

MALUS

**International
Ornamental Crabapple Society
Bulletin**

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Cover Photo:

**John J. Sabuco (Kodak VRG 200 ASA no filters)
The barn at Boerner Botanical Garden.**

Editorial:

**Dr. Tom Green
Dr. Ed Hasselkus**

**Dr. John J. Sabuco
Dr. Floyd Swink**

MALUS

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INTERNATIONAL
ORNAMENTAL CRABAPPLE SOCIETY
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Letters to the Editor

Tom Green
Ed Hasselkus
John Sabuco

Dear Editor,

The following is a list of Flowering Crabapples growing in Rhody Ridge Arboretum Park and current methods of maintenance. I would appreciate your comments.

Taxon	Planted in Year
'Almey'	1959
'Hillieri'	1961
'Hopa'	1959
Malus x purpurea	1961
Malus sargentii	1961
Malus toringoides	1961
'Pink Perfection'	1976
'Prince Georges'	1961
'Royal Ruby'	1976
'Van Eseltine'	1976
'White Angel'	1985

We have also grown and discarded several other taxa either due to poor performance in flower or habit, failure of the graft after a number of years, or inability to keep scab under reasonable control (if five or six sprays per year can't keep a tree looking presentable, we give up on it).

Discards:

- Malus x robusta (scab)
- 'Oekonomierat Echtermeyer' (poor in flr. & fruit)
- 'Dorothea' (graft failure)
- 'Irene' (poor in flr. & fruit).
- 'Red Silver' (scab)
- Malus x zumi calocarpa (scab)*
- first 'Van Eseltine' (graft failure).

*Keith Warren thinks this plant was not the true variety, which is generally scab resistant.

Spray Schedule for Apple Scab

Over the years we have sprayed as follows: pre-pink; calyx; thereafter two-week intervals through mid-June; if there is significant rain during summer, we do a midsummer spray. We have alternated with Cyprex, Dikar and Benlate (Benlate has been used less often because of buildup of resistance.)

Mildew

This has been a minor problem, chiefly on 'Almey'. Karathane is added to the spray twice during the growing season.

Basal Suckers

We conducted testing in 1979 and 1980 under Dr. Thomas Reese of the Fruit Research Lab, Wenatchee, with NAA. We found the 1% rate very effective in controlling basal suckers, with the best results for aesthetic purposes in cutting shoots to one-half inch above the ground, giving enough surface for the spray to be effective, and avoiding unsightly dieback of pruned suckers. We have continued this program following the tests, and while we make applications more frequently, we feel that a reasonable program for the home gardener would be two growing season applications (May-June and June-July) and one early fall application in September.

(There was no phytotoxic reaction in any of the crabs to six applications per year).

Sucker Control Test in Ornamental Malus -- Second Year NAA (AMCHEM) 1% Rate

Six applications -- May 1 through Nov. 15, 1980.

Ten trees (most 15 to 20 years old).
(Same subject individuals as in 1979 test).

Shield was again used to prevent chemical from reaching trunk.

Percentages apply to original count of suckers on May 1 or on date of first appearance.

* * *

The following modifications were made in 1980 on last year's test procedures:

- A) All applications were made at the 1% rate.
- B) Number of applications was increased to six; the four growing season applications were at a monthly rate, and the fall applications were more widely spaced. This was chiefly for aesthetic reasons, but also because cutting shoots to $\frac{1}{2}$ inch left less surface to absorb the chemical than 1979 suckers (cut to 4-6" or left uncut).
- C) All suckers were cut to approximately $\frac{1}{2}$ inch above ground (mulch) line. This makes a great improvement in appearance and was done with the hope that reasonable control could still be maintained.
- D) Records cover only the one category of separate new shoots, since the incidence of new shoots on treated stems and green leaves on treated stems was insignificant in 1979.

Summary of Test --- 2nd Year

- 1) There was no indication of any adverse effect from prior year's use of NAA. Trees bloomed, grew, and fruited in a normal manner in 1980. I could see no difference in leaf size and color or in vigor of new growth. In short, trees appeared normal at the start of the 1980 growing season and remained normal through leaf drop at the end of a second year of NAA applications. Barring some sort of cumulative effect resulting from use over many years, NAA does not appear phytotoxic to the scion.

- 2) Prior treated shoots have virtually no live cambium above ground line by August 1 (after three applications), comparing favorably with a fair number of 1979 shoots which still had live cambium above ground line at the end of growing season. In comparing those stubs with no live cambium above ground, most of the 1979 stubs had live wood in cross section below or at ground line.

The fact that 50% of the 1980 stubs still had green wood below ground line suggests that dieback of shoots tends to be restricted in many cases to the surface area directly treated -- that translocation below the ground line is partial at best.

- 3) By the time of the third application on July 1 most new shoots were under three inches in height. This pattern is similar to 1979 test results.

4) General Conclusion -- 1979/1980

1980 results were even more satisfactory than in 1979. Cutting shoots to $\frac{1}{4}$ " stubs did not appear to stimulate significantly either the number of vigorous or subsequent new shoots, nor was the NAA effectiveness diminished. There was no noticeable increase in resprouts, due to reduced surface of the $\frac{1}{4}$ " stubs. Although shoot dieback advanced somewhat below groundline in approximately 50% of the suckers in 1980, there was no discernible effect on health of trees, nor was there any adverse reaction to more frequent applications.

Aesthetically, this method of treating suckers seems close to ideal. One can very quickly cut shoots to $\frac{1}{4}$ " stubs -- less than thirty minutes' work for ten trees once a month. Within two or three days these short stubs turn brown and can only be seen in bark mulch if one searches for them. By midsummer newly emerging shoots are both shorter and fewer in number. The net effect is a clean tree trunk whose beauty can be appreciated without the distraction of a small forest of unsightly suckers.

Fir Butler
Rhody Ridge Arboretum Park
Residential Caretaker
17427 Clover Road
Bothell, Washington 98012
(206) 743-3945

Note from the editor: Information regarding the effectiveness of NAA in suppressing root sprouts on the crabapples mentioned at the beginning of this letter is available upon request.

REPLY:

Control of suckers (shoots arising from the understock of grafted plants) is the most important maintenance requirement of ornamental crabapples. Second in importance is the removal of watersprouts (shoots originating from adventitious buds on the trunk or main branches). Chemical treatments that retard or eliminate the regrowth of suckers and watersprouts, and offer labor-saving gains in the maintenance of crabapples.

This 1979 and 1980 trial at Rhody Ridge Arboretum Park, with the application of NAA (naphthaleneacetic acid) to cut off suckers of ten ornamental crabapples, demonstrates the effectiveness of this treatment.

NAA, supplied by Amchem Products, Inc. for this project, is now marketed as "TRE-HOLD" by Union Carbide Agricultural Products Co., Inc.

Dr. Edward Hasselkus
Professor of Horticulture
University of Wisconsin-Madison

Dear Dr. Green,

I am interested in finding a description for a certain flowering crab which we call 'Almata'. I have never seen it mentioned in Malus, but we propagated it perhaps 20 years ago from budwood given to us by Mr. Al Lumley of Amherst MA, who had a rather large collection of crabs and lilacs at his farm on Pelham Road. I believe the farm has since been sold. We began propagating it again a few years ago and have some trees available for sale this year, but need a good description of it. In the nursery, it is a vigorous grower with leaves a light bronze green. We are told it has large red apples which color all the way through. Any help you can give us would be greatly appreciated.

Sincerely,

Dorothy O. Glazier
Roaring Brook Nurseries
Rt. 128
Wales, Maine 04259

REPLY:

Dear Dorothy,

I only know of 'Almata' through the Boerner Botanical Gardens. If any other members know of it, please contact Dorothy or myself.

Dr. Tom Green
Executive Dir., I.O.C.S.

Flowering Crabapples

Gus A. van der Hoeven and John C. Pair

(Editor's Note: *This is an excellent article for those just undertaking the culture of crabapples. For reprint information write, Kansas State University, Cooperative Extension Service, Manhattan, Kansas.*)

To see a crabapple in bloom in the spring is an unforgettable sight, and looking forward to its blooming each new growing season heightens awareness of the changing seasons. Flowering crabapples are among the most popular ornamental trees. They provide spectacular bloom, pleasing foliage in a range of colors from green to red, and a show of colorful fruit often retained well into winter. Many crabapples have an attractive bark color and interesting twig and branch forms during the dormant season. The gnarled and twisted limbs of older specimens are particularly striking in the winter landscape.

The showy blossoms make their appearance in early April, although the bloom period can vary from year to year, depending on weather conditions. Because of the attractive blossom development, with color display in the ballooning stage, the total bloom period may last up to 2 weeks. By selecting early and late-blooming species or cultivars, one can spread the blooming period over 4 to 5 weeks.

Crabapple blossoms in the ballooning stage vary from white to pink or red. The open blossoms range from white to dark purplish-red, with many variations of pink. Most crabapples have single flowers, but a few have semi-double or double blossoms.

In the summer, most crabapples have attractive green foliage. Some have a distinct reddish-green color throughout the growing season; others show the red or bronze color only for the first month or so of the growing season.

Although most exhibit poor fall color, many crabapples do have showy, colorful fruit. The color ranges from bright red to purple, and from bright yellow to orange, in a variety of shades and combinations. The fruits of some cultivars begin to color in August; others don't begin to color until September. Some varieties drop their ripened fruit, while others hold their fruit until spring, providing food for birds. For areas where fruit drop may be a nuisance, fruitless cultivars ('Spring Snow', for example) will have all the other attractive crabapple features but no fruit. Those who enjoy jelly made from the tart fruit will want to choose a tree that produces larger fruit. Flowering crabapple (a subset of genus *Malus*) includes fruit 2 inches or less in diameter.

Choosing Crabapples for the Landscape

Besides being a tree for all seasons, its wide range of forms and sizes makes the crabapple a tree for all landscapes, from city parks to street plantings and, especially, home landscapes.

Selecting a crabapple for landscaping requires considerable thought. There are many factors to consider: formal or natural setting; tree size and shape; flower color; and fruit color, size, and retention.

Crabapples have many uses in landscape design. In a park or large garden setting, they may be used as a group on gently rolling slopes. A variety selected for its round, mounded growth habit would further accentuate that land form.

A row of columnar crabapples can be used for an impressive but scaled-down effect of a tree-lined drive. Because of their dense growth, many crabapples are well suited for creating a screen or enclosure for an outdoor space. Crabapples can be used in a natural setting as well, when planted among native plant materials.

In the home landscape, crabapples can provide a background for a shrub border. They add seasonal color when placed against a group of evergreens. Used at the entrance, the right tree form can complement the architectural lines of the house.

As with other landscape planning, the ultimate size of the tree and its form or growth habit are important considerations. Mature crabapples can be as small as 10 feet high or less, or as tall as 30 to 40 feet high. Most have a rounded shape with a dense branch structure, but growth habits vary from narrowly upright to weeping. Crabapples can be trained to be espaliered to enhance a wall or fence.

The attractive characteristics of crabapples usually mean that they are chosen for prominent locations. Therefore, one should be sure that the crabapple selected will not only survive, but flourish.

Considering the large number of crabapple cultivars available, only a few meet the stringent requirements of excellent flowering, fruit, habit of growth, and disease resistance. Many are slightly susceptible to scab or fireblight disease, but may be acceptable for landscape use if their limitations are understood.

Cultural Requirements

Crabapples are adaptable to a variety of soil conditions but seem to do best in a heavy loam. The soil should be well drained, slightly acid, with adequate moisture. Most crabapples are cold-hardy. For best development of flowers and fruits, they should be planted in full sun. Crabapples planted in shaded locations tend to develop an open shape, and are more susceptible to disease.

(Editor's Note: Many of our native crabapples are forest edge and occasionally understory trees and somewhat adaptable to shade. Some of these are: M. fusca, M. ioensis, and M. coronaria, this last tolerating approximately 50% shade. M. fusca is very shade tolerant; normally found in deep coves and ravines under heavy shade in climates that are quite cloudy. In hot summer areas partial shade is always recommended. This shade extends the blooming season several days, and this ensures better fruit set due to the greater chance for pollination. John J. Sabuco.)

Keeping suckers removed is important to maintaining the beauty of ornamental crabapples. On some cultivars, especially dwarf selections, the seedling understock is too vigorous for the top and forces suckering at the base of the trunk. Some cultivars are now being grown from rooted cuttings and do not exhibit this characteristic.

Generally, crabapples require little pruning beyond early training to select scaffold branches. As the tree develops, it is best to remove low limbs that interfere with mowing under the tree. This training, which also prevents a very low, multi-stemmed trunk, should be done during the first 2 or 3 years. Extensive pruning to remove large limbs should be done during or before early June. Light pruning to remove unwanted sucker growth or to open up the center of the tree to let in light and air and remove out-of-place branches can be done at any time. Most crabapples initiate flower bud set for the next season in mid-June to early July, so pruning during or after this period will limit flower production the following year.

The most attractive form for upright crabapples is obtained when the ratio of trunk to leafy top is about one-fourth trunk to three-fourths top.

Crabapples tend to be strong trees, well anchored in the ground, and not prone to topple or suffer branch damage under the weight of ice or snow.

Disease

Susceptibility or resistance to disease is as important a consideration as the ornamental traits of a crabapple. Four diseases--apple scab, fireblight, cedar-apple rust, and powdery mildew are the major pest problems affecting crabapples (see table).

Apple scab causes smoky blotches on the leaves, causing them to turn yellow and drop prematurely. Fruit also may become infected, showing round, rough-surfaced spots of black or brown. The discoloration detracts from the ornamental value of the fruit.

Fireblight is a bacterial disease that causes leaves to blacken and shrivel up on the tree. As the disease spreads to larger branches, more of the tree dies as the bark of infected branches becomes rough and peels off.

Rust-colored spots on leaves are characteristic of cedar-apple rust. It is a problem only in areas where native cedars or ornamental junipers are growing within a mile of apple trees or crabapple trees.

(Editor's Note: *Usually only those trees with a large amount of native stock influence on their genotype are infected with cedar-apple rust. Furthermore, it is usually only native Junipers and Chamaecyparis that act as alternate hosts. No Cedrus act as host.*)

Severe infection may cause early leaf falls and dwarfing of the tree.

Powdery mildew is the least serious of the 4 diseases. Its symptoms are twisted, narrow, cupped terminal leaves covered with a powdery white fungus. It is usually a problem only with susceptible crabapples growing in locations with little air movement and humid nights.

(Editor's Note: *The chief problem with powdery mildew is when it occurs in spring. If the unopened or newly opened flower and leaf buds are infected, they will blast, usually causing complete loss of bloom and a serious stress setback in the loss of all early leaves. When it occurs later in the season, as is more usual, it is only unsightly. Powdery Mildew is more prevalent in the warmer south, mid-Atlantic, and northwestern states than elsewhere.*)

The problem can be corrected by opening up the crown of the tree through selective removal of branches.

In addition to the crabapples listed in the following table, several other selections offer a variety of forms, flower colors, and fruit types. *Malus* 'Ralph Shay' has large fruit that never drops and is suitable for jelly-making.* *M. sargentii* 'Tina' is a very dwarf form, and *M. tschonoskii* is a Japanese species with silvery young foliage and excellent fall color. It rarely blooms and is therefore grown for its attractive foliage.

Numerous new cultivars have been introduced recently that have not yet been fully evaluated in Kansas. Additional selections showing promise include 'Harvest Gold', 'Jewelberry', 'Molten Lava' (weeping growth form), 'Redbird', and 'Sugar Tyme'.

*NOTE: *The authors bring up an excellent point here; the push for small fruit is primarily for the prevention of a maintenance nuisance and increased persistence. However, if the fruit is so persistent that it does not drop, then larger size is not a detrimental factor and in the case of 'Ralph Shay', renders the plant possibly the best of all crabs for fall fruit display.*

Flowering Crabapple Cultivar Characteristics

The following are the 20 best Crabs of 50 tested in Kansas and are representational of that area.

Malus species and/or cultivar	Flower color	Fruit color, size, retention	Tree shape & size	Major diseases	Description, comments
Adams	Pink	Dark Red Medium Excellent	R 20 feet	Scab (moderate)	Dependable cultivar; annual bloomer, distinctive oval fruit; bold winter effect.
baccata jackii (Siberian Crab)	White	Red Small Excellent	R 35 feet	Scab; fireblight (moderate)	Very hardy; med. size, annual bloomer; fruit attractive to birds.
Centurian	Rose-Red	Glossy red Medium Excellent	Upr-V	Scab (moderate)	Large vigorous, upright tree, rose-red flowers, good winter fruit & disease resistant.
David	Pink/ white	Red Small Good	Narr. Upr Compact	Scab (mod.) Fireblight (slight)	Small, open, very showy in bloom.
Dolgo	White	Red Large Poor	Upr-Ov 40 feet	Scab (moderate)	Large fruit, can be used for jelly; fruit drops in summer.
Donald Wyman	Pink/ white	Bright red Small Excellent	R 15-20 feet	Scab (mod.) Fireblight (severe)	Annual, profuse flowering. Excellent dense form an attractive winter fruit.
floribunda (Japanese Flowering Crab)	Pink/ white	Red/yellow Small	Spr 25 feet	Fireblight (moderate)	A popular old favorite. Annual bloomer, resistant to most diseases.

Indian Summer	Rose/ pink	Bright red Medium-large Good	R Medium	Scab (moderate)	Vigorous; rounded tree; some fall color and winter fruit for birds.
Ormiston Roy	Pink/ white	Yellow Tiny Excellent	Upr-Spr 25-30 feet	Fireblight (moderate)	Annual bloomer, upright when young, becoming more spreading & open. Attractive fruit persists til spring.
Radiant	Red	Orange Medium Fair	R 25-30 feet	Scab (severe)	Popular red-flowering crab; has had severe scab in recent years.
Red Baron	Red	Red Medium Good	Col-Upr 20 feet	Scab but tolerant Fireblight (slight)	Narrow, columnar form for compact spaces. One of newest red-flowering crabs.
Red Jade	White	Bright red Excellent	W Medium	Scab (severe)	Graceful weeping form; good winter fruit retention.
Red Jewel	White	Bright red Small Excellent	Upr-Ov 15 feet	Scab (mod.) Fireblight (very severe)	Winter fruit remains on tree until flowering.
Red Splendor	Red/ pink	Orange red Medium Excellent	Upr-Spr 35 feet	Scab (severe) Fireblight (moderate)	Large single pink flowers; vigorous, irregular growth. Good winter fruit.
sargentii	Pink/ white	Dark red Tiny Excellent	Sh, Spr (compact) 6-8 feet	Fireblight (moderate)	Dwarf, compact form. other cultivars include 'Roseglow', 'Tina'.

Snowdrift	White	Orange-red Small Excellent	Spr-R 15-20 feet	Scab, Fireblight (severe)	Strong-growing, wind-resistant; very showy, dense white flowers. Fruit preferred by birds in fall.
Spring Snow	White	Fruitless	Upr-Ov 20 feet	Scab (severe)	Large white single flowers, very dense, showy in bloom.
Van Eseltine	Pink (double)	Gold-yellow Medium Excellent	Upr-V 20 feet	Fireblight (very severe)	Double pink, very showy blossoms on upright, vigorous tree.
White Angel (Inglis)	White	Dark Red Medium Excellent	Upr-Spr 20-25 feet	Scab(slight) Fireblight (moderate)	Large, vigorous tree, open growth habit, heavy fruiting, retained well into winter.
x zumi*	Pink/ white	Red Small Excellent	R-Spr 25 feet	Fireblight (severe) Scab (slight)	Pink buds open into white blossoms. Attractive fruit.

Representatives of the best cultivars, but not including all selections evaluated. New introductions continue to be tested which offer unique characteristics such as weeping forms, yellow fruit and other distinctive features.

Tree shape symbols: Col=Columnar, Ov=Oval, Pyr=Pyramidal, R=Round, Sh=Shrubby, Spr=Spreading, Upr=Upright, W=Weeping, V=Vase

Susceptibility to various diseases based on information by Professor Lester Nichols, formerly Plant Pathologist, Penn State University.

**NOTE: The authors originally had Malus X zumi as Malus sieboldii var.zumi. The accepted nomenclature here is Malus X zumi, a natural hybrid of Malus sieboldii and Malus baccata mandshurica. Malus X zumi var.(or ssp.) calocarpa is the preferred variety, for it is resistant to most diseases where Malus X zumi is not. Malus x zumi is rare in cultivation. Look for more information regarding Malus x zumi in the next issue of "MALUS".*

The Boerner Crabapple Collection

Michael D. Yanny and Lori K. Yanny

Part 1 The History

Located within the confines of Whitnall Park and the Root River Parkway in Hales Corners, Wisconsin, the Boerner Crabapple Collection is one of the largest and most comprehensive in the country. It contains nearly 800 trees of approximately 250 species and cultivars.

The setting for the collection is a superb piece of pastoral Wisconsin countryside. At its heart is an old red barn that preceded its inception and helped inspire its conception. The German farmer who once owned this land had his apple orchard next to the barn on a hillside, sloping down to a marsh.

In approximately 1927, Alfred L. Boerner, the Milwaukee County Landscape Architect, and Charles B. Whitnall, a member of the Milwaukee County Park Commission, became interested in securing this property along with many other properties surrounding it for the purpose of creating a large rural county park and arboretum, which would contain a crabapple collection. The purchase was made, and the work began.

In the early 1930's, under the direction of Mr. Boerner and his chief construction and planting supervisor, John E. Voight, the marsh was dredged to form two beautiful lagoons that were bridged by a small winding road sloping down a hillside. Much of this work was done by federally funded CCC workers.

Between 1933 and 1941 most of the areas around and adjacent to the two lagoons were planted with ornamental crabapples. Trees near the tops of the hillsides framed the views to the trees and lagoons below, creating picturebook scenes.

After World War II, funds were scarce, and public labor was not as readily available. Planting was slowed.

During the early 1950's an important occurrence took place. John Voight, who had become director of Whitnall Park, and Alfred Boerner met the noted crabapple authority, Arie den Boer, for the first time. Mr. den Boer, from the Des Moines Water Works in Iowa, enthused and influenced Mr. Voight and Mr. Boerner. They became inspired to build a bigger and better crabapple collection.

John Voight proceeded to have two gardeners on his staff trained specifically in the art of piece-root grafting of crabapples. In this way, he was able to obtain crab scions from many different places and produce trees from them. Some of his sources included: the Arie den Boer Crabapple Collection at the Des Moines Water Works, the Arnold Arboretum, the Morton Arboretum, the Central Experimental Farm in Ottawa, the Morden Experimental Farm in Manitoba, the Minnesota State Fruit Breeding Farm, and Michigan State University.

Soon, because the grafters were so successful, finding locations to plant all of the new trees became a problem. It was not the normal procedure of the county to acquire and grow so many different kinds of plants without first having a landscape plan. The normal procedure was avoided because Mr. Voight foresaw possible objections to such a massive expansion of the collection. However, with the trees in hand already, it would have been hard for the county authorities to object. This was John Voight's clever way of forcing the rapid development of the crabapple collection.

The expansion was approved and it was decided to string out the crabapple trees in groupings along the adjacent Root River Parkway to create a scenic drive.

Further development of the crabapple collection took place in the 1960's and 1970's. A park service road was reconstructed for public use, and crabapples were planted along this new drive. In older areas of the collection, new crabapples were added to the original plantings.

In 1984, Horticultural Director, William J. Radler, established large crabapple test plots in the Root River Parkway as part of the National Crabapple Evaluation Program. The test plots were designed to provide a simple and scientific method of evaluating and comparing fifty crabapple cultivars.

After over fifty years of development, the Boerner Crabapple Collection is impressive. The care of such a huge collection is no small task. Milwaukee county park workers prune the trees annually, mow the turf beneath them, and provide each tree with a small metal identification label.

Visitors discover that such a well-maintained collection is both beautiful and valuable. Many people enjoy the scenic crabapple drives. Homeowners and landscape architects find that the collection helps them choose desirable crabs for their planting plans. Plant breeders use the Boerner crabapples for hybridizing. Nurserymen tour the collection to look at new and promising cultivars. The Boerner crabapple collection is also used in the national disease and aesthetic rating program begun by the late Lester P. Nichols and continued by Thomas L. Green.

The Boerner Crabapple Collection will also be an important resource in the future. New and improved cultivars will continue to be planted as they become available.

Part 2 A Visit

What is it like to visit the Boerner Crabapple Collection?

Let's take a quick "tour" of some of the highlights:

As we meander around the lagoons at the heart of the collection, we find a large M. 'Red Jade' tree under which we could host a picnic for four and not be disturbed by outsiders. Just west of here is a majestic forty-foot-tall M. X robusta towering above all the crabapples near the lagoon. Looming over the lagoon, is a glorious fifty-years-old M. X purpurea 'Lemoinei'.

Back in the tall grass due south of M. X 'Lemoinei' is an old M. florentina, which always raises the question: "Is this really a crabapple?"

Continuing around the lagoon, we cross the road and view a twenty-five-foot-tall, vase-shaped M. 'Winter Gold' that lightens up this little corner of the park each fall with its golden yellow fruits.

Traveling into the Root River Parkway we come upon five large, thirty-years-old M. prunifolia var. 'Rinkii' trees standing guard at a curve in the road. Their narrow, upright habit makes them unique for crabapples of this age.

Along this route we also see a beautiful M. 'Ormiston Roy' tree which was produced from a scion received from Arie den Boer. This twenty-five-foot-tall tree is a standout in all four seasons of the year. Its bright yellow fruit turns a pleasing reddish brown and persists into late winter. Its pink/white flowers are a spring delight, and its rich green leaves form a cool canopy in the summer.

Continuing down the road, we meet the little known M. 'Blanche Ames'. This tree, which is about twenty-five feet tall and fifteen feet wide, is one of the few crabs with semi-double white flowers. The summer foliage is a healthy dark green. More people should be introduced to the charming M. 'Blanche Ames'.

As we go to the furthest reaches of the collection on a parkway side road, we seek out three thirty-year-old M. 'Liset' trees. These hidden gems, with their twisting turning branches, mounded shapes and iridescent flowers are worth the search.

Heading back into Whitnall Park, we come across some exceptional trees. Nobly perched on the crest of a hill is a magnificent M. 'Adams'. This thirty-year-old specimen is fifteen feet tall and twenty-five feet wide with a mounded outline.

Rolling down the road we spot two huge, thirty-five-foot-tall specimens of M. 'Red Splendor'. These trees with their beautiful October fruit stand out as clouds of red from seventy-five yards away.

The last sight, at the exit of the park, is a twenty-five-year-old M. 'Mary Potter' stretching out to us. The horizontal branches of this tree seem to defy gravity.

The Boerner Crabapple Collection may be toured at any time of year. Admission is free. You may want to purchase the self-guiding tour booklet for the crabapple collection. Park maps and more information are also available at:

The Garden House
Boerner Botanical Gardens
5879 South 92nd Street
Hales Corners, Wisconsin 53130
(414) 425-1130

Boerner Crabapple Taxa

Malus 'Adams'	'Fiona'
x <u>adstringens</u>	'Flame'
'Alexis'	'Florence'
'Almata'	<u>florentina</u>
'Almey'	<u>floribunda</u>
'Arctic Dawn'	'Garnet'
'Arrow'	'George Eden'
x <u>atrosanguinea</u>	'Gertrude'
<u>baccata</u>	'Giant Wild'
<u>baccata</u> <u>cerasifera</u>	'Gibbs Golden Gage'
<u>baccata</u> (scab-immune hybrid)	'Girard's Weeping Dwarf'
<u>baccata</u> var. <u>jackii</u>	<u>glabrata</u>
'Barbara Ann'	'Gladwyne'
'Bartoni'	<u>glaucescens</u>
'Basketong'	x <u>gloriosa</u>
'Beauty'	'Golden Hornet'
'Bedford'	'Goldfinch'
'Beverly'	'Gorgeous'
'Blanche Ames'	'Guiding Star'
'Bob White'	'Gwendolyn'
'Brandywine'	<u>halliana</u> 'Parkmanii'
'Brier'	x <u>hartwigii</u>
'Burgundy'	'Harvest Gold'
'Candied Apple'	'Helen'
'Cardinal'	'Henningii'
'Cathsy'	'Henrietta Crosby'
'Centennial'	'Henry Kohankie'
'Centurion'	'Hillier'
'Cheal's Crimson'	'Hopa'
'Chilko'	<u>hupehensis</u>
'Christmas Holly'	'Indian Magic'
'Columbia'	'Indian Summer'
'Coralburst'	<u>ioensis</u>

coronaria 'Charlottae'
'Cowichan'
'Crimson Beauty'
'Crimson Brilliant'
'Dartmouth'
'David'
'Delite'
'Dolgo'
'Donald Wyman'
'Dorothea'
'Dr. Van Fleet'
'E. H. Wilson'
'Elise Rathke'
'Elk River' x coronaria dasycalyx
'Ellen Gerhart'
'Ellwangeriana'
'Erie'
'Evelyn'
'Exzellenz Thiel'
'Liset'
x magdeburgensis
'Makamik'
'Marshall Oyama'
'Martha Dolgo'
'Mary Potter'
'Mathews'
'Mercer'
'Midnight'
'Milton Kral'
'Minn. 4-P'
'Minn. 11-AB'
'Molten Lava'
'Morden 454'
'Morden 450'
'Morton'
'Mount Arbor Special'
'Mrs. Bayard Thayer'
'Neville Copeman'
'N.Y. 49-23'
'N.Y. 50-4'
'Oekonomierat Echtermeyer'
'Olga'
'Orchid'
'Ormiston Roy'
'Osman'
'Patricia'
'Pink Eye'
'Pink Giant'
'Pink Spires'
'Piotosh'
'Pioneer Scarlet'
'Pixie'
'Prairifire'
prattii
'Professor Sprenger'
'Profusion'

ioensis 'Boone Park'
ioensis 'Klehm's Improved'
ioensis 'Plena'
'Irene'
'Jack Humm'
'Jay Darling'
'Jewelberry'
'J. L. Pierce'
'Joan'
'John Downie'
'K & K'
'Katherine'
'Kibele'
'Kingsmere'
'Kola'
'Lady Ilgen'
'Lady Northcliffe'
'L. B. #1'
'Leslie'
'Red Jade'
'Red Jewel'
'Red River'
'Red Silver'
'Red Splendor'
'Red Tip'
'Rescue'
'Ringo'
'Robinson'
x robusta
x robusta 'Persicifolia'
rockii
'Rondo'
'Rosseau'
'Royalty'
'Ruby Luster'
'Rudolph'
'Ruth Ann'
sargentii
sargentii 'Rosea'
sargentii 'Roselow'
sargentii 'Scanlon's Rancho Ruby'
x scheideckeri
'Scugog'
'Selkirk'
'Sentinel'
'Severn'
sieboldii
sieboldii arborescens
sieboldii 'Fuji'
sikkimensis
'Silver Moon'
'Silvia'
'Sissipuk'
'Slocan'
'Smith'
'Snowcap'

prunifolia
prunifolia 'Fastigiata'
prunifolia f. 'Pendula'
prunifolia rinkii
pumila 'Aurea'
pumila niedzwetzkyana
pumila paradisiaca foleus-aureus
pumila paradisiaca ruberrima
 'Purple Wave'
 x purpurea 'Aldenhamensis'
 x purpurea 'Eleyi'
 x purpurea 'Lemoinei'
 'Radiant'
 'Ralph Shay'
 'Red Barron'
 'Redfield'
 'Redflesh'
 'Redford'
 'Redglobe'
toringoides
toringoides 'Macrocarpa'
 'Toshprince'
 'Trail'
tschonoskii
 'Turesi'
 'University'
 'Van Eseltine'
 'Vanguard'
 'Veitch's Scarlet'
 'Velvet Pillar'
 'Virginia Seedless'
 'Wabiskaw'
 'White Angel'
 'Snowcloud'
 'Snowdrift'
 x soulardii
 x soulardii 'Soulard'
spectabilis 'Riversii'
 'Spring Glory'
 'Spring Snow'
 'Stark's Gold'
 'Strathmore'
 'Strawberry Parfait'
 'Striped Beauty'
 x sublobata
 'Sugar Tyme'
 'Sundog'
 'Susan'
 'Sutherland'
 'Tanner'
 'Tolsteme'
 'Tomiko'
 'White Candle'
 'White Cascade'
 'William Anderson'
 'William Sim'
 'WinterGold'
 'Wynema'
 'Yellow Jewel'
 'Young America'
yunnanensis
yunnanensis veitchii
 'Zita'
 x zumi
 x zumi var. calocarpa

Malhumor

- Q. When does an apple become a pear?
A. When you have two.

Biblical question:

Did the problem start with the apple on the tree or the pair on the ground?

(That presents a good question. Did Adam first encounter an apple, crabapple or a pear?) (I believe he first encountered Eve. John Sabuco).

This issue of Malhumor was provided by Floyd Swink, Morton Arboretum, Lisle, Illinois.

Notice:

The next board meeting of the I.O.C.S. is tentatively scheduled Saturday, January 16th, from 2:00 p.m. - 5:00 p.m. at the Mid-Am Show, in the "School Room" at the Hyatt Regency Hotel in Chicago.

Crabs You Should Know

This is a new column in Malus devoted to the introduction of new Malus cultivars. We welcome the participation of all to submit candidates for selection (that are worthy of introducing). Color separations would be welcome. In the near future we will be covering the topic of how to describe a new crabapple. After that time we will request a full taxonomic description on "Crabs You Should Know". This society will gladly offer its assistance with descriptions.

Malus cv. Louisa

Polly Hill

In 1959, during a short course on woody plants at Longwood Gardens, our instructor, Mrs. Lois Paul, brought to class a small fruiting branch of a crabapple from Mrs. Arthur Hoyt Scott's garden, "Todmorden", in Swarthmore, Pa. Mrs. Paul pointed out the ornamental quality of its large, colorful fruits. However unlikely, I remember them to have been about the size of ping-pong balls. She was unable to supply a name, nor do I remember any further description of the plant. In any case, I saved the seeds from the fruit I was given. After being stratified over the winter, they were planted in my nursery at Barnard's Inn Farm in May of 1960.

In 1962 I selected one seedling for its sprawling habit. It was fastened to a 6' stake until 1969 after having grown to about 5'. In 1971 it produced deep pink, fragrant, single flowers. Its fruit was approximately 3/8", ovoid, and yellow with a tawny rose blush. Its form was umbrella-shaped with outward facing branches weeping at the terminals.

For several years I was privileged to have Dr. Les Nichols visit my Malus collection on Martha's Vineyard, and give me advice. Dr. Nichols' observations on its disease resistance were most gratifying to me. Now, with its release in Schmidt's 1988 catalog, I rejoice to know that my Malus 'Louisa' can be available to anyone wanting a fragrant, pink, weeping crabapple, of proven disease resistance.

Description

Height - 15'

Spread - 15'

Hardiness - -25°F

Habit - weeping

Foliage - Dark green, glossy

Flowers - True pink

Fruit - Yellow with a tiny, rose blush, 3/8"

Disease Resistance (evaluated by L.P. Nichols)

Scab: Excellent

Cedar-Apple Rust: Good

Mildew: Good

Fireblight: Good

Availability

J. Frank Schmidt & Sons, Inc., Boring, Oregon, 97009

Malus cv. Louisa



(We would like to thank J. Frank Schmidt & Sons, Inc., Boring, Oregon, 97009, for providing the photo of Malus cv. Louisa)

A Perfect Crab

Betty Powell

Crabapples are the most versatile and popular small trees from lower Canada to all but the southernmost U. S. Very few, however, of the 700 species and hybrids have both fine landscape characteristics and resistance to the four diseases of crabapples - scab, fireblight, powdery mildew, and cedar-apple rust.

A new hybrid developed at the U. S. National Arboretum (Washington, DC 20002) combines great disease resistance with low maintenance and superior ornamental value. 'Narragansett', a cross of an unnamed dwarf hybrid with a highly disease-resistant plant of Malus 'WinterGold', has shown no infection by any of the four diseases for the last ten years when grown close to heavily infected plants and climatic conditions ideal for inoculation.

'Narragansett' has grown 13' tall in 12 years, with a broad crown and gray-green bark. The leaves are dark green and leathery, and rarely bothered by aphids or mites. In early spring, the velvety, dark carmine buds which turn bright red, are showy for weeks. They open to white flowers with a pink tinge. 'Narragansett' blooms and fruits every year, and the brilliant red fruit persists as long as four months.

'Narragansett' is hardy to -30° , and softwood cuttings root easily under mist. The tree's small size makes it an excellent choice as an accent plant, the focal point in a shrub border, screening, massed planting, or a patio container tree. Besides requiring no spraying for disease or pest control, it needs little pruning because of its wide crotch angles and open branching. The fruits are attractive to birds and other wildlife after they are softened by a hard freeze, so do not produce a litter problem.

The arboretum has distributed this fine new crabapple to numerous wholesale nurseries, so watch for it at your local garden center or nursery and in the catalogs this year.

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Editor's Note: According to Les Nichols 'Narragansett' is severely infested with scab; however, it is tolerant to scab, refusing to drop its leaves even when severely infested.



The brilliant red fruit of Malus 'Naragansett' remains attractive until mid Winter.



The slow-to-open dark red tight buds change first to carmine then pink and finally open to white flowers with a pink blush.

Reprinted with permission from the "American Nurserymen", photographed by Don Egolf.

Editor's Note:

We are interested in providing information where new cultivars can be obtained. If other nurseries are carrying these new plants, we will add this information to subsequent issues of Malus. We make no endorsements for a given nursery or the quality of their stock. At some point in a future issue we will be happy to present a consolidated source list for these new crabs.

Candidates for selection should contain the following information:

PARENTAGE (if known)

HISTORY (if known)

DESCRIPTION (height, spread, habit, flower color in tight bud, and open stage, if flowers fade, annual or alternate, fragrance, single, semi-double or double, any other taxonomic flower anomalies, fruit color, size, persistence, shape, foliage, twig, and bark characteristics, and disease resistance.

Dr. Tom Green

The Allegheny Crabapple

Anonymous *Bill Purton*

As an introduction, let me briefly review the "Checklist of United States Trees" (Native and Naturalized - Sept., 1979). Under MALUS it lists:

Malus angustifolia	Southern Crabapple
Malus coronaria	Sweet Crabapple
Malus fusca	Oregon Crabapple
Malus ioensis	Prairie Crabapple

as the natives. Other references from earliest times talk about the Allegheny Crabapple (Sweet Crabapple - *M. coronaria*) growing in abundance on the open hillsides, tops of hills, and low wet broad valleys of southwestern Pennsylvania.

Of all the trees that recover land from severe disturbances, our native flowering crabapples do the job with a dogged persistence. To give proper credit to other trees in this capacity, I here mention Black Locust (*Robinia pseudoacacia*), Hawthorns (*Crataegus*), Sassafras (*Sassafras albidum*), Flowering Dogwood (*Cornus florida*), and Black Cherry (*Prunus serotina*). These trees are some of the first to become established naturally after grazing, mining, or farming. These often thorn-bearing trees fend off grazing animals and allow seedlings of the eventual climax forest to get started.

This crabapple is tough. This term means that after being carried and planted by mice, rabbits, moles, deer, and some birds, the sprouts feed these same members of the briar patch community as a winter survival food, showing scars of various browsers on the trunk and lower branches well into its later years. After about four to six years this plant begins to overtop the grasses and briars and spreads its crown out over the goldenrods to find the sun to bloom and produce the sour, hard, green fruits called crabapples.

The following chapter is indeed sad. Few crabapples of large mature size are ever recorded, since in twenty years time they are overtopped and suppressed by the same trees that the crabs protected as saplings. The Big Tree Record for Pennsylvania lists a tree from the Allegheny National Forest with a circumference of 2' 3" and a crown spread of 18' as being the largest. The National Register, however, lists a *M. coronaria* from Wayne County, Ohio with a 4' circumference and a 28' crown as being the largest of the species.

Its wood has a limited use because the tree seldom grows to a harvestable size. However, the wood has been used for carving, engraving, tool handles, and turned articles because of its hardness and resilience.

The fruit always appeared on our family table when my grandmother was alive in the form of jelly and spiced red condiments for the Christmas turkey. Its use for cider is mentioned in "Pennsylvania Trees", by Illick. Peter Kalm on the other hand considered the fruit only suitable for vinegar. Euell Gibbons in a more positive way writes about jellied apple butter and apple sauce from the wild crabs. I was once saved from an inglorious meal of cattail rhizomes, goldenrod tea, and plantain salad by a scout troop that diced and candied wild crabapples as an emergency preparedness food.

Description:

M. coronaria (L.) Mill. Tree to 10 m; brts. tomentose at first: lvs. ovate to ovate-oblong, acute, usually rounded at base, 5-10 cm long, irregularly serrate and usually slightly lobed, those of shoots with short broad lobes, floccose-tomentose when young, finally glabrous, green beneath, or those at ends of shoots pubescent on the veins, rather thin: fls. 3-4 cm across; pedicels glabrous: fr. depressed-globose, about 3 cm across, ribbed at apex, greenish. B.M.2009(c). B.R.651(c). S.S.4:t.167. Gn.29:395;34:206. S.L.233(h). (*M. fragrans* Rehd., *Pyrus c. L.*) N.Y. to Ala., w. to Mo. Intr. 1724. Hardy to -

34°F. *M. c. elongata* Rehd., var. Lvs. narrowly triangular-ovate or oblong-ovate, more deeply lobed and incisely serrate, sometimes cuneate. N.Y. to N.C. and Ala. Intr. 1912. *M. c. dasycalyx* Rehd., var. Lvs. paler beneath, those of shoots sometimes pubescent on the veins: calyx villous. Ont. to Ohio and Ind. Intr. 1920. *M. c. charlottae* Rehd., f. A form of the preceding var. with semi-double large fls. Intr. about 1900. *M. c. nieuwlandiana* Slavin, f. Similar to *f. charlottae*, but fls. brighter; pedicels 3-5.5 cm long: fr. 4-5 cm across.

M. c. x pumila = *M. heterophylla* Spach. Here belongs "Mathew's Crab" and some forms cult. as *M. soulardii*. Differs from *M. soulardii* chiefly in the broader less pubescent lvs. and slightly pubescent pedicels.

Related species: *M. bracteata* Rehd. Lvs. less lobed, on flowering brts. elliptic-ovate to oblong, abruptly acute or obtusish, sparingly serrate or sometimes entire, on shoots slightly lobed, pubescent when young, soon glabrous, green or pale beneath. S.M. 387. (*Pyrus b. Bailey.*) Mo. to Ga. and Ala. Intr. 1912. Hardy to -25°F.

Inhibition of Crabapple Suckers

John C. Pair

Traditionally, many crabapple cultivars, especially the smaller selections, are grafted on vigorous understock, such as seedling apples that sprout easily. Various methods recently suggested include: (1) grafting on less vigorous understock, (2) putting crabapples on their own roots, or (3) using timely sprays of sprout inhibitors. The latter was tried in the spring of 1987, using a commercial sprout inhibitor, Tre-Hold, containing 15% naphthaleneacetic acid (NAA).

The following treatments were applied across several cultivars: (1) suckers pruned off and sprayed while trees were dormant, (2) suckers pruned off and allowed to grow to 6-12 inches before spraying on April 30, and 3) suckers removed and allowed to grow back naturally (control). Results were rather dramatic in that dormant applications of 1.3% NAA (10 oz./gal. water) prevented regrowth of most basal sprouts (Figure 1). Early May spraying of sprouts 6-12 inches tall inhibited further growth but did not eliminate existing sprouts. The practice of removal by dormant spraying should have practical application to the grounds maintenance industry.

Certain cultivars appear to be worse than others in suckering habit, however, if grafted on seedling apples, most will produce some basal sprouts. Table #1 contains the results of various treatments of NAA on sucker growth.

Although pruning and spraying reduced the number of suckers from 33 to 5 per tree, removal and spraying after regrowth was 6-12" tall increased the numbers of sprouts from 31 to 133 and those pruned but not sprayed from 23 to 85, due to the proliferation of shoots caused by pruning. This would verify the need to completely remove the shoot by perhaps digging and pulling out the shoots arising from adventitious buds, but such would be impractical. Spring spraying on April 30 stopped growth, whereas untreated sprouts reached nearly 40 cm high by May 13.

Table 1. Effect of 1.3% NAA sprays on basal sprouting of Crabapple cultivars.

Treatment	# Sprouts/ Tree 3/11/87	# Sprouts 5/15/87	Average ht. (cm)
1. Cut off & dormant sprayed	33	5	24.5
2. Cut off & regrowth sprayed 6-12' tall	31	133	23.5
3. Control (cut off but untreated)	23	85	39.8

All suckers removed from 19 cultivars on March 11, 1987. Treatment #1 was applied a few hours later to cut surfaces. Treatment #2 was applied on April 30. Suckers were counted and measured on May 13 (mean of 3 replications).



Figure 1. Basal sprouts pruned and sprayed with NAA.



Figure 2. Basal sprouts pruned off but left untreated.

*Report of Progress 523, "1987 Woody Ornamental Evaluations",
Wichita Horticulture Research Center, Agricultural Experimental
Station, Kansas State University, Manhattan, 66506.*

MALUS "OBSCURUS"

A series featuring some of the lesser known crabapples.

Malus sieboldii (Reg.) Rehder
The Toringo Crab

John Martens & Tom Green

It must have been great sport a century or so ago to roam the wilds abroad in search of new species of trees. Plants and seeds could be sent home as "trophies", which expanded domestic collections of exotic plants. Today, the chances of discovering a new species of crabapple are slim, but there is ample opportunity to resolve questions concerning the species that have been collected in the past. One such question concerns Malus sieboldii and its associate M. sieboldii var. arborescens Rehder. That question is; Are the two forms distinct enough to be considered varieties of each other?

M. sieboldii was discovered by Philipp Franz von Siebold (1796-1866) in gardens in Japan. He introduced it into Europe in 1853. It was originally described by Regel in 1859 as Pyrus sieboldii. Rehder placed this species in the genus Malus in 1915 and described specimens collected by E. H. Wilson in Japan in 1914 as follows: "The specimens ... agree very well with the cultivated form originally introduced by Siebold into European gardens; they have the same deeply lobed, pubescent leaves, small apparently yellow fruits and shrubby habit". Wilson found common bushy thickets (1.5-4 m tall) on Hondo, Japan near Mt. Yatsuga-dake in moorland from 1200-1500 m elevation and near Mt. Tsubakura-dake from 900-1200 m elevation.

Its name "Toringo" can be found in the (European) literature as early as 1856 and signifies "Chinese Apple". However, the Japanese name for this species was "Zumi", a name applied also to the other small-fruited indigenous crabs, i.e., M. baccata var. mandshurica and M. x zumi. It will take some real library research effort to obtain the late 19th century literature to determine why it is called the Toringo crab. In Japan the "Chinese Apple" applies to M. prunifolia var. rinkii.

M. sieboldii var. arborescens was named by Rehder in 1915. Wilson and C. S. Sargent found this plant widely distributed in Japan (Hokkaido and Hondo), ranging in elevation from 300 to 1600 m and in height to 9 m. It was also found in Korea. Sargent introduced this plant into the U. S. in 1882. Rehder states that this variety differs from the type in its more arborescent habit, and less pubescent, somewhat larger and usually less deeply divided leaves, often lobed only at the end of vigorous shoots and usually nearly glabrous at maturity; the flowers are often nearly white and the fruits yellow or red on different plants.

Some taxonomists, including Jefferson in Crabapples of Documented Authentic Origin, say that the name M. sieboldii var. arborescens is a synonym for M. sieboldii. This leads us to wonder whether or not the dwarf or bush form described as the species is genetically true or a product of certain environmental conditions present in Japan. Will the seeds from a dwarf shrub form grow into the arborescent form in a different environment?

It is interesting to note that the species was described on the less abundant shrub form. This is like finding a red-flowering dogwood and describing it as the species, and the abundant white-flowering form is designated as forma albafloral

At the present time we believe that the trees labeled var. *arborescens* in the Morton Arboretum East *Malus* collection are not true to either description. Two of our trees labeled *M. sieboldii* located in East *Malus* are definitely taller than 4 m, more like 7 m. They also have numerous non-lobed leaves. We believe these trees are var. *arborescens*. In our Japanese collection we have a shrubby *M. sieboldii*, believed to be true. However, we won't be able to verify our suspicions until spring.

As for the trees themselves, it seems that both, but especially *M. s.* var. *arborescens*, would be good specimens to have in any collection of crabs. Den Boer says that *M. sieboldii* "is excelled by many others, but is valuable because it is a late bloomer and its tiny fruit, red or yellow, is very attractive to birds. In form, it resembles *M. sargentii*." *M. s.* var. *arborescens* is an excellent tree. It, too, has small but very abundant flowers and fruit of either color. "Graceful and handsome tree, showy in bloom", says Rehder. Another attribute of these crabs is their fall color, usually golden yellow to orangish-red. Jefferson's charts of hybrid lineation show that *M. sieboldii* is a very popular selection for parentage.

Description

M. sieboldii (Reg.) Rehder, Toringo Crab. Shrub to 4 m with spreading branches widely spaced and nodding, black-brown; young branches pubescent; leaves ovate or elliptic, acuminate, 2.5-6 cm long, sharply serrate, those of shoots broad-ovate, coarsely serrate and partly 3 or sometimes 5-lobed, pubescent on both sides, later glabrous or glabrescent above, deep green above, fall color red and yellow; petioles pubescent, 6-18 mm long; flowers pink or deep rose in bud, finally nearly white, about 2 cm across; pedicels 2-2.5 cm long, like the calyx pubescent; petals obovate-oblong; styles 3-4; fruit globose, 6-8 mm across, red or brownish-yellow, persistent.

Var. *arborescens* Rehder. Tree to 10 m; leaves larger, less deeply lobed and less pubescent; flowers often nearly white, 3 cm across; fruit yellow or red, globose, 8-10 mm across.

M. toringo Siebold, 1856. Cat. Rais. 4 (nomen nudum); De Vriese, 1856. Tuinbow-fl. III. 368, t. 17 (sine descriptione), quoad ramum fructiferum depictum; Koehne, 1893. Duetsch. Dendr. 261; Schneider, 1906. Ill. Handb. Laubholz. I. 723, fig. 399c, 400 g-h; Koidzumi, 1913. Jour. Coll. Sci. Tokyo, XXXIV. art. 2, 80 (Consp. Rosac. Jap.).

Pyrus rivularis Gray, 1857. Mem. Am. Acad. n. ser. VI. 388 (non Nutt.). *Pyrus sieboldii* Regel, 1858. Ind. Sem. Hort. Petrop. 51; Regel, 1859. Gartenfl. VIII. 82; Kirchner, 1864. Petzold & Kirchner, Arb. Musc. 325. *Sorbus toringo* K. Koch, 1864. Ann. Mus. Lugd.-Bat. I. 249. *Pyrus toringo* Siebold apud Miquel, 1867. Prol. Fl. Jap. 229; K. Koch, 1869. Dendr. I. 212; Franchet & Savatier, 1873. Enum. Pl. Jap. I. 139; 1879. II. 350. *Pyrus mengo* Siebold ex K. Koch, 1869. Dendr. I. 213. (pro synonym.). *Malus toringo* Carriere, 1870-71. Rev. Hort. 451, fig. 63t. *Pyrus rivularis* B. *toringo* Wenzig, 1874. Linnaea, XXXVIII. 39; Voss, 1894. Vilmorin's Blumegart. ed. 3 I. 277.

Pyrus toringo B, *incisa* Franchet & Savatier, 1873. Enum. Pl. Jap. I. 139; II. 350.

Malus microcarpa toringo Carriere, 1883. Etude Pomm. Microcarp. 61, fig. 11.

Malus baccata, subsp. *toringo* Koidzumi, 1911. Tokyo Bot. Mag. XXV. 76.

In the next issue of Malus we will feature the controversial M. X zumi var. calocarpa, the Redbud Crab, an M. sieboldii X baccata mandshurica hybrid.

Agenda For Director's Meeting

(January 16th, 1988 at the Mid Am Show, at the Hyatt Regency Hotel in Chicago.)

Computer Tracking for Malus Taxa	John Den Boer
Test Plot Proposal & New Introductions	Tom Green
Continuing Les Nichols Work/Exclusive Research Fund	Tom Green
Treasury Report	Tom Green
Future Meetings:	
1988 Dow Gardens	Ed Hasselkus
1989 U.S. National Arboretum	Tom Green
1990 Minnesota Landscape Arboretum	Tom Green
Publications	John J. Sabuco
Malus	John J. Sabuco
Crabapple Book	Father Fiala or John J. Sabuco
Publicity	Norbert Kinen John J. Sabuco Bill Hendricks
Other Business	

All Members Welcome

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