

Environmental Stewardship Begins in Your Backyard

CUES Summary: Sustainable Management Of Urban Ecosystems

A sustainable landscape requires low inputs of labor, fertilizers, herbicides, insecticides and fungicides to thrive. These chemicals have the potential to pollute surface and ground water and disturb natural ecosystem processes. The landscaper's objectives differ from the agricultural model driven by yield and profits which justifies the use of chemicals. Sustainable management embraces four principles.

Conserving Biodiversity. The naturally diverse landscape discourages outbreaks of disease or insects. Such a landscape also attracts birds and butterflies.

Restoring native vegetation. Consider using native vegetation in landscapes. Restore native vegetation to shorelines to reduce nutrient enrichment through stabilizing sediments and shorelines.

Promoting nutrient recycling through composting. Backyard and community composting is an ecologically sound way of disposing of yard wastes and increasing nutrients in urban soils.

IPM, integrated pest management, for insect and diseases. Inspect and monitor your plants' health on a regular basis, before problems are out of control. Instead of routinely spraying for insects, use spot treat problems of soft pesticides such as soaps, oils and biorational products such as Bt (commercial formulations of *Bacillus thuringiensis*). Adopt these biorational practices which target the pest and not the naturally occurring biological control agents such as parasitoids and predatory insects. Use naturally resistant plants. When necessary use hard pesticides, timed

to the vulnerable stage of the insect so the application has a major impact on the pest.

What is CUES?

CUES strives to educate urban residents and landscape managers on ways to embrace environmental stewardship by practicing sustainable management. CUES reaches consumers and landscape industry through the resource center, educational materials and public programs. A Minnesota Extension Service, MES, collegiate grant in 1995 funded the creation of CUES. CUES is housed in the Andersen Library at the Minnesota Landscape Arboretum (MLA).

What is the message Of CUES?

CUES' main goal is to convince people that environmental stewardship is not confined to the Serengeti in Africa. Environmental stewardship starts in your backyard. CUES tries to reach the managers of urban green spaces to convince them to practice the principles of plant health care (PHC) and Integrated Pest Management (IPM).

What is Sustainable Landscape Design?

Landscape managers and gardeners generally want a landscape that is easy to maintain as well as one that looks good. Sustainable landscaping is a common sense approach to obtaining both goals. These landscapes use native and introduced plants adapted to the conditions of the sites so the plants can prosper without chemical inputs into the environment.

Properly designing or even redesigning a landscape is the first step towards lowering maintenance. A sustainable landscape is one that

preserves and protects nature's balance, while providing aesthetic pleasure.

Once a good design is in place, other practices come into play such as following principles of plant health care (PHC), encouraging biodiversity, composting yard waste and implementing Integrated Pest Management (IPM).

What is Sustainable Landscape Management?

A sustainable landscape requires low inputs of labor, fertilizers, herbicides, insecticides and fungicides to thrive. These chemicals have the potential to pollute surface and ground water and disturb natural ecosystem processes. Fertilizers from urban landscapes run off into storm drains and enter waterways and cause algae blooms which affect light penetration, oxygen and fish populations. The urban ecosystem objectives differ from the agricultural model driven by yield and profits which justifies the high usage of fertilizers, herbicides, insecticides and fungicides.

Sustainable management promotes tactics that recycle nutrients to promote an ecological balance. Composting and using mulching lawn mowers all return nutrients back to the urban ecosystem. Other strategies lower the use of broad spectrum pesticides to permit the natural control of damaging insect populations by insect predators and parasitoids. Finally, sustainable management encourages diverse and alternative landscapes which require lower long-term maintenance.

What is Plant Health Care, PHC?

An important component of Plant
(Continued on Page 19)

CUES—

(Continued from Page 17)

Health Care (PHC) practices is selecting plants appropriate for the purpose and appropriate for the site. A plant correctly matched to its site will experience fewer pest problems because a healthy plant is less prone to insect and disease attack. Know and meet the cultural requirements of any plants. Once you have decided on a particular plant, investigate the characteristics of various cultivators.

Much research has been done on plant resistance to pests. Plants can be bred with inherent chemical or growth attributes that make them unattractive to insect feeding or resistant to diseases. For example, honey-suckle witches' broom aphid feeding, a common problem with older honey-suckle cultivars, results in branch tips with a mass of shoots which is at first, merely unattractive, but eventually weakening the entire shrub. Newer cultivars have been bred that are resistant to aphid feeding.

Many common plant diseases will cause defoliation which will stress the plant over time, reducing its vigor and winter hardiness. For example, select rose cultivars that are resistant to black spot (*Diplocarpon rosae*), an important rose disease, and select crab apple cultivars that are resistant to apple scab (*Venturia inaequalis*), a common problem in Minnesota.

What is Integrated Pest Management, IPM?

CUES stresses the use of Integrated Pest Management, or IPM, which is the practice of using a variety of cultural, biological and chemical techniques to reduce pest problems. IPM is the part of PHC that is concerned with managing insects and diseases. One goal of IPM is to reduce any harmful impact chemicals may have on the environment including wildlife, soil and water quality. OPM methods include proper plant selection, biorational and biological pest controls, using traps for monitoring insect populations, regularly examining or scouting plant materials for signs of trouble, and the judicious use

of chemical pesticides applied at the most vulnerable time in an insect's life history.

When pesticides are necessary, use environmentally sound controls, such as horticultural oils and soaps, which break down quickly in the environment. The commonly available commercial formulations of *Bacillus thuringiensis* (Bt), fungi and nematodes are called biorational pesticides and these products can be used to reduce insect populations.

Controls such as insect parasitoids, beneficial wasps which lay their eggs on harmful insects, thereby parasitizing them and predators such as lady beetles and lacewings are generally referred to as a biological control. These biological controls are naturally found in the environment, but the widespread use of insecticides kills them as well as the pest insect. By limiting the use of insecticides and incorporating a variety of plants in the landscape to attract a wide range of insects, these beneficial insects can thrive and help to regulate harmful pests.

How Does CUES Affect Me?

All these strategies are part of responsible urban landscape stewardship. Environmental stewardship of the urban landscape is within our grasp. A landscape managed by sustainable methods provides for a healthier environment that can be shared with butterflies, birds and fish. The kind of place we all long for on weekends. An urban environment where we can lay back, kick off our shoes and enjoy nature.

Sustainability promotes the concept that whether you are planting a garden, managing turf, developing a parkland or landscaping, your management practices affect everyone. The decisions you make affect water quality, waste disposal and the survival of all forms of wildlife.

When looking at alternative landscape practices, think in terms of management, rather than control. Work with nature to restore the ecosystem balance by improving soil and site conditions. Since problems

can't be eradicated, begin by accepting some imperfections, understanding the problems and using creative management strategies to restore environmental health.

The result is a more harmonious environment, with more leisure time to enjoy it.

CUES Educational Materials

Educational materials on sustainable management of the urban landscape are available to extension educators, homeowners and the professional landscape manager in the CUES resource center at the Andersen Library at the Minnesota Landscape Arboretum. Extension bulletins are available for preview and can be ordered directly from a CUES order form for the MES distribution center. CUES is also multimedia. A slide caramate, monitor and VCR are available for viewing videos and slide sets.

The arboretum bookstore has books available for sale on plant health care, sustainability and IPM.

Visit CUES And See For Yourself!

For more information of CUES visit the Andersen Library at the Minnesota Landscape Arboretum or contact Dr. Vera Krischik, Assistant Professor and Extension Specialist, Department of Entomology, University of Minnesota, 219 Hodson Hall, 1980 Folwell Ave., St. Paul, MN 55108. E-mail: krisc001@maroon.tc.umn.edu or (612) 625-7044.

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