

The ultimate city garden

CALIFORNIANS CREATE A SMALL FARM ON A TINY URBAN PLOT

Surrounding an undistinguished old house in Berkeley, California, is a most extraordinary garden. While a parching drought savaged gardens all over California last year, this one remained lush and lovely throughout the dry months while using almost none of the area's dwindling water supply. Even more remarkable, three people living in the house were able to produce most of their food—both meat and vegetable—from their tidy one-fifth acre of urban living space.

The whole setup is the brain child of two University of California ecologists, Helga and William Olkowski. Called the Integral Urban House, the project is spon-

sored by the Farallones Institute, a nonprofit group dedicated to "the design, selection, and integration of living systems that promote diversity and stability." The House's object is to show how urbanites can create self-sufficient environments on small city lots.

While the Olkowskis continue to teach at the University, a director and two students live on the grounds where, with other student volunteers, they mind the garden and try new ways to get even more use out of the space and resources at hand. Although some of the methods work best in California's mild weather, many can be used by home gardeners everywhere.



Tom Javits, the House's resident director, harvests alfalfa from a small field between the street and the wood-chip sidewalk. Alfalfa is grown instead of grass because it needs little care and provides fodder for the rabbits.

A curious passerby examines the sloping sun-sensitive panels above the front door that heat the House's hot water. The mulberry hedge by the front fence will feed silkworms whose cocoons the Olkowskis hope to use as insulation for quilts or clothing. Some 200 visitors tour the garden each week.



In the backyard garden of the Integral Urban House, cofounder Helga Oikowski and a student weed a potato patch near a fruit-bearing quince tree. Visitors standing below the sun-porch-roof garden are listening to a lecture on how the garden functions. Along the fence (left background) runs a row of dwarf fruit trees. At lower right is the corner of an experimental rubber-lined fishpond; its fish feed on dead honeybees that drop from overhead hives. Above the pond, Bibb lettuce and other plants grow in boxed beds that are raised to improve drainage.

The vital roles of simple structures

The small, simply constructed greenhouse that the Olkowskis attached to the side of the Integral Urban House—and the other easily made structures they employ—are vitally important to the operation of the experimental garden. The greenhouse is used to start seedlings whose development is carefully timed so that when a garden crop has been harvested the seedlings

are ready to transplant into the then-vacant outdoor bed. This procedure ensures maximum use of garden space and a year-round supply of produce. If seedlings are transplanted early and need further protection, they are sheltered by temporary mini-greenhouses of wire and plastic (right). Simple wooden trellises (below, right) are used to train mature plants.



In the greenhouse, Helga Olkowski checks an onion seedling in a planter. To make the planter, she cut a quart-sized milk container into open-ended cubes, which were placed in a tray made from a half-gallon milk carton cut in half lengthwise. Seedlings can be removed without damaging the roots.



William Olkowski helps Helga erect a temporary greenhouse. During the uncertain weather of early spring, these tube-tents can be used to protect seedlings. They are made from heavy gauge plastic and flexible wire rods.



A visitor helps to harvest ripe cucumbers that have been trained to grow on an easily made tent-shaped trellis. This device keeps the vines from sprawling across the garden and robbing other plants of sunshine and space.

Putting wastes to work

Recycling everything from bathwater to kitchen scraps makes the garden both green and self-sufficient. While the average American family pours away some 50,000 gallons of water a year, the plumbing in the Integral Urban House saves much of this outflow for a second use. "Gray water" from sinks and tubs flows into a tank (below). Used in moderation, it not only recycles

scarce water but also provides plant nutrients, since dishwashing detergents contain phosphorus, an important element in plant nutrition. In another experiment, urine is collected and, diluted, is used for fertilizer. Similarly, kitchen scraps are saved, then mixed with dead leaves and other plant and animal wastes to make a rich mulch that can be spread around plants.



A hose from the gray-water tank is positioned to soak only the compost surrounding the plants. Organisms in the compost help to decompose harmful elements. The wood chips on the path allow rain to penetrate without causing soil to erode or compact.



A student resident waters dwarf fruit trees with a simple nitrogen-rich solution of five parts water and one part urine.



The temperature of the compost in a bin is carefully checked with a thermometer. As the tightly packed mixture of kitchen scraps, plant debris and animal manure decomposes, it generates considerable heat—about 71° C. or 160° F.—thus killing any microbes or weed seeds and rendering it safe to spread on the garden.

Wearing thick gloves and net-covered headgear, Olkowski gingerly inspects the garden's honey-producing beehives. As the bees die—about 1,000 are born and 1,000 die each day at the peak of the season—their bodies drop into the tank below and are eaten by the fish. Water in the fish tank is aerated by the wind mill next to Olkowski.

Dr. Sterling Bunnell, a Farallones Institute biologist, measures a crayfish. The small crustaceans eat dead bees and weeds; the crayfish and blackfish eat each others' wastes, efficiently using basic nutrients. Both excrete ammonia, nourishing algae, the blackfish's food.



Perfecting the downtown ranch

For the staff at the Integral Urban House, a garden means more than just fruits and vegetables. To their minds, meat, eggs, honey and fish are equally good candidates for backyard cultivation. Chickens and rabbits are kept in cages that are located along the cool north side of the house. The rabbits—long considered a delicacy in Europe—are a perfect urban food animal,

since they take up little room and can produce as many as 50 offspring per female each year.

Some chickens are also raised for meat, but eight hens are kept for the 30 eggs they produce weekly. The fish tank nurtures primarily blackfish, a native fresh-water fish, and native crayfish, while the beehives produce up to 25 quarts of honey a year.



Two grown rabbits and three babies in one of the wire cages munch on alfalfa cut from the Integral Urban House's lawns. The elevated cages have wire bottoms so that the droppings can easily be collected and recycled for fertilizer.



A hen lunches on a snail, a common garden pest. Overturned flowerpots serve as traps for these spoilers. Other pests are thwarted by attracting insect-eating predators, and most seedlings are started indoors so that they will be leafy enough to withstand minor attacks from hungry insects.



Spread on the table in the pleasant kitchen of the Integral Urban House is the bounty from just a single day's harvest. It includes a basket of eggs, red and yellow onions, cucumbers, squash, Swiss chard, carrots and lettuce, as well as a few handfuls of strawberries.



The House's pantry is stocked to overflowing with produce of the efficient organic garden. The preserved fruits and vegetables include pickled cucumbers, plums, peaches and apricots. A string of braided garlic and dried sprigs of herbs hang from nails on the shelves.