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LETTERS TO THE EDITOR

Dear Editor:

I am interested in a variety, or varieties, of crabapples that fruits like a Callaway but drops its fruit in October, November, and December, and that is blight and scab resistant. I would also be interested in a pear or plum tree that would fruit this same time of year.

My interest in these trees is for wildlife food, specifically deer, in northern Mississippi and east-central Alabama.

Any information you can give me would be appreciated.

Robert M. Bailey
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FROM THE EDITOR'S DESK

In this edition of MALUS you will find an index of all the articles that have been published in MALUS since the first issue. You will also find in this issue all the information known to the Editor on the Bob White Crabapple. The members of the Board of Directors indicated that they would like to see this type of information in MALUS.

A few months ago I was concerned about having enough articles to complete this issue. Thanks to a few old faithfuls like Mike Yanny, I ended up with more than needed for this issue. Please, if you are working on something that might be of interest to our members, consider writing to me about your work.

IDENTIFYING CRABAPPLE TREES

Karen J. Kopetz
Illinois State University
Normal, Illinois

I am a senior undergraduate biology major at Illinois State University. I have been in the Honors Program since I first came to Illinois State in 1992. One of my goals, graduating with departmental honors, requires the completion of an independent honors research project. My decision to work with crabapple trees for the project was a gradual one, beginning in Spring 1995. I volunteered for the newly developed Fell Arboretum at Illinois State to see how the inventory process operated, and began to work in the summer of 1995 with Don Schmidt, Horticulturist, Department of Biological Sciences. This involved creating an inventory of the existing trees on campus. When completed, the inventory will serve as the initial collections record for the arboretum. I was amazed at the number of beautiful flowering and fragrant trees located on the campus. At that point, I had limited experience in horticulture, but soon learned that those trees were crabapples, genus *Malus*. The inventory listed over 250 crabapples with most of the names entered in the database as "*Malus* sp". I soon became aware of the enormous number of species, cultivars, and varieties that existed and of the difficulty in actually identifying an individual crabapple tree beyond the genus level.

In my ecology and identification of plants class, we used dichotomous keys to determine unknown plant specimens. I wondered whether a dichotomous key for the cultivars of *Malus* had been constructed; if not, I could create such a key to determine the *Malus* species to cultivars as my honors research project. Schmidt had not seen any such key, so he asked his colleague, Kris Bachtell, Director of Plant Collections at the Morton Arboretum in Lisle, IL whether a key existed. Bachtell knew about the work of John den Boer, who graciously sent me a copy of the IOCS Crabapple Encyclopedia (copyright 1988).

My research project began in January of this year, with the Crabapple Encyclopedia as the cornerstone and Schmidt as my project advisor. The main goal of my research is to identify 35 unknown crabapple trees, using ten known cultivars as controls. I am following the phenology of the plants through the 1996 growing season, recording the morphological characters required by the encyclopedia. To date, I have collected winter characteristics, young leaf characteristics, and flower characteristics.

This project will not only attempt to determine unknown cultivars, but will also test the utility of the computer program. Once the utility of the program has been determined and any final problems worked out within the system, the IOCS Crabapple Program will be available for distribution. Upon initial examination, the Crabapple Encyclopedia seems quite user-friendly; the program flows through a progression of screens containing the character choices.

I will test the strength of the program by its ability to determine known crabapples. The ten known hybrids, cultivars, and species are *Malus* 'Red Barron' (columnar), *M.* 'Centurion', *M. x zumi*, *M.* 'David', *M.* 'Adams', *M. floribunda*, *M.* 'Red Jade', *M.* 'Profusion', *M. sargentii*, and *M.* 'Mary Potter'. These known plants are immature trees that were planted on the campus in 1994. They were planted in groups of three, and these trees are labeled with in-ground stakes and nameplates. These are known plants that were labeled at the nursery prior to purchase, but I have viewed these names with some skepticism, for a labeling error may have occurred at some point. All of the crabapples that have been planted on campus are commercially available. As an additional test, Thomas Green, Urban Forestry Professor at Western Illinois University, will visit the campus this fall to verify independently or refute determinations of some of the knowns and unknowns.

The identification of some cultivars of the crabapples will be of great benefit for the Fell Arboretum, for after the cultivars are determined, other cultivars can be planted to increase the diversity on campus. Many of the specimens of various trees were labeled with nameplates last year, and, upon determination, some crabapple specimens could also be labeled, especially on the main quadrangle of the campus. A few years ago, a map of the trees was constructed, and a second edition of this map is being published. A similar "walking tour" map of the various crabapple cultivars could be made after identification is complete. Realistically, it may not be possible to narrow down each tree to one cultivar. The encyclopedia lists all cultivars that are matches for the characters entered and, in some cases, it may not be possible to limit the unknown to a single cultivar. If a single unknown can be narrowed down to two or three alternatives, however, this will still be beneficial information for the Fell Arboretum's collection record. Having a few possible cultivar names for one unknown will serve as an aid in the future selection of other cultivars with different characteristics.

I will continue collecting data throughout the summer and fall and, after fruit data have been collected, I will make a final analysis of each known and unknown, using the Crabapple Encyclopedia. I plan to submit another article next year (Spring 1997) upon completion of the project, presenting the final results and conclusions.

TREES FOR SMALL SPACES

Becke Davis

If there is anything more unsightly than overhead cables, it must be the sight of trees topped ruthlessly to fit below the cables, or even worse, with a big "V" carved out of their crowns. This can be avoided by planting trees whose ultimate height will remain lower than the cables. Likewise, trees for planting near walkways or doorways should be selected for their ultimate width as well as height.

The trick is always to select a tree that will fit the size restrictions, offer ornamental value in more than one season, thrive in the scorching summers and frigid winters of the Midwest, survive in alkaline and often heavy clay soil, and be as pest free and disease resistant as possible. Redbud, Washington hawthorns, Japanese tree lilacs, Tina and Sargent Crabapples are popular choices for a small space; a variety of other trees also fit the bill.

Roy Klehm of Klehm's Nursery in South Barrington, Illinois, highly recommends the crabapples introduced by the late Father Fiala, which were bred for disease resistance. *Malus* 'Satin Cloud' is a very compact tetraploid (possibly octoploid) tree form whose satiny white flowers boast a distinct cinnamon fragrance. *M.* 'Satin Cloud' is outstanding, agrees Jerry Garner, horticulturist and plant buyer for Mariani Landscape in Lake Bluff. He describes the fall color as a range of "yellow, orange, red, and rust" -- a coloration rare in crabapples. A dense, ball-shaped tree with slightly horizontal branching, *M.* 'Satin Cloud' has a probable mature height and width of about ten feet. Like most crabs, it prefers full sun.

Malus 'Amberina' was Father Fiala's personal favorite, and the Morton Arboretum in Lisle, Illinois recommends it for the Midwest. Pink buds open to profuse white flowers all up and down the stems, and the unusual amberine-red fruits persist through spring. Ultimate size is not known, but the habit is semi-dwarf and somewhat spreading.

Among the 40 crabapples recommended by the Morton Arboretum are cultivars selected by Klehm, and others including *M.* 'Liset', a horizontally branched crab 15 feet by 20 feet; *M.* 'Coral Cascade,' a compact weeping form; and *M.* 'Sentinel,' an upright spreader (up to 15 feet high and 10 feet wide) suitable for parkway planting if pruned.

Carl Dravis, nursery operations manager at Schroeder's Nursery in Grayslake, Illinois likes *M. 'Red Jewel'*, an upright oval crab reaching 15 feet high and wide. Disease resistant and white flowering, *M. 'Red Jewel'* is noted for its many bright red fruits that persist through spring. Roger Fick, owner of the Wilson Nursery Group in Hampshire/Ingleside, Illinois recommends a red-fruited *M. x zumi calocarpa* that doesn't have the coarsely branched irregular habit normally associated with that tree. Hybridized by Roy Clavey and introduced by the Morton Arboretum in the 1940's *M. x zumi calocarpa* has been the subject of some confusion in the trade. Fick describes his selection as smaller and finer growing than the yellow-fruited Zumi, with beautiful fall color "like a sugar maple."

Fick also rates the native northern blackhaw, *Viburnum prunifolium*, as "one of the very best all-round plants." Ultimately as large as 30 feet, the usual size of a mature blackhaw is about 15 feet high by 12 feet wide. Upright and not prone to heavy suckering, this hardy and hard-wooded shrub can also be trained as a compact tree. Creamy-white flowers bloom in late spring, followed by pinkish-white drupes that turn blue-black. The variable fall color ranges from bright red to wine, purple and bronze.

Garner likes the 'Winter King' hawthorn, *Crataegus viridis 'Winter King'*, which he recommends grafting at three inches on a four-foot standard. With pruning, the small shape can be maintained. He finds the bark very attractive and likes the effect of 'Winter King' pollarded against a dark building to show it off. A thorny tree with white flowers, red fruit, and purple to red fall color, 'Winter King' has a probable ultimate height and width of 30 feet. It is very hardy, tolerant of alkaline soil, and drought resistant.

Fick also recommends the cockspur hawthorn, *C. crus-galli*, finding that it "out performs most other intermediate ornamentals." While the thornless cockspur hawthorn, *C. crus-galli inermis*, would be better for planting near walks or where children will be present, it lacks the bronze, red, and purple fall color of the thorny cockspur hawthorn. The broad, low, horizontal branching gives this tree a distinctive appearance and all-season appeal; it reaches an ultimate height of 20-30 feet with a spread of 20-35 feet. The white flowers, which appear just as crabapples finish flowering, have a somewhat unpleasant scent. Cedar-hawthorn rust can attack the deep red fruit, but the foliage usually resists infection; it requires well drained soil.

Winged Euonymus, the popular shrub known as 'Burning Bush,' is probably most familiar in the cultivar *Euonymus alatus 'Compactus'* which grows to ten feet tall and nearly as wide. However, the species, *Euonymus alatus*, is both hardier and more ornamental, with its more pronounced corky bark. Reaching an ultimate height and spread of about 20 feet, winged euonymus is grown mainly for its clean foliage and

brilliant deep pink to red fall color. Adaptable from sun to full shade, not bothered by disease or insect pests, the only things to avoid are extremely wet and extremely dry soil.

The star magnolia, *Magnolia stellata*, is hardy to Zone 4 and rarely exceeds 20 feet in height and 15 in spread. The dark green foliage has ornamental value, even when the star-shaped white flowers are damaged by wind and late freezes. An excellent choice for courtyard plantings or sheltered locations near buildings, *M. 'Royal Star'* is the preferred cultivar. *M.x loebneri* cultivars *M. 'Merrill'* and *M. 'Leonard Messel'* are also hardy and popular, but usually larger.

Garner especially likes the 'Little Girl Hybrids' introduced by the US National Arboretum, resulting from crosses with the lily-flowered magnolia, *M. liliflora* and *M. stellata 'Rosea'*. Blooming slightly later than *M. stellata*, these hardy upright forms mature at 15-20 feet. *M. 'Susan'* features red-purple flowers, *M. 'Betty'* has deep purple-red flowers that are white inside; *M. 'Ann'* has deep purple-red flowers, a wide open form and an ultimate height and width of about 10 feet.

The native common witchhazel, *Hamamelis virginiana*, was recommended by both Klehm and Dravis for its ornamental qualities. The fragrant yellow flowers bloom in October or November, occasionally at the same time as the leaves take on their brilliant yellow fall color. Rarely more than 20 feet in height, with a slightly greater width, the open, irregular branches provide winter interest. *H. virginiana* is slow growing, but blooms when young, requiring full sun and adequate moisture; it makes a good alternative to the weeping willow when a smaller plant is needed.

The serviceberries are another popular group, although much confusion has resulted from its tendency to hybridize among related species and varieties. Dravis is pleased with the strain of *Amelanchier canadensis* being grown at Schroeder's, liking the form, which is upright when young and less arching than *A. x grandiflora*, as well as its uniform stems. Scab has not been a problem, although there was some defoliation due to the very wet spring in 1993. Fick also notes that when Wilson's evaluated plants for mildew resistance, *A. canadensis* performed very well.

Garner likes the Allegheny serviceberry, *A. laevis*, for its upright, narrow form. The edible blue-black fruits are popular with birds, and ornamental value is provided by its white spring flowers and orange-red fall color. He also recommends 'Forest Prince', a selection of the apple serviceberry, *A. x grandiflora*, introduced by Klehm's. It features white flowers over the length of the stem and orange-red fall color. Garner uses the cultivar 'Cumulus', reported to be a selection of *A. laevis* on a standard for use as a small tree. He uses the standards planted in a row in courtyards and also recommends using serviceberries as espalier plants.

Other possibilities might include the paperbark maple, *Acer griseum*, the Amur maple, *A. ginnala*, and the hedge maple, *A. campestre*, as well as the pagoda dogwood, *Cornus alternifolia*, the Chinese dogwood, *C. kousa chinensis*, (although there is some dispute as to whether "chinensis" is a valid designation) and the red buckeye, *Aesculus carnea* 'Briotti'. Harder to find selections might still be worth a try; the Korean pear, *Pyrus fauriei*, the Japanese snowbell, *Styrax japonicus*, the Carolina silverbell, *Halesia carolina*, white fringe-tree, *Chionanthus virginicus*, or the yellow-leaved black locust *Robinia pseudoacacia* 'Frisia.' Save the less hardy for protected sites, and choose disease-resistant cultivars whenever possible. Remember, the best trees can come in small packages.

This article originally appeared in the April 1994 issue of *The Landscape Contractor*.

ANOTHER NOMENCLATURE PROBLEM

It has been learned that a crabapple was registered in 1993 by Paul G. Olse of Roseberry Gardens under the name of *Malus* 'Royal Splendor.' The original Royal Splendor was bred by the late Father J. L. Fiala, who named it in 1976 and registered it in 1987.

CRABAPPLE BLOOM SEQUENCE AND LENGTH OF BLOOM PERIOD IN 1996

Jeffery K. Iles and Joanna S. Stookey
Iowa State University

Crabapples (*Malus spp.*), like many woody landscape plants, have relatively short flowering periods. If weather conditions are favorable during the spring bloom period (mild temperatures, moderate breezes, and little or no rainfall), the floral display on individual trees may be ornamentally effective for up to 10 days (Fiala, 1994). Unfortunately for midwesterners, high winds, frequent rainfall, and temperatures ranging from below freezing to 90°F often coincide with the first crabapple blossom. But by carefully selecting early-, mid-, and late-season flowering crabapples for the landscape, the threat of capricious spring weather ruining the entire floral display is reduced, and the long-awaited flowering period can be significantly extended.

Blossom times and/or bloom sequences have been reported for many crabapples (Den Boer, 1995; Warren, 1987). But, similar information is not available for a number of other crabapple taxa commonly used in today's landscapes. During the spring of 1996, crabapples planted at the Iowa State University Horticulture Research Station (lat. 42° 3' N) as part of the National Crabapple Evaluation Program, were evaluated for bloom sequence and length of ornamentally effective bloom period. Using the concept of a Blossom Time Index (BTI) developed by John H. den Boer, crabapples were assigned to four bloom period categories (very early season, early season, mid-season, and late season). The BTI's reported in Table 1 represent the average number of days to first flower after a reference crabapple has flowered. In this study, *Malus* 'Pink Spires' was the first crabapple to flower (5/9/96) and thus became the reference point for categorizing all other taxa. Days of Effective Bloom, also reported in Table 1, represent the average number of days from first open flower to 50% petal drop. In 1996, favorable weather conditions during the very early season in Iowa promoted extended flowering periods. This helps to explain the unusually high number of days of effective bloom for *M.* 'Dolgo', *M.* 'Pink Spires', and *M.* 'Selkirk'.

Data from a single season cannot provide the same detail that would result from a multi-year study. Still, information from our investigations during the spring of 1996 lays the foundation for future observations, and classifies, in some cases for the first time, relative blossom times for several new crabapple cultivars. Information about blossom times will be of particular interest to growers and retailers of crabapples as they plan future inventories, and to those who include crabapples in their landscape designs.

Table 1. Relative bloom sequence as indicated by a blossom time index (BTI) and days of ornamentally effective bloom for selected crabapple cultivars during spring 1996.

Taxa	BTI ^z	BTI ^y	Days of Effective Bloom ^x
VERY EARLY SEASON			
<i>M.</i> 'Dolgo' (Dolgo)	1.3 ^w	4.7 ⁽¹⁾	9.4
<i>M.</i> 'Pink Spires' (Pink Spires)	0.0	2.8	9.3
<i>M.</i> 'Selkirk' (Selkirk)	3.0	5.8	8.0
EARLY SEASON			
<i>M.</i> 'Adams' (Adams)	6.0	8.8	5.0
<i>M. x adstringens</i> 'Hopa' (Hopa)	4.0	5.9 ⁽¹⁾	6.0
<i>M. baccata jackii</i> (Jack)	4.7	7.8 ⁽¹⁾	5.3
<i>M.</i> 'Centurion' (Centurion)	5.0	7.8	6.0
<i>M. floribunda</i> (Japanese Flowering)	6.0	10.1 ⁽¹⁾	6.0
<i>M.</i> 'Indian Summer' (Indian Summer)	4.0	6.8	6.0
<i>M.</i> 'Louisa' (Louisa)	5.3	8.1	5.7
<i>M.</i> 'Morning Sun' (Morning Sun)	5.0	7.8	6.0
<i>M.</i> 'Ormiston Roy' (Ormiston Roy)	6.0	8.8	5.3
<i>M.</i> 'Professor Sprenger' (Professor Sprenger)	6.0	8.8	5.0
<i>M.</i> 'Ralph Shay' (Ralph Shay)	5.0	7.8	6.0
<i>M.</i> 'Red Barron' (Red Barron)	5.0	7.8	7.0
<i>M.</i> 'Red Jade' (Red Jade)	6.0	8.8	5.3
<i>M.</i> 'Red Splendor' (Red Splendor)	5.7	8.5	5.3
<i>M.</i> 'Sentinel' (Sentinel)	4.0	6.8	7.0
<i>M.</i> 'Silver Drift' (Silver Drift)	5.3	8.1	5.7
<i>M.</i> 'Thunderchild' (Thunderchild)	5.0	7.8	6.0
<i>M.</i> 'Weepeanzam' (Weeping Candied Apple)	5.7	8.5	5.3
<i>M.</i> 'White Angel' (White Angel)	6.0	8.8	6.3
MID-SEASON			
<i>M.</i> 'Bob White' (Bob White)	6.7	9.5	4.3
<i>M.</i> 'Canary' (Canary)	7.0	9.8	4.0
<i>M.</i> 'Cascole' (White Cascade ^(TM))	7.7	10.5	5.6
<i>M.</i> 'Chrishozam' (Christmas Holly ^(TM))	7.0	9.8	6.0
<i>M.</i> 'David' (David)	8.3	9.4 ⁽¹⁾	6.7
<i>M.</i> 'Donald Wyman' (Donald Wyman)	7.0	9.5 ⁽¹⁾	6.0
<i>M.</i> 'Henning' (Henning)	7.0	9.8	6.0
<i>M.</i> 'Huber' (Royal Fountain [®])	8.0	10.8	4.3
<i>M.</i> 'Indian Magic' (Indian Magic)	7.0	9.8	4.7
<i>M.</i> 'Jewelberry' (Jewelberry)	7.0	9.8	5.7
<i>M.</i> 'Jewelcole' (Red Jewel ^(TM))	8.0	10.8	4.0
<i>M.</i> 'Lanzam' (Lancelot)	8.0	10.8	6.7
<i>M.</i> 'Liset' (Liset)	8.0	10.8	7.0
<i>M.</i> 'Mary Potter' (Mary Potter)	8.0	10.8	6.0

Table 1 Cont.

Taxa	BTI ^z	BTI ^w	Days of Effective Bloom ^x
MID-SEASON Cont.			
<i>M.</i> 'Molazam' (Molten Lava [®])	7.0	9.8	5.0
<i>M.</i> 'Parsii' (Pink Princess ^(TM))	8.0	10.8	4.0
<i>M.</i> 'Pink Satin' (Pink Satin)	7.0	9.8	6.3
<i>M.</i> 'Prairifire' (Prairifire)	8.0	10.8	5.0
<i>M.</i> 'Profusion' (Profusion)	7.0	9.6 ⁽¹⁾	5.0
<i>M.</i> 'Robinson' (Robinson)	7.7	10.5	4.0
<i>M.</i> 'Ruby Luster' (Ruby Luster)	8.0	10.8	6.3
<i>M. sargentii</i> 'Candymint' (Candymint Sargent)	8.0	10.8	4.3
<i>M.</i> 'Sinai Fire' (Sinai Fire)	6.3	9.1	5.0
<i>M.</i> 'Snowdrift' (Snowdrift)	8.3	11.1	5.7
<i>M.</i> 'Strawberry Parfait' (Strawberry Parfait)	8.0	10.8	4.0
<i>M.</i> 'Sutyzam' (Sugar Tyme [®])	7.0	9.8	4.0
<i>M.</i> 'Velvetcole' (Velvet Pillar ^(TM))	8.3	11.1	6.0
<i>M.</i> 'Winter Gem' (Winter Gem)	7.0	9.8	4.0
<i>M. x zumi</i> var. <i>calocarpa</i> (Redbud)	8.0	10.8	5.0
LATE SEASON			
<i>M.</i> 'Adirondack' (Adirondack)	9.0	11.8	5.3
<i>M.</i> 'Camzam' (Camelot ^(TM))	8.7	11.5	5.0
<i>M.</i> 'Doubloons' (Doubloons)	9.0	11.8	6.0
<i>M.</i> 'Hargozam' (Harvest Gold ^(TM))	9.0	11.8	6.0
<i>M.</i> 'Prairie Maid' (Prairie Maid)	9.0	11.8	5.0
<i>M.</i> 'Schmidt Cutleaf' (Golden Raindrops ^(TM))	10.0	12.8	5.0
<i>M.</i> 'Silver Moon' (Silver Moon)	10.0	12.8	6.0

^z Blossom time index - number of days to first flower after the first crabapple blooms

M. 'Pink Spires' = 0.0).

^y This column of data was added by the Editor to present Blossom Time Indices that are equivalent to those presented in the literature cited below, which are based on the time of blossoming of *Malus mandshurica*, which is the first of all crabapples to bloom. Except where noted, the indices are based directly on the data presented by the authors. To develop those indices, the average value of the differences between those reported by the authors and those presented in the cited literature, where available, was added to the value reported by the authors. Where noted, the value shown is as presented in the cited literature.

^x Days from first open flower to 50% petal drop.

^w All values are means of three different trees randomized.

⁽¹⁾ These are the values reported in the cited literature.

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SPRING and WINTER WONDER... 'Bob White'

by Erik A. Draper and James A. Chatfield

The crabapple *Malus* 'Bob White' appears to be a well kept secret even among crabapple connoisseurs. Adding to the shroud of mystery is its unknown parentage and its origin as a chance seedling found in Massachusetts. Unfortunately, *M.* 'Bob White' has been ignored for a long time since its introduction by the Arnold Arboretum before 1876... and no, that is not a typographical error!

The pleasing growth habit is that of a very dense, yet uncluttered, broadly rounded crown with maximum tree height of 20 feet (6m) and width of 30 feet (9m). There is only one way to discover the nuances of its floral display... up close! The first offering of color in the spring comes as the prolific carmine-red buds appear. As the buds begin to swell and open the colors soften to reveal a touch of pink on the petals' edges. The single flower opens fully to show off the creamy-white interior. Now imagine all of these stages of bloom and color artfully sprinkled throughout a tree that appears overloaded with flowers. It is a magnificent sight to behold! There are some reports of alternate bearing so... the floral display goes from "Unbelievable" to... "Oh, that's nice!" In a blossom longevity study (3) by the authors *M.* 'Bob White' had good floral impact for about 13 days in Ohio in 1995.

M. 'Bob White' offers no special aesthetic appeal (2,5) during the summer doldrums and early fall months. However, mid-fall through late winter (Nov.-Feb.) is when this crabapple really eclipses many others. The extremely prolific fruit display starts with a light yellow-gold color and slowly evolves to a light orange-gold with each succeeding frost. As the colder weather creeps in the light orange-gold fruits change by deepening in color. With the coming of numerous deep freeze and thaw cycles, the deep orange-gold fruits give way to a final deep orange-rust brown color. The small 0.5 inch (1.2 cm) fruits cling unyieldingly on the tree until eaten by birds or removed by harsh winter elements. *M.* 'Bob White' delivers fabulous, knockout fruit colors four months of the season when there is little to no color left in the landscape.

Although equipped with few enticements to combat the summer blahs, it is worth noting that *M.* 'Bob White' is very resistant to all of the serious foliar diseases affecting crabapples. Somehow 'Bob White' has received an undeserved reputation as having serious apple scab problems. Michael Dirr, in his "Manual of Woody Landscape Plants" (8) states that *M.* 'Bob White' is very susceptible to scab, and many other descriptions of crabapples include the statement "some scab problems". However, Den Boer (1) reported over 30 years of observations and concluded *M.* 'Bob White' to be highly resistant to apple scab. Elton Smith in his observations (7) indicates *M.*

'Bob White' to be highly resistant to apple scab. The authors' studies (3,6) also indicate this crabapple to be resistant to apple scab and other diseases. Don't hesitate to "go against the tide" and plant this tree in your collection... you won't regret it at all. In fact, you just might become the talk of the town.

There have been reports that *M.* 'Bob White' is hard to find in the trade. In Ohio, for example, it can be found at The Siebenthaler Co. in Dayton and Wade & Gatton Nurseries in Bellville, and in Indiana at Simpson's Nursery Co. in Vincennes. Don't become discouraged and give up if you ask for *M.* 'Bob White' and all you get is "Who is he?". Keep looking because it is well worth all of the extra effort for this outstanding crabapple. Take a tip from us and you'll find there are some secrets that you just have to tell... everybody.

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DESCRIPTION OF BOB WHITE CRABAPPLE

John H. den Boer

TRADE NAME: Bob White Crabapple
TAXON: *Malus* 'Bob White'
SYNONYM: *Malus floribunda* Sieb. ex Van Houtte 'Bob White'

YEAR OF ORIGINATION: Before 1876
PARENTAGE: Chance seedling of unknown parentage, perhaps *M. x zumi*

PLOIDY LEVEL: Diploid
TYPE: Single flower
COLOR OF BUD: Rose
Red
COLOR OF BALLOON: Pale pink to white
Rose
Red
COLOR OF FLOWER: White
Pale pink to white
Pink to white
FADING OF FLOWER: Fades to white
FRINGE COLORED?: No
PETAL SHAPE: Flat or slightly undulate
SHAPE OF PETAL BASE: Attenuate to cuneate
Attenuate to rounded
SHAPE OF PETAL APEX: Rounded
PETAL POSITION: Separated from each other
Slightly overlapping
ANTHER COLOR BEFORE ANTHESIS: Light yellow
Yellow
ANTHER COLOR AFTER ANTHESIS: Yellow
Yellow to brown
STYLE LENGTH BEFORE ANTHESIS: Style same length as stamen
STYLE LENGTH AFTER ANTHESIS: Style longer than stamen
STYLE COLOR: Greenish
STYLE BASE PUBESCENCE: Style base villous
Style base heavily villous

PEDICEL COLOR - FLOWER: Green
Bronze
PEDICEL STIFFNESS: Flexible pedicel
PEDICEL PUBESCENCE: Slightly pubescent
FILAMENT COLOR: White
Greenish
OVARY COLOR: Green
Purplish
CALYX COLOR: Green
Red
Purple
CALYX PUBESCENCE - INSIDE: Heavily pubescent
Faintly villous
Villous
CALYX PUBESCENCE - OUTSIDE: Glabrous
Faintly pubescent
CALYX LOBE SHAPE: Lobe slightly recurved
Lobe recurved
CALYX TUBE CONSTRICTION: Constricted above ovary
HYPANTHIUM PUBESCENCE: Hypanthium pubescent
INFLORESCENCE POSITION: Separated
INFLORESCENCE FORM: Umbellate
BLOSSOM TIME - RANGE: Medium
FRAGRANCE OF FLOWER: Slight fragrance
Moderate fragrance
COLOR - IMMATURE FRUIT: Green
RIPE FRUIT COLOR - SHADED SIDE: Yellow
Light yellow
Yellowish-green
RIPE FRUIT COLOR - SUNNY SIDE: Orange-red
Yellow
Light yellow
Yellowish-green
POST FROST COLOR: Orange-red
Orange
Orange-yellow
BLUSH INTENSITY: Slight blush
Obvious blush
BLOOM INTENSITY: Negligible
Slight
BLOOM COLOR: White

LENTICEL INTENSITY: Faintly visible
 Prominently visible
 LENTICEL QUANTITY: Few
 Numerous
 LENTICEL SIZE: Small
 LENTICEL DISTRIBUTION: Unevenly distributed
 Evenly distributed
 LENTICEL COLOR: Yellowish
 Russet
 LUSTER: Dull
 Glossy
 WAX ON FRUIT: Fruit not waxy
 FLESH COLOR - BODY OF FRUIT: Pale yellow
 Yellow
 Peach or pale orange
 FLESH COLOR - NEAR SKIN: Pale yellow
 Peach or pale orange
 Light red to red
 CORE-LINE INTENSITY: Faintly visible
 Prominently visible
 CORE-LINE COLOR: White
 Pale yellow
 Yellow
 Orange
 SEED COLOR BEFORE MATURITY: White
 SEED COLOR AFTER MATURITY: Light brown
 Dark brown
 Brown
 CALYX PERSISTENCE: Deciduous most of the time
 Calyx deciduous
 PERCENT OF FRUIT WITH CALYX: 1-9%
 CALYX DEPRESSION: Shallow
 Moderate
 PROTUBERANCE AT CALYX? No
 PEDICEL COLOR - FRUIT: Yellowish-green
 Green
 Light red
 Red
 Light purple
 Brown
 PEDICEL SWELLING AT BASE? No

FRUIT SHAPE - LONGITUDINAL: Ovoid
 Globose
 Oblate
 FRUIT SHAPE - TRANSVERSE: Slightly ribbed or angular
 Ribbed or angular
 FRUIT PERSISTENCE ON TREE: Drops in spring
 COLOR - YOUNG LEAVES: Green
 COLOR - MATURE LEAVES: Green
 Light-green
 LEAF SHAPE: Oval
 Elliptical
 Lanceolate
 Ovate
 Deltoid
 LEAF MARGIN: Crenate
 Serrate
 LEAF BASE SHAPE: Acute
 Inequilateral
 Rounded
 Cordate
 LEAF APEX SHAPE: Acute
 Acuminate
 PUBESCENCE - TOP SURFACE - YOUNG: Slightly pubescent
 PUBESCENCE - BOTTOM SURFACE - YOUNG: Glabrous
 PUBESCENCE - TOP SURFACE - MATURE: Glabrous
 Slightly pubescent
 PUBESCENCE - BOTTOM SURFACE: Glabrous
 Slightly pubescent
 Moderately pubescent
 LOBES - VIGOROUS SHOOTS: Sometime lobed
 Not lobed
 % LEAVES (MATURE) LOBED: 0%
 1-9%
 LOBES - MATURE SHOOTS: Slightly lobed
 Sometime lobed
 Not lobed
 % LEAVES (MATURE) LOBED: 0%
 10-19%
 PETIOLE PUBESCENCE: Petiole glabrous
 Petiole pubescent
 TREE SHAPE - YOUNG: Round

TREE SHAPE - MATURE: Spreading
 Round
 CAMBIUM COLOR: Green
 BRANCHING TEXTURE: Coarsely branched
 BRANCHING HABIT: Dense
 Horizontal
 Upward
 THORN-LIKE SPURS: Spurs absent
 GENERAL TREE SIZE: Medium (15 to 25 ft.)
 MATURE TREE HEIGHT: 20.0 feet
 MATURE TREE WIDTH: 25.0 feet

MEASUREMENTS

(Dimensions in centimeters)

Characteristics	Average	Standard Deviation	Number of Measurements
NUMBER OF FLOWER PETALS:	5.033	0.177	30
FLOWER DIAMETER:	2.815	0.192	23
PETAL LENGTH:	1.620	0.103	10
PETAL WIDTH:	0.775	0.010	14
PEDICEL LENGTH:	2.382	0.404	28
SEPAL LENGTH:	0.432	0.062	28
SEPAL WIDTH:	0.209	0.019	28
OVARY DIAMETER:	0.242	0.024	28
HYPANTHIUM LENGTH:	0.417	0.048	28
HYPANTHIUM DIAMETER:	0.290	0.033	28
NUMBER OF STAMENS:	17.600	1.899	50
NUMBER OF STYLES:	4.125	0.771	40
INFLORESCENCE NUMBER:	4.967	1.282	30
FRUIT DIAMETER:	1.093	0.141	150
FRUIT LENGTH:	0.932	0.102	137
RATIO - FRUIT LENGTH/DIA.:	0.854	0.051	131
PEDICEL LENGTH OF FRUIT:	2.557	0.585	138
CALYX SCAR DIAMETER:	0.340	0.083	137
LEAF LENGTH:	7.940	0.987	80
LEAF WIDTH:	3.915	0.651	80
RATIO - LEAF BALDE/WIDTH:	1.567	0.251	80
PETIOLE LENGTH:	1.898	0.300	80
STIPULE LENGTH:	0.667	0.322	30

NUMBER OF REPORTED DISEASE
 AND AESTHETIC RATINGS
 FALL EVALUATIONS - UP TO 1995

TRADE NAME: Bob White Crabapple
 TAXON: *Malus* 'Bob White'

NUMBER OF OCCURENCES FOR ZONE LOCATION ⁽¹⁾

Evaluation Criteria	Rate Value	P/8	M/5	M/8	C/4	C/5	C/7	E/5	E/6	E/7
SCAB	0	12	9	2	12	106	2	166	63	29
	1	9	0	2	0	2	1	5	0	5
	2	0	0	0	8	0	1	0	0	4
	3	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0	0
FIRE BLIGHT	0	21	5	4	20	108	4	157	62	35
	1	0	3	0	0	0	0	0	1	2
	2	0	1	0	0	0	0	7	0	0
	3	0	0	0	0	0	0	7	0	0
	4	0	0	0	0	0	0	0	0	1
	5	0	0	0	0	0	0	0	0	0
CEDAR/APPLE RUST	0	21	9	4	20	108	4	169	63	38
	1	0	0	0	0	0	0	2	0	0
	2	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	1
POWDERY MILDEW	0	21	9	4	20	108	4	171	63	38
	1	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0

NUMBER OF OCCURENCES FOR ZONE LOCATION⁽¹⁾ Cont.

Evaluation Criteria	Rate									
	Value	P/8	M/5	M/8	C/4	C/5	C/7	E/5	E/6	E/7
FROGEYE LEAF SPOT										
	0	19	9	4	20	104	4	169	56	37
	1	0	0	0	0	4	0	2	4	0
	2	1	0	0	0	0	0	0	3	1
	3	1	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0
AESTHETIC										
	0	3	0	0	0	3	0	3	1	0
	1	8	2	1	10	16	2	32	14	10
	2	0	7	3	4	18	0	12	5	16
	3	1	0	0	0	1	2	1	1	5
	4	0	0	0	0	0	0	0	0	1
	5	0	0	0	0	0	0	0	0	0

⁽¹⁾ Rating values and definitions of Zone Locations are described in detail in the Fall 1995 issue (Vol. 9 No. 2) of MALUS. In essence, the "P" represents the Pacific Time Zone, "M", the Mountain Time Zone, "C", the Central Time Zone, and "E", the Eastern Time Zone. The numeral following the letter in the Zone Location represents the USDA Hardiness Zone number. The ratings vary from 0 to 4 or 5, representing the best to the worst conditions.

ORNAMENTAL CRABAPPLES - FOR THE BIRDS

Michael Yanny

Ornamental crabapple trees have long been known to be attractive to birds. Some cultivars, or varieties, seem to be more desirable than others. Those preferred the most should be given our attention.

Crabapples of marble size seem to be rather attractive to birds. Those that are closer to pea-sized seem to be top choice. The larger fruited cultivars, for the most part, are ignored by birds and most often drop, littering the ground beneath the trees. These may be attractive to deer and small animals

The time when crabapple fruit becomes palatable to birds seems to be after it changes from a hard marble-like state to a softened condition when it can easily be squashed between the thumb and index finger. The fruit has an apple sauce consistency inside. The birds relish the small fruit in this softened condition.

Flocks of cedar waxwings move through our nursery in the fall, winter, and early spring, eating primarily crabapple fruit. They can be seen in groups of up to 100 individuals cleaning blocks of trees. It is quite a sight! Robins are also frequent visitors, particularly in fall and spring.

The most common time for fruit softening and the corresponding bird feeding frenzy is in the fall after a few hard frosts. At this time some of the most attractive species and cultivars are: *M. floribunda*, *M. 'Snowdrift'*, *M. 'White Cascade'*, *M. sargentii*, and *M. buccata 'Jacki'*.

Another group of ornamental crabapples trees also begins softening after a few hard frosts, but usually at a slower rate. Those trees can supply bird food in the Milwaukee, Wisconsin area later into the season, typically into early winter. Some of the best of these cultivars are as follows: *M. 'Indian Magic'*, *M. 'Red Splendor'*, *M. x zumi calocarpa*, *M. 'Profusion'*, and *M. 'Anne E'*.

A very important group of crabapples for birds are those that remain firm for most of the winter and don't soften until late winter to early spring. Many of these trees have handsome cider-colored, or red, fruit that adds interest to the winter landscape. The fruits of these cultivars often become fermented with the freezing and thawing that occurs in our area. The tree becomes an arbored tavern, with each fruit providing a

shot of apple-jack for the avian revelers. (Is this the source of the term "Drunk as a Jay Bird"? Ed.) The birds are most fun to watch at this time of year. Some of the best trees for late winter feeding are: *M.* 'Bob White', *M.* 'Golf Course', *M.* 'Winter Gem', and *M.* 'Silver Drift'.

A few ornamental crabapples have small, beautifully colored, winter fruit but remain hard and are not taken by birds. The fruits of *M.* 'Red Jewel' fruits from the previous season can often be seen on flowering plants in the spring. It often falls off the tree uneaten after flowering. *M.* 'Donald Wyman' has also been observed with fruit on it while in flower though it will be taken if bird food is scarce. *M.* 'Adams', and *M.* 'White Angel' seem never to soften or drop their fruit, forming mummies that are often times present for two seasons.

Two of the very finest ornamental crabapples for birds are *M.* 'Birdland' and *M.* 'Orniston Roy'. What makes these trees fine is the steady supply of food they provide for the birds from mid-autumn to late winter. These two cultivars have a continual period of fruit softening from fall through winter. They act as self-filling bird feeders.

Following are several lists of ornamental crabapples — crabapples for the birds!

Ornamental Crabapples trees for attracting birds at different seasons in Southeast Wisconsin:

<u>Mid to Late Fall</u>	<u>Late Fall to Early Winter</u>	<u>Late Winter to Early Spring</u>
<i>M.</i> 'Autumn Glory'	<i>M.</i> Anne E'	<i>M.</i> 'Adirondack'
<i>M.</i> <i>baccata</i> <i>jackii</i>	<i>M.</i> <i>baccata</i> 'Walters'	<i>M.</i> 'Amberina'
<i>M.</i> 'Blanche Ames'	<i>M.</i> 'Jewelberry'	<i>M.</i> 'Bob White'
<i>M.</i> 'Canary'	<i>M.</i> 'Mary Potter'	<i>M.</i> 'Golf Course'
<i>M.</i> 'Christmas Holly'	<i>M.</i> 'Pink Spires'	<i>M.</i> 'Harvest Gold'
<i>M.</i> <i>floribunda</i>	<i>M.</i> 'Profusion'	<i>M.</i> 'Indian Magic'
<i>M.</i> 'Louisa'	<i>M.</i> 'Red Splendor'	<i>M.</i> 'Prairifire'
<i>M.</i> 'Mary Potter'	<i>M.</i> \times <i>zumi calocarpa</i>	<i>M.</i> 'Winter Gem'
<i>M.</i> 'Molten Lava'		<i>M.</i> 'Winter Gold'
<i>M.</i> 'Prairie Maid'		
<i>M.</i> 'Red Swan'		
<i>M.</i> <i>sargentii</i>		
<i>M.</i> 'Silver Moon'		
<i>M.</i> 'Snowdrift'		
<i>M.</i> 'White Cascade'		

ABOUT CRABAPPLES

The following articles have been published recently that are about crabapples or include information about them:

"Aesthetic Evaluation of Crabapples at Secrest Arboretum in Wooster, Ohio: 1994-1995"

by James A. Chatfield, Erik A. Draper, Kenneth C. Cochran, Peter W. Bristol, and Charles E. Tubesing
Ornamental Plants, Annual Reports and Research Summaries, Special Circular 152, January 1996, Ohio Agriculture Research and Development Center, Wooster, Ohio

Forty-five crabapples were evaluated in replicate on 14 occasions from October 1994 through September 14, 1995.

"Emergence, Longevity, and Aesthetic Evaluations of Flower in Ornamental Crabapples at Secrest Arboretum in Wooster, Ohio: 1995"

by: Erik A. Draper, James A. Chatfield, and Kenneth C. Cochran
Ornamental Plants, Annual Reports and Research Summaries, Special Circular 152, January 1996, Ohio Agriculture Research and Development Center, Wooster, Ohio

Forty-six ornamental crabapple selections were evaluated for timing and duration of bloom. These selections were also appraised three times during the bloom period for aesthetic qualities of blossoms and addition to other factors that either enhanced or detracted from bloom.

"Landscape Ornamental Disease Problems in Ohio: 1995"

by: James A. Chatfield, Nancy Taylor, Randall H Zondag, Mary Ann Rose, Gary Yu Gao, Daniel R. Balsler, and David J. Shetlar
Ornamental Plants, Annual Reports and Research Summaries, Special Circular 152, January 1996, Ohio Agriculture Research and Development Center, Wooster, Ohio

A compilation is presented of noteworthy disease problems affecting landscape ornamental plants in Ohio during the 1995 season.

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- The Ornamental Crabapple: A Tree with an Image Problem Winter 1990 Vol. 4 No. 2
 Comprehensive Aesthetic Evaluations of Crabapples in Ohio: 1993 - 1995 Spring 1996 Vol. 10 No. 1
 Evaluating Crabapples for Aesthetic Qualities Winter 1985 Vol. 1 No. 2

Arboreta & Botanical Gardens, etc.

- Arie den Boer Arboretum Spring 1994 Vol. 8 No. 1
 Boerner Crabapple Collection, The Crabapples at Hollyhedge Nursery, Farmingdale, NJ Winter 1988 Vol. 3 No. 1
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- Flowering Crabapples - The Genus Malus Spring 1995 Vol. 9 No. 1

Crabapples

- Fiala Ornamental Crabapples, The Flowering Crabapples Spring 1996 Vol. 10 No. 1
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 Identifying Crabapple Trees Fall 1996 Vol. 10 No. 2
M. 'Adirondack' (Malus 'Adirondack') Spring 1994 Vol. 8 No. 1
M. 'Allegheny' (The Allegheny Crabapple) Winter 1988 Vol. 3 No. 1
M. angustifolia (Malus obscurus) Fall 1989 Vol. 4 No. 1
M. 'Anne E' (Malus 'Anne E') Spring 1993 Vol. 7 No. 1
M. 'Blanche Ames' (The Shy Yet Elegant Crabapple - Blanche Ames) Fall 1992 Vol. 6 No. 2
M. 'Bob White' (Spring and Winter Wonder... 'Bob White') Fall 1996 Vol. 10 No. 2
M. 'Cornell' (Another Crabapple You Should Know) Spring 1993 Vol. 7 No. 1
M. 'Cornell' (Cornell Crabapple - Descriptive Information) Spring 1993 Vol. 7 No. 1
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M. 'Kelsey' (Kelsey Crabapple) Summer 1992 Vol. 6 No. 1
M. 'Louisa' (Crabs You Should Know) Winter 1988 Vol. 3 No. 1

Crabapples Cont.

<i>M.</i> 'Madonna' (Crabs You Should Know)	Fall 1988	Vol. 3 No. 2
<i>M.</i> 'Narragansett' (A Perfect Crab)	Winter 1988	Vol. 3 No. 1
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<i>M.</i> 'Professor Sprenger' (Crabs You Should Know)	Winter 1990	Vol. 4 No. 2
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<i>M.</i> <i>sylvestris</i> (Malus obscurus)	Fall 1990	Vol. 4 No. 3
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Front Cover Photo: Malus 'Bob White'
James A. Chatfield