



SUSTAINABLE GARDENING

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Sustainable Lawn Management

What is a lawn? Lawn, n. a stretch of grass- covered land, especially near a house or in a park, that is regularly and closely mowed, continuously green, and, to the greatest possible degree, free of weeds and pests.

The Industrial Lawn vs. The Freedom Lawn The industrial lawn, advocated by the lawn-care industry, is what most people consider to be the standard feature of today's yards. It is a monoculture, heavily dependent on chemicals and resources. The freedom lawn, on the other hand, is mowed when needed, free of pesticides and fertilisers, and may be designed to reduce the proportion of yard maintained as lawn. People are becoming more aware of the impacts of the industrial lawn and are increasingly adopting more environmentally friendly landscape management techniques. There are four basic principles of the industrial lawn:

- *It is composed of grass species only*
- *It is free of weeds and other pests*
- *It is continuously green*

- *It is regularly mowed to a low even height.*

The industrial lawn is the product of strict human management. Humans, with the help of technology, try to control the pattern of biological relationships within the lawn. Plant diversity is minimised, insecticides control natural insect predation, herbicides control species that are considered to be weeds; fertilisers replace naturally occurring nutrient cycles, irrigation subsides drought, and the absence of a naturally aerating soil structure is compensated for by mechanical soil aeration. The industrial lawn depends on fossil fuel energy, irrigation, pesticides, and fertilisers; it incurs a greater drain on world resources. The industrial lawn is totally dependent on the expenditure of money, time and energy. It is not place-sensitive; it ignores microclimates and species diversity. It substitutes technology, in the form of fossil fuels, irrigation water, pesticides, and fertilisers, for natural processes. The freedom lawn is a product of human management, though its pattern is the result of natural processes. The freedom lawn emphasises the use of solar energy, minimises fossil energy

and other scarce natural resources.

Environmental Costs of the industrial lawn In lawns exists a dynamic community of people, grass plants, earthworms, and other organisms that live in or pass through the lawn. These species in the lawn ecosystem interact with each other and their physical and chemical surroundings. **Natural ecosystems vs human-modified ecosystems**

- Figure (separate word doc - needs work)

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Chemicals Once fertilisers and pesticides are applied to a lawn, they can follow a variety of paths and have unanticipated environmental effects. Through the lawn's connection with the air stream and flowing water, chemicals can move into and affect distant ecosystems. For more information on the carbon cycle and global warming, please refer to ENFO leaflets BS23 and FS16.

Fertilisers Naturally occurring ecosystems usually retain most nutrients within the system, but human-modified ecosystems can lose substantial amounts of nutrients. This loss can occur through erosion, harvesting and the clipping and leaves that are removed from the lawn. Synthetic fertilisers replace lost nutrients, however, over-fertilisation is a common problem. Because plants can use only a part of the nitrogen present in fertiliser immediately, some nitrogen will be incorporated into the soil, some may change form and be lost as a gas, and some may be lost in drainage water. This can contribute to climate change. Too much nitrogen can reduce the grass plant's disease resistance, reduce its drought and temperature tolerance, and discourage beneficial micro-organisms from doing their job. Some synthetic fertilisers may increase the soil's acidity, limiting important biological and chemical processes.

Pesticides Pesticides have been used to combat three groups of

organisms that may be thought to threaten the lawn: animals, weeds, and fungi. Destroying these organisms discourages lawn diversity, which can be problematic should the few species that are present be weakened by insects or disease. There are other potential problems associated with continuous pesticide use:

- *Pest resistance – resistant stains of target pests may increase, the pest population may become more difficult to control.*
- *Inadvertent pest enhancement*
- *Killing beneficial organisms, reducing productivity. Natural predators and micro-organisms help maintain the health of the lawn.*
- *Pesticide persistence – lethal capabilities may last for a long time in the immediate environment or be transferred to other environments.*

Water Supplies A great deal of the water used for residential purpose goes to watering lawns, even in wet climates. Once water passes through the industrial lawn, it can be contaminated with chemicals and sediments, becoming less usable and possibly destructive to interconnected aquatic ecosystems. For more information on Water Pollution please refer to ENFO leaflet BS11

Solid Waste Grass clippings make up three quarters of yard waste. There is no reason for grass clippings to be considered waste; they can be left on the lawn to be decomposed by micro-organisms, releasing nutrients that are

stored in the grass. Removal of grass clippings can account for the loss of up to 100 pounds of nitrogen per acre of lawn per year. The decomposing of lawn wastes in landfills can produce methane, a powerful greenhouse gas, contributing to global warming. Empty insecticide and herbicide containers are hazardous wastes.

Species diversity When compared to a forest or field, which typically contains a diverse mosaic of plant and animal life, the lawn is a highly simplified ecosystem. The creation of a lawn is therefore synonymous with a reduction of species diversity. The vegetation available for food and shelter often determines animal populations, a lawn provides little in regards to either. With increasing areas of land being converted from natural ecosystems to lawns, more and more species of plants and animals are being restricted to smaller areas, with larger groups of fewer species dominating the landscape.

Alternatives For most people, the lawn is part of our lives and is a considerable investment in both time and money. Before launching a course of action creating an alternative lawn, it is important to assess what you hope to gain by changing your lawn's management and design. The first step is to assess your needs

– determine what role your lawn plays in your life. A good place to start is to survey your existing lawn. Identify how various subsections of your yard are used. Things to consider include

- *recreational uses*



- *views*
- *settings for flowers, shrubs, and vegetable gardens,*
- *sun and shade*
- *wet or dry spots*
- *shallow or deep soils*
- *the climate*
- *vegetation native to the area*

Budget is also a consideration. When making extensive changes, initial costs may be relatively high, but in the long term there will be substantial savings in energy, fertiliser, pesticides, and water costs. Even if you choose to retain your lawn, immediate money saving management strategies include reducing how often you mow, water and fertilise.

Changing lawn care practice

A primary goal of changing lawn management strategies is to make the lawn more dependant on solar energy and on the site's natural growing conditions. Changes might include:

- *Selecting the right grass*
- *Reducing energy, fertiliser, pesticide, herbicide, and water inputs*
- *Selecting an ecologically minded lawn care company.*

Grass Species Lawn grasses include many species and many varieties within species. By selecting varieties appropriate for your local environment and the special circumstances of your lawn, you can minimise the inputs required and the negative environmental impact of the lawn. Adding a non-grass species,

such as clover can be advantageous because of its nitrogen fixing properties, reducing the need for synthetic nitrogen fertilisers. Clover also has attractive white flowers, roots that bind the soil, and can live in harmony with grass. 'Eco- turf' lawn seed mixes contain various grasses, low-growing broad-leaved plants, and flowering perennials which require less maintenance, water and fertiliser than traditional industrial lawns. Common plants in these mixtures include strawberry clover, dandelion, English daisy, and creeping yarrow and thyme. Such mixtures result in a three- to six-inch meadow-like lawn that requires a monthly mowing and watering regime.

Energy and Mowers By using fossil energy more carefully and efficiently, we can begin to reduce the environmental impact of our energy consumption. We can reduce the harmful effect of gasoline-powered lawn care machines by using them less frequently or by considering alternatives. Electric devices have less negative impact than gasoline-powered ones, because pollution is created at the power station rather than your backyard. However, this is not the ideal. Many lawns currently being cut by power mowers could be cut using a non- powered hand-pushed reel mower, which for yards of a modest size requires only slightly more effort than a hand-pushed power mower. A reel mower cuts the grass blade straight across rather than at an angle, resulting in less cut area on the grass blade, thus a lower rate of water loss from the cut. The advantage of longer grass

blades is that they act to shade the soil, reducing evaporation and root stress. Longer grass usually has deeper, more efficient roots which can better withstand drought and disease. In very tall grass, however, hand-pushed reel mowers are not effective, and gasoline-powered rotary mower may be the best option currently available. It is important to keep rotary blades sharp to avoid ripping the blades and increasing water loss. In addition, frequent sharpening and balancing of mower blades can reduce fuel consumption by as much as 22 percent.

Fertilisers Organic fertilisers derived from decomposing organic matter can provide for most of your lawn's needs. The nutrients from such fertilisers are largely insoluble and are released over time by the action of microbes and promote deeper root systems, which can reach more water. There are two sources of organic fertiliser for your lawn – leaving clippings on the lawn, and using compost. Please refer to the ENFO leaflet SG2 on garden compost and leaf mould. By using these two methods of organic fertilisation, you are not only saving on the use of commercial fertiliser but are also reducing solid waste.

Pesticides and Herbicides In general, it is best to avoid pesticide use. If pesticides must be used, however, they should be applied with extreme caution and careful planning. Read all labels and seek advice from qualified individuals. The need for herbicides is influenced by what someone personally consider to be a weed and the degree to which one wishes to eradicate weeds. Integrated Pest

Management (IPM) refers to the combined use of cultural, biological, and chemical strategies (in that order) in dealing with pests.

Reducing amount of lawn in your yard Replacing lawn with low- maintenance herbs, shrubs, or trees reduces the need for any water or chemicals you may be using on the lawn, as well as amount of lawn that must be mowed. Trees and shrubs can also add structural variety and species diversity, attracting birds and wildlife by providing food and shelter. They can also be used as architectural elements, to create spaces or to provide privacy. Consider gravel, wood or brick patios or decks in some parts of the yard. If building a new home, you may want to preserve some of the existing vegetation and blend it with lawn.

When considering lawn replacement plants, it is best to select species that are adapted to where you live that can maintain themselves without added supplements and are suited to the size of your yard. Replacing part of your lawn with vegetable or flower gardens can provide great satisfaction and pleasure. In our efforts to make our lawns greener, all grass, and closely mowed, we are unnecessarily contributing to some of the world's most severe environmental problems. While not all aspects of the lawn are negative, we are more aware of the ecological implications of our modifications of the natural landscape, and are enabled to act to minimise the lawn's harmful effects.

Reference:

Borman *et al.* 2001. Redesigning the American Lawn: A Search for Environmental Harmony. 2nd edition. Yale University Press.



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