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Apple Scab on Crabapple At Secrest Arboretum: 2003

James A. Chatfield, Erik A. Draper, and Kenneth D. Cochran

"Crabapple cultivars generate tens of millions of dollars in wholesale revenues for Ohio nurseries each year. This was not always the case, as important diseases resulted in reduced demand. Market demand for crabapples was revitalized by research at OARDC (the Ohio Agricultural Research and Development Center) that identified disease-resistant varieties. The research created a higher-value product for the consumer while decreasing production expenses for the grower."

— Letter from the Ohio Nursery Landscape Association to the Ohio General Assembly, 2003

Summary

Crabapple evaluation research at The Ohio State University's Ohio Agricultural Research and Development Center's Secrest Arboretum has a long history, commencing decades before the establishment there of an International Ornamental Crabapple Society National Crabapple Evaluation Program plot in 1983.

These evaluations, both for horticultural features and for disease-resistance ratings, continue to the present in the Crablandia II plot at Secrest, where 68 taxa of a planned 80 are now in a randomized replicated plot. In addition, hundreds of trees planted along the roadways of the arboretum are the biggest annual horticultural draw to the arboretum during the spring flowering period. Additional plots are in the planning stage at OARDC and Secrest for evaluation of edible crabapples.

Ohio State University's leadership in crabapple research continues with Ohio State faculty serving in leadership positions within the International Ornamental Crabapple Society (board

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president and board member) and with the appointment in 2003 by the International Society of Horticultural Science of an Ohio State faculty member and the Secrest Arboretum as the International Cultivar Registration Authority for ornamental *Malus*.

Introduction

Apple scab disease caused by the fungal pathogen *Venturia inaequalis* continues to be the key disease that limits the ornamental appeal of crabapples for landscape and commercial use. Evaluation of crabapple taxa for apple scab therefore continues for both newer and older crabapple taxa as a primary activity of the International Ornamental Crabapple Society.

Because of wet spring weather, pressure from apple scab was high at Secrest Arboretum of the Ohio State University's Ohio Agricultural Research and Development Center (OARDC) in 2003. Yet, even under this considerable disease pressure, 19 of the 68 taxa in the Crablandia II Evaluation Plot showed no evidence of apple scab in 2003. This points out that genetic disease resistance is a key practical disease control approach for apple scab on crabapple.

Materials and Methods

Sixty-eight crabapple taxa were planted in 1997–1999 at OARDC's Secrest Arboretum in Wooster, Ohio, in a completely randomized design. There are five replicate plants for each taxa with the exception of 'Beverly,' 'Scarlet Brandywine,' 'Canterbury,' 'Callaway,' 'Cardinal,' 'Indian Magic,' 'Jewelberry,' 'Red Jade,' and 'Royal Scepter,' for which there are four replicates, and 'Brandywine,' 'Hamlet,' 'King Arthur,' 'Silver Moon,' and 'American Spirit' for which there are 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 2, July 2, and August 14, 2003, all trees were rated on a scale of 0 to 5, with:

0 = No scab observed.

1 = Less than 5% of leaves affected and no aesthetic impact.

2 = 5% to 20% of leaves affected, with some yellowing but little or no defoliation, moderate aesthetic impact.

3 = 20% to 50% of leaves affected, significant defoliation and/or leaf yellowing, substantial aesthetic impact.

4 = 50% to 80% of leaves affected, severe foliar discoloration and defoliation, severe aesthetic impact.

5 = 80% to 100% of foliage affected, with 90% to 100% defoliation.

Results and Discussion

Apple scab ratings of crabapples at Secrest Arboretum for the 2003 season are presented in Table 1. Here are key findings.

1. This was a high scab year for the plot. For example, 30 of the 68 taxa rated exhibited "significant defoliation and/or leaf yellowing, and substantial aesthetic impact" (a rating of 3) or worse) by the August 14 rating period. This compares to 19 in 2002 and 20 in 2001.

2. Despite this level of scab pressure, 19 of the taxa exhibited no scab in 2003, and an additional 19 taxa exhibited

Table 1. Apple Scab at Secrest Arboretum in Wooster, Ohio, in 2003.			
Crabapple Taxon	**Aug 14**	**Jul 2**	**Jun 2**
'Adirondack'	0.00	0.00	0.00
'Bob White'	0.00	0.00	0.00
'Canterbury'	0.00	0.00	0.00
'Cardinal'	0.00	0.00	0.00
'Firebird'	0.00	0.00	0.00
'Foxfire'	0.00	0.00	0.00
'Golden Raindrops'	0.00	0.00	0.00
'Holiday Gold'	0.00	0.00	0.00
'Jackii'	0.00	0.00	0.00
'King Arthur'	0.00	0.00	0.00
'Lollipop'	0.00	0.00	0.00
'Louisa'	0.00	0.00	0.00
'Prairie Maid'	0.00	0.00	0.00
'Rawhide'	0.00	0.00	0.00
'Silver Moon'	0.00	0.00	0.00
'Strawberry Parfait'	0.00	0.00	0.00
'Tina'	0.00	0.00	0.00
M. sargentii	0.00	0.00	0.00
'Royal Raindrops'	0.00	0.00	0.00
'Sinai Fire'	0.20	1.00	1.00
'Hamlet'	0.33	0.00	0.00
'Camelot'	0.40	0.40	0.20
'Callaway'	0.50	0.00	0.00
'Dolgo'	0.60	0.60	0.60
'Excalibur'	0.60	0.60	0.00
'Prairifire'	1.00	0.80	0.40
'Red Jewel'	1.00	1.00	0.60
'Beverly'	1.20	0.25	0.00
'Guinevere'	1.20	0.80	0.80
'Candymint'	1.40	1.00	1.00
'Pink Princess'	1.80	1.00	0.20
'Cinderella'	2.00	2.00	1.20
'Lancelot'	2.00	1.00	0.60
'Mary Potter'	2.00	2.00	1.80
'Purple Prince'	2.00	1.40	1.00
'Scarlet Brandywine'	2.25	1.50	1.25
'David'	2.80	2.00	2.00
'American Salute'	3.00	3.00	2.00

Table 1 (continued).Apple Scab at Secrest Arboretum in Wooster, Ohio, in 2003.			
Crabapple Taxon	**Aug 14**	**Jul 2**	**Jun 2**
'Manbeck Weeper'	3.00	2.80	1.80
'Molten Lava'	3.00	2.00	1.00
'Royal Fountain'	3.00	2.80	1.80
'Red Jade'	3.00	2.00	2.00
'Canary'	3.20	2.80	2.00
'Coralburst'	3.20	3.00	1.00
'Professor Sprenger'	3.20	300	2.00
'Brandywine'	3.25	2.00	1.75
'Adams'	3.40	2.80	2.20
'Sugar Tyme'	3.40	3.00	2.00
'Sentinel'	3.40	2.60	1.80
'Thunderchild'	3.40	3.00	2.00
'Red Splendor'	3.60	2.60	2.00
'Silver Drift'	3.80	2.80	1.80
'Doubloons'	4.00	2.20	1.60
'Donald Wyman'	4.20	2.80	2.00
M. floribunda	4.00	2.60	2.00
'Harvest Gold'	4.00	3.00	2.00
'Indian Magic'	4.60	3.00	2.00
'Pink Satin'	4.60	3.60	2.00
'Spring Snow'	4.60	3.00	2.00
'Snowdrift'	4.20	3.00	2.00
'Weeping Candied Apple'	4.20	3.80	2.00
'Jewel Berry'	4.60	3.30	2.00
'White Cascade'	4.60	3.00	2.20
'Royal Scepter'	4.80	2.20	2.00
'American Masterpiece'	5.00	3.00	2.00
'American Spirit'	5.00	3.00	2.00
'American Triumph'	5.00	3.00	2.00

* 0 = no scab observed;
1 = less than 5% of leaves affected and no aesthetic impact;
2 = 5% to 20% of leaves affected, with some yellowing but little or no defoliation, moderate aesthetic impact;
3 = 20% to 50% of leaves affected, significant defoliation and/or leaf yellowing, substantial aesthetic impact;
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scab with less than substantial aesthetic impact as of the August 14 rating period. This wide range of crabapples with good scab resistance, crabapples that also have diverse horticultural features, from uprights to weepers, from pink-flowered to white-flowered types, from red- to purple- to yellow-fruited, suggests that landscape managers have the option of selecting a wide palette of crabapples for the landscape.

References

Draper, E. A., Chatfield, J. A., and Cochran, K. D. 2003. A collection of crabapple knowledge from Secrest Arboretum: 1993-2002. In: *Ornamental Plants: Annual Reports and Research Reviews, 2002*. Special Circular 189: 119-138. Ohio Agricultural Research and Development Center, The Ohio State University.

Chatfield, J. A., Draper, E. A., Herms, D. A., and Cochran, K. D. 2002. Apple scab on crabapples at Secrest Arboretum: 2001. In: *Ornamental Plants: Annual Reports and Research Reviews, 2001.* Special Circular 186: 93-96. Ohio Agricultural Research and Development Center, The Ohio State University.

Fiala, Fr. John L. 1994. *Flowering Crabapples — The Genus Malus.* Timber Press, Portland, Oregon.

Acknowledgments

The authors would like to thank Ohio nurseries, including Lake County Nursery, Klyn Nurseries, Sunleaf Nursery, Willoway Nursery, and others for support and plant material for this project as well as Bailey Nurseries of Minnesota and J. Frank Schmidt Nursery of Oregon for plant material and participation in the International Ornamental Crabapple Society National Crabapple Evaluation Project.

We would also like to thank the Secrest Arboretum of The Ohio State University's Ohio Agricultural Research and Development Center, especially the always professional and helpful grounds department headed by James Karcher.

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