



Malus

International Ornamental
Crabapple Society

Winter, 2001

Volume 15, No. 2



The NCEP test plot at the Secret Arboretum was the site of this fall's 2001 Crab Odyssey. (Photo by James Chatfield)



Sara Chatfield examines *Malus* Brandywine[®] (Photo by James Chatfield)

Malus

International Ornamental Crabapple Society Bulletin

Winter, 2001
Volume 15, No. 2

Malus is the official publication of the International Ornamental Crabapple Society and is published twice annually. The Society is a non-profit organization.

You are invited to join our Society. Please address all membership and other inquiries to the IOCS office:

International Ornamental Crabapple Society
c/o David Allen
The Holden Arboretum
9500 Sperry Road
Kirtland, OH 44094

www.malus.net

2001 Annual Membership Fees

• Individual	\$20.00
• Commercial/Corp.	\$20.00
• Organization	\$20.00
• Student	\$10.00
• Sponsorship	\$200.00
• Individual Life	\$250.00

If you are moving, please notify the IOCS office, so you may continue to receive your issues of *Malus*.

Manuscripts and other editorial matters pertaining to *Malus* should be mailed to the editor:

International Ornamental Crabapple Society
c/o David Guthery, Editor
Johnson's Nursery, Inc.
W180 N6275 Marcy Road
Menomonee Falls, WI 53051

Contents

- President's Corner
by Jim A. Chatfield
- Fight Crabapple Fireblight with Fireblight Resistance
by Glen R. Stanosz, Ph.D. and Patricia S. McManus, Ph.D.
- Apple Scab at Secret Arboretum in Wooster, Ohio: 2001
by Erik A. Draper, James A. Chatfield, Daniel A. Herms and Kenneth D. Cochran
- Evaluation of Crabapples for Apple Scab at the Secret Arboretum in Wooster, Ohio; 2000
by James A. Chatfield, Erik A. Draper, Kenneth D. Cochran and Daniel A. Herms

Front Cover Photo: The neon purple fruits of *Malus* 'Dolgo' at the Secret Arboretum. Dolgo crabapple has been a great performer for apple scab resistance as well. (Photo by James Chatfield)

Rear Cover Photos:

(Top left) Fireblight canker (Photo by Glen Stanosz)

(Top right) Sara Chatfield alongside *Malus* 'Adirondack' in the NCEP plot at the Secret Arboretum. (Photo by James Chatfield)

(Bottom) A new introduction from Johnson's Nursery, Inc., *Malus sargentii* Firebird[™] begins to color its fruit in late August. (Photo by David Guthery)

President's Corner

It was the best of crabs, it was the worst of crabs. Charles Dickens might have said that about the 2001 season - at least for the Midwestern U.S. It was an outstanding season for fruit show, with abundant, high quality fruits making October and November displays among the best in a decade. On the other hand, warm wet weather during bloom in Spring were the perfect conditions for infections of flowers by fireblight bacteria.

This brought the worst fireblight by far in a decade, at least at Ohio State University's Secrest Arboretum in Wooster, Ohio. This good and bad were both topics of display and conversation at *2001: A Crab Odyssey*, the IOCS seminar in Wooster in October. There were also a number of outstanding presentations, including a terrifically toothsome tasting of Dolgo Butter by master chef Mike Lee of Bailey Nurseries.

One of the features of the meetings was a four hour Aesthetics rating of the National Crabapple Evaluation Plot at Secrest's Crablandia by the IOCS Board members. One of the best suggestions to come out of the event was to make this joint evaluation a regular component of each year's IOCS summer/fall seminar. For 2002 that seminar is scheduled for one of the country's highest rated amenity of life locations - the twin cities of Minnesota (date and precise location to be announced).

Join us this summer to share in the merits and magic of *Malus*, the care and conversations of crabapples, and perhaps, just perhaps, some new verses to the *Crabapple Song*, a veritable pome to *Malus*. The song premiered this past Crabtoberfest, penned from the strange and febrile minds of Iowa State's malologist James Romer and yours truly, to the tune of *The Garden Song*. Here it goes:

*Buds spring forth, ready set go
Spring's answer to winter's snow
Nature's greatest flower show
The season blooms anew.*

*Beetles, mildew rust and blight
Boy, those scab dogs really bite
Suckers born every minute - right
Sometimes crabs they are no fun.*

*So leaves go, then fruits appear
Fruit first fall fest is in gear
Winter comes but have no fear
Malus reigns throughout the year.*

Jim Chatfield
President, IOCS

Fight Crabapple Fireblight with Fireblight Resistance

by Glen R. Stanosz^{1,2}, Ph.D., and Patricia S. McManus¹, Ph.D.

Departments of ¹Plant Pathology and ²Forest Ecology and Management,
University of Wisconsin-Madison

One of the most frequent and widespread diseases of woody rosaceous plants is fireblight. Among the landscape trees and shrubs in the rose family, some varieties of ornamental crabapples can be very severely affected. Disease results in temporary disfigurement and longer-term deterioration of tree health. Although a number of practices can be employed to reduce the impact of fireblight to ornamental crabapple trees, *success in the fight against fireblight begins with selection of taxa with proven fireblight resistance.*

Fireblight is caused by the plant pathogenic bacterium *Erwinia amylovora*, which overwinters in cankers on branches and twigs that were colonized during the previous growing season. Sticky bacterial ooze, produced from these cankers in spring, can be splashed by rain or carried by animals (especially insects, birds, and humans). After arriving on healthy plants, bacteria multiply and infect blossoms, new shoots, and fresh wounds. "Blight" symptoms result from death of young shoots in late spring and early summer, on which foliage turns brown and droops downward as though "scorched" by fire. Larger branches and main stems can be affected by sunken "cankers" characterized by darkly discolored bark over purple-brown stained sapwood. Early in the growing season, margins of fireblight cankers can be indistinct, but these become sharper by late summer. *Erwinia amylovora* is just one cause of blight and canker symptoms, however, so diagnosis may require submission of a specimen to your university or state plant disease clinic.

A variety of cultural practices can help reduce the impact of fireblight and increase the longevity of crabapples that already are established in the landscape. Overhead irrigation or sprinkling that wets foliage and branches should be avoided. Thinning or pruning trees in dense plantings will decrease spread by rainsplash and reduce infection by facilitating air movement and drying. Existing cankers should be removed by pruning affected branches at least 12 inches below the canker margin.

Suckers (watersprouts) are highly susceptible and also should be removed. This should be done during dry weather (e.g., late winter) and tools must be sanitized after each cut to avoid reinoculating the tree in the process. Excessive nitrogen fertilization, which stimulates succulent and highly susceptible tissue, must be avoided. Other factors such as mulching and maintaining soil pH in the range of 6 to 6.5 will help improve the general health of crabapple trees. Management of fireblight by use of chemicals in the landscape has been unreliable, and is not recommended.

Much of the damage from fireblight (and the need for cultural management of this disease) can be reduced merely by choosing resistant crabapple taxa for landscape plantings. Anecdotal observations and comparative university trials reported in a variety of sources have provided information on the relative resistance or susceptibility of cultivars (Table 1, below). The large number of resistant taxa with various horticultural characteristics allows use of fireblight resistant crabapples in any landscape situation. Of course, to ensure an appropriate selection, other plant characteristics (including blossom and fruit color and retention, hardiness, size, form, and resistance to other pests) and characteristics of the particular planting site must be carefully considered.

(Mention of particular plant taxon or other materials do not constitute endorsement. Always read pesticide labels and apply in accordance with label directions.)

Copyright © 2001 by Glen R. Stanosz and Patricia S. McManus. All Rights Reserved.

Examples of crabapple cultivars and their reported relative resistance or susceptibility to fireblight (from various sources).

Resistant to moderately resistant

<i>M.</i> 'Adams' *	<i>M.</i> Pink Princess™
<i>M.</i> 'Ames White' *	<i>M.</i> 'Pink Spires'
<i>M.</i> 'Autumn Glory' *	<i>M.</i> 'Profusion'
<i>M.</i> 'Baskatong'	<i>M.</i> 'Radiant'
<i>M.</i> 'Bob White'	<i>M.</i> 'Red Snow' *
<i>M.</i> 'Centennial' *	<i>M.</i> 'Red Splendor'
<i>M.</i> Centurion® *	<i>M.</i> 'Red Vein'
<i>M.</i> 'Coralburst'	<i>M.</i> 'Russian R.M.J. 102' *
<i>M.</i> 'Coral Cascade' *	<i>M.</i> <i>sargentii</i> *

Examples of crabapple cultivars and their reported relative resistance or susceptibility to fireblight (from various sources).

Resistant to moderately resistant

<i>M.</i> 'David'	<i>M.</i> 'Mount Arbor Special' *
<i>M.</i> 'Donald Wyman'	<i>M.</i> 'Simpson' *
<i>M.</i> 'Eleya Golden Gem' *	<i>M.</i> 'Spring Snow'
<i>M.</i> 'Gibbs Golden Gage' *	<i>M.</i> 'Strawberry Parfait'
<i>M.</i> Harvest Gold® *	<i>M.</i> 'Thunderchild'
<i>M.</i> 'Henningi'*	<i>M.</i> 'Vanguard'
<i>M.</i> 'Indian Summer'	<i>M.</i> Velvet Pillar™
<i>M.</i> 'Jewelberry'	<i>M.</i> Weis*
<i>M.</i> 'Liset' *	<i>M.</i> 'White Angel' ('Inglis')
<i>M.</i> 'Louisa'	<i>M.</i> 'White Cascade'
<i>M.</i> Molten Lava® *	<i>M.</i> x <i>zumi</i> var. <i>calocarpa</i> *

Slightly to moderately susceptible

<i>M.</i> Brandywine®	<i>M.</i> 'Selkirk'
<i>M.</i> 'Dolgo'	<i>M.</i> 'Snow Cloud'
<i>M.</i> 'Hopa'	<i>M.</i> Spring Snow'
<i>M.</i> <i>hupehensis</i>	<i>M.</i> Sugar Tyme®
<i>M.</i> 'Kelsey'	<i>M.</i> Weeping Candied Apple®
<i>M.</i> Red Jewel®	<i>M.</i> 'White Candle'
<i>M.</i> 'Red Splendor'	<i>M.</i> 'Winter Gold'

Highly susceptible

<i>M.</i> <i>baccata</i> var. <i>mandshurica</i>	<i>M.</i> 'Red Jade'
<i>M.</i> 'Doubloons'	<i>M.</i> 'Royalty'
<i>M.</i> 'Hyslop'	<i>M.</i> 'Sentinel'
<i>M.</i> 'Indian Magic'	<i>M.</i> 'Silver Moon'
<i>M.</i> <i>ioensis</i> 'Plena'	<i>M.</i> 'Sinai Fire'
<i>M.</i> 'Mary Potter'	<i>M.</i> 'Snowdrift'
<i>M.</i> 'Old Hope'	<i>M.</i> 'Strathmore'
<i>M.</i> 'Ormiston Roy'	<i>M.</i> 'Transcendent'
<i>M.</i> 'Prairifire'	<i>M.</i> <i>transitoria</i> Golden Raindrops®
<i>M.</i> 'Purple Prince'	<i>M.</i> 'Van Eseltine'
<i>M.</i> 'Red Barron'	

* Cultivars marked with an asterisk also have been reported to be resistant to scab, cedar-apple rust, powdery mildew and frog-eye leafspot diseases.

Apple Scab on Crabapple at Secrest Arboretum in Wooster, Ohio: 2001

by Erik A. Draper, James A. Chatfield, Daniel A. Herms and Kenneth D. Cochran
Ohio State University

Sixty three crabapple taxa, planted in 1997-1998 at the Secrest Arboretum of OARDC (Wooster, Ohio) in a completely randomized design were rated for apple scab disease as part of the National Crabapple Evaluation Program. There were five replicate plants for each taxa with the exception of *M. Brandywine*[®], *M. 'Canary'*, *M. 'Dolgo'*, *M. 'Indian Magic'*, *M. King Arthur*[®] and *M. 'Royal Scepter'*, for which there were four replicates, and *M. Hamlet*[®], for which there were three. Plants were mulched with composted yard waste and irrigated as needed during the year of transplanting. Weeds were controlled with spot applications of glyphosate. On 13 June, 9 July, 2 August, and 19 September 2001, all trees were rated on a scale of 0-5, with 0 = no scab observed; 1 = less than 5% of leaves affected and no aesthetic impact; 2 = 5-20% of leaves affected, with some yellowing but little or no defoliation, moderate aesthetic impact; 3 = 20-50% of leaves affected, significant defoliation and/or leaf yellowing, substantial aesthetic impact; 4 = 50-80% of leaves affected, severe foliar discoloration and defoliation, severe aesthetic impact; and 5 = 80-100% of foliage affected, with 90-100% defoliation.

Scab pressure was high at Secrest Arboretum in 2001. Yet, even under this considerable disease pressure, 20 of the 63 taxa showed no evidence of apple scab in 2001 and a total of 30 never received a rating that exceeded 1 (no aesthetic impact) on any evaluation date. Until the past two years of heavy scab, *M. 'Prairifire'* had never before exhibited scab in our trials at Secrest (conducted for over two decades) but did have some lesions in both 2000 and 2001, though incidence was minor. This raises the possibility that *M. 'Prairifire'* is being infected by a race of the apple scab pathogen, *Venturia inaequalis*, that was not present in the plot until recent years. Twenty-one taxa received a rating of 3 or higher on at least one date in 2001, indicating substantial defoliation and aesthetic impact. Fireblight was also severe at Secrest in 2001, worse than in the previous

eight years of evaluations there, especially on *M. 'Sinai Fire'*, *M. transitoria* Golden Raindrops[®], *M. Foxfire*[™] and *M. 'Silver Moon'*. This was presumably due to the unusually warm, wet weather during bloom of many crabapples in Wooster this year.

Apple Scab Ratings for Crabapple Selections at Secrest Arboretum in 2001.

Crabapple Taxon	Sept. 19	Aug. 2	July 9	June 13
<i>M. 'Adams'</i>	3.00kl	3.00gh	2.60ijk	2.60g
<i>M. 'Adirondack'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. American Masterpiece</i> [®]	4.80q	3.60ij	3.00l	2.00f
<i>M. American Salute</i> [™]	3.20lm	3.00gh	1.80gh	2.00f
<i>M. American Spirit</i> [™]	3.20lm	3.00gh	3.00l	2.00f
<i>M. American Triumph</i> [™]	5.00q	3.40ij	2.60jk	2.00f
<i>M. Anne E</i> [®]	1.60ef	1.80c	1.20ef	1.00bc
<i>M. baccata</i> 'Jackii'	0.00a	0.00a	0.00a	0.00a
<i>M. 'Bob White'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. Brandywine</i> [®]	3.50mn	2.25de	1.60fg	2.00f
<i>M. 'Callaway'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. 'Camelot</i> [®]	0.00a	0.00a	0.00a	0.00a
<i>M. 'Canary'</i>	3.00kl	3.00gh	1.80gh	2.00f
<i>M. Canterbury</i> [™]	0.00a	0.00a	0.00a	0.00a
<i>M. Cinderella</i> [®]	1.60ef	0.00a	1.00de	1.00bc
<i>M. Coralburst</i> [®]	2.00fgh	2.00cd	2.40ijk	1.40cde
<i>M. 'David'</i>	1.00cd	1.00b	0.80de	0.75b
<i>M. 'Dolgo'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. 'Donald Wyman'</i>	2.75jkl	2.00cd	2.00ghi	3.00g
<i>M. 'Doubloons'</i>	3.60nm	3.00gh	1.80gh	1.60def
<i>M. Excalibur</i> [™]	0.40a	0.00a	0.00a	0.00a
<i>M. floribunda</i>	2.25ghi	2.00cd	1.80gh	1.80ef
<i>M. Foxfire</i> [™]	0.00a	0.00a	0.00a	0.00a
<i>M. Guinevere</i> [®]	0.00a	0.00a	0.00a	0.00a
<i>M. Hamlet</i> [®]	0.00a	0.00a	0.00a	0.00a
<i>M. Harvest Gold</i> [®]	3.60nm	3.00gh	3.00l	2.00f
<i>M. Holiday Gold</i> [™]	0.20ab	0.00a	0.25ab	0.00a

Apple Scab Ratings for Crabapple Selections at
Secret Arboretum in 2001.

Crabapple Taxon	Sept. 19	Aug. 2	July 9	June 13
<i>M.</i> 'Indian Magic'	4.75q	3.00gh	3.00l	1.50de
<i>M.</i> 'Jewelberry'	4.20op	3.20hi	3.00l	2.00f
<i>M.</i> King Arthur®	0.50ab	0.00a	0.00a	0.00a
<i>M.</i> Lancelot®	1.00cd	1.00b	0.40abc	0.00a
<i>M.</i> Lollipop™	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Louisa'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Mary Potter'	2.00fgh	2.40def	1.00de	1.80ef
<i>M.</i> Molten Lava®	2.20ghi	2.40def	1.00de	1.00bc
<i>M.</i> Pink Princess™	1.40ef	1.00b	0.60bcd	0.00a
<i>M.</i> 'Pink Satin'	4.60pq	4.00j	3.00l	2.00f
<i>M.</i> 'Prairie Maid'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Prairifire'	0.60bc	0.60b	0.80cde	0.00a
<i>M.</i> 'Professor Sprenger'	2.75jkl	2.75fg	1.00de	1.50de
<i>M.</i> 'Purple Prince'	0.00a	1.00b	0.50	0.00a
<i>M.</i> 'Rawhide'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Red Jade'	2.20ghi	2.40def	1.00de	1.50de
<i>M.</i> Red Jewel®	0.60bc	0.80b	0.25ab	0.00a
<i>M.</i> 'Red Splendor'	2.60hij	2.60efg	1.60fg	1.00bc
<i>M.</i> Royal Fountain®	3.00kl	2.80fgh	2.00ghi	2.00f
<i>M.</i> Royal Scepter™	4.75q	3.20hi	2.00ghi	1.60def
<i>M. sargentii</i>	0.00a	0.00a	0.00a	0.00a
<i>M. sargentii</i> 'Candy mint'	0.20ab	0.60b	0.20ab	0.00a
<i>M. sargentii</i> Firebird™	0.00a	0.00a	0.00a	0.00a
<i>M. sargentii</i> 'Tina'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Sentinel'	1.80efg	2.00cd	1.20ef	1.00bc
<i>M.</i> 'Silver Drift'	3.00kl	2.40def	2.00ghi	2.00f
<i>M.</i> 'Silver Moon'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Sinai Fire'	0.00a	0.00a	0.60bcd	0.00a
<i>M.</i> 'Snowdrift'	4.20op	3.00gh	2.20hij	2.00f
<i>M.</i> 'Spring Snow'	4.00no	2.80fgh	2.00ghi	2.00f
<i>M.</i> 'Strawberry Parfait'	0.00a	0.00a	0.00a	0.00a

Apple Scab Ratings for Crabapple Selections at
Secret Arboretum in 2001.

Crabapple Taxon	Sept. 19	Aug. 2	July 9	June 13
<i>M.</i> Sugar Tyme®	2.40ijk	2.00cd	1.80gh	1.40cde
<i>M.</i> 'Thunderchild'	3.00kl	2.60efg	1.80gh	1.20cd
<i>M. tr.</i> Golden Raindrops®	0.00a	0.00a	0.00a	0.00a
<i>M.</i> Weeping Candied Apple®	4.80q	4.00j	3.75m	3.00g
<i>M.</i> White Cascade®	4.80q	3.00gh	3.00l	2.00f
Grand Mean	1.74	1.47	1.12	0.93
LSD	0.47	0.42	0.47	0.44

* 0 = no scab observed; 1 = less than 5% of leaves affected and no aesthetic impact; 2 = 5-20% of leaves affected with some yellowing but little or no defoliation, moderate aesthetic impact; 3 = 20-50% of leaves affected, significant defoliation and/or leaf yellowing, substantial aesthetic impact; 4 = 50-80% of leaves affected, severe foliar discoloration and defoliation, severe aesthetic impact; and 5 = 80-100% of foliage affected, with 90-100% defoliation.

** Means in a column with the same letter are not significantly different (LSD test, $p < 0.05$).

Evaluation of Crabapples for Apple Scab at the Secret Arboretum in Wooster, Ohio: 2000

* by James A. Chatfield, Erik A. Draper, Kenneth D. Cochran and
Daniel A. Herms

Summary

Sixty-three crabapples in a new replicated plot at the Secret Arboretum of The Ohio State University were evaluated for apple scab four times in 2000. Though it was a heavy year for scab at Secret, 25 of

the 63 taxa showed no evidence of apple scab in 2000, and a total of 33 never received a rating that exceeded 1 (no aesthetic impact) on any evaluation date. *M. 'Prairifire'* had never before exhibited scab in our trials at Secrest but did have some lesions in 2000. *M. Red Jewel*[®] and *M. sargentii* 'Candymint', two cultivars that had also shown very little scab in past years, had a trace of scab in 2000. Seventeen taxa received a rating of 3 or higher on at least one date, indicating substantial defoliation and aesthetic impact.

Introduction

Apple scab (pathogen: *Venturia inaequalis*) is a major fungal disease problem of many crabapple species (*Malus* spp). Although it generally is not a major health problem for the tree, it can severely impact ornamental effect and the marketability of highly susceptible crabapples.

Symptoms of apple scab on crabapple include olive to gray to brown to black spots on foliage, yellowing and discoloration of foliage, leaf drop and scabby lesions on fruits. Apple scab can be effectively controlled with a fungicide spray program and certain cultural and sanitary practices (thinning to avoid dense canopies, cleanup of leaves at the end of the season) are also beneficial for control.

However, the best method for control of apple scab is through the use of genetically resistant crabapple selections. The evaluations presented here are the latest in a series of apple scab evaluations for Ohio (1).

The authors emphasize that apple scab in particular and diseases and pests in general are not the only consideration relative to crabapple effectiveness in the landscape. This is the rationale for the inception of more comprehensive evaluations of a number of different aesthetic criteria. These include fruit, flower and foliage features, plant texture and shape, and disease and pest problems. These are reported in a series of publications from data collected in the Secrest plots (2-3).

Materials and Methods

Sixty-three crabapple taxa were planted in 1997-1998 at the Secrest Arboretum of the Ohio Agricultural Research and Development Center (OARDC) in Wooster, Ohio, in a completely randomized design. There were five replicate plants for each taxa with the exception of

M. Brandywine[®], *M. 'Canary'*, *M. 'Dolgo'*, *M. 'Indian Magic'*, *M. King Arthur*[®] and *M. Royal Scepter*[™], for which there were four replicates and *M. Hamlet*[®], for which there were three. Plants were mulched with composted yard waste and irrigated as needed during the year of transplanting. Weeds were controlled with spot applications of glyphosate. On June 14, July 7, August 2 and September 7, 2000, all trees were rated on a scale of 0-5, with 0 = no scab observed; 1 = less than 5% of leaves affected and no aesthetic impact; 2 = 5-20% of leaves affected, with some yellowing but little or no defoliation, moderate aesthetic impact; 3 = 20-50% of leaves affected, significant defoliation and/or leaf yellowing, substantial aesthetic impact; 4 = 50-80% of leaves affected, severe foliar discoloration and defoliation, severe aesthetic impact; and 5 = 80-100% of foliage affected, with 90-100% defoliation.

Results and Discussion

Scab pressure was extremely high at Secrest Arboretum in 2000. In an adjacent crabapple plot, apple scab severity was greater in 2000 than in any year since ratings began in 1993. Yet, even under this considerable disease pressure, 25 of the 63 taxa showed no evidence of apple scab in 2000 and a total of 33 never received a rating that exceeded 1 (no aesthetic impact) on any evaluation date.

M. 'Prairifire' had never before exhibited scab in our trials at Secrest, but did have some lesions in 2000. *M. Red Jewel*[®] and *M. sargentii* 'Candymint', two cultivars that had also shown very little scab at Secrest in past years, had a trace of scab in 2000. Seventeen taxa received a rating of 3 or higher on at least one date, indicating substantial defoliation and aesthetic impact.

Literature Cited

- (1) Chatfield, J.A., E.A. Draper, K.D. Cochran, P.W. Bristol and C.F. Tubesing. 2000. Evaluation of crabapples for apple scab at Secrest Arboretum in Wooster, Ohio: 1999. The Ohio State University, Ohio Agricultural Research and Development Center. Special Circular 173. *Ornamental Plants; Annual Reports and Research Reviews, 1999*. pp. 83-87.

(2) Chatfield, J.A., E.A. Draper and K.D. Cochran. 1996. Comprehensive aesthetic evaluations of crabapples in Ohio; 1993-1995. *Malus; International Ornamental Crabapple Bulletin* 10(1) 5-16.

(3) Chatfield, J.A., E.A. Draper, K.D. Cochran, P.W. Bristol and D.E. Allen. 1998. Comprehensive Evaluations of Crabapples at Secrest Arboretum in Wooster: 1993-1998. The Ohio State University, Ohio Agricultural Research and Development Center. Special Circular 162. *Ornamental Plants; Research Reports and Extension Summaries, 1998*. pp. 94-104.

* James A. Chatfield, Ohio State University Extension, Northeast District/Department of Horticulture and Crop Science; Erik A. Draper, Ohio State University Extension, Geauga County; Kenneth D. Cochran, The Ohio State University, Secrest Arboretum of the Ohio Agricultural Research and Development Center and Ohio State University Extension; Daniel A. Herms, Department of Entomology, Ohio Agricultural Research and Development Center.

Table 1. Apple Scab Ratings for Crabapple Selections at Secrest Arboretum in 2000.

Crabapple	Sept.7	Aug. 2	July 7	June 14
<i>M.</i> 'Adams'	3.00jk	2.60ij	1.80e	1.60ef
<i>M.</i> 'Adirondack'	0.00a*	0.00a	0.00a	0.00a
<i>M.</i> American Masterpiece®	4.40m	3.00jk	3.00hi	3.00j
<i>M.</i> American Salute™	2.60hi	2.20hi	2.40fg	1.80fg
<i>M.</i> American Spirit™	3.20k	3.00jk	3.00hi	2.00g
<i>M.</i> American Triumph™	5.00o	3.00jk	3.00hi	2.00g
<i>M.</i> Anne E®	1.20cd	1.00cd	1.00c	1.00c
<i>M.</i> <i>baccata</i> 'Jackii'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Bob White'	0.00a**	0.00a	0.00a	0.00a
<i>M.</i> Brandywine®	0.25a	0.25ab	1.00c	0.00a
<i>M.</i> 'Callaway'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Camelot®	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Canary'	2.75hij	1.75fg	2.00ef	1.75cfg
<i>M.</i> Canterbury™	0.00a	0.00a	0.00a	0.00a

Table 1. Apple Scab Ratings for Crabapple Selections at Secrest Arboretum in 2000.

Crabapple	Sept.7	Aug. 2	July 7	June 14
<i>M.</i> Cinderella®	1.00bc	0.00a	0.00a	0.00a
<i>M.</i> Coralburst®	1.00bc	1.00cd	1.00c	0.00a
<i>M.</i> 'David'	1.00bc	0.00a	0.00a	0.00a
<i>M.</i> 'Dolgo'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Donald Wyman'	2.00g	1.00cd	1.00c	0.00a
<i>M.</i> 'Doubloons'	2.00g	1.20de	1.00c	1.00c
<i>M.</i> Excalibur™	0.00a	0.00a	0.00a	0.00a
<i>M.</i> <i>floribunda</i>	1.40de	1.40def	1.60de	1.00c
<i>M.</i> Foxfire™	0.00a	0.00a	0.00a	0.00a
<i>M.</i> Guinevere®	0.00a	0.00a	0.00a	0.00a
<i>M.</i> Hamlet®	0.00a	0.00a	0.00a	0.00a
<i>M.</i> Harvest Gold®	4.40m	3.40kl	3.40ij	3.00j
<i>M.</i> Holiday Gold™	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Indian Magic'	5.00o	3.75l	3.00hi	2.50hi
<i>M.</i> 'Jewlberry'	4.40m	2.80j	3.00hi	2.40h
<i>M.</i> King Arthur®	0.00a	0.00a	0.00a	0.00a
<i>M.</i> Lancelor®	1.00bc	1.00cd	1.00c	0.00a
<i>M.</i> Lollipop™	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Louisa'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Mary Potter'	1.60ef	1.20de	1.20cd	1.00c
<i>M.</i> Molten Lava®	2.40h	1.40def	1.00c	1.00c
<i>M.</i> Pink Princess™	1.00bc	0.40ab	0.00a	0.00a
<i>M.</i> 'Pink Satin'	4.80no	3.80l	3.00hi	3.00j
<i>M.</i> 'Prairie Maid'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Prairifire'	0.80b	0.60bc	0.40ab	0.00a
<i>M.</i> 'Professor Sprenger'	1.40de	1.00cd	1.00c	0.60b
<i>M.</i> 'Purple Prince'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Rawhide'	0.00a	0.00a	0.00a	0.00a
<i>M.</i> 'Red Jade'	3.80l	3.00jk	2.00ef	1.20cd
<i>M.</i> Red Jewel®	1.00bc	1.00cd	0.80bc	0.20a
<i>M.</i> 'Red Splendor'	3.00jk	2.00gh	2.00ef	1.80fg
<i>M.</i> Royal Fountain®	3.00jk	2.00gh	1.80e	1.40de

Table 1. Apple Scab Ratings for Crabapple Selections at Secret Arboretum in 2000.

Crabapple	Sept.7	Aug. 2	July 7	June 14
<i>M. Royal Scepter</i> TM	3.75l	2.75j	1.75e	1.50def
<i>M. sargentii</i>	0.00a	0.00a	0.00a	0.00a
<i>M. sargentii</i> 'Candymint'	1.00bc	0.40ab	0.00a	0.00a
<i>M. sargentii</i> Firebird TM	0.00a	0.00a	0.00a	0.00a
<i>M. sargentii</i> 'Tina'	0.00a	0.00a	0.00a	0.00a
<i>M. 'Sentinel'</i>	2.80ij	1.60efg	1.60de	1.60ef
<i>M. 'Silver Drift'</i>	3.00jk	2.00gh	2.00ef	2.00g
<i>M. 'Silver Moon'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. 'Sinai Fire'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. 'Snowdrift'</i>	3.00jk	2.00gh	1.80e	1.60de
<i>M. 'Spring Snow'</i>	4.80no	3.60l	2.80gh	2.80ij
<i>M. 'Strawberry Parfait'</i>	0.00a	0.00a	0.00a	0.00a
<i>M. Sugar Tyme</i> [®]	1.80fg	1.20de	1.20cd	1.00c
<i>M. 'Thunderchild'</i>	5.00o	5.00m	3.60j	3.00j
<i>M. tr.</i> Golden Raindrops [®]	0.00a	0.00a	0.00a	0.00a
<i>M. Weeping Candied Apple</i> [®]	4.80no	3.80l	3.20hij	3.00j
<i>M. White Cascade</i> [®]	4.60mn	3.40kl	3.20hij	2.80ij
Grand Mean	1.64	1.19	1.06	0.85
LSD	0.39	0.42	0.41	0.39

* 0 = no scab observed; 1 = less than 5% of leaves affected and no aesthetic impact; 2 = 5-20% of leaves affected, with some yellowing but little or no defoliation, moderate aesthetic impact; 3 = 20-50% of leaves affected, significant defoliation and/or leaf yellowing, substantial aesthetic impact; 4 = 50-80% of leaves affected, severe foliar discoloration and defoliation, severe aesthetic impact; and 5 = 80-100% of foliage affected, with 90-100% defoliation.

** Means in a column with the same letter are not significantly different (LSD test, $p < 0.05$).

International Ornamental Crabapple Society

OFFICERS

President

James A. Chatfield
Ohio State University Extension
1680 Madison Ave.
Wooster, OH 44691
(330)263-3831

Vice-President

Jim Stolzenburg
Bailey Nurseries, Inc.
1325 Bailey Rd.
St. Paul, MN 55119-6199
(651)459-9744

Executive Director

David Allen
The Holden Arboretum
9500 Sperry Rd.
Kirkland, OH 44094
(440) 256-1110

Editor

David Guthery
Johnson's Nursery, Inc.
W180 N6275 Marcy Rd.
Menomonee Falls, WI 53051
(262)252-4988

Publisher

Jackie Wencka
Johnson's Nursery, Inc.
W180 N6275 Marcy Rd.
Menomonee Falls, WI 53051
(262)252-4988

BOARD OF DIRECTORS

Douglas Chapman (Exp. 1/03)
The Dow Gardens
1018 West Main St.
Midland, MI 48640-4292
(517)631-2677

William Hendricks (Exp. 1/03)
Klyn Nursery, Inc.
3322 South Bridge Rd.
P.O. Box 343
Perry, OH 44081
(440)259-3811

Mark Levandoski (Exp. 1/02)
Poplar Farms Nursery
39W100 Main St.
Batavia, IL 60510
(630)879-7202

Keith Warren (Exp. 1/02)
J. Frank Schmidt & Son Co.
P.O. Box 189
Boring, OR 97009
(503)663-4128

Erik Draper (Exp. 1/02)
Ohio State University Extension
490 S. Broad St.
Canfield, OH 44406
(330)553-5538

Laura Jull (Exp. 1/02)
University of Wisconsin-Madison
1575 Linden Dr.
UW-Madison
Madison, WI 53706-1590
(608)262-1450

Dr. Jeffery Iles (Exp. 1/03)
Iowa State University
106 Horticulture Bldg.
Ames, IA 50011
(515)294-0029

SPONSORING MEMBERS

Bailey Nurseries, Inc.
St. Paul, Minnesota.

G&G Nursery,
Lesage, West Virginia.

High Ridge Farms/Trees Now,
Imlaystown, New Jersey.

J. Frank Schmidt & Son, Co.,
Boring, Oregon.

Johnson's Nursery, Inc.,
Menomonee Falls, Wisconsin.

Lied's Nursery, Inc.,
Sussex, Wisconsin.

Sunleaf Nursery,
Madison, Ohio.

Tuckahoe Nurseries, Inc.,
Tuckahoe, New Jersey.

Warner Nurseries,
Willoughby, Ohio.

LIFE MEMBERS

John H. den Boer
Tim C. Brotzman
Roger F. Fick
Polly Hill

MaryLouisa B. Hill
Bernard Holmes
Philip Keenan
Engelbert Koetter
Peter Kyne
Phillipe LeMaistre
Steven L. Mayer
Jef Van Meulder
Gary M. Moller
William Muetze
Catherine Oliver
Peter N. Scarff
Richard Thomas
Van Wade
James Webb
Ned Wells
Michael Yanny

HONORARY LIFE MEMBERS

Dr. Elton M. Smith
Dr. Thomas L. Green
Dr. Edward R. Hasselkus
John J. Sabuco



Erik Draper cannot control his excitement for *Malus* 'Rosseau' at the Secret Arboretum. (Photo by James Chatfield)



Malus Molten Lava® is spectacular in fall. (Photo by James Chatfield)