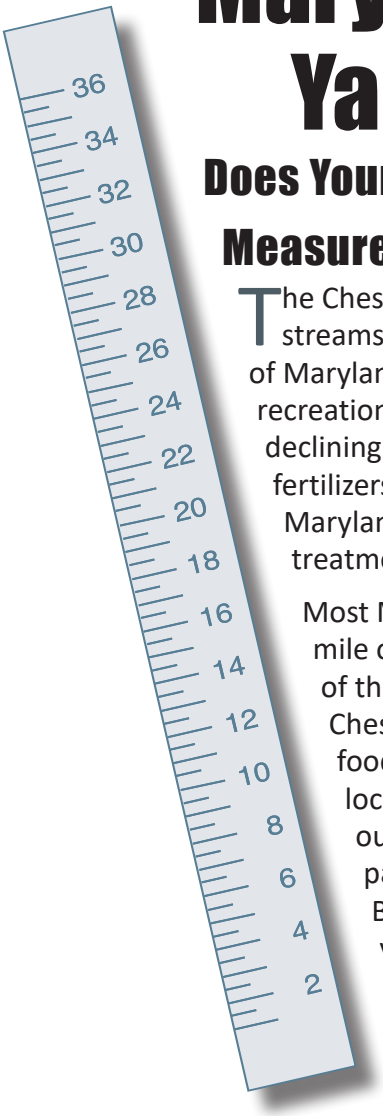
UNIVERSITY OF MARYLAND EXTENSION | BAY-WISE

A MASTER GARDENER PROGRAM

Bay-Wise Maryland Yardstick



Does Your Food Garden Measure Up?

The Chesapeake Bay, its rivers, and tributary streams play an important role in the lives of Marylanders by providing us with food, recreation, and commerce. Our waterways are declining due, in large part, to air pollution and fertilizers, manures, and other pollutants from Maryland homes, landscapes, farms, sewage treatment plants, and industry.

Most Maryland residents live within a half-mile of a storm drain, stream, or river. Most of those waterways eventually drain into the Chesapeake Bay. What we do in our own food gardens can affect the health of our local waterways, the Chesapeake Bay, and our environment. We all need to do our part to take care of our waterways. By changing a few simple practices, you and your family can help keep our Maryland water healthy.

extension.umd.edu/bay-wise

Are you a Bay-Wise homeowner?

Gardeners can contribute to a cleaner local waterway, Chesapeake Bay, and environment by using several climate resilient approaches.

- ***Feed the Soil/Fertilize Wisely***
- ***Water Efficiently***
- ***Plant Wisely***
- ***Compost Yard and Kitchen Wastes***
- ***Protect the Soil with Mulch and Cover Crops***
- ***Manage Garden Pests and Diseases with Integrated Pest Management (IPM)***

Directions: Listed in this brochure are management practices and approaches designed for food gardens. Read through the choices carefully. Select those actions that you have already taken in your garden. Mark off your credits on the yardstick on the cover as you complete each action. Your goal is to reach or exceed 36 inches. Then, complete the table at the end of the application to total your score and follow the instructions to return to your local University of Maryland Extension Office.

Feed the Soil/Fertilize Wisely

Many vegetable crops are annual plants with a relatively short lifespan in the garden, have fairly shallow root systems, and compete poorly with weeds for water, light, and nutrients. They require deep, fertile soil for maximum root growth and a sufficient supply of nutrients. “Feeding the soil” means adding organic matter (e.g., compost, dead plants, cover crops) on a regular basis. The organic matter is food for a wide range of soil microorganisms and invertebrates, like earthworms. This dynamic and unseen web of life in the soil is responsible for the slow but steady release of nutrients taken up by plant roots. Organic matter also improves soil structure, resulting in improved water holding capacity, air movement, and root growth.

To get the most out of their vegetable patch, some gardeners apply water-soluble, quick-acting fertilizers. However, fertilizers can be harmful to the environment and your garden if not used properly. When applied at the wrong time or over-applied, fertilizers can burn plants or promote excessive growth making them more susceptible to diseases and pests. Excess nitrogen and phosphorus (two components of fertilizers and manure) can pollute ground water and surface water (ponds, streams, rivers, and the Chesapeake Bay).

Actions:

☐ Test your soil. Fertilize and lime according to the soil test recommendations. Detailed soil testing information is available on the Home & Garden Information Center (HGIC) website. A basic test that includes lead is recommended. **Credit: 4 inches**

- ☐ Add 3 to 6 inches of organic matter (compost or well-aged manure) into a new garden, preferably in the fall. This will improve soil tilth (the soil will become lighter and looser and warm up more quickly). Soil organic matter also helps the soil hold and release water and nutrients for improved plant growth. **Credit: 3 inches**
- ☐ Add organic matter into your garden yearly. Regular additions of organic matter can make fertilizer applications unnecessary. Do not add fresh manure to vegetable beds during the spring and summer. **Credit: 3 inches**
- ☐ Always read and follow fertilizer label directions. **Credit: 1 inch**
- ☐ Avoid over-application of nitrogen because it can promote excessive foliar growth at the expense of fruit production and can encourage insect pest feeding. **Credit: 1 inch**
- ☐ If needed, lightly fertilize leafy greens and other "heavy feeders" like broccoli, potato, tomato, and pepper once or twice during the season to increase yields. Soybean, cottonseed, and alfalfa meals are examples of widely available organic fertilizers. **Credit: 2 inches**

Water Efficiently

Many Bay-Wise Marylanders reduce water loss by mulching and using drip irrigation and soaker hoses. Irrigate only when your garden needs it. Since vegetable plants are 75 to 90% water, they require regular watering when rainfall is insufficient. Efficient watering is important to reducing runoff and maintaining a healthy Maryland garden.

Actions:

- ☐ Vegetable plants require 1 inch of water each week for optimum growth. This water may be supplied by rain or irrigation. (A rain gauge is helpful for measuring water.) **Credit: 1 inch**
- ☐ Water in the morning to conserve water (the heat of the day causes high water losses to evaporation). Morning watering also reduces potential disease problems (evening watering encourages diseases by keeping leaf surfaces wet). **Credit: 1 inch**
- ☐ Apply ½ to 1 inch of water at a time (30 to 60 gallons per 100 sq. ft.), but never more than the soil will absorb. Stop watering when water begins to run off. Long, slow soaking applications are good. Short, frequent, shallow applications may encourage a shallow root system in long-season crops such as tomato, which can make plants more susceptible to drought damage. However, quick growing, leafy greens with shallow root systems require frequent and shallow irrigation. **Credit: 1 inch**

- ☐ Direct water to the soil at the base of the plant. Excess water on the leaves increases the potential for foliar diseases. **Credit: 1 inch**
- ☐ Occasional overhead watering, during hot, dry weather, can help to cool plants, reduce spider mite populations, and provide moisture for beneficial insects and spiders. Only water overhead in the morning or early afternoon to allow leaves time to dry. **Credit: 1 inch**
- ☐ Provide adequate moisture during the critical times of the plant's life: during the first few weeks of seedling growth, immediately after transplanting, and during development of the edible plant parts. **Credit: 2 inches**

For gardens that use an irrigation system (sprinkler, soaker hose, or drip irrigation):

- ☐ Use a soaker hose or drip-irrigation system to conserve water in garden beds. Cover soaker hoses with mulch or soil. **Credit: 2 inches**
- ☐ Calibrate your irrigation system to apply no more than 1 inch of water per application per week. **Credit: 1 inch**
- ☐ Re-direct stormwater to prevent heavy rains from carrying away soil, nutrients, and mulch. **Credit: 1 inch**
- ☐ Periodically check all hoses, fittings and connections. Ensure that water is flowing properly and fix leaks. **Credit: 1 inch**
- ☐ Rain barrel water is not potable (safe to drink) and may contain contaminants, such as animal droppings, that create human health risks. Apply rain barrel water to the soil around landscape plants rather than directly to edible plants. **Credit: 1 inch**

Plant Wisely

A good garden location will result in healthy plants and reduce negative environmental impacts. Most vegetables require a minimum of 6 to 8 hours of direct sunlight. Late afternoon shade is beneficial for vegetable gardens located in warm urban locations.

Actions:

- ☐ Create your garden on level ground to prevent soil and nutrients from running off OR create terraces on sloped ground. **Credit: 1 inch**
- ☐ Use raised beds to increase garden productivity. Raised beds make better use of available space, warm up faster in spring, and allow greater root growth than in-ground garden beds. **Credit: 1 inch**
- ☐ Locate the garden away from trees. Tree roots will compete with vegetables for water and nutrients. **Credit: 1 inch**

Compost Yard and Kitchen Waste

Organic materials such as vegetable & fruit peelings, egg shells, tea & coffee grounds, grass clippings, fallen leaves, and yard trimmings should be composted rather than thrown away. Composting these materials allows you to recycle plant nutrients, reduce pressure on landfills, and decrease fertilizer use. Fallen leaves and dried grass clippings can also be used as mulch.

Action:

- ☐ Create and maintain a compost pile. When collecting materials for your compost pile, avoid weeds with seed heads, diseased plants, pet waste, and animal products. Kitchen scraps can be added to a worm bin (vermicomposting), buried in a compost pile if the practice is allowed in your jurisdiction, or safely buried in garden soil where they decompose, releasing nutrients for uptake by plant roots. **Credit: 4 inches**
- ☐ Add a 1/2 inch to 1 inch layer of compost into soil between crops, after one crop is removed and before the next one is planted. **Credit: 2 inches**

Protect the Soil with Mulch and Cover Crops

Mulching retains soil moisture, moderates soil temperature, and helps prevent erosion and weeds. Cover crops hold soil in place, reduce nutrient losses, add organic matter, and enhance the soil food web.

Actions:

- ☐ Maintain 2-3 inches of organic mulch (e.g. straw, leaves, newspaper, grass clippings, compost) around plants and in walkways. Note: deeper mulch may prevent water from getting to plant roots. **Credit: 2 inches**
- ☐ Minimize soil disturbance (tilling and cultivation) to prevent weeds, reduce erosion, and store soil carbon. **Credit: 2 inches**
- ☐ If tilling or cultivation are necessary, avoid working in wet soil as this can damage soil structure. How to determine the right time to cultivate: Squeeze a handful of soil. If it remains in a ball and does not easily break apart, it is too wet; if it breaks apart easily, it is ready for cultivation. **Credit: 2 inches**
- ☐ Create pathways to walk on between vegetable beds. Prevent soil compaction and encourage healthy root systems by not walking on the beds. **Credit: 2 inches**
- ☐ After the growing season, prepare vegetable beds for winter by covering the soil with a thick layer of mulched leaves. **Credit: 3 inches**
- ☐ Plant a cover crop such as oats, winter rye, winter wheat, barley, crimson clover, forage radish, or hairy vetch. Planting cover crops in September gives them time to grow before the winter months. **Credit 3 inches**

Manage Garden Pests and Diseases with Integrated Pest Management (IPM)

It's unrealistic to strive for a pest- and disease-free garden. Pesticides may provide effective treatment of serious and persistent pest problems, but they should not be used routinely or indiscriminately. Improper use of pesticides can result in pest resistance and can harm humans, pets, beneficial organisms, and groundwater. Integrated Pest Management (IPM) is a comprehensive approach to managing pests. It involves understanding the life cycle of potential pests and the ability to accurately diagnose plant problems. At least half of all observed plant problems are not caused by insects or disease. They are caused by cultural and environmental factors (e.g. old seed, drought, excessive shade, compacted soil).

The steps of IPM include regular monitoring for signs of plant problems and insect pests. Most mature vegetable plants can produce a decent crop even with some loss of leaves to insect feeding and disease. Identifying pest problems and preventing them before they occur is the best means of control. If pesticides are warranted, select least-toxic "bio-rational" materials like insecticidal soap, horticultural oil, and Bt (for caterpillar pests).

Actions:

- ☐ Avoid routine applications of pesticides. Applying insecticides is always the last resort. Treat only affected plants rather than spraying your entire garden. Spray in the early evening and never spray plants with flowers. **Credit: 1 inch**
- ☐ Check plants regularly. Make it a habit to walk in your garden at least twice each week to look for signs of problems. Look at leaf surfaces and undersides for any insects, egg masses, or disease problems. A hand lens can be helpful when performing this inspection. **Credit: 1 inch**
- ☐ Learn to identify three beneficial insects that provide natural control of harmful pests. List them: _____, _____ &_____. **Credit: 3 inches**
- ☐ When necessary, use environmentally friendly pesticides such as horticultural oil, insecticidal soap, Bacillus thuringiensis (Bt), and neem as an alternative to more toxic pesticides. **Credit: 4 inches**
- ☐ Hand pick insect pests (adults, larvae, and egg masses) and diseased leaves off plants rather than using a pesticide. **Credit: 2 inches**
- ☐ Use floating row covers to exclude insect pests on vegetables. Remove covers from squash, melon and cucumber crops during bloom to ensure pollination. **Credit: 2 inches**
- ☐ Remove plant debris and diseased plants at the end of the growing season to prevent the spread of disease from one season to the next. **Credit: 2 inches**

☐ Choose insect- and disease-resistant varieties to reduce potential need for pesticides. **Credit: 2 inches**

☐ Erect a suitable fence if deer, groundhogs or rabbits are a problem in your garden. **Credit: 2 inches**

☐ Attract beneficial insects to your garden by planting lots of herbs and flowering annuals and perennials in and around your garden. Choose plants that provide habitat, nectar, and pollen. Many herbs that attract beneficial insects are edible. Examples include anise, basil, coriander, dill, fennel, mints, anise hyssop, parsley, sage, and thyme. **Credit: 1 inch**

Total Your Score!

Section	Score
Feed the Soil / Fertilize Wisely	
Water Efficiently	
Plant Wisely	
Compost Yard and Kitchen Wastes	
Protect the Soil with Mulch and Cover Crops	
Manage Garden Pests and Diseases with Integrated Pest Management (IPM)	
TOTAL	

Please return this completed brochure along with your completed application to your local University of Maryland Extension Office. Master Gardeners will review your information and contact you to schedule a certification site visit. To find your local office, visit:
extension.umd.edu/locations

UNIVERSITY OF MARYLAND EXTENSION | BAY-WISE
A MASTER GARDENER PROGRAM

BAY-WISE

A MASTER GARDENER PROGRAM

Wanda MacLachlan • Area Educator—Environmental Management

Jon Traunfeld • Extension Specialist—Fruits & Vegetables

Have a pest or gardening question?

University of Maryland Extension's Home & Garden Information Center (HGIC) website has lots of great gardening information including videos, factsheets, photos, e-newsletter, and the Maryland Grows blog. You can even send your gardening and pest questions (and photos) 24/7 to HGIC through the Ask an Expert service. To learn more, visit

extension.umd.edu/hgic

*Please visit **extension.umd.edu** to find out more about Extension programs in Maryland.*

Client:_____

Date: _____ Score: _____