



CONTENTS

Glynn C. Percival

**Evaluation of Silicon Fertilizers and a Resistance Inducing Agent for Control of Apple and Pear Scab under Field Conditions ..... 205**

**Abstract.** Two field trials were conducted using established apple (*Malus* cv. Golden Delicious) and pear (*Pyrus communis* ‘Williams’ Bon Chrétien’) to assess the efficacy of a range of silicon (Si) fertilizers, a resistance-inducing (IR) agent based on salicylic acid and a combination of Si + IR when applied at four growth stages of tree development (i.e., bud break, green cluster, 90% petal fall, early fruitlet) against the foliar pathogens apple (*Venturia inaequalis*) and pear (*V. pirina*) scab. In addition, a comparative evaluation of a conventional synthetic fungicide (penconazole) used within the UK for apple and pear scab control was performed. Greatest protection against apple and pear scab was provided by a combination of a Si fertilizer + IR agent and the synthetic fungicide penconazole in both the 2014 and 2015 field trials where statistically comparable degrees of control were achieved. Efficacy as scab-protectant compounds (i.e., reduced scab severity of leaves and fruit) enhanced leaf chlorophyll content and fruit yield, and was confirmed when each Si fertilizer was applied at four growth stages during two growing seasons; however, there was little difference in the degree of control conferred by each Si fertilizer. The IR agent used alone proved the least effective scab protectant compound.

**Key Words.** Apple Scab; Fungicide; Integrated Disease Management; Orchard Management; Pathogen Control; Pear Scab; Plant Health Care; Urban Landscapes.

Parisa Panahi, Mehdi Pourhashemi, and Maryam Hasaninejad

**Acorn Biomass and Carbon Stock Variation in Five Oak Species Planted in the National Botanical Garden of Iran ..... 215**

**Abstract.** Botanical gardens, as one of the most important urban forests to any region, play an important role in the ecology of human habitats in many ways (e.g., air filtering). The National Botanical Garden of Iran, with an area of 145 ha, includes various woody species with a predominance of oaks (*Quercus* spp.). The size of acorns, fruits of oaks, varies in different species, which can affect their biomass. The biomass and carbon content of acorn components (endocarp, pericarp, and cupule) of four native oak species (*Q. castaneifolia* C.A. Mey., *Q. libani* Oliv., *Q. infectoria* Oliv., and *Q. brantii* Lindl.) and one exotic oak species (*Q. ilex* L.), planted in the National Botanical Garden, were studied to obtain detailed comparative results. Regarding the biomass of acorn components, *Q. libani* and *Q. ilex* showed the highest and lowest values among the study species, respectively. The ranges of carbon content of acorn components were 53.5% (pericarp of *Q. brantii*) to 58% (cupule of *Q. castaneifolia*). These results confirm the variation of biomass and carbon content of acorn components among the oak species studied.

**Key Words.** Acorn; Botanical Garden; Carbon Stock; Cupule; Endocarp; Exotic; Iran; Native; Oak; Pericarp; *Quercus*.

W. Jim Cortese

**An Appraisal of the University of Tennessee Arboretum Holly Collection..... 224**

**Abstract.** Maintaining land resources for research and education requires sound stewardship. These environments are affected by factors that can impact the health and benefits of the property. The University of Tennessee Forest Resources AGResearch and Education Center (Knoxville, Tennessee, U.S.) includes an arboretum of 101 hectares. Established in 1965, this section of the Oak Ridge Forest includes more than 2,500 native and exotic woody plant specimens. Identifying the value of the collections was necessary for determining the extent of resources that should be dedicated to its upkeep. Should weather, infestations, and other occurrences damage the property, replacement values need to be accurate. The Elmore Holly Collection was the only section that had not been appraised. This study examined the *Ilex* aquifoliaceae to appraise the current value of the collection. The objectives were to 1) identify the best appraisal method, and 2) apply that method to every holly plant in the collection to determine the total value. The traditional appraisal methods did not suit the study. A slight modification of the Replacement Cost Method was found to be the best approach. The method was repeated to confirm accuracy of the appraisal. The modified valuation method provides a tool that gives practical application of a research method to use in collection appraisals and is repeatable in all sections of the United States.

**Key Words.** Appraisal; Aquifoliaceae; Holly; *Ilex*; Replacement Cost; Shrub/Small Tree Appraisal; Tennessee.