controlled atmosphere storage, which literally makes the Golden Delicious a year-around apple.

We are endebted to the research workers of New Jersey Standard Oil, who gave us Captan; to Food Machinery Corporation, Wallace & Tiernan, and Decco, who gave us fruit waxes; and to Grady Auvil for improving training methods.

Last but not least, we owe much to Elton Gilbert, Phil Jenkins and Joe Steimbacher, who discovered and helped develop the first spur type Golden which has greatly enhanced the production and orchard efficiency of the parent variety.

Let's take a close look at this variety. The tree is strong, especially the spur type. Golden Delicious is a heavy, long season bloomer, self-fruitful, extremely frost resistant, and one of the earliest, heaviest of bearers. At three to five years of age it will pay its way. Properly thinned, it is probably the heaviest bearer of acceptable sized fruit of all the major varieties. It is the "sweetheart" of apple varieties among apple growers. The fruit is beautiful to behold, without a com-

*Based on talk presented at the Golden Delicious Conference, Aug. 13, 1970 at Pennsylvania State University.

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