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National Elm Trial

Mark L. Gleason
Iowa State University, mgleason@iastate.edu

Jean C. Batzer
Iowa State University, jbatzer@iastate.edu

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Abstract
Although many Dutch elm disease-resistant elm cultivars are available in the nursery trade, many people are hesitant to purchase and plant an elm tree due to their traumatic memories of the damage caused by this devastating fungal disease. In order to promote interest in planting these Dutch elm disease-resistant trees, scientific data on their survival, growth, form, and pest resistance are essential.

Disciplines
Agricultural Science | Agriculture | Plant Pathology

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Mark Gleason, professor
Jean Batzer, assistant scientist
Department of Plant Pathology

Introduction

Although many Dutch elm disease-resistant elm cultivars are available in the nursery trade, many people are hesitant to purchase and plant an elm tree due to their traumatic memories of the damage caused by this devastating fungal disease. In order to promote interest in planting these Dutch elm disease-resistant trees, scientific data on their survival, growth, form, and pest resistance are essential.

The National Elm Trial is a multi-state effort to evaluate and promote the use of commercially available Dutch elm disease resistant American and hybrid elms. Seventeen elm cultivars and species have been planted in large replicated trials in a wide range of conditions across the United States so that their growth and performance can be evaluated. Public and private sites in 15 states are cooperating to evaluate these tree cultivars over a wide range of growing conditions and hardiness zones. The project is coordinated by William Jacobi and James Klett of Colorado State University, and James Walla of North Dakota State University. Iowa State University is among the 15 state cooperators.

The objectives of this research were: 1) to determine the growth and horticultural performance of commercially available Dutch elm disease-resistant elm cultivars in various climate regimes in the United States; 2) to determine the relative disease, insect, and abiotic stress tolerance of these cultivars; and 3) to promote the propagation and use of elms through local, regional, and national reporting of the trial results to wholesale tree propagators and growers, retail nursery and garden center operators, landscape designers, arborists, and the general public.

Materials and Methods

In April 2005, elm cultivars and species 1–14 were planted (Table 1). Cultivars/species 15–16 were planted in May 2006 and Cultivar 17 (Prairie Expedition) was planted May 2007. Each cultivar is represented by one tree in each of five blocks in a randomized complete block (Figure 1). The elm cultivars represent a range of promising hybrids and species of *Ulmus* that are commercially available. The trial will be conducted over a period of 10 years.

Annual assessment of each tree has been made from July to December, including height, diameter, and crown characteristics. In addition, the presence of vascular diseases, canker diseases, foliar diseases, scale insect infestations, foliar-feeding insect infestations, bark beetle infestations, and abiotic damage (frost/freeze, wind, winter dieback, sunscald, and insufficient soil moisture) have been noted.

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Figure 1. **Plot map of National Elm trial at Horticultural Research Station, Ames, IA. Numbers indicate replicate-cultivar.**

Column/ Row	1	2	3	4	5	6	7	8
1			**2-11***	2-10	3-2	3-12	5-15	5-4
2			2-7	2-12	3-15	3-17	5-13	5-9
3			2-15	2-6	3-11	3-9	5-10	5-12
4			2-5		3-1	4-1	5-7	5-1
5		1-6	2-17	2-13	3-8	5-17	**4-4***	5-16
6			1-8	**2-14****		4-16		**5-14****
7	1-17	1-15	1-16	2-2	**3-14***	4-10		**5-17*****
8	1-10	1-13		2-9	3-6	4-8	4-12	
9		1-2			3-4	4-5	4-2	5-5
10		1-7	**1-1***	**2-16****	3-13	4-7	**4-11****	**5-11***
11		1-14	1-4	**2-1****	3-16	4-9	4-15	5-2
12	**1-11*****		1-9	2-8	3-7	4-13	4-17	5-6
13	1-12		1-5	2-4	**3-10***	**4-14****	**4-6***	5-8

***died in 2007 **blew over in 2008 *** dead in 2009**

ROAD