

**MDA Horticulture Fund
Final Report Year 3**

1. Project Title:

**Evaluation of disease and insect resistant elm hybrids and selections
for the Michigan climate**

2. Project MDAH #: 97513

3. Principal Investigator(s): Gerard C. Adams, MSU Dept. Plant Pathology
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4. Reporting period: FY-07, January 2008-July 2008

5. Summary of goals and objectives:

The goals and objectives of this project are to continue the cultivation and evaluation of 20 or more hybrids and cultivars of *Ulmus* selected for disease and insect resistance. The America elms, European and Asian elm hybrids are to be evaluated for performance and growth characteristics under Michigan climatic conditions, including measurements of tree height, diameter at breast height, crown appearance, fall coloration and survival of disease and insect damages. :

6. Status of goals and objectives:

A. In 2008, *U. americana* 'Jefferson' was planted. Mowing, weed barrier and bark mulch was applied around each tree.

B. A website was established for the National Elm Trial which will be used by the MSU Trial
<http://treehealth.agsci.colostate.edu/research/nationalelmtrial/NationalElmTrial.htm>

C. A second website is established for the Dutch Elm Disease (DED) extension bulletin that discusses elm cultivars with DED resistance:
<http://www.extension.iastate.edu/Publications/SUL4.pdf>

D. For the second season, Japanese beetle damage was heavy and leaves were collected to estimate susceptibility. We quantified the damage to samples of leaves taken from each tree and statistically compare the replicated cultivars to one another. A modification of the methods described by Dr. Doug Landis (O'Neal ME, Landis DA, Isaac R (2002) *An inexpensive, accurate method for measuring leaf area and defoliation through digital image analysis*. J. Econ. Entomol. 95(6): 1190-1194.) was employed. The original leaf area was measured using a flat bed scanner and Scion Image™ public domain software. And, the area of leaf tissue remaining after herbivory was measured using a LI-COR LI-3000 leaf area meter (LI-COR, Lincoln, NE). Percentage of leaf tissue remaining is then compared among cultivars in a Mean Separation test. This statistical comparison is in progress and results will be provided for the Final report in July 2008. Assessment of tree form and growth will be measured at bud break and recorded as 2007 growth. Data on tree assessments will be appended to the final report.

E. Tree height, Crown width, diameter at breast height, crown appearance, and survival were recorded for May 2008. In July 2008 insect damage, disease damage and

abiotic damage assessments were made. The data sheets for these evaluations are attached to this document as MS-Excel files with weather data.

Outreach activities related to project:

In Spring 2005-2007, ca. 50 MSU undergraduate and graduate students will be driven to the Elm trial location and received a detailed discussion of the trial's purpose, the history of the cultivars, and the current results of performance evaluations. The graduate students in the course Plant Pathology 885, Plant Diseases in the Field, were taken to the trial planting and it was discussed. Extension bulletins on Dutch Elm Disease that feature photographs and descriptions of DED resistant elm cultivars were distributed to the MSU students majoring in horticulture and forestry during the PLP/ENT 407 DISEASES AND INSECTS OF FOREST AND SHADE TREES course in May.

An article, "Improved Elms for Michigan's Urban Landscapes", describing the MSU trial planting will be submitted for publication to The Michigan Landscape, published by the Michigan Nursery and Landscape Association.

Table of Cultivars planted in Michigan

	<i>Ulmus</i> Species	Cultivar	Source
1	<i>U. propinqua</i> (JFS Bierberich)	'Emerald Sunshine'	J. Frank Schmidt & Son
2a	<i>U. parvifolia</i>	Emer II Allee	The Botany Shop
2b	<i>U. americana</i>	'Princeton'	Princeton Nurseries
3	<i>U. carpinifolia</i> X <i>U. parvifolia</i>	'Frontier'	J. Frank Schmidt & Son
4	<i>U. glabra</i> X <i>U. carpinifolia</i> X <i>U. pumila</i>	'Homestead'	J. Frank Schmidt & Son
5	<i>U. pumila</i> X <i>U. japonica</i> X <i>U. wilsoniana</i> Mortality is high	'Morton Glossy Triumph'	J. Frank Schmidt & Son
6	<i>U. pumila</i> X <i>U. japonica</i>	'Morton Plainsman Vanguard'	J. Frank Schmidt & Son
7	<i>U. japonica</i> X <i>U. wilsoniana</i>	'Morton Red Tip Danada Charm'	J. Frank Schmidt & Son
8	<i>U. carpinifolia</i> X <i>U. pumila</i> X <i>U. wilsoniana</i>	'Morton Stalwart Commendation'	J. Frank Schmidt & Son
9	<i>U. japonica</i> X <i>U. wilsoniana</i>	'Morton Accolade'	J. Frank Schmidt & Son
10	<i>U. pumila</i> X <i>U. japonica</i>	'New Horizon'	J. Frank Schmidt & Son
11	(<i>U. glabra</i> X <i>U. carpinifolia</i> X <i>U. pumila</i>) X <i>U. wilsoniana</i>	'Patriot'	J. Frank Schmidt & Son
12	<i>U. glabra</i> X <i>U. carpinifolia</i>	'Pioneer'	J. Frank Schmidt & Son
13	<i>U. wilsoniana</i>	'Prospector'	J. Frank Schmidt & Son
14	<i>U. americana</i>	'Valley Forge'	J. Frank Schmidt & Son
15	<i>U. americana</i>	New Harmony' Planted in 2006	Princeton Nurseries
16	<i>U. americana</i> plantedr Spring 2008	'Jefferson'	The Botany Shop & Phytotektor
17	<i>U. americana</i>	'Prairie Expedition'	Lee Nursery, Inc.
18	<i>U. parvifolia</i>	Emer I 'Athena Classic'	Angel Creek Nursery, Inc.

		Lacebark	
19	<i>U. parvifolia</i>	'Everclear' Lacebark	Angel Creek Nursery, Inc.

Photographs of the Michigan State University Elm Trial May 2008

