Edible Landscapes Grow Healthy Children, Families and Communities

Pete Melby, ASLA, Professor, Landscape Architecture
Sylvia H. Byrd PhD, RD, LD, Professor, Department of Food Science, Nutrition and Health Promotion
David Nagel, PhD, Extension Professor, Department of Plant and Soil Sciences
Andrew D. Frugé, MS, MBA, Graduate Research Assistant, Department of Food Science, Nutrition and Health Promotion Mississippi State University

Obesity increases the risk for chronic diseases, threatens the overall health of children, families and communities and is a major public health concern. More than one-third of adults and one out of every six children/adolescents in the United States are obese according to recent national data. Obesity is associated with increased incidence of diabetes and cardiovascular disease and risk for disability. It is plausible, that a gene-environment interaction, where genetically susceptible individuals respond to an environment with increased availability of palatable, energy dense foods and decreased opportunities for physical activity contributes to the current prevalence of obesity.

Substantial changes are required in communities and diet to ameliorate health outcomes. Community planners hold the key to changing the way communities and families view their environment. The purpose of this paper presented by a landscape architect, horticulturist, and dietitian is to propose an environment where high quality, nutrient dense fruits and vegetables and opportunities for physical activity are invasive and pervasive through creating edible landscapes.

Fruit and vegetable consumption declined significantly over the last three decades. Nationally, fewer than half of Americans report eating five or more servings of fruits and vegetables on five or more days per week. The health benefits associated with fruit and vegetable consumption are growing rapidly. Increased fruit and vegetable consumption has been documented to decrease the risk of chronic diseases such as cancer, heart disease, and stroke. Evidence is also emerging with regard to a positive association for fruit and vegetable consumption and reduction in the risk of cataracts, diverticulosis, chronic obstructive pulmonary disease, and hypertension. More needs to be accomplished to improve the food environment such as access, availability and affordability of fruits and vegetables. Edible landscapes can generate an interest in fruits and vegetables which may influence food choices and diet quality.

Currently, only about 37% of households in the United States have food gardens. A resource has been developed to teach individuals how to create, grow, and manage a food producing landscape. The Home Food Production Garden resource and Food Servings calculator (www.energyusereduction.com) is the product of an interdisciplinary collaboration which includes nutritionists, horticulturists, and a landscape architect.

The landscape of a home on a ¼ - ⅓ acre lot receiving full sunlight can grow enough vegetables and fruit to provide four family members with five vegetable and fruit servings a day for a year. To accomplish this, fruit producing trees, bushes, and vines along with raised beds, the cornerstone of home vegetable production are located in the home landscape. Food producing components can be blended into the landscape so that traditional home landscape needs are accommodated such as having a central open space for playing, growing flowers, and social get-togethers.

Accommodation of edible landscapes in the future might be enhanced through planning considerations that protect the home landscape’s access to sunlight. All-day sunlight is best for food production, and also for solar hot water production, passive home heating with sunlight,
and for the direct production of electricity through the use of solar panels. Particular topics needing evaluation are ultimate tree sizes and locations to eliminate shading of food gardens, layout of streets and lots for best solar energy access, ideal lot widths and shapes for best food garden production, the impacts of two story housing on solar access, and evaluation of building setbacks in order to obtain more concentrated space with full sunlight throughout the day.

Growing all the vegetables and fruit servings for a family of four in the home landscape is dependent on raised beds to provide the right amount of vegetables. They should be 3 feet wide and 40 feet long. Edges can be made with 2x6 boards or other materials. After filling the beds with a suitable soil and mixing the fill soil with the existing soil, the garden is ready for planting. The reason the beds are raised is so the running grasses prevalent in the Southeast will not grow into the garden, and also so the bed area will serve as a defined space for seasonally adding organic matter needed to create the ideal soil environment for growing vegetables. The 3 foot width creates a bed that can be managed by reaching across, and without having to step on the soil. This is important because the voids in soil are where the roots grow. Porous soil voids also serve as conduits for air, water, and nutrients – all critical needs of productive garden plants. Stepping on soil compresses soil voids thereby restricting the movement of essential plant needs and reducing optimum plant growth.

The *Home Food Garden Production* resource explains garden management that works toward creating an ideal-for-gardening soil environment. Management of the highly productive raised vegetable beds consists of creating compost nearby to apply around garden transplants as seedlings emerge during each of the 3 growing seasons in the southeast. Organic yard waste like leaves, pine straw, and grass clippings can be taken from the home landscape waste stream and converted to plant nutrients through the action of microbes. This “compost” provides another valuable job by covering the soil to suppress photosensitive weed seeds. Applying compost creates a friable soil environment which allows weed to be easily picked-out and allows for cultivating garden soil with only a hoe. No longer is there a need for the ubiquitous garden tiller except during construction the raised beds to initially mix the raised bed soil with existing soil. Scarifying the existing soil will allow the raised bed soil to drain better and for plant roots to extend into the native soil type. Open and easy-to-work garden soil is dependent on the seasonal addition of compost.

In the southeast United States it is possible to have a spring, summer, and fall vegetable garden which produces a large variety of cool and warm season vegetables. The cool season gardens can contain lettuces, greens, radishes, rutabagas, broccoli, carrots, cauliflower, potatoes, and Brussels sprouts. The summer warm season garden can host tomatoes, squash, cucumbers, eggplant, peppers, beans, peas, and okra. A large variety of garden vegetables provides diversity for best health and enjoyment.

Laying out a home food garden and creating raised beds for vegetable production is illustrated and explained in the *Home Food Production Garden* resource. Although developed for the hot-humid climate zone of the southeast United States, the gardening resource has general application to other regions as well. The format shows what to plant in which of the three
garden growing seasons – spring, summer, and fall. Along with plant spacing, the amount of food ready to eat is provided per linear foot of a row for specific vegetables, and per tree and bush for fruit. The quantification of food servings enables the garden planner to plan a garden that will grow the amount of food necessary to meet a family’s best nutritional needs.

As an example, a family of four, consuming five vegetable and fruit servings a day will need 7,300 servings a year. An average spring garden in the raised beds can produce 1,266 servings, while the average summer garden can produce 746 servings and the fall garden 1,164 servings. The vegetables selected for each season’s garden will affect the amount of food servings produced and nutrient availability. On average, the three-season raised beds can produce 3,176 servings of vegetables each year. To meet the 7,300 servings needed by the family each year, the remaining 4,124 servings can be supplied through the planting of fruit producing trees, bushes, and vine crops, including pear, peach, plum, and fig trees, and blueberry bushes. Grape arbors can host the production of grapes and muscadines, and vining fruits including cantaloupe and melons can be grown either in additional raised beds along the property border, or on vertical trellis-gardens. The Food Servings Calculator, a component of the Home Food Production Garden resource, allows the gardener to plan the linear feet of raised bed to be devoted to each of the vegetables selected to be grown, and to plan how many fruiting plants are required in the food garden to meet the family’s need for vegetables and fruit. In addition to being rewarding, an edible landscape will help protect families from food security concerns, allow for interaction with nature, and provide opportunities for physical activity while having fun while growing your own food.

Planning the edible landscape to meet individual nutrient needs is also important. Deciding which vegetables to plant each season should be based on variety, yield, and personal preference. Choosing a variety of different vegetables will provide multiple vitamins, minerals, antioxidants, and phytochemicals, many that the human body can store for multiple months. In the fall and spring gardens, leafy green vegetables are essential for obtaining and storing the fat soluble vitamins A, E, and K. Cruciferous vegetables provide a number of minerals as well as Vitamin C. Very rich flavors come from starchy roots, tubers, and winter squash, as well as potassium and otherwise absent caloric density. In the summer, numerous unique nutrients can be found in the nightshade family, ranging from purple eggplant, to red tomatoes, and peppers of all colors and heat. Melons can also be grown in the summer and are both nutritious and refreshing.

While most families already have preferences for many of vegetables and fruits, it is important to plant a few feet each season of a new or less favorite vegetables to increase exposure. It is important to re-expose yourself and especially children to different flavors and textures. Research shows that 10 to 15 exposures to a new food are required for individuals to accept an unfamiliar flavor. Edible landscapes provide a perfect opportunity to introduce new fruits and vegetables. Acceptance of new foods is higher when the individual has participated in the growing and/or meal preparation of the food.
After choosing which fruits and vegetables to plant, it is important to consider the average yield per foot of each vegetable type, as well as how soon it will be ready to harvest. In the winter, you can continually harvest mustard greens, Swiss chard, and kale, even cauliflower and broccoli to a degree, but cabbages, potatoes and root crops will typically be a one-time harvest toward the end of the season. It is important to stagger your planting and to plan ahead for large harvests, using freezing and canning techniques to prevent spoilage and loss.

In addition to eating fresh, home produced food, food produced in the home landscape will also have to be preserved. Our team’s approach to food preservation combines interesting old methods with new approaches to preserving food through freezing, canning, and drying. There are effective and time-honored family traditions centered on gardening and food preservation. This is necessary in order to have food quantity and variety for 12 months of the year. A schedule will be provided to illustrate how to preserve and store all the vegetables and fruit for a family that is grown in their own home landscape.

Communities and public facilities can also incorporate edible landscapes as an alternative to strictly ornamental plantings. Edible plants can be just as attractive while also producing fruits and vegetables. Edible landscapes can be used to empower individuals, families and communities to learn about food production and influence awareness of seasonally available fruits and vegetables and how availability affects food choice and diet quality.

Edible landscapes can be utilized for development of school gardens. These gardens can be used to teach math, science, and writing across the curriculum. Experiential learning has been shown to be effective in changing behavior. Utilization of edible plantings may be effective in teaching children about seasons, principles of gardening, and ease of growing their own food.

Edible landscapes provide fresh fruits and vegetables which can be eaten right after harvest. Having fruits and vegetables right outside your home, office or business may increase consumption of fruits and vegetables. Research is beginning to document the complexity of the factors involved with consumption of fruits and vegetables, but more is need to identify the causal relationship and effective policy interventions. Community resources available to assist with selecting, growing and preserving food can be found from the Cooperative Extension Service, Master Gardeners, Landscape Architects, Landscape Contractors, and Registered Dietitians.

Additional benefits of edible landscapes include protecting the environment and improving quality of life leading to long term economic benefit. Producing your own food is cost effective and utilization of public space provides greater access. Traditional community waste streams consisting of regular yard waste, such as bagged leaves, pine needles, and grass clippings, are all organic sources of carbon and the micronutrients needed by food plants and can be easily recycled for home or community food production gardens. Carbon footprint can be reduced by consuming locally grown foods. Consumers value high quality foods produce with low environmental impact. Local access, availability of affordable fruits and vegetables may increase awareness and improve diet quality and food security.