

# THE RIGHT NICHE

Disease control on trees and ornamentals may be as simple as finding the right environment for the plant to thrive. But when that's not enough, follow this guide.

by Douglas J. Chapman

**D**isease or pathogenic organisms frequently infect stressed plants. This weakening, or predisposition of plants to disease, can be the result of transplanting, drought, high water conditions or not placing the plant in the right ecological niche.

Ecological niche has not been considered enough in landscape design or development. For example, junipers must grow in full sun or in well-drained, droughty soils.

Few disease organisms will attack healthy, vigorous trees, such as oak wilt on oak; apple scab on crab apple; or Dutch elm disease on elm. But, in general, disease organisms attack weakened plants, like *Botryosphaeria* canker on *Cornus sericea*.

Promotion of healthy, vigorous plants or a holistic approach, is the

key to disease management. The holistic approach includes, in order of priority, four strategies: ecological niche, clonal or varietal resistance, maintenance and disease control programs. Each of the four strategies is an important component of "integrated plant management."

## Ecological niche

Planting a tree or shrub in the right place is paramount to health and survival. If one understands ecological requirements of plants and tries to grow them where they will flourish, then healthy landscapes will be the result.

Birch (*Betula papyrifera*) is a pioneer tree. Thus, it must be grown in full sun on sandy (low to medium nutrient) soils. Conversely, sugar maple (*Acer saccharum*) is a climax forest tree. Therefore it will grow in sun or shade in fertile, well-drained soils. Frequently, we plant trees or shrubs in conditions to which they are not

adapted and try to fertilize or water them to good health. When they are not in the correct ecological niche, then the plant may become predisposed to disease infection.

## Clonal selection

Selecting and planting cultivars which exhibit resistance to disease is becoming a more important tool for reducing disease problems in the landscape. Fireblight, apple scab and frog-eye are serious diseases of crab apple.

To eliminate the need for fungicide application, and thus a maintenance requirement, resistant cultivars such as *Malus* 'Sugar Tyme', *M. floribunda*, or *M. 'Donald Wyman'* should be planted.

Each area of the country must plant different cultivars of the same species to determine which cultivars are resistant in that region. Disease organisms have geographic races or strains.

Many lists of resistant cultivars exist, but some may not apply to your area of the country.

For Michigan, I have included a list of disease resistant crab apples to apple scab and fireblight and a list of disease resistant junipers to Phomopsis twig blight (see charts).

## Maintenance

Healthy, vigorous trees are the best protection against disease infection. When we transplant a tree, it is weakened until establishment. We should try to help the plant to become established as rapidly as possible by watering when needed, fertilize to stimulate establishment, and protect against additional injury, such as lawn mower damage or pruning. Further, any condition which may weaken a tree (change in grade, over-pruning, insect attack, or drought) must be countered by watering, fertilizing, mulching or any practice which will protect and revitalize it.

Soil compaction is an urban problem which must be addressed. Fre-

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### PHOMOPSIS TWIG BLIGHT RESISTANT JUNIPERS

*Juniperus chinensis* 'Hetzii'  
*Juniperus chinensis* 'Keteleerri'  
*Juniperus chinensis* 'Mint Julep'  
*Juniperus chinensis* 'Pfitzeriana'  
*Juniperus chinensis* 'Pfitzeriana Compacta'  
*Juniperus chinensis procumbens*

*Juniperus chinensis procumbens* 'Nana'  
*Juniperus chinensis sargentii*  
*Juniperus chinensis* 'Upright Hetzii'  
*Juniperus horizontalis* 'Douglasii'  
*Juniperus sabina* 'Broadmoor'  
*Juniperus sabina* 'Tamariscifolia'  
*Juniperus virginiana* 'Tripartita'

### APPLE SCAB AND FIREBLIGHT RESISTANT CRAB APPLES

*Malus* 'Adams'  
*Malus* 'Beverly'  
*Malus* 'Bob White'  
*Malus* 'Candied Apple'  
*Malus* 'Centurian'  
*Malus* 'Coralburst'  
*Malus* 'Donald Wyman'  
*Malus floribunda*  
*Malus* 'Golden Harvest'  
*Malus* 'Golden Hornet'  
*Malus* 'Harvest Gold'

*Malus hupehensis*  
*Malus* 'Indian Magic'  
*Malus* 'Indian Summer'  
*Malus* 'Mary Potter'  
*Malus* 'Red Baron'  
*Malus* 'Red Jewel'  
*Malus sargentii*  
*Malus* 'Sentinel'  
*Malus* 'Silver Moon'  
*Malus* 'Sygar Tyme'  
*Malus* 'Van Eseltine'  
*Malus* 'White Angel'  
*Malus* 'White Cascade'



quently, people or vehicles compact the soil when it is wet, during construction or after the landscape is completed. This condition must be countered. Strategies to counter compaction include mulching, rototilling and/or core aeration. Watering with alkaline water, found in much of the Midwest, negatively impacts plants which need a slightly acid soil to survive. If the deficient condition is corrected, the plant resumes growth, but, if not corrected, then decreased vigor and predisposition to disease are the end products.

### Disease control programs

Pesticides should be just one strategy used in the arsenal to prevent or cure disease problems. Fungicides can be protective or prophylactic (curing disease after infection).

Many fungicides—Bordeaux, captan, ferbam, etc.—protect plants from disease infection. These fungicides must be applied before infection, thus a complete understanding of the disease life cycle is a must. Further, this group of fungicides must cover the entire part of the plant that can be infected including leaves.

A second class of fungicides is prophylactic, which control the disease after infection. Several examples of this type of fungicide include Benlate and Subdue.

One must still know the biology of the particular pathogen or disease when prophylactic fungicides are used. Further, this group of fungicides can be applied after a disease infection is evident. Fungicides are only effective if the correct procedures are followed.

One must select the most efficacious fungicide to control the specific pathogen. This information can be obtained by consulting a supplier, local university, extension bulletins and/or reading the label.

Pesticides must be applied to the plant at the site of infection or when it can be absorbed to control the disease. Timing of application is critical. If one is trying to control apple scab, the correct fungicide must be applied prior to infection when the temperature is optimal, during the spring and before a rain.

Disease control programs must be developed around the total landscape. One should grow the plant in the right ecological niche, use disease resistant cultivars, provide good maintenance, and use pesticides to help overcome temporary problems. Pesticides should not be considered the long-term solution to plant diseases or a healthy landscape.

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## Fungicides

The following is only a representative list of fungicides frequently used to control diseases of woody ornamentals. No endorsement of products is intended.

**BENOMYL**—a systemic fungicide effective against apple scab, powdery mildew, botrytis and anthracnose. The water should be acidified in regions where the water pH is above 6.5.

**BORDEAUX**—a protective fungicide for fireblight and many foliar diseases.

**CAPTAN**—a limited-use broad spectrum protective fungicide which is effective for many foliar diseases.

**CUPRIC HYDROXIDE**—a fungicide against many leaf spots and blights. Phytotoxicity has been noted as a problem - Read the label.

**CYCLOHEXIMIDE**—effective for powdery mildews.

**FENARIMOL**—locally systemic fungicide used for the prevention and control of powdery mildew. Reduced dosages are recommended when used under high humidity-cool-cloudy conditions.

**FOLPET**—specific for leaf spot diseases.

**MANCOZEB**—a combination of maneb and zinc salt, effective for a broad group of foliage diseases and blights.

**RIDOMIL**—a systemic fungicide absorbed through the roots that controls phytophthora and pythium. One of the few products effective for phytophthora on rhododendrons.

**STREPTOMYCIN**—an antibiotic specific for bacterial pathogens, e.g. fireblight.

**TRIADIMEFOR**—a systemic fungicide effective for the control of powdery mildew and rusts. Check the label. There are some precautions related to phytotoxicity.

**VINCLOZOLIN**—effective for the control of Botrytis sp. and Sclerotinia sp. on woody ornamentals, herbs and bulbs.

**ZINEB**—good for the control of foliar diseases, rusts, and blight.

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