



MALUS

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LETTER FROM THE EDITOR

This issue of *MALUS* is the second one with which I, your Editor, have been involved in the preparation for publication. I accepted the responsibilities of being editor of *MALUS* knowing full well that I did not have the experience for such duties. The task is interesting and challenging. I am coming to you for help with the most difficult part of the job, that of obtaining material for each issue.

You may have noted that many of the articles that you have read have been authored by just a few people. To them we all owe a great debt of gratitude. Wouldn't it be nice to spread this joy around? Don't you have knowledge on a subject of interest, not only to yourself, but to the readers of *MALUS*? Wouldn't you like to author an article on that subject? Its very easy. Just start writing. Let me know if you need help. Between us I can accomplish miracles.

We are a small society. To accomplish the task of getting out two issues of *MALUS* each year I need more authors to write articles for this journal. Let this be your challenge. Let me know what you are willing to do.

John den Boer

CONTROLLING FIRE BLIGHT

by Thomas L. Green
Research Plant Pathologist
Morton Arboretum

Fire blight is a serious disease of crabapples (*Malus*), pears (*Pyrus*), mountain ash (*Sorbus*), and other members of the Rosaceae (rose family). At least 75 species are susceptible. It is caused by the bacterium *Erwinia amylovora* (Burr.) Winsl. *et al.* Fire blight was observed in New York before 1800.

This disease has historical significance to plant pathologists because it was the first that associated a bacterium as the causal agent. T. J. Burrill published a series of papers, beginning in 1878, showing the relationship of the bacteria to the disease. M. B. Waite was the first to report in 1891 that honeybees, visiting the blossoms of infected branches, became contaminated with the bacteria and transmitted the disease to healthy trees. His experiments were the first proof of insect transmission of a plant disease.

Symptoms

Fire blight often first appears on blossoms. It also occurs on leaves and twigs. Infected blossoms turn brown, and the discoloration extends to the pedicel (leafstalk) and often down the twig. Leaves may be affected at the margins or on the blade. Dieback extends down twigs and water sprouts, rapidly killing the tissue and turning it to a characteristic brown. The dead leaves persist with a scorched appearance, and the tip often curls downward forming a crozier or shepherd's crook. Both the scorched appearance and crozier are symptoms of this disease. The twig blight may extend downward into branches, trunk, or root. Dark-colored cankers develop which vary in size and shape. When the cankers are large enough to girdle the branches, trunk, or root collar, they cause dieback or even death of the plant.

Disease Cycle

The bacteria can exist and be disseminated in three forms: 1) bacterial ooze or exudate, 2) dry tendrils or strands and 3) bacterial cells. Bacterial ooze is a syrup-like liquid which exudes from infected tissue, especially near the margin of infected tissue. Dry tendrils may be produced under low humidity conditions. Bacterial cells may exist on plant surfaces or systemically in the vascular tissues. Bacterial ooze is the form most likely to spread the disease, and it does so with aid from insects and wind-driven rain. The source for the bacterial inoculum comes from the blighted twigs and stems. Drops with millions of bacteria form near the edge of the canker closest to living tissue. Bacteria gain entry in unwounded blossoms through natural openings in the stigma, nectary, anthers, and sepals. The stigmas and anthers are the main centers for penetration in *MALUS*.

Fire blight bacteria can be found in relatively high numbers on flower parts of several rosaceous hosts without causing any disease. The environmental conditions greatly affect the disease epidemiology. Warm, moist conditions (>63° F) are positively correlated with the incidence and spread of the disease. Fire blight is more severe on trees that are planted with poor drainage. Also, there is a correlation with disease severity and fertilization and pruning. Both heavy fertilization and heavy pruning stimulate formation of water sprouts which are more susceptible.

CONTROL

1. SELECT RESISTANT CULTIVARS. In my evaluations of various crabapple collections throughout the United States I find the incidence of fire blight to be erratic. A crabapple test plot in Fort Collins, CO was hit hard in '91. Some disease was observed at the Secrest Arboretum in Wooster, OH, but none was seen at the Holden Arboretum near Cleveland, 90 miles away. It periodically hits trees at the National Arboretum in Washington D.C., but it appears to be rare at the Scott Arboretum in Swarthmore, PA. The Scott Arboretum has some magnificent old *M. hupehensis* (Tea Crab) which are very susceptible, yet show no evidence of any infection. In my 11 years at the Morton Arboretum, I have not seen fire blight on anything. Yet the disease has been observed in adjacent communities. When living in an area where fire blight is a problem, select crabapples that are known to have some resistance. Check with the Cooperative Extension Director in your county for information on the incidence of fire blight in your area and on recommended controls.

2. SELECT PLANTING SITES WITH GOOD DRAINAGE.

3. FOLLOW PROPER PRUNING AND FERTILIZATION PRACTICES. Avoid the promotion of water sprouts by excessive fertilization or pruning. Fertilize when shoot growth is less than 6". Shoot growth should not exceed 12" per year. Apply fertilizer in the spring (early April) or fall (after mid-October) but not during the growing season. Research has shown that mulching under the trees with wood chips, hardwood bark, or ground corn cobs reduces the incidence of fire blight.

4. PRUNE OUT FIRE BLIGHT CANKERS DURING THE DORMANT SEASON. Pruning during the dormant season helps prevent the spread of the disease. Make pruning cuts at least 6 inches below the point of visible infection. After each cut sterilize the pruning shears with bleach (1 part bleach: 4 parts water) or alcohol. Root suckers and water sprouts should be removed during the dormant season. Their infection can lead to the death of a tree. Remove severely infected trees growing in the vicinity. Adjacent pear and apple orchards are sources of inoculum.

5. FOLLOW A BACTERICIDE SPRAY PROGRAM. Bacterial diseases are generally more difficult to control than most fungal diseases. The recommended control is to apply Streptomycin sprays several times, starting at prebloom and repeating at 4-day intervals during bloom when maximum temperatures are above 65° F, especially when accompanied by rain or high humidity. When temperatures drop below 60° F or are above 86° F, the incidence of disease is greatly reduced. In areas where Streptomycin has been extensively used for control, the bacteria have developed resistance. Fixed copper fungicides (such as Bordeaux or copper sulfate) are then recommended.

A trademark may be used only by or with the permission of its owner. Trademark rights are protected under federal and state law, as well as under common law. Trademarks may be registered at the state level with the Secretary of State of a particular state, and at the federal level at the United States Patent and Trademark Office (hereinafter referred to as "PTO"). While there is no requirement to register, registration provides valuable substantive and procedural advantages to the trademark owner.

An application may be filed to register a trademark at the PTO before the trademark has ever been used. That is, the application is based on the applicant's *bona fide* intention to use the mark in the future. Assuming that the trademark is registrable, a registration cannot be issued until the mark is used in connection with a plant in the normal course of trade in commerce which can be regulated by the United States Congress (which includes interstate commerce between two states, commerce between the United States and another country, commerce within a U.S. territory such as Puerto Rico, and commerce within the District of Columbia). The length of a federal registration has been reduced from 20 years to 10 years as part of an effort to reduce the unused "deadwood" cluttering up the federal trademark register. Registrations issued on or after November 16, 1989 will last for 10 years. Registrations issued prior to that date last for 20 years.

Two symbols are commonly associated with designating a trademark; ^(R) and TM (it is not necessary to put periods after the T and M). These two symbols have different meanings and are not interchangeable.

When the trademark is first used, it is appropriate to place the symbol TM to the right of the mark whenever it is used, such as on tags or in catalogs or advertisements. This symbol merely indicates that you claim ownership right to the trademark. For example, when using the Lancelot trademark it is appropriate for it to appear as follows:

Lancelot TM

When used in conjunction with a mark, TM can be used to denote either an unregistered federal trademark or a trademark registered at the state level. Once a trademark is registered at the PTO, it can be designated by placing one of the following statutory notices after the trademark name: ^(R), Registered in the U. S. Patent and Trademark Office or REG. U. S. Patent & Trademark Office, such as follows:

Centurion ^(R)
Malus 'Centzam'

or

CENTURION
Registered in the U. S. Patent and Trademark Office

or

CENTURION
Reg. U. S. Patent & Trademark Office

The symbol ^(R) is generally preferred and is sufficient to denote a federal registration.

Cultivar Names

In contrast to a trademark (which is the exclusive property of one person used to identify and distinguish his products from those of others), is a cultivar or varietal name. A cultivar name is the descriptive or generic name given to a particular plant variety which may be used by anyone to describe it. In other words, a cultivar name describes a particular plant variety, but does not serve to indicate the particular source (Lake County Nursery, Inc.) from which the particular plant came. General considerations and guiding principles regarding the use of cultivar names are addressed in the International Code of Nomenclature for Cultivated Plants ("Code"). The aim of the Code is to promote uniformity, accuracy, and fixity in the naming of agricultural, horticultural, and silvicultural varieties. As stated in Article 3, a cultivar name must be freely available for use by anyone. The Code promotes the registration of cultivar names by a cultivar registration authority and the inclusion of the name upon a register. However, there is no legal requirement to do so, thus making the Code essentially a gentleman's agreement. Article 4 further distinguishes trademarks from cultivar names by stating that registration of trademarks, which may be used to market certain cultivars, is a legal process and not the concern of the Code.

Since the cultivar name is devised and intended to be used as the common descriptive name, or generic name, of a variety, the cultivar name cannot serve as a valid trademark and cannot be validly registered at the U. S. Patent and Trademark Office as a trademark. The federal courts have made it clear that a cultivar or variety name cannot serve as a trademark because it does not identify and distinguish particular plants of a competitor. It is important that trademarks and cultivar names be displayed in a manner so as to minimize confusion to the public. Valuable trademark rights may be lost if trademarks are used for an extended period of time as if they are cultivar names. The trademark can lose its trademark significance and eventually be considered a generic name such as with the case of escalators and aspirin. If trademarks are to be used on plants, it is strongly recommended that such plants also be given a cultivar name, so that the trademark is not inadvertently used as if it were the common descriptive name of the plant. Accordingly, all trademarks and cultivar names should be clearly identified in catalogs, promotional materials, etc. Also, it may be well to differ the typeface or font used for cultivar names. Further the TM symbol or ^(R) registration symbol (whichever is applicable) should be placed next to the trademark.

At this point I would like to tell you how we derive cultivar names for our varieties. We at Lake County Nursery, Inc. sat down as a group and asked ourselves how we could turn the cultivar name format into something positive for our company. We decided to follow the format used by many other respected new plant introducers. We have incorporated part of the plant inventor/owner's name, which is 'zam', into the cultivar name. We believe by making the 'zam' a constant in our cultivar names, the final user will associate guaranteed quality with their new hybrid plant selections.

Patents

Patents have their own unique status. A patent is a reward granted for making something new available to the public. It takes nothing from them which they already have. In regards to the green industry, a patent is protection of the plant itself. Without a license a person is unable to propagate and sell the plant legally. The owner of the patent is guaranteed protection for 17 years from the date of the grant. After the 17 years have expired, the plant becomes a part of the public domain and anyone is free to propagate and/or sell the variety, and describe it by its cultivar name in doing so. In other words, the originator, even though he was the one who coined a cultivar name for his new variety, does not have any exclusive

right in the name as such. If he wants the public to know that he is the source of a particular plant, he must originate and use a proper trademark for it and use the trademark in conjunction with the proper cultivar name or at least a generic name, such as "Molten Lava crabapple tree". The important thing to bear in mind is that a trademark is essentially an adjective or modifier which qualifies a noun, and the trademark itself should never be thought of or used as a noun. In other words, when a new plant variety is created or discovered and the owner wishes to retain a proprietary name for it, it is important to create for it not only a distinctive cultivar name which other people can freely use to describe it, but also a trademark which, if properly used, can remain the exclusive property of the trademark owner indefinitely.

An example of this would be the application of the trademark Madonna ^(R) to the patented *Malus* 'Mazam', P. P. 6962. This patented plant is probably more easily recognizable by the trademark designation. Once the patent expires, although one legally would be free to propagate 'Mazam', he would not be able to sell it in connection with the term Madonna ^(R) without infringing on the trademark.

As a licensor, we believe that if after 17 years, our marketing efforts continue on a plant that is still in demand, our continued royalty fees are justified. Also, from a business perspective, it may take the better part of the 17 years to recoup costs that were necessary to develop and market the plant. Since 1987 the PTO has required that a plant patent application designate the cultivar name. A trademark should not be used as the cultivar name in a patent application or confused as one. For instance, on page 110 of our 1992 catalog, the trademark Sugar Tyme bears the encircled "R" symbol, ^(R), and is thereby identified as being a federally registered trademark under which these plants are being marketed by Lake County Nursery, Inc. and its licensees. 'Sutyzam' is designated as the cultivar name for this variety in the catalog.

Many headaches have surfaced since it became necessary to designate cultivar names. As a new plant introducer, we constantly strive to insure that our patent and trademarks are identified in a consistent manner throughout the green industry, so as not to be confused with cultivar names. This is no easy task and can often meet with great hesitation to those who do not fully understand patents and trademarks. However, it is believed that those associated within the green industry should list patents and trademarks according to the wishes of the owners or assignees of those cultivars.

CONCLUSION

It is hoped that the above discussion has shed some light on the proper and distinct use to be made of cultivar names in connection with plants, and the scope of protection afforded trademark and patent rights in the United States. The future of developing new and improved plants depends on the efforts of growers who are willing to invest their time and energy in the endeavor and to all involved in the green industry to make a concerted effort not to misuse their colleagues' trademarks inadvertently or knowingly as cultivar names.

Note: To foster greater understanding and awareness of patents and trademarks, the National Association of Plant Patent Owners offers a publication titled PLANT PATENTS AND FEDERAL TRADEMARKS ON PLANTS. Individual copies are available free of charge. Contact NAPPO, 1250 I Street NW, Suite 500, Washington DC 20005, FAX 202/789-2900.

KELSEY CRABAPPLE

John den Boer

The reader may recall that in the previous issue (Vol. 5, No. 2) there was a request for information that would clarify a problem with two different descriptions for the Kelsey Crabapple. The answer turned out to be somewhat surprising. There are two Kelsey Crabapples.

The first Kelsey Crabapple, *Malus floribunda* Sieb. ex Van Houtte 'Kelsey', is an open pollinated seedling of *M. floribunda*. It was introduced by the Kelsey-Highlands Nursery, East Boxford, MA in 1934. It was originally named 'Snowbank' but was renamed 'Kelsey' in 1940 for Mr. H. P. Kelsey, an early explorer of Manitoba northland. This crabapple is single-flowered with pink to white blossoms and yellow and orange-yellow fruit.

The second Kelsey Crabapple, *M. x adstringens* Zab. 'Kelsey', is the result of a cross of *M. x adstringens* 'Almey' with *M. x adstringens* #5212 by W. A. Cumming, Morden, Manitoba. It was introduced in 1970 by the Canadian Department of Agriculture, Morden, Manitoba, and was named after the same Mr. H. P. Kelsey. This crabapple has semi-double flowers that are purple to red in color. The fruit are dark red.

Many thanks to those who provided the necessary information to solve the puzzle.

CRABS YOU SHOULD KNOW

Malus 'Donald Wyman'

Professor Edward R. Hasselkus

I saw the original Donald Wyman crabapple in full bloom in May 1972 during the centennial observance of the Arnold Arboretum. It had been named in honor of Dr. Donald Wyman in 1970 and later described in *Arnoldia* 30(3):116. The original plant was first noticed as a spontaneous seedling of unknown parentage on the Arboretum grounds prior to 1950. Robert S. Hebb, in the *Arnoldia* article, reported that the decision to introduce the Donald Wyman crabapple was based on "its ability to retain its fruit, in good condition, well into the winter months when the fruit of nearly every other crabapple in the collection has either dropped, been eaten by the birds, or has turned brown and unattractive."

A 3-4' B & B plant of *Malus* 'Donald Wyman' was planted in the Longenecker Gardens of the University of Wisconsin Arboretum - Madison in the spring of 1973. After 18 years, it measures 20 feet high with a spread of 31 feet. In the nursery, it is one of the fastest-growing cultivars. The large green leaves turn to a fine yellow-bronze color in autumn.

Cardinal red (as determined by the RHS Colour Chart) flower buds open to single, large white flowers measuring 40 mm (1 1/2") in diameter. The emerging new foliage may reduce the overall impact of the flower display in some years. Our evaluation of crabapples in the Longenecker Gardens has emphasized the fruiting qualities of small (non-littering), brightly colored, persistent fruits, and resistance to apple scab. 'Donald Wyman' produces heavy crops of deep oxblood red* fruits, 13 mm (1/2") diameter, every year. Fruits persist in good color throughout the winter. In fact, glossy red fruits are usually still present at flowering time in May. Raccoons, pheasants, and other birds take the fruits as they soften in the spring. Hebb, in his *Arnoldia* article, suggests that "it may be considered as a source of 'slow release' bird food."

Apple scab does not mar the foliage of *M.* 'Donald Wyman'. Though we have not observed fire blight in Madison, it has been reported at other locations. Considering all of the desirable qualities of this cultivar, if I could have but one crabapple, it would be 'Donald Wyman'!

PLASTIC PAPER OR HOW TO WRITE IN THE RAIN

Thomas L. Green
Morton Arboretum

Each fall I evaluate crabapples in various collections throughout the United States. Last year I evaluated the National Crabapple Collections (NCEP) in Illinois, Ohio (Holden Arboretum and Secrest Arboretum), Pennsylvania (Swarthmore College), Wisconsin (Boerner Botanic Garden), Iowa (Iowa State University), Minnesota (University of MN Landscape Arboretum), North Dakota (ND State University), Nebraska (University of NE), Colorado (CO State University), Oregon (J. Frank Schmidt & Son Co.), and Washington (WA Experiment Station). I was also able to evaluate collections at Penn State University, Den Boer Arboretum in Des Moines, IA, and University of Washington Arboretum. These evaluations are set on a schedule and conducted rain or shine. Fortunately, in late September and early October the weather is mostly shine.

It is the rain that presents a problem for conducting evaluations. It is difficult to write on paper in the rain. In 1990 I caught the tail end of a hurricane at the Holden Arboretum. It was very difficult trying to write beneath a poncho and keep the paper dry. It rained two inches while I was in the collection, and it was hard to keep myself dry. That was resolved in 1991 by using plastic paper. The paper is called KIMDURA (8 1/2 X 11 68 FPG 130). A package of 400 sheets costs approximately \$35.00, or about .10 per sheet. I placed the master form in our Xerox copy machine and ran about 100 copies. It copied well, but the heat will curl it a little. If you can get someone to run your forms on a printing machine, you can eliminate the curl. I have found this an excellent tool for my purpose.

Check with your paper supplier. If you have trouble finding it, at least I know that Graphic III Papers, Inc., 307 Eisenhower Lane South, Lombard, IL 60148 (708-620-7660) is a source.

DOUBLE FLOWERING CRABAPPLES

John H. den Boer

Have you ever wondered how many crabapples have double flowers? Before you read further, stop, and guess how many there are. There are actually forty-four of them. Listed below are those crabapples. They are listed as having double flowers only; semi-double and double flowers; and single, semi-double, and double flowers.

Crabapples Having Double Flowers Only

Botanical Name	Trade Name
<i>Malus</i> 'American Beauty'	American Beauty Crabapple
<i>M.</i> 'Angel Choir'	Angel Choir Crabapple
<i>M.</i> 'Barbara Ann'	Barbara Ann Crabapple
<i>M. ioensis</i> 'Plena'	Bechtel Crabapple
<i>M.</i> 'Branzam'	Brandywine TM Crabapple
<i>M.</i> 'Bridal Crown'	Bridal Crown Crabapple
<i>M.</i> 'Candy Pink'	Candy Pink Crabapple
<i>M.</i> 'Dakota Beauty'	Dakota Beauty Crabapple
<i>M. sylvestris</i> 'Plena'	Double Flowering Crabapple
<i>M.</i> 'Doubloons'	Doubloons Crabapple
<i>M.</i> 'Egret'	Egret Crabapple
<i>M. ioensis</i> 'Fimbriata'	Fringepetal Crabapple
<i>M. sieboldii</i> 'Fuji'	Fuji Crabapple
<i>M.</i> 'Garden View'	Garden View Crabapple
<i>M.</i> 'Guiding Star'	Guiding Star Crabapple
<i>M.</i> 'Karen Murray'	Karen Murray Crabapple
<i>M. ioensis</i> 'Klehm's Improved Bechtel'	Klehm's Improved Bechtel Crabapple
<i>M.</i> 'Mazam'	Madonna TM Crabapple
<i>M.</i> 'Margaret'	Margaret Crabapple
<i>M. ioensis</i> 'Nova'	Nova Crabapple
<i>M.</i> 'Pink Perfection'	Pink Perfection Crabapple
<i>M. ioensis</i> 'Prairie Rose'	Prairie Rose Crabapple
<i>M. angustifolia</i> 'Plena'	Prince Georges Crabapple
<i>M.</i> 'Royal Ruby'	Royal Ruby Crabapple
<i>M.</i> 'Sheila'	Sheila Crabapple
<i>M. sylvestris</i> 'Flore Plena'	Sylvestris Flore Plena Crabapple
<i>M.</i> 'Teobel'	Teobel Crabapple

Crabapples Having Semi-double and Double Flowers

Botanical Name	Trade Name
<i>Malus coronaria</i> 'Charlottae'	Charlotte Crabapple
<i>M. spectabilis</i> 'Plena'	Chinese Double Flowering Crabapple
<i>M.</i> 'Coralburst' ^(R)	Coralburst Crabapple
<i>M.</i> 'Cotton Candy'	Cotton Candy Crabapple
<i>M.</i> 'Cranberry Lace'	Cranberry Lace Crabapple
<i>M.</i> 'Dorothea'	Dorothea Crabapple
<i>M.</i> 'Katherine'	Katherine Crabapple
<i>M. x magdeburgensis</i>	Magdeburg Crabapple
<i>M.</i> 'Maybride'	Maybride Crabapple
<i>M. coronaria</i> 'Nieuwlandiana'	Nieuwland Crabapple
<i>M. halliana</i> 'Parkmanii'	Parkman Crabapple
<i>M. x scheideckeri</i>	Scheidecker Crabapple
<i>M. spectabilis</i> 'Van Eseltine'	Van Eseltine Crabapple

Crabapples Having Single, Semi-double and Double Flowers

Botanical Name	Trade Name
<i>M.</i> 'Blanche Ames'	Blanche Ames Crabapple
<i>M. x scheideckeri</i> 'Hillier'	Hillier Crabapple
<i>M. spectabilis</i> 'Riversii'	Rivers Chinese Crabapple
<i>M.</i> 'Snowcloud'	Snowcloud Crabapple

MULTIPLE USE OF NAMES FOR CRABAPPLES

John H. den Boer

Names are given to crabapples (or any plant) for the simple purpose of distinguishing one from another in either oral or written communications. All crabapples have a botanical name and generally a common name. Sometimes there is more than one common name used for a crabapple. Some crabapples have synonyms or code names. One, *Malus pumila*, has 106 synonyms! These come about over many years from published descriptions made by many botanists and taxonomists. As might be expected, sometimes a given name is applied to more than one crabapple tree. There are at least 42 known instances of a name being applied to more than one crabapple. This could lead to mass confusion. It certainly complicates matters.

One interesting example of a shared name is the crabapple name 'Cardinal'. This name has been applied to at least two different crabapples, and possibly a third. In two cases crabapples were registered with the U.S. Patent Office (Nos. 2035 and 7147). It has been reported that another crabapple was named 'Cardinal' by an organization in Geneva, N. Y., but written confirmation is not available. Perhaps our readers are aware of other crabapples that are sharing names in addition to those that are listed below.

What follows are those known instances of names applied to more than one crabapple. Along with each name is the identity of the crabapples to which these names were applied and identification of documentation where these names can be found.

NAMES OF CRABAPPLES APPLIED TO MORE THAN ONE TREE

<u>Applied Name</u>	<u>Applied to</u>	<u>Trade Name (Source of Information)</u>
angustifolia plena	<i>Malus ioensis</i> 'Plena'	Bechtel Crabapple (1)
	<i>Malus angustifolia</i> 'Plena'	Prince Georges Crabapple (2)
baccata	<i>Malus baccata</i>	Siberian Crabapple (1)
	<i>Malus baccata</i> var. <i>himalaica</i>	Himalayan Crabapple (4)
baccata var. <i>himalaica</i>	<i>Malus baccata</i> var. <i>himalaica</i>	Himalayan Crabapple (4)
	<i>Malus hupehensis</i>	Tea Crabapple (1)
Cardinal	<i>Malus</i> 'Cardinal'	Cardinal Crabapple (5)
	<i>Malus</i> 'Cardinal'	Cardinal Crabapple (6)
Cerasifera/cerasifera	<i>Malus cerasifera</i>	Cerasifera Crabapple (4)
	<i>Malus baccata</i> var. <i>mandshurica</i>	Manchurian Crabapple (1)
	<i>Malus robusta</i>	Cherry Crabapple (1)

<u>Applied Name</u>	<u>Applied to</u>	<u>Trade Name (Source of Information)</u>
communis	<i>Malus pumila</i>	Common Apple (1)
	<i>Malus sylvestris</i>	European Wild Crabapple (1)
coronaria	<i>Malus angustifolia</i>	Southern Crabapple (1)
	<i>Malus coronaria</i>	Wild Sweet Crabapple (1)
coronaria dasycalyx	<i>Malus coronaria</i> var. <i>dasycalyx</i>	Dasycalyx Crabapple (1)
	<i>Malus coronaria</i>	Wild Sweet Crabapple (1)
coronaria 'Flore Plena'	<i>Malus ioensis</i> 'Plena'	Bechtel Crabapple (1)
	<i>Malus coronaria</i> 'Charlottae'	Charlotte Crabapple (7)
dasyphylla pendula	<i>Malus pumila</i> 'Apetala'	Bloomless Crabapple (7)
	<i>Malus pumila</i> 'Pendula'	Elise Rathke Crabapple (1)
domestica	<i>Malus pumila</i>	Common Apple (1)
	<i>Malus baccata</i> var. <i>mandshurica</i>	Manchurian Crabapple (1)

Applied Name

Applied to

Trade Name (Source of Information)

floribunda

Malus halliana

Hall's Crabapple (7)

Malus floribunda

Japanese Flowering Crabapple (1)

Geneva

Malus 'Geneva'

Geneva Crabapple (2)

Malus spectabilis 'Van Eseltine'

Van Eseltine Crabapple (9)

glaucescens

Malus glabrata

Biltmore Crabapple (1)

Malus glaucescens

Dunbar Crabapple (1)

Malus coronaria

Wild Sweet Crabapple (1)

hybrida

Malus x astracana

Astracan Crabapple (1)

Malus prunifolia

Pearleaf Crabapple (1)

Kaido

Malus x micromalus

Midget Crabapple (1)

Malus prattii

Pratt's Crabapple (4)

Linda

Malus 'Linda Sweet'

Linda Sweet Crabapple (11)

Malus 'Linda'

Linda Crabapple (8)

Applied Name

Applied to

Trade Name (Source of Information)

Pyrus baccata X *pumila astracana*

Malus x adstringens

Adstringens Crabapple (1)

Malus x astracana

Astracan Crabapple (1)

praecox

Malus asiatica

Chinese Pearleaf Crabapple (1)

Malus pumila

Common Apple (1)

pumila dasphylla

Malus asiatica

Chinese Pearleaf Crabapple (1)

Malus pumila

Common Apple (1)

Pyrus baccata

Malus baccata var. *himalaica*

Himalayan Crabapple (1)

Malus baccata var. *mandshurica*

Manchurian Crabapple (1)

Malus baccata

Siberian Crabapple (1)

Malus hupehensis

Tea Crabapple (1)

Malus sieboldii 'Arborescens'

Tree Toringo Crabapple (1)

Pyrus coronaria

Malus coronaria

Wild Sweet Crabapple (1)

Malus angustifolia

Southern Crabapple (1)

Applied Name
Applied to
Trade Name (Source of Information)

- Pyrus Malus
Malus asiatica
 Chinese Pearleaf Crabapple (1)
Malus pumila
 Common Apple (1)
Malus prunifolia
 Pearleaf Crabapple (1)
- Pyrus Malus tomentosa
Malus asiatica
 Chinese Pearleaf Crabapple (1)
Malus pumila
 Common Apple (1)
- Pyrus praecox
Malus asiatica
 Chinese Pearleaf Crabapple (1)
Malus pumila
 Common Apple (1)
- Pyrus prunifolia
Malus x adstringens
 Adstringens Crabapple (1)
Malus baccata var. mandshurica
 Manchurian Crabapple (1)
Malus prunifolia
 Pearleaf Crabapple (1)
- Pyrus rivularis
Malus fusca
 Oregon Crabapple (1)
Malus sieboldii
 Toringo Crabapple (1)

Applied Name
Applied to
Trade Name (Source of Information)

- Pyrus sieversii/Pyrus sieversii
Malus pumila 'Niedzwetzkyana'
 Redvein Crabapple (4)
Malus pumila
 Common Apple (1)
- Pyrus spectabilis/Pirus spectabilis
Malus spectabilis
 Chinese Crabapple (1)
Malus halliana
 Hall's Crabapple (1)
Malus x micromalus
 Midget Crabapple (1)
- Pyrus yunnanensis
Malus yunnanensis veitchii
 Veitch Crabapple (1)
Malus yunnanensis
 Yunnan Crabapple (1)
- Redbird/Red Bird
Malus 'Crimson Beauty'
 Crimson Beauty Crabapple (7)
Malus 'Redbird'
 Redbird Crabapple (9)
- Ringo/ringo
Malus asiatica
 Chinese Pearleaf Crabapple (1)
Malus formosana
 Formosa Crabapple (7)
- rockii
Malus baccata var. himalaica
 Himalayan Crabapple (1)
Malus rockii
 Rock Crabapple (1)

Applied Name
Applied to
Trade Name (Source of Information)

sibirica	<i>Malus x astracanica</i> Astracan Crabapple (1)
	<i>Malus baccata</i> Siberian Crabapple (4)
sieboldii	<i>Malus sieboldii</i> Toringo Crabapple (1)
	<i>Malus sieboldii</i> 'Arborescens' Tree Toringo Crabapple (1)
sieversii	<i>Malus pumila</i> Common Apple (1)
	<i>Malus pumila</i> 'Niedzwetzkyana' Redvein Crabapple (4)
sinensis	<i>Malus spectabilis</i> Chinese Crabapple (1)
	<i>Malus baccata</i> Siberian Crabapple (4)
spectabilis	<i>Malus spectabilis</i> Chinese Crabapple (1)
	<i>Malus hupehensis</i> Tea Crabapple (1)
subcordata	<i>Malus fusca levipes</i> Levipes Crabapple (1)
	<i>Malus fusca</i> Oregon Crabapple (7)

Applied Name
Applied to
Trade Name (Source of Information)

toringo	<i>Malus sieboldii</i> 'Arborescens' Tree Toringo (1)
	<i>Malus sieboldii</i> Toringo (1)
	<i>Malus floribunda</i> Japanese Flowering Crabapple (1)
Winter Gem	<i>Malus</i> 'Winter Gem' Winter Gem Crabapple, synonym for Glen Mills (3)
	<i>Malus</i> 'Winter Gem' Winter Gem Crabapple (10)
yunnanensis	<i>Malus yunnanensis veitchii</i> Veitch Crabapple (1)
	<i>Malus yunnanensis</i> Yunnan Crabapple (1)

Literature Cited

- (1) Bibliography of Cultivated Trees and Shrubs, Alfred Rehder
- (2) Crab Apples for America July 1943, Donald Wyman
- (3) Crab Apples for America 1955, Donald Wyman
- (4) Letter from John H. Wiersema to T. L. Green, 21 July 1986
- (5) Plant Patent #2035 to Wellington
- (6) Plant Patent #7147 to New Plant Associates
- (7) Names and Synonyms, A. F. den Boer (unpublished)
- (8) Flowering Crabapples, A. F. den Boer
- (9) Letter from Fr. J. Fiala to John H. den Boer, Feb. 26, 1990
- (10) Johnson's Nursery brochure (undated)
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MALUS OBSCURUS

Malus yunnanensis (Franchet) Schneider, Yunnan Crab

Thomas L. Green
Morton Arboretum

Malus yunnanensis is named for the Yunnan Province of China. It was originally discovered by Abbe Delavay in Yunnan, growing in mountain woods at 10,000 feet elevation (1). It is also native to Hupeh and Szechwan, where it was collected by E. H. Wilson in the early 1900s (2). Wilson sent seeds to the Coombe Wood Nursery in England, which was owned by the Veitch family. Kew Gardens planted some of Veitch's trees in their *Pyrus* collection under the name *P. veitchii* (3). It was sold as *P. veitchiana* and even won an Award of Merit at Westminster (England) in 1912. *M. yunnanensis* var. *veitchii* Rehder is the more common form found in public gardens (1). The taxonomic description by Bean (1) is very good.

Malus yunnanensis (Franchet) Schneider

Pyrus yunnanensis Franchet, Pl. Delav. 228 (1889)

Malus yunnanensis Schneider in Repert. Sp. Nov. Reg. Veg. 3:
179 (1906)

A deciduous tree 20 to 40 ft high; young shoots at first felted, afterwards glabrous and reddish brown. Leaves ovate, finely and irregularly toothed, sometimes slightly lobed, pointed, rounded or slightly heart-shaped at the base, 2 to 4 1/2 in. long, 1 1/2 to 3 in. wide, chief veins in six to nine pairs, dull green and ultimately glabrous above, clothed beneath with a pale brown felt; stalk 3/4 to 1 1/2 in. long. Flowers white or with a faint pink tinge, 5/8 in. wide, produced during May in flattish clusters 2 to 2 1/2 in. wide at the end of short leafy side twigs. Calyx clothed with white wool at first, its lobes triangular; petals round; stamens twenty with yellow anthers; styles five, glabrous or nearly so. Fruits globose, 1/2 in. wide, deep red sprinkled with whitish dots, the reflexed calyx-lobes persisting at the top in a cup-shaped depression; flesh gritty, harsh, acid.

Rehder (2) mentions that this species resembles *M. tschonoskii*, but it is easily distinguished by its smaller flowers in many-flowered corymbs, by the much smaller red fruits with reflexed calyx-lobes and by the more distinctly lobed, sharply and closely serrulate leaves.

M. yunnanensis var. *veitchii* Rehder

Pyrus veitchii Hort. in Gard. Chron. ser. 3, LII. 288 (1912).

Pyrus yunnanensis Bean in Bot. Mag. CXLI. t. 8629 (1915), in part, and as to plant figured.

Malus yunnanensis Rehder in Sargent, Pl. Wilson. II. 287 (1915), in part, as the Hupeh plant.

Malus yunnanensis var. *veitchii* Rehder in J. Arnold Arb. 4:
115 (1923)

Rehder (4) gives the following description:

This variety differs from the type in the generally larger ovate leaves all or nearly all distinctly lobulate with short-acuminate lobules becoming glabrescent in autumn and in the more brightly colored smooth fruit, while in the typical form the leaves are ovate to oblong-ovate, less often cordate at base, partly or mostly without any trace of lobules or less deeply lobulate, more densely tomentose beneath with more persistent tomentum; the inflorescence is usually smaller, more compact and more densely tomentose and the fruit is verruculose and of duller color. As in some other species of wider distribution in central China the plants from Hupeh and eastern Szechwan, east of the Red Basin, though conspecific differ more or less from those from western Szechwan, west of the Red Basin. In the herbarium these differences are often not so pronounced and may escape notice, but when both forms are in cultivation and can be seen growing side by side the differences are more apparent. The variety was introduced by E. H. Wilson for Veitch in 1901 and in 1907 a plant was received from the Veitchian nurseries at this Arboretum (Arnold). The type originally described from Yunnan was found in 1908 by E. H. Wilson in western Szechwan and seeds sent by him to this Arboretum were received in February, 1909.

Both forms have proved hardy at the Arnold Arboretum and have grown into handsome pyramidal trees; as an ornamental plant the variety is to be preferred on account of its more brightly colored fruit.

M. yunnanensis var. *veitchii* is being evaluated in the National Crabapple Evaluation Program (NCEP). It tends to be a rather upright tree. Its leaves turn orange and scarlet in the fall. Most of these little trees (planted in 1984) have not yet produced abundant flowers. Therefore, their fruit display has been sparse. This lowers their aesthetic value in comparison with the other crabapples being evaluated. This variety is very resistant to Scab. Fire blight was observed in the collection at Wooster, Ohio in 1991. The trees in Colorado are gone. It is not certain if their death was due to fire blight or cold (lack of hardiness). They are surviving in other collections that get as cold as Fort Collins, Colorado. Therefore, I would conclude that their death is due to fire blight. I think the tree shows promise for use where there is severe scab and no fire blight, such as the Pacific Northwest.

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