MALUS

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INTERNATIONAL
ORNAMENTAL CRABAPPLE SOCIETY
BULLETIN

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LETTER TO THE EDITOR

Dear Editor:

Our station maintains a repository of virus-tested fruit trees for distribution to researchers and industry. I am hoping that you can help us with a trueness-to-type problem in one of our crabapples. The variety in question is *Malus floribunda rosea*, although I doubt whether this is a correct classification. We received it from the Agriculture Canada Research Station in Summerland, British Columbia in 1974. No one at Summerland knows the origin, but a tree still exists there which matches our trees. This cultivar is similar to Selkirk and Almey, two of the "Rosybloom" crabapples developed in Ottawa. Thinking that *M. floribunda rosea* might be a Latin version of "Rosybloom", I contacted Dr. Trevor Cole at the Dominion Arboretum in Ottawa, but he could not match our tree with any of the named "Rosybloom" selections. He suggested that it may be an unnamed "Rosybloom" selection. Another possibility is a variety called *M. floribunda purpurea* which I do not have a description for. Do you have a description?

Dan Thompson, Biologist (Tree Fruit)
Saanichton Plant Quarantine Station
8801 East Saanich Road
Sidney, B.C. V8L 1H3

If you have any information available that would help Mr. Thompson, please send him a note. Ed.

LETTER FROM THE EDITOR

I apologize for the delay in getting the last issue of MALUS to you so late. Several changes have been made to overcome many of the problems in getting these issues to you on a timely basis. Most importantly, we had to change printers. I am now serving as publisher as well as editor. The issues will be mailed directly from the city (Cullman, AL) where the magazine is to be printed. Every effort is being made to identify the causes for delays and to do something to prevent those delays. Your patience as a member of IOCS and a reader of MALUS is appreciated.

NORTHEASTERN AMERICAN *MALUS* SECTION *CHLOROMELES*

Elizabeth E. Dickson
L. H. Bailey Hortorium, Cornell University
Ithaca, New York 14853

Many lovely crabapples are derived from *Malus* species originally from Asia. Although less well known, American *Malus* species also prove to be of value as flowering ornamentals. Their relatively late-blooming, fragrant, pink flowers provide a beautiful addition to the spring garden. Several accessions and hybrids with northeastern American origins have been introduced to cultivation, including 'Prince Georges', 'Kola', and 'Dorothea'.

The native species of northeastern America belong to the taxonomic group: *Malus* section *Chloromeles*. Unique characters that separate species in this section from other *Malus* species are the pink styles and anthers, stone cell distribution within the fruit, and open carpels in the mature fruit.

Determining the number of species that are native to northeastern America has been problematic for plant taxonomists, although three species are generally recognized in section *Chloromeles*: *Malus angustifolia* (Aiton) Michaux, from southern New Jersey to Florida and Arkansas; *M. coronaria* (L.) Miller, from Ontario and Michigan, south through Illinois, New York, Virginia, Pennsylvania, and the Carolinas; and *M. ioensis* (Wood) Britton, from Minnesota to Texas and east to Illinois. Several early botanists believed that all the wild eastern American apple trees belonged to just one polymorphic species. Later taxonomists thought that the differences in leaf lobing and venation, hairiness, and fruit shapes were great enough to warrant recognition of three to as many as 20 species in section *Cloromeles*. Difficulties in defining species in *Malus* section Chloromeles may

be attributed to the continuous type of morphological variation seen in this group. For example, the under surfaces of leaves from trees native to Iowa are densely hairy, whereas those of Florida are smooth.. The presence or absence of undersurface leaf hair distinguishes the difference between *M. ioensis* from Iowa and *M. angustifolia* from Florida. However, there is a gradation in the amount of undersurface leaf hair in trees growing between Florida and Iowa. Assigning an individual to a species based on an intermediate amount of leaf hair can be ambiguous.

As part of a Ph.D. dissertation on evolutionary relationships among *Malus* species, I have been studying the molecular systematics of *Malus* section *Chloromeles*. Because the morphological variation within section *Chloromeles* is continuous, I have been looking for discrete molecular characters for use as species markers. My interest has been to determine whether species in section *Chloromeles* can be distinguished by their proteins (isozymes), ploidy levels, and chloroplast DNA patterns.

Isozyme studies indicated that there is little isozyme divergence among trees of *Malus* section *Chloromeles* (Dickson et al., 1991). Trees were sampled from areas as diverse as Ontario, New Jersey, Florida, Texas, and Nebraska. Although there was isozyme and morphological variation among individuals between populations, no distinctive isozyme differences were detected that could be used to distinguish species. The lack of divergence among the isozyme encoding genes of section *Chloromeles*, suggests that species within this section are closely related.

Ploidy levels are of potential value in delimiting species within plants. Within *Malus* section *Chloromeles*, three ploidy levels have been reported: diploids in *M. angustifolia* and *M. ioensis*; triploids in *M. coronaria*; and tetraploids in *M. angustifolia* and *M. coronaria* (Huckins, 1972). Diploid organisms have two sets of chromosomes, one inherited from the maternal and one from the paternal parent. Triploids have three sets of chromosomes, whereas tetraploids have four sets. In *Malus*, each set consists of seventeen chromosomes; therefore, *Malus* diploids have 34 chromosomes, triploids have 51 chromosomes, and tetraploids have 68 chromosomes.

The total amount of DNA within the nucleus is a function of the size and number of the chromosomes that it contains. Tetraploid nuclei are expected to have twice as much DNA as diploid nuclei of the same species; triploids to have intermediate amounts between those of diploids and tetraploids. To determine the distribution of ploidy levels with section Chloromeles, I measured the amount of nuclear DNA of over six individuals, using flower cytometry. The results indicate a geographical component to the distribution of polyploidy. No diploids were identified as *M. coronaria*. *Malus coronaria* individuals samples from Ontario were tetraploids, and those further south and west were either triploids or tetraploids. From regions common to more than one species, all ploidy levels were detected for *M. angustifolia* and *M. ioensis*; however, at the centers of their ranges they were found mostly to be diploids (Dickson, unpublished data).

Chloroplast DNA evolves very slowly compared to nuclear DNA and has proven useful in understanding relationships at higher taxonomic levels. Chloroplast DNA restriction sites were surveyed with *Malus* section Chloromeles and minor amounts of variation were found (Dickson, unpublished data). Restriction site characters marking species were not detected, supporting the conclusion from isozymes that the species of *Malus* section Chloromeles, have very close evolutionary relationships.

Before beginning molecular studies, I collected seed and branch cuttings from trees from over 50 sites within the United States and Canada during August of 1987 and 1988. These collecting trips were supported by the USDA-ARS Plant Genetic Resources Unit in Geneva, NY. Branch cuttings were mailed to Geneva, where they were grafted onto dwarfing rootstock and planted in the orchard. Seeds were germinated and planted in a seedling nursery. Last spring, the first flowers bloomed on several of the trees grafted in 1987. Persons interested in visiting this collection or in obtaining seed for scientific use may contact Phil Forsline, Curator of the Repository for Apples and Grapes, USDA-ARS Plant Genetic Resources, Cornell University, Geneva, NY 11456.

Dickson, E. E., S. Kresovich, and N. F. Weeden. 1991. Isozymes in North American Malus (Rosaceae): hybridization and species differentiation. Systematic Botany 16(2):363-375.

Huckins, C. A., 1972. A revision of the section of the genus Malus Miller. Ph.D. dissertation, Cornell University, Ithaca, New York.

GUIDING RULES FOR NAMING CULTIVARS

Ruth Kvaalen
1721 Fernleaf Drive
West Lafayette, IN 47906

A few years ago I was struggling to make sense out of a document called the International Code of Nomenclature for Cultivated Plants, which gives the rules, recommendations, and procedures to name a cultivar and have that name registered so that it is on record and will not be used for a different cultivar in the same plant group. The Code, often referred to as the "Cultivated Code," is a counterpart to the International Code for Botanical Nomenclature, which governs the genus and species names for plants. I have simplified the Code and added explanations, but for precision some of the complicated structure of the Cultivated Code had to be preserved.

The most recent Cultivated Code (1980) is 31 pages of small print and technical terms, and rather difficult to use the first time one reads it. This article covers portions of the Code that deal with correct usage of cultivar names, how to select a cultivar name to agree with the Code stipulations, and what makes a cultivar name "legitimate."

Correct Usage of Cultivar Names

1. The following rules apply to the use of cultivar names:
   a. For cultivars named after 1958, the name must be in common language, not in Latin (*Art 27*). Latin is reserved for botanical names. However, Latin cultivar names that predate January 1, 1959, are retained if published in conformity with the cultivated Code, as are Latin names when a botanical category is transferred to cultivar status after this date.

   b. Cultivar names are **not** printed in italics (*Art. 29*). This distinguishes cultivar names from names of botanical entities--genus, species, subspecies, varieties, and forms--which **are** italicized.
   c. First letters of all words in cultivar names **are** capitalized.

2. The full name of the cultivar consists of the botanical or common name of the species plus the cultivar name (*Art. 27*). Examples: *Malus sargentii* 'Tina', Sargent Crabapple 'Tina', or 'Tina' Sargent Crabapple.

3. The cultivar name, when following the botanical or common name, must be set apart or distinguished either by single quotation marks around the name (as shown by examples in 2), or by the abbreviation "cv." before the cultivar name (examples: *Malus sargentii* cv. Tina; Sargent Crabapple cv. Tina). When a cultivar name **precedes** a common name, it should be distinguished by single quotation marks (examples: 'Delicious' apple, 'Mary Potter' crabapple), or it may be used without the quotation marks if there is no chance for confusion (example: Mary Potter crabapple). Double quotation marks or abbreviation "var." must **not** be used to distinguish cultivar names (*Art. 29*).

   Note that for cultivars with Latin names, (named prior to 1959, as explained above), the same treatment is used to set off the cultivar names as for names in English or other modern language. Examples: *Malus baccata* 'Columnaris'; *Malus baccata* cv. *Columnaris*; 'Columnaris' Siberian crabapple.

4. When a cultivar name is to be used where another language prevails, preferably it is left unchanged (*Art. 32*). However, it may be transliterated into the prevalent script. Example: 'Amanogawa', the name of a cultivar of *Prunus serrulata*, is a transliteration into Roman script from Japanese Script. Occasionally, difficult names may be translated, although this should be done only with the approval of the appropriate Registration Authority. Personal names should **not** be translated. (For commercial synonyms, see 24)

5. Cultivar names may follow the name of a genus, species, or botanical variety, as follows:
   a. When a cultivar has been selected from within a species (hybrid or natural), the cultivar name follows that of the *species (examples: Malus baccata* 'Columnaris'; *Malus* x *purpurea* 'Lemoinei').
   b. Similarly, if the cultivar has been selected from within a botanical variety of a species, the cultivar name follows that of the variety (example: *Malus sieboldii* var. *zumi* 'Calocarpa') (Note that the crabapple once known as *Malus sieboldii* var. *zumi* is now considered to be a hybrid, *Malus* x *zumi*, so this example is out of date. The older name is used here for illustrative purposes only.)
   c. For cultivars of hybrid origin where no species name exists, such as 'Mary Potter', whose parentage is *Malus sargentii* 'Rosea' crossed with *Malus* x *atrosanguinea*), the botanical name is simply the genus name followed by the cultivar name: *Malus* 'Mary Potter'. Note that the multiplication sign (x) is not used under these circumstances.

The multiplication sign to indicate hybrid origin is used only in botanical names, such as when a hybrid between two or more botanical entities has been given a name (example: *Malus* x *purpurea*), or to indicate parentage of a hybrid (example: *Malus baccata* x *M. sieboldii*).

Some of the examples cited above have cultivar names in Latin, indicating that these cultivars were named before 1959. As stated above (1 a), for cultivars named **after** 1958, names in Latin form are contrary to the rules for cultivar nomenclature. Although not strictly stated in the Code, names mimicking Latin names should be avoided also.

Legitimate Names

6. Any person may name a cultivar so long as it has not been legitimately named previously, and if doing so is not against the expressed wish of the cultivar originator or his or her assignee. (See 7 for what makes a name legitimate.)

A new cultivar name cannot be applied to a plant for commercial or commemorative purposes if that plant already has a legitimate valid name in accordance with the rules of the Cultivated Code. (For permissible commercial synonyms, see 24.)

7. To be considered legitimate, a name must fit certain requirements:
   a. It must be selected in accordance with the Cultivated Code (see 10 through 24).
   b. It must be **published** in a manner stipulated by the Cultivated Code. ("Valid publication" means the printing of the cultivar name be accompanied with a description (and illustration, if possible) in a dated trade catalog, horticultural journal or magazine, or registration list of a Registration Authority. These stipulations apply to the initial publication which is required to legitimize the name, not to the use of the name in other publications thereafter.)
   c. It must be applied to a cultivar not already legitimately named.
   d. It must not duplicate a name already in use for another cultivar or the same cultivar class.

"Cultivar class" means that taxonomic level within which the use of a cultivar name for two distinct cultivars would lead to confusion (*Art. 50*). The taxonomic level may be that of species, genus, or cultivar group; the level is determined by the Registration Authority for that plant or, lacking that, by the International Commission for the Nomenclature of Cultivated Plants. Example: The existence of the cultivar named 'Harvest Moon' among rhododendrons prevents the use of this name for an azalea cultivar, but does not prevent using 'Harvest Moon' as the name of a crabapple cultivar.

8. A person planning to name a new cultivar should contact the appropriate Registration Authority (for crabapples, the Arnold Arboretum) to learn whether the contemplated name is acceptable (*i.e.*, the name agrees with the stipulation of the Cultivated Code and has not been used previously).

9. A name may not be reused later for any other cultivar on the assumption that the original cultivar no longer exists. However, Registration Authorities have power to grant exceptions to this rule under certain specified conditions (*Art. 48*).

Guide lines for Selecting Cultivar Names

In addition to the requirements already stated, the following guidelines apply to forming cultivar names after 1958:

10. A cultivar name must not consist of more than three words and preferably should be one or two words only (Art. 30). **Numerals, abbreviations, or arbitrary sequences of letters (code names) should be avoided** except in certain crops or countries where this is established custom; if used, these are counted as words (*Art. 30 & 31 A a*).

11. The cultivar name must not include the botanical name of a genus or the common name of a genus or species if it would lead to confusion. Example: Camellia 'Rose' might be carelessly referred to as rose 'Camellia', so would **not** be acceptable (*Art. 31 a*). However, carnation 'Heather Pink' or redbud 'Forest Pansy' are acceptable since likelihood of confusion is small..

12. Names of cultivars derived from hybrid origin must not be formed by combining parts of the Latin names of the parent species. Example: The name 'Torintina' for a hypothetical cultivar whose parent species were *Malus toringoides* and *M. florentina* would **not** be an acceptable name (*Art. 31 b*).

13. Cultivar names published on or after January 1, 1959, must not include the word "variety," the abbreviation "var.", or the word "form." The word "Variegated" is acceptable but must be written out in full, not abbreviated (*Art. 31 c*). The Cultivated Code recommends also that the words "hybrid," "hybrids," "cross," "crossed," and "grex" should not be used in cultivar names (*Art. 31 A i*).

14. Names should not contain or consist of excessively long words or phrases (*Red. 31 A e*). Example: The crabapple cultivar named 'Oekonomierat Echtermeyer' (German for "Economics Adviser Echtermeyer"), although valid, is an example of a type of name to be avoided.

15. Names should not contain forms of address, such as Mr., Señor, Herr, Miss, Mademoiselle, except when required by national custom, as in the case of married women using their husband's names. For example: crabapple 'Mrs. Bayard Thayer' and narcissus 'Mrs. William Copeland' are permissible (*Rec. 31 A d*).

16. Avoid abbreviations in proper names (except for the abbreviation Mrs. in English (see 15). Examples: Use 'Mount Arbor,' not 'Mt. Arbor'; use 'William Anderson', not 'Wm. Anderson' or 'W. Anderson" (*Rec. 31 A c*).

17. Avoid names composed of abbreviations, numerals, or arbitrary sequences of letters (except where established customs for a crop requires; **not** landscape plants) (*Rec. 31 A b*).

18. The articles "a," "an," " or "the" and their equivalents in other languages should be avoided unless required by linguistic custom, as in French. Examples: 'Highwayman', not 'The Highwayman'; but 'Le Printemps', not 'Printemps' (*Rec. 31 A b*).

19. Avoid names so similar to other names in the same or related cultivar classes that they are likely to be confused. Examples: 'Norman', 'Normand', 'Normandy'; 'Wagner' and 'Wagener'; 'Darwin' and 'Charles Darwin' (*Rec. 31 A h*).

20. Avoid names which exaggerate the merits of a cultivar or which may become outdated or inaccurate through the introduction of new cultivars or other circumstances.. Examples: 'Best Ever'; 'Darkest Red'; 'Earliest of All' (*Rec. 31 A f*).

21. Cultivar names should not be common descriptive terms. Examples: Use crabapple 'Wintergold', not crabapple 'Gold'. Use juniper 'Amethyst Spreader', not juniper 'Spreader'.

22. Avoid names incorporating the common name of the plant, such as Malus 'Crabapple Jelly' or *Cercis canadensis* 'Sunset Redbud. (*Rec 31 A j*).

23. A new cultivar which originated by selection or by bud-mutation from another cultivar, and which still retains a strong resemblance to it, should, when appropriate, be named to indicate the relationship. The same applies to new cultivars differentiated by the introduction of a single character (*Rec. 21 a*). Example: Apple 'Crimson Bramley' is a bud-mutation from apple 'Bramley's Seedling'.

    Amu such selection showing sufficient differences from the parent cultivar to render it worthy of a name is to be regarded as a distinct cultivar. It should not be designated as a "strain" (*Art. 12*). Strains in the sense of a cultivar group of hybrid origin are handled as group names.

24. Each cultivar has only one correct cultivar name; it may also have one or more legitimate commercial synonyms under restricted particular circumstances (*Art. 35*). A commercial synonym is an alternative name which may be sued instead of its correct name if the correct name is commercially unacceptable in a particular country. For instance, a name might be considered commercially unacceptable in a country where the correct name is difficult to pronounce or l;where the original name or its translation would have an undesirable connotation or implication. Only one cultivar named for a single cultivar should be current under any particular circumstance. (See 4 for information on translation and transliteration).

DELAVAN - CITY OF CRABAPPLES

W. Gordon Yadon
Arboretum Director
Municipality of Delavan
Delavan, WI 53115

For the past thirty years Delavan, WI has assumed a leadership role in the promotion of flowering crabapples. Since 1962, about 6000 crabapples have been planted in Delavan, nearly one for each of its 6500 residents. Delavanites take pride in the flowering splendor that adorns their city for a few weeks every spring. As a bonus, many cultivars exhibit colorful fruit throughout the winter months.

The program started in 1962 when the Delavan Park Board purchased 2500 mixed, 6 - 7 ft. , branched, bare-root crabapples for 47 cents each. On Arbor Day they were distributed free to Delavan residents willing to plant them on their premises, excluding street terraces. Block captains picked up the trees and delivered them to their neighborhoods.

Some of the mixed cultivars distributed in 1962 later exhibited undesirable traits, and many have since been removed and replaced with newer cultivars. The 1962 mixture included 'Red Splendor', 'Scheidecker', 'Cardinal', 'Dolgo', 'Carmine', and 'Flame', all of which were found to be satisfactory. The others which were later discarded were: 'Eleyi', 'Hopa', 'Jay Darling', 'Prince Georges', and 'Purple Wave'.

The program was so well received it was repeated in 1963, with 1500 trees, chiefly 'Flame' and 'Almey' being distributed. 'Almey' was discarded later. Over the ensuing decade the City Parks Department made mass plantings of crabapples at various sites, including some streets, parks, lagoons, median strips, school properties, and in the Municipal Arboretum, utilizing the following selections: 'Bob White', 'David', 'Ellen Gerhart', 'Evelyn', 'Floribunda', 'Indian Magic', 'Katherine', 'Lemoine', 'Ormiston Roy', 'Mary Potter', 'Ringo', 'Selkirk', 'Silver Moon', 'Van Eseltine', 'White Candle', 'Wintergold', and 'Redbud'.

Delavan has a distinctive three-block parkway median leading to its downtown business district. In 1969, the first block was planted with *Malus* 'Wintergold' and the other two with *M. sargentii* 'Rosea' on six-foot standards. The 'Wintergolds' have been sheared annually to assume a compact globular shape.

In 1971, Edward H. Scanlon, editor of "Trees" Magazine, featured a photograph of the 'Wintergold' on the cover of his publication and commented: " The trees are absolutely beautiful and sophisticated -- your boulevard is probably the first example that has come to my attention of a classical planting in this country."

During the Christmas season the Delavan Chamber of Commerce places decorative lights on 'Wintergold' and *M. sargentii* 'Rosea'. Red and yellow Emperor tulips planted at the base of each tree provide a colorful early spring display followed by multiflora white petunia and red salvia during the summer and fall. The 'Wintergolds' were practically disease-free for over 20 years until some fire blight was noted during the summer of 1991 and intensified this year to the extent that contemplation is being given to replacing the entire planting with a more disease-resistant cultivar.

To lengthen the spring flowering period, commencing with 1972, Delavan began using *Pyrus calleryana* 'Chanticleer' on new residential streets and industrial sites. Over the past 20 years about 500 Callery pear cultivars have been planted by the Delavan Parks Department, including: 'Red Spire', 'Autumn Blaze', 'Capital', and 'Stone Hill'.

To commemorate the nation's bicentennial in 1976, Delavan made free distribution of 2000, 3-4 ft. Washington hawthorns on Arbor Day. In 1981-82, the Delavan Beautification Association sold 1750 5-6 ft. crabapples at a cost of $5.00 each. The cultivars were 'Red Jewel', 'Floribunda', and 'Indian Summer'. In 1990 Delavan distributed 1000 *Amalanchier laevis* transplants on Arbor Day.

Although crabapples can be viewed on practically any Delavan street, the largest concentration is in the Municipal Arboretum, where 101 different varieties have been planted. Lester P. Nichols, prior to his death, visited Delavan on three different occasions to evaluate crabapples for disease resistance.

Delavan's crabapple planting program has not been without mistakes. In 1966, both sides of a new street were lined with 'Radiant' crabs. Although a breathtaking sight in early-mid May, the scab susceptible trees are a disaster by midsummer.

Delavan's citizens have reacted most favorably to the crabapple program. At first there were some negative comments, chiefly that the city was promoting a high-maintenance, disease-prone, messy tree with numerous problems such as cross branching, basal shoots, water sprouts, and a haven for tent caterpillars.

Cultivars with colorful, retentive winter fruit have done much to endear crabapples to the Delavan citizenry -- the following having earned the highest rating by the Parks Department: 'Donald Wyman', 'Birdland', 'Red Jewel', 'Adams', 'Indian Magic', 'Professor Sprenger', 'Sugar Tyme', 'Zumarang', 'Ormiston Roy', 'Bob White', 'Christmas Holly', 'Walters', 'Indian Summer', and 'Red Barron'.

In normal years Delavan's crabapples are in peak flower between May 7th and 17th. The Chamber of Commerce offers visitors free maps showing especially attractive viewing sites.

For a city of its modest size, Delavan has probably more crabapples per capita than any community in the nation. The future for crabapples looks promising in Delavan. The city recently purchased a six-acre addition to the Municipal Arboretum, which will be chiefly planted with new cultivars of crabapples over the next decade. All trees in the Delavan Arboretum are identified with Metalphoto in-ground, 6x4 inch labels on concrete bases.

Although Delavan has never claimed the title, it is a strong candidate for: "Crabapple City USA."

Malus 'Wintergold' along a street in Delavan, Wisconsin

Marker for Malus 'Weeping Candied Apple'

THE TRAGIC TALE OF THE TAIWAN CRAB

John H. den Boer

In May of 1936 A. F. den Boer wrote to the Yokohama Nursery Company in Yokohama, Japan for assistance in getting seed from the Taiwan Crab. He had been unsuccessful in finding this crabapple anywhere in the USA.

Three years later, during one of his "annual desk clean-ups" he discovered a copy of that letter and realized that he had never received a response. He thereupon wrote another letter, this time to the General Consulate of the USA in Yokohama asking if they could be of assistance in collecting seed from this crabapple. Less than a month later they responded to say that they had been in touch with the Yokohama Nursery, and that a response was to be expected from that nursery. They did not know of the previous letter to that nursery. This was in March of 1939.

Four months passed, and there was no response from the Yokohama Nursery. Therefore, another letter was sent to the General Consulate with the request for help. Within a month Mr. Boyce, the American Consulate, responded that he had been in contact again with the Yokohama Nursery. It seems that Mr. Inanami of the Yokohama Nursery had written to his representative and had not received a response. Mr. Inanami had addressed another letter to his representative. Further, Mr. Boyce advised that the American Consul in Taihoku, Formosa was being brought into this affair and would be following up on this.

A month later a letter was received by Den Boer from the consul in Formosa with a discussion of what was necessary to get the seeds. This crabapple grows at the 7,000 - 8,000 ft. elevation in the central mountainous districts of the island. The local nurserymen had tried to grow this tree at lower elevations without success. Therefore, to get the seeds, it would require a special trip into the mountains.

In February, 1940, the American Consul in Formosa wrote to advise that he had received a packet of seeds and was sending them with the letter. In the same letter was a request for help in obtaining Mexican rubber tree seeds. Den Boer promptly wrote to the American Consulate in Mexico City for assistance in this matter.

He was advised by the consul that they would try to get some, but that it might prove more worthwhile to write to the Dean of Agriculture, University of California at Berkeley. The Mexican Consul thought that this plant was being grown in California for experimental purposes, and indeed it was. Den Boer was to find out that experiments were being conducted with this plant to produce rubber from the latex of the plant. As you will remember, this was a period of time just before the United States was at war with Japan. Den Boer had to advise the consul in Formosa that he had written to several locations and was "not successful" in his attempt to get the seeds.

You might wonder what happened to the seeds. The seeds were divided into three groups; one was retained for planting in Des Moines. The other two were sent to widely scattered locations. Records haven't been found to indicate where they went but it is believed to be the Arnold Arboretum and somewhere in the West. The retained seeds were packed in sand, then into a wooden box which was then buried and left in the ground over winter. The following spring, 1941, they were planted. Many of the seeds germinated, and the trees grew to about 6" in height that first year. On Armistice Day of that year there was quite an unusual drop in temperature. By that afternoon the temperature had dropped to well below freezing. Up to that time the weather had been beautiful; leaves were still on the trees. By four that afternoon one could hit a bush with a stick and hear all the leaves crack, falling to the ground in pieces. None of the seeds that germinated in Des Moines survived. Worse, the storm covered the entire country, and all the plants which had germinated from those seeds were killed by the same storm. No new attempt was made to get more seeds.

THE SHY YET ELEGANT CRABAPPLE - 'BLANCHE AMES'

Michael Yanny
Propagator
Johnson's Nursery
Milwaukee, WI

In my travels throughout the United States and Canada, I have seen few trees that rival *Malus* 'Blanche Ames' for beauty and elegance. It has bloom qualities similar to the flowering cherries commonly seen in the eastern and western United States, and its graceful, slightly weeping form is reminiscent of the Japanese Maples that I have always wanted but cannot grow in the harsh Wisconsin climate. Yet even with its many superb attributes, few people know about 'Blanche Ames', and very few nurseries grow and sell the tree. The plant that became 'Blanche Ames' was selected by Dr. Karl Sax of the Arnold Arboretum from a group of open-pollinated seedlings of *Malus spectabilis* 'Riversii' that he raised in 1939. Originally known as 'Sax #6639', the tree was introduced into the Arboretum collection in 1947, but was not named 'Blanche Ames' by Dr. Sax until February 1955 --to honor the noted botanical illustrator Blanche Ames, wife of the former Supervisor of the Arboretum, Dr. Oakes Ames.

As a young tree, *Malus* 'Blanche Ames' is taller than its width, but with age, it broadens out to form a dome wider than its height. The original plant at the Arnold Arboretum, which was 15 feet tall at fifteen years of age, is now 23 feet tall and 31 feet wide at fifty years. By comparison, a 28-year old specimen at Boerner Botanical Gardens in Hales Corners, Wisconsin, is about 25 feet tall and 25 feet wide. In silhouette, the tree is very striking, with its purplish-brown limbs ascending upwards and outwards, like streams of water flowing from a fountain. In winter, the drooping maroon branchlets delicately mask the light gray trunks. In southern Wisconsin, 'Blanche Ames' leafs out in early spring before most other woody plants, at about the same time as *Larix decidua*, in early to mid-April. About a month later, along with

Malus 'Dorothea' and 'Profusion', its crimson buds open to reveal white semi-double flowers with a pink blush and a sweet scent. In full bloom 'Blanche Ames' creates a billowy, cloud-like impression. The individual flowers, about 1.3 inches in diameter, are unique among crabapples: the approximately fifteen narrow strap-like petals, when open, reveal a center full of golden stamens. The fully opened flowers, which look something like *Rosa multiflora* blossoms, are exquisite when seen close up. The tree has been a consistent annual bloomer in the Milwaukee area, as well as in and around Boston. The fruit of 'Blanche Ames', while colorful, is not persistent enough to be considered a major attribute. The small, 0.3-inch diameter crabapples color to a golden yellow by early September in Madison, Wisconsin. Within a month, the slightly elongated fruit changes to a cardinal red, though a small shaded portion of the fruit usually remains yellow. Late October frosts soften up the tiny crabapples, turning them a garnet brown. By late November, most of the fruit is taken by birds, thus eliminating the need for any fruit clean-up. Fall color may vary from year to year in Madison, Wisconsin; the foliage was an attractive orange-red in 1989, but in 1990 it was a disappointing yellow.

Disease Resistance

In any discussion of the ornamental potential of crabapple trees, disease resistance is of major importance. The response of 'Blanche Ames' to the three most serious crabapple diseases is as follows:

1. Powdery Mildew (*Podosphaera leucotricha*) is a foliar fungus disease that coats the new terminal growth of trees with a white powdery substance. The mildew causes leaves to become twisted, narrow, and cupped. It weakens terminal shoots, making them more prone to winter kill. This disease is a serious problem only in the hot, humid climates found in many parts of the southeastern United States. Unfortunately 'Blanche Ames' has not been evaluated to any extent under such conditions, and a meaningful disease rating cannot be given as yet.

2. Fireblight (*Erwinia amylovora*) is a bacterial disease and a major concern because of its ability to kill or severely deform susceptible Malus cultivars. The bacteria enter trees primarily through flowers, growing tips, and open wounds, transmitted by insects or by rainwater splash of the bacterial ooze. Once in the tree, the disease moves quickly through the vascular system. Symptoms of attack are a sudden browning or blackening of new vigorously growing shoots with a characteristic sheperd's crook bend at the tip. Fireblight was reported in *Malus* 'Blanche Ames' only twice in the twenty-seven years from 1963 to 1990, and those infections were rated as mild. Ratings were done primarily in the Midwest, the East, and the Pacific Northwest; unfortunately, no trees have been evaluated in the Plains states where fireblight occurs with great regularity.

3. Apple scab (*Ventruia inaequalis*) is a fungus disease whose development is favored by wet, humid weather conditions. Symptoms include smoky-gray spots on the leaves and brownish, corky spots on the fruit. Severely susceptible cultivars may be completely defoliated by mid-summer in many seasons. Mildly susceptible trees , on the other hand, show little evidence of the disease except for a few inconspicuous leaf spots. 'Blanche Ames' has had mixed reviews in terms of resistance to scab. Reports from the Pacific Northwest in 1985 indicate that 'Blanche Ames' is severely susceptible to scab and is therefore not a good tree for that climate. In the drier, less humid areas, such as the Plains and the Rocky Mountain states, apple scab is of little concern. Midwest reports from 1973 to 1990 show 'Blanche Ames' to be only mildly susceptible to scab. Reports from the East, based primarily on observations at the Arnold Arboretum, show 'Blanche Ames' to be only mildly susceptible to the scab. However, on two occasions, in 1973 and again in 1979, severe scab was reported in single trees, indicating that continued evaluation is necessary.

Propagation and Cultivation

Propagation of *Malus* 'Blanche Ames' has been done by chip-bud grafting onto seedling understock in late summer. Because 'Blanche Ames' stops growing relatively late in the season, it should be one of the last ornamental crabapples to be budded. In Wisconsin good results have been achieved in mid-August. When budded on seedling understock, trees will send up sucker shoots from the stock. This can be an annual maintenance headache. For this reason, a non-suckering clonal rootstock, such as EMLA 111, should be used. Another possible alternative may be the rooting of softwood cuttings, thus eliminating the understock altogether. Like most ornamental crabapples, 'Blanche Ames' can be a tough durable urban tree. The full extent of its hardiness, however, is unknown. Vigorously growing two-year-old trees planted in southeastern Wisconsin (USDA Zone 5a) showed some tip dieback on young branches, indicating the need for further hardiness testing in colder zones. 'Blanche Ames', with its many beautiful attributes, has numerous landscape uses. The tree can serve well as an accent or a focal point in the garden. Imagine 'Blanche Ames' in full flower in the distance, fronting a border stand of tall, dark-green Austrian pines (*Pinus nigra*). In this situation, the tree will stand out and give the border depth and dimension as well as multi-season interest. Another use might be as a specimen limbed up high enough to accommodate a garden bench; in time, its pendulous branchlets will make a wonderful private sitting area, at the destination of a garden path. And finally, the graceful 'Blanche Ames' overhanging a pond will create spectacular reflections when in bloom. Indeed, there are many possibilities for this fine tree, and it seems unlikely that it will remain unknown much longer. But who knows? Obscurity may be the nature of the very elegant 'Blanche Ames.'

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WEEPING CRABAPPLES

John H. den Boer

Some call them weeping, some call them semi-weeping. There are a few who will argue that there are no weeping crabapples. As Archie says "Whatever!" Listed below are the crabapples that have been reported to be either weeping or semi-weeping.

The colors described below for the flowers and fruit are somewhat abbreviated and should not be taken as fully correct, but more an indication of the major color.

Crabapple	Flower Color	Leaf Color	Fruit Color
'Aloise'	Pink	Reddish	Purple
'Amberina'	Cream	Green	Red
'Anne E'	White	Green	Dark Red
'Autumn Treasure'	White	Green	Yellow
'Blanche Ames'	Pink, White	Green	Dark Red
'Color Parade'	White	Dark Green	Orange Red
'Coral Cascade'	Pink, White	Dark Green	Orange Red
'Coralene'	White	Dark Green	Orange Red
'Echtermeyer'	Pink, Purple	Bronze Green	Purple
'Egret'	Pink, White	Dark Green	Red
'Elise Rathke'	Pink, White	Green	Red
'Exzellenz Thiel'	Pink, White	Green	Yellow
'Fiesta'	White	Dark Green	Orange Red
'Firecloud'	White	Dark Green	Orange Red
'Firecracker'	Pink, White	Dark Green	Red
'Firedance'	White	Green	Red
'Flamingo'	Red, Purple	Red	Purple
'Fountain'	White		Dark Red

Crabapple	Flower Color	Leaf Color	Fruit Color
'Goldilocks'	White	Dark Green	Yellow
'Little Troll'	White	Dark Green	Orange Red
'Louisa'	Pink	Green	Red
'Luwick'	Pink, White	Dark Green	Red
'Maria'	Red	Bronze Green	Dark Red
'Ming Dynasty'		Bronze Green	Purple
'Mollie Ann'	White	Green	Dark Red
'Molten Lava'	White, Rose	Green	Dark Red
'Pagoda '	White	Dark Green	Orange Red
'Pixie'	Pink, White		Red
'Red Jade'	Pink, White	Green	Red
'Red Peacock'	White	Green	Orange Red
'Red Swan'	Pink, White		Red
'Royal Beauty'	Red	Bronze Green	
'Royal Splendor'	White	Green	Red
'Ryan'	White	Dark Green	
'Seafoam'	Pink, White	Green	Yellow
'Sensation'	White	Green	Orange
'Sinai Fire'	White	Dark Green	Red
'Weeping Candied Apple'	Pink	Green	Red
'Weeping Pearleaf'	White	Green	Orange Yellow
'White Cascade'	White	Green	Yellow
'Wildfire'	Pink	Reddish	Red
'Woven Gold'	White	Dark Green	Yellow

COLOR STANDARDS

John H. den Boer

Here is something that may be of interest to those of you who are using or contemplate using color standards in the characterization of crabapple flowers, leaves and fruit. I have learned that there are several color standards available, and some have the same name as others. In reviewing four different Plant Patents I found those patents referencing "Nickerson Color Fan", approved by the American Horticultural Society. David Guthery, in his work at the University of Wisconsin, used a RHS Colour Chart. The National Association of Plant Patent Owners recommends the Royal Horticultural Society's Colour Chart, obtainable from the Flower Council of Holland. This Standard is not the same as the one used originally by David Guthery. He has very recently issued a revised report using the latest RHS Colour Chart.

Dr. A. C. Leslie, Registration Officer for The Royal Horticultural Society, advised me the following:

"The Chart you should be using is the one with the holes in the middle of each colour block and the colours identified by a number and a letter, *e.g.* Blue-green Group 112A. This is the current chart originally published in 1966 and reprinted in 1986 (the 1966 printing lacked the holes).

"The other chart you have is the Horticultural Colour Chart, also produced by the RHS. This is now effectively obsolete, which is a pity, as the colours always seem so much better. There is every reason to believe that the 1986 printing will be available for many years yet and will continue to be a widely used standard."

The Colour Chart recommended by Dr. Leslie can be obtained from :

Flower Council of Holland
Publication Department
250 West 57th Street
New York, N.Y. 10019

MALUS OBSCURUS

Malus floribunda Siebold ex Van Houtte, Floribunda Crab

Thomas L. Green
Morton Arboretum

Malus floribunda is commonly called the Japanese Flowering Crabapple. It is widely planted and one of the most common to be found in nurseries. This species more fittingly belongs as a feature of **CRABS YOU SHOULD KNOW** than **MALUS OBSCURUS**. It is certainly not obscure. However, its history is fascinating (to me) and worth featuring.

There seems to be little doubt that its origin is Japan. Dr. Philipp Franz Balthasar von Siebold, a great plant explorer (exploiter?) of Japan, named this crabapple and introduced it to European gardens in the 1850's. It was named as early as 1856 (1). Louis van Houtte was the first to write specifically about *M. floribunda* (2).

> *Malus ringo, toringo, spectabilis kaido* and *floribunda*, all introduced by Dr. von Siebold, have made their entrance in the world with very little fanfare. They excite scarcely any attention, and those competent in matters of taxonomic determination hardly know them.
>
> They reached this institution [Horticultural and Nursery Gardens, Ghent, Belgium] together with numerous other Japanese plants and have been cultivated here, multiplied and even resown without having attracted any special attention on our part.
>
> They have grown to the dimensions of young trees, 4-5 m in height. One of them, shipped under the name *floribunda*, proved to be so beautiful that we tried to make a sketch of the whole tree, first, when it was in bud and a second time, in full flower, and then finally we made a painting of a flowering branch, in which all the parts are shown full size. [The plate adjoining the original text is unmistakably *Malus floribunda* - TLG]

> I was in the process of drawing and painting the fruits in the fall (which are small, a beautiful yellow-gold in color, spherical, flattened on the side of the hilum which is very depressed), but in August a general rheumatism of the joints attacked me and confined me to bed for months and still keeps me indoors.
>
> It is therefore a case of pleasure deferred. Nevertheless, in order not to deprive our readers of the sight of these beautiful plates, I insert them here with the hope of returning to *Malus floribunda* when all its characteristics have been examined, if indeed the task is possible next year. These trees flower in early spring, and late frosts can destroy the flowers. This misfortune would not simplify the question already rather confused by the results obtained from the sowings of *Malus floribunda*; they have given us *Malus ringo*, of a beautiful pyramidal form, with leaves broad as the apple and quite unlike the little branch shown of *Malus floribunda*, the branches of which are horizontal, slightly hanging. This same sowing provided us with *Malus toringo*, and *Malus spectabilis kaido* and finally *Malus floribunda*, all names that Dr. Siebold has given us.
>
> Zuccarini does not seem to be engaged in the study of these plants; we find no mention of them in the Abhandlungen der math. physisch. Klasse der konigl. bair. Akademie der Wissenschaften.
>
> All these *Malus* can be grafted and injected on ungrafted apple and apple root-stock; their hardiness is proven.(2) (A special thanks to Ian MacPhail who translated this French article).

At the present time it is not known where in Japan Dr. Siebold collected *Malus floribunda* nor the exact date when it was introduced into Europe. Did he bring out seeds or a tree? Both Rehder (3) and Asami (4) report that *M. floribunda* cannot be found in Japan:

I have seen no Japanese specimens of *M. floribunda*, nor has Mr. Wilson collected it or seen it in Japan. The Japanese botanists apparently do not know it; the plant they enumerate under the name *M. floribunda* is *M. Halliana*, as part of their synonymy, their descriptions and specimens named by Japanese botanists show. All we know of this plant is the fact that it was introduced by Siebold from Japan. It may possibly be a hybrid of *M. baccata* and *M. Sieboldii*, as Zabel suggests; according to Wenzig it represents *P. kaido x baccata* and Schneider mentions as possible parentage *M. prunifolia x M. toringo* (3).

As Rehder says [3], *Malus halliana* has been often confused with *M. spectabilis* Borkhausen and *M. floribunda* Siebold by our botanists. *M. floribunda*, though it is nearer to *M. halliana*, can be distinguished by the conduplicate vernation of the leaves, sharply serrulate leaves, mostly thinly pubescent pedicels, the calyx-tube thinly tomentose at the base with slightly longer segments and by the fruits impressed at the both ends. ... Both *M. spectabilis* and *M. floribunda* are not known in Japan though the latter species is said by Siebold to have been introduced into Europe from Japan (4)

This raises some interesting questions. Did Dr. Siebold take the only *M. floribunda* tree out of Japan or did he take seeds from *M. floribunda* which later died without being repropagated? Did he collect seeds from a *M. sieboldii, M. baccata*, or other *Malus*, and plant them and later select *M. floribunda* from the progeny? Can we call a tree that was never proven to be growing in Japan the Japanese Flowering Crabapple? In light of this puzzle, I prefer to call it the Floribunda Crab.

Floribunda is a perfect name for this crab. Bean eloquently describes *Malus floribunda*.

A tree ultimately 20 to 30 feet high, with a spreading tangle of branches forming a rounded head wider than the tree is high; often shrubby; young

shoots downy at first, becoming glabrous later. Leaves on the flowering and weaker shoots usually narrowly or broadly ovate, and from 1.5 to 3" long; rounded or tapering at the base, rather coarsely toothed. On strong shoots they are occasionally three or five-lobed, 3 to 4.5" long, and half as wide, upper surface dark dullish green glabrous; lower one paler and downy; stalk .5 to 1" long, downy. Flowers 1 to 1.24" across, rosy-red in bud, pale pink when open, produced in clusters of four to seven, each on a stalk 1 to 1.5" long. Fruits round, .75" in diameter, yellow, with the calyx fallen away.

Introduced from Japan about 1862, and perhaps the most beautiful of all crabs in flower. It blossoms towards the end of April, producing then an amazing profusion of flowers, each branch a garland. Perhaps its beauty is greatest when half the flowers are expanded, the pale pink contrasting with the rich rose of the other half still in bud. This crab is not considered to be a true wild species, but a hybrid from *M. sieboldii* and perhaps *M. baccata* or *prunifolia*. The deeply three- or even five-lobed leaves occasionally seen on strong branches certainly indicate affinity with *M. sieboldii* (5).

Korban and Skirvin (6) cite work by Williams, who demonstrated the presence of a distinct glucoside (sugar derivative) compound which is common to only 4 of the 25 Malus species listed by Rehder(7): *M. floribunda, M. x zumi, M. sargentii,* and *M. sieboldii*. Its spreading habit and fruit characteristics makes it a likely progeny of *M. x zumi calocarpa* or one of its hybrids.

Rehder's description (7) incorrectly describes the fruit of *M. floribunda* as red. Some botanic gardens and arboreta have listed a *M. floribunda* 'Red Fruit'. Those that I have seen are not the Floribunda Crab. It is possible that it could be a hybrid. Known hybrids of *M. floribunda* include: x arnoldiana (*M. f. X M. baccata*), x scheideckeri (*M. f. X M. prunifolia*), 'Exzellenz Thiel' (*M. f. X M. prunifolia* cv. Pendula).-

Malus floribunda is one of my favorite crabapples. About seven years ago I moved into my present home which had an established tree in the back yard. It is spectacular in flower. The red buds open to a pink and white flower which fades to white. The flowers do not open simultaneously. Therefore, there are white flowers present with red buds. From a distance the tree is a soft pink. The fruits are yellowish that soften and turn amber (Mike Yanny describes it as cider colored). They finally turn brown before dropping. However, very few ever drop. The birds love them. Migrating robins, waxwings, and starlings know which fruits are ripe and have a feast. During my fall evaluations, the young trees (planted in 1984) do not rate as highly as many of the red-fruited cultivars. However, there are specimen Floribunda Crabs at the Scott Arboretum, Swarthmore College; Boerner Botanic Garden, Hales Corners, Wisconsin; the Morton Arboretum; and the Chicago Botanic Garden, which are second-to-none. I would say that this is one tree that continues to improve with age. Its horizontal spread makes it easy to train as an ideal Japanese garden tree. It is very resistant to disease, and the only major limiting factor is its lack of hardiness in northern United States and Canada. *M. floribunda* is highly recommended and should never become OBSCURE.

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THE THREE CARDINALS

Mention was made in the last issue of MALUS in the article "Multiple Use of Names for Crabapples" that there were two and possibly three different crabapples with the name of 'Cardinal'. It has determined that there are now three crabapples with the name "Cardinal" applied to them.

The first "Cardinal" is an open pollinated seedling of *M. arnoldiana* introduced by Wellington. It is covered by Plant Patent #2035. The second "Cardinal" is a cross between *M. hupehensis* 'Strawberry Parfait' and *M.* 'Crimson Cloud.' Plant Patent #7147 was issued to New Plant Associates for this crabapple in 1990. Later another crabapple was named 'Cardinal' temporarily by Lake County Nursery until they discovered that the crabapple had the same name. Tthen they renamed their crabapple 'Foxfire ™.'

CRABAPPLES IN PERSPECTIVE

E K U P I S S I S N K D E E S

D G E N A K A E O C I O L V E

K I N G S T N I A K A Y R O E

O W H A A E T D S F T P C E G

Z C T C R A N O G S O M U L A

R U C U R O N D O L I A R T W

U A M I R O B I N S O N M E A

B A P I H E S U T A A W M A U

R S D C O A S U S A N A U L B

A A S A L K O I R T N N A O A

D T E L M A H V O R A M A K Y

ADAM
ADIRONDACK
AKANE
AMUR
ANN TRIO
ANNA
ASPIRATION
BACCATA
CAPUTA
EVE
GLOW
GOLD
HAMLET
KAMAROV
KINGS
KOI
KOLA
KOREA
LASIOSTYLE
NAMEW
ORANGE
ORCHID
ROBINSON
ROBUSTA
RONDO
RUBRA
SEAFOAM
SIMCOE
SISSIPUK
SNOWCLOUD
SUSAN
TEA
TINA
TRAIL
TSCHONOSKI
TURESI
WAUBAY
ZUMI

The letters in the spaces left over spell another name in the list above

DIRECTORS

Front Cover Photo: *Malus coronaria*
Photo Credit: Beth Dickson

Back Cover Photo: *Malus* 'Blanche Ames'
Photo Credit: Michael Yanny

Centerfold Photo: 'Wintergold'
Photo Credit: W. Gordon Yadon

Centerfold Photo: 'Candied Apple' Name Plate
Photo Credit: W. Gordon Yadon